SARAJI EAST MINING LEASE PROJECT

Environmental Impact Statement

AppendixJ-1

Traffic and Transport Impact Assessment

BMA

BHP Mitsubishi Alliance

Prepared for
BM Alliance Coal Operations Pty Ltd
ABN: 67096412752

Environmental Impact Assessment

Appendix J-1 Traffic and Transport Impact Assessment

27-Oct-2023
Saraji East Mining Lease Project

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Environmental Impact Assessment

Appendix J-1 Traffic and Transport Impact Assessment

Client: BM Alliance Coal Operations Pty Ltd

ABN: 67096412752

Prepared by

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27-Oct-2023

Job No.: 60507031

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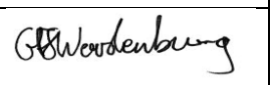
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Table of Contents

Executive Summary i
Abbreviations iv
1.0 Introduction 1
1.1 Project description 1
1.2 Objectives 1
2.0 Scope of assessment 3
2.1 Overview 3
2.2 Road infrastructure 3
2.3 Rail infrastructure 3
2.4 Port infrastructure 3
2.5 Airport infrastructure 3
3.0 Legislation and policy 4
3.1 Transport Infrastructure Act 1994 4
3.2 Transport Operations (Road Use Management) Act 1995 4
3.3 Local Government Act 2009 4
3.4 Guide to Traffic Impact Assessment 4
3.5 Australian Level Crossing Assessment Model 4
3.6 Planning Act 2016 and Planning Regulation 2016 5
4.0 Methodology 6
4.1 Assessment horizon and assessment years 6
4.2 Traffic impact assessment 6
4.2.1 Access 7
4.2.2 Intersections 7
4.2.3 Highway link capacity 8
4.2.4 Pavements 8
4.2.5 Road Safety 9
4.3 Rail impact assessment 10
4.4 Port infrastructure 10
4.5 Airport infrastructure 10
5.0 Description of environment values 11
5.1 Development context 11
5.1.1 Site location 11
5.1.2 Project road transport routes 11
5.1.3 Project rail transport route 11
5.1.4 Project air transport route 11
5.1.5 Project port transport route 11
5.1.6 Road transport network 13
5.2 Development details 20
5.3 Traffic volumes 21
5.3.1 Background traffic 21
5.3.2 Construction traffic 24
5.3.3 Operation traffic 28
5.4 Development traffic 31
5.5 Total traffic 34
5.6 Crash history 36
5.7 Scheduled road improvement projects 37
5.8 School bus routes 37
5.9 Rail transport networks 37
5.10 Air transport networks 37
5.11 Sea and shipping transport networks 37
6.0 Potential impacts 38
6.1 Overview 38
6.2 Road transport 38
6.2.1 Intersection assessments 38
6.2.2 Highway Link assessments 69

6.2.3 Level crossing assessments 74
Assessment of regional road network 76
Pavement impact assessment 79
Emergency services operations 82
6.2.4 Road safety 82
6.3 Rail transport 85
6.4 Air transport 85
6.5 Sea transport 86
7.0 Mitigation measures 88
7.1 Intersection 1 – Saraji Road / Lake Vermont Road 89
7.2 Saraji Road Intersection A – Saraji Road / Saraji East Mine Entrance 89
7.3 Intersection 3 – Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road 90
7.4 Air transport 90
7.5 Sea transport 91
7.6 Proposed Level Crossing A 91
7.7 Road use management plan 91
7.8 Summary of mitigation measures 91
8.0 Residual impacts 93
8.1 Intersection 1 – Saraji Road / Lake Vermont Road 93
8.2 Intersection 3 – Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road 93
8.3 Air transport 93
8.4 Proposed Level Crossing A 93
8.5 Summary of residual impacts 93
9.0 Conclusion 95
9.1 Traffic impact assessment 95
9.1.1 Traffic volumes 95
9.1.2 Intersection assessments 96
9.1.3 Highway link assessment 97
9.1.4 Level crossing assessments 98
9.1.5 Pavement impact assessment 98
9.1.6 Emergency services operations 98
9.1.7 Road safety 98
9.1.8 Potential impacts and mitigation measures 98
9.2 Rail impact assessment 99
9.3 Port impact assessment 99
9.4 Air impact assessment 99
10.0 References 100

Appendix A A
Background Traffic A

Appendix B B
Regional Traffic B

Appendix C C
Development Traffic C

Appendix D D
Total Traffic D

Appendix E E
SIDRA E

Appendix F F
Crash Data F

Appendix G G-A
Level Crossing Concept Design G-A

List of tables

Table 1	Transport Impact Assessment Terms of Reference	2
Table 2	Level of Service	8
Table 3	Austroads Risk Matrix	9
Table 4	Frequency / probability of crash	9
Table 5	Severity of crash	9
Table 6	Background traffic (2018) – highway links	22
Table 7	Background traffic (2018) – intersections	22
Table 8	Percentage change in AADT on Peak Down Highway and Saraji Road (2019 reference year)	22
Table 9	Future background traffic – highway links	23
Table 10	Future background traffic – intersections	23
Table 11	Construction workers traffic	25
Table 12	Quantities for construction materials and equipment	25
Table 13	Quantities for construction materials and equipment	26
Table 14	Construction materials and equipment traffic	28
Table 15	Construction traffic summary	28
Table 16	Operation workers traffic	29
Table 17	Quantities for operation materials and equipment	30
Table 18	Operation materials and equipment traffic	30
Table 19	Operation traffic	30
Table 20	Development traffic	31
Table 21	Development traffic – highway links (ordinary day)	32
Table 22	Development traffic – highway links (shift changing day)	32
Table 23	Development Traffic – intersections (ordinary day)	33
Table 24	Development Traffic – intersections (shift changing day)	33
Table 25	Total traffic – highway links (ordinary day)	34
Table 26	Total traffic – highway links (shift changing day)	34
Table 27	Total traffic – intersections (ordinary day)	35
Table 28	Total traffic – intersection (shift changing day)	35
Table 29	Severity of crashes	36
Table 30	Location of crashes	36
Table 31	Crash types	36
Table 32	Relevant planned road improvements in Project Area	37
Table 33	Percentage of development traffic in the total traffic at identified intersections (ordinary day)	38
Table 34	Percentage of development traffic in the total traffic at identified intersections (shift changing day)	38
Table 35	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for 2018 background traffic	40
Table 36	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2021 background traffic	40
Table 37	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2021 / Year 1 (construction) total traffic (ordinary day)	41
Table 38	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2023 background traffic	41
Table 39	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2023 / Year 3 (construction / operation) total traffic (ordinary day)	42
Table 40	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2040 background traffic	42
Table 41	SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for 2040 / Year 20 (operation) total traffic (ordinary day)	43
Table 42	SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for 2018 background traffic	45
Table 43	SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2021 background traffic	45

Table 44 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2021 / Year 1 (construction) total traffic (ordinary day) 46
Table 45 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2023 background traffic 46
Table 46 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2023 / Year 3 (construction / operation) total traffic (ordinary day) 47
Table 47 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2040 background traffic 47
Table 48 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2040 / Year 20 (operation) total traffic (ordinary day) 48
Table 49 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for 2018 background traffic 50
Table 50 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2021 background traffic 50
Table 51 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2021 / Year 1 (construction) total traffic (shift changing day) 51
Table 52 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2023 background traffic 52
Table 53 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2023 / Year 3 (construction / operation) total traffic (shift changing day) 52
Table 54 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2040 background traffic 53
Table 55 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2040 / Year 20 (operation) total traffic (shift changing day) 54
Table 56 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for 2018 background traffic 56
Table 57 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2021 background traffic 56
Table 58 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2021 / Year 1 total traffic (shift changing day) 57
Table 59 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2023 background traffic 57
Table 60 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2023 / Year 3 (operation / construction) total traffic (shift changing day) 58
Table 61 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2040 background traffic 58
Table 62 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2040 / Year 20 (operation) total traffic (shift changing day) 59
Table 63 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for 2018 background traffic 61
Table 64 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2021 background traffic 61
Table 65 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2021 / Year 1 (construction) total traffic (shift changing day) 62
Table 66 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2023 background traffic 63
Table 67 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2023 / Year 3 (construction / operation) total traffic (shift changing day) 63
Table 68 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2040 background traffic 64
Table 69 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2040 / Year 20 (operation) total traffic (shift changing day) 65

Table 70 SIDRA assessment for Proposed Intersection A (Saraji Road / the Project Site Entrance) for FY 2021 / Year 1 (construction) total traffic (shift changing day) 67
Table 71 SIDRA assessment for Proposed Intersection A (Saraji Road / the Project Site Entrance) for FY 2023 / Year 3 (construction / operation) total traffic (shift changing day) 67
Table 72 SIDRA assessment for Proposed Intersection A (Saraji Road / the Project Site Entrance) for FY 2040 / Year 20 (operation) total traffic (shift changing day) 68
Table 73 Percentages of development traffic in the total traffic on identified highway links (ordinary day) 70
Table 74 Percentages of development traffic in the total traffic on identified highway links (shift changing day) 70
Table 75 V/C ratio for background traffic 71
Table 76 V/C ratio for development traffic (ordinary day) 72
Table 77 V/C ratio for development traffic (shift changing day) 72
Table 78 V/C ratio for total traffic (ordinary day) 73
Table 79 V/C ratio for total traffic (shift changing day) 74
Table 80 Estimated vehicle queue lengths at level crossings 75
Table 81 Development traffic as a percentage of background traffic on regional road network (ordinary day) 76
Table 82 Development traffic as a percentage of background traffic on regional road network (shift changing day) 76
Table 83 Volume / capacity ratio for total traffic on regional road network (ordinary day) 78
Table 84 V/C ratio for total traffic on regional road network (shift changing day) 79
Table 85 Preliminary pavement impact assessment results – development traffic (loaded) 80
Table 86 Preliminary pavement impact assessment results – development traffic (unloaded) 81
Table 87 Number of workers at Moranbah Airport on shift changing day 85
Table 88 Capacity of coal terminals 86
Table 89 Number of additional ships during maximum production of 8 Mtpa 86
Table 90 Summary of resultant risks and mitigation measures 92
Table 91 Summary of residual risks 94
Table 92 Project traffic generation 95
Table 93 Worst traffic condition in identified intersections 96
Table 94 Worst traffic conditions on identified highway links 97

List of figures

Figure 1 Regional Context 12
Figure 2 Road network study area 14
Figure 3 Railway level crossings 15
Figure 4 SIDRA layout for Intersection 1 39
Figure 5 SIDRA layout for Intersection 2 44
Figure 6 SIDRA layout for Intersection 3 49
Figure 7 SIDRA layout for Intersection 4 55
Figure 8 SIDRA layout for Intersection 5 60
Figure 9 SIDRA layout for Proposed Intersection A 66
Figure 10 Regional road network 77
Figure 11 Concept Proposed Intersection A – Saraji Road / Saraji East Mine Entrance 84
Figure 12 Coal terminals 87

Executive Summary

This Traffic and Transport Impact Assessment Report has been prepared by AECOM Australia Pty Ltd (AECOM) on behalf of BM Alliance Coal Operations Pty Ltd (BMA) to assess the traffic and transport impacts associated with the Saraji East Mining Lease Project (the Project) as part of an Environmental Impact Statement (EIS). This assessment has been completed to address the traffic and transport matters specified in the *Saraji East Mining Lease Project: Final terms of reference for an environmental impact statement* (Department of Environment and Heritage Protection (DEHP), 2017).

The Project is a greenfield single-seam underground mine development with the capacity to mine up to 11 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal and produce up to eight Mtpa of product coal.

The Project will be divided into construction and operation stages. The construction period is assumed to be in the order of three years, with the majority of construction work occurring over Year 2 and Year 3 of construction. Mining operation is expected to commence in Year 3 of construction and will continue operating for approximately 20 years. The total length of the Project considering both the construction and operation phases is expected to be approximately 22 years.

This assessment was originally undertaken with the understanding that construction of the Project commenced in 2021. As a result, the assessment years of Financial Year (FY) 2021, FY2023 and FY2040 were selected as being years in which the maximum development traffic was anticipated. Given the length of the EIS process to date and the uncertainty of actual timing, the Project will be assessed based on the timing assumptions adopted to date for impact assessment purposes. This assessment has been carried out in accordance with the Project's Terms of Reference (ToR) and updated in response to submissions on the Draft EIS.

BMA will only be able to commence construction following grant of relevant approvals and a business decision and financial investment to proceed with the Project. Should the remainder of the Project assessment process be resolved quickly, with Project construction can be assumed to commence this year (Year 1), and mining assumed to commence in 2025 (Year 3), with full operation anticipated in the third year of operations (Year 3) through to end of mining (Year 20). Prior to construction, BMA will undertake a revised Traffic and Transport Impact Assessment with new traffic counts and updated assessment years prior to construction to inform secondary approval requirements.

Methodology

The major mode of transport potentially impacted by the Project is the Queensland road network and was the focus of this impact assessment. Other transport modes, including air, rail and sea, have been considered to identify their relevance to the Project.

The assessment of road impacts has been undertaken based on the *Guide to Traffic Impact Assessment (GTIA)* released by the Department of Transport and Main Roads (DTMR) in 2018. The GTIA outlines the principles and framework for undertaking traffic impact assessments for the State-Controlled Road (SCR) network. It also provides advice on mitigation strategies to address impacts.

The assessment methodology adopted for this component of this report is summarised in the following key tasks:

- broadly identify the existing transport infrastructure which may be impacted by the Project
- estimate the traffic generation associated with the construction and operation phase of the Project and the distribution of this traffic on the identified road network
- assess the potential impact of the Project on the surrounding transport infrastructure (highway link capacity and intersection assessment) during the construction and operation phase
- identify potential mitigation and management strategies to be implemented during the construction and operation phase to offset the impact of the proposed Project (if required).

The methodology adopted for assessments of other transport modes included desktop reviews of the current infrastructure and services including port facilities, aircraft capacity, train movements and rail

infrastructure (level crossings). It identified level of demands of the transport modes, potential impacts, safety issues and mitigation measures.

Traffic Impact Assessment

The assessment shows that Project traffic is anticipated to exceed 5 per cent of the background traffic volumes. While this level of traffic is considered material, the assessment concluded that all highway links and intersections are anticipated to operate within capacities and without significant congestion, delays or queuing. Therefore, the impact to efficiency and operation of the road network is predicted to be minimal.

Level crossing assessments were undertaken to understand the potential impacts to road traffic, specifically vehicle queuing due to activation of the level crossings during peak traffic periods and the impact thereof on adjacent closely spaced intersections. The assessment concluded that Level Crossing A on the Saraji East Mine access roads may not have sufficient storage to contain the estimated vehicle queues.

This assessment proposed several mitigation measures including:

- auxiliary turn lanes on Saraji Road to store vehicles
- stagger the workers' rosters to minimise number of vehicles at the level crossings
- vertical realignment of Saraji Road to increase queuing distance between Saraji Road and Goonyella Rail alignment.

It is noted that the rail authority may undertake Australian Level Crossing Assessment Model (ALCAM) assessments for all affected level crossings during the detailed design stage to determine the required level of safety protection.

A road safety assessment was also performed. The assessment identified several intersections and highway upgrades on Saraji Road and Lake Vermont Road. It is also recommended that a Road Safety Audit be undertaken for the proposed road infrastructure upgrades during the detailed design stage. The upgrades are considered necessary, and implementation would contribute to maintaining the long term safety of road users.

Given the length of the EIS process to date and the uncertainty of actual timing, BMA will make the following commitments in relation to the Project's Traffic Impact Assessment (TIA) and road safety audit:

- During the detailed design phase and no later than 6 months prior to construction, in consultation with DTMR, BMA will prepare an updated Traffic Impact Assessment including, amongst other things a Road Use Management Plan, in accordance with Section 7.6 of the GTIA and in consultation with DTMR, and implement agreed management and / or mitigation measures.
- During the detailed design phase and no later than 6 months prior to construction, in consultation with DTMR, BMA will undertake a road safety audit in accordance with Part C – section 9 of the GTIA and implement identified mitigation measures.

Pavement Impact Assessment

The assessment concluded that the significant Equivalent Standard Axle (ESA) loads generated by the Project traffic warrant a Pavement Impact Assessment (PIA). It should be undertaken during the detailed design stage with full consultation with DTMR and Isaac Regional Council (IRC). The conclusion of the PIA will inform the level of contribution and/or pavement improvement works required.

Emergency services operations

The assessment concluded that Project heavy vehicles are typically road trains and articulated vehicles and it is not expecting any Over-Size-Over-Mass (OSOM) vehicles. Therefore, it is anticipated that vehicle manoeuvring should not be restricted on the road network. It is concluded that the Project will not impede emergency services operations.

Air transport

The assessment concluded that it is anticipated that the demand for air travel for workers will increase during the construction and operation stages of the Project. During operations, the Project will result in up to 15 additional trips per week. This increase can be accommodated within the existing capacity of the Moranbah airport.

Sea transport

Product coal from the Project will be exported via either Hay Point Coal Terminal or Abbot Point Coal Terminal. The product coal shipped via these ports will be within the approved port and shipping capacity and throughput limits, as such no additional impacts to the surrounding environment are expected as a result. The preferred coal export terminal will be a part of commercial discussions between BMA and the relevant port authorities.

Rail transport

It is not expected that rail transport will be utilised during the construction stage. For operations, it is intended than 100 per cent of coal mined will be transported to port facilities along the existing Goonyella Rail system to a port facility for export. When operating at peak production, the Project is anticipated to generate up to three additional trains per day on the Norwich Park Branch rail line. It has been confirmed by BMA that the rail network has available capacity to support the additional demand required by the Project. The volume of coal to be transported via the network will be within Aurizon's existing approval limits. As such, no additional impacts above those already approved are expected.

Abbreviations

AADT	Annual Average Daily Traffic
AECOM	AECOM Australia Pty Ltd
AUL	Auxiliary Left-turn Treatment
BAL	Basic Left-turn Treatment
BMA	BM Alliance Coal Operations Pty Ltd
CHL	Channelised Left-turn Treatment
CHPP	Coal Handling and Preparation Plant
CHR	Channelised Right-turn Lane
DoS	Degree of Saturation
EIS	Environmental Impact Statement
ESA	Equivalent Standard Axle
FIFO	Fly-In-Fly-Out
FY	Financial Year
GTIA	Guide to Traffic Impact Assessment
IRC	Isaac Regional Council
LGA	Local Government Area
LoS	Level of Service
MIA	Mine Infrastructure Area
Mtpa	Million tonnes per annum
ML	Mining Lease
MLA	Mining Lease Application
OSOM	Over-Size-Over-Mass
Project	Saraji East Mining Lease Project
PIA	Pavement Impact Assessment
QAS	Queensland Ambulance Service
QFES	Queensland Fire and Emergency Services
QPS	Queensland Police Service
RMP	Road-use Management Plan
ROM	Run-of Mine
SCR	State Controlled Road
SEMLP	Saraji East Mining Lease Project
SES	State Emergency Service
SIDRA	Signalised and unsignalised Intersection Design and Research Aid
TIA	Traffic Impact Assessment
DTMR	Queensland Department of Transport and Main Roads
V/C	Volume / Capacity Ratio

1.0 Introduction

This Traffic and Transport Impact Assessment Report has been prepared by AECOM Australia Pty Ltd (AECOM) on behalf of BM Alliance Coal Operations Pty Ltd (BMA) to assess the traffic and transport impacts associated with the Saraji East Mining Lease Project (the Project) as part of an Environmental Impact Statement (EIS). This assessment has been completed to address the traffic and transport matters specified in the *Saraji East Mining Lease Project: Final terms of reference for an environmental impact statement* (Queensland Government, 2017).

1.1 Project description

The Project is a greenfield single-seam underground mine development with a capacity to mine up to 11 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal.

The location of the Project is adjacent to the existing Saraji Mine on Saraji Road, near Dysart. It is within the Isaac Regional Council (IRC) Local Government Area (LGA) approximately 170 kilometres (km) south-west of Mackay.

The Project will be divided into construction and operation stages. The construction period is assumed to be in the order of three years, with most construction work occurring over Year 2 and Year 3 of construction. Mining operation is expected to commence in Year 3 of construction and will continue operating for approximately 20 years. The total length of the Project considering both the construction and operation phases is expected to be approximately 22 years.

Should the remainder of the Project assessment process be resolved quickly, with Project construction can be assumed to commence this year (Year 1), and mining assumed to commence in 2025 (Year 3), with full operation anticipated in the third year of operations (Year 3) through to end of mining (Year 20).

BMA will only be able to commence construction following grant of relevant approvals and a business decision and financial investment to proceed with the Project. Prior to construction, BMA will undertake a revised Traffic and Transport Impact Assessment with new traffic counts and updated assessment years prior to construction to inform potential impacts, mitigations and secondary approval requirements.

This assessment has been updated in response to submissions but as the Project start date is currently unknown, further assessment and consultation will be undertaken during detailed design stage.

This assessment was originally undertaken with the understanding that construction of the Project commenced in 2021. As a result, the assessment years of Financial Year (FY) 2021, FY2023 and FY2040 were selected as being years in which the maximum development traffic was anticipated. Given the length of the EIS process to date and the uncertainty of actual timing, the Project will be assessed based on the timing assumptions adopted to date for impact assessment purposes. This assessment has been carried out in accordance with the Project's Terms of Reference (ToR) and updated in response to submissions on the Draft EIS.

1.2 Objectives

As set out in the Project's Terms of Reference (ToR) the objectives of the traffic and transport assessment are as follows:

The construction and operation of the Project will aim to:

- maintain the safety and efficiency of all affected transport modes for the project workforce and other transport system users
- assess, avoid and mitigate impacts on the condition of transport infrastructure
- ensure any required works are compatible with existing infrastructure and future transport corridors.

The information requirements specific to the assessment are stated in Table 1 along with references to the relevant sections of this report where the specific requirements have been met.

Table 1 Transport Impact Assessment Terms of Reference

Reference	Requirements	Relevant Section/s of this Report
8.11.1	The EIS should include a clear summary of the total transport task for the project, including workforce, inputs and outputs, during the construction and operational phases. Proponents should make appropriate modal choices to ensure transport efficiency and minimise impacts on the community.	Section 9.0
8.11.2	Present the transport assessment in separate sections for each project affected mode (road, rail, air and sea) as appropriate for each phase of the project. Provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by project transport at the local and regional level (e.g. local roads and state-controlled roads).	Section 5.0 and Section 6.0
8.11.3	Include details of the adopted assessment methodology: • for impacts on roads: the road impact assessment report in accordance with the Guidelines for Assessment of Road Impacts of Development (Department of Main Roads, 2006), with traffic data in DTMR-suitable formats • for impacts on rail level crossings: the Australian Level Crossing Assessment Model.	Section 4.0
8.11.4	Discuss and recommend how identified impacts will be mitigated so as to meet the above objectives for each transport mode. Mitigation strategies may include works, contributions or management plans strategies that can be documented in a Road-use Management Plan 28 and are to be prepared in close consultation with relevant transport authorities (including local government). Strategies should consider those transport authorities' works program and forward planning, and be in accordance with the relevant methodologies, guidelines and design manuals.	Section 7.0 and Section 8.0
8.11.5	Discuss impacts on the delivery of emergency services operations within the project area and any impacts this may have on the nearby community. Outline feasible alternatives and mitigation for these operations if adverse impacts are, or are likely, to occur.	Section 6.0

2.0 Scope of assessment

2.1 Overview

The major mode of transport potentially impacted by the Project is the Queensland road network and this was the focus of this assessment. Other transport modes, including air, rail and sea, have been considered to identify their relevance to the Project.

2.2 Road infrastructure

Transport of personnel, materials and equipment is anticipated to be undertaken using the existing local government and State-Controlled road (SCR) networks. The road transport requirements of the Project have been addressed through the preparation of a Traffic Impact Assessment (TIA) in accordance with the *Guide to Traffic Impact Assessments (GTIA)* (The State of Queensland (Department of Transport and Main Roads), 2018) developed by the Department of Transport and Main Roads (DTMR).

The TIA component of this report identifies and quantifies the impact of the Project on the SCR network and proposes mitigation measures to address significant impacts.

2.3 Rail infrastructure

Product coal will be loaded on site and will connect to the existing Goonyella rail system via a new balloon loop and rail spur; the Goonyella rail system will transport the coal to ship loading facilities. A desktop review of the rail infrastructure servicing the area in the vicinity of the Project was conducted as part of the assessment. This review consisted of identifying existing rail infrastructure within the vicinity of the Project and determining the extent of any possible impacts on the rail lines.

2.4 Port infrastructure

The coal produced by the Project will be exported through existing port(s) to overseas markets. A desktop review of the current Queensland sea ports of relevance to the Project, including existing port infrastructure and future expansionary projects was conducted as part of the assessment. The preferred combination of identified coal export terminal(s) will be a part of commercial discussions between BMA and the relevant port authorities.

2.5 Airport infrastructure

As part of the scope of assessment, a desktop review of existing airports in the vicinity of the Project was undertaken. This review consisted of identifying the major aviation infrastructure in the area and determining the extent of any potential impacts such as increased flights for the transport of workers as a result of the Project.

3.0 Legislation and policy

3.1 Transport Infrastructure Act 1994

The *Transport Infrastructure Act 1994* (TI Act) allows the Queensland Government to have a strategic overview of transport infrastructure in Queensland. On behalf of the Government, DTMR is responsible for the construction, maintenance and operation of the SCR network. The TI Act's objectives include the promotion of safety, the efficiency of the road network and the reduction of environmental impacts.

Section 49 of the TI Act specifies requirements for impact assessments to be carried out for developments that may cause environmental impacts to the SCR network. After the assessment, DTMR may give directions about the use of the roads to lessen the impacts or require the development proponent to carry out works to lessen the impacts.

3.2 Transport Operations (Road Use Management) Act 1995

The *Transport Operations (Road Use Management) Act 1995* (Transport Operations Act) aims to provide a regulatory framework whose overall objective is to provide for the effective and efficient management of the use of Queensland state road network. The Transport Operations Act provides a scheme which promotes the effective movement of goods and people, improves road safety and also contributes to the strategic management of the road network in ways consistent with the TI Act.

3.3 Local Government Act 2009

The *Local Government Act 2009* (LG Act) gives power to local government to control all roads in its Local Government Area (LGA). This includes:

- making local laws to regulate the use of roads and the movement of traffic
- imposing obligations on the owners of land that adjoins local roads.

Section 72 of the LG Act specifies requirements for impact assessments to be carried out for development that may cause environmental impact to the local road network. After the assessment, the local government may give directions about the use of the roads to lessen the impacts or require the development proponent to carry out works to lessen the impacts.

3.4 Guide to Traffic Impact Assessment

The *Guide to Traffic Impact Assessment* (GTIA) (The State of Queensland (Department of Transport and Main Roads), 2018) provides guidance for development proponents how to assess the traffic impacts of a proposed development on the SCR network.

The GTIA outlines the principles and the framework for undertaking a traffic impact assessment and provides advice on mitigation strategies to address traffic impacts. The guide provides advice for both development proposals assessable under the *Planning Act 2016*, as well as for major development assessed under other assessment frameworks (usually subject to an environmental impact statement, or a notifiable road use).

3.5 Australian Level Crossing Assessment Model

The Australian Level Crossing Assessment Model (ALCAM) is the Australian and New Zealand standard for assessing level crossings. ALCAM is an assessment tool designed to prioritise level crossing safety improvement works as well as assisting in the determination of the most effective treatment at each of the potentially affected level crossings.

All public level crossings on the Government supported non-commercial rail network in Queensland have been risk assessed using ALCAM.

When assessing level crossings for required upgrades, ALCAM looks at many factors at the crossing such as:

- road geometry

- road and rail traffic volume and speed
- visibility
- existing protection measures at crossing.

The outcomes of the ALCAM assessment are then used to identify priority level crossings for safety upgrades.

A railway safety assessment incorporating comparative ALCAM assessments are likely to be undertaken for the impacted railway level crossings, with and without the Project. DTMR will arrange for the ALCAM assessments to be undertaken by the railway manager (Aurizon). The outcomes of the ALCAM assessments may identify the mitigation measures required to address any identified railway safety issues.

3.6 Planning Act 2016 and Planning Regulation 2016

Under the framework of the Queensland Planning Act 2016 and Planning Regulation 2016, benchmarks are defined for assessment of state matters in the State Development Assessment Provisions (SDAP).

The SDAP State code 2: development in a railway environment and State code 6: Protection of state transport networks set assessment benchmarks to protect railway corridors, rail transport infrastructure and safety of railways.

To ensure the Project does not adversely impact the structural integrity or physical condition or operating condition of railways, rail transport infrastructure or other rail infrastructure within a railway corridor, the Project will be designed and developed to comply with performance outcomes, including:

- Development does not result in a material worsening of flooding impacts within a railway corridor
- Drainage infrastructure does not create a safety hazard in a railway corridor
- Construction activities do not cause ground movement or vibration impacts in a railway corridor

BMA will progress detailed design to demonstrate these performance outcomes are met.

4.0 Methodology

4.1 Assessment horizon and assessment years

The construction of the Project is expected to commence this year (FY 2023) and continue until FY 2025. The operation of the mine is assumed to commence in FY 2025 and continue until FY 2044 with operations winding down during FY 2043 and FY 2044. Based on these timeframes, the Project is anticipated to have a one year period where the construction phase and operations phase overlap, being FY 2025.

However, this assessment was originally undertaken with the understanding that construction of the Project would be commenced in 2021. Given the length of the EIS process to date and the uncertainty of actual timing, the Project will be assessed based on the timing assumptions adopted to date for impact assessment purposes. As a result, the assessment years of Financial Year (FY) 2021, FY2023 and FY2040 were selected as being years in which the maximum development traffic was anticipated.

It is noted that construction will commence following the grant of relevant approvals and BMA's decision to proceed with the Project. The actual timing for Project commencement will be determined based on progress of mining and commercial market drivers. Given the length of the EIS process to date and the uncertainty of actual timing, BMA will make the following commitments in relation to the Project's Traffic Impact Assessment (TIA) and road safety audit:

- During the detailed design phase and no later than 6 months prior to construction, in consultation with DTMR, BMA will prepare an updated Traffic Impact Assessment, background traffic counts, and Road Use Management Plan, in accordance with section 7.6 of the GTIA and in consultation with DTMR and implement agreed management and / or mitigation measures.
- During the detailed design phase and no later than 6 months prior to construction, in consultation with DTMR, BMA will undertake a road safety audit in accordance with Part C – section 9 of the GTIA and implement identified mitigation measures.

4.2 Traffic impact assessment

To inform the Traffic impact assessment (TIA), an inspection of the existing road network was undertaken in September 2021. In addition to the inspection, data pertaining to the existing condition of various roads has been sourced from DTMR and IRC. This includes data relating to existing traffic volumes, the existing pavement condition, existing school bus routes and historic crashes, as well as information pertaining to planned future road works. To supplement the information received from the road authorities, traffic counts were also independently undertaken at a number of intersections in April 2018.

Traffic count data collected in 2018 and subsequently used in this assessment was compared against more recent DTMR traffic count data (2019) used in the Lake Vermont Meadowbrook Project EIS (published in 2022) to verify its accuracy and relevance to existing traffic volumes.

This comparison identified that AADT traffic volume counts and heavy vehicle percentages collected in 2018 are comparable to baseline traffic volumes collected in 2019. As a result, the 2018 traffic count data is considered appropriate for the purposes of this assessment. BMA will undertake a new traffic count prior to construction to inform secondary approval requirements.

The TIA component of this report has been prepared with reference to the GTIA (The State of Queensland (Department of Transport and Main Roads), 2018) which supersedes the Guidelines for Assessment of Road Impacts of Development 2006 (GARID) referenced in the Project's ToR.

The GTIA outlines the principles and framework for undertaking traffic impact assessments for the SCR network. It also provides advice on mitigation strategies to address impacts.

It is intended to be used in preparing TIAs, as well as for DTMR departmental staff to assess them. The principles and strategies in the GTIA are written specifically for the SCR network; however, local governments may choose to adopt the GTIA for assessment of impacts to the local government road network.

The assessment methodology adopted for the TIA component of this report is summarised in the following key tasks:

- broadly identify the existing transport infrastructure which may be impacted by the Project
- estimate the traffic generation associated with the construction and operation phase of the Project and the distribution of this traffic on the identified road network
- assess the potential impact of the Project on the surrounding transport infrastructure during the construction and operation phase
- identify potential mitigation and management strategies to be implemented during the construction and operation phase to offset the impact of the proposed Project (if required).

As outlined above, the adopted methodology centres on establishing a background “without development” traffic scenario for the identified transport routes and comparing this with a scenario including the Project generated traffic, i.e. the “with development” scenario.

The process allows for the assessment of the traffic impacts of the Project in terms of access, intersections, link capacity, pavement and road safety. Further detail regarding the assessment of each of these impact types is provided below.

Following the impact assessment, if required, potential mitigation and management measures would be formulated to address the potential traffic impacts caused by the proposed Project.

4.2.1 Access

As the majority of the SCRs have a primary function of catering for through traffic, vehicular and access management is a key consideration for ensuring the SCR network maintains this function. Therefore, accesses to the SCR network should be minimised where safe and efficient alternative access points can be provided via the local government road network.

The location and configuration of accesses from adjacent development or its roads can affect the safety and efficiency of SCRs by providing another location where turning vehicle movements conflict with through vehicle movements. In addition, development of land fronting a SCR requires that configuration of that frontage to be consistent with the current or intended form of the SCR.

4.2.2 Intersections

An intersection is where two or more roads cross or converge at a single location. Vehicles travelling through an intersection may be required to stop or slow down. When these manoeuvres take place, delays and queuing may occur.

Delays and queuing are undesirable outcomes. The following methods are typical ways to measures performance for intersections with further descriptions are provided below:

- Degree of Saturation (DoS)
- Level of Service (LoS)
- Queuing and Delay.

For the purpose of this assessment, signalised and unsignalised Intersection Design and Research Aid (SIDRA) was used to analyse intersection performance, including intersections between roads and intersections between road and rail infrastructure.

The intersection analyses were carried out for the existing traffic conditions and for the traffic conditions expected during the Project. Comparison of these results quantifies the impact to the intersection as a result of the Project.

4.2.2.1 Degree of Saturation

DoS is the ratio of traffic volume to the capacity of an intersection approach. It is expressed as a percentage with 100 per cent meaning that demand has reached the approach capacity and no further traffic will be able to progress through the intersection.

4.2.2.2 Level of Service

LoS is a qualitative measure of intersection performance which, in this assessment, is based on vehicle delay as summarised in Table 2.

Table 2 Level of Service

Level of Service	Delay (seconds)
A	Less than 10 seconds
B	Between 10 and 15 seconds
C	Between 15 to 25 second
D	Between 25 to 35 seconds
E	Between 35 to 50 seconds
F	More than 50 seconds

4.2.2.3 Delay and queuing

Delay is the difference between interrupted and uninterrupted travel times at an intersection. Delay, measured in seconds, is the sum of Geometry Delay and Queuing Delay. Geometry Delay is the delay caused by vehicles negotiating or manoeuvring corner radius. Queuing Delay is the delay caused by gap acceptance at priority intersections or red time at signalised intersections.

SIDRA uses Back of Queue to measure queuing at intersections. It is the maximum extent of queue (in metres and vehicle length) for the vehicle movements.

4.2.3 Highway link capacity

A highway link is a connection between an origin and a destination. There are several ways to measure performance including travel time, speed, delay and safety. As stated in the latest GTIA, the assessment of road link capacity impacts is based on the incremental worsening of LoS. It further states, road operation capacity impacts are only considered for major developments and link capacity assessments are not required unless new State-Controlled Road (SCR) road links are needed to be constructed to service the development. For the purpose of this assessment, volume / capacity (v/c) ratios have been used to assess the performance of the highway links with and without the traffic generated by the Project.

4.2.4 Pavements

Road pavements are designed to carry vehicle loads over an expected life. Developments which generate significant heavy vehicle traffic cause pavement impacts which shorten the pavement life expectancy compared to DTMR’s maintenance schedules.

A preliminary desktop pavement impact assessment (PIA) was undertaken to determine the potential impacts to the pavement caused by heavy vehicles generated by the Project. It is based on determining Equivalent Standard Axle (ESA) load and payloads for heavy vehicles using the road network. An ESA is a unit measurement which converts the wheel loads of traffic to an equivalent number of standard loads which is usually expressed in terms of the equivalent number of 80 kilo-Newtons (kN) single axle load.

The ESA for the background heavy vehicle component was calculated based on an average 3.2 ESAs per heavy vehicle, which is based on a DTMR-approved PIA calculation tool. The heavy vehicle traffic volumes generated by the Project were converted into ESA based on the assumed heavy vehicle (HV) classes used on the Project and the appropriate ESA/HV rate for each vehicle class.

Where the number of ESA of the additional Project generated traffic equals or exceeds five per cent of the background ESA, the pavement is considered to be impacted based on the requirements of GTIA. Therefore, further assessment of applicable mitigation measures, including possible compensation contributions, is required.

4.2.5 Road Safety

Safety is one of the principal objectives in road infrastructure. Traffic accidents pose significant burdens and economic loss to the community. Therefore, it is a key consideration in assessing development proposals. DTMR requires that developments should ensure safety is not significantly worsened and that any safety issues should be addressed and mitigated.

In addition, the GTIA requires developments to address all pre-existing high-risk safety issues due to the expectation that additional traffic will exacerbate poor existing safety conditions.

Road safety risks associated with the traffic generated by the Project, including resultant and residual road safety risks, were evaluated with the results described in Sections 6.2.4 and 8.0. Risks were classified and ranked as low, medium, high or intolerable based on the risk matrix in Table 3 taken from Austroads *Guide to Road Safety Part 6: Road Safety Audit* (2009).

Table 3 Austroads Risk Matrix

Risk Matrix	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

Road safety risk has been evaluated based on frequency and severity of accidents. The frequency is presented in Table 4, which describes how likely it is for an accident to occur. The severity is presented in Table 5, which describes how serious the consequences of the accident are, including personal injury and property damage.

Table 4 Frequency / probability of crash

Frequency / probability	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 5 Severity of crash

Severity	Description	Example
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on a freeway
		Car runs into crowded bus stop
		Bus and petrol tanker collide
		Collapse of a tunnel
Serious	Likely death or serious injury	High or medium-speed vehicle/vehicle collision
		High or medium-speed collision with a fixed roadside object
		Pedestrian or cyclist struck by a car
Minor	Likely minor injury	Some low-speed vehicle collisions
		Cyclist falls from bicycle at low speed

Severity	Description	Example
		Left-turn rear-end crash in a slip lane
Limited	Likely trivial injury or property damage only	Some low-speed vehicle collisions
		Pedestrian walks into object (no head injury)
		Car reverses into post

4.3 Rail impact assessment

The rail impact assessment involves the identification of the proposed routes and the existing rail infrastructure, including level crossings. The assessment estimates the existing usage of the rail infrastructure, in comparison to the additional demand as a result of the Project.

4.4 Port infrastructure

The approach adopted for assessing the impacts to port infrastructure included the identification of existing port infrastructure and existing usage, an estimation of the additional demand caused as a result of the Project, and an impact assessment as a result of the Project.

The preferred coal export terminal will be a part of commercial discussions between BMA and the relevant port authorities.

4.5 Airport infrastructure

The approach adopted for assessing the impacts to airport infrastructure included the identification of existing airport infrastructure and existing usage, an estimation of the additional demand caused as a result of the Project, and an impact assessment as a result of the Project.

5.0 Description of environment values

This section of the report presents the key transport networks and infrastructure considered relevant to the Project. The environmental values related to traffic include congestion, travel time, road safety and sustainable travel. The road assessment has focused on safety and efficiency for the identified intersections and highway links in the Traffic Impact Assessment Area.

5.1 Development context

5.1.1 Site location

The location of the Project is adjacent to the existing Saraji Mine on Saraji Road, Dysart. It is within the LGA under the jurisdiction of the IRC approximately 170 km southwest of Mackay as shown in Figure 1.

5.1.2 Project road transport routes

The following section provides information regarding the two regional routes which would be utilised for transporting materials and equipment to the Project Site.

Transport route from Rockhampton, south of the Project Site:

- Capricorn Highway (16A and 16B)
- Fitzroy Development Road (85C)
- Dysart-Middlemount Road (519).
- Saraji Road (R44)

Transport route from Mackay, north of the Project Site:

- Peak Downs Highway (33A)
- Peak Downs Mine Road
- Saraji Road (R44).

It is anticipated that the following transport routes would be utilised for staff vehicles traveling to the Project Site:

Transport route from Dysart, south of the Project Site:

- Saraji Road (R44).

Transport route from Moranbah, north of the Project Site:

- Moranbah Access Road
- Peak Downs Highway (33A)
- Peak Downs Mine Road
- Saraji Road (R44).

5.1.3 Project rail transport route

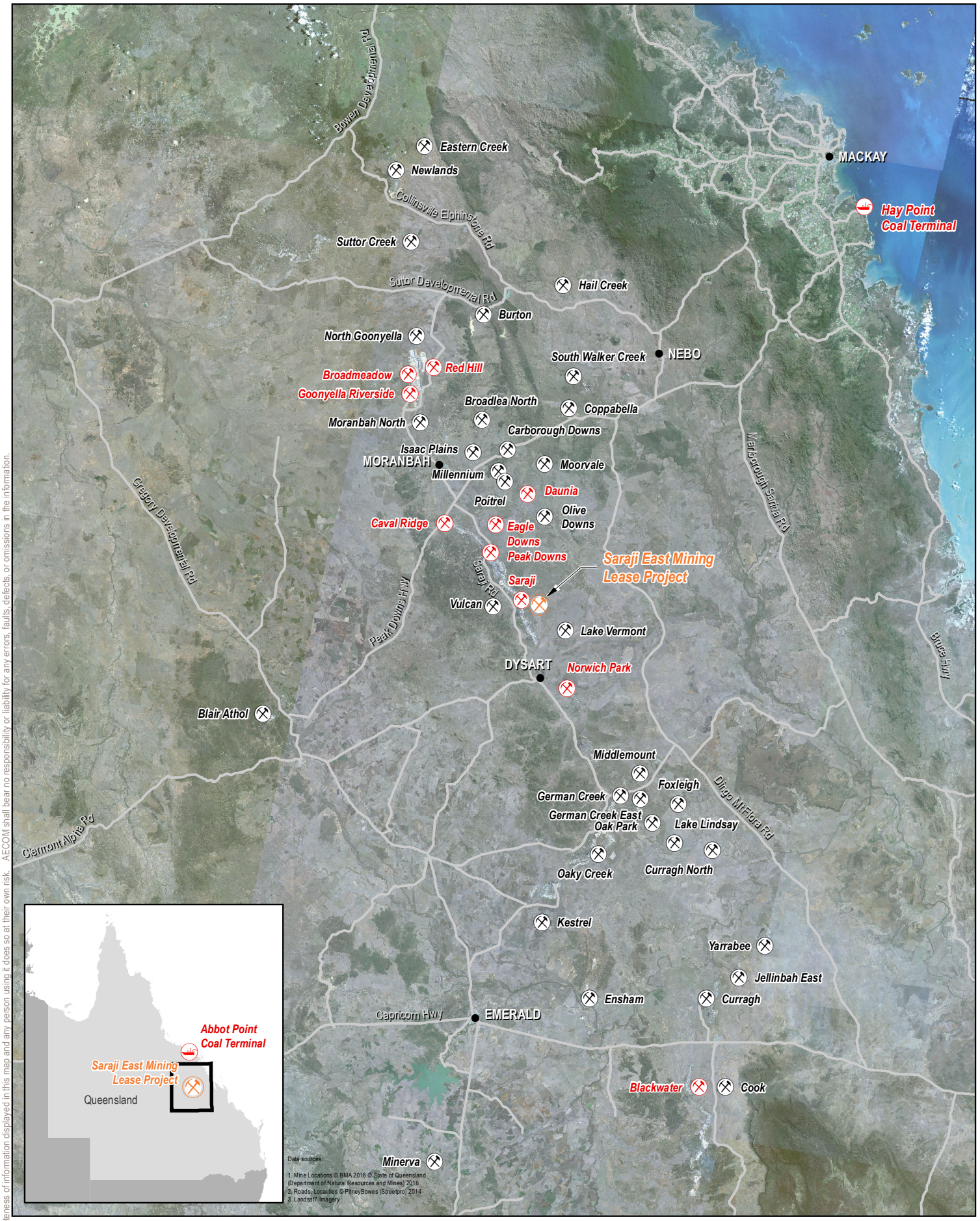
The existing Goonyella rail system (specifically the Norwich Park Branch Line) which is owned and operated by Aurizon runs adjacent to the Saraji Mine.

5.1.4 Project air transport route

Moranbah Airport is located 35 km north of the Project Site. The route from the Project Site to the airport follows Saraji Road, Peak Downs Mine Road, Peak Downs Highway and Moranbah Access.

5.1.5 Project port transport route

Product coal from the Project will be exported via either Hay Point Coal Terminal or Abbot Point Coal Terminal. The coal will be transported to these ports via the Goonyella rail system.



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LEGEND

- Saraji East Mining Lease Project
- BMA Coal Terminal
- BMA Mine
- Other Mine
- Locality
- Major Road

N

Figure 1
Regional Context

Environmental Impact Statement
Saraji East Mining Lease Project

0 5 10 20
Kilometres

Scale: 1:1,500,000(when printed at A4)
Projection: Map Grid of Australia - Zone 55 (GDA94)

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5.1.6 Road transport network

For the purpose of this assessment, parts of Saraji Road, Peak Downs Mine Road, Peak Downs Highway and Lake Vermont Road as highlighted in blue in Figure 2 have been identified as within the Traffic Impact Assessment Area. It is anticipated that these roads will carry the increased traffic associated with the Project during the construction and operation stages.

The assessment of highway link efficiency has been undertaken at specific points shown on Figure 2 and are listed below:

- Highway Link 1 — Saraji Road south of Lake Vermont Road
- Highway Link 2 — Saraji Road between Lake Vermont Road and Intersection A
- Highway Link 3 — Peak Downs Mine Road south of Peak Downs Highway
- Highway Link 4 — Peak Downs Highway east of Moranbah Access Road.

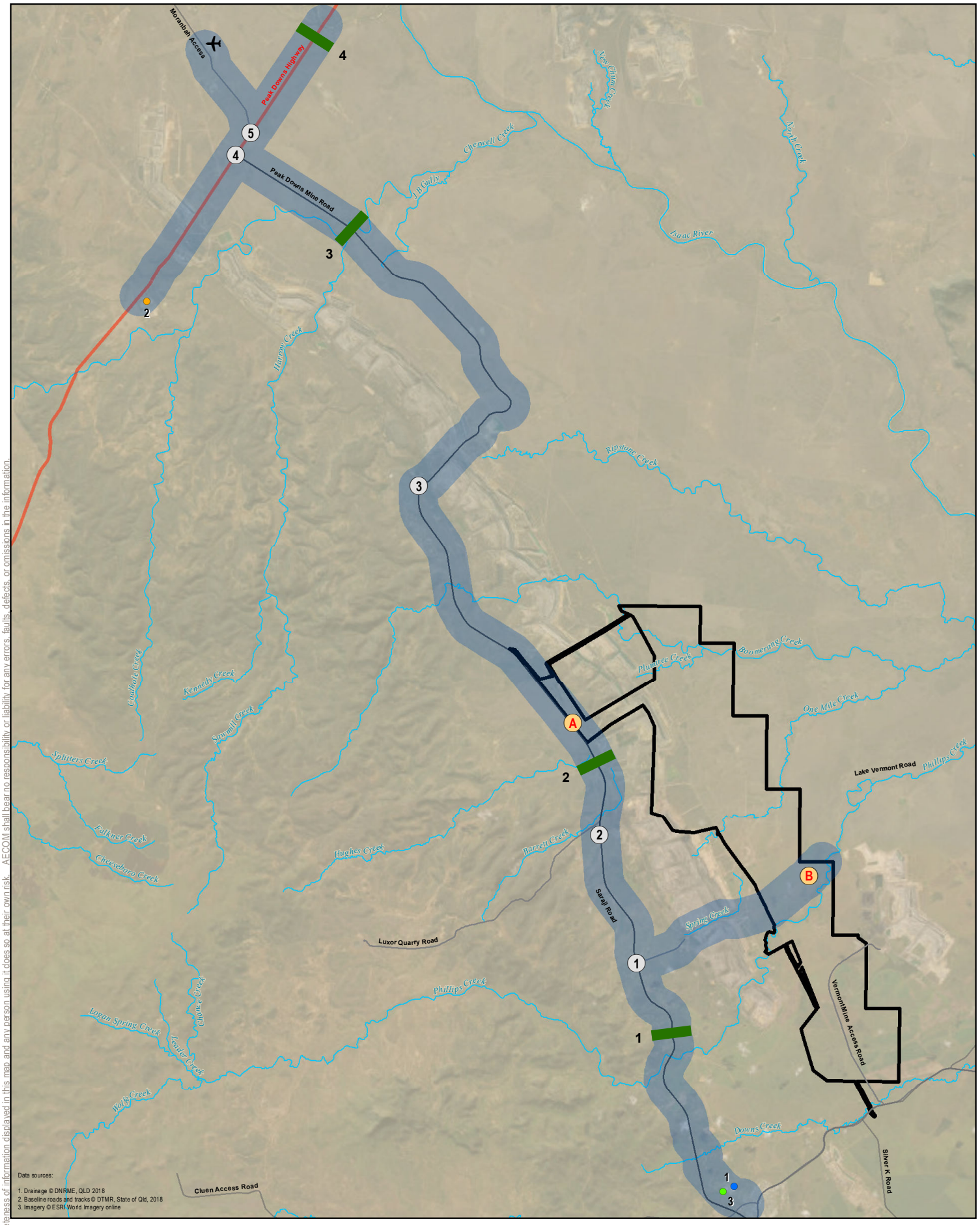
The selection of road links was based on estimated trip distribution. As the location of the development is adjacent to the existing Saraji Mine on Saraji Road, Dysart; it is anticipated that the above road links would be utilised for transporting materials and equipment and movement for workers to and from the site during construction and operation stages. The study area includes all road links where the development traffic exceeded 5% of the base traffic in either direction on the link's annual average daily traffic in the year of opening of each stage, as stated in the GTIA.

Intersections expected to be utilised by Project traffic are shown in Figure 2 and are listed below:

- Intersection 1 — Saraji Road / Lake Vermont Road
- Intersection 2 — Saraji Road / Existing Saraji Mine Entrance
- Intersection 3 — Saraji Road / Peak Downs Mine Road / Existing Peak Downs Mine Entrance
- Intersection 4 — Peak Downs Highway / Saraji Road
- Intersection 5 — Peak Downs Highway / Moranbah Access Road
- Proposed Intersection A — Saraji Road / Proposed access to the Project Site
- Proposed Intersection B — Lake Vermont Road / Accommodation village access.

There are also a number of level crossings within the study area that may be impacted by Project traffic, which are shown in Figure 3 and are listed below:

- Level Crossing 1 — Lake Vermont Road / Norwich Park Branch Line
- Level Crossing 2 — Saraji Road / Norwich Park Branch Line
- Proposed Level Crossing A — Proposed access to the Project Site / Norwich Park Branch Line.



Data sources:

1. Drainage © DNRME, QLD 2018
2. Baseline roads and tracks © DTMR, State of Qld, 2018
3. Imagery © ESRI World Imagery online

LEGEND

- Moranbah Airport
- Project Site
- Watercourse
- Highway
- Major Road
- Other Road
- Existing Intersection
- Proposed intersection
- Identified Highway Link
- Traffic Impact Assessment Study Area

Workers Accommodation

- 1. Dysart BMA SPV
- 2. Buffel Park Village
- 3. Stayover in Dysart

N

Figure 2
Road network study area

Saraji East Mining Lease Project
Traffic and Transport Technical Report

0 1 2 4
Kilometres

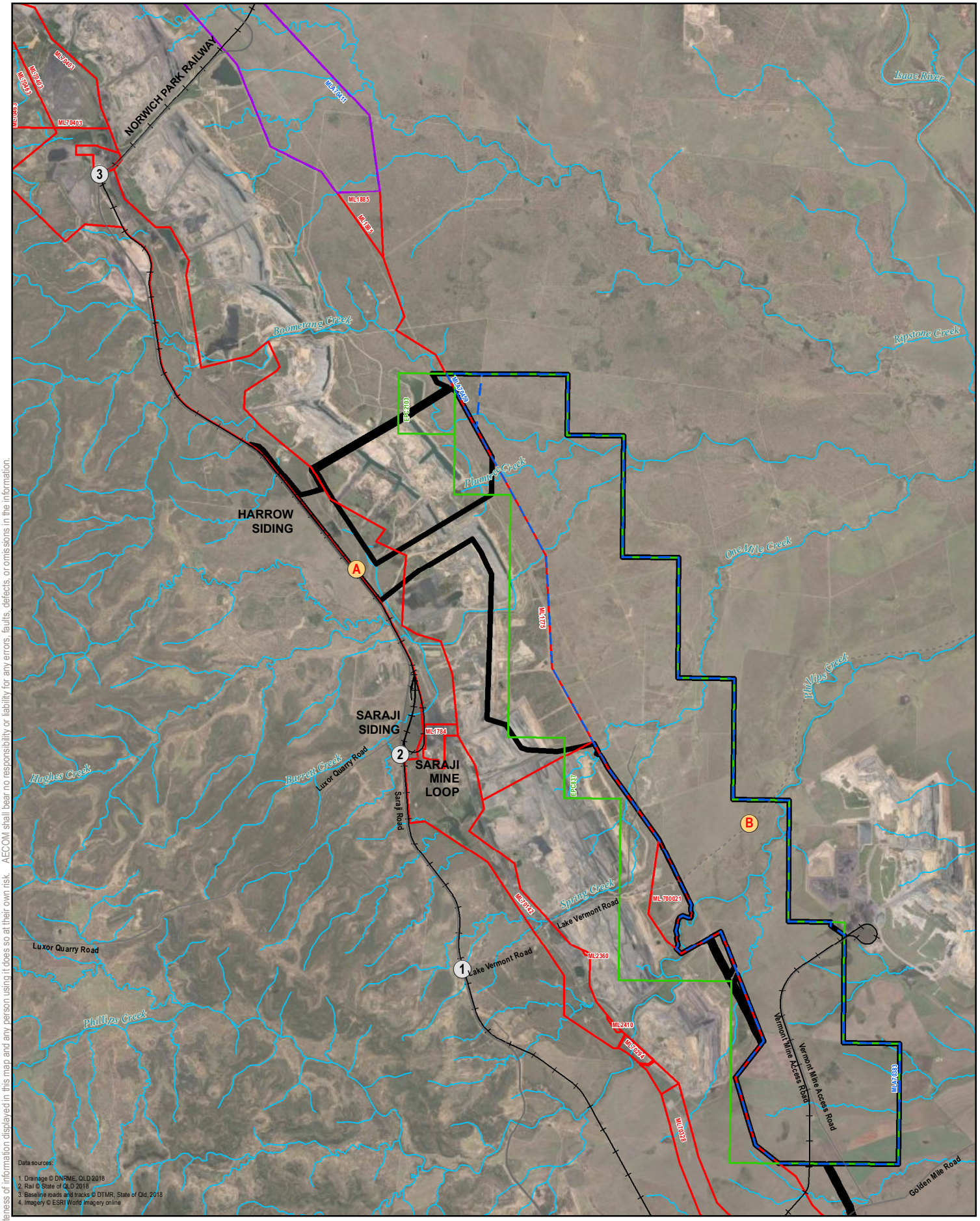
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Projection: Map Grid of Australia - Zone 55 (GDA94)

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LEGEND

- Project Site
- Exploration Permit Coal (EPC)
- Mineral Development Licence
- Mining Lease (ML)
- Mining Lease Application (MLA)
- Private Access Road
- Public Road
- Watercourse
- Existing Railway
- Existing Intersection
- Proposed intersection

N

Figure 3
Railway level crossings

Saraji East Mining Lease Project
Traffic and Transport Technical Report

0 0.5 1 2
Kilometres

Scale: 1:150,000 (when printed at A4)
Projection: Map Grid of Australia - Zone 55 (GDA94)

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5.1.6.1 Description of road links

5.1.6.1.1 Saraji Road (R44)

Saraji Road is a single carriageway, two-lane two-way sealed road providing a connection between Peak Downs Mine and Dysart. The road is approximately 8m wide and the speed limit is generally 100 km/h with reduced limits applied near critical intersections.

The road link between the intersection with the Peak Downs Mine and the entrance to Dysart is a local government road managed by IRC. To the south of Dysart, the road name changes to Dysart-Middlemount Road and is part of the SCR network managed by DTMR.

5.1.6.1.2 Peak Downs Mine Road

Peak Downs Mine Road is a single carriageway, two-lane two-way sealed road providing a connection between Peak Downs Mine and Peak Downs Highway. The road is approximately 7m to 8m wide and the speed limit is generally 100 km/h. The road link between Peak Downs Mine and Peak Downs Highway is a local government road managed by IRC.

5.1.6.1.3 Peak Downs Highway (33A)

Peak Downs Highway (33A) is a SCR linking Mackay on the Whitsunday coast and Clermont in the central west region of Queensland. It is a single carriageway two-lane two-way sealed road. The road is approximately 10m wide and the speed limit is generally 50 km/h in built-up areas and 100 km/h in rural areas. It is classified as a Type 1 Road Train route.

5.1.6.1.4 Lake Vermont Road

Lake Vermont Road is a single carriageway unsealed rural road approximately 5 m to 6 m wide and is privately owned by BMA. There is no posted speed limit therefore the general rural limit of 100 km/h applies along with the requirement on an unsealed road to drive to the conditions. Existing traffic volumes on this road are very low and are either associated with a small number of rural residences or exploration activities for the existing Saraji Mine. An accommodation village for the construction workforce is proposed to be constructed on a new access road off Lake Vermont Road. Therefore, Lake Vermont Road will be utilised for transporting workers between the Project and the village.

5.1.6.2 Description of intersections

5.1.6.2.1 Intersection 1 – Saraji Road / Lake Vermont Road

The intersection between Saraji Road and Lake Vermont Road is a give way priority T-intersection with Basic Left-turn Treatment (BAL). The throat of the side road is sealed and the intersection is unlit.

The Norwich Park Branch rail line runs parallel with Saraji Road with an offset of approximately 34 m at the intersection. This allows for 34 m of vehicle storage on Lake Vermont Road when a train is passing, and vehicles must stop. Vehicle queues in excess of 34 m will encroach on the through lanes of Saraji Road.



Plate 1 Saraji Road / Lake Vermont Road intersection

Lake Vermont Road will be utilised for transporting workers between the Project and the construction-phase accommodation village; therefore all staff buses will pass through Intersection 1 between the Project and the village.

5.1.6.2.2 Intersection 2 – Saraji Road / Saraji Mine Entrance

The intersection between Saraji Road and the entrance to Saraji Mine is a give way priority T-intersection under IRC jurisdiction. As heavy vehicles are expected frequently, it has been constructed to include a Channelised Right-turn Lane (CHR) for approximately 660 m and an Auxiliary Left-turn Treatment (AUL) for approximately 110 m. Intersection lighting is installed. The Norwich Park Branch rail line runs parallel with Saraji Road with an offset of approximately 34 m at this intersection. This allows for 34 m of vehicle storage on the Saraji Mine access when a train is passing and vehicles must stop. Vehicle queues in excess of 34 m will encroach on the through lanes of Saraji Road.



Plate 2 Saraji Road / Saraji Mine Entrance intersection

5.1.6.2.3 Intersection 3 – Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance

The intersection between Saraji Road, Peak Downs Mine Road and the entrance to Peak Downs Mine is a give way priority T-intersection with Basic Left-turn Treatment (BAL) as shown in the following photos. Peak Downs Mine Road and the entrance to the Peak Downs mine are the eastern and western legs, respectively. Saraji Road is the minor leg, approaching from the south. Currently the intersection does not have lighting installed.



Plate 3 Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance intersection

Even though the give-way control is located on the Saraji Road south approach, it is noted that the main traffic movement is the right-turn from Saraji Road (southern leg) and left turn from Peak Downs Mine Road (eastern approach).

5.1.6.2.4 Intersection 4 – Peak Downs Highway / Peak Downs Mine Road

The intersection between Peak Downs Highway and Peak Downs Mine Road is a give way priority T-intersection with a staged right turn for vehicles exiting Peak Downs Mine Road (seagull). It has an approximately 190 m CHR and an approximately 120 m Channelised Left-turn Treatment (CHL) on the Peak Downs Highway. The intersection has an acceleration lane on Peak Downs Highway northbound for the staged right-turn movement from Peak Downs Mine Road. Intersection lighting is installed.



Plate 4 Peak Downs Highway / Peak Downs Mine Road intersection

5.1.6.2.5 Intersection 5 – Peak Downs Highway / Moranbah Access Road

The intersection between Peak Downs Highway and Moranbah Access is a give way priority T-intersection with a staged right turn for vehicles exiting Moranbah Access (seagull). It has an approximately 60 m CHR and approximately 140 m CHL on the Peak Downs Highway. The intersection has an acceleration lane on Peak Downs Highway southbound for the staged right-turn movement from Moranbah Access. Intersection lighting is installed.



Plate 5 Peak Downs Highway / Moranbah Access Road intersection

5.1.6.2.6 Proposed Road Intersection A – Saraji Road / access road to the Project

The proposed intersection A will be located approximately 4 km north of the existing entrance to the Saraji Mine as shown in Figure 2.

The proposed configuration of proposed Intersection A will be very similar to the existing entrance to the Saraji Mine. The intersection is expected to include a CHR and an AUL.

The Norwich Park Branch rail line runs parallel with Saraji Road with an offset of approximately 30 m at this proposed intersection. Concept designs for this intersection propose a 10 m horizontal realignment of Saraji Road to the west which would increase the available space and will allow for 40 m of vehicle storage on the Project access road when a train is passing and vehicles must stop. Vehicle queues in excess of 40 m will encroach on the through lanes of Saraji Road.

5.1.6.2.7 Proposed Road Intersection B – Lake Vermont Road / Accommodation village access

A new intersection is proposed on Lake Vermont Road for an access road to the proposed construction accommodation village. It is anticipated all staff buses between the Project and the village will use this intersection if the village is required. Design of this intersection will be undertaken in the detailed design stage of the Project.

5.1.6.3 Description of level crossings

5.1.6.3.1 Level Crossing 1 – Lake Vermont Road / Norwich Park Branch rail line

The Norwich Park Branch rail line runs parallel with Saraji Road approximately 34 m east on Lake Vermont Road from Saraji Road / Lake Vermont Road intersection. The intersection of the rail line and Lake Vermont Road is a passive level crossing with stop sign control.

5.1.6.3.2 Level Crossing 2 – Peak Downs Mine Road / Norwich Park Branch rail line

The Norwich Park Branch rail line runs parallel with Saraji Road at Level Crossing 2 approximately 40 m east on Saraji Mine Access Road from the Saraji Road / Saraji Mine Access Road intersection. The intersection is an active level crossing with boom barriers and flashing lights controls.

5.1.6.3.3 Proposed Level Crossing A – the Project Site access road / Norwich Park Branch rail line

The proposed level crossing between the Project Site access road and Norwich Branch rail line is approximately 40 m offset from Saraji Road when accounting for the proposed horizontal realignment of Saraji Road. The detailed design of this level crossing will be undertaken in the detailed design stage. Concept designs of this level crossing are presented in Appendix G.

5.2 Development details

BMA proposes to develop the Project, a greenfield single-seam underground mine development on Mining Lease Application (MLA) 70383 and MLA 70459 commencing from within Mining Lease (ML) 1775. The Project proposal also comprises a Coal Handling and Preparation Plant (CHPP), a coal transport conveyor network, a Mine Infrastructure Area (MIA) and a new rail spur and balloon loop; which are proposed to be located on the site of the existing adjacent Saraji Mine. Additionally, a new transport and infrastructure corridor will be constructed on MLA 70383.

Product coal will be transported along the existing rail system that currently runs along the western boundary of the Saraji Mine ML 70142. A new rail spur, balloon loop and signalling system will be required to connect to the existing rail network. The balloon rail loop will be approximately 4.4 km in length and located on ML 70142 and adjacent to the existing rail line. The balloon rail loop will be a narrow gauge electrified line.

One new access intersection (Intersection A) will be constructed on Saraji Road. Design of the intersection will be undertaken during the detailed design stage. However, it is proposed that it will include the following design elements:

- CHR on Saraji Road
- AUL on Saraji Road
- Active level crossing with boom gates and flashing lights control on Norwich Park Branch rail line.

Concept designs for the proposed intersection (Intersection A) are presented in Appendix G.

One accommodation village is proposed to be constructed in the construction stage to accommodate construction workers. It is proposed to be located on a new access road off Lake Vermont Road. Access to the village will be via Saraji Road, Lake Vermont Road and the new access road.

A new intersection (Proposed Road Intersection B) on Lake Vermont Road will also be required for transporting workers to and from the accommodation village and the Project if required. Design of this intersection will be undertaken during the detailed design stage of the Project.

As part of the Project, upgrades will be made to the existing Saraji Mine Access Road level crossing (level crossing 2) to accommodate the increased traffic. Design of this upgrade will be undertaken during the detailed design stage of the Project, however concepts can be seen in Appendix G.

5.3 Traffic volumes

The Project will be divided into construction and operation stages. At each stage, traffic generation will include workers traveling to and from the Project Site and the delivery of materials and equipment. Estimates of the traffic volumes generated by the Project in the construction and operation stages will be described in this section.

5.3.1 Background traffic

The estimate of existing (2018) and future traffic volumes on the identified road network is based on the following input data:

- Intersection traffic counts undertaken at the five intersections in the Traffic Impact Assessment Area
- Annual Average Daily Traffic (AADT) segment reports provided by DTMR for the Peak Downs Highway and Saraji Road.

Traffic counts were undertaken at the following intersections on Wednesday 21 March 2018:

- Intersection 1 Saraji Road / Lake Vermont Road
- Intersection 2 Saraji Road / Existing Saraji Mine Entrance
- Intersection 3 Saraji Road / Peak Downs Mine Road / Existing Peak Downs Mine Entrance
- Intersection 4 Peak Downs Highway / Peak Downs Mine Road
- Intersection 5 Peak Downs Highway / Moranbah Access Road.

A review of the traffic flows indicated maximum traffic volumes occurred approximately during the following hourly periods:

- 5am to 6am (AM peak hour)
- 5pm to 6pm (PM peak hour).

The peak hour flows from the traffic count data for the highway links are presented in Table 6 with the total intersection volumes presented in Table 7. Flow diagrams are included in Appendix A.

Table 6 Background traffic (2018) – highway links

Highway link	Location	Direction	Traffic flow (vehicles per hour)	
			AM Peak Hour	PM Peak Hour
(1) Saraji Road	South of Lake Vermont Road	Northbound	390	161
		Southbound	67	229
(2) Saraji Road	Intersection A	Northbound	148	91
		Southbound	42	104
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	25	136
		Southbound	247	125
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	172	118
		Westbound	84	195

Table 7 Background traffic (2018) – intersections

Intersection	Number of vehicles	
	2018 AM (5am – 6am)	2018 PM (5pm – 6pm)
1	460	403
2	513	462
3	390	388
4	495	483
5	646	674
A	190	195

A review of the 2019 AADT segment reports for the Peak Downs Highway and Saraji Road showed a general trend of continuous decline in traffic volumes for the historic one-year period, five-year period and ten-year period as summarised in Table 8.

Table 8 Percentage change in AADT on Peak Down Highway and Saraji Road (2019 reference year)

Highway Link	Direction	1 Year Historic Growth	5 Year Historic Growth	10 Year Historic Growth
Peak Downs Highway	Eastbound	0.12%	5.42%	1.89%
	Westbound	-1.98%	5.14%	1.55%
	Average	-0.94%	5.28%	1.72%
Dysart-Middlemount Road	Eastbound	NA	-1.70%	-4.56%
	Westbound	NA	-2.04%	-4.74%
	Average	NA	-1.87%	-4.65%

The results show a decline in the ten-year growth for Dysart-Middlemount Road (approx. 4.65% decrease p.a.) and an increase in the ten-year growth for Peaks Down Highway (approx. 1.72%). However, this assessment has adopted a positive growth rate of one per cent per annum as a conservative approach to estimate future background traffic volumes. Flow diagrams for AADT and relevant data from DTMR are included in Appendix B.

The adopted growth rate of one per cent per annum has been applied to the 2018 background traffic to estimate future background traffic in the nominated assessment years. Table 9 and Table 10 summarise the future background traffic for the identified highway links and intersections, respectively. Flow diagrams are included in Appendix B.

Table 9 Future background traffic – highway links

(1) Background traffic			Traffic flow (Number of vehicles)					
Highway link	Location	Direction	FY 2021		FY 2023		FY 2040	
			AM	PM	AM	PM	AM	PM
			5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	406	168	414	171	490	202
		Southbound	70	238	71	243	84	288
(2) Saraji Road	Intersection A	Northbound	154	95	157	97	186	114
		Southbound	44	108	45	110	53	131
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	26	142	27	144	31	171
		Southbound	257	130	262	133	311	157
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	179	123	183	125	216	148
		Westbound	87	203	89	207	106	245

Table 10 Future background traffic – intersections

(1) Background traffic	Traffic flow (Number of vehicles)					
Intersections	FY 2021		FY 2023		FY 2040	
	AM (5am - 6am)	PM (5pm - 6pm)	AM (5am - 6am)	PM (5pm - 6pm)	AM (5am - 6am)	PM (5pm - 6pm)
1	479	419	488	428	578	507
2	534	481	545	490	645	581
3	406	404	414	412	490	488
4	515	503	525	513	622	607
5	672	701	686	715	812	847
A	198	203	202	207	239	245

5.3.2 Construction traffic

The following sections describe the generation and distribution of traffic associated with the construction phase of the Project, including the movement of workers and the delivery of materials and equipment.

5.3.2.1 Construction workers traffic

It is anticipated that 500 workers will be required during the construction stage in Year 1 with construction activities ramping up to require 1,000 workers in Year 2 and Year 3 of construction.

The following assumptions form the basis for the estimate of traffic volumes for the construction workers:

- construction schedule comprises works across 24 hours per day, seven days per week, 365 days per year
- two twelve hour shifts per day
- rosters based on seven days on, seven days off alternating with six nights on, eight nights off
- ten per cent of the workforce have been assumed to be based locally, adopting an equal split between Moranbah and Dysart
- local workforce will travel by cars, with an assumed occupancy rate of one person per vehicle
- 90 per cent of the workforce have been assumed to be fly-in, fly-out (FIFO) to Moranbah Airport
- FIFO workforce will be transported between the Moranbah Airport, Project Site and the construction accommodation village by bus (48 seat capacity)
- FIFO workers will reside at the construction accommodation village
- at the start of the roster, FIFO workers will be transported by bus from the Moranbah Airport directly to the Project site to commence shift
- at the shift changeovers (two per day), FIFO workers will be transported between the Project Site and the construction accommodation village by bus
- at the end of the roster, FIFO workers will be transported directly from the Project Site to the Moranbah Airport by bus.

For the purpose of this assessment, it was conservatively assumed that the shifts would changeover at the existing peak hour periods of 5am - 6am in the morning and 5pm - 6pm in the evening.

Vehicle movements associated with the FIFO workforce will vary across the week due to the rostered on and off periods. This assessment has considered two different days which represent different traffic conditions as a result of the rosters, including:

- Shift change day
    - FIFO workers at the end of shift are also at the end of the roster and are transported directly from the Project Site to the Moranbah Airport
    - FIFO workers about to commence their shift are also at the start of the roster and are transported from the Moranbah Airport to the Project Site.
- Ordinary day
    - FIFO workers are transported between the Project Site and the construction accommodation village at the start and end of the shift.

On a shift change day, there will be higher traffic volumes to the north of the Project Site than on an ordinary day, due to the bus movements to and from the Moranbah Airport. On an ordinary day, there will be higher traffic volumes to the south of the Project Site than on a shift change day, due to the bus movements to and from the construction accommodation village. The same number of vehicle movements will occur on the shift changing day and ordinary day, but will be distributed differently on the road network.

Based on the above assumptions, Table 11 shows the number of vehicles (buses and cars) estimated for construction workers traffic.

Table 11 Construction workers traffic

(2A) Construction Workers Traffic		Number of vehicles (buses and cars)					
Year (FY)	Workers	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
		IN	OUT	IN	OUT	IN	OUT
Year 1	500	30	30	30	30	60	60
Year 2	1,000	60	60	60	60	120	120
Year 3	1,000	60	60	60	60	120	120

It is concluded that the construction workers traffic is expected to range from 30 to 60 vehicles per hour and 60 to 120 vehicles per day.

5.3.2.2 Construction materials and equipment traffic

A major component of the transport task for the construction phase will be heavy vehicle traffic for the delivery of construction materials, the removal of waste and the delivery of equipment. The vehicle fleet anticipated for the construction phase of the Project is presented in Table 12. The material quantities and estimate heavy vehicle movements across the construction period as well as for the peak construction year are listed in Table 13.

Table 12 Quantities for construction materials and equipment

Type of equipment	No.	Type of equipment	No.
Road trains	6	110t Outrigger crane	1
Body trucks	4	Rough terrain crane	1
Articulated dump trucks	4	Franna cranes	4
Road header	1	Elevated work platforms	6
Rock bolting machine	1	Scissor lifts	6
Bulldozers	3	Air compressors	2
Excavators	4	Welders	2
Backhoes	2	Winches	2
Graders	3	Bitumen sprayer	1
Scrapers	2	Concrete pump	2
Roller compactors	2	Diesel generators	4
Water trucks	4	Tamping machine	1
Concrete trucks	6	Grinding machine	1
Ballast train	1		

Table 13 Quantities for construction materials and equipment

Material	Units	Origin / Destination	Material Quantities		Vehicle Type	Heavy Vehicle volume (one way)		
			Total Construction Requirement	Year 2 and 3 (construction)		Total Construction Deliverables	Year 2 and 3 (construction)	Daily peak hour
Construction Equipment	T	Mackay	7,200	2,400	Various	480	160	2
Base & Sub base materials	m^3	Local Quarry	1,500,000	1,175,000	B Double	43,150	34,320	10
Concrete	m^3	Local / Dysart	18,000	6,975	Articulated Truck	2,900	1,137	3
Structural steel	T	Mackay	4,600	1,000	24T trailer	254	42	1
Mechanical steel	T	Mackay	54	27	24T trailer	2	1	0
Pipe work - steel	m	Mackay	1,650	225	Truck	15	5	1
Pipe work - steel with lining	m	Sydney	10,000	5000	Truck	50	25	1
Pipe work - PE	m	Brisbane	60,010	10,005	Truck	187	13	1
Electrical reticulation cable	m	Mackay	23,9028	64,014	Truck	107	76	1
Electrical reticulation poles	ea	Mackay	545	95	Truck	470	20	1
Conveyor belts	km	Sydney	11	6	18t Trailer	133	13	1
Pumps & compressors	T	Local	150	75	Truck	10	0	0
Process equipment	T	Brisbane	200	100	Truck	20	10	1
Other equipment*	T	Local	3,467	2000	Truck	367	287	2
Asphalt	m^3	Local	950	750	Truck	1	0	0
Bulk Bitumen	m^3	Local	900	700	Truck	1	0	0
Prefabricated buildings	m^2	Mackay	68,000	32,197	Truck	1,998	955	7
Fuel	kL	Mackay	1,925	1,140	B Double	39	23	1
Waste oil, sludge & grease	T	Local	25	15	Truck	1	0	0
Hydraulic fluid	T	Local	91	15	Truck	31	10	1

Material	Units	Origin / Destination	Material Quantities		Vehicle Type	Heavy Vehicle volume (one way)		
			Total Construction Requirement	Year 2 and 3 (construction)		Total Construction Deliverables	Year 2 and 3 (construction)	Daily peak hour
General & recyclable waste*	T	Local	7,020	2,340	Truck	468	156	2
Hydraulic hoses	T	Local	0.9	0.3	Truck	75	25	1
Oil filters	T	Local	0.3	0.1	Truck	30	10	1
Rail Line	km	Mackay	5	5	Single Articulated	226	1	1
TOTAL TRIPS (worst case scenario)								**39**

**Other equipment and General & Recyclable waste items include workforce consumables and wastes associated with the workforce accommodations on site.*

Based on the above information, it is anticipated that 39 heavy vehicles per hour during peak conditions and 102 heavy vehicles per day will likely be required during the peak hours as summarised in Table 14.

Table 14 Construction materials and equipment traffic

(2B) Construction materials and equipment traffic	Number of heavy vehicles					
Construction year	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
	IN	OUT	IN	OUT	IN	OUT
Year 1	39	39	39	39	102	102
Year 2	39	39	39	39	102	102
Year 3	39	39	39	39	102	102

It is anticipated that delivery vehicles will originate from local areas such as Moranbah (north) and Dysart (south) as well as from regional centres such as Rockhampton (south-west) and Mackay (north-east). Vehicles will either travel to/from the east using Peak Downs Highway or to/from the south along Dysart-Middlemount, Fitzroy Development Road and the Capricorn Highway.

For the purpose of this assessment, an equal distribution between these routes has been applied, that is, 50 per cent of delivery vehicles are expected to use Peak Downs Highway and 50 per cent are expected to use Saraji Road to travel to and from destinations to the south of the Project.

5.3.2.3 Summary of construction traffic

For the purpose of this assessment, the construction traffic is defined as the sum of the construction workers traffic and the construction materials and equipment traffic as summarised in Table 15.

Table 15 Construction traffic summary

(2) Construction Traffic	Number of vehicles (buses, heavy vehicles and cars)					
Construction year	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
	IN	OUT	IN	OUT	IN	OUT
Year 1	69	69	69	69	162	162
Year 2	99	99	99	99	222	222
Year 3	99	99	99	99	222	222

Therefore, it is concluded that the construction traffic ranges from 69 to 99 vehicles per hour during peak conditions and 162 to 222 vehicles per day. The majority of construction traffic resulting from the Project is expected to occur during the AM and PM peak hours, with minimal activity occurring outside of these hours.

Operation traffic

The following sections describe the generation and distribution of traffic associated with the operations phase of the Project, including the movement of workers and the delivery of materials and equipment.

5.3.3.1 Operation workers traffic

The operations phase workforce is anticipated to fluctuate during the life of the Project. Between Year 3 and Year 4 of operation, it is expected 260 workers will be required with a gradual increase to 500 workers during Year 5 to Year 20, before reducing back to 260 workers in the final two years of the Project.

The following information forms the basis for the estimate of traffic volumes for the operation workers:

- proposed operating schedule 24 hours per day, seven days per week, 365 days per year
- three shifts per day of ten hours with overlapping periods between shifts
- rosters based on seven days on, seven days off alternating with six nights on, eight nights off

- 40 per cent of the workforce have been assumed to be locally based, adopting an equal split between Moranbah and Dysart
- local workforce will travel by car, with an assumed occupancy rate of one person per vehicle
- 60 per cent of the workforce have been assumed to be FIFO to Moranbah Airport
- FIFO workforce will be transported between Moranbah Airport, Project Site and accommodation village by bus (48 seat capacity)
- FIFO workers will reside at existing accommodation villages adopting an equal split between Moranbah and Dysart. The existing villages that may be used include Moranbah SPV, Dysart SPV and Dysart Ausco (Stayover). For the purpose of this assessment, the number of vehicles associated with FIFO workers will be equally assigned on Saraji Road between Moranbah and Dysart.
- at the end of the roster, FIFO workers will be transported directly from the Project Site to Moranbah Airport by bus.

As there are three shifts proposed per day, it is only possible for one of the shift changeovers to coincide with the peak hour periods for the background traffic, that is, the overlap will occur in either the AM or the PM peak hour. However, the shift changeover times have not yet been set, so this assessment has conservatively assessed both the AM and PM peak periods assuming overlap between the operations shift changeovers and the background traffic peak periods.

Vehicle movements associated with the FIFO workforce will vary across the week due to the rostered on and off periods. This assessment has considered two different days which represent different traffic conditions as a result of the rosters, including:

- Shift change day
  - FIFO workers at the end of shift are also at the end of the roster and are transported directly from the Project Site to the Moranbah Airport
  - FIFO workers about to commence their shift are also at the start of the roster and are transported from the Moranbah Airport to the Project Site.
- Ordinary day
  - FIFO workers are transported between the Project Site and the existing operation accommodation villages.

On a shift change day, there will be higher traffic volumes to the north of the Project Site than on an ordinary day, due to the bus movements to and from the Moranbah Airport. On an ordinary day, buses will move to and from operational accommodation in Dysart and Moranbah. The same number of vehicle movements will occur on the shift changing day and ordinary day but will be distributed differently on the road network.

Based on the above assumptions, Table 16 shows the number of vehicles (buses and cars) estimated for operations workers traffic. Therefore, it is concluded that the operational work force traffic is expected to range from 37 to 70 vehicles per hour and 111 to 210 vehicles per day.

Table 16 Operation workers traffic

(3A) Operation workers traffic		Number of vehicles (buses and cars)					
Operational year	No. of workers	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
		IN	OUT	IN	OUT	IN	OUT
Year 3 to Year 4	260	37	37	37	37	111	111
Year 5 to Year 20	500	70	70	70	70	210	210
Year 21 and Year 22	260	37	37	37	37	111	111

5.3.3.2 Operation materials and equipment traffic

Based on the information from BMA, vehicle movements associated with operation phase materials and equipment is shown in Table 17. Vehicle movements of Project consumables and wastes associated with the workforce accommodation have not been included in the calculations of materials and equipment, as these movements are considered to be indirectly accounted for in the conservative approach taken to calculating heavy vehicle peak period estimates. It is noted that the operations accommodation villages are expected to be existing accommodation villages within Dysart and Moranbah.

Table 17 Quantities for operation materials and equipment

Materials	Approximate quantities (tonnes per annum)	Vehicle type	Annual deliveries (number of heavy vehicles)	Peak period (number of heavy vehicles)
Magnetite	8,000	B-doubles	202	1
Flocculant	1,000	Trucks	214	1
Coalyeaulant	1,000	Trucks	225	1
Diesel	720	Road Trains	16	1
MIBC	360	Semi-trailers	18	1
Fuel & additives	32,000	Road Trains	642	1

Materials and equipment will be transported by heavy vehicles to and from the Project and source of origins. Based on information from BMA, it is anticipated that six heavy vehicles per hour will likely represent a conservative estimate of peak hour traffic during the operation stage as summarised in Table 18.

Table 18 Operation materials and equipment traffic

(3B) Operation materials and equipment traffic	Number of heavy vehicles					
Operational year	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
	IN	OUT	IN	OUT	IN	OUT
Year 3 to Year 22	6	6	6	6	12	12

Therefore, it is concluded that the operation materials and equipment traffic is estimated to be six heavy vehicles per hour and 12 heavy vehicles per day.

5.3.3.3 Summary of operation traffic

For the purpose of this assessment, operation traffic is defined as the sum of operational work force traffic and operation materials and equipment traffic as summarised in Table 19.

Table 19 Operation traffic

(3) Operation traffic		Number of vehicles (buses, heavy vehicles and cars)					
Operational year	Number of workers	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
		IN	OUT	IN	OUT	IN	OUT
Year 3 to Year 4	260	43	43	43	43	123	123
Year 5 to Year 20	500	76	76	76	76	222	222
Year 21 and Year 22	260	43	43	43	43	123	123

Therefore, it is concluded that the operation traffic is expected to range from 43 to 76 vehicles per hour and 123 to 222 vehicles per day.

5.4 Development traffic

The total road transport task for the Project is the combined traffic volumes for the construction phase and the operation phase. The peak hour and daily traffic volumes for the development traffic over the assessment horizon are summarised in Table 20. During the life of the project, no OSOM vehicles are expected.

Table 20 Development traffic

Stage	Number of vehicles (buses, heavy vehicles and cars)					
	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
	IN	OUT	IN	OUT	IN	OUT
Year 1 (construction)	69	69	69	69	162	162
Year 2 (construction)	69	69	69	69	162	162
Year 3 (construction/operation)	142	142	142	142	345	345
Year 4 (operation)	76	76	76	76	222	222
Year 5 (operation)	76	76	76	76	222	222
Year 6 (operation)	76	76	76	76	222	222
Year 7 (operation)	76	76	76	76	222	222
Year 8 (operation)	76	76	76	76	222	222
Year 9 (operation)	76	76	76	76	222	222
Year 10 (operation)	76	76	76	76	222	222
Year 11 (operation)	76	76	76	76	222	222
Year 12 (operation)	76	76	76	76	222	222
Year 13 (operation)	76	76	76	76	222	222
Year 14 (operation)	76	76	76	76	222	222
Year 15 (operation)	76	76	76	76	222	222
Year 16 (operation)	76	76	76	76	222	222
Year 17 (operation)	76	76	76	76	222	222
Year 18 (operation)	76	76	76	76	222	222
Year 19 (operation)	76	76	76	76	222	222
Year 20 (operation)	76	76	76	76	222	222
Year 21 (operation)	43	43	43	43	123	123
Year 22 (operation)	43	43	43	43	123	123

As the development traffic shows, the number of vehicles fluctuates during the life of the Project. During the early stage of construction, 69 vehicles per hour are expected during the peak hours. It gradually increases to 142 vehicles per peak hour during the period FY 2023 when both construction and operation occur concurrently. The traffic associated with the operation phase is lower than the traffic in the construction phase. After the construction ends in FY 2023, the project traffic comprises only the operation phase between FY2024 and 2042 which is estimated to be 43 to 76 vehicles per hour. Table 21 and Table 22 summarise the development traffic on the identified highway links.

Table 21 Development traffic – highway links (ordinary day)

Highway Link	Location	Direction	Traffic flow (Number of vehicles)					
			Year 1 (Construction)		Year 3 (Operation)		Year 20 (Operation)	
			AM (5am – 6am)	PM (5pm – 6pm)	AM (5am – 6am)	PM (5pm – 6pm)	AM (5am – 6am)	PM (5pm – 6pm)
(1) Saraji Road	South of Lake Vermont Road	Northbound	33	33	67	67	39	39
		Southbound	33	33	67	67	39	39
(2) Saraji Road	Intersection A	Northbound	38	38	77	77	39	39
		Southbound	38	38	77	77	39	39
(3) Saraji Road	South of Peak Downs Highway	Northbound	32	32	66	66	39	39
		Southbound	32	32	66	66	39	39
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	19	19	22	22	3	3
		Westbound	19	19	22	22	3	3

Table 22 Development traffic – highway links (shift changing day)

Highway Link	Location	Direction	Traffic flow (Number of vehicles)					
			Year 1 (Construction)		Year 3 (Operation)		Year 20 (Operation)	
			AM (5am – 6am)	PM (5pm – 6pm)	AM (5am – 6am)	PM (5pm – 6pm)	AM (5am – 6am)	PM (5pm – 6pm)
(1) Saraji Road	South of Lake Vermont Road	Northbound	33	33	66	66	37	37
		Southbound	33	33	66	66	37	37
(2) Saraji Road	Intersection A	Northbound	33	33	66	66	37	37
		Southbound	33	33	66	66	37	37
(3) Saraji Road	South of Peak Downs Highway	Northbound	37	37	77	77	40	40
		Southbound	37	37	77	77	40	40
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	19	19	22	22	3	3
		Westbound	19	19	22	22	3	3

The traffic volumes generated by the Project are relatively low. At the peak of the construction in construction Year 3, it is expected that 77 vehicles per hour will pass through highway link 3 (Peak Downs Mine Road south of Peak Downs Highway) during a shift changing day. Flow diagrams for the development traffic are included in Appendix C and Table 23 summarise the development traffic at identified intersections.

Table 23 Development Traffic – intersections (ordinary day)

(4) Development Traffic	Number of vehicles (buses, heavy vehicles and cars)					
Intersections	Year 1 (construction)		Year 3 (operation/construction)		Year 20 (operation)	
	AM	PM	AM	PM	AM	PM
	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
1	76	76	154	154	78	78
2	76	76	154	154	78	78
3	64	64	132	132	77	77
4	64	64	132	132	77	77
5	64	64	132	132	77	77
A	140	140	286	286	156	156

Table 24 Development Traffic – intersections (shift changing day)

(4) Development Traffic	Number of vehicles (buses, heavy vehicles and cars)					
Intersections	Year 1 (construction)		Year 3 (construction/operation)		Year 20 (operation)	
	AM	PM	AM	PM	AM	PM
	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
1	66	66	132	132	74	74
2	66	66	132	132	74	74
3	74	74	154	154	80	80
4	74	74	154	154	80	80
5	74	74	154	154	80	80
A	140	140	286	286	154	154

At the peak of the construction in FY 2023 / construction Year 3, it is expected that 286 vehicles per hour are expected to use Intersection A during the ordinary day. Flow diagrams for the Development Traffic are included in Appendix C.

5.5 Total traffic

For the purpose of this assessment, total traffic is defined as the sum of development traffic and background traffic. Table 25 and Table 26 show the total traffic on the identified highway links. Flow diagrams are included in Appendix D.

Table 25 Total traffic – highway links (ordinary day)

(5) Total traffic			Traffic flow (Number of vehicles)					
Highway link	Location	Direction	FY 2021 / Year 1 (construction)		FY 2023 / Year 3 (construction/operation)		FY 2040 / Year 20 (operation)	
			AM	PM	AM	PM	AM	PM
			5am-6am	5pm-6pm	5am-6am	5pm-6pm	5am-6am	5pm-6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	439	201	481	238	529	241
		Southbound	103	271	138	310	123	327
(2) Saraji Road	Intersection A	Northbound	192	133	234	174	225	153
		Southbound	82	146	122	187	92	170
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	58	174	92	210	70	210
		Southbound	289	162	328	199	349	196
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	198	142	205	147	219	151
		Westbound	106	222	111	229	109	248

Table 26 Total traffic – highway links (shift changing day)

Total traffic			Traffic flow (Number of vehicles)					
Highway Link	Location	Direction	FY 2021 / Year 1 (construction)		FY 2023 / Year 3 (construction/operation)		FY 2040 / Year 20 (operation)	
			AM	PM	AM	PM	AM	PM
			5am-6am	5pm-6pm	5am-6am	5pm-6pm	5am-6am	5pm-6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	439	201	480	237	527	239
		Southbound	103	271	137	309	121	325
(2) Saraji Road	Intersection A	Northbound	187	128	223	163	223	151
		Southbound	77	141	111	176	90	168
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	63	179	103	221	71	211
		Southbound	294	167	339	210	350	197
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	198	142	205	147	219	151
		Westbound	106	222	111	229	109	248

The above tables show total traffic in the study area is anticipated to be moderate. At the peak of the construction, it is expected that 619 vehicles per hour will pass through highway link 1 (Saraji Road south of Lake Vermont Road) in the 2023 AM peak during ordinary days.

Table 27 and Table 28 show the total traffic on identified intersections.

Table 27 Total traffic – intersections (ordinary day)

Total traffic	Number of vehicles					
Intersections	FY 2021 / Year 1 (construction)		FY 2023 / Year 3 (construction/operation)		FY 2040 / Year 20 (operation)	
	AM	PM	AM	PM	AM	PM
	5am-6am	5pm-6pm	5am-6am	5pm-6pm	5am-6am	5pm-6pm
1	555	495	642	582	656	585
2	610	557	699	645	723	659
3	470	468	546	544	568	565
4	579	567	657	645	700	685
5	736	765	818	847	889	925
A	338	343	488	493	394	401

Table 28 Total traffic – intersection (shift changing day)

Total traffic	Number of vehicles					
Intersections	FY 2021 / Year 1 (construction)		FY 2023 / Year 3 (construction/operation)		FY 2040 / Year 20 (operation)	
	AM	PM	AM	PM	AM	PM
	5am-6am	5pm-6pm	5am-6am	5pm-6pm	5am-6am	5pm-6pm
1	545	485	620	560	652	581
2	600	547	677	623	719	655
3	480	478	568	566	570	568
4	589	577	679	667	702	687
5	746	775	840	869	892	927
A	338	343	488	493	393	399

The above tables show total traffic in the study area is anticipated to be moderate. At the peak of the construction, it is expected that 847 vehicles per hour will use Intersection 5 between Peak Downs Highway and Moranbah Access Road during shift changing day in FY 2023 PM peak.

5.6 Crash history

A review of the latest available crash data in the area showed a total of 18 crashes were recorded in the past five years between January 2017 and December 2021. The following tables summarise the severity, locations and crash types.

Table 29 Severity of crashes

Severity	Number of crashes	Percentage of total crashes
Minor injury	1	6%
Medical treatment	6	33%
Hospitalisation	9	50%
Fatal	2	11%

Table 29 summarises the severity of the accidents. It shows the majority are serious accidents with 33 per cent requiring medical treatments at the scene and 50 per cent resulting in hospital treatments. Table 30 summarises the locations of the accidents within the study area. It shows the majority of the accidents occurred on Saraji Road (61 per cent), followed by Peak Downs Highway (28 per cent).

Table 30 Location of crashes

Location	Number of crashes	Percentage of total crashes
Peak Downs Highway	5	28%
Saraji Road \ Peak Downs Mine Road	11	61%
Moranbah Access Road	1	6%
Garnham Drive	1	6%

Table 31 Crash types

Crash type	Number of crashes	Percentage of total crashes
Off carriageway on straight / off carriageway on straight hit object	7	39%
Out of control on straight / out of control on straight	3	17%
Head on	2	11%
Rear end	2	11%
Other	4	22%

Table 31 summarises the accident types based on Definition of Coding Accident. It shows the majority of the accidents involved vehicles going off the carriageway on straight sections (39 per cent), out of control on straight (17 per cent), followed by head on and rear end crashes (11 per cent each) and other crashes (22 per cent).

5.7 Scheduled road improvement projects

Queensland Transport and Roads Investment Program (QTRIP) *2022-23 to 2025-26* (The State of Queensland (Department of Transport and Main Roads), 2017c) sets out the current and planned investments in transport and road infrastructure for the next four years. A review of QTRIP was undertaken to identify any planned upgrades to sections of the road network expected to be used by traffic associated with the Project.

Table 32 summarises the three planned improvements in the vicinity of the Project Area that are listed in QTRIP 2022-23 to 2025-26.

Table 32 Relevant planned road improvements in Project Area

Investment name / Location	Location description	Work description
Peak Downs Highway (Clermont - Nebo)	Wuthung Road - Caval Ridge	Widen pavement
Saraji Road	Saraji Road	Rehabilitate pavement
Peak Downs Mine Road	Peak Downs Mine Road	Pavement rehabilitation

5.8 School bus routes

School bus routes currently use the Peak Downs Highway and Moranbah Access Road to service schools in Moranbah, and Saraji Road and Peak Downs Mine Road to service schools in Dysart. School bus routes typically operate outside of shift start and end times for mine workers and are therefore not anticipated to be affected.

5.9 Rail transport networks

The existing Goonyella rail system (specifically the Norwich Park Branch Line) which is owned and operated by Aurizon, runs adjacent to the Saraji Mine. The Goonyella rail system consists of 477 km of track length which services the coal mining area in the Bowen Basin, carrying coal to a number of port locations, including Hay Point Coal Terminal and Abbot Point Coal Terminal.

The product coal will be transported approximately 250 km to ship loading facilities at the Hay Point Coal Terminal or approximately 400 km to the Abbot Point Coal Terminal. The total amount of coal railed will be up to 110 Mt over the life of the Project, with an annual average of 6.2 Mt equating to an additional two trains per day. The maximum coal production is 8 Mtpa, equating to an additional three trains per day. Existing rail level crossings are described in Section 5.1.6.3.

5.10 Air transport networks

The closest major commercial airport to the Project is Moranbah Airport, which is located 35 km north of the Project Site. Moranbah Airport is currently served by QantasLink with direct flights between Brisbane and Moranbah. The airport averages 36 QantasLink flights each week, most of these being Dash-8 (or equivalent) aircraft. The aircraft has capacity for approximately 60 passengers. The airport is operated by BMA and has one runway 1,524 m long.

5.11 Sea and shipping transport networks

Product coal from the Project will be exported via either:

- Hay Point Coal Terminal: located approximately 40 km south of Mackay and 155 km north-east of the Project. The terminal is owned and operated by BMA.
- Abbot Point Coal Terminal: located approximately 266 km north of the Project Site and 25 km north of Bowen on the Central Queensland coast.

The average shipping size through the Hay Point Coal Terminal and Abbot Point Coal Terminal is 93,000 t. This equates to an annual average of 67 additional ships per year of operation and up to 88 ships in peak production. The product coal shipped via these ports will be within the approved port and shipping capacity and throughput limits.

6.0 Potential impacts

6.1 Overview

Potential impacts to transport infrastructure are assessed for each mode of transport, including road, air, rail and sea.

Impacts to road transport are considered as per the requirements of GTIA 2018, including:

- intersections and access
- highway link capacity
- level crossing vehicle queues
- pavements
- safety.

6.2 Road transport

6.2.1 Intersection assessments

Table 33 and Table 34 summarise the development traffic impact as a percentage of the total traffic at the identified intersections for the assessment years.

Table 33 Percentage of development traffic in the total traffic at identified intersections (ordinary day)

Intersections	FY 2021 / Year 1 (construction)		FY 2023 / Year 3 (construction/operation)		FY 2040 / Year 20 (operation)	
	AM	PM	AM	PM	AM	PM
	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
1	14%	15%	24%	26%	12%	13%
2	12%	14%	22%	24%	11%	12%
3	14%	14%	24%	24%	14%	14%
4	11%	11%	20%	20%	11%	11%
5	9%	8%	16%	16%	9%	8%
A	41%	41%	59%	58%	39%	39%

Table 34 Percentage of development traffic in the total traffic at identified intersections (shift changing day)

Intersections	FY 2021 / Year 1 (construction)		FY 2023 / Year 3 (construction/operation)		FY 2040 / Year 20 (operation)	
	AM	PM	AM	PM	AM	PM
	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
1	12%	14%	21%	24%	11%	13%
2	11%	12%	20%	21%	10%	11%
3	15%	15%	27%	27%	14%	14%
4	13%	13%	23%	23%	11%	12%
5	10%	10%	18%	18%	9%	9%
A	41%	41%	59%	58%	39%	39%

The results show the development traffic at the identified intersections is anticipated to exceed 5% of the total traffic in FY 2021 / Year 1 (construction), FY 2023 / Year 3 (construction/operation) and FY 2040 / Year 20 (operation). Therefore, SIDRA assessment is required.

As the traffic is distributed differently during the ordinary days and shift changing days, the following list summarises the scenarios for which the maximum traffic occurs at the intersections. The SIDRA assessments were undertaken based on the following scenarios at each intersection:

- Intersection 1 – Ordinary day
- Intersection 2 – Ordinary day
- Intersection 3 – Shift changing day
- Intersection 4 – Shift changing day
- Intersection 5 – Shift changing day
- Proposed Intersection A – Shift changing day.

The development of the SIDRA models were based on aerial images. All geometric input into the models were based on measurements from aerial images.

6.2.1.1 Intersection 1 – Saraji Road / Lake Vermont Road

The following diagram shows the layout of Intersection 1.

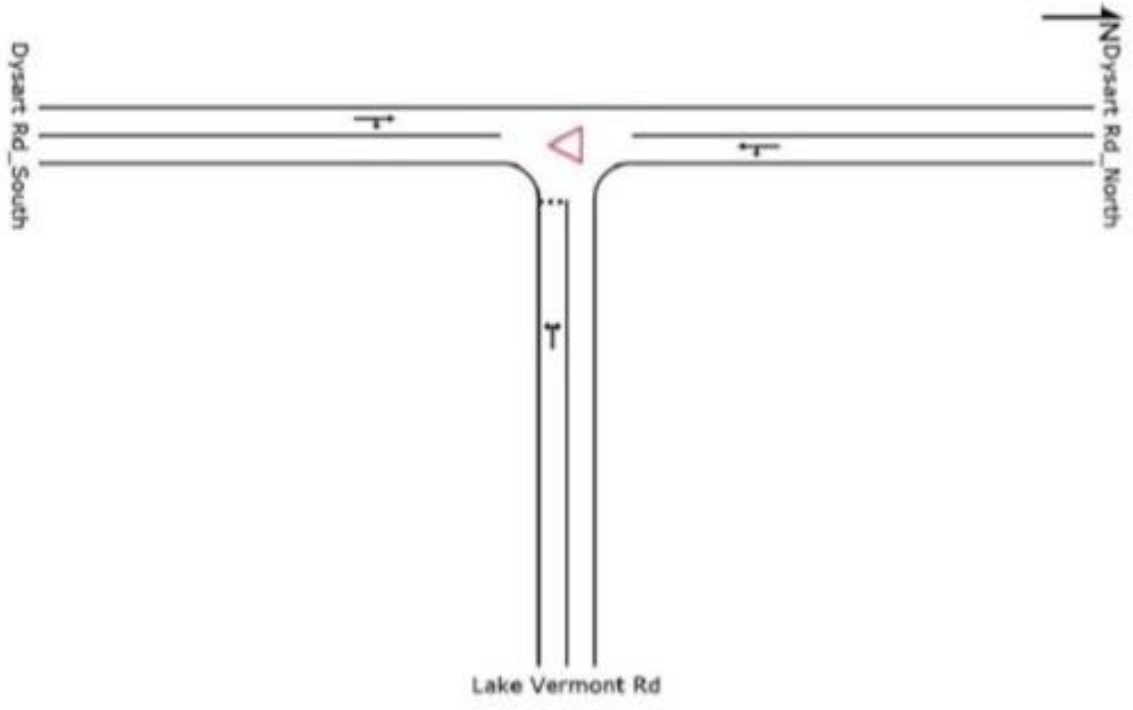


Figure 4 SIDRA layout for Intersection 1

The following tables show the results of the SIDRA analysis for the background traffic and the total traffic for Intersection 1.

Table 35 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for 2018 background traffic

Intersection 1	2018 AM background traffic					2018 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.204	0.1	NA	0	0.2	0.086	0.1	NA	0	0.1
Lake Vermont Road	0.004	8	A	0	0.1	0.024	7.9	A	0.1	0.7
Saraji Road North	0.035	0.1	NA	0	0	0.118	0	NA	0	0
All vehicles	0.204	0.1	NA	0	0.2	0.118	0.4	NA	0.1	0.7

Table 36 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2021 background traffic

Intersection 1	FY 2021 AM background traffic					FY 2021 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.212	0.1	NA	0	0.2	0.089	0.1	NA	0	0.1
Lake Vermont Road	0.004	8.1	A	0	0.1	0.025	8	A	0.1	0.8
Saraji Road North	0.037	0.1	NA	0	0	0.123	0	NA	0	0
All vehicles	0.212	0.1	NA	0	0.2	0.123	0.4	NA	0.1	0.8

Table 37 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2021 / Year 1 (construction) total traffic (ordinary day)

Intersection 1	FY 2021 / Year 1 (construction) AM total traffic					FY 2021 / Year 1 (construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.236	0.1	NA	0	0.2	0.113	0	NA	0	0.1
Lake Vermont Road	0.018	11.6	B	0.1	0.7	0.039	9.3	A	0.1	1.3
Saraji Road North	0.065	0.6	NA	0	0	0.151	0.2	NA	0	0
All vehicles	0.236	0.3	NA	0.1	0.7	0.151	0.6	NA	0.1	1.3

The SIDRA results show the impact of the development traffic at Intersection 1 in FY 2021 / Year 1 (construction) is anticipated to be insignificant with minimal changes in queuing and delay when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Lake Vermont Road with an average delay of approximately 12 seconds estimated in the FY 2021 / Year 1 (construction) AM peak for the total traffic. This represents an increase of approximately 43 per cent (8.1 seconds to 11.6 seconds) in delay.

Table 38 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2023 background traffic

Intersection 1	FY 2023 AM background traffic					FY 2023 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.217	0.1	NA	0	0.2	0.092	0.1	NA	0	0.1
Lake Vermont Road	0.004	8.2	A	0	0.1	0.025	8	A	0.1	0.8
Saraji Road North	0.037	0.1	NA	0	0	0.126	0	NA	0	0
All vehicles	0.217	0.1	NA	0	0.2	0.126	0.4	NA	0.1	0.8

Table 39 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2023 / Year 3 (construction / operation) total traffic (ordinary day)

Intersection 1	FY 2023 / Year 3 (construction / operation) AM total traffic					FY 2023 / Year 3 (construction / operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.259	0.1	NA	0	0.2	0.134	0	NA	0	0.1
Lake Vermont Road	0.038	14	B	0.1	1.4	0.058	10.8	B	0.2	2
Saraji Road North	0.089	0.8	NA	0	0	0.177	0.4	NA	0	0
All vehicles	0.259	0.5	NA	0.1	1.4	0.177	0.8	NA	0.2	2

The SIDRA results show the impact of the development traffic at Intersection 1 in FY 2023 / Year 3 (construction/operation) is anticipated to be insignificant with minimal changes in queuing and delay when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Lake Vermont Road with an average delay of approximately 14 seconds estimated in the FY 2023 AM peak for the total traffic. This represents an increase of approximately 71 per cent (8.2 seconds to 14 seconds) in delay from future year 2023 base AM peak hour conditions.

Table 40 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for FY 2040 background traffic

Intersection 1	FY 2040 AM background traffic					FY 2040 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.257	0.1	NA	0	0.2	0.108	0	NA	0	0.1
Lake Vermont Road	0.005	8.9	A	0	0.1	0.035	8.6	A	0.1	1.1
Saraji Road North	0.044	0.1	NA	0	0	0.148	0	NA	0	0
All vehicles	0.257	0.1	NA	0	0.2	0.148	0.5	NA	0.1	1.1

Table 41 SIDRA results for Intersection 1 (Saraji Road / Lake Vermont Road) for 2040 / Year 20 (operation) total traffic (ordinary day)

Intersection 1	FY 2040 / Year 20 (operation) AM total traffic					FY 2040 / Year 20 (operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.278	0.1	NA	0	0.2	0.13	0	NA	0	0.1
Lake Vermont Road	0.005	9.6	A	0	0.2	0.039	9.3	A	0.1	1.2
Saraji Road North	0.066	0.1	NA	0	0	0.17	0	NA	0	0
All vehicles	0.278	0.1	NA	0	0.2	0.17	0.4	NA	0.1	1.2

The SIDRA results show the impact of the development traffic at Intersection 1 in FY 2040 / Year 20 (operation) is anticipated to be insignificant with minimal change in queuing and delay when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Lake Vermont Road with an average delay of 10 seconds estimated in the FY 2040 / Year 20 (operation) AM peak for the total traffic. This represents an increase of approximately 8 per cent (8.9 seconds to 9.6 seconds) in delay.

The SIDRA assessment concludes that, even though the Project increases traffic volumes at Intersection 1 by more than 5 per cent, the intersection is anticipated to operate within capacity without significant impacts to vehicle delay and queuing. The incremental worsening in LoS is considered insignificant. Full SIDRA results are included in Appendix E.

6.2.1.2 Intersection 2 – Saraji Road / Saraji Mine Entrance

The following diagram shows the layout of Intersection 2.

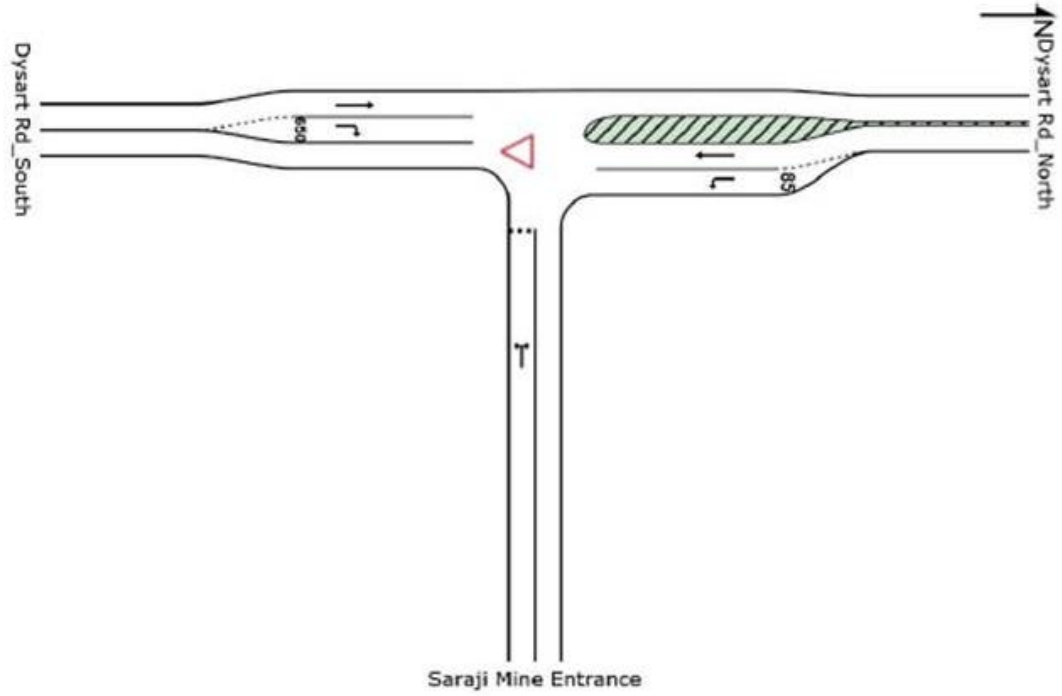


Figure 5 SIDRA layout for Intersection 2

The following tables show the results of the SIDRA analysis for the background traffic and the total traffic for Intersection 2.

Table 42 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for 2018 background traffic

Intersection 2	2018 AM background traffic					2018 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.182	3.5	NA	0.8	6	0.075	3.2	NA	0.3	2.3
Saraji Mine Entrance	0.075	6.4	A	0.3	2	0.181	6.3	A	0.7	5.4
Saraji Road North	0.013	3.4	NA	0	0	0.045	0.2	NA	0	0
All vehicles	0.182	4	NA	0.8	6	0.181	4	NA	0.7	5.4

Table 43 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2021 background traffic

Intersection 2	FY 2021 AM background traffic					FY 2021 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.189	3.5	NA	0.9	6.3	0.079	3.3	NA	0.3	2.4
Saraji Mine Entrance	0.078	6.4	A	0.3	2.1	0.189	6.3	A	0.8	5.6
Saraji Road North	0.014	3.4	NA	0	0	0.046	0.2	NA	0	0
All vehicles	0.189	4	NA	0.9	6.3	0.189	4	NA	0.8	5.6

Table 44 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2021 / Year 1 (construction) total traffic (ordinary day)

Intersection 2	FY 2021 / Year 1 (construction) AM total traffic					FY 2021 / Year 1 (construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.198	3.4	NA	0.9	6.6	0.083	2.8	NA	0.3	2.5
Saraji Mine Entrance	0.085	6.9	A	0.3	2.3	0.202	6.7	A	0.8	6
Saraji Road North	0.037	1.7	NA	0	0	0.074	0.1	NA	0	0
All vehicles	0.198	3.6	NA	0.9	6.6	0.202	3.6	NA	0.8	6

The SIDRA results show the impact of the development traffic at Intersection 2 in FY 2021 is anticipated to be insignificant with minimal changes in delay and queuing when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on the Saraji Mine Entrance with an average delay of approximately 7 seconds estimated in the FY 2021 AM peak for the total traffic. This represents approximately 8 per cent (from 6.4 seconds to 6.9 seconds) increase in delay.

Table 45 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2023 background traffic

Intersection 2	FY 2023 AM background traffic					FY 2023 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.194	3.5	NA	0.9	6.5	0.08	3.3	NA	0.3	2.4
Saraji Mine Entrance	0.081	6.5	A	0.3	2.2	0.192	6.3	A	0.8	5.7
Saraji Road North	0.014	3.4	NA	0	0	0.047	0.2	NA	0	0
All vehicles	0.194	4	NA	0.9	6.5	0.192	4	NA	0.8	5.7

Table 46 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2023 / Year 3 (construction / operation) total traffic (ordinary day)

Intersection 2	FY 2023 / Year 3 (construction / operation) AM total Traffic					FY 2023 / Year 3 (construction / operation) PM total Traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.212	3.2	NA	1	7.1	0.095	2.5	NA	0.4	2.6
Saraji Mine Entrance	0.095	7.3	A	0.3	2.5	0.219	7.1	A	0.9	6.5
Saraji Road North	0.06	1.1	NA	0	0	0.099	0.1	NA	0	0
All vehicles	0.212	3.4	NA	1	7.1	0.219	3.4	NA	0.9	6.5

The SIDRA results show the impact of the development traffic at Intersection 2 in FY 2023 / Year 3 (construction / operation) is anticipated to be insignificant with minimal changes in delay and queuing when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on the Saraji Mine Entrance with an average delay of approximately 7 seconds estimated in the FY 2023 / Year 3 (construction / operation) AM and PM peaks for the total traffic. This represents approximately 12 per cent (from 6.5 seconds to 7.3 seconds) increase in delay.

Table 47 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2040 background traffic

Intersection 2	FY 2040 AM background traffic					FY 2040 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.231	3.6	NA	1.1	8.1	0.097	3.3	NA	0.4	3
Saraji Mine Entrance	0.102	6.8	A	0.4	2.8	0.237	6.5	A	1	7.3
Saraji Road North	0.017	3.4	NA	0	0	0.057	0.2	NA	0	0
All vehicles	0.231	4	NA	1.1	8.1	0.237	4.1	NA	1	7.3

Table 48 SIDRA assessment for Intersection 2 (Saraji Road / Saraji Mine Entrance) for FY 2040 / Year 20 (operation) total traffic (ordinary day)

Intersection 2	FY 2040 / Year 20 (operation) AM total traffic					FY 2040 / Year 20 (operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.241	3.4	NA	1.2	8.4	0.102	2.9	NA	0.4	3.1
Saraji Mine Entrance	0.11	7.2	A	0.4	3	0.251	6.9	A	1.1	7.7
Saraji Road North	0.032	1.9	NA	0	0	0.079	0.2	NA	0	0
All vehicles	0.241	3.8	NA	1.2	8.4	0.251	3.8	NA	1.1	7.7

The SIDRA results show the impact of the development traffic at Intersection 2 in FY 2040 / Year 20 (operation) is anticipated to be insignificant with minimal changes in queuing and delay when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on the Saraji Mine Entrance with an average delay of approximately 7 seconds estimated in the FY 2040 / Year 20 (operation) AM and PM peaks for the total traffic. This represents approximately 6 per cent (from 6.8 seconds to 7.2 seconds) increase in delay.

The SIDRA assessment concludes that, even though the Project increases traffic volumes at Intersection 2 by more than 5 per cent, the intersection is anticipated to operate within capacity without significant impacts to vehicle delay and queuing. The incremental worsening in Level of Service is considered insignificant. Full SIDRA results are included in Appendix E.

6.2.1.3 Intersection 3 – Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance

The following diagram shows the layout of Intersection 3.

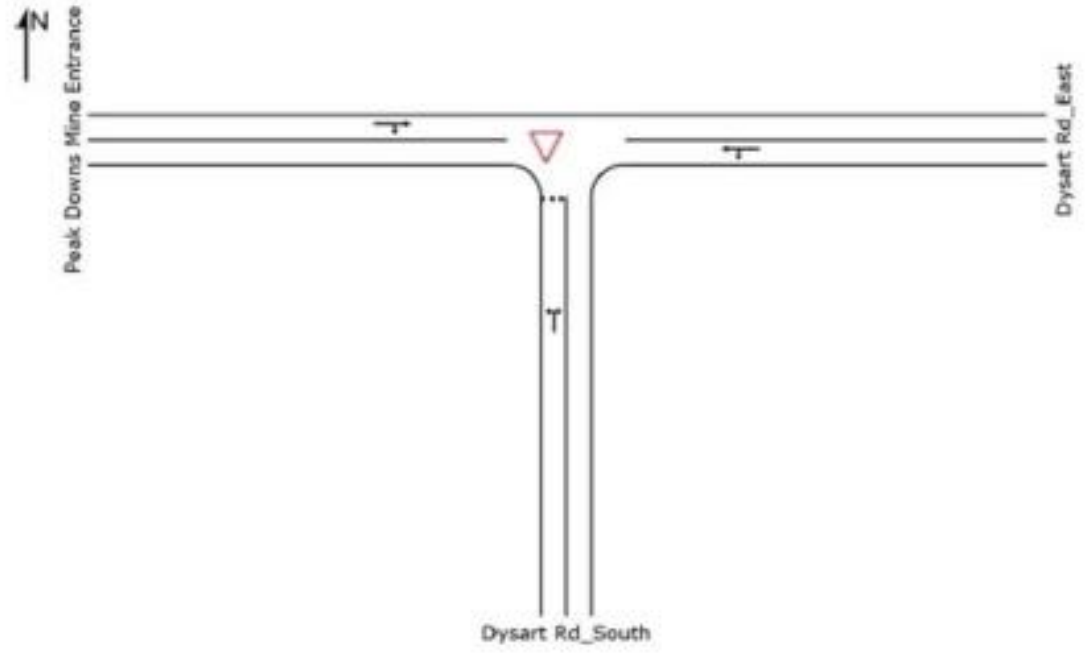


Figure 6 SIDRA layout for Intersection 3

The following tables show the results of the SIDRA analysis for the background traffic and the total traffic for Intersection 3.

Table 49 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for 2018 background traffic

Intersection 3	2018 AM background traffic					2018 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.119	6.3	A	0.5	3.5	0.079	6.3	A	0.3	2.2
Peak Downs Mine Road East	0.117	1.3	NA	0	0	0.064	2.2	NA	0	0
Peak Downs Mine Entrance West	0.016	6.9	NA	0.1	0.4	0.106	7.8	NA	0.4	3.1
All vehicles	0.119	3.6	NA	0.5	3.5	0.106	5.8	NA	0.4	3.1

Table 50 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2021 background traffic

Intersection 3	FY 2021 AM background traffic					FY 2021 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.124	6.4	A	0.5	3.6	0.083	6.4	A	0.3	2.3
Peak Downs Mine Road East	0.121	1.3	NA	0	0	0.066	2.2	NA	0	0
Peak Downs Mine Entrance West	0.016	6.7	NA	0.1	0.4	0.11	7.8	NA	0.4	3.2
All vehicles	0.124	3.6	NA	0.5	3.6	0.11	5.8	NA	0.4	3.2

Table 51 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2021 / Year 1 (construction) total traffic (shift changing day)

Intersection 3	FY 2021 / Year 1 (construction) AM total traffic					FY 2021 / Year 1 (construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.176	6.8	A	0.7	5.6	0.141	7.1	A	0.5	4.3
Peak Downs Mine Road East	0.15	2.3	NA	0	0	0.095	3.6	NA	0	0
Peak Downs Mine Entrance West	0.017	6.8	NA	0.1	0.4	0.113	8	NA	0.4	3.3
All vehicles	0.176	4.3	NA	0.7	5.6	0.141	6.3	NA	0.5	4.3

The SIDRA results show the impact of the development traffic at Intersection 3 in FY 2021 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on the Peak Downs Mine Entrance with an average delay of approximately 8 seconds estimated in the FY 2021 PM peak for the total traffic. This represents approximately 3 per cent (from 7.8 seconds to 8 seconds) increase in delay.

Table 52 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2023 background traffic

Intersection 3	FY 2023 AM background traffic					FY 2023 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.127	6.4	A	0.5	3.7	0.084	6.4	A	0.3	2.3
Peak Downs Mine Road East	0.125	1.3	NA	0	0	0.067	2.2	NA	0	0
Peak Downs Mine Entrance West	0.016	6.7	NA	0.1	0.4	0.113	7.8	NA	0.4	3.3
All vehicles	0.127	3.6	NA	0.5	3.7	0.113	5.9	NA	0.4	3.3

Table 53 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2023 / Year 3 (construction / operation) total traffic (shift changing day)

Intersection 3	FY 2023 / Year 3 (construction / operation) AM total traffic					FY 2023 / Year 3 (construction / operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.23	7	A	0.9	7.5	0.194	7.4	A	0.7	6.1
Peak Downs Mine Road East	0.179	2.9	NA	0	0	0.122	4.2	NA	0	0
Peak Downs Mine Entrance West	0.017	7	NA	0.1	0.5	0.117	8.1	NA	0.5	3.5
All vehicles	0.23	4.8	NA	0.9	7.5	0.194	6.5	NA	0.7	6.1

The SIDRA results show the impact of the development traffic at Intersection 3 in FY 2023 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on the Peak Downs Mine Entrance with an average delay of approximately 8 seconds estimated in the FY 2023 PM peak for the total traffic. This represents approximately 4 per cent (from 7.8 seconds to 8.1 seconds) increase in delay.

Table 54 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2040 background traffic

Intersection 3	FY 2040 AM background traffic					FY 2040 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.156	6.6	A	0.6	4.6	0.104	6.6	A	0.4	2.9
Peak Downs Mine Road East	0.147	1.3	NA	0	0	0.081	2.2	NA	0	0
Peak Downs Mine Entrance West	0.02	7	NA	0.1	0.5	0.136	7.9	NA	0.5	4.1
All vehicles	0.156	3.7	NA	0.6	4.6	0.136	6	NA	0.5	4.1

Table 55 SIDRA assessment for Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance) for FY 2040 / Year 20 (operation) total traffic (shift changing day)

Intersection 3	FY 2040 / Year 20 (operation) AM total traffic					FY 2040 / Year 20 (operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.202	6.8	A	0.8	6.1	0.155	7	A	0.6	4.4
Peak Downs Mine Road East	0.17	2.1	NA	0	0	0.104	3.3	NA	0	0
Peak Downs Mine Entrance West	0.02	7.1	NA	0.1	0.5	0.139	8.1	NA	0.6	4.2
All vehicles	0.202	4.2	NA	0.8	6.1	0.155	6.2	NA	0.6	4.4

The SIDRA results show the impact of the development traffic at Intersection 3 in FY 2040 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on the Peak Downs Mine Entrance with an average delay of approximately 8 seconds estimated in the FY 2040 PM peak for the total traffic. This represents approximately 3 per cent (from 7.9 seconds to 8.1 seconds) increase in delay. The SIDRA assessment concludes that, even though the Project increases traffic volumes at Intersection 3 by more than 5 per cent, the intersection is anticipated to operate within capacity without significant impacts to vehicle delay and queuing. The incremental worsening in Level of Service is considered insignificant. Full SIDRA results are included in Appendix E.

6.2.1.4 Intersection 4 – Peak Downs Highway / Peak Downs Mine Road

The following diagram shows the layout of Intersection 4.

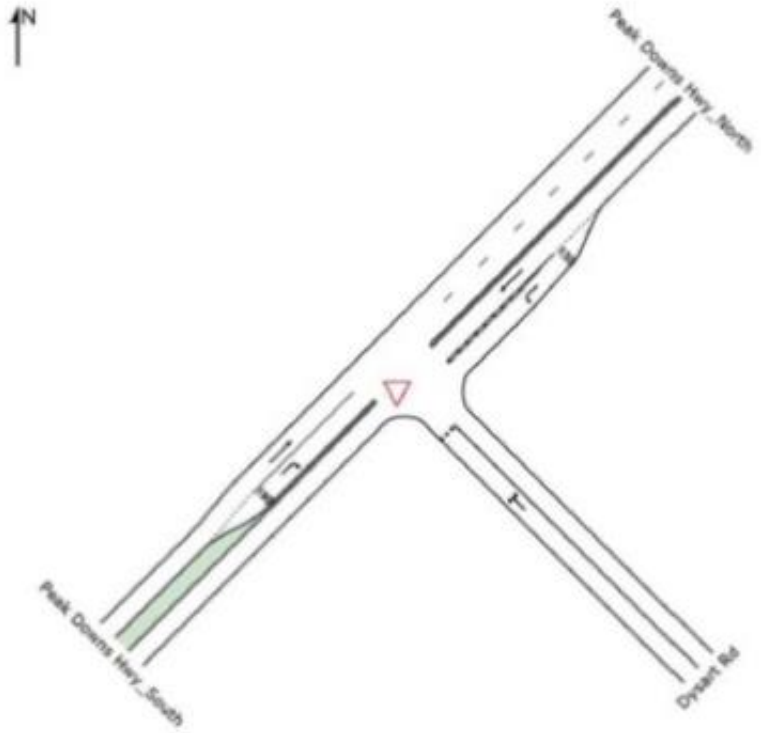


Figure 7 SIDRA layout for Intersection 4

The following tables show the results of the SIDRA analysis for the background traffic and the total traffic for Intersection 4.

Table 56 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for 2018 background traffic

Intersection 4	2018 AM background traffic					2018 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.039	8.6	A	0.1	1.2	0.185	8.1	A	0.8	5.6
Peak Downs Highway North	0.141	3.3	NA	0	0	0.068	3.6	NA	0	0
Peak Downs Highway South	0.029	0.3	NA	0	0.1	0.086	0.3	NA	0	0.2
All vehicles	0.141	3.3	NA	0.1	1.2	0.185	3.7	NA	0.8	5.6

Table 57 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2021 background traffic

Intersection 4	FY 2021 AM background traffic					FY 2021 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.042	8.8	A	0.2	1.2	0.195	8.2	A	0.8	5.9
Peak Downs Highway North	0.147	3.3	NA	0	0	0.07	3.6	NA	0	0
Peak Downs Highway South	0.03	0.3	NA	0	0.1	0.09	0.3	NA	0	0.2
All vehicles	0.147	3.3	NA	0.2	1.2	0.195	3.8	NA	0.8	5.9

Table 58 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2021 / Year 1 total traffic (shift changing day)

Intersection 4	FY 2021 / Year 1 (construction) AM total traffic					FY 2021 / Year 1 (construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.132	11.1	B	0.5	4.9	0.278	9.3	A	1.2	9.8
Peak Downs Highway North	0.176	3.5	NA	0	0	0.099	4	NA	0	0
Peak Downs Highway South	0.03	0.3	NA	0	0.1	0.09	0.3	NA	0	0.2
All vehicles	0.176	4.1	NA	0.5	4.9	0.278	4.6	NA	1.2	9.8

The SIDRA results show the impact of the development traffic at Intersection 4 in FY 2021 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Peak Downs Mine Road with an average delay of approximately 11 seconds estimated in the FY 2021 AM peak for the total traffic. This represents approximately 26 per cent (from 8.8 seconds to 11.1 seconds) increase in delay.

Table 59 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2023 background traffic

Intersection 4	FY 2023 AM background traffic					FY 2023 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.042	8.9	A	0.2	1.2	0.201	8.3	A	0.8	6.1
Peak Downs Highway North	0.149	3.3	NA	0	0	0.072	3.6	NA	0	0
Peak Downs Highway South	0.031	0.3	NA	0	0.1	0.091	0.3	NA	0	0.2
All vehicles	0.149	3.3	NA	0.2	1.2	0.201	3.8	NA	0.8	6.1

Table 60 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2023 / Year 3 (operation / construction) total traffic (shift changing day)

Intersection 4	FY 2023 / Year 3 (operation / construction) AM total traffic					FY 2023 / Year 3 (operation / construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.216	11.5	B	0.9	7.9	0.366	10.7	B	2	16
Peak Downs Highway North	0.204	3.7	NA	0	0	0.127	4.3	NA	0	0
Peak Downs Highway South	0.031	0.3	NA	0	0.1	0.091	0.3	NA	0	0.2
All vehicles	0.216	4.6	NA	0.9	7.9	0.366	5.4	NA	2	16

The SIDRA results show the impact of the development traffic at Intersection 4 in FY 2023 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Peak Downs Mine Road with an average delay of approximately 12 seconds estimated in the FY 2023 AM peak for the total traffic. This represents approximately 29 per cent (from 8.9 seconds to 11.5 seconds) increase in delay.

Table 61 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2040 background traffic

Intersection 4	FY 2040 AM background traffic					FY 2040 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.057	9.7	A	0.2	1.7	0.261	9.1	A	1.1	8.1
Peak Downs Highway North	0.177	3.3	NA	0	0	0.086	3.6	NA	0	0
Peak Downs Highway South	0.036	0.4	NA	0	0.1	0.108	0.3	NA	0	0.2
All vehicles	0.177	3.3	NA	0.2	1.7	0.261	4.1	NA	1.1	8.1

Table 62 SIDRA assessment for Intersection 4 (Peak Downs Highway / Peak Downs Mine Road) for FY 2040 / Year 20 (operation) total traffic (shift changing day)

Intersection 4	FY 2040 / Year 20 (operation) AM total traffic					FY 2040 / Year 20 (operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Mine Road	0.137	10.5	B	0.5	4.1	0.335	10.1	B	1.7	12.4
Peak Downs Highway North	0.201	3.5	NA	0	0	0.109	3.9	NA	0	0
Peak Downs Highway South	0.036	0.4	NA	0	0.1	0.108	0.3	NA	0	0.3
All vehicles	0.201	3.9	NA	0.5	4.1	0.335	4.8	NA	1.7	12.4

The SIDRA results show the impact of the development traffic at Intersection 4 in FY 2040 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Peak Downs Mine Road with an average delay of approximately 11 seconds in the FY 2040 AM peak for the total traffic. This represents approximately 8 per cent (from 9.7 seconds to 10.5 seconds) increase in delay. The SIDRA assessment concludes that, even though the project increases traffic volumes at Intersection 4 by more than 5 per cent, the intersection is anticipated to operate within capacity without significant impacts to vehicle delay and queuing. The incremental worsening in Level of Service is considered insignificant. Full SIDRA results are included in Appendix E.

6.2.1.5 Intersection 5 – Peak Downs Highway / Moranbah Access Road

The following diagram shows the layout of Intersection 5.

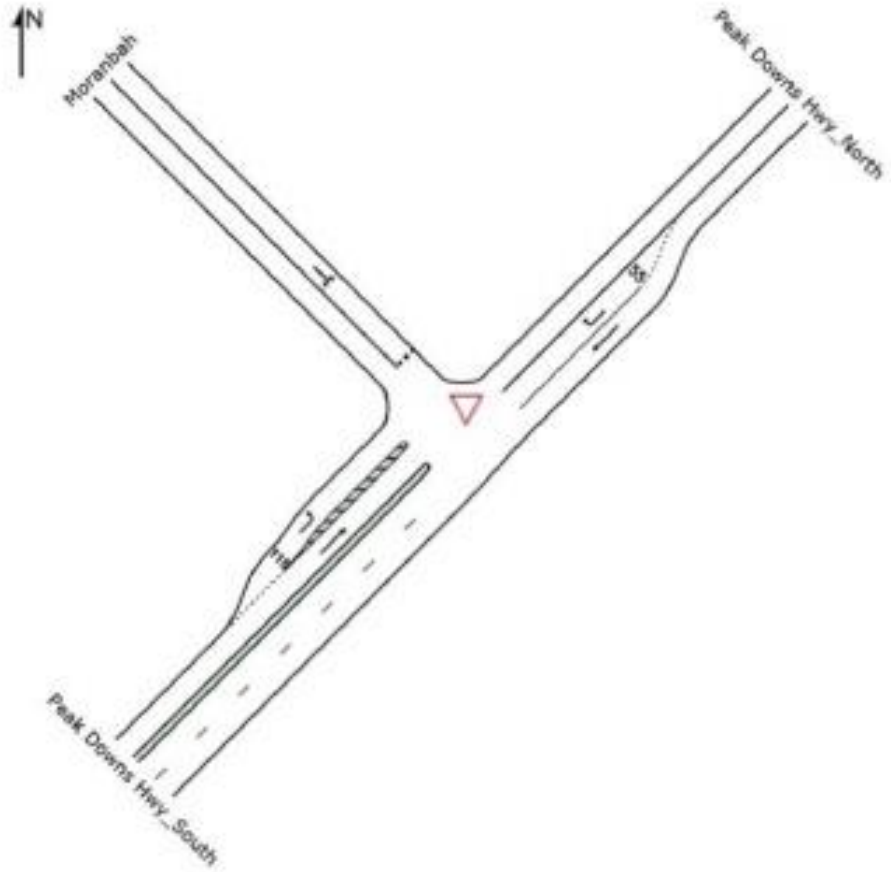


Figure 8 SIDRA layout for Intersection 5

The following tables show the results of the SIDRA analysis for the background traffic and the total traffic for Intersection 5.

Table 63 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for 2018 background traffic

Intersection 5	2018 AM background traffic					2018 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.03	2.2	NA	0.1	0.7	0.134	4.9	NA	0.6	4.1
Moranbah Access Road	0.527	7.7	A	4.1	30.8	0.262	8.1	A	1.1	8.7
Peak Downs Highway South	0.031	1.7	NA	0	0	0.135	4.8	NA	0	0
All vehicles	0.527	6.3	NA	4.1	30.8	0.262	5.8	NA	1.1	8.7

Table 64 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2021 background traffic

Intersection 5	FY 2021 AM background traffic					FY 2021 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.042	2.9	NA	0.2	1.5	0.163	5.3	NA	0.7	5.4
Moranbah Access Road	0.581	8.8	A	5.7	43.3	0.301	8.4	A	1.3	10.6
Peak Downs Highway South	0.032	1.7	NA	0	0	0.141	4.8	NA	0	0
All vehicles	0.581	7.2	NA	5.7	43.3	0.301	6.1	NA	1.3	10.6

Table 65 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2021 / Year 1 (construction) total traffic (shift changing day)

Intersection 5	FY 2021 / Year 1 (construction) AM total traffic					FY 2021 / Year 1 (construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.048	1.9	NA	0.1	0.8	0.149	4.8	NA	0.6	4.5
Moranbah Access Road	0.623	10.3	B	6.9	51.5	0.337	9.5	A	1.7	12.9
Peak Downs Highway South	0.048	2.1	NA	0	0	0.152	4.6	NA	0	0
All vehicles	0.623	7.8	NA	6.9	51.5	0.337	6.1	NA	1.7	12.9

The SIDRA results show the impact of the development traffic at Intersection 5 in FY 2021 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Moranbah Access Road with an average delay of approximately 10 seconds estimated in the FY 2021 AM peak for the total traffic. This represents approximately 17 per cent (from 8.8 seconds to 10.3 seconds) increase in delay.

Table 66 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2023 background traffic

Intersection 5	FY 2023 AM background traffic					FY 2023 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.053	3.3	NA	0.2	2.1	0.186	5.6	NA	0.8	6.5
Moranbah Access Road	0.614	9.5	A	6.8	51.8	0.328	8.7	A	1.5	12.4
Peak Downs Highway South	0.033	1.7	NA	0	0	0.143	4.8	NA	0	0
All vehicles	0.614	7.7	NA	6.8	51.8	0.328	6.3	NA	1.5	12.4

Table 67 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2023 / Year 3 (construction / operation) total traffic (shift changing day)

Intersection 5	FY 2023 / Year 3 (construction / operation) AM total traffic					FY 2023 / Year 3 (construction / operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.051	1.9	NA	0.1	0.9	0.163	5	NA	0.7	4.9
Moranbah Access Road	0.712	12.6	B	9.9	74.7	0.434	11.5	B	2.7	20.8
Peak Downs Highway South	0.051	2.9	NA	0	0	0.177	4.7	NA	0	0
All vehicles	0.712	9.4	NA	9.9	74.7	0.434	6.9	NA	2.7	20.8

The SIDRA results show the impact of the development traffic at Intersection 5 in FY 2023 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Moranbah Access Road with an average delay of approximately 13 seconds estimated in the FY 2023 AM peak for the total traffic. This represents approximately 33 per cent (from 9.5 seconds to 12.6 seconds) increase in delay.

Table 68 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2040 background traffic

Intersection 5	FY 2040 AM background traffic					FY 2040 PM background traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.054	3	NA	0.2	2	0.215	5.8	NA	0.9	7.3
Moranbah Access Road	0.737	12.3	B	11.9	90.3	0.401	10.2	B	2.3	18.6
Peak Downs Highway South	0.039	1.7	NA	0	0	0.169	4.8	NA	0	0
All vehicles	0.737	9.8	NA	11.9	90.3	0.401	6.8	NA	2.3	18.6

Table 69 SIDRA assessment for Intersection 5 (Peak Downs Highway / Moranbah Access Road) for FY 2040 / Year 20 (operation) total traffic (shift changing day)

Intersection 5	FY 2040 / Year 20 (operation) AM total traffic					FY 2040 / Year 20 (operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Peak Downs Highway North	0.04	2.3	NA	0.1	1	0.193	5.5	NA	0.8	5.9
Moranbah Access Road	0.763	13.1	B	13.4	99.3	0.448	11.2	B	2.8	21.8
Peak Downs Highway South	0.041	2.8	NA	0	0	0.191	4.9	NA	0	0
All vehicles	0.763	10.3	NA	13.4	99.3	0.448	7	NA	2.8	21.8

The SIDRA results show the impact of the development traffic at Intersection 5 in FY 2040 is anticipated to be insignificant with minimal changes in queuing and delays when comparing the background traffic analysis to the total traffic analysis. The longest delay is anticipated to occur on Moranbah Access Road with an average delay of approximately 13 seconds estimated in the FY 2040 AM peak for the total traffic. This represents approximately 7 per cent (from 12.3 seconds to 13.1 seconds) increase in delay.

The SIDRA assessment concludes that, even though the Project increases traffic volumes at Intersection 5 by more than 5 per cent, the intersection is anticipated to operate within capacity without significant impacts to vehicle delay and queuing. The incremental worsening in Level of Service is considered insignificant. Full SIDRA results are included in Appendix E.

6.2.1.6 Proposed Intersection A – Saraji Road / Saraji East Mine Entrance

The following diagram shows the layout of Proposed Intersection A.

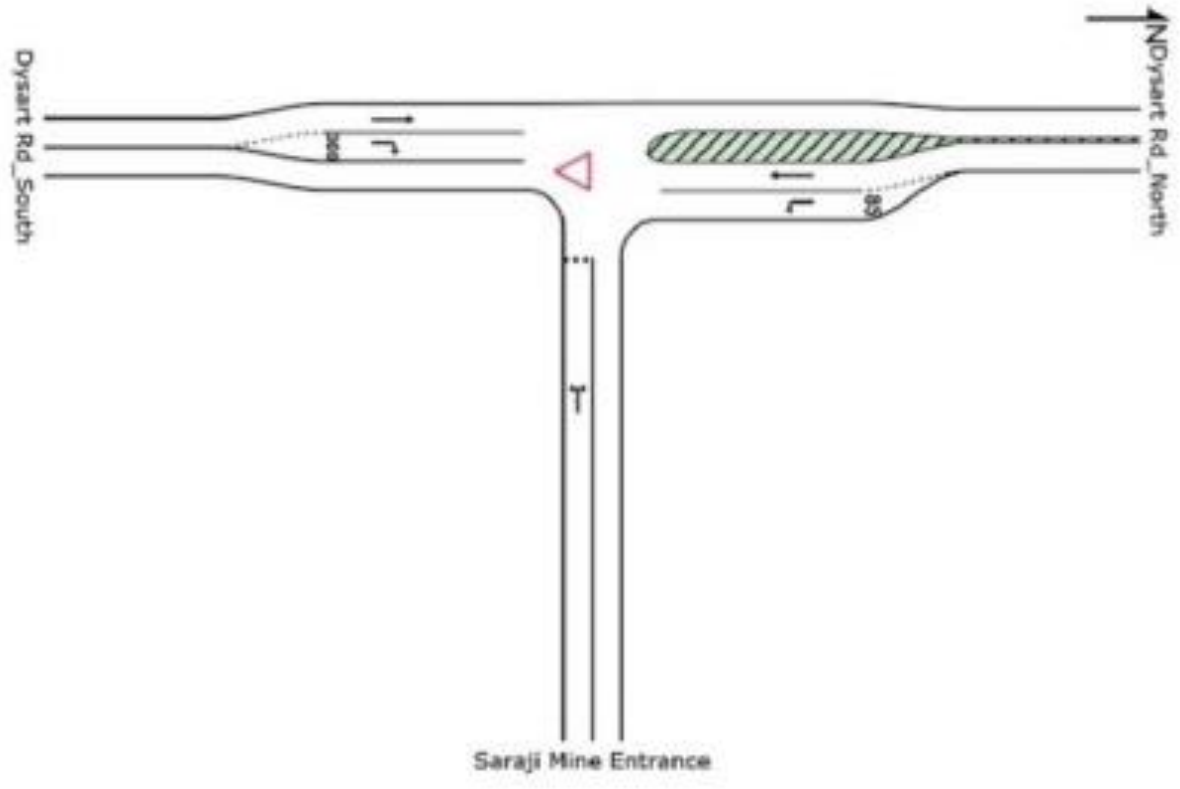


Figure 9 SIDRA layout for Proposed Intersection A

The following tables show the results of the SIDRA analysis for the total traffic for Intersection A.

Table 70 SIDRA assessment for Proposed Intersection A (Saraji Road / the Project Site Entrance) for FY 2021 / Year 1 (construction) total traffic (shift changing day)

Intersection A	FY 2021 / Year 1 (construction) AM total traffic					FY 2021 / Year 1 (construction) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.082	1.2	NA	0.1	1.4	0.051	1.9	NA	0.1	1.5
Saraji East Mine Entrance	0.105	8.4	A	0.4	4.4	0.108	8.6	A	0.4	4.5
Saraji Road North	0.029	2.9	NA	0	0	0.058	1.6	NA	0	0
All vehicles	0.105	3.1	NA	0.4	4.4	0.108	3.1	NA	0.4	4.5

Table 71 SIDRA assessment for Proposed Intersection A (Saraji Road / the Project Site Entrance) for FY 2023 / Year 3 (construction / operation) total traffic (shift changing day)

Intersection A	FY 2023 / Year 3 (construction / operation) AM total traffic					FY 2023 / Year 3 (construction / operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.084	2	NA	0.3	2.3	0.068	2.9	NA	0.3	2.5
Saraji East Mine Entrance	0.206	8.5	A	0.8	8	0.211	8.7	A	0.9	8.2
Saraji Road North	0.055	3.9	NA	0	0	0.06	2.5	NA	0	0
All vehicles	0.206	4.3	NA	0.8	8	0.211	4.4	NA	0.9	8.2

Table 72 SIDRA assessment for Proposed Intersection A (Saraji Road / the Project Site Entrance) for FY 2040 / Year 20 (operation) total traffic (shift changing day)

Intersection A	FY 2040 / Year 20 (operation) AM total traffic					FY 2040 / Year 20 (operation) PM total traffic				
Approach	Degree of Saturation	Average Delay	Level of Service	Queuing		Degree of Saturation	Average Delay	Level of Service	Queuing	
				Vehicles	Distance				Vehicles	Distance
	(DoS)	(Sec)	(LoS)	(No.)	(m)	(DoS)	(Sec)	(LoS)	(No.)	(m)
Saraji Road South	0.099	1	NA	0.1	0.9	0.062	1.5	NA	0.1	0.9
Saraji East Mine Entrance	0.09	7.2	A	0.3	2.7	0.093	7.4	A	0.4	2.7
Saraji Road North	0.03	2.5	NA	0	0	0.07	1.4	NA	0	0
All vehicles	0.099	2.6	NA	0.3	2.7	0.093	2.6	NA	0.4	2.7

The SIDRA results show the proposed Intersection A is expected to operate within capacity. The longest delay is anticipated to occur on the Project Site Entrance with an average delay of approximately 7 seconds in FY 2040 AM and PM peaks. The SIDRA assessments show that the proposed layout is adequate for the anticipated development traffic. Full SIDRA results are included in Appendix E.

6.2.1.7 Intersections utilised by Operational Workforce

The following intersections would be used by the operational workforce to access existing off-site operational worker accommodation:

- Dysart – Middlemount Road / Dysart Clermont Road intersection
- Garnham Drive / Workers' accommodation camp access road intersection
- Peak Downs Highway / Workers' accommodation camp access road intersection

Potential traffic impacts relevant to these intersections have been considered and are assessed below.

6.2.1.7.1 Dysart – Middlemount Road / Dysart Clermont Road intersection

The Dysart – Middlemount Road / Dysart Clermont Road intersection is a 4-arm priority intersection. The main through movement is on the Dysart – Middlemount Road approaches with stop sign controls on Dysart Clermont Road approach and Garnham Drive approach.

The intersection has an Auxiliary Left-turn (AUL) treatment approximately 150m long installed on Dysart – Middlemount Road north approach and a Basic Left-turn (BAL) treatment installed on Dysart Clermont Road approach.

Turn movements at this intersection will increase very slightly due to traffic movements for the workforce residing at worker's accommodation camp in Dysart. The Project is proposing to accommodate some of the workforce within the existing capacity of the camp and does not intend to increase the camp capacity. Therefore, it is anticipated that the intersection should be able to operate satisfactorily, and safety should not be significantly impacted in the assessment years.

6.2.1.7.2 Garnham Drive / Workers' accommodation camp access road intersection

The Garnham Drive / Workers' accommodation camp access road intersection is a 3-arm priority intersection. The main through movements are on Garnham Drive approaches with a give-way control on the Workers' accommodation camp approach.

The intersection has a channelised Right-turn treatment approximately 20m long installed on Garnham Drive north approach and a Basic Left-turn treatment installed on the Workers' accommodation camp approach.

It is expected that the access intersection was originally designed to cater for traffic movements for the camp when operating at full capacity. The Project is proposing to accommodate some of the workforce within the existing capacity of the camp and does not intend to increase the camp capacity. Therefore, the existing intersection is anticipated that the intersection should be able to operate satisfactorily, and safety should not be significantly impacted in the assessment years.

6.2.1.7.3 Peak Downs Highway / Workers' accommodation camp access road intersection

The Peak Downs Highway / Workers' accommodation camp access road intersection is a 3-arm priority intersection. The main through movements are on Peak Downs Highway approaches with a give-way control on the Workers' accommodation camp approach.

The intersection has a channelised Right-turn treatment approximately 180m long installed on Peak Downs Highway south approach and an Auxiliary Left-turn treatment approximately 160m long installed on Peak Downs Highway north approach. It also has a Basic Left-turn treatment installed on the Workers' accommodation camp approach.

It is expected that the access intersection was originally designed to cater for traffic movements for the camp when operating at full capacity. The Project is proposing to accommodate some of the workforce within the existing capacity of the camp and does not intend to increase the camp capacity. Therefore, it is anticipated that the intersection should be able to operate satisfactorily, and safety should not be significantly impacted in the assessment years.

Highway Link assessments

Table 73 and Table 74 summarise the development traffic impact as a percentage of the total traffic on the identified highway links during the assessment years.

Table 73 Percentages of development traffic in the total traffic on identified highway links (ordinary day)

Percentages of development traffic / total traffic								
Highway link	Location	Direction	FY 2021		FY 2023		FY 2040	
			AM	PM	AM	PM	AM	PM
			5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	8%	16%	14%	28%	7%	16%
		Southbound	32%	12%	49%	22%	32%	12%
(2) Saraji Road	Intersection A	Northbound	20%	29%	33%	44%	17%	25%
		Southbound	47%	26%	63%	41%	43%	23%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	55%	18%	71%	31%	55%	19%
		Southbound	11%	20%	20%	33%	11%	20%
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	10%	13%	11%	15%	1%	2%
		Westbound	18%	9%	20%	10%	3%	1%

Table 74 Percentages of development traffic in the total traffic on identified highway links (shift changing day)

Percentages of development traffic / total traffic								
Highway link	Location	Direction	FY 2021		FY 2023		FY 2040	
			AM	PM	AM	PM	AM	PM
			5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	8%	16%	14%	28%	7%	15%
		Southbound	32%	12%	48%	21%	31%	11%
(2) Saraji Road	Intersection A	Northbound	18%	26%	30%	41%	17%	24%
		Southbound	43%	23%	60%	37%	41%	22%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	59%	21%	74%	35%	56%	19%
		Southbound	13%	22%	23%	37%	11%	20%
(4) Peak Downs Highway	East of Moranbah Access Road	Eastbound	10%	13%	11%	15%	1%	2%
		Westbound	18%	9%	20%	10%	3%	1%

The assessments show the development traffic on the identified highway links is anticipated to exceed 5 per cent of the background traffic.

Whilst the majority of assessed road links have exceeded the 5% threshold, given the low background traffic in the network, it is anticipated that delay or congestion on the road links is unlikely to occur and the road links would operate within an acceptable Level of Service.

As stated in the GTIA, road operation capacity impacts are only considered for major developments and link capacity assessments are not required unless new State-Controlled Road (SCR) road links need to be constructed to service the development.

It is confirmed that the Project will not require new State-Controlled Road (SCR) road links to be constructed to service the development. Therefore, additional road operation capacity assessment is not necessary as part of this assessment.

6.2.2.1 Highway link capacity assessment

The *Highway Capacity Manual* (2016) from the Transportation Research Board of the United States of America suggests a road capacity of 1,700 passenger vehicles per hour for a 3.6 m wide lane. However, to account for the heavy vehicles and property accesses along the identified highway links, this assessment developed a factor based on the 2019 AADT data to reduce the suggested road capacity.

A review of the AADT data shows the proportions of heavy vehicles on Peak Downs Highway and Saraji Road are 26 per cent and 31 per cent respectively. In addition, a further five per cent reduction in road capacity has been applied to account for the property accesses. Therefore, the revised road capacities for the two roads are shown below.

- Peak Downs Highway (-31 per cent) - 1,173 vehicles per hour per lane
- Saraji Road (-36 per cent) - 1,088 vehicles per hour per lane.

For the purpose of comparison, the *Design Manual for Roads and Bridges: Advice Note TA 79/99 Traffic Capacity of Urban Roads* (The Highways Agency 1999) from the United Kingdom suggests a lane capacity of 1,320 vehicles per hour for an Urban All-Purposes Road (UAP1) of high standard single carriageway (6.75 m width) carrying predominantly through traffic with limited access and speed limit of 64 km/h.

The comparison is similar in terms of road geometry with the exception that The Highways Agency standards specified a lower speed of 64 km/h in urban environment whereas the speed limits on Saraji Road and Peak Downs Highway are in the region of 100 km/h. Therefore, it is considered that the estimated capacities are conservative.

Table 75 shows the V/C ratios for background traffic on the identified highway links using the estimated capacities.

Table 75 V/C ratio for background traffic

Background traffic / capacity			Volume / capacity ratio						
Highway link	Location	Direction	Capacity	FY 2021		FY 2023		FY 2040	
				AM	PM	AM	PM	AM	PM
			(Vehicle / hour)	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	1,088	37%	15%	38%	16%	45%	19%
		Southbound	1,088	6%	22%	7%	22%	8%	26%
(2) Saraji Road	Intersection A	Northbound	1,088	14%	9%	14%	9%	17%	11%
		Southbound	1,088	4%	10%	4%	10%	5%	12%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	1,088	2%	13%	2%	13%	3%	16%
		Southbound	1,088	24%	12%	24%	12%	29%	14%
(4) Peak Downs Highway	East of Moranbah Access Road	Northbound	1,173	15%	10%	16%	11%	18%	13%
		Southbound	1,173	7%	17%	8%	18%	9%	21%

The capacity table (Table 75) shows the background traffic volumes range from two per cent to 45 per cent of the road capacity on the identified highway links. This level of traffic is considered low to moderate. Table 75 shows the V/C ratios for the development traffic (ordinary day) on the identified highway links using the estimated capacities.

Table 76 V/C ratio for development traffic (ordinary day)

Development traffic / capacity			Volume / capacity ratio						
Highway link	Location	Direction	Capacity	Year 1		Year 3		Year 20	
				AM	PM	AM	PM	AM	PM
			(Vehicle / hour)	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	1,088	3%	3%	6%	6%	4%	4%
		Southbound	1,088	3%	3%	6%	6%	4%	4%
(2) Saraji Road	Intersection A	Northbound	1,088	3%	3%	7%	7%	4%	4%
		Southbound	1,088	3%	3%	7%	7%	4%	4%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	1,088	3%	3%	6%	6%	4%	4%
		Southbound	1,088	3%	3%	6%	6%	4%	4%
(4) Peak Downs Highway	East of Moranbah Access Road	Northbound	1,173	2%	2%	2%	2%	0%	0%
		Southbound	1,173	2%	2%	2%	2%	0%	0%

The development traffic (ordinary day) capacity table shows the development traffic volumes range from zero per cent to seven per cent of the road capacity on the identified highway links. This level of traffic is considered low.

Table 77 shows the V/C ratios for development traffic (shift changing day) on the identified highway links using the estimated capacities.

Table 77 V/C ratio for development traffic (shift changing day)

Development traffic / capacity			Volume / capacity ratio						
Highway link	Location	Direction	Capacity	Year 1		Year 3		Year 20	
				AM	PM	AM	PM	AM	PM
			(Vehicle / hour)	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	1,088	3%	3%	5%	5%	3%	3%
		Southbound	1,088	3%	3%	5%	5%	3%	3%
(2) Saraji Road	Intersection A	Northbound	1,088	3%	3%	5%	5%	3%	3%
		Southbound	1,088	3%	3%	5%	5%	3%	3%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	1,088	3%	3%	6%	6%	3%	3%
		Southbound	1,088	3%	3%	6%	6%	3%	3%
(4) Peak Downs Highway	East of Moranbah Access Road	Northbound	1,173	2%	2%	2%	2%	0%	0%
		Southbound	1,173	2%	2%	2%	2%	0%	0%

The development traffic (shift changing day) capacity table shows the development traffic volumes range from 0 per cent to 6 per cent of the road capacity on the identified highway links. This level of traffic is considered low.

Table 78 shows the V/C ratios for total traffic (ordinary day) on the identified highway links using the estimated capacities.

Table 78 V/C ratio for total traffic (ordinary day)

Total traffic / capacity			Volume / capacity ratio						
Highway link	Location	Direction	Capacity	FY 2021 / Year 1		FY 2023 / Year 3		FY 2040 / Year 3	
				AM	PM	AM	PM	AM	PM
			(Vehicle / hour)	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	1,088	40%	18%	44%	22%	49%	22%
		Southbound	1,088	9%	25%	13%	29%	11%	30%
(2) Saraji Road	Intersection A	Northbound	1,088	18%	12%	22%	16%	21%	14%
		Southbound	1,088	8%	13%	11%	17%	8%	16%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	1,088	5%	16%	8%	19%	6%	19%
		Southbound	1,088	27%	15%	30%	18%	32%	18%
(4) Peak Downs Highway	East of Moranbah Access Road	Northbound	1,173	17%	12%	17%	13%	19%	13%
		Southbound	1,173	9%	19%	9%	20%	9%	21%

The total traffic (ordinary day) capacity table shows the total traffic volumes range from five per cent to 49 per cent of the road capacity on the identified highway links. This level of traffic is considered low to moderate. Table 79 shows the V/C ratios for total traffic (shift changing day) on the identified highway links using the estimated capacities.

Table 79 V/C ratio for total traffic (shift changing day)

Total traffic / capacity			Volume / capacity ratio						
Highway link	Location	Direction	Capacity	FY 2021 / Year 1		FY 2023 / Year 3		FY 2040 / Year 20	
				AM	PM	AM	PM	AM	PM
			(Vehicle / hour)	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm	5am – 6am	5pm – 6pm
(1) Saraji Road	South of Lake Vermont Road	Northbound	1,088	36%	16%	39%	19%	43%	20%
		Southbound	1,088	8%	22%	11%	25%	10%	27%
(2) Saraji Road	Intersection A	Northbound	1,088	15%	10%	18%	13%	18%	12%
		Southbound	1,088	6%	12%	9%	14%	7%	14%
(3) Peak Downs Mine Road	South of Peak Downs Highway	Northbound	1,088	5%	15%	8%	18%	6%	17%
		Southbound	1,088	24%	14%	28%	17%	29%	16%
(4) Peak Downs Highway	East of Moranbah Access Road	Northbound	1,173	16%	11%	16%	12%	18%	12%
		Southbound	1,173	9%	18%	9%	18%	9%	20%

The total traffic (shift changing day) capacity table shows the total traffic volumes range from 5 per cent to 43 per cent of the road capacity on the identified highway links. This level of traffic is considered low to moderate. Therefore, upgrading the highway links are not considered necessary.

Level crossing assessments

There are three level crossings within the Traffic Impact Assessment Area as shown in Figure 3 in Section 5.1.6. It is anticipated that these level crossings will be impacted due to an increase in vehicle and/or train volumes associated with the Project.

The level crossings relevant to the Project are listed below:

- Level Crossing 1 Lake Vermont Road / Norwich Park Branch rail line
- Level Crossing 2 Peak Downs Mine Road / Norwich Park Branch rail line
- Proposed Level Crossing A Proposed access to the Project Site / Norwich Park Branch rail line.

The level crossing assessment has considered the potential impacts to road traffic, specifically vehicle queuing due to activation of the level crossings during AM and PM peak periods. The assessment made a conservative assumption that one train will arrive at the level crossing during the AM and PM peak hour periods. The expected queue lengths are listed in Table 80 for each approach to the level crossings.

Table 80 Estimated vehicle queue lengths at level crossings

Level Crossing	Approach	95% Queue length (m)						Available queue space (m)
		FY 2021 / Year 1		FY 2023 / Year 3		FY 2040 / Year 20		
		AM	PM	AM	PM	AM	PM	
Level Crossing 1 - Lake Vermont Road	East approach - Lake Vermont Road east from the Norwich Park Branch rail line	6	16	10	20	2	15	>500m
	West approach - Lake Vermont Road between Saraji Road and Norwich Park Branch rail line	6	5	10	10	2	1	34m
Level Crossing 2 - Peak Downs Mine Road	South-east approach – Peak Downs Mine Road between Peak Downs Mine and Norwich Park Branch rail line	45	115	72	149	41	126	>500m
	North-west approach – Peak Downs Mine Road between Peak Downs Highway and Norwich Park Branch rail line	199	111	239	145	234	122	>500m
Proposed Level Crossing A - Proposed Access	East approach – Saraji East Mine access road east from Norwich Park Branch rail line	56	56	104	104	45	45	>500m
	West approach – Saraji East Mine access road between Saraji Road and Norwich Park Branch rail line	56	56	104	104	45	45	40m

Level Crossing 1 on Lake Vermont Road is close to the intersection of Saraji Road / Lake Vermont Road. The available queue distance between the level crossing and the road intersection is 34 m. The queue length results show that the maximum queue length (10m) at the level crossing does not exceed the available space of 34 m. Therefore, no adverse impact on queuing is expected as a result of the Project traffic. A copy of SIDRA results is included in Appendix E.

The proposed new level crossing (Level crossing A) on the access road into the Project will be close to the adjacent intersections with Saraji Road. The short stacking requirement for this intersection is a minimum distance of 48 m between the edge line of the roadway to the nearest rail line. In the area nominated for a new access, Chainage 41, the road and rail run parallel with a constant offset of 43 m between the edge line and the nearest rail. There is no location in the vicinity of the proposed access where the road and rail diverge enough to accommodate the required short stacking distance. As a result, the concept design for Level Crossing A includes a horizontal alignment shift of the existing roadway in order to meet the minimum short stacking distance of 48 m (including boom gate clearance, stop line set back and factor of safety for short stacking).

Based on the Level Crossing A concept designs the available queue distance between the level crossing and the road intersection (not including boom gate clearance and stop line setbacks) is estimated to be approximately 40 m. The queue length identified that the queue at the level crossing in FY2023 (45 m to 104 m) is expected to exceed the available space of 40 m. This may result in vehicles waiting in the auxiliary lanes on Saraji Road while the level crossing is activated. Insufficient queuing length on the proposed Project access roads may overflow the vehicle queue onto Saraji Road. Therefore, the risk of vehicle collisions may exist.

While this situation is not ideal, it is only anticipated to occur for a relatively short period of time. This assessment conservatively assumed that one train will cross during the peak traffic hour, which is not expected to occur every day. The operations phase vehicle queues are expected to be able to be safely contained in the available space between the Saraji Road intersection and the level crossing.

Insufficient queuing length on the Project Site access roads may overflow the vehicle queue onto Saraji Road. Therefore, risk of vehicle collisions may exist. Based on the risk matrix, the probability of an

accident is considered ‘occasional’ and the severity is considered as ‘minor’. Therefore, the resultant risk is classified as medium.

Road authorities may need to refer a development application, including the TIA, to the relevant railway manager (Aurizon) for a rail safety assessment incorporating ALCAM assessments. An ALCAM assessment would be undertaken for each railway level crossing impacted on by a development proposal.

Assessment of regional road network

As traffic associated with delivery of materials and equipment during the construction and operation stages will use the regional road network of Peak Downs Highway to Mackay and Dysart-Middlemount Road to the Capricorn Highway, this report has undertaken an assessment of these regional roads as shown in Figure 10.

The assessment was based on the 2016 AADT data which was factored by the adopted one per cent background traffic growth rate to estimate future background traffic for the assessment years. The future background traffic was then compared to the daily development traffic on the regional road network. Table 81 and Table 82 summarise the development traffic volumes as a percentage of the background traffic volumes on Peak Downs Highway and Dysart-Middlemount Road on the regional road network.

Table 81 Development traffic as a percentage of background traffic on regional road network (ordinary day)

Percentage of development traffic / background traffic	Peak Downs Highway	Saraji Road
Year 1 (construction)	3%	25%
Year 3 (construction/operation)	6%	53%
Year 20 (operation)	3%	29%

The comparison shows the percentage of the development traffic (ordinary day) exceeds 5 per cent of the background traffic on Dysart-Middlemount Road in FY 2021, FY 2023 and FY 2040 and on Peak Downs Highway in FY 2023. Flow diagrams for the development and background traffic are included in Appendix B.

Table 82 Development traffic as a percentage of background traffic on regional road network (shift changing day)

Percentage of development traffic / background traffic	Peak Downs Highway	Saraji Road
Year 1 (construction)	7%	10%
Year 3 (construction/operation)	16%	20%
Year 20 (operation)	8%	11%



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LEGEND

- Locality
- Moranbah Airport
- Drainage
- Project Site
- Highway
- Major Road
- Regional Road Network Assessment Area
- Traffic Impact Assessment Study Area

Workers Accommodation

- 1. Dysart BMA SPV
- 2. Buffel Park Village
- 3. Stayover in Dysart

N

Figure 10
Regional road netwok

Saraji East Mining Lease Project
Traffic and Transport Technical Report

0 4.5 9 18
Kilometres

Scale: 1:1,000,000 (when printed at A4)
Projection: Map Grid of Australia - Zone 55 (GDA94)

BMA
BHP Mitsubishi Alliance

DATE: 8/06/2023 VERSION: 3

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The comparison shows the percentage of the development traffic (shift changing day) exceeds 5 per cent of the background traffic on Peak Downs Highway and Dysart-Middlemount Road in FY 2021, FY 2023 and FY 2040. Flow diagrams for the development and background traffic are included in Appendix B.

As Saraji Road is managed by IRC, consultation with the Council is considered necessary and will be undertaken ahead of the construction phase of the Project.

An assessment of V/C ratio has been undertaken based on the following daily road capacities on Peak Downs Highway and Dysart-Middlemount Road:

- Peak Downs Highway 29,784 vehicles per day per lane
- Dysart-Middlemount Road 29,376 vehicles per day per lane.

Table 83 shows the V/C ratios for total traffic (ordinary day) based on the development traffic and the background traffic on Peak Downs Highway and Dysart-Middlemount Road.

Table 83 Volume / capacity ratio for total traffic on regional road network (ordinary day)

Percentage of total traffic / capacity		Peak Downs Highway (Number of vehicles per day)		Dysart-Middlemount Road (Number of vehicles per day)	
Year		Eastbound	Westbound	Northbound	Southbound
	Capacity (Vehicles / day)	29,784	29,784	29,376	29,376
FY 2021 / Year 1	Background traffic	2071	2048	723	741
	Development traffic	44	44	119	119
	Total traffic	2115	2091	841	859
	Volume / capacity ratio	7%	7%	3%	3%
FY 2023 / Year 3	Background traffic	1621	1632	709	703
	Development traffic	93	93	252	252
	Total traffic	1714	1725	961	955
	Volume / capacity ratio	6%	6%	3%	3%
FY 2040 / Year 20	Background traffic	1920	1933	839	832
	Development traffic	60	60	162	162
	Total traffic	1980	1993	1002	995
	Volume / capacity ratio	7%	7%	3%	3%

The total traffic capacity table (ordinary day) shows the regional road network of Peak Downs Highway and Dysart-Middlemount Road are anticipated to operate within available capacities. The total traffic volumes are approximately 3 per cent to 7 per cent of the road capacities in FY 2040. It is concluded that travel time and vehicle travelling speed are not expected to be significantly affected by the increase in traffic due to the Project.

Table 84 shows the V/C ratios for total traffic (shift changing day) based on the development traffic and the background traffic on Peak Downs Highway and Dysart-Middlemount Road.

Table 84 V/C ratio for total traffic on regional road network (shift changing day)

Percentage of total traffic / capacity		Peak Downs Highway (Number of vehicles per day)		Dysart-Middlemount Road (Number of vehicles per day)	
Year		Eastbound	Westbound	Northbound	Southbound
	Capacity (Vehicles / day)	29,784	29,784	29,376	29,376
FY 2021 / Year 1	Background traffic	1589	1600	695	689
	Development traffic	116	116	46	46
	Total traffic	1706	1716	740	735
	V/C Ratio	6%	6%	3%	3%
FY 2023 / Year 3	Background traffic	1621	1632	709	703
	Development traffic	248	248	97	97
	Total traffic	1869	1880	806	800
	V/C Ratio	6%	6%	3%	3%
FY 2040 / Year 20	Background traffic	1920	1933	839	832
	Development traffic	160	160	62	62
	Total traffic	2080	2092	902	895
	V/C Ratio	7%	7%	3%	3%

The total traffic capacity table (shift changing day) shows the regional road network of Peak Downs Highway and Dysart-Middlemount Road are anticipated to operate within available capacities. The total traffic volumes are approximately 3 per cent to 7 per cent of the road capacities in FY 2040. It is concluded that travel time and vehicle travelling speed are not expected to be significantly affected by the increase in traffic due to the Project.

Pavement impact assessment

Road pavements are designed to carry vehicle loads over an expected life. Heavy vehicles contribute to the deterioration of the pavement and shorten the pavement life expectancy. A Pavement Impact Assessment (PIA) is a process to determine impacts to pavement loading caused by heavy vehicles. It is based on determining ESA load and payloads for heavy vehicles using the road network. A comparison between ESA loads for existing heavy vehicle traffic on the road and the ESA loads for a specific development or project are used as the basis to determine the value of pavement impact contributions.

The completion of the PIA is based on a DTMR approved methodology which states that developments should ensure no worsening to the SCR pavements as a result of the increased traffic from developments.

Table 85 and Table 86 summarise the preliminary PIA for the identified highways based on the anticipated heavy vehicles when loaded and unloaded.

Table 85 Preliminary pavement impact assessment results – development traffic (loaded)

		Equivalent Standard Axle (ESA)						Percentage of Equivalent Standard Axle		
		Background traffic			Development traffic (Loaded)			Development traffic (Loaded) / background traffic		
Highway link	Location	FY2021	FY2023	FY2040	Year 1 (Construction)	Year 3 (Construction /operation)	Year 20 (Operation)	FY2021 / Year 1 (Construction)	FY2023 / Year 3 (Construction /operation)	FY2040 / Year 20 (Operation)
Peak Downs Highway	East of Moranbah Access Road	393,344	401,250	475,203	113,853	117,712	3,860	28.94%	29.34%	0.81%
Peak Downs Highway	Between Moranbah Access Road and Saraji Road	533,975	544,708	645,100	116,947	131,345	17,820	21.90%	24.11%	2.76%
Peak Downs Mine Road	Between Peak Downs Highway and Peak Downs Mine	171,100	174,539	206,708	116,947	131,345	17,820	68.35%	75.25%	8.62%
Saraji Road	Between Peak Downs Mine and Intersection, A	171,100	174,539	206,708	116,947	131,345	17,820	68.35%	75.25%	8.62%
Saraji Road	Between Intersection A and Lake Vermont Road	180,523	184,151	218,091	132,478	160,551	15,035	73.39%	87.18%	6.89%
Saraji Road	South of Vermont Road	180,523	184,151	218,091	113,853	117,712	3,860	63.07%	63.92%	1.77%

Table 86 Preliminary pavement impact assessment results – development traffic (unloaded)

		Equivalent Standard Axle (ESA)						Percentage of Equivalent Standard Axle		
		Background traffic			Development traffic (Unloaded)			Development traffic (Loaded) / background traffic		
Highway link	Location	FY2021	FY2023	FY2040	Year 1 (Construction)	Year 3 (Construction /operation)	Year 20 (Operation)	FY2021 / Year 1 (Construction)	FY2023 / Year 3 (Construction /operation)	FY2040 / Year 20 (Operation)
Peak Downs Highway	East of Moranbah Access Road	393,344	401,250	475,203	9,869	10,227	358	2.51%	2.55%	0.08%
Peak Downs Highway	Between Moranbah Access Road and Saraji Road	533,975	544,708	645,100	10,430	12,696	2,886	1.95%	2.33%	0.45%
Peak Downs Mine Road	Between Peak Downs Highway and Peak Downs Mine	171,100	174,539	206,708	10,430	12,696	2,886	6.10%	7.27%	1.40%
Saraji Road	Between Peak Downs Mine and Intersection, A	171,100	174,539	206,708	10,430	12,696	2,886	6.10%	7.27%	1.40%
Saraji Road	Between Intersection A and Lake Vermont Road	180,523	184,151	218,091	13,243	17,986	2,382	7.34%	9.77%	1.09%
Saraji Road	South of Vermont Road	180,523	184,151	218,091	9,869	10,227	358	5.47%	5.55%	0.16%

The assessment shows the ESAs generated by the Project traffic are significant when compared to the background traffic ESAs. The ESAs from the development traffic range from 1 per cent to 88 per cent of the background traffic ESAs when the Project heavy vehicles are fully loaded. Therefore, it is concluded that the significant development traffic ESAs would warrant a PIA and estimate of contribution and/or pavement improvement works to mitigate the expected impacts.

The process of the PIA will require a considerable amount of road data (roughness, sealed width, etc.) and specific details of the heavy vehicles (payloads, axle loads and ESA loads, etc.) that will be used in the Project. Therefore, it is recommended that the PIA for the Traffic Impact Assessment Area should be undertaken six months before commencement of construction in consultation with DTMR and IRC. The conclusion of the PIA will inform the level of contribution and/or pavement improvement works required.

Emergency services operations

Emergency services in Queensland consist of Queensland Fire and Emergency Services (QFES), Queensland Police Service (QPS), State Emergency Service (SES) and Queensland Ambulance Service (QAS). Fire stations, police stations and medical facilities are located in Moranbah and Dysart.

The assessment concluded that the volume of the Project traffic will be low during the life of the Project with additional delays minimal. Heavy vehicles during the construction and operation stages are typically road trains, articulated vehicles and trucks. In addition, the fleet is not expecting OSOM vehicles. Therefore, it is anticipated that manoeuvring by Project vehicles should not be restricted at intersections and road structures. Emergency vehicles should therefore be able to overtake the Project road trains or articulated vehicles without obstructing traffic movement. Therefore, it is concluded that the Project will not impede emergency services operations.

6.2.4 Road safety

Safety issues that are likely to be introduced or exaggerated by the Project were identified to include:

- unsealed Lake Vermont Road for approximately 11 km from Saraji Road
- no intersection lighting at Intersection 1 (Lake Vermont Road / Saraji Road)
- Proposed Intersection A on Saraji Road
- no intersection lighting at Intersection 3 (Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road).

Each issue is described in the following sections.

6.2.4.1 Unsealed Lake Vermont Road

Lake Vermont Road is currently an unsealed road from Saraji Road eastward. As it will be used as the main access road to the proposed construction accommodation villages, upgrading is considered necessary if a decision is made to proceed with the accommodation village.

It is believed that an unsealed surface is one of the likely contributing factors to accidents involving vehicles overturning or leaving the carriageway when travelling at high speed. Consequences may include personal injury and property damage. Therefore, based on the risk matrix, the probability of an accident is estimated as ’occasional’ and the severity is considered as ‘minor’. Therefore, the resultant risk is classified as medium.

6.2.4.2 No road lighting at Intersection 1 (Saraji Road / Lake Vermont Road)

The geometric layout of the Saraji Road / Lake Vermont Road intersection is believed to be adequate for the Project traffic. However due to the potential bus schedule for workers traveling to and from the villages in low light conditions, for safety reasons this assessment proposes lighting be installed at the intersection to improve visibility.

It is believed that lack of road lighting on rural roads during night-time travel is one of the contributors to accidents involving head-on collision or vehicles leaving the carriageway. Consequences may include fatality and property damage. Therefore, based on the risk matrix, the probability of an accident is

estimated as ‘occasional’ and the severity is considered as ‘minor’. Therefore, the resultant risk is classified as medium.

6.2.4.3 Proposed Intersection A (Saraji Road / the Project Site entrance)

A new intersection (Intersection A) on Saraji Road will be required to gain access to the Project Site. The design and configuration are required to meet the traffic demand and safety for heavy vehicles during the construction and operation stage. In addition, a level crossing will be included in the design. A copy of the suggested concept design is included in Figure 11.

6.2.4.4 No road lighting at Intersection 3 (Saraji Road / Peak Downs Mine Road / Peak Downs Mine entrance)

The geometric layout of the Saraji Road / Peak Downs Mine Road / Peak Downs Mine intersection is believed to be adequate. However, the intersection is not lit at present. Even though no accidents had been recorded in the past five years, a risk is perceived due to the increase in traffic due to the Project. In addition, the intersection geometry is such that the movement of vehicles between Peak Downs Mine Road and Saraji Road is not the priority movement in both directions which is not readily perceived at night.

It is believed that lack of lighting on rural roads during night-time travel is one of the contributing factors to accidents involving head-on collision or vehicles leaving the carriageway. Consequences may include serious personal injury or property damage. Therefore, based on the risk matrix, the probability of an accident is estimated as ‘occasional’ and the severity is considered as ‘minor’ (as the speed environment in the intersection is below 100 km/h). Therefore, the resultant risk is classified as medium.

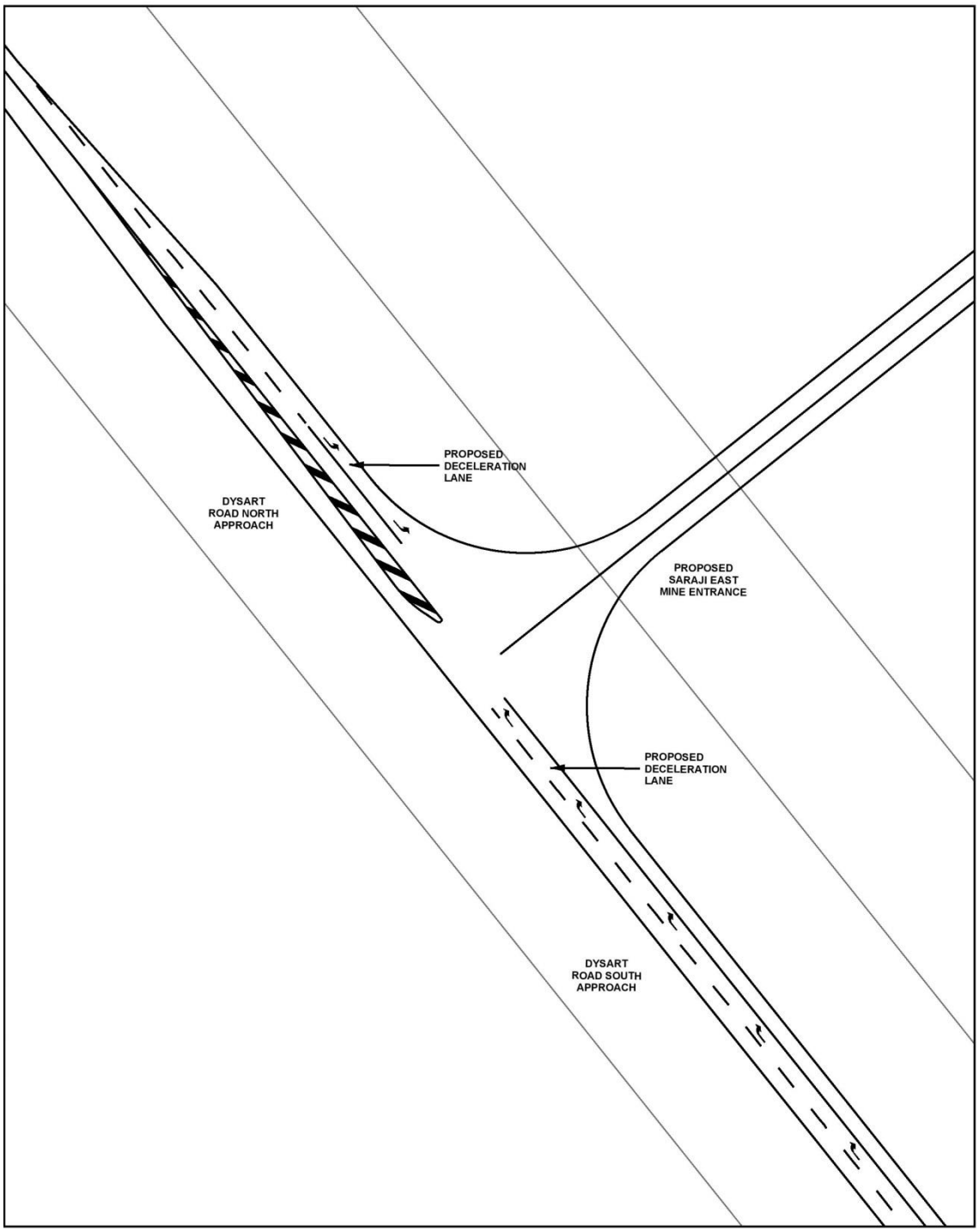


Figure 11 Concept Proposed Intersection A – Saraji Road / Saraji East Mine Entrance

6.3 Rail transport

It is not expected that rail transport will be utilised during the construction stage.

For operations, it is intended than 100 per cent of coal mined will be transported to port facilities along the existing Goonyella Rail system to a port facility for export. Aurizon owns the Norwich Park Branch rail line which runs parallel to Saraji Road near the Project Site and links to the overall Goonyella Rail system. The Project proposes to construct a new balloon loop and train load out facility to connect to the existing rail system. All coal will then be transported by rail to one of the Abbot Point and Hay Point Terminals. This corresponds to transport using the rail network over distances of 400 km to Abbot Point and 250 km to Hay Point.

The new balloon loop and train load out facility will be located north of the existing level crossings at the Saraji Mine access. Trains will travel north from the new balloon loop to the port facilities. Therefore, trains generated by the Project are not expected to increase at Level Crossing 1 on Lake Vermont Road. The additional trains associated with the Project will increase daily train numbers at the level crossing on Peaks Downs Mine Road (Level Crossing 2).

The maximum production of the Project is estimated to be 8 Mtpa of product coal for an export market over a life of approximately 20 years. The average train length is approximately 100 wagons with a total payload of approximately 8,500 ts. Therefore, when operating at peak production, the Project is anticipated to generate up to three additional trains per day on the Norwich Park Branch rail line. The annual average of coal production is 6.2 Mtpa, equating to up to two additional trains per day whilst in early months of operations it is expected that there will be only one additional train per day.

It has been confirmed by BMA that the rail network has available capacity to support the additional demand required by the Project. The volume of coal to be transported via the network will be within Aurizon's existing approval limits. As such, no additional impacts above those already approved are expected.

6.4 Air transport

The existing Moranbah Airport will be utilised for the transportation of the Project workforce. It is anticipated that the demand for air travel for workers will increase during the construction and operation stages of the Project. During operations, the Project will result in up to 15 additional trips per week. This increase can be accommodated within the existing capacity of the Moranbah Airport.

Table 87 summarises the peak number of workers expected to pass through the Moranbah Airport on the shift changing day (this assumes as minimum of 10 per cent of the workforce will reside locally during construction and 40 per cent during operation stage).

Table 87 Number of workers at Moranbah Airport on shift changing day

Assessment Year	Number of workers in construction stage	Number of workers in operation stage	Number of workers to Moranbah Airport	Number of workers from Moranbah Airport
Year 1 (Construction)	500	0	450	450
Year 3 (construction / operation)	1,000	260	1,059	1,059
Year 20 (operation)	0	500	303	303

6.5 Sea transport

Coal from the Project will be exported from Australia by ship. Product coal from the Project will be exported to international markets via either Hay Point Coal Terminal or Abbot Point Coal Terminal. The locations of these port facilities are shown in Figure 12.

The Project is expected to produce a maximum 8 Mtpa of product coal for export and will require approximately 88 ships per year to transport this product to market. Annual average production is 6.2 Mt which correlates to 67 ships per year. The existing port facilities are able to service a range of ships including Handymax, Panamax, Small Cape, and Large Cape vessels with corresponding sizes of 50,000 dead weight tons (dwt), 80,000 dwt, 150,000 dwt, and 220,000 dwt respectively.

It is anticipated that the nominated ports will continue using these types of vessels across the Project's design life. Basic information about the two ports is presented in Table 88.

Table 88 Capacity of coal terminals

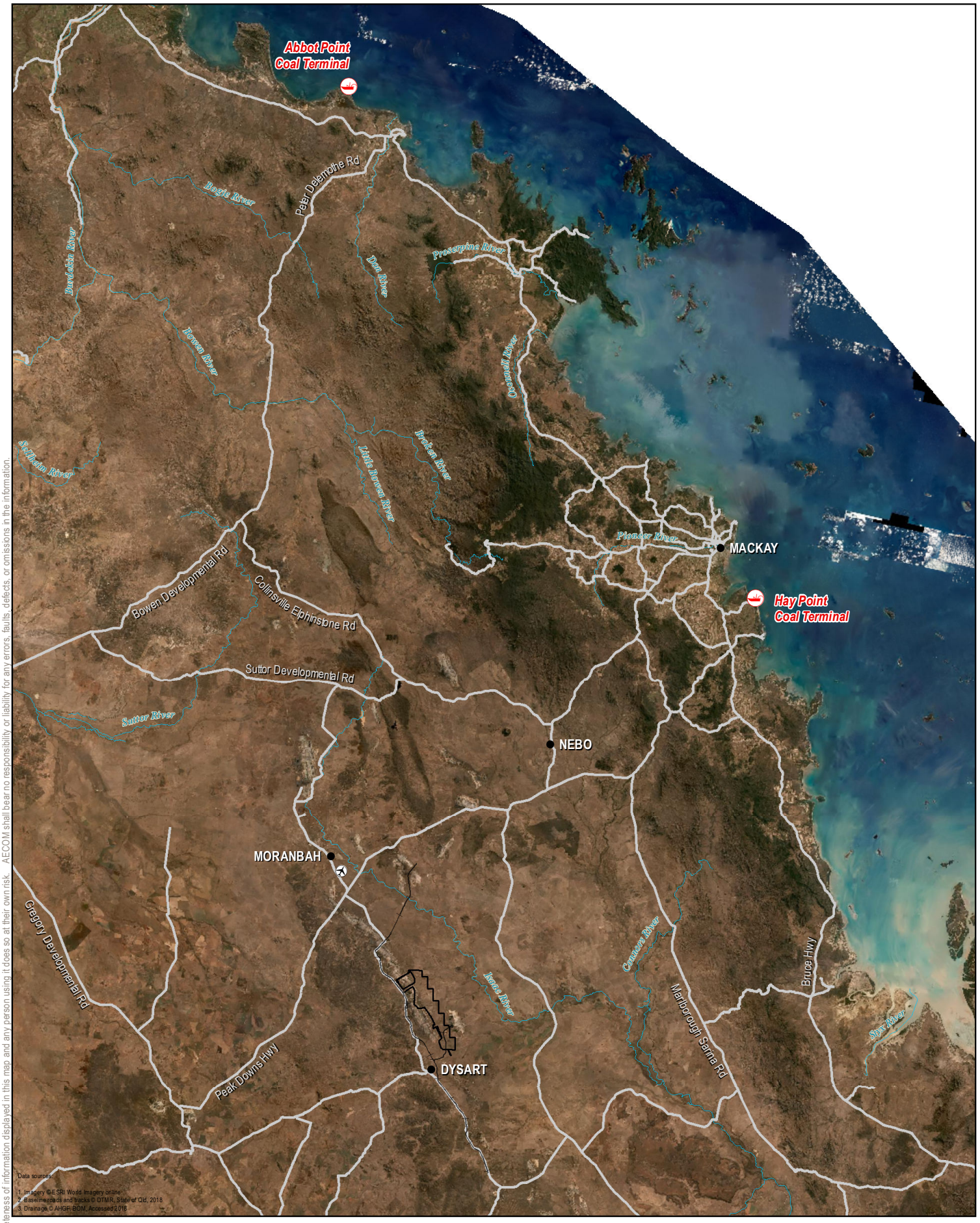
Port	Terminal capacity (Mtpa)	Throughput 2016/17 (Mtpa)	Number of berths
Hay Point Coal Terminal	55	43.4	3
Abbot Point Coal Terminal	50	25.4	2
Total	**105**	**68.8**	**5**

The product coal shipped via these ports will be within the approved port and shipping capacity and throughput limits, as such no additional impacts to the surrounding environment are expected as a result. This assessment shows that, based on the maximum throughput of 8 Mtpa product coal, the coal produced by the Project corresponds to approximately eight per cent of the combined terminal capacities of 105 Mtpa. It is considered that the impact to the combined terminal capacity is minimal.

The approximate number of additional ships per year of operation is outlined in Table 89.

Table 89 Number of additional ships during maximum production of 8 Mtpa

Calendar year	Additional number of ships per year
3 years of construction	0
20 years of operation	88



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LEGEND

- Project Site
- Drainage
- Locality
- Mornabah Airport
- BMA Coal Terminal
- Rail Network
- Major Road

N

Figure 12
Coal terminals

Saraji East Mining Lease Project
Traffic and Transport Technical Report

0 5 10 20
Kilometres

Scale: 1:1,500,000 (when printed at A4)
Projection: Map Grid of Australia - Zone 55 (GDA94)

BMA
BHP Mitsubishi Alliance

DATE: 8/06/2023 VERSION: 0

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7.0 Mitigation measures

The assessment concluded that most of the road links have exceeded the 5% threshold. However given the low background traffic in the network, it is anticipated that substantial delays or congestion on the road links is unlikely to occur.

Therefore, immediate mitigation measures at the assessed road links are not required. While no immediate mitigation is required, it is recommended to continue to undertake traffic surveys on the road links to monitor and assess traffic conditions. In the event that traffic conditions have worsened, a new traffic impact assessment is recommended to identify appropriate mitigations.

When considering future road safety, the following mitigation measures are proposed to address the issues identified in this assessment, with further details provided in subsequent sections:

- provide intersection lighting at Intersection 1 (Lake Vermont Road / Saraji Road)
- construct proposed Intersection A on Saraji Road
- provide intersection lighting at Intersection 3 (Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road)

It is noted that the investments committed by DTMR and listed in QTRIP 2022-23 to 2025-26 (The State of Queensland (Department of Transport and Main Roads), 2017c) were considered in developing the mitigation measures proposed.

7.1 Intersection 1 – Saraji Road / Lake Vermont Road

The geometric layout of the Saraji Road / Lake Vermont Road intersection is believed to be adequate for the development traffic. However due to the potential bus schedule for workers traveling to and from the villages in low light conditions, for safety reasons this assessment proposes lighting be installed at the intersection to improve visibility.



Plate 6 Intersection 1 (Saraji Road / Lake Vermont Road intersection)

Therefore, this assessment recommends that road lighting be installed at the Saraji Road / Lake Vermont Road to improve visibility in low light conditions.

7.2 Saraji Road Intersection A – Saraji Road / Saraji East Mine Entrance

An additional intersection (Intersection A) on Saraji Road will be required to gain access to the Project Site. The design and configuration are required to meet the traffic demand and safety for heavy vehicles during the construction stage. Therefore, it is proposed to include deceleration lanes on the north and south approaches to the intersection on Saraji Road. Concept designs for Intersection A are presented in Appendix G.



Plate 7 Road corridor at the proposed location of Intersection A (Saraji Road / the Project Site Entrance intersection)

At the proposed location Saraji Road runs parallel with the railway line. Therefore, it is recommended that the new intersection should include active devices such as boom barriers and flashing lights. In addition, road lighting at the intersection is also proposed. Concept signalised boom gate designs for Intersection A are presented in Appendix G.

7.3 Intersection 3 – Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road

The geometric layout of the Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road intersection is believed to be adequate. However, the intersection is not lit at present. Even though no accidents had been recorded in the past five years, the high percentage of heavy vehicles generated by the Project and the give-way control on Saraji Road present a safety risk.

Therefore, this assessment proposes road lighting to be installed at the Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road to improve visibility in low light conditions.

7.4 Air transport

The assessment concluded that a peak of approximately 1,059 workers will be travelling through Moranbah Airport on the shift changing day. Even though these estimates are considered conservative and the airport has sufficient capacity, this assessment recommends the optimisation of workers' rosters to minimise air travel peak demands.

7.5 Sea transport

The export of coal product using the identified coal export terminal is covered by existing approvals held by the ports. The preferred port(s) will be determined through commercial discussions between BMA and the relevant port authorities.

7.6 Proposed Level Crossing A

It is expected all coal produced by the Project will be transported by rail along the existing Norwich Park Branch rail line. This assessment concluded that proposed Level Crossing A may not have sufficient queue length to contain the long vehicles expected during the construction and operation stages.

This issue is expected to arise for a short time period during peak hours only and assumes that a train crosses the level crossing during the peak hours. This assessment proposes the following mitigation measures to address the queue length issue.

- Design auxiliary turn lanes and horixontal alignment shift on Saraji Road to include appropriate storage lengths considering the potential overflow queue from the level crossing. Appendix G presents the level crossing concept design.
- Stagger the shift changeover times for the construction and operations workforces to occur at different hours of the day to reduce the number of vehicles at the crossing during the peak hour.
- Safety education for heavy vehicle drivers in relation to the use of the level crossings.

During the detailed design stage of the Project, ALCAM assessments will be required by the rail authority. These assessments will be conducted on all affected level crossings in order to finalise the required treatment options.

7.7 Road use management plan

It is recommended that a Road Use Management Plan be prepared in the detailed design phase. The objective of the Plan is to demonstrate how road impacts of the Project traffic, particularly for heavy vehicles, will be managed during the construction and operation stages with an emphasis on avoiding or managing impacts through low or no-cost strategies. It should be prepared in accordance with consultation and engagement with DTMR.

The proposed mitigation measures within this report are based on available information and estimations of future traffic. However, it is expected that the Project will be progressed to the consultation stage with DTMR, where specific requirements for the mitigation measures will become available. Hence the Road-use Management Plan will provide the opportunity to revise the proposed mitigation measures based on the latest information.

The outcomes of this TIA should form the basis of consultation with relevant stakeholders, including DTMR and IRC, to reach agreement regarding the proposed measures to mitigate impacts. Following the consultation period, preparation of a Road-use Management Plan is proposed to update the assessments and document the final mitigation measures in the next stage of this TIA process.

7.8 Summary of mitigation measures

This assessment considered the scheduled road resurfacing on Saraji Road and Peak Downs Highway as stated in QTRIP 2022-23 to 2025-26 (The State of Queensland (Department of Transport and Main Roads), 2017c). It is believed that the maintenance works will not interfere with the proposed mitigation measures. Table 90 summarises the proposed mitigation measures for the safety issues identified in this assessment. It is concluded that the issues are manageable and with the implementation of the proposed mitigation measures, it is anticipated that risks will be reduced to an acceptable level.

Table 90 Summary of resultant risks and mitigation measures

Location	Issue	Possible accident	Frequency / probability	Severity / consequence	Resultant risk	Proposed mitigation measures
Lake Vermont Road	Unsealed road surface	Vehicles overturning or come off carriageway	Occasional	Minor	Medium	Sealing Lake Vermont Road and replace tunnel under railway line
Intersection 1 (Saraji Road / Lake Vermont Road)	No road lighting	Head-on collision or vehicles come off carriageway	Occasional	Minor	Medium	Install road lighting
Intersection A (Saraji Road / Saraji East Mine Entrance)	No access to Saraji East Mine	-	-	-	-	Construct intersection
Intersection 3 (Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road)	No road lighting	Head-on collision or vehicles come off carriageway	Occasional	Minor	Medium	Install road lighting
Moranbah Airport	High demand for air travel	Minor aircraft incident	Occasional	Minor	Medium	Optimise workers' roster
Level Crossing A	Insufficient queuing space	Vehicles collisions	Occasional	Minor	Medium	Auxiliary turn lanes on Saraji Road and optimise workers' roster (refer to Appendix G)

8.0 Residual impacts

8.1 Intersection 1 – Saraji Road / Lake Vermont Road

The lack of road lighting at Intersection 1 – Saraji Road and Lake Vermont Road is believed to be one of the contributing factors to potential accidents involving head-on collision or vehicles leaving the carriageway. However, if the proposed road lighting is installed, it is believed that the probability of such incidents will likely be reduced to Improbable. Therefore, the residual risk will be reduced to low.

8.2 Intersection 3 – Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road

The lack of road lighting at Intersection 3 – Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road is believed to be one of the contributing factors to potential accidents involving head-on collision or vehicles leaving the carriageway. However, if the proposed road lighting is installed, it is believed that the probability of such incidents will be reduced to Improbable. Therefore, the residual risk will be reduced to low.

8.3 Air transport

The high air travel demand is expected to increase air traffic using Moranbah Airport. However, if the proposed management measure is implemented, the air travel demand will be able to reduce to an acceptable level. Therefore, the probability of an aircraft incident will be reduced to improbable. Therefore, the residual risk will be reduced to low.

8.4 Proposed Level Crossing A

Insufficient queuing length on the Project Site access roads may result in overflow vehicles queuing onto Saraji Road. The assessment proposed several mitigation measures such as auxiliary turn lanes on Saraji Road to store vehicles on Saraji Road and a horizontal alignment shift of Saraji Road to accommodate the short stacking distance between Saraji Road and the Goonyella System Rail Line. If implemented, it is estimated that the probability of an accident will be reduced to Improbable. Therefore, the residual risk will be reduced to low. Concept designs for the proposed Level Crossing A are presented in Appendix G.

8.5 Summary of residual impacts

Table 91 summarises the residual risks if the proposed mitigation measures are implemented. As previously concluded the issues are manageable and with implementation of the proposed measures it is anticipated that risks will be reduced to an acceptable level.

Table 91 Summary of residual risks

Location	Issue	Possible accident	Resultant risk	Proposed mitigation measures	Frequency / probability after mitigation	Severity / consequence after mitigation	Residual risk
Intersection 1 (Saraji Road / Lake Vermont Road)	No road lighting	Head-on collision or vehicles come off carriageway	Medium	Install road lighting	Improbable	Minor	Low
Proposed Intersection A (Saraji Road / Saraji East Mine Entrance)	No access to Saraji East Mine	-	-	Construct intersection	-	-	-
Intersection 3 (Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road)	No road lighting	Head-on collision or vehicles come off carriageway	Medium	Install road lighting	Improbable	Minor	Low
Moranbah Airport	High demand for air travel	Minor aircraft incident	Medium	Optimise workers' roster	Improbable	Minor	Low
Proposed Level Crossing A	Insufficient queuing space	Vehicles collisions	Medium	Auxiliary turn lanes on Saraji Road, horizontal alignment shift of Saraji Road and optimise workers' roster	Improbable	Minor	Low

9.0 Conclusion

AECOM was commissioned by BMA to prepare an assessment of traffic and transport impacts for the Project.

The Project will be divided into two stages – construction and operation. The construction period is assumed to be in the order of three years, with the majority of construction work occurring over 18 months between Year 1 and Year 2 of construction. While the Project is under construction, mining operation is expected to commence in FY 2023, and will continue until approximately FY 2042.

It is noted that construction will commence following the grant of relevant approvals and BMA's decision to proceed with the Project. The actual timing for Project commencement will be determined based on progress of mining and commercial market drivers. For EIS-related impact assessment purposes, construction is assumed to commence FY 2023 (Year 1) and production beginning during Year 3 of construction.

The major mode of transport potentially impacted by the Project is the Queensland road network and was hence the focus of this traffic and transport impact assessment. Other transport modes, including air, rail and sea, have been considered to identify their relevance to the Project.

9.1 Traffic impact assessment

The Project is expected to generate additional traffic on the adjacent road network. This report includes an assessment of the impacts to the safety and efficiency of the road network based on the requirements of GTIA (The State of Queensland (Department of Transport and Main Roads), 2018).

9.1.1 Traffic volumes

Background traffic volumes for the relevant road network were based on AADT segment reports from DTMR and traffic surveys undertaken in March 2018. Future background traffic volumes were estimated based on a low one per cent per annum growth rate.

Traffic volumes generated by the Project were estimated based on the information available from BMA regarding the workforce, construction schedule and anticipated materials and equipment. The traffic generated by the development across the construction and operation of the Project is shown in Table 92.

Table 92 Project traffic generation

Development traffic		Number of vehicles					
Year	Stage	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
		IN	OUT	IN	OUT	IN	OUT
Year 1	Construction	69	69	69	69	162	162
Year 2	Construction	69	69	69	69	162	162
Year 3	Construction + Operation	142	142	142	142	345	345
Year 4	Operation	76	76	76	76	222	222
Year 5	Operation	76	76	76	76	222	222
Year 6	Operation	76	76	76	76	222	222
Year 7	Operation	76	76	76	76	222	222
Year 8	Operation	76	76	76	76	222	222
Year 9	Operation	76	76	76	76	222	222
Year 10	Operation	76	76	76	76	222	222
Year 11	Operation	76	76	76	76	222	222

Development traffic		Number of vehicles					
Year	Stage	AM (5am – 6am)		PM (5pm – 6pm)		Average Daily	
		IN	OUT	IN	OUT	IN	OUT
Year 12	Operation	76	76	76	76	222	222
Year 13	Operation	76	76	76	76	222	222
Year 14	Operation	76	76	76	76	222	222
Year 15	Operation	76	76	76	76	222	222
Year 16	Operation	76	76	76	76	222	222
Year 17	Operation	76	76	76	76	222	222
Year 18	Operation	76	76	76	76	222	222
Year 19	Operation	76	76	76	76	222	222
Year 20	Operation	76	76	76	76	222	222
Year 21	Operation	43	43	43	43	123	123
Year 22	Operation	43	43	43	43	123	123

9.1.2 Intersection assessments

SIDRA intersection assessments were undertaken for five existing intersections and one proposed intersection. The SIDRA assessments concluded that the intersections are anticipated to operate within capacity and without significant queuing and delay during the life of the Project. The assessments also concluded that, the aggregate delays for the intersections are insignificant. Table 93 summarises the anticipated intersection performances. The worst traffic condition occurs at Intersection 2 with 14 seconds of delay anticipated in FY 2040.

Table 93 Worst traffic condition in identified intersections

ID	Intersection	Year & scenario	Approach	Degree of Saturation	Average Delay	Queuing	
						Vehicles	Distance
				(DoS)	(Sec)	(No.)	(m)
1	Saraji Road / Lake Vermont Road	FY 2021 / Year 1 (construction) AM total traffic (ordinary day)	Lake Vermont Road	0.018	12.5	0.1	0.7
2	Saraji Road / Saraji Mine Entrance	FY 2040 / Year 20 (operation) PM total traffic (ordinary day)	Saraji Mine Entrance	0.11	14.1	0.4	3
3	Saraji Road / Peak Downs Mine Road / Peak Downs Mine Entrance	FY 2023 / Year 3 (construction/operation) AM total traffic (shift changing day)	Peak Downs Mine Entrance	0.017	8.5	0.1	0.5
4	Peak Downs Highway / Peak Downs Mine Road	FY 2023 / Year 3 (construction/operation) PM total traffic (shift changing day)	Dysart Road	0.216	11.7	0.9	7.9

ID	Intersection	Year & scenario	Approach	Degree of Saturation	Average Delay	Queuing	
						Vehicles	Distance
				(DoS)	(Sec)	(No.)	(m)
5	Peak Downs Highway / Moranbah Access Road	FY 2040 / Year 20 (operation) AM total traffic (shift changing day)	Moranbah Access Road	0.765	13.9	13.4	99.3
A	Saraji Road / Saraji East Mine Entrance	FY 2023 / Year 3 (construction/operation) PM total traffic (ordinary day)	Saraji East Mine Entrance	0.211	10.5	0.9	8.2

9.1.3 Highway link assessment

The assessment of V/C ratios concluded that the highway links are anticipated to operate within capacity during the life of the Project. Table 94 summarises the anticipated highway link performance. The worst traffic condition occurs on Saraji Road south of Lake Vermont Road with development traffic volumes at 43 per cent of the road capacity in FY 2040.

Table 94 Worst traffic conditions on identified highway links

Highway Link	Location	Year and Scenario	Direction	V/C Ratio
(1) Saraji Road	South of Lake Vermont Road	FY 2040 / Year 20 (operation) AM Total (Ordinary day / Shift changing day)	Northbound	43%
		FY 2040 / Year 20 (operation) PM Total (Ordinary day / Shift changing day)	Southbound	27%
(2) Saraji Road	Intersection A	FY 2023 / Year 3 (construction/operation) AM Total (Ordinary day)	Northbound	19%
		FY 2023 / Year 3 (construction/operation) PM Total (Ordinary day)	Southbound	15%
(3) Peak Downs Mine Road	South of Peak Downs Highway	FY 2040 / Year 20 (operation) PM Total (Shift changing day)	Northbound	18%
		FY 2040 / Year 20 (operation) AM Total (Ordinary day / Shift changing day)	Southbound	29%
(4) Peak Downs Highway	East of Moranbah Access Road	FY 2040 / Year 20 (operation) AM Total (Ordinary day / Shift changing day)	Eastbound	18%
		FY 2040 / Year 20 (operation) PM Total	Westbound	20%

Highway Link	Location	Year and Scenario	Direction	V/C Ratio
		(ordinary day / Shift changing day)		

An assessment of the regional road network of Peak Downs Highway and Saraji Road showed that the development traffic is anticipated to exceed five per cent of the background traffic. However, the V/C ratios show the road network will operate within capacities and travel time and vehicle travelling speed will not be affected. Therefore, it is concluded that the impact of the Project on the operation of the regional road network is minimal.

9.1.4 Level crossing assessments

SIDRA assessments were undertaken for the level crossings which may be impacted by additional road traffic. This assessment concluded that proposed Level Crossing A on the Project access road may not have sufficient storage to contain the estimated vehicle queues. This assessment proposed several mitigation measures including auxiliary turn lanes on Saraji Road to store vehicles, a horizontal alignment shift of Saraji Road to create more space for queueing between the rail line and Saraji Road and stagger the workers' rosters to minimise number of vehicles at the level crossings.

It is noted that the rail authority may undertake ALCAM assessments for all affected level crossings during the detailed design stage.

9.1.5 Pavement impact assessment

A preliminary PIA was undertaken to compare the background traffic ESAs to the Project traffic ESAs. The assessment concluded the ESA loads generated by the Project traffic are significant and appropriate mitigation measures will be required. Therefore, a full PIA is warranted in consultation with the road authorities. The process of the PIA will require a considerable amount of road data and specific details of the heavy vehicles that will be used in the Project. Therefore, it is recommended that the PIA should be undertaken during the detailed design stage with full consultation with DTMR and IRC. The conclusion of the PIA will inform the level of contribution and/or pavement improvement works required.

9.1.6 Emergency services operations

Various fire stations, police stations and medical facilities are located in Moranbah and Dysart. The assessment concluded that heavy vehicles during the Construction and Operation stages are typically road trains, articulated vehicles and trucks and the fleet is not expecting any OSOM vehicles. Therefore, manoeuvring of the Project vehicles will not be restricted at intersections and road structures. Vehicles will be able to overtake the Project road trains or articulated vehicles without obstructing traffic movement. Therefore, it is concluded that the Project will not impede emergency services operations.

9.1.7 Road safety

Safety issues that are likely to be introduced or exaggerated by the Project include:

- no intersection lighting at Intersection 1 (Lake Vermont Road / Saraji Road)
- proposed intersection A on Saraji Road
- no intersection lighting at Intersection 3 (Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road).

These issues were subject to a safety risk assessment and mitigation measures were proposed. It is recommended that a Road Safety Audit be undertaken for the proposed road infrastructure upgrades during the detailed stage.

9.1.8 Potential impacts and mitigation measures

The assessment proposed mitigation measures to respond to the road safety issues identified in the Project Area. The issues are related to road lighting and unsealed road surface. Based on road safety, the following mitigation measures are proposed to address the issues identified in this assessment:

- provide intersection lighting at Intersection 1 (Lake Vermont Road / Saraji Road) to improve visibility in low light conditions

- construct proposed Intersection A on Saraji Road, which would include deceleration lanes on the north and south approaches to the intersection on Saraji Road, and active devices such as boom barriers and flashing lights in addition to road lighting at the intersection
- provide intersection lighting at Intersection 3 (Peak Downs Mine Access / Peak Downs Mine Road / Saraji Road) to improve visibility in low light conditions.

The assessment concluded that the safety issues are manageable. With the implementation of the proposed mitigation measures, the safety risks will be reduced to an acceptable level.

9.2 Rail impact assessment

It is expected all coal produced by the Project will be transported by rail along the existing Goonyella rail system, specifically the Norwich Park Branch rail line. It has been confirmed by BMA that the rail network has available capacity to support the additional demand required by the Project. The volume of coal to be transported via the network will be within Aurizon's existing approval limits. As such, no additional impacts are expected.

9.3 Port impact assessment

The Project is expected to require approximately 88 ships per year in peak production to transport this product to market via port facilities in Abbot Point and Hay Point. This assessment shows that the annual maximum production rate of the Project corresponds to approximately eight per cent of the combined terminal capacities. It is considered that the impact to the combined terminal capacity is minimal.

9.4 Air impact assessment

It is anticipated that the demand for air travel will increase as a portion of workers are expected to originate from outside the local region. This assessment recommends optimising workers' rosters to minimise peak air travel demand.

10.0 References

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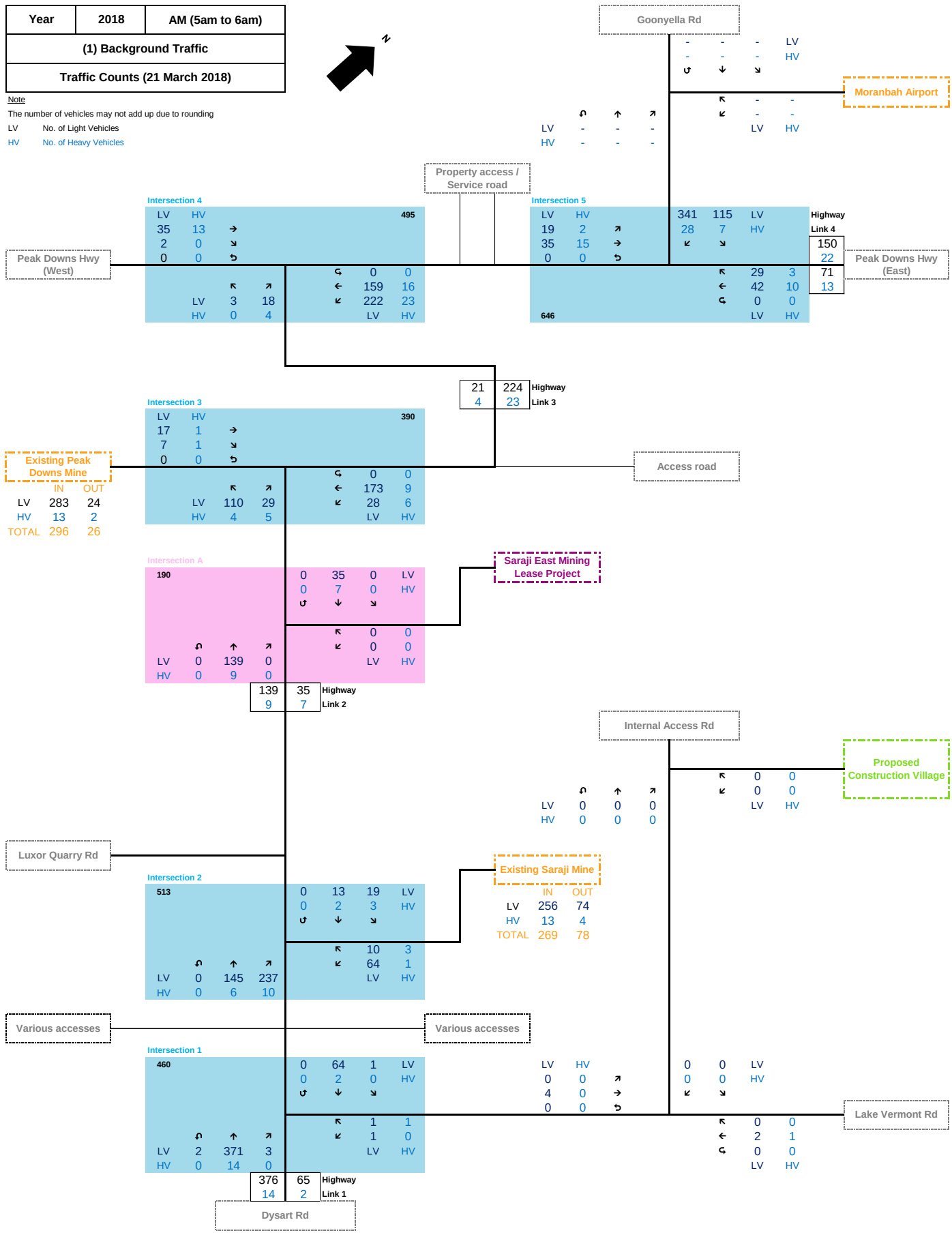
Transportation Research Board. 2016. *Highway Capacity Manual*. 6th edition. Washington, Transportation Research Board.

Appendix A

Background Traffic

Year	2018	AM (5am to 6am)
(1) Background Traffic		
Traffic Counts (21 March 2018)		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles



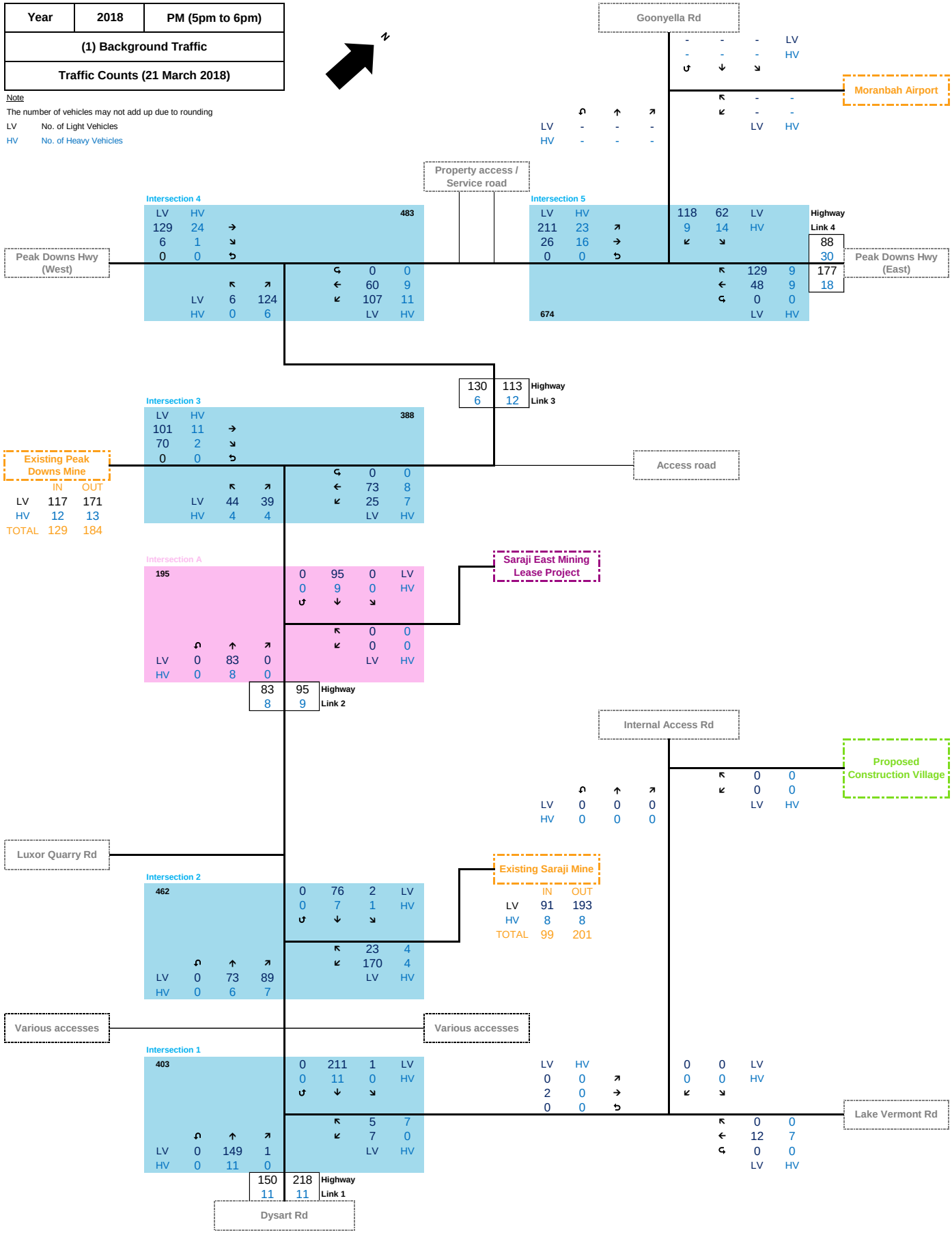
Year	2018	PM (5pm to 6pm)
(1) Background Traffic		
Traffic Counts (21 March 2018)		

Note

The number of vehicles may not add up due to rounding

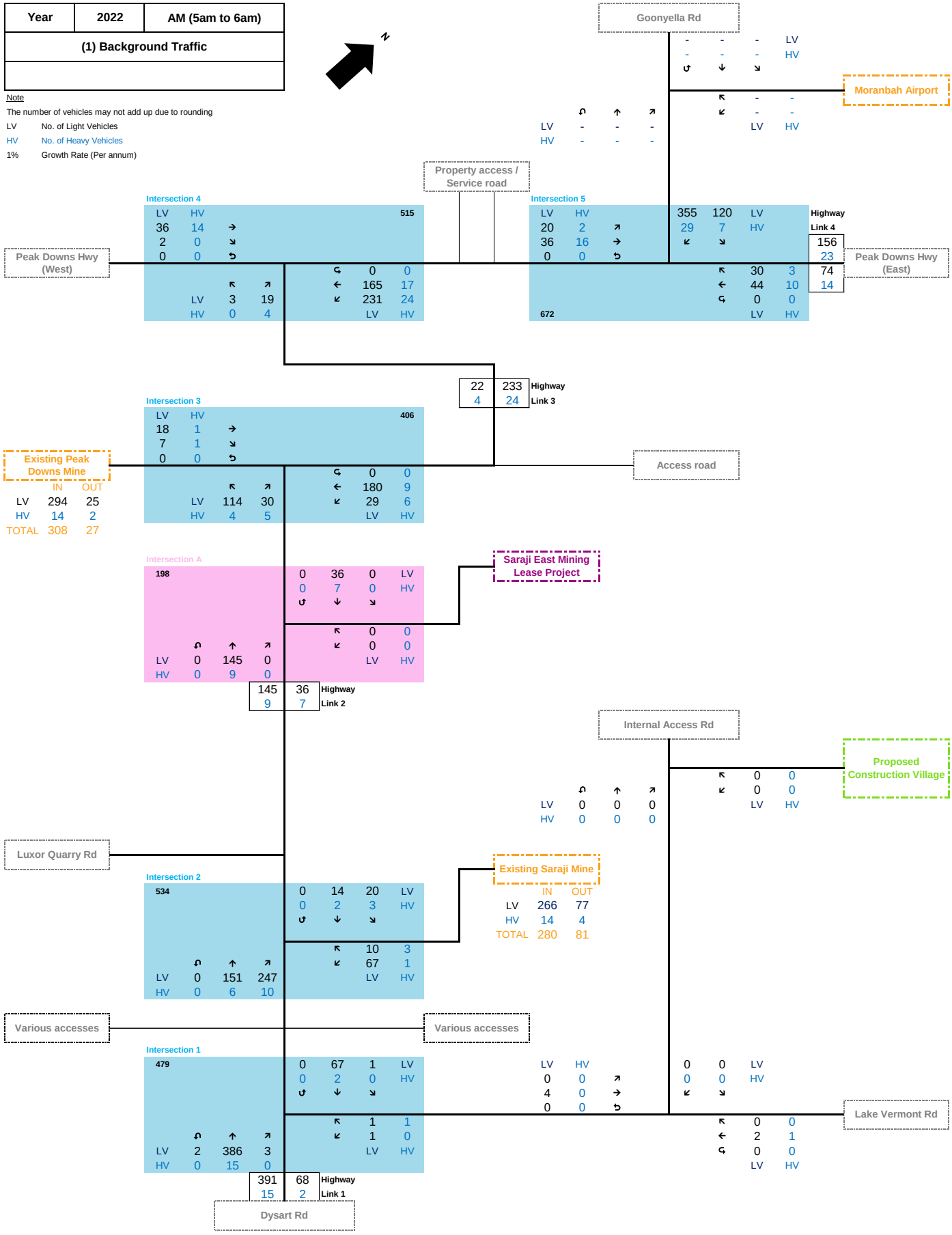
LV No. of Light Vehicles

HV No. of Heavy Vehicles



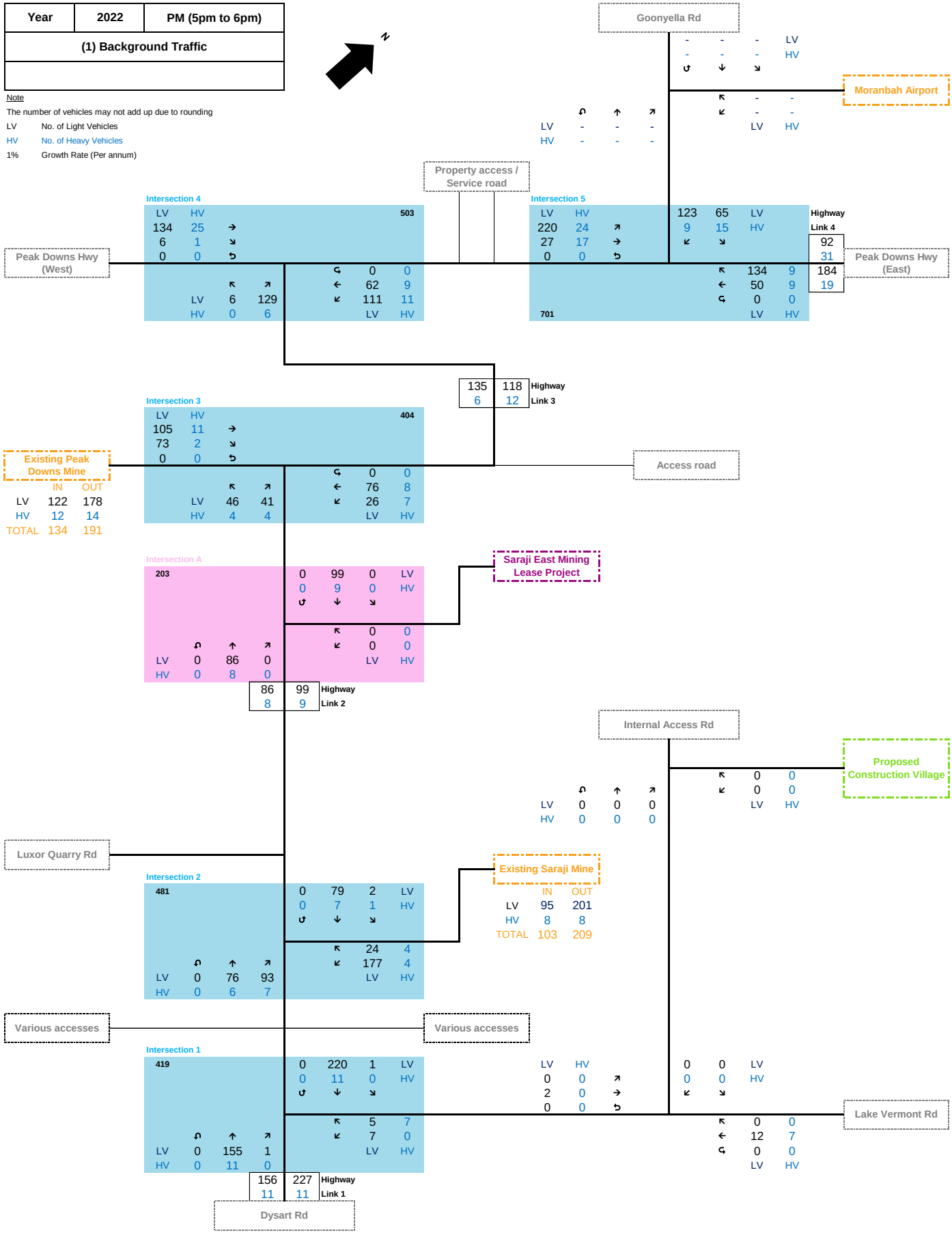
Year	2022	AM (5am to 6am)
(1) Background Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
1% Growth Rate (Per annum)



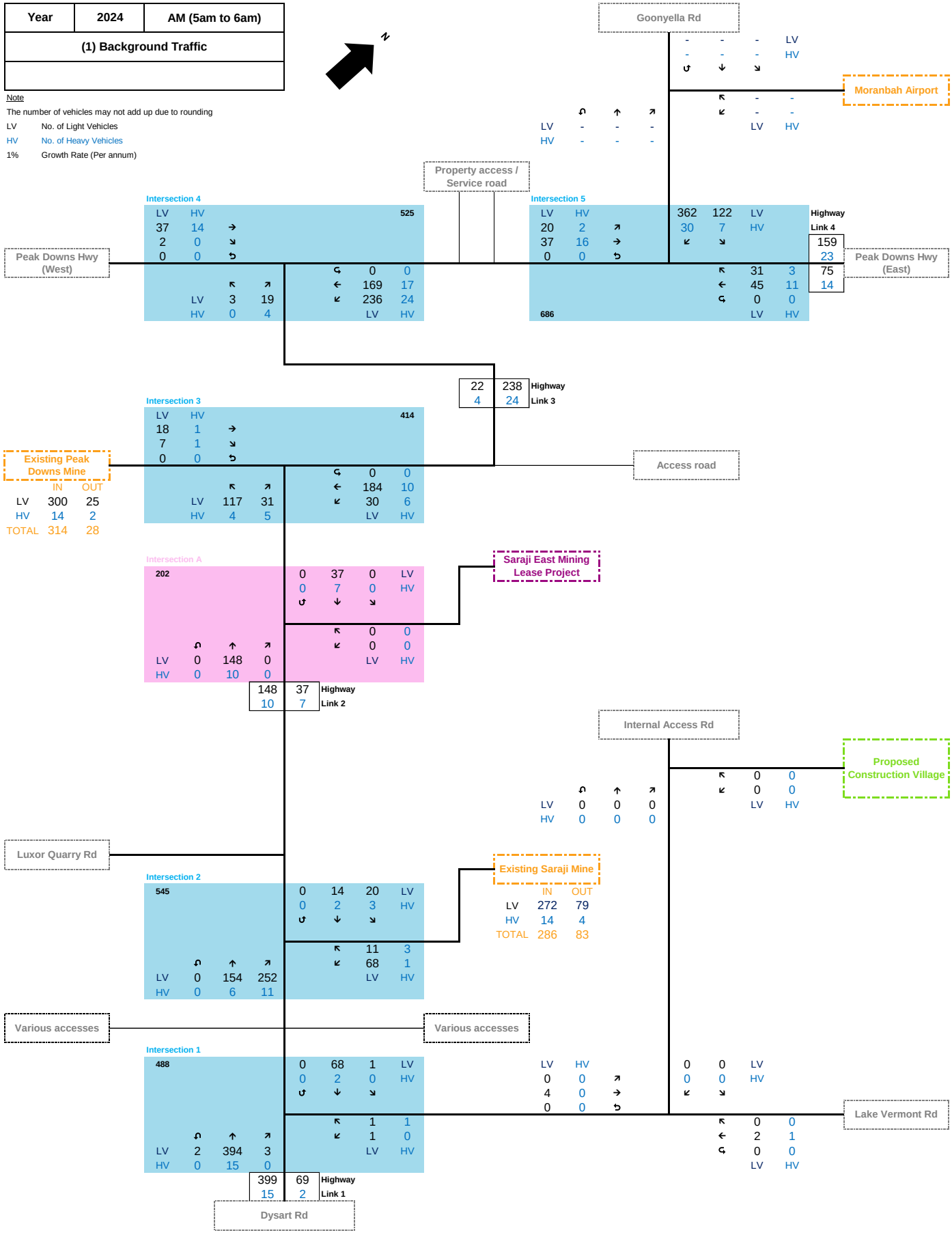
Year	2022	PM (5pm to 6pm)
(1) Background Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
1% Growth Rate (Per annum)



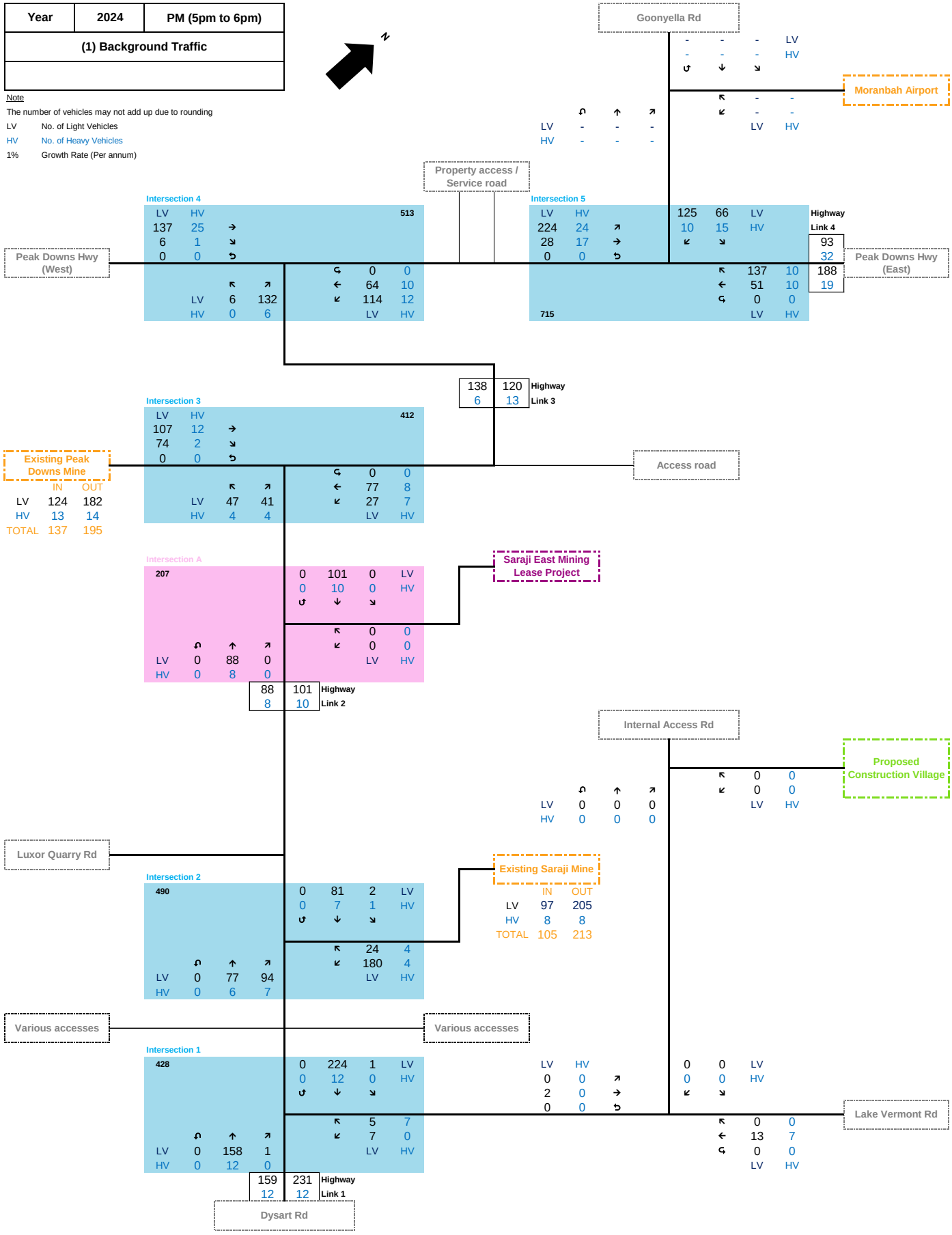
Year	2024	AM (5am to 6am)
(1) Background Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
1% Growth Rate (Per annum)



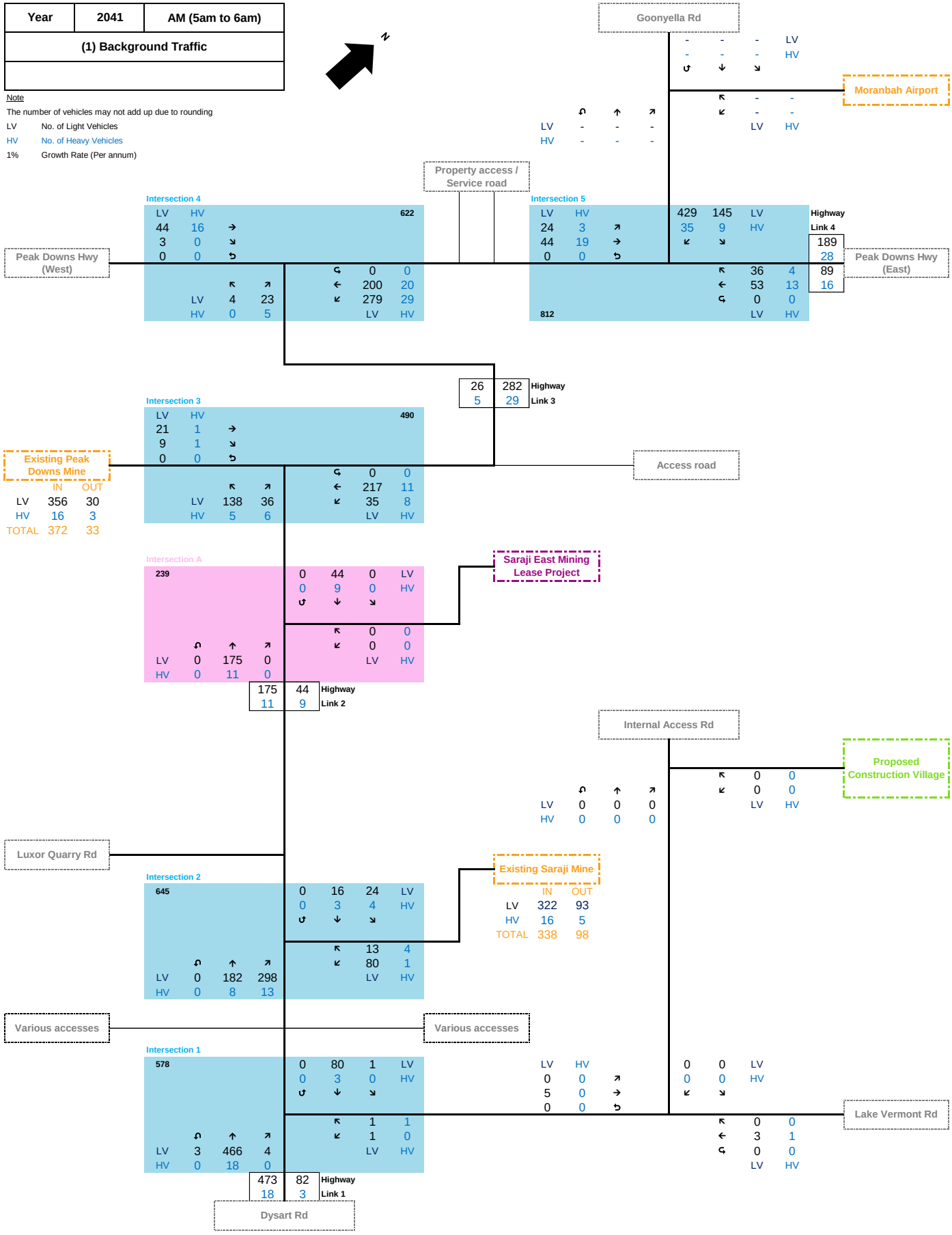
Year	2024	PM (5pm to 6pm)
(1) Background Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
1% Growth Rate (Per annum)



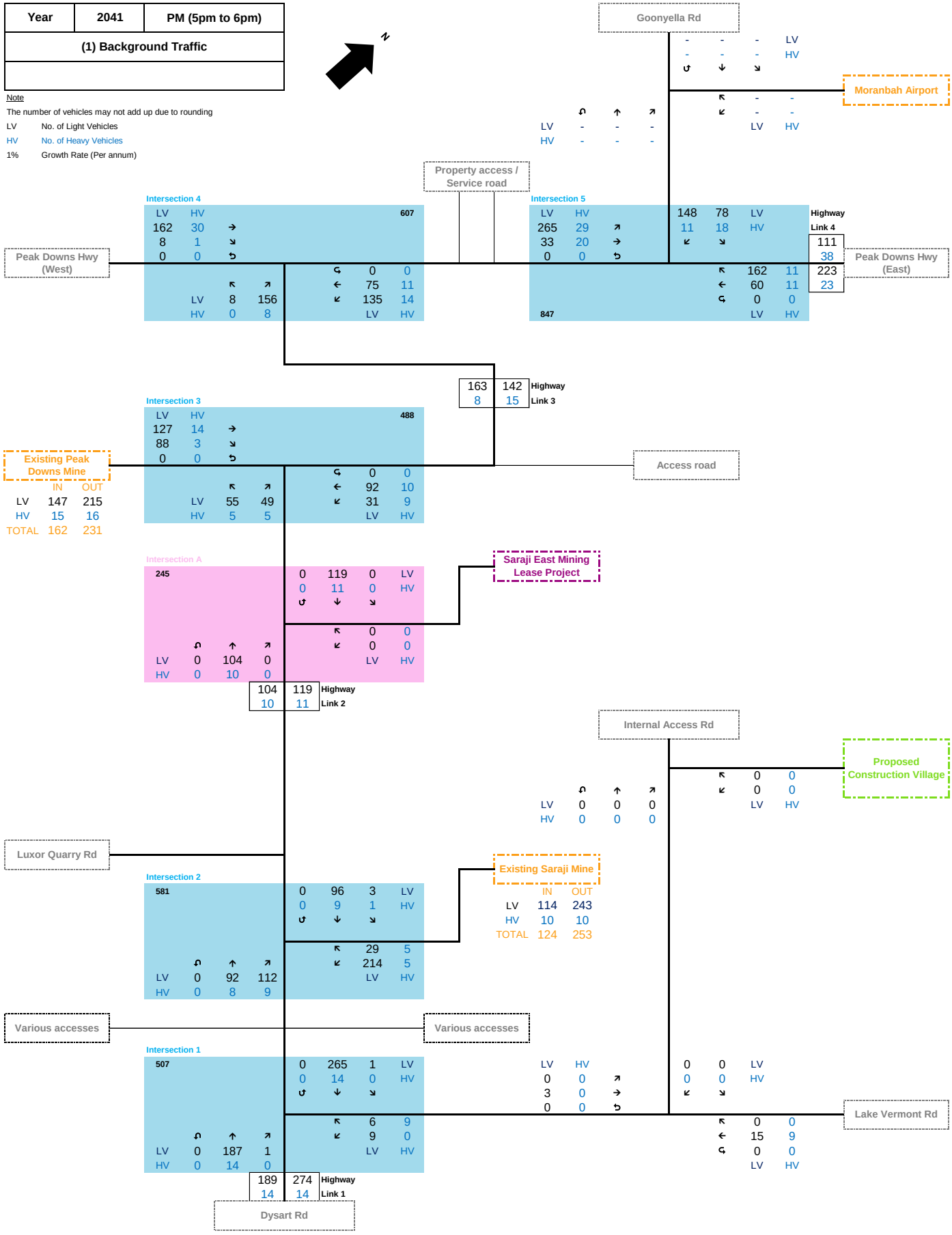
Year	2041	AM (5am to 6am)
(1) Background Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
1% Growth Rate (Per annum)



Year	2041	PM (5pm to 6pm)
(1) Background Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
1% Growth Rate (Per annum)



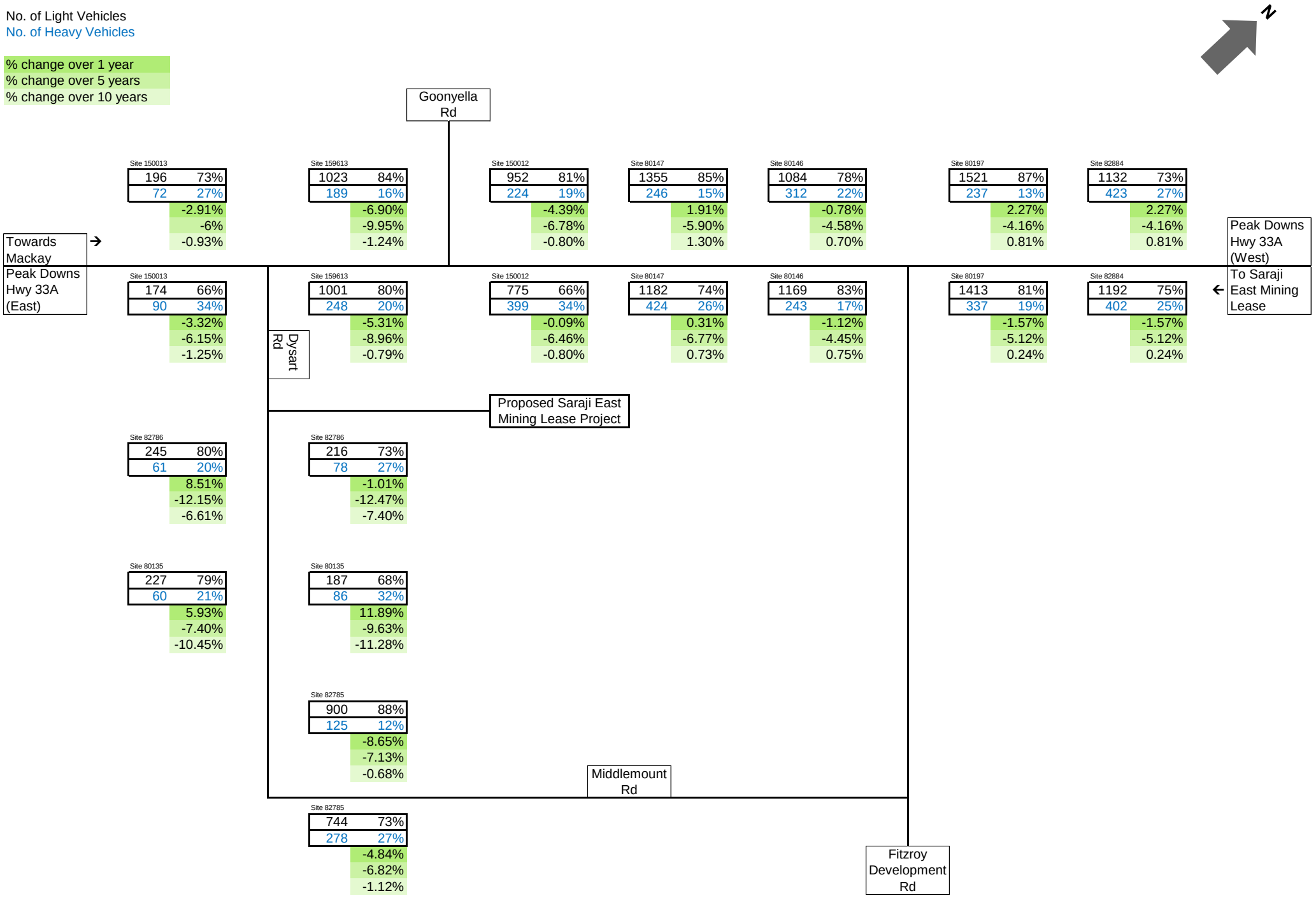
Appendix B

Regional Traffic

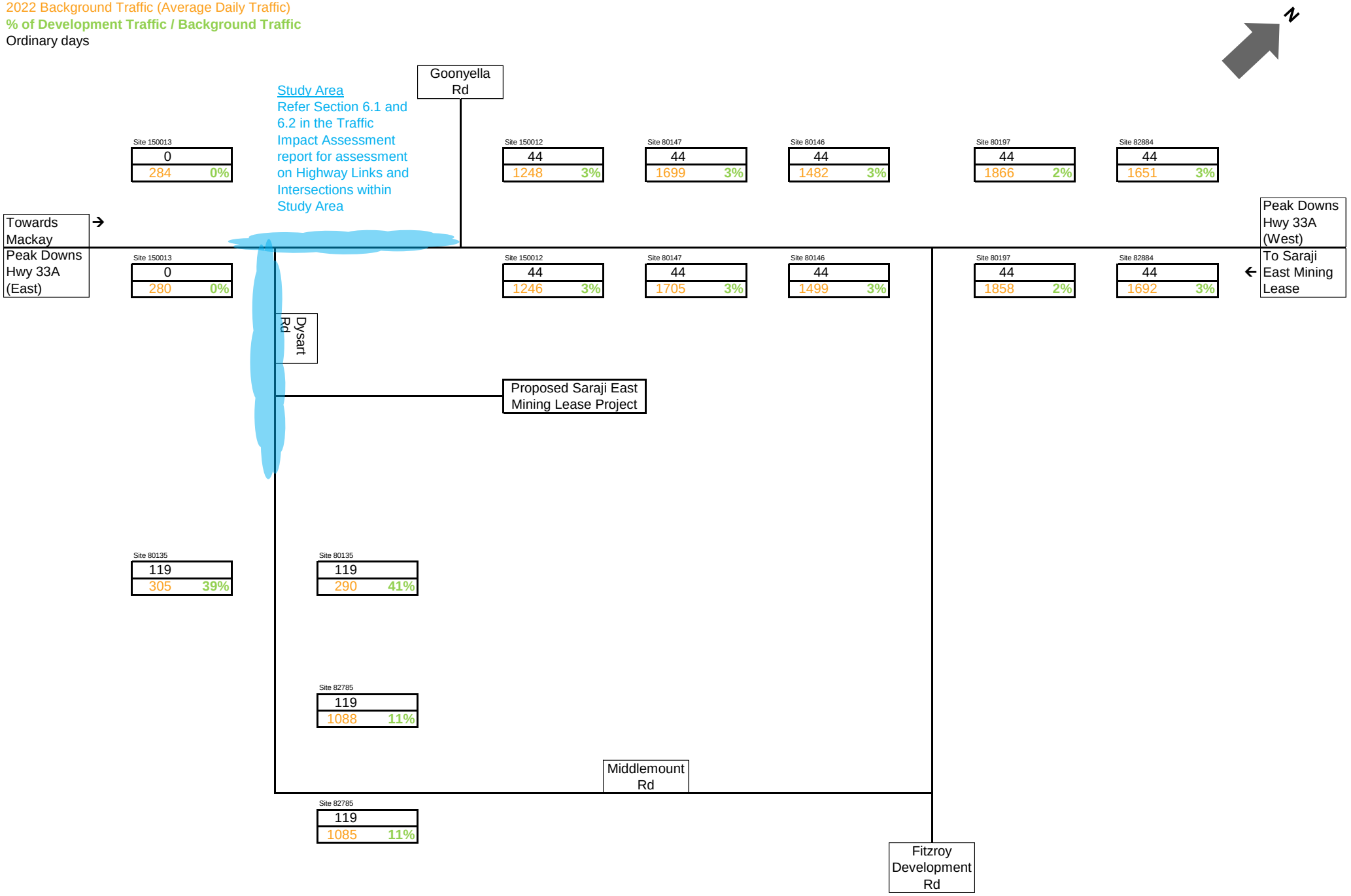
2016 Annual Average Daily Traffic (AADT)

No. of Light Vehicles
No. of Heavy Vehicles

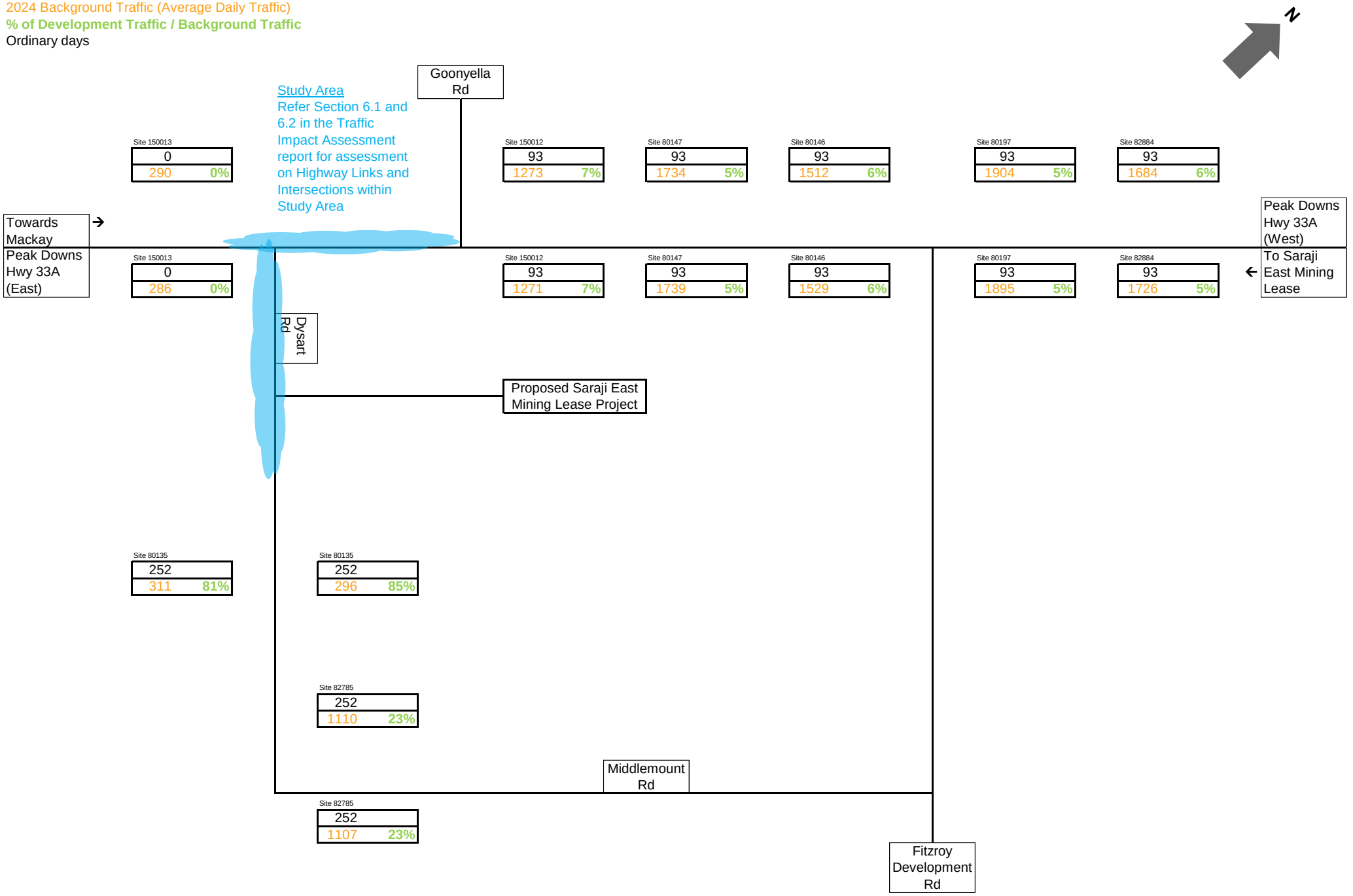
% change over 1 year
% change over 5 years
% change over 10 years



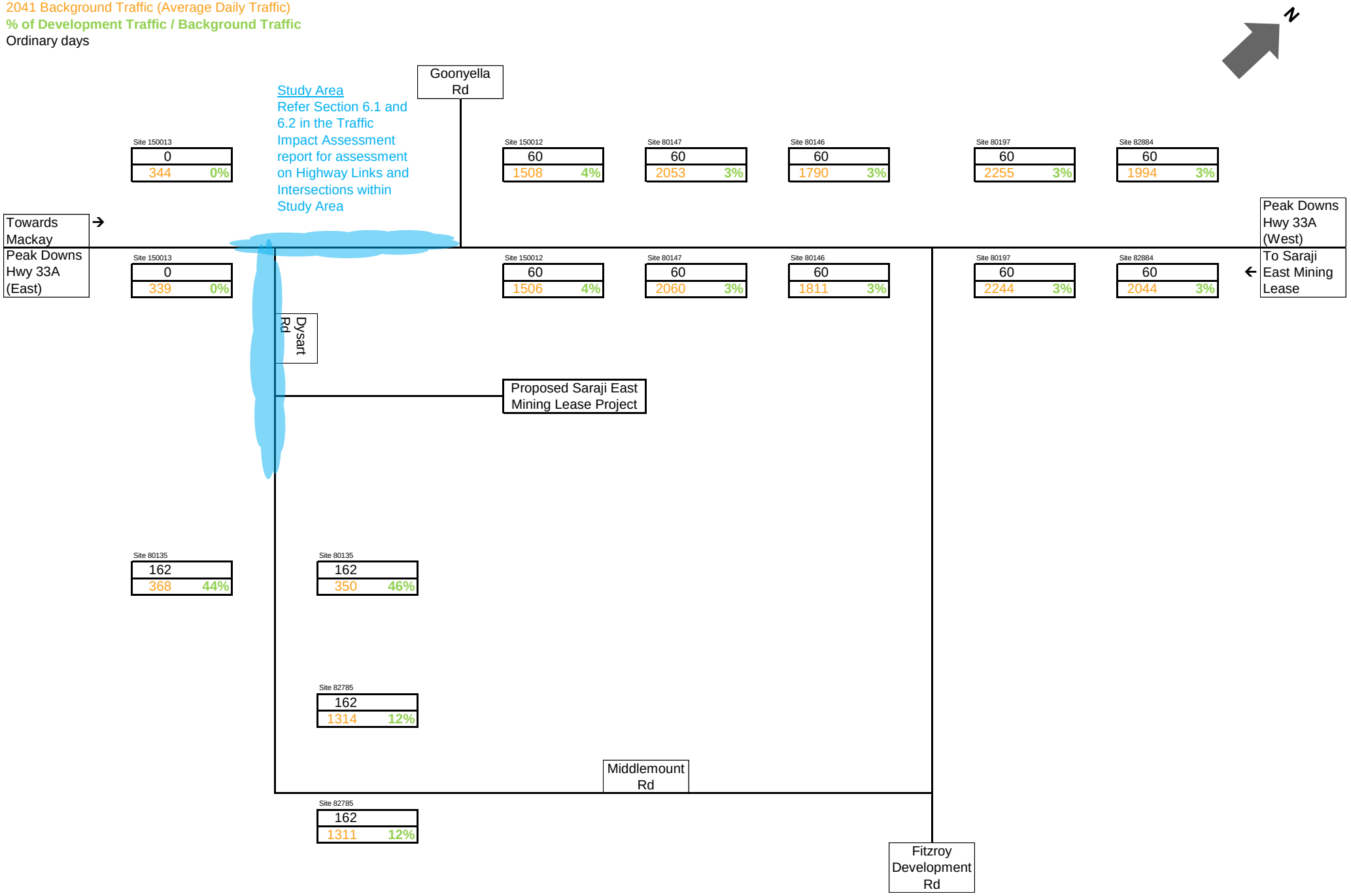
2022 Development Traffic (Average Daily Traffic)
2022 Background Traffic (Average Daily Traffic)
% of Development Traffic / Background Traffic
Ordinary days



2024 Development Traffic (Average Daily Traffic)
2024 Background Traffic (Average Daily Traffic)
% of Development Traffic / Background Traffic
Ordinary days



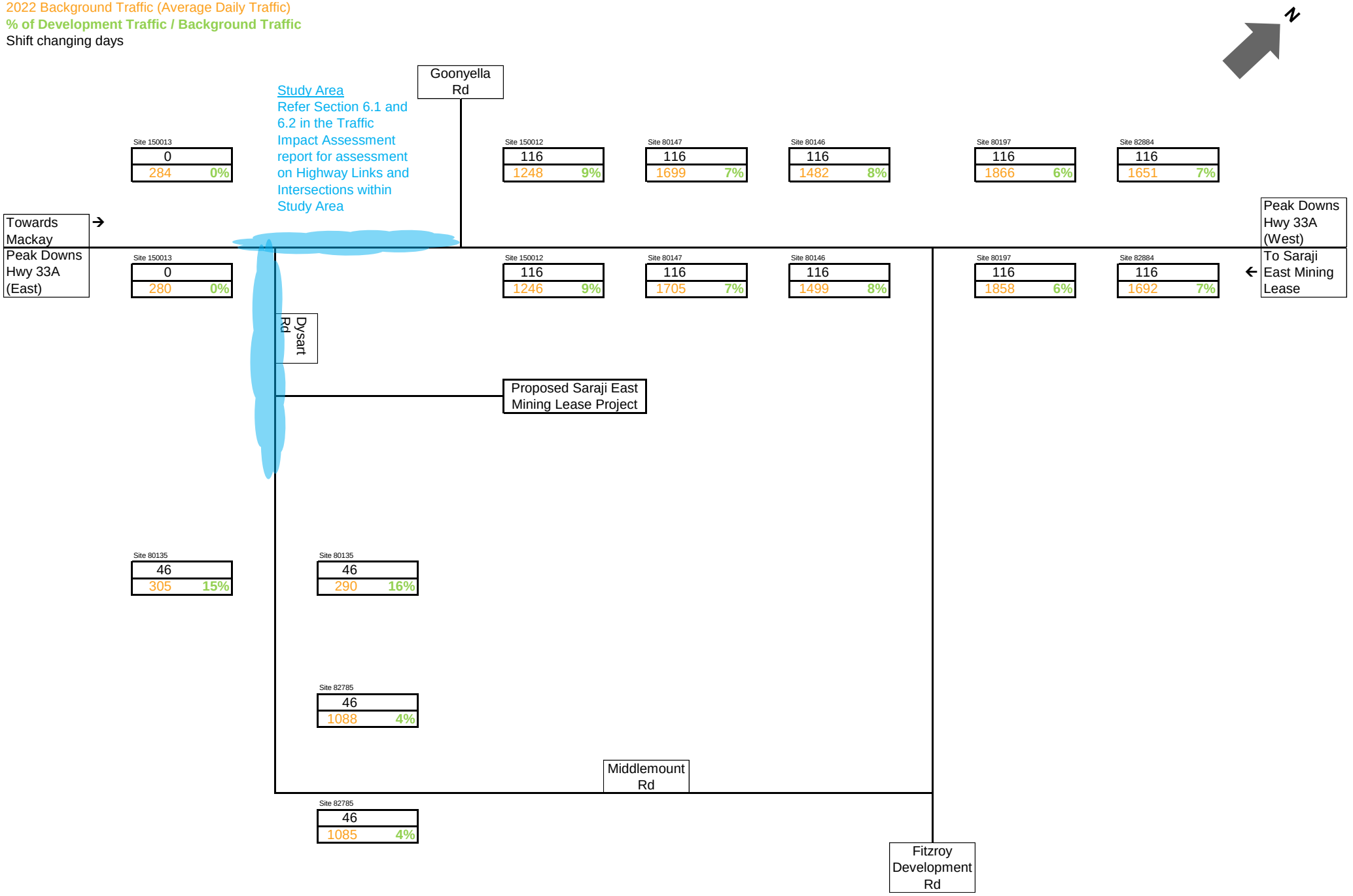
2041 Development Traffic (Average Daily Traffic)
2041 Background Traffic (Average Daily Traffic)
% of Development Traffic / Background Traffic
Ordinary days



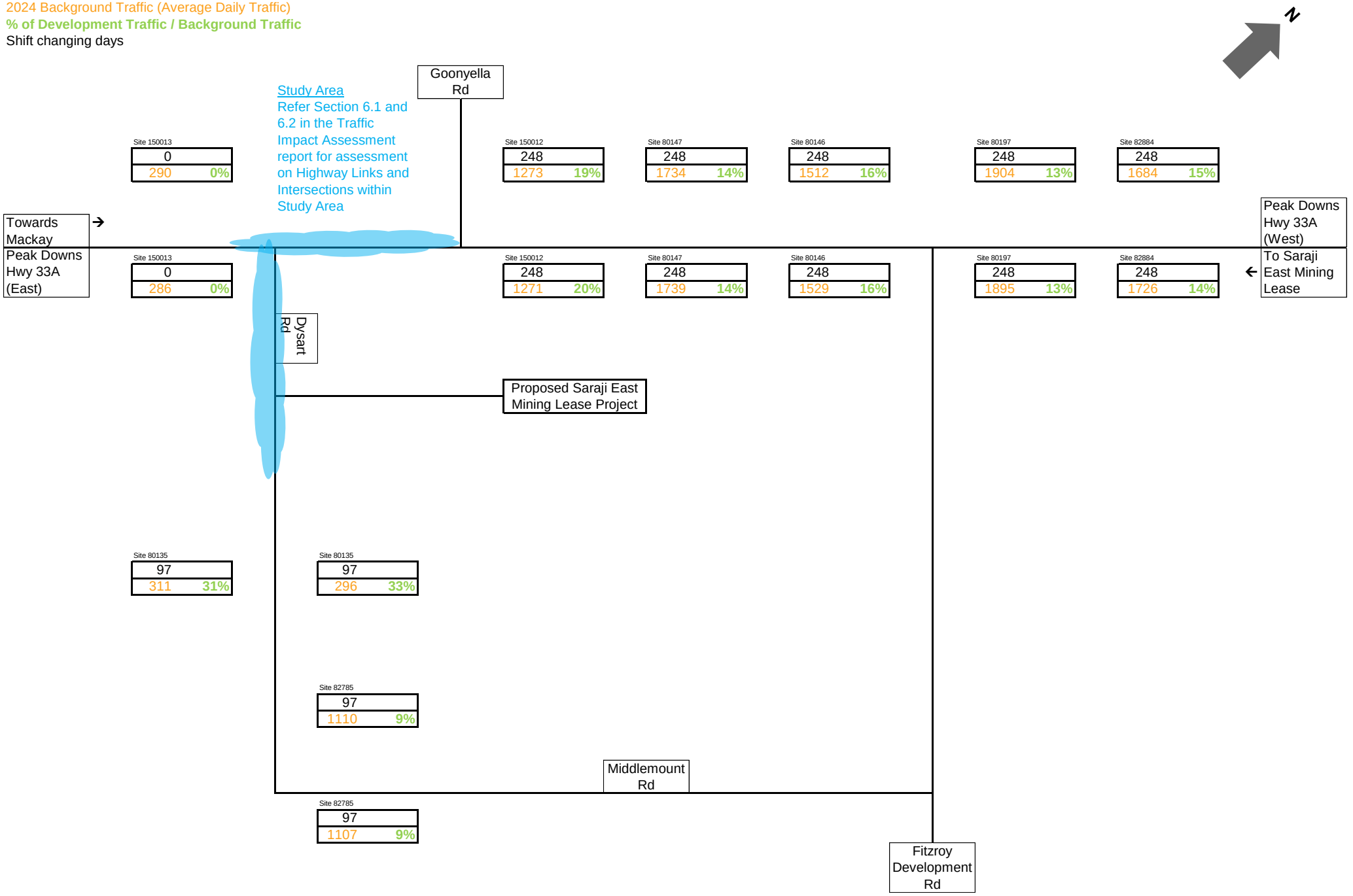
Regional Traffic Assessment on Peak Downs Highway and Dysart Road

2022 Development Traffic (Average Daily Traffic)

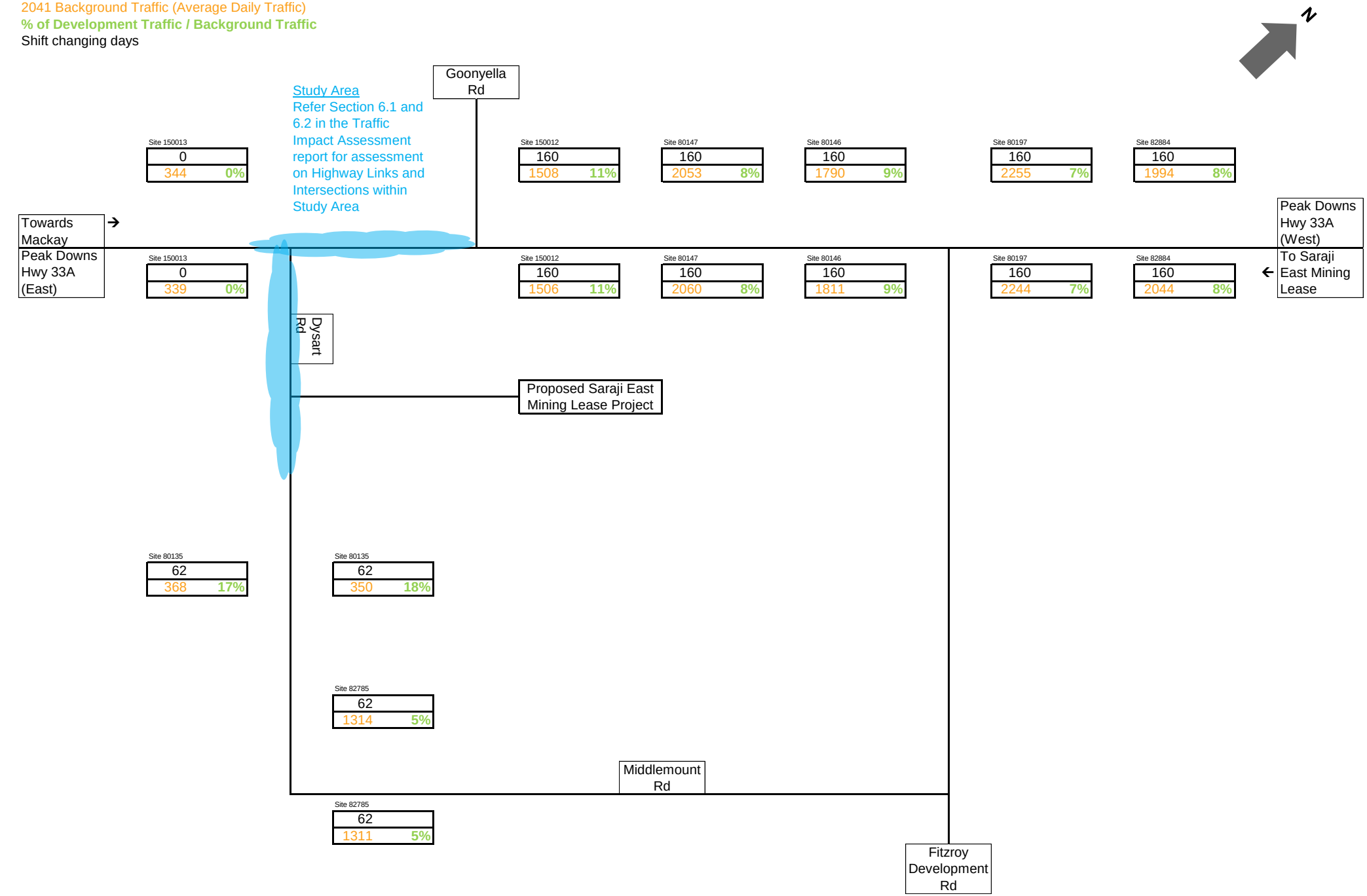
2022 Development Traffic (Average Daily Traffic)
2022 Background Traffic (Average Daily Traffic)
% of Development Traffic / Background Traffic
Shift changing days



2024 Development Traffic (Average Daily Traffic)
2024 Background Traffic (Average Daily Traffic)
% of Development Traffic / Background Traffic
Shift changing days



2041 Development Traffic (Average Daily Traffic)
2041 Background Traffic (Average Daily Traffic)
% of Development Traffic / Background Traffic
Shift changing days



Appendix C

Development Traffic

Year	2022	AM (5am to 6am)
(4) Development Traffic / (2) Construction Traffic		
(2A) Construction Workers Traffic + (2B) Constrution Materials & Equipment Traffic		

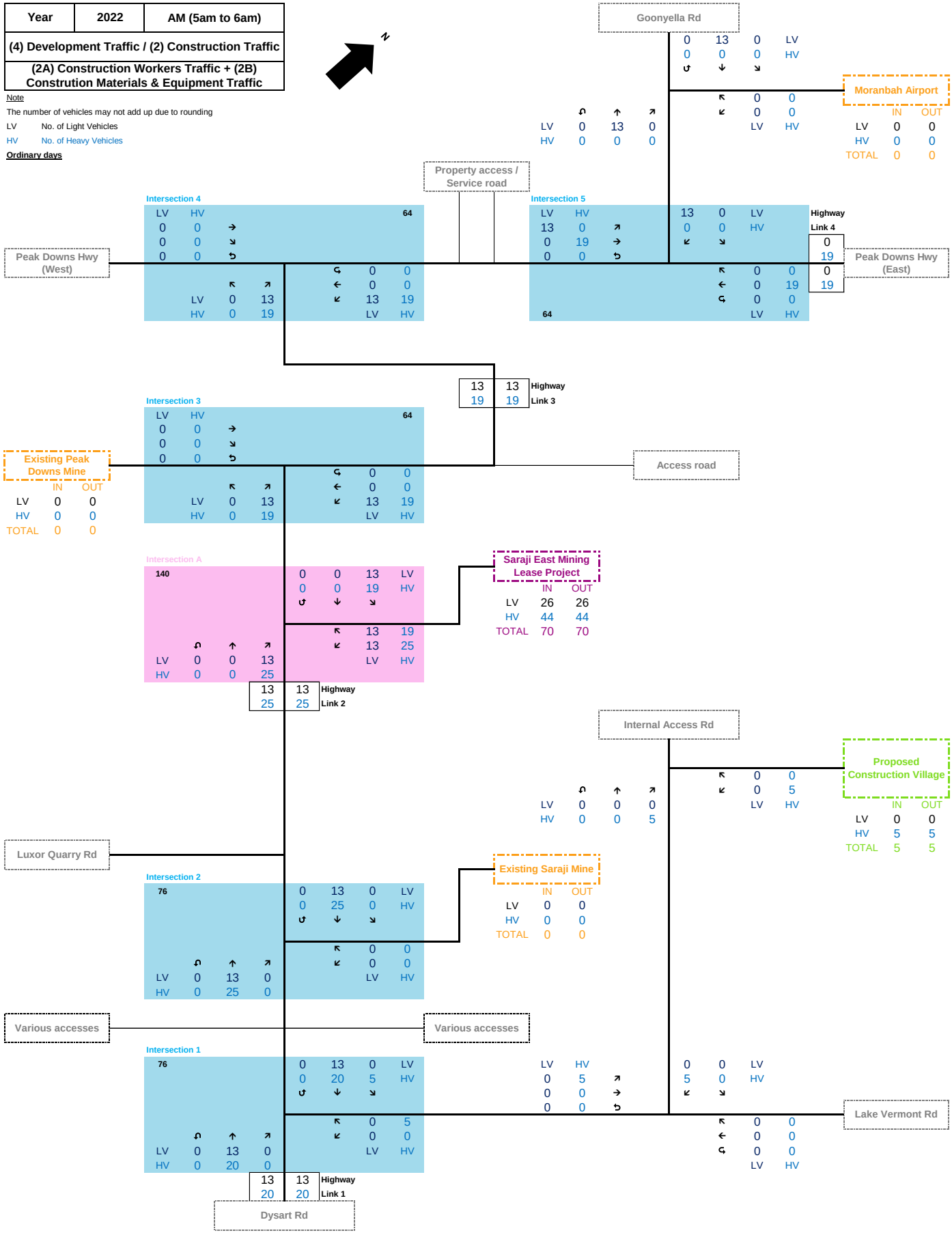
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2022	PM (5pm to 6pm)
(4) Development Traffic / (2) Construction Traffic		
(2A) Construction Workers Traffic + (2B) Constrution Materials & Equipment Traffic		

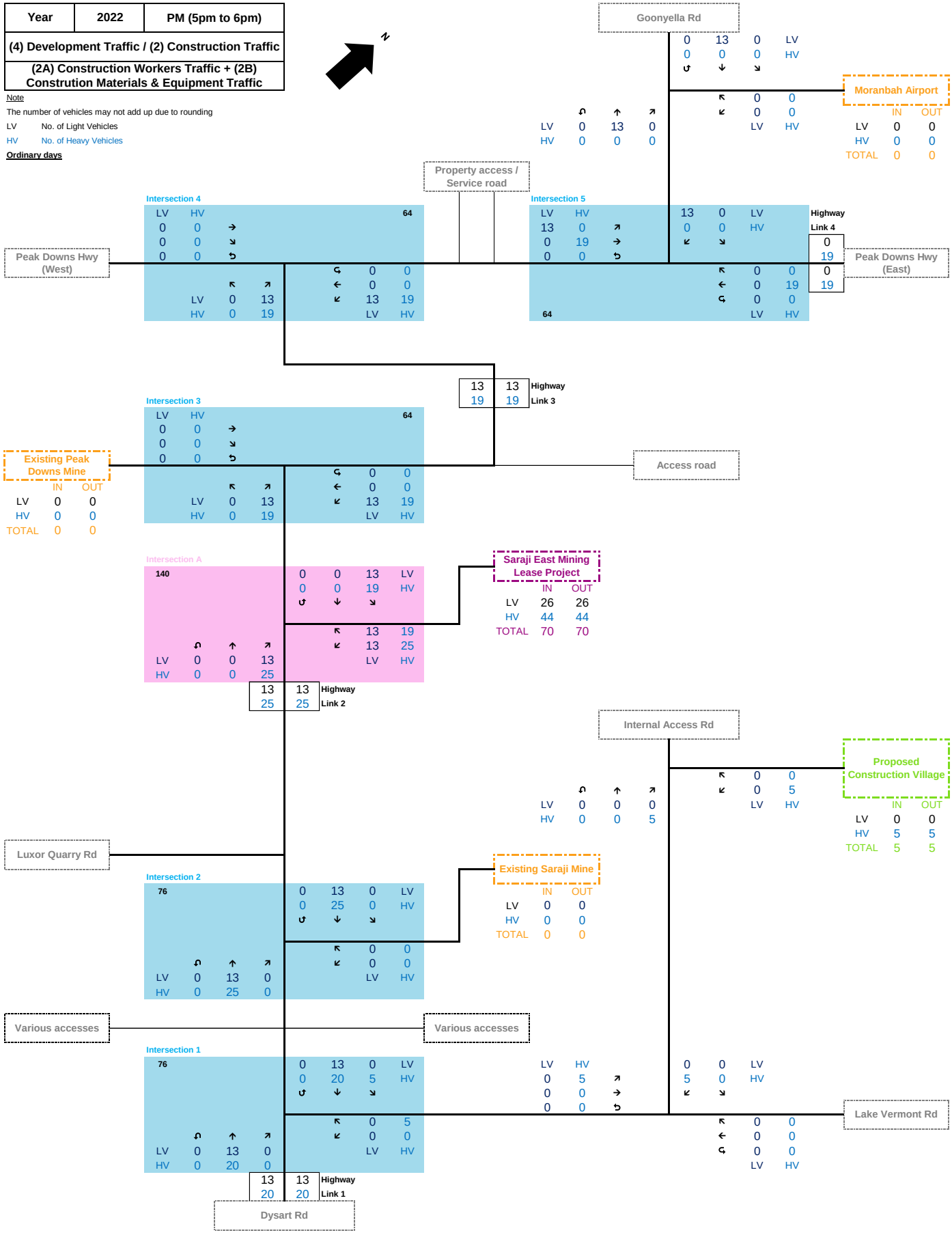
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2024	AM (5am to 6am)
(4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

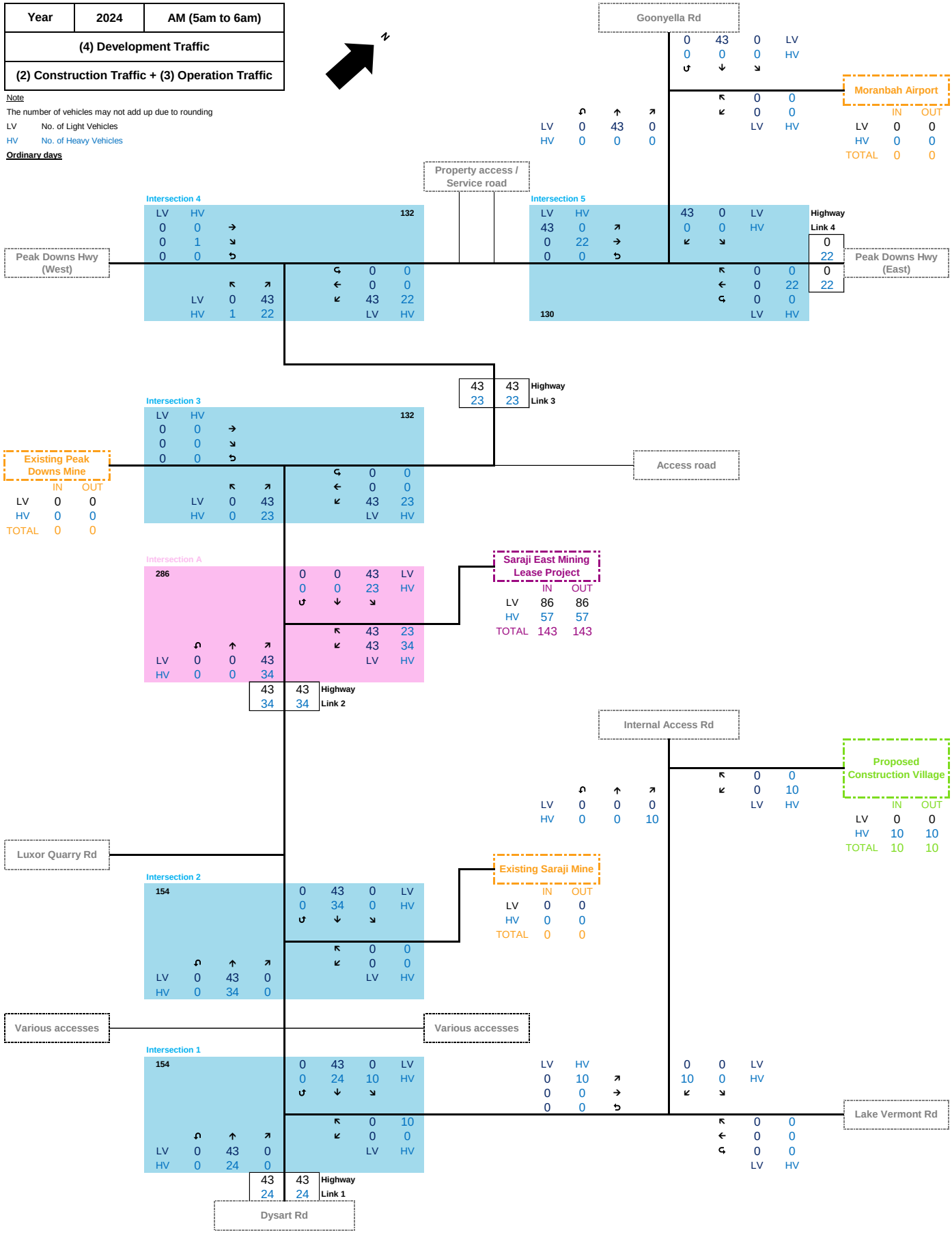
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2024	PM (5pm to 6pm)
(4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

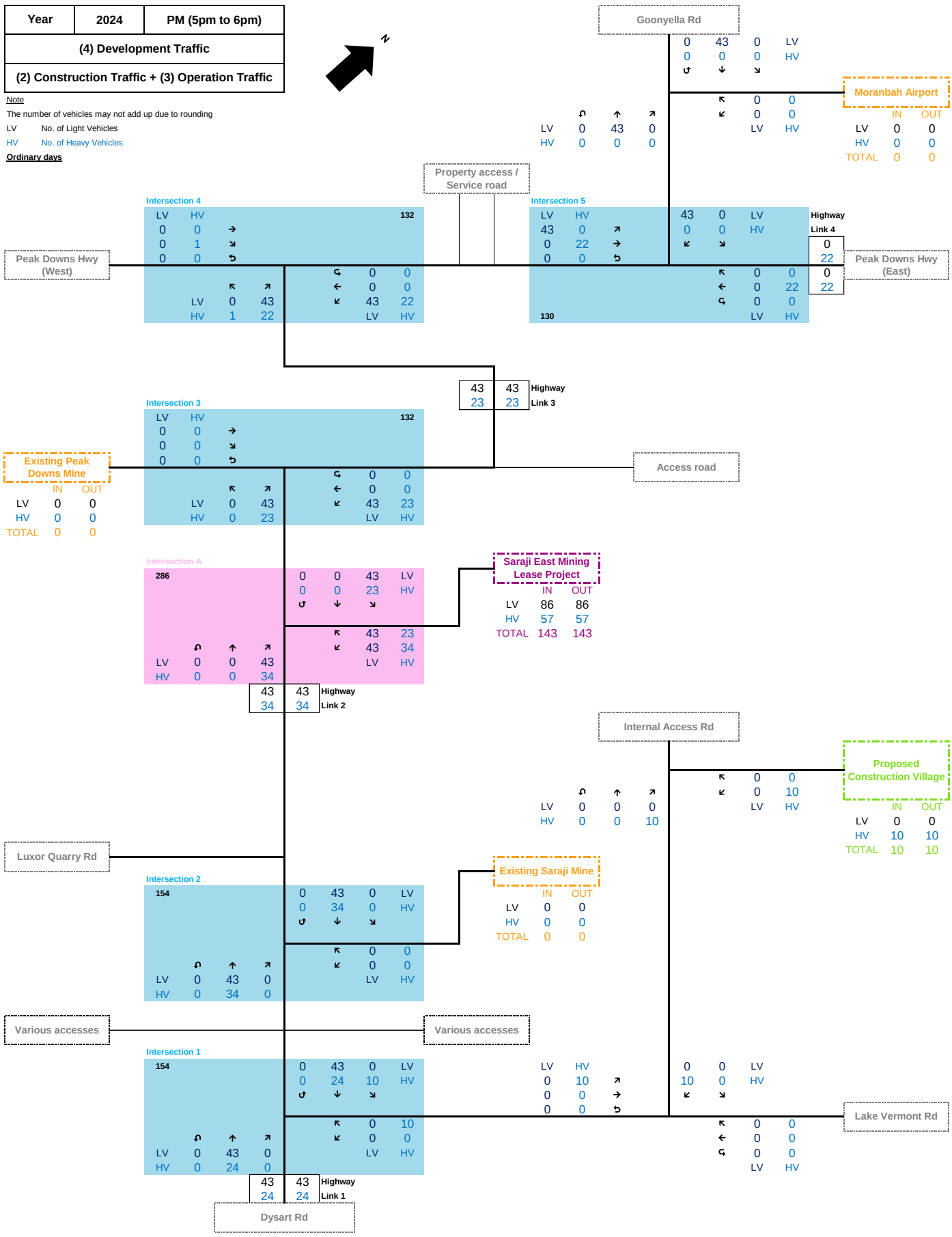
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2041	AM (5am to 6am)
(3) Operation Traffic / (4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

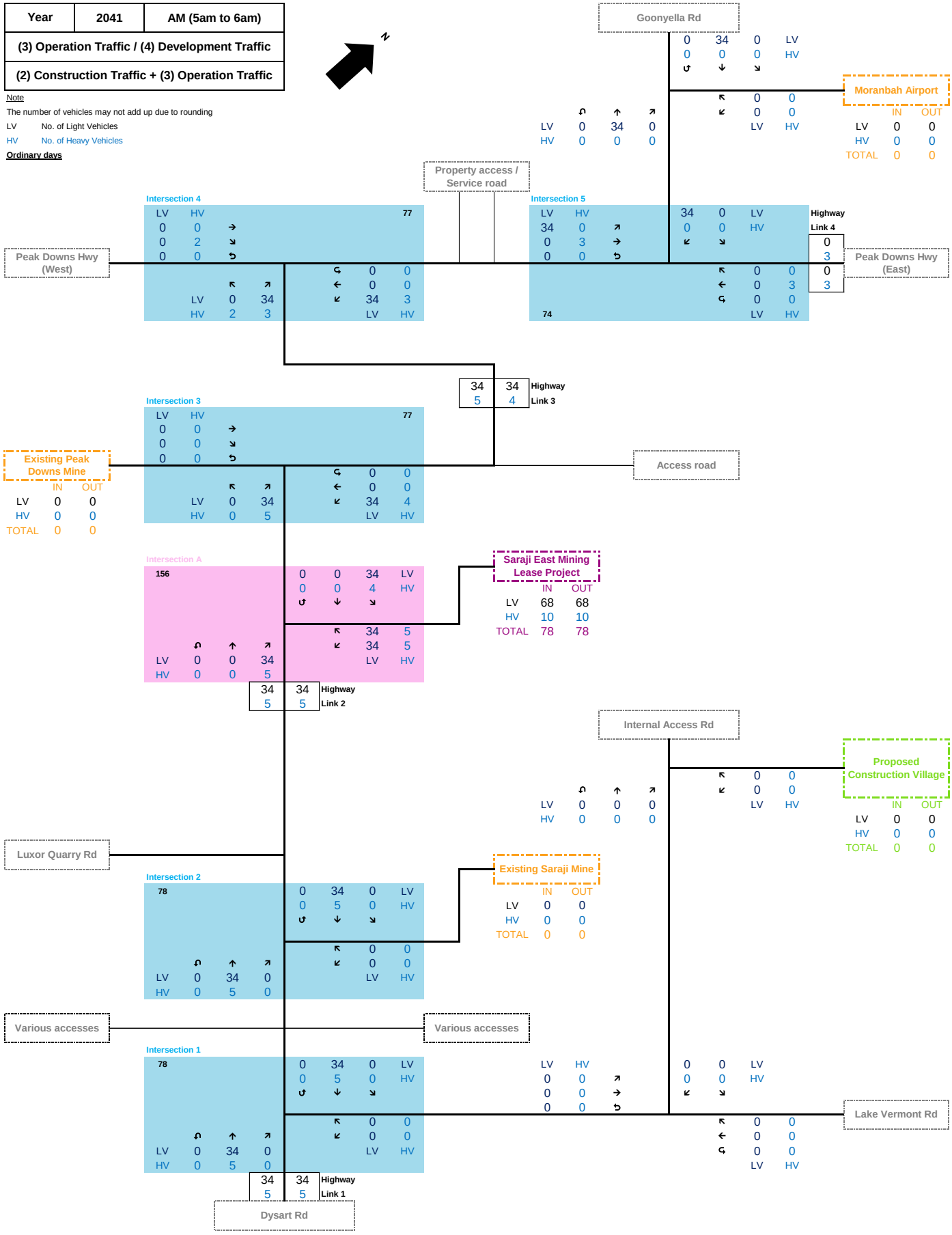
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2041	PM (5pm to 6pm)
(3) Operation Traffic / (4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

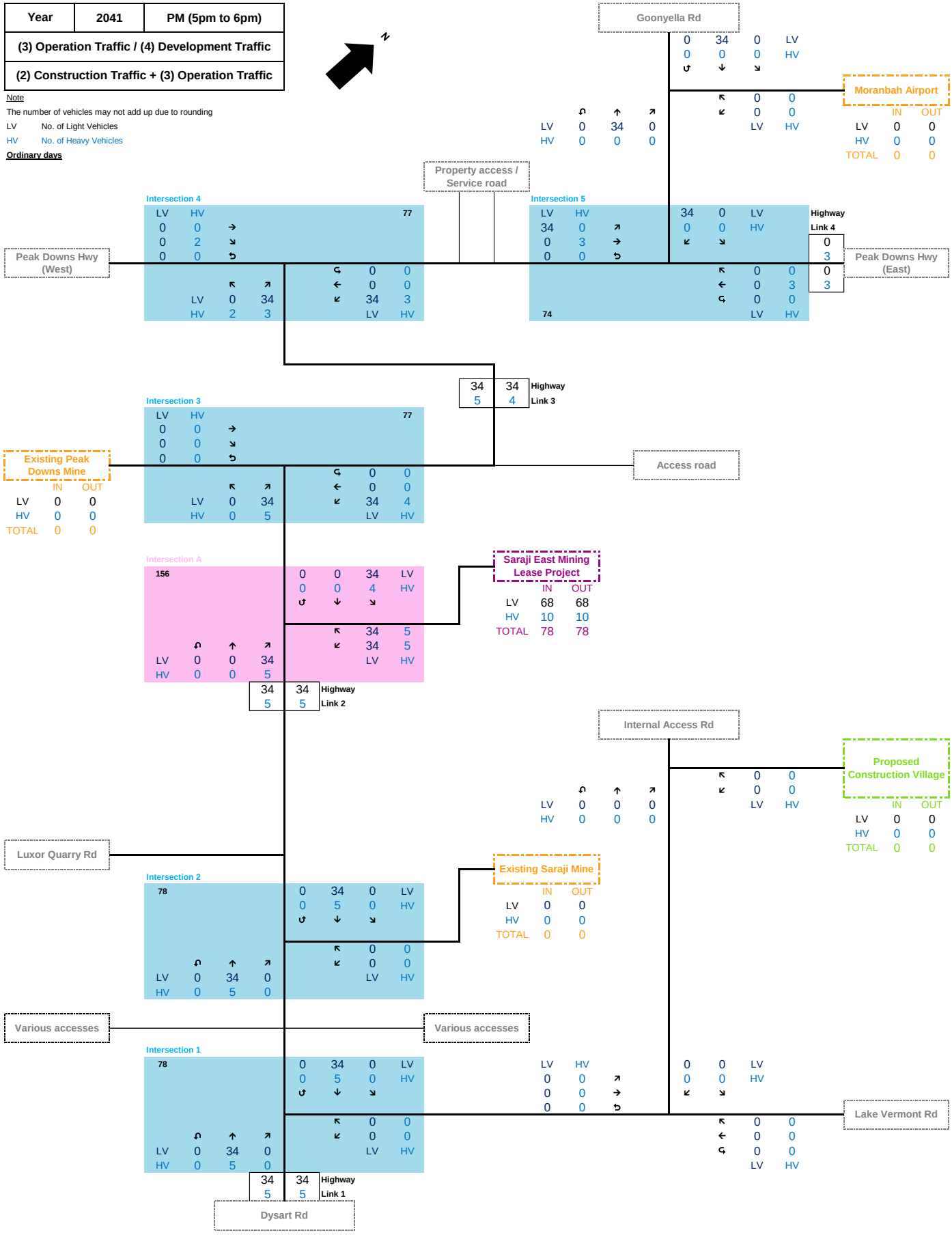
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2022	AM (5am to 6am)
(4) Development Traffic / (2) Construction Traffic		
(2A) Construction Workers Traffic + (2B) Constrution Materials & Equipment Traffic		

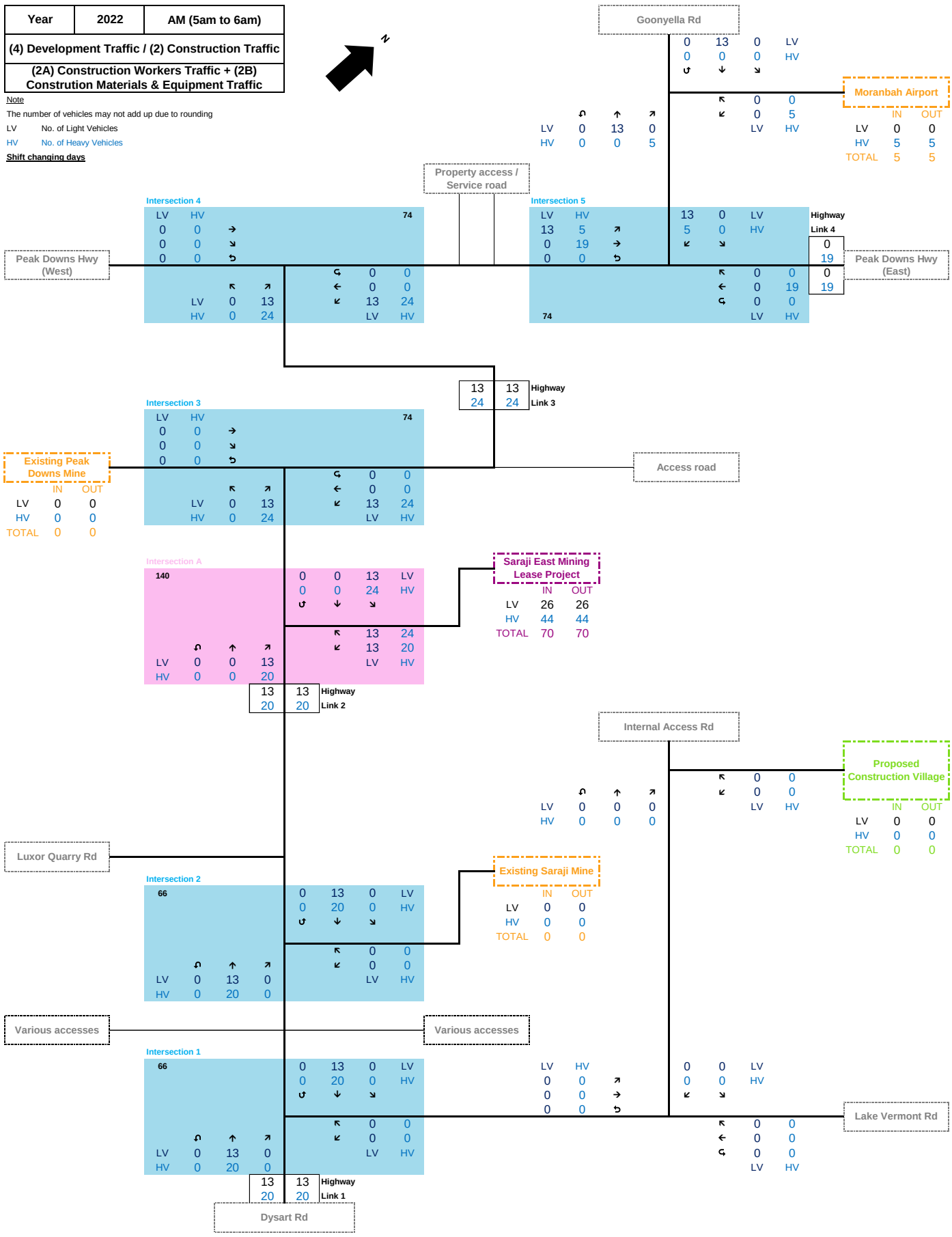
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2022	PM (5pm to 6pm)
(4) Development Traffic / (2) Construction Traffic		
(2A) Construction Workers Traffic + (2B) Constrution Materials & Equipment Traffic		

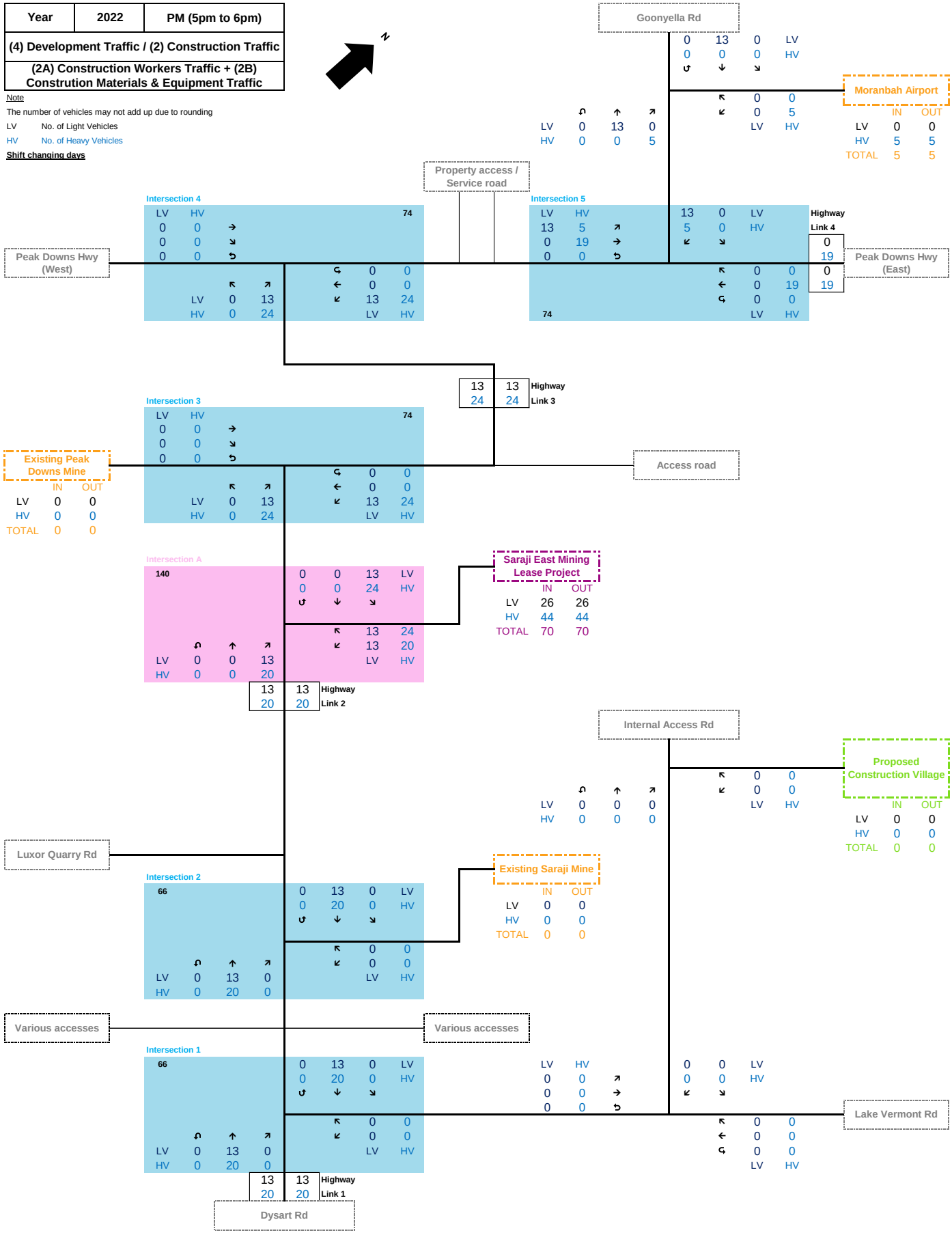
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2024	AM (5am to 6am)
(4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

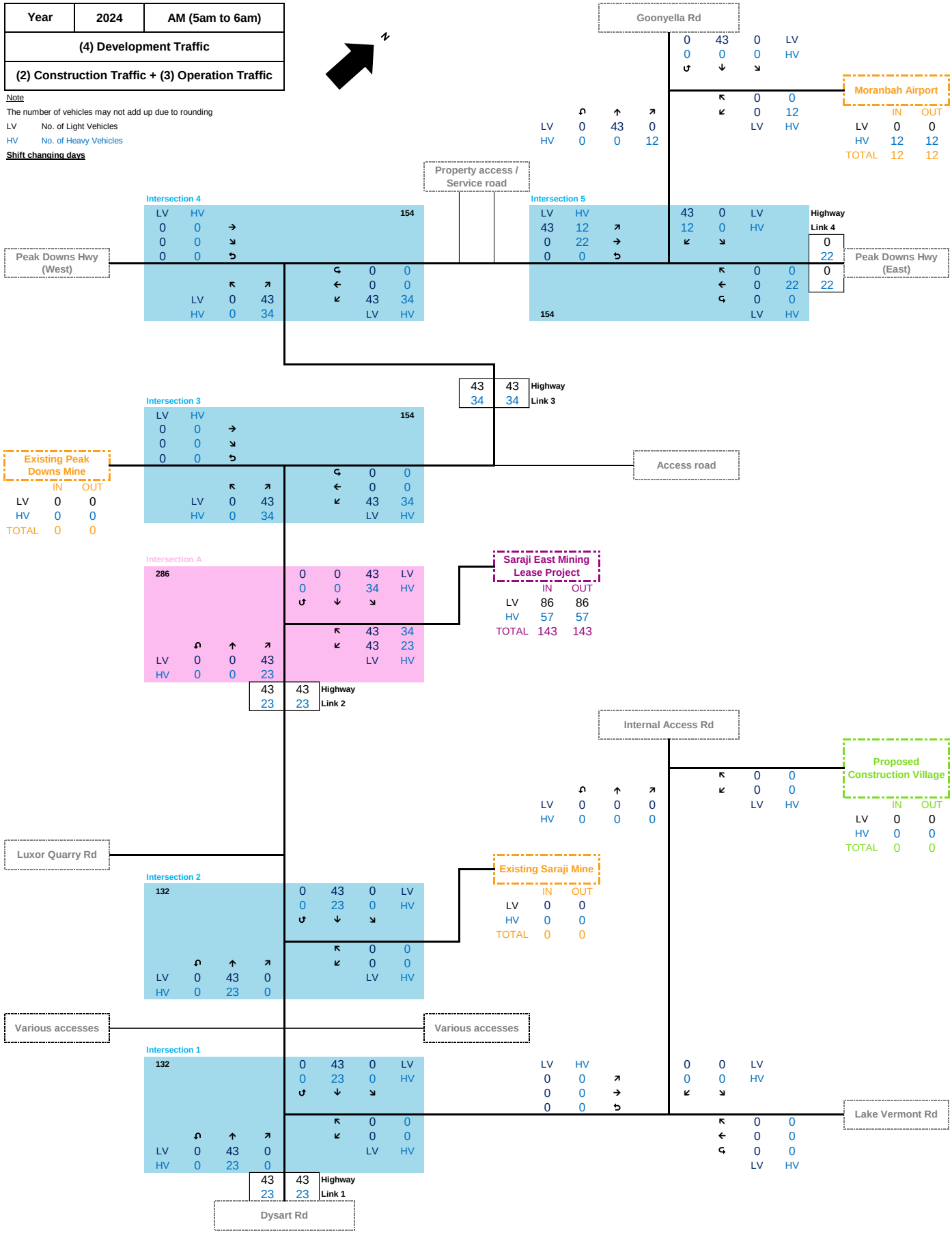
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

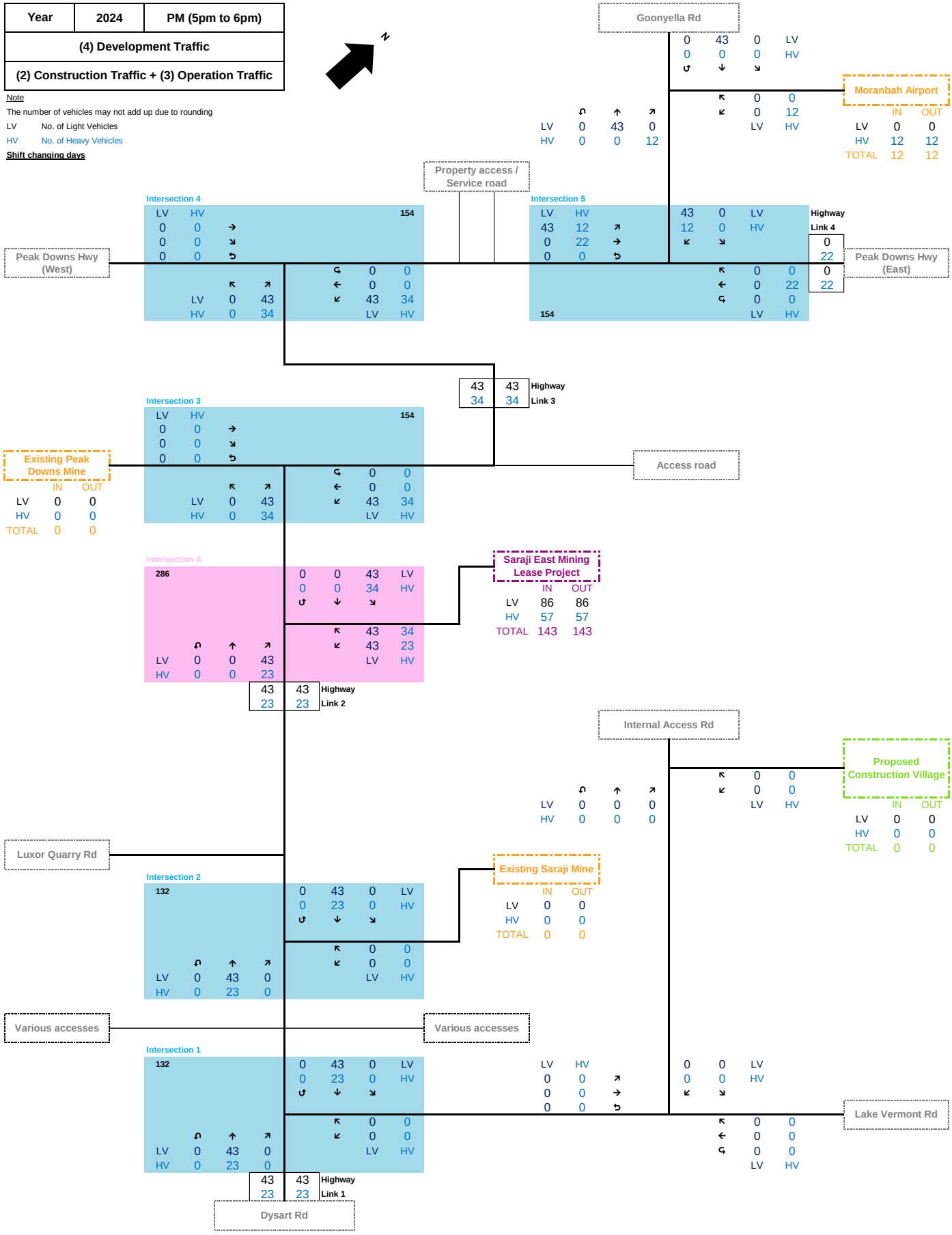
HV No. of Heavy Vehicles

Shift changing days



Year	2024	PM (5pm to 6pm)
(4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

Note
The number of vehicles may not add up due to rounding
LV No. of Light Vehicles
HV No. of Heavy Vehicles
Shift changing days



Year	2041	AM (5am to 6am)
(3) Operation Traffic / (4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

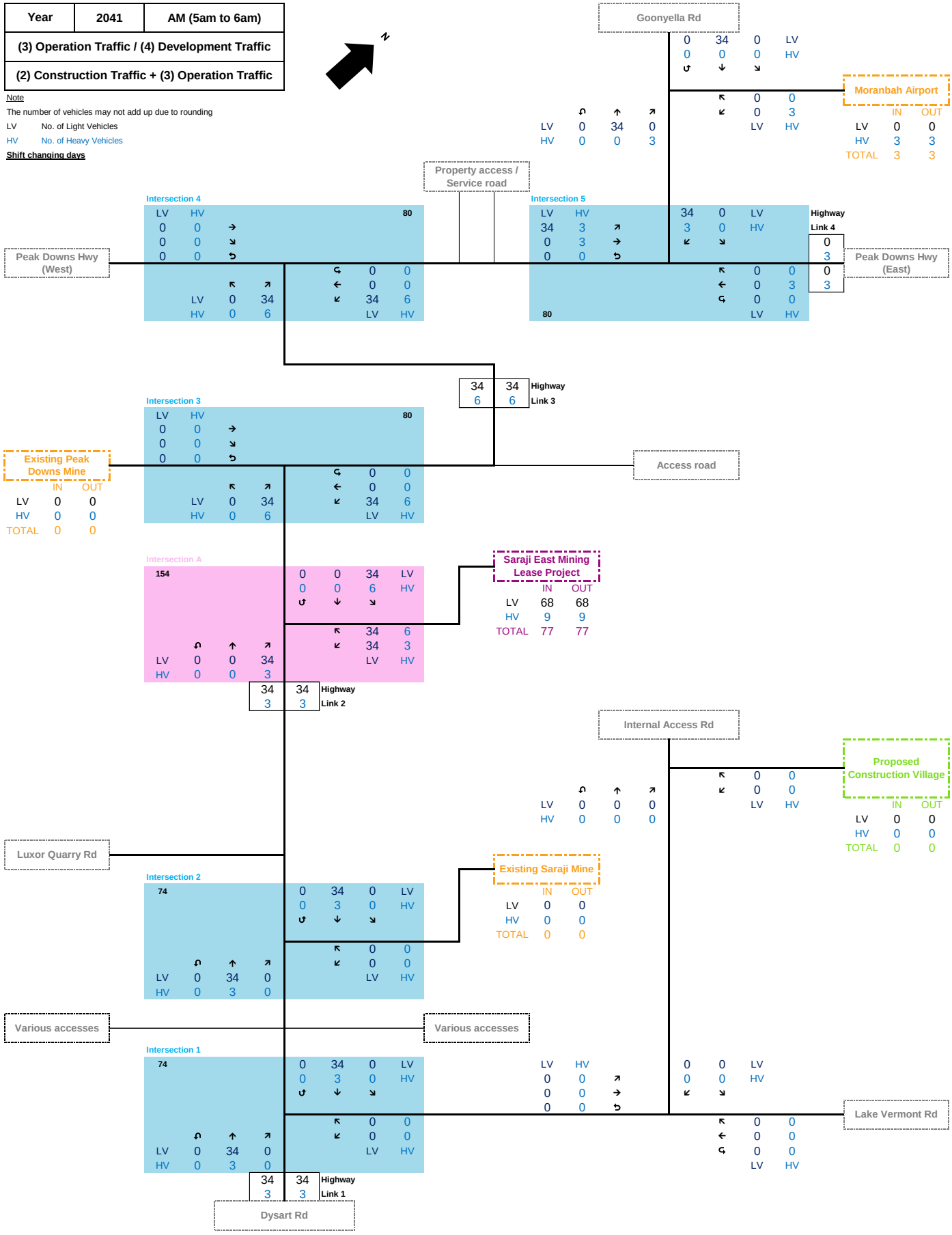
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2041	PM (5pm to 6pm)
(3) Operation Traffic / (4) Development Traffic		
(2) Construction Traffic + (3) Operation Traffic		

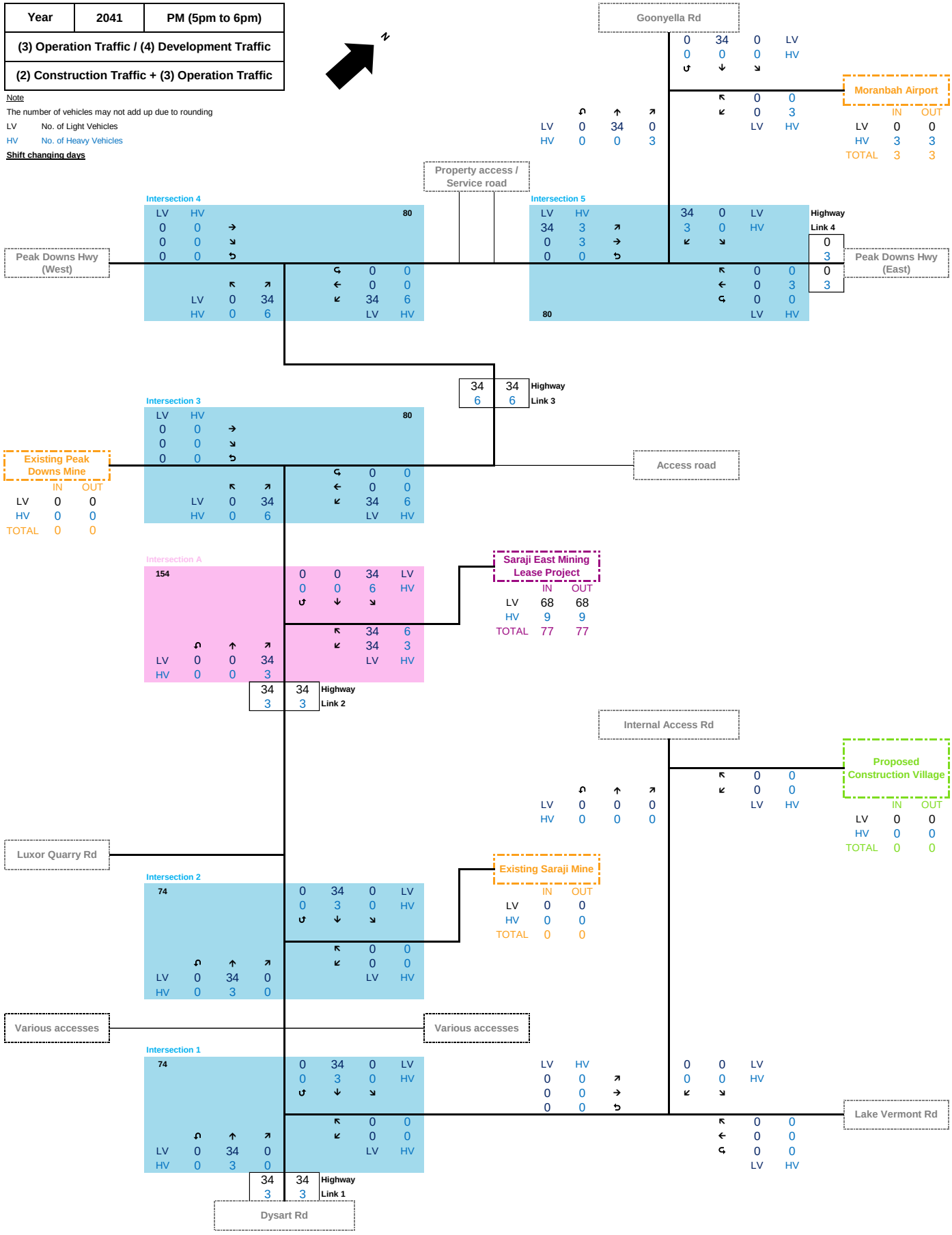
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Appendix D

Total Traffic

Year	2022	AM (5am to 6am)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

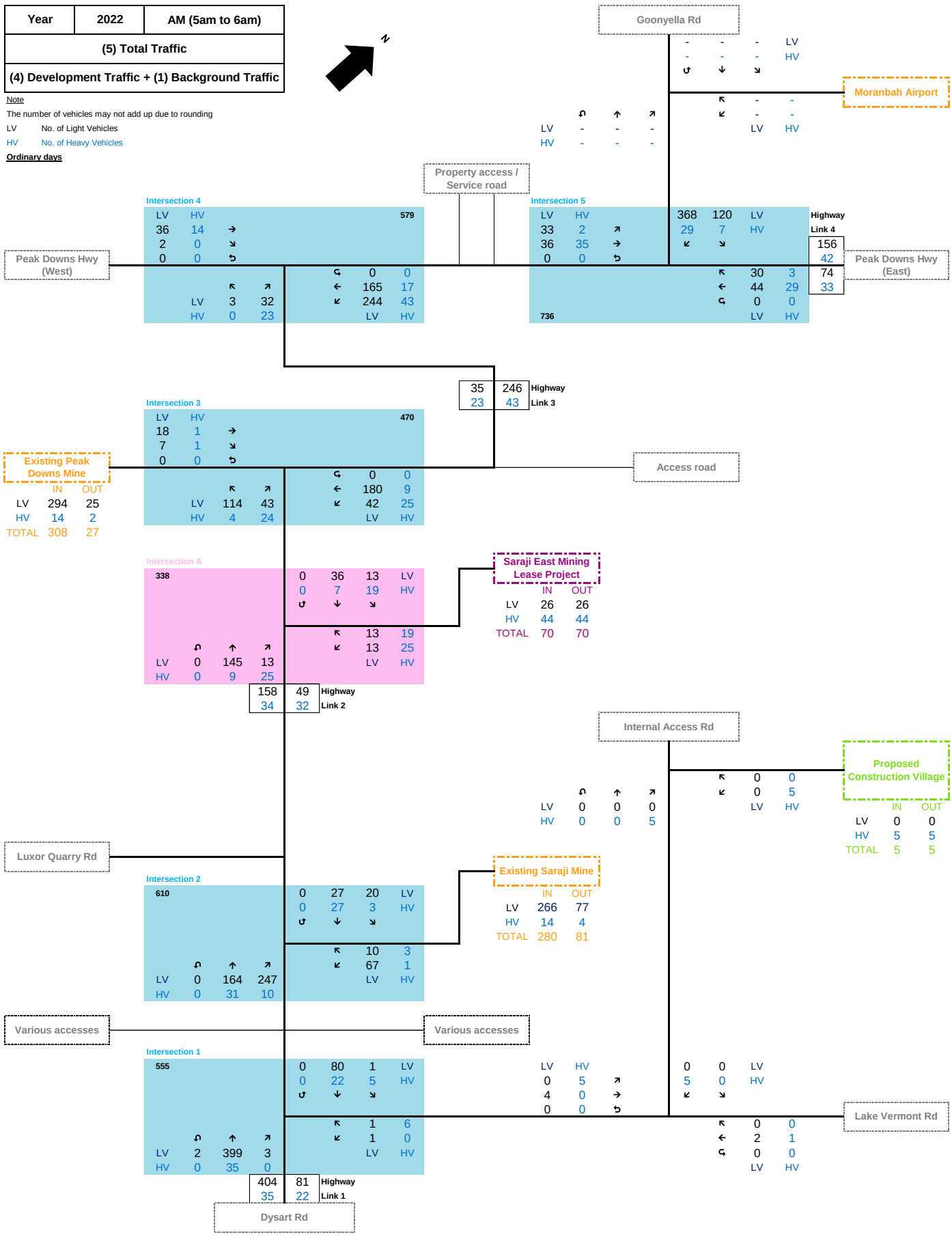
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2022	PM (5pm to 6pm)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

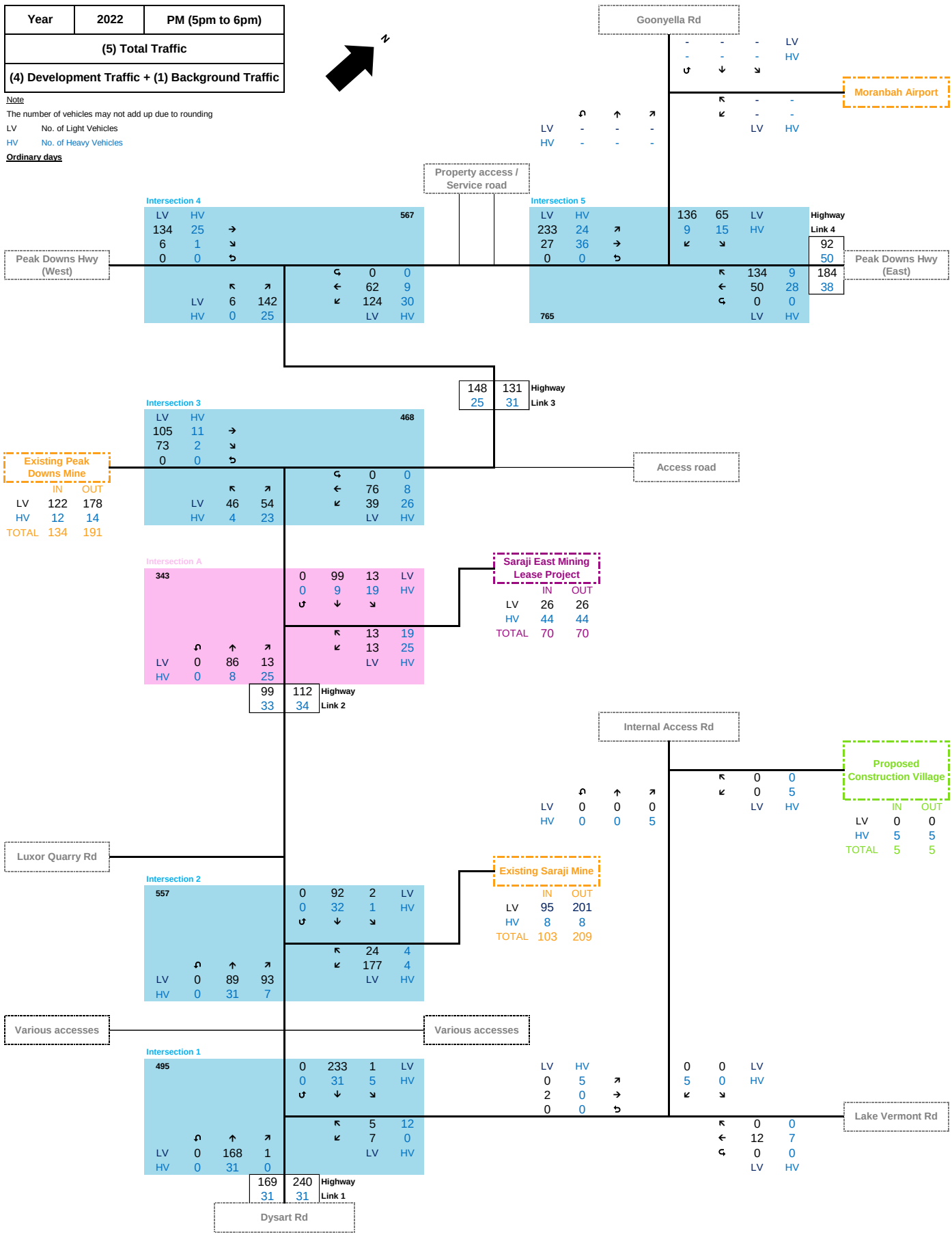
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2024	AM (5am to 6am)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

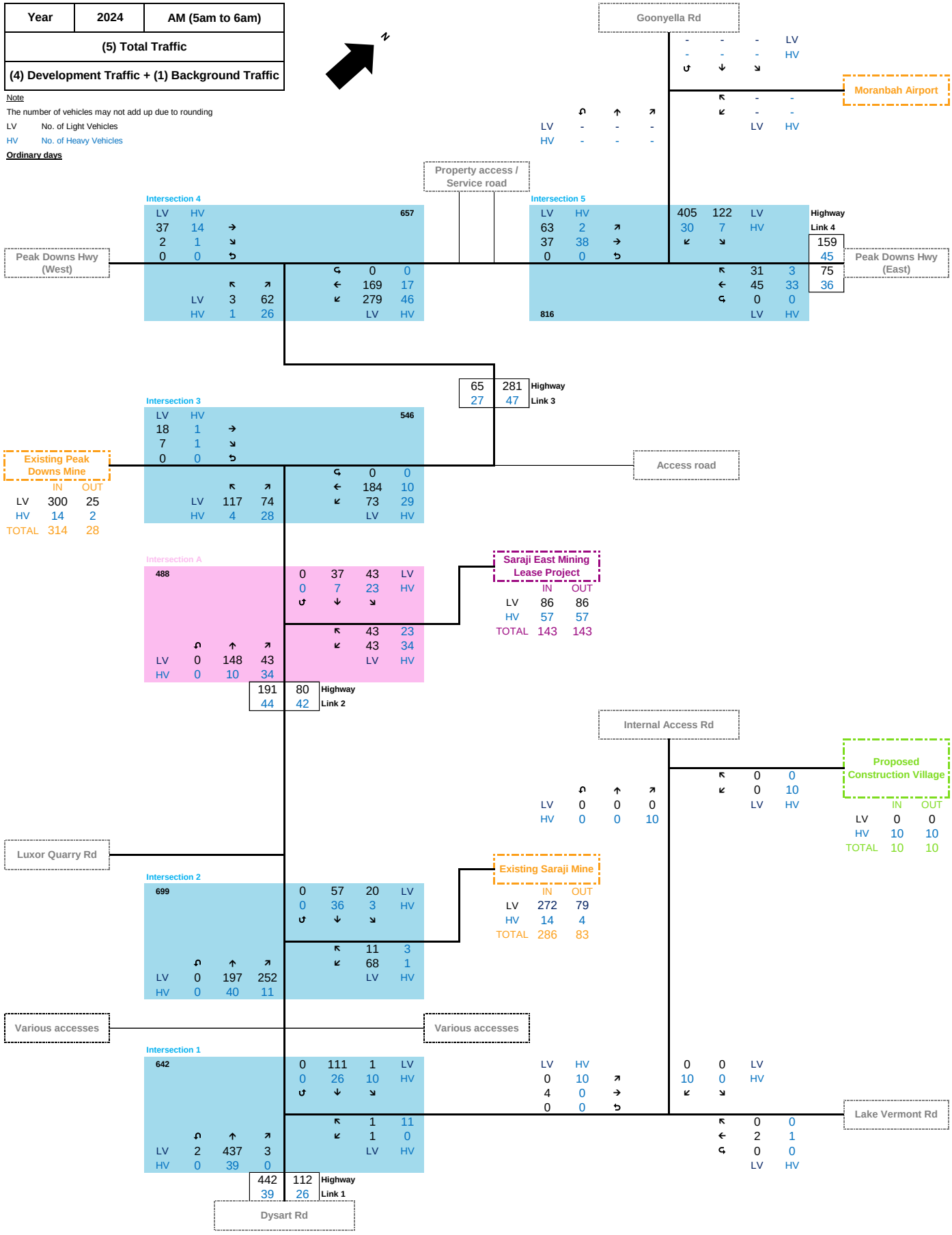
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2024	PM (5pm to 6pm)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

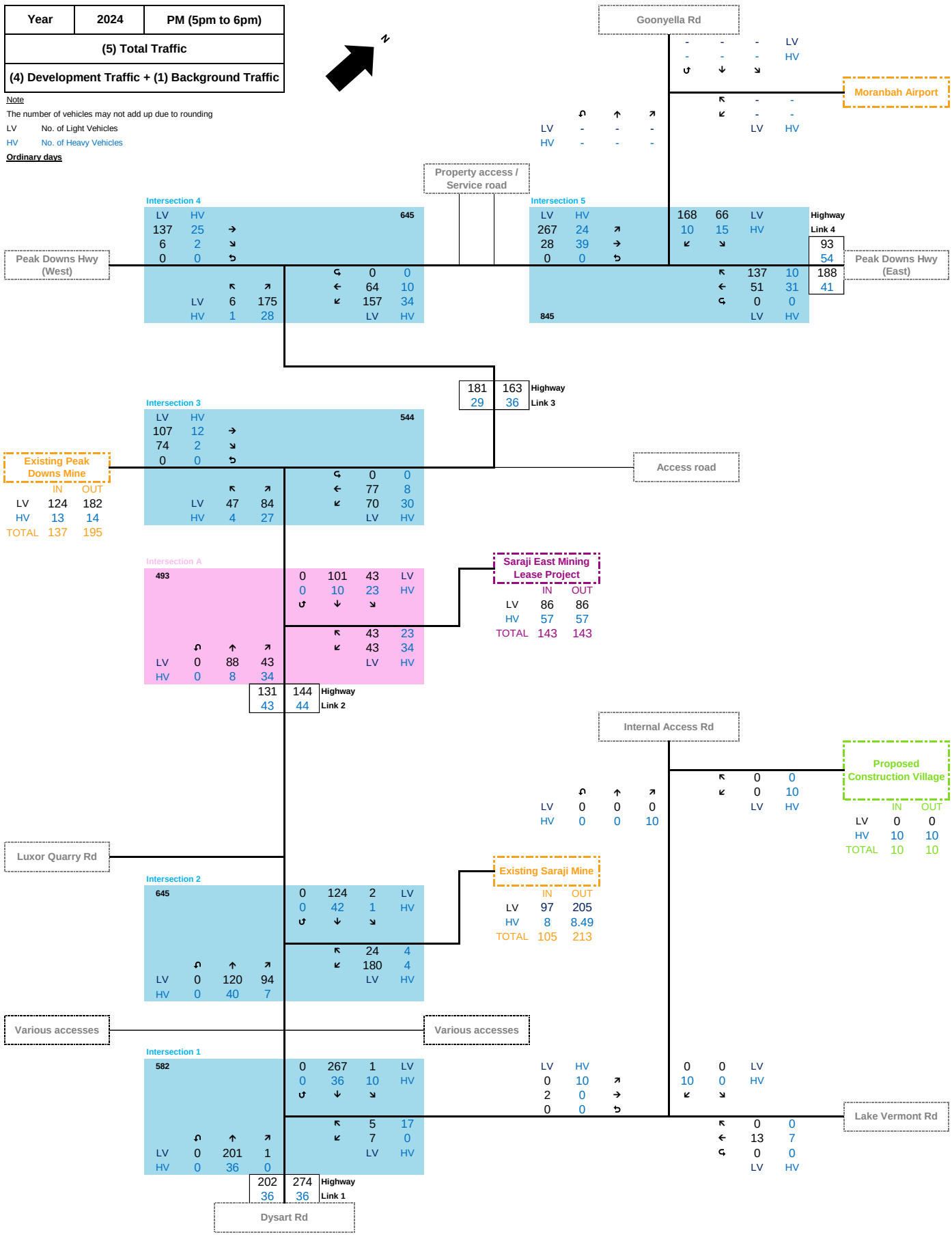
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2041	AM (5am to 6am)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

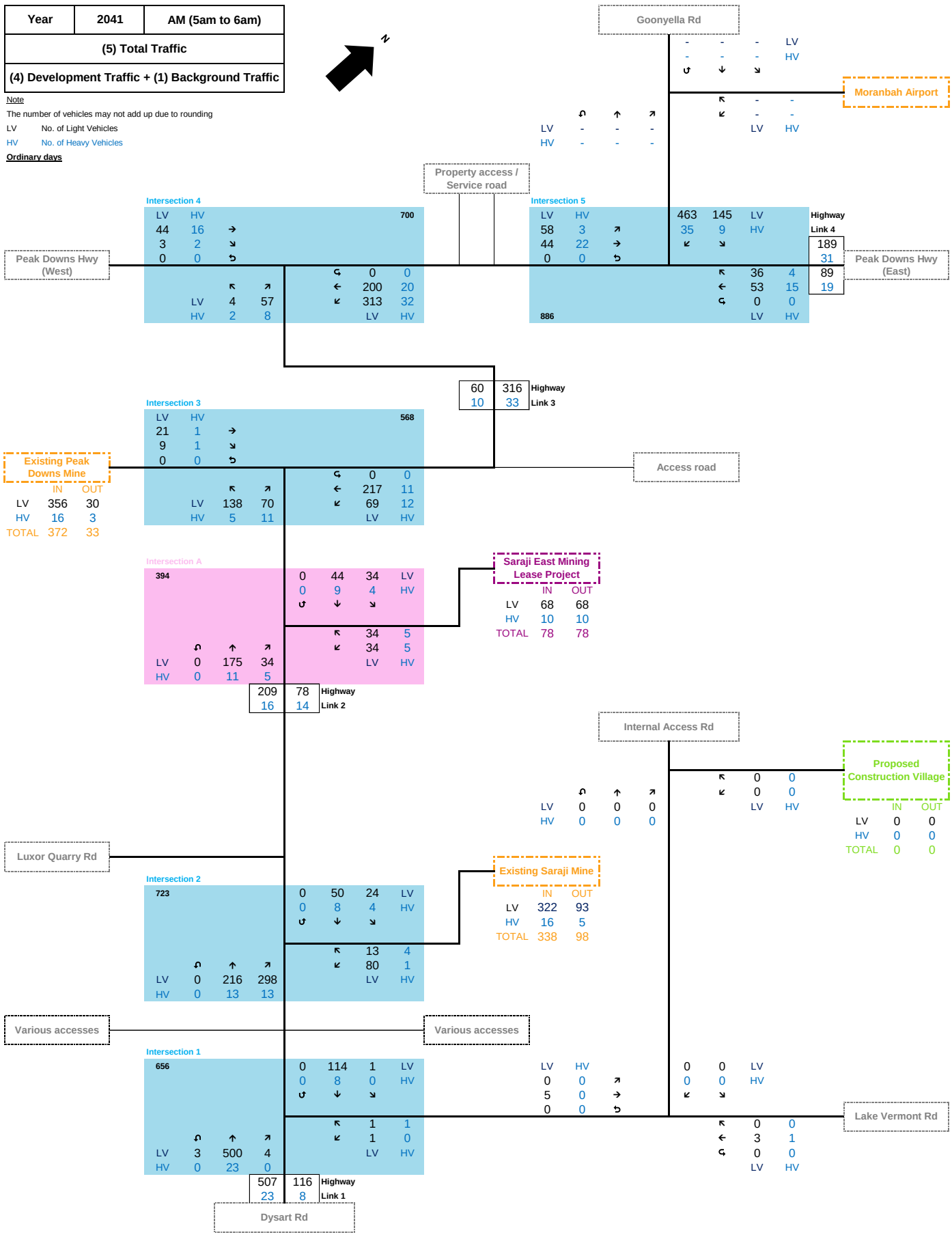
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2041	PM (5pm to 6pm)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

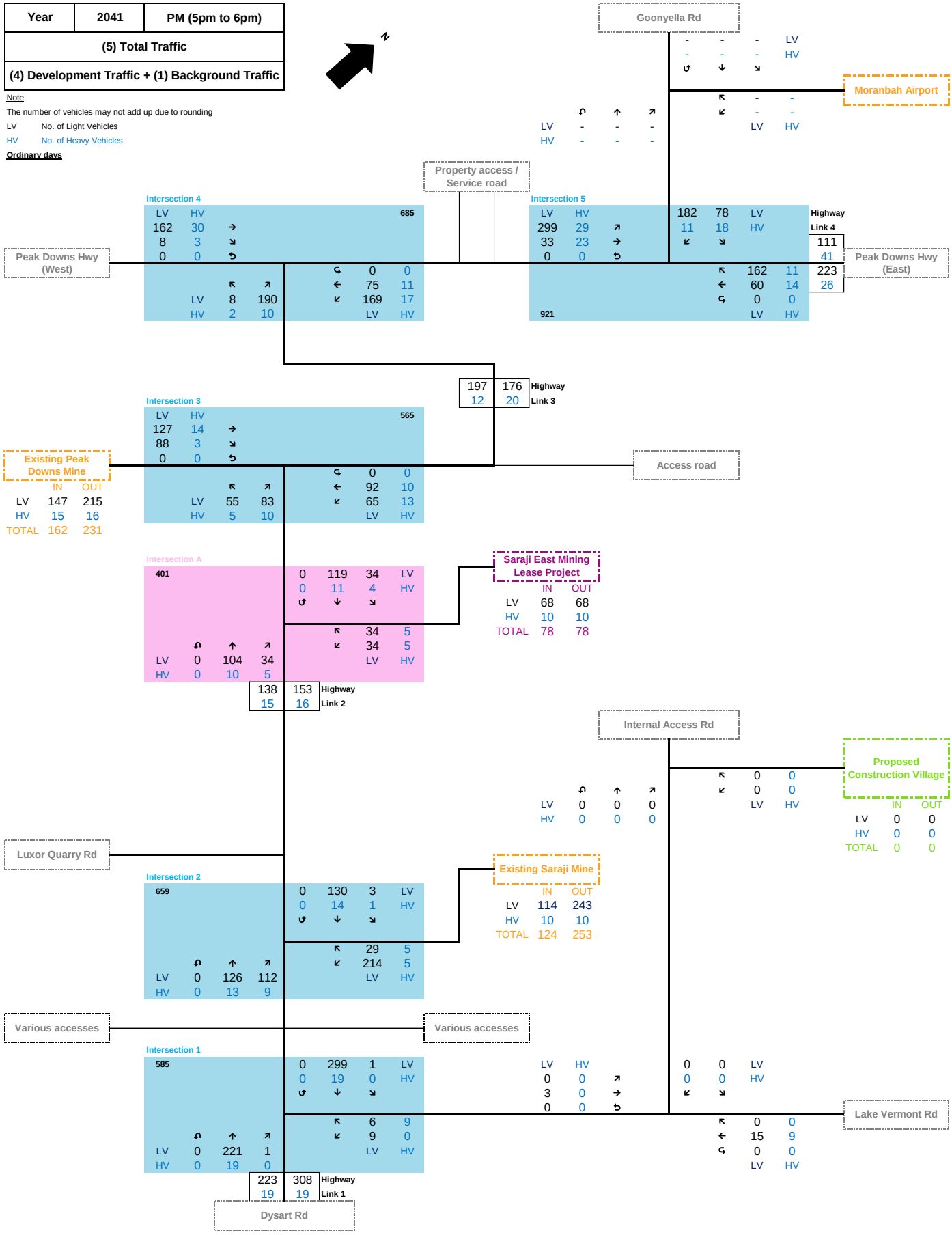
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Ordinary days



Year	2022	AM (5am to 6am)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

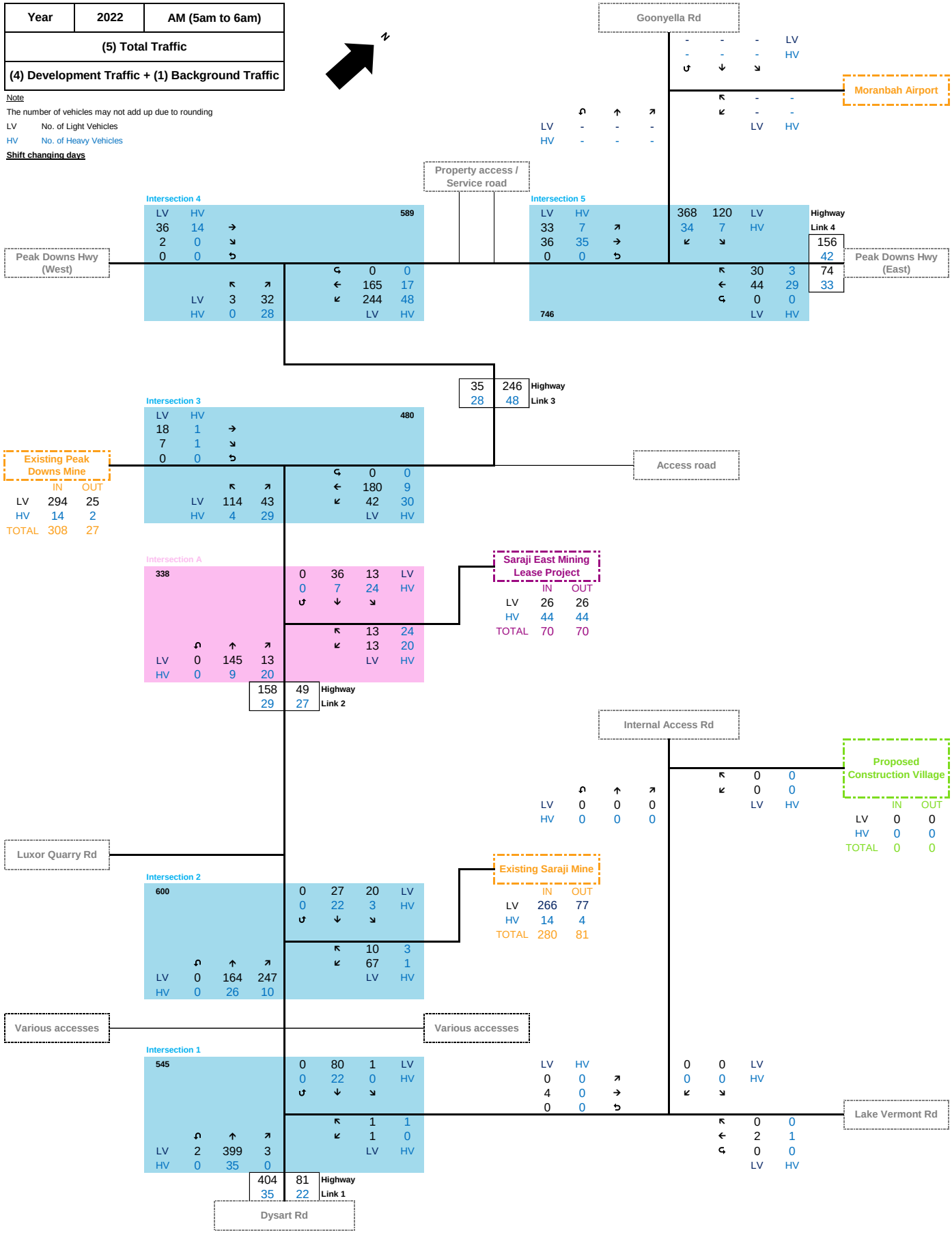
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2022	PM (5pm to 6pm)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

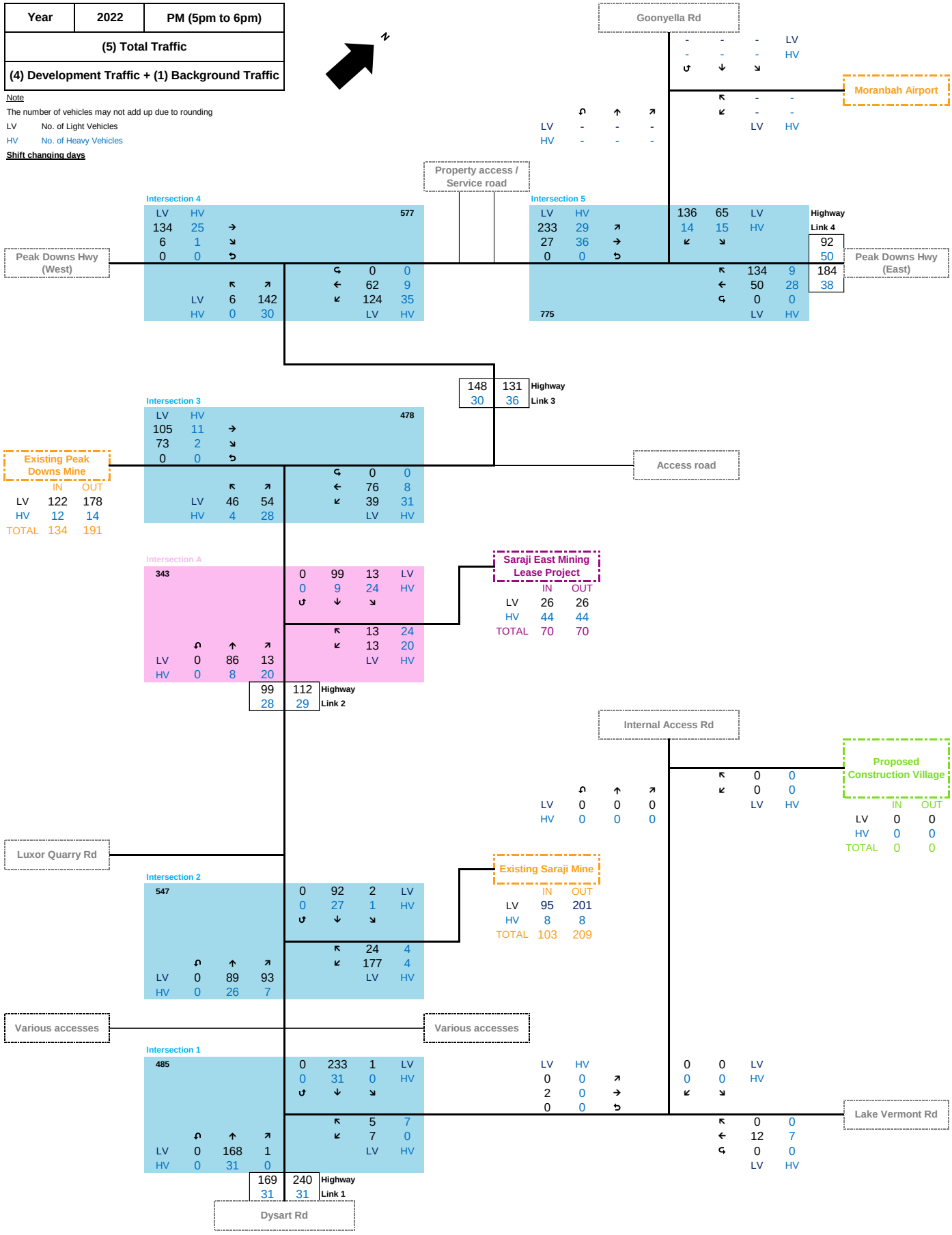
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2024	AM (5am to 6am)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

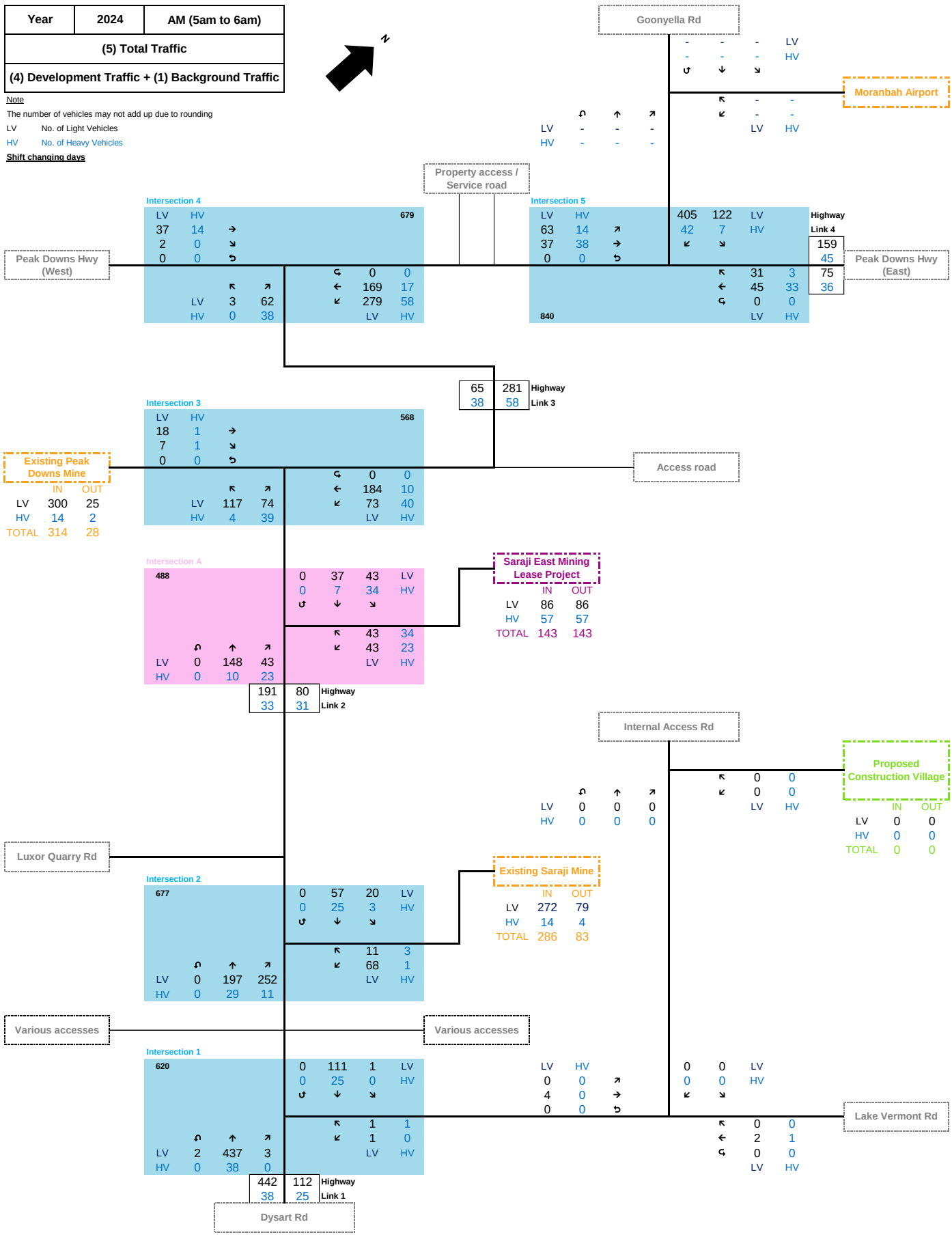
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2024	PM (5pm to 6pm)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

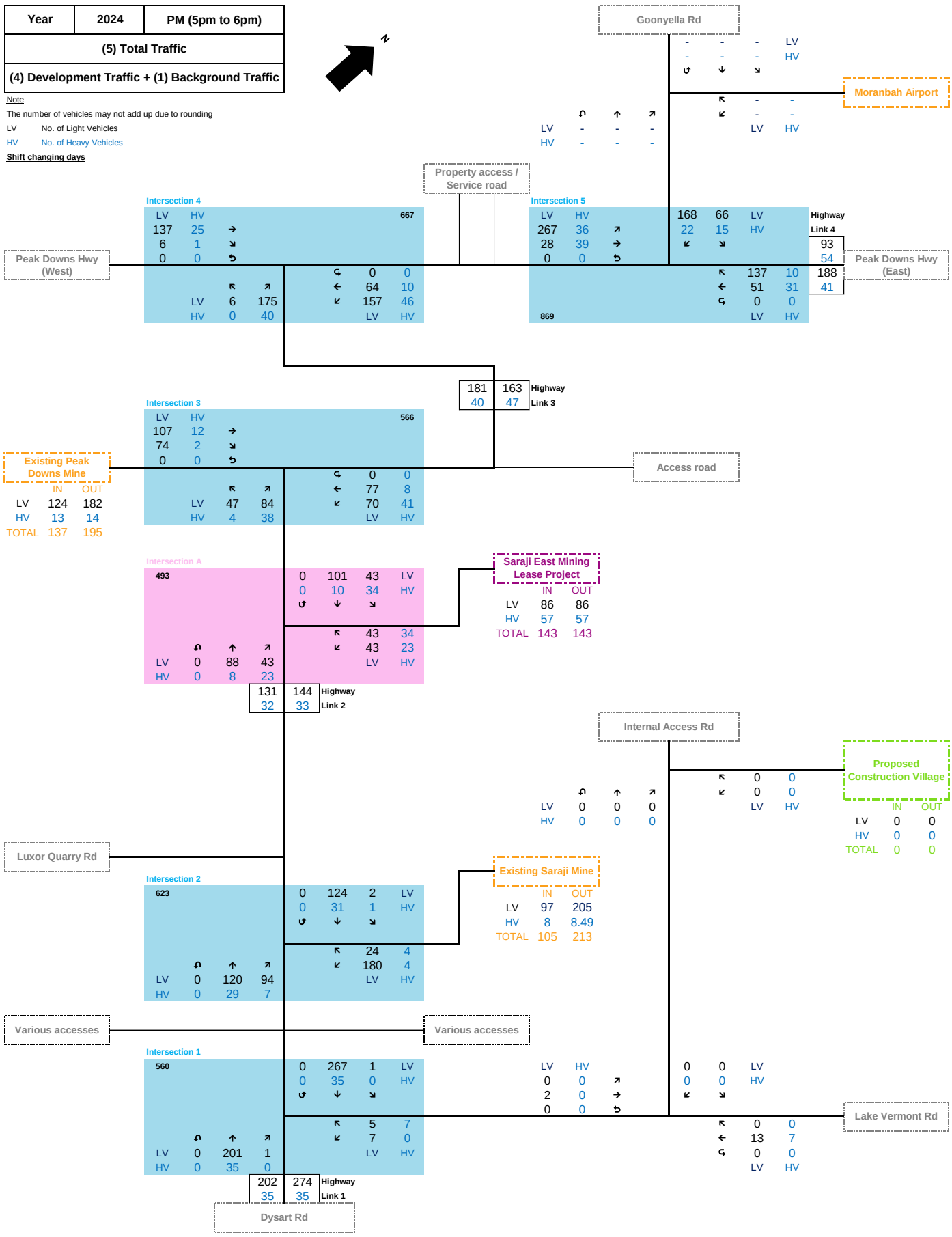
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2041	AM (5am to 6am)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

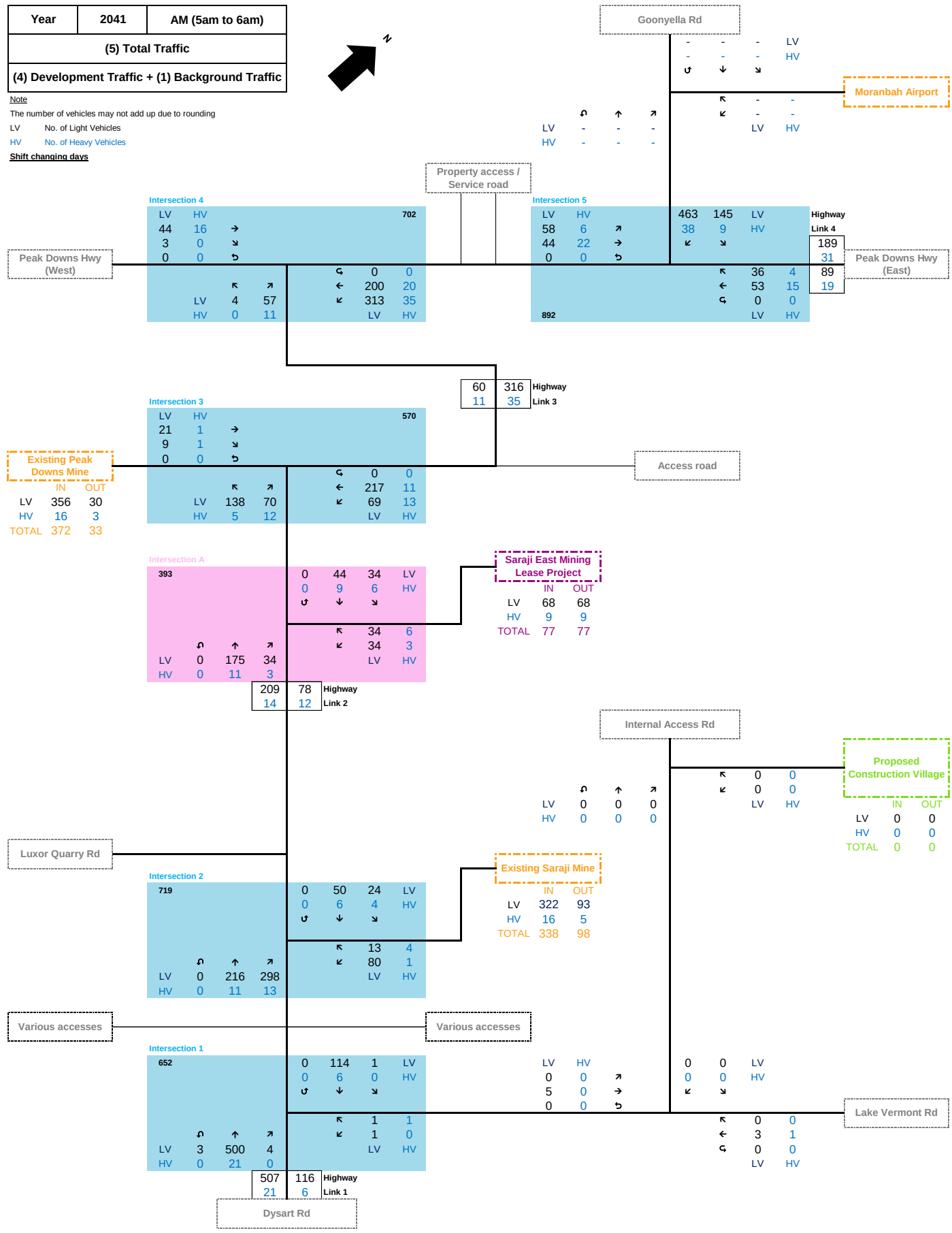
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Year	2041	PM (5pm to 6pm)
(5) Total Traffic		
(4) Development Traffic + (1) Background Traffic		

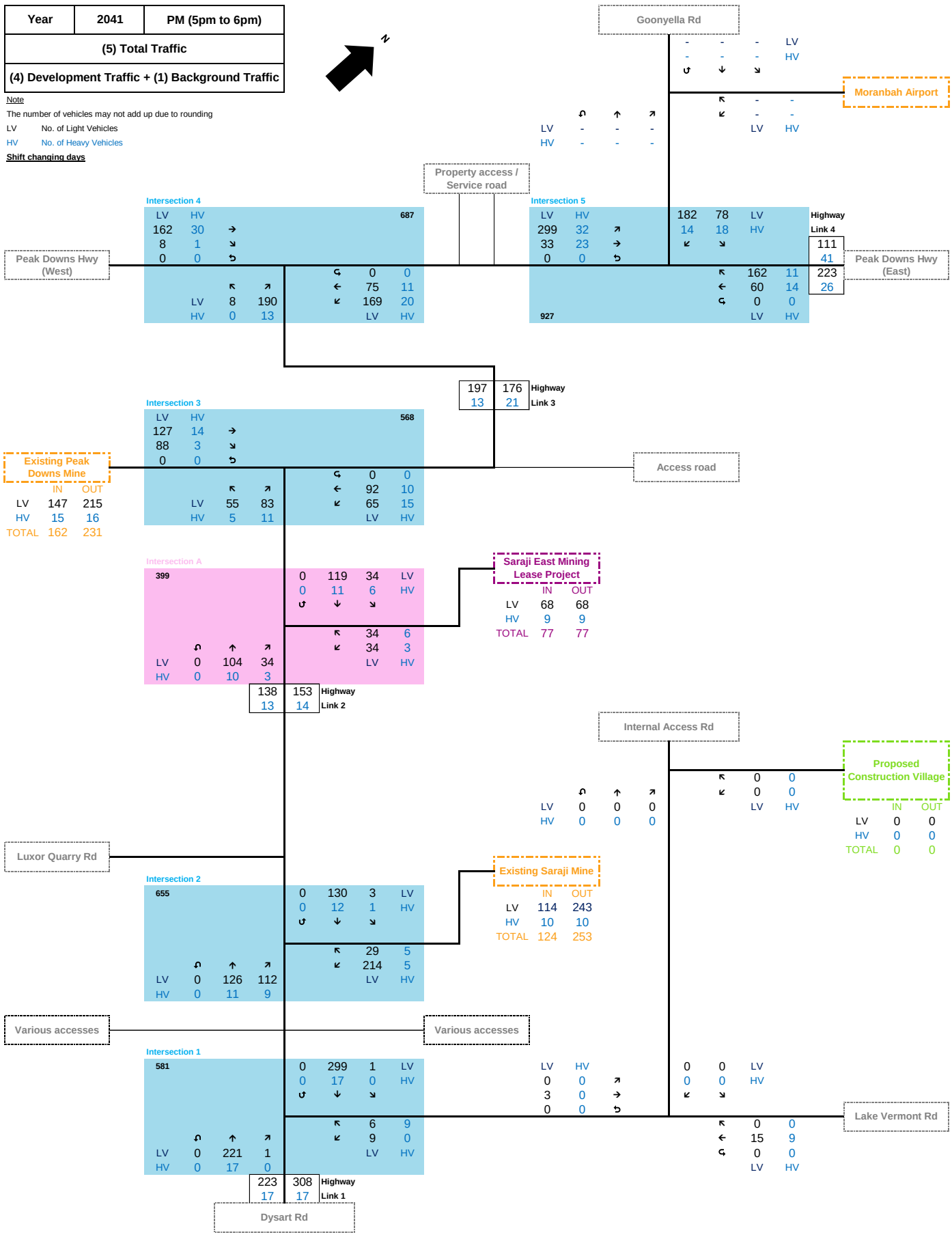
Note

The number of vehicles may not add up due to rounding

LV No. of Light Vehicles

HV No. of Heavy Vehicles

Shift changing days



Appendix E

SIDRA

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2018 AM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	385	3.6	0.204	0.0	LOS A	0.0	0.2	0.00	0.01	99.6
3	R2	3	0.0	0.204	7.6	LOS A	0.0	0.2	0.00	0.01	71.5
Approach		388	3.6	0.204	0.1	NA	0.0	0.2	0.00	0.01	99.3
East: Lake Vermont Rd											
4	L2	1	0.0	0.004	5.7	LOS A	0.0	0.1	0.23	0.57	52.1
6	R2	2	50.0	0.004	9.1	LOS A	0.0	0.1	0.23	0.57	49.5
Approach		3	33.3	0.004	8.0	LOS A	0.0	0.1	0.23	0.57	50.3
North: Dysart Rd_North											
7	L2	1	0.0	0.035	7.8	LOS A	0.0	0.0	0.00	0.01	88.1
8	T1	66	3.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.01	99.1
Approach		67	3.0	0.035	0.1	NA	0.0	0.0	0.00	0.01	98.9
All Vehicles		458	3.7	0.204	0.1	NA	0.0	0.2	0.00	0.01	98.6

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2018 PM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	160	6.9	0.086	0.0	LOS A	0.0	0.1	0.01	0.00	99.7
3	R2	1	0.0	0.086	8.2	LOS A	0.0	0.1	0.01	0.00	71.5
Approach		161	6.8	0.086	0.1	NA	0.0	0.1	0.01	0.00	99.4
East: Lake Vermont Rd											
4	L2	7	0.0	0.024	6.2	LOS A	0.1	0.7	0.37	0.60	52.2
6	R2	12	58.3	0.024	8.8	LOS A	0.1	0.7	0.37	0.60	49.3
Approach		19	36.8	0.024	7.9	LOS A	0.1	0.7	0.37	0.60	50.3
North: Dysart Rd_North											
7	L2	1	0.0	0.118	7.8	LOS A	0.0	0.0	0.00	0.00	88.4
8	T1	222	5.0	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	99.7
Approach		223	4.9	0.118	0.0	NA	0.0	0.0	0.00	0.00	99.6
All Vehicles		403	7.2	0.118	0.4	NA	0.1	0.7	0.02	0.03	95.1

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2018 AM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	151	4.0	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	247	4.0	0.182	5.7	LOS A	0.8	6.0	0.13	0.57	53.7
Approach		398	4.0	0.182	3.5	NA	0.8	6.0	0.08	0.35	65.1
East: Saraji Mine Entrance											
4	L2	65	1.5	0.075	5.6	LOS A	0.3	2.0	0.05	0.56	54.0
6	R2	13	23.1	0.075	10.4	LOS B	0.3	2.0	0.05	0.56	51.8
Approach		78	5.1	0.075	6.4	LOS A	0.3	2.0	0.05	0.56	53.7
North: Dysart Rd_North											
7	L2	22	13.6	0.013	5.7	LOS A	0.0	0.0	0.00	0.57	53.0
8	T1	15	13.3	0.008	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		37	13.5	0.013	3.4	NA	0.0	0.0	0.00	0.34	67.2
All Vehicles		513	4.9	0.182	4.0	NA	0.8	6.0	0.07	0.38	63.2

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2018 PM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	79	7.6	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	96	7.3	0.075	5.9	LOS A	0.3	2.3	0.20	0.57	53.4
Approach		175	7.4	0.075	3.2	NA	0.3	2.3	0.11	0.31	67.6
East: Saraji Mine Entrance											
4	L2	174	2.3	0.181	5.9	LOS A	0.7	5.4	0.21	0.56	53.9
6	R2	27	14.8	0.181	8.2	LOS A	0.7	5.4	0.21	0.56	52.1
Approach		201	4.0	0.181	6.3	LOS A	0.7	5.4	0.21	0.56	53.7
North: Dysart Rd_North											
7	L2	3	33.3	0.002	5.9	LOS A	0.0	0.0	0.00	0.57	52.2
8	T1	83	8.4	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		86	9.3	0.045	0.2	NA	0.0	0.0	0.00	0.02	97.4
All Vehicles		462	6.3	0.181	4.0	NA	0.7	5.4	0.13	0.37	64.1

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2018 AM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	114	3.5	0.119	6.2	LOS A	0.5	3.5	0.29	0.58	52.6
3	R2	34	14.7	0.119	6.7	LOS A	0.5	3.5	0.29	0.58	51.6
Approach		148	6.1	0.119	6.3	LOS A	0.5	3.5	0.29	0.58	52.3
East: Dysart Rd_East											
4	L2	34	17.6	0.117	8.0	LOS A	0.0	0.0	0.00	0.11	74.8
5	T1	182	4.9	0.117	0.0	LOS A	0.0	0.0	0.00	0.11	91.2
Approach		216	6.9	0.117	1.3	NA	0.0	0.0	0.00	0.11	88.1
West: Peak Downs Mine Entrance											
11	T1	18	5.6	0.016	6.4	LOS A	0.1	0.4	0.21	0.83	80.8
12	R2	8	12.5	0.016	8.0	LOS A	0.1	0.4	0.21	0.83	60.5
Approach		26	7.7	0.016	6.9	NA	0.1	0.4	0.21	0.83	73.3
All Vehicles		390	6.7	0.119	3.6	NA	0.5	3.5	0.13	0.34	69.2

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2018 PM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	48	8.3	0.079	5.9	LOS A	0.3	2.2	0.20	0.58	52.7
3	R2	43	9.3	0.079	6.8	LOS A	0.3	2.2	0.20	0.58	52.1
Approach		91	8.8	0.079	6.3	LOS A	0.3	2.2	0.20	0.58	52.4
East: Dysart Rd_East											
4	L2	32	21.9	0.064	7.9	LOS A	0.0	0.0	0.00	0.19	68.9
5	T1	81	9.9	0.064	0.0	LOS A	0.0	0.0	0.00	0.19	84.8
Approach		113	13.3	0.064	2.2	NA	0.0	0.0	0.00	0.19	79.6
West: Peak Downs Mine Entrance											
11	T1	112	9.8	0.106	8.2	LOS A	0.4	3.1	0.18	1.01	78.0
12	R2	72	2.8	0.106	7.3	LOS A	0.4	3.1	0.18	1.01	59.4
Approach		184	7.1	0.106	7.8	NA	0.4	3.1	0.18	1.01	69.5
All Vehicles		388	9.3	0.106	5.8	NA	0.4	3.1	0.13	0.67	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2018 AM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	3	0.0	0.039	6.2	LOS A	0.1	1.2	0.45	0.65	51.4
23	R2	22	18.2	0.039	8.9	LOS A	0.1	1.2	0.45	0.65	50.5
Approach		25	16.0	0.039	8.6	LOS A	0.1	1.2	0.45	0.65	50.6
NorthEast: Peak Downs Hwy_North											
24	L2	245	9.4	0.141	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	175	9.1	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		420	9.3	0.141	3.3	NA	0.0	0.0	0.00	0.33	66.0
SouthWest: Peak Downs Hwy_South											
31	T1	48	27.1	0.029	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	2	0.0	0.002	7.2	LOS A	0.0	0.1	0.45	0.58	51.8
Approach		50	26.0	0.029	0.3	NA	0.0	0.1	0.02	0.02	96.4
All Vehicles		495	11.3	0.141	3.3	NA	0.1	1.2	0.02	0.32	67.1

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2018 PM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	6	0.0	0.185	5.8	LOS A	0.8	5.6	0.43	0.68	51.7
23	R2	130	4.6	0.185	8.2	LOS A	0.8	5.6	0.43	0.68	51.3
Approach		136	4.4	0.185	8.1	LOS A	0.8	5.6	0.43	0.68	51.3
NorthEast: Peak Downs Hwy_North											
24	L2	118	9.3	0.068	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	69	13.0	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		187	10.7	0.068	3.6	NA	0.0	0.0	0.00	0.36	64.3
SouthWest: Peak Downs Hwy_South											
31	T1	153	15.7	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	7	14.3	0.006	6.4	LOS A	0.0	0.2	0.30	0.56	51.7
Approach		160	15.6	0.086	0.3	NA	0.0	0.2	0.01	0.02	96.0
All Vehicles		483	10.6	0.185	3.7	NA	0.8	5.6	0.13	0.34	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2018 AM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	52	19.2	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	32	9.4	0.025	5.9	LOS A	0.1	0.7	0.18	0.56	52.2
Approach		84	15.5	0.030	2.2	NA	0.1	0.7	0.07	0.21	74.2
NorthWest: Moranbah											
27	L2	122	5.7	0.527	6.5	LOS A	4.1	30.8	0.37	0.62	51.8
29	R2	369	7.6	0.527	8.1	LOS A	4.1	30.8	0.37	0.62	51.5
Approach		491	7.1	0.527	7.7	LOS A	4.1	30.8	0.37	0.62	51.6
SouthWest: Peak Downs Hwy_South											
30	L2	21	9.5	0.012	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	50	30.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		71	23.9	0.031	1.7	NA	0.0	0.0	0.00	0.17	79.3
All Vehicles		646	10.1	0.527	6.3	NA	4.1	30.8	0.29	0.52	55.9

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2018 PM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	57	15.8	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	138	6.5	0.134	7.0	LOS A	0.6	4.1	0.40	0.65	51.8
Approach		195	9.2	0.134	4.9	NA	0.6	4.1	0.29	0.46	60.2
NorthWest: Moranbah											
27	L2	76	18.4	0.262	6.0	LOS A	1.1	8.7	0.24	0.62	51.1
29	R2	127	7.1	0.262	9.3	LOS A	1.1	8.7	0.24	0.62	51.3
Approach		203	11.3	0.262	8.1	LOS A	1.1	8.7	0.24	0.62	51.2
SouthWest: Peak Downs Hwy_South											
30	L2	234	9.8	0.135	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	42	38.1	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		276	14.1	0.135	4.8	NA	0.0	0.0	0.00	0.49	57.2
All Vehicles		674	11.9	0.262	5.8	NA	1.1	8.7	0.15	0.52	56.1

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2022 AM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	401	3.7	0.212	0.0	LOS A	0.0	0.2	0.00	0.01	99.6
3	R2	3	0.0	0.212	7.6	LOS A	0.0	0.2	0.00	0.01	71.5
Approach		404	3.7	0.212	0.1	NA	0.0	0.2	0.00	0.01	99.4
East: Lake Vermont Rd											
4	L2	1	0.0	0.004	5.7	LOS A	0.0	0.1	0.23	0.57	52.0
6	R2	2	50.0	0.004	9.3	LOS A	0.0	0.1	0.23	0.57	49.4
Approach		3	33.3	0.004	8.1	LOS A	0.0	0.1	0.23	0.57	50.2
North: Dysart Rd_North											
7	L2	1	0.0	0.037	7.8	LOS A	0.0	0.0	0.00	0.01	88.2
8	T1	69	2.9	0.037	0.0	LOS A	0.0	0.0	0.00	0.01	99.1
Approach		70	2.9	0.037	0.1	NA	0.0	0.0	0.00	0.01	98.9
All Vehicles		477	3.8	0.212	0.1	NA	0.0	0.2	0.00	0.01	98.7

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2022 PM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	166	6.6	0.089	0.0	LOS A	0.0	0.1	0.01	0.00	99.7
3	R2	1	0.0	0.089	8.2	LOS A	0.0	0.1	0.01	0.00	71.5
Approach		167	6.6	0.089	0.1	NA	0.0	0.1	0.01	0.00	99.4
East: Lake Vermont Rd											
4	L2	7	0.0	0.025	6.3	LOS A	0.1	0.8	0.38	0.61	52.1
6	R2	12	58.3	0.025	9.0	LOS A	0.1	0.8	0.38	0.61	49.2
Approach		19	36.8	0.025	8.0	LOS A	0.1	0.8	0.38	0.61	50.2
North: Dysart Rd_North											
7	L2	1	0.0	0.123	7.8	LOS A	0.0	0.0	0.00	0.00	88.5
8	T1	231	4.8	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	99.7
Approach		232	4.7	0.123	0.0	NA	0.0	0.0	0.00	0.00	99.6
All Vehicles		418	6.9	0.123	0.4	NA	0.1	0.8	0.02	0.03	95.3

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2022 AM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	157	3.8	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	257	3.9	0.189	5.7	LOS A	0.9	6.3	0.14	0.57	53.7
Approach		414	3.9	0.189	3.5	NA	0.9	6.3	0.09	0.35	65.1
East: Saraji Mine Entrance											
4	L2	68	1.5	0.078	5.6	LOS A	0.3	2.1	0.05	0.56	54.0
6	R2	13	23.1	0.078	10.7	LOS B	0.3	2.1	0.05	0.56	51.8
Approach		81	4.9	0.078	6.4	LOS A	0.3	2.1	0.05	0.56	53.6
North: Dysart Rd_North											
7	L2	23	13.0	0.014	5.7	LOS A	0.0	0.0	0.00	0.57	53.1
8	T1	16	12.5	0.009	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		39	12.8	0.014	3.4	NA	0.0	0.0	0.00	0.34	67.4
All Vehicles		534	4.7	0.189	4.0	NA	0.9	6.3	0.07	0.38	63.2

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2022 PM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	82	7.3	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	100	7.0	0.079	5.9	LOS A	0.3	2.4	0.20	0.57	53.4
Approach		182	7.1	0.079	3.3	NA	0.3	2.4	0.11	0.31	67.6
East: Saraji Mine Entrance											
4	L2	181	2.2	0.189	6.0	LOS A	0.8	5.6	0.21	0.56	53.9
6	R2	28	14.3	0.189	8.3	LOS A	0.8	5.6	0.21	0.56	52.1
Approach		209	3.8	0.189	6.3	LOS A	0.8	5.6	0.21	0.56	53.7
North: Dysart Rd_North											
7	L2	3	33.3	0.002	5.9	LOS A	0.0	0.0	0.00	0.57	52.2
8	T1	86	8.1	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		89	9.0	0.046	0.2	NA	0.0	0.0	0.00	0.02	97.4
All Vehicles		480	6.0	0.189	4.0	NA	0.8	5.6	0.14	0.37	64.1

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2022 AM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	118	3.4	0.124	6.3	LOS A	0.5	3.6	0.30	0.59	52.6
3	R2	35	14.3	0.124	6.7	LOS A	0.5	3.6	0.30	0.59	51.6
Approach		153	5.9	0.124	6.4	LOS A	0.5	3.6	0.30	0.59	52.3
East: Dysart Rd_East											
4	L2	35	17.1	0.121	8.0	LOS A	0.0	0.0	0.00	0.10	75.0
5	T1	189	4.8	0.121	0.0	LOS A	0.0	0.0	0.00	0.10	91.2
Approach		224	6.7	0.121	1.3	NA	0.0	0.0	0.00	0.10	88.2
West: Peak Downs Mine Entrance											
11	T1	19	5.3	0.016	6.1	LOS A	0.1	0.4	0.21	0.81	81.3
12	R2	8	12.5	0.016	8.0	LOS A	0.1	0.4	0.21	0.81	60.7
Approach		27	7.4	0.016	6.7	NA	0.1	0.4	0.21	0.81	73.9
All Vehicles		404	6.4	0.124	3.6	NA	0.5	3.6	0.13	0.33	69.3

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2022 PM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	50	8.0	0.083	5.9	LOS A	0.3	2.3	0.20	0.58	52.7
3	R2	45	8.9	0.083	6.9	LOS A	0.3	2.3	0.20	0.58	52.1
Approach		95	8.4	0.083	6.4	LOS A	0.3	2.3	0.20	0.58	52.4
East: Dysart Rd_East											
4	L2	33	21.2	0.066	7.8	LOS A	0.0	0.0	0.00	0.19	69.2
5	T1	84	9.5	0.066	0.0	LOS A	0.0	0.0	0.00	0.19	84.8
Approach		117	12.8	0.066	2.2	NA	0.0	0.0	0.00	0.19	79.7
West: Peak Downs Mine Entrance											
11	T1	116	9.5	0.110	8.2	LOS A	0.4	3.2	0.18	1.00	77.9
12	R2	75	2.7	0.110	7.3	LOS A	0.4	3.2	0.18	1.00	59.4
Approach		191	6.8	0.110	7.8	NA	0.4	3.2	0.18	1.00	69.4
All Vehicles		403	8.9	0.110	5.8	NA	0.4	3.2	0.14	0.67	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2022 AM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	3	0.0	0.042	6.3	LOS A	0.2	1.2	0.46	0.66	51.3
23	R2	23	17.4	0.042	9.1	LOS A	0.2	1.2	0.46	0.66	50.4
Approach		26	15.4	0.042	8.8	LOS A	0.2	1.2	0.46	0.66	50.5
NorthEast: Peak Downs Hwy_North											
24	L2	255	9.4	0.147	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	182	9.3	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		437	9.4	0.147	3.3	NA	0.0	0.0	0.00	0.34	66.0
SouthWest: Peak Downs Hwy_South											
31	T1	50	28.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	2	0.0	0.002	7.3	LOS A	0.0	0.1	0.45	0.58	51.7
Approach		52	26.9	0.030	0.3	NA	0.0	0.1	0.02	0.02	96.5
All Vehicles		515	11.5	0.147	3.3	NA	0.2	1.2	0.02	0.32	67.1

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2022 PM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	6	0.0	0.195	5.9	LOS A	0.8	5.9	0.44	0.69	51.6
23	R2	135	4.4	0.195	8.3	LOS A	0.8	5.9	0.44	0.69	51.2
Approach		141	4.3	0.195	8.2	LOS A	0.8	5.9	0.44	0.69	51.3
NorthEast: Peak Downs Hwy_North											
24	L2	122	9.0	0.070	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	71	12.7	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		193	10.4	0.070	3.6	NA	0.0	0.0	0.00	0.36	64.2
SouthWest: Peak Downs Hwy_South											
31	T1	159	15.7	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	7	14.3	0.006	6.5	LOS A	0.0	0.2	0.30	0.56	51.7
Approach		166	15.7	0.090	0.3	NA	0.0	0.2	0.01	0.02	96.2
All Vehicles		500	10.4	0.195	3.8	NA	0.8	5.9	0.13	0.34	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2022 AM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	54	18.5	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	47	36.2	0.042	6.3	LOS A	0.2	1.5	0.20	0.57	51.0
Approach		101	26.7	0.042	2.9	NA	0.2	1.5	0.09	0.26	69.1
NorthWest: Moranbah											
27	L2	141	14.9	0.581	7.3	LOS A	5.7	43.3	0.41	0.66	50.7
29	R2	384	7.6	0.581	9.3	LOS A	5.7	43.3	0.41	0.66	50.8
Approach		525	9.5	0.581	8.8	LOS A	5.7	43.3	0.41	0.66	50.7
SouthWest: Peak Downs Hwy_South											
30	L2	22	9.1	0.013	5.6	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	52	30.8	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		74	24.3	0.032	1.7	NA	0.0	0.0	0.00	0.17	79.2
All Vehicles		700	13.6	0.581	7.2	NA	5.7	43.3	0.32	0.55	54.9

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2022 PM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	59	15.3	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	157	14.6	0.163	7.3	LOS A	0.7	5.4	0.43	0.67	51.2
Approach		216	14.8	0.163	5.3	NA	0.7	5.4	0.31	0.49	59.1
NorthWest: Moranbah											
27	L2	94	30.9	0.301	6.2	LOS A	1.3	10.6	0.24	0.63	50.4
29	R2	132	6.8	0.301	9.9	LOS A	1.3	10.6	0.24	0.63	51.1
Approach		226	16.8	0.301	8.4	LOS A	1.3	10.6	0.24	0.63	50.8
SouthWest: Peak Downs Hwy_South											
30	L2	244	9.8	0.141	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	44	38.6	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		288	14.2	0.141	4.8	NA	0.0	0.0	0.00	0.49	57.3
All Vehicles		730	15.2	0.301	6.1	NA	1.3	10.6	0.17	0.53	55.6

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2024 AM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	409	3.7	0.217	0.0	LOS A	0.0	0.2	0.00	0.01	99.7
3	R2	3	0.0	0.217	7.6	LOS A	0.0	0.2	0.00	0.01	71.5
Approach		412	3.6	0.217	0.1	NA	0.0	0.2	0.00	0.01	99.4
East: Lake Vermont Rd											
4	L2	1	0.0	0.004	5.7	LOS A	0.0	0.1	0.24	0.57	51.9
6	R2	2	50.0	0.004	9.4	LOS A	0.0	0.1	0.24	0.57	49.4
Approach		3	33.3	0.004	8.2	LOS A	0.0	0.1	0.24	0.57	50.2
North: Dysart Rd_North											
7	L2	1	0.0	0.037	7.8	LOS A	0.0	0.0	0.00	0.01	88.2
8	T1	70	2.9	0.037	0.0	LOS A	0.0	0.0	0.00	0.01	99.1
Approach		71	2.8	0.037	0.1	NA	0.0	0.0	0.00	0.01	98.9
All Vehicles		486	3.7	0.217	0.1	NA	0.0	0.2	0.00	0.01	98.7

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2024 PM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	170	7.1	0.092	0.0	LOS A	0.0	0.1	0.01	0.00	99.7
3	R2	1	0.0	0.092	8.2	LOS A	0.0	0.1	0.01	0.00	71.5
Approach		171	7.0	0.092	0.1	NA	0.0	0.1	0.01	0.00	99.5
East: Lake Vermont Rd											
4	L2	7	0.0	0.025	6.3	LOS A	0.1	0.8	0.39	0.61	52.0
6	R2	12	58.3	0.025	9.0	LOS A	0.1	0.8	0.39	0.61	49.1
Approach		19	36.8	0.025	8.0	LOS A	0.1	0.8	0.39	0.61	50.2
North: Dysart Rd_North											
7	L2	1	0.0	0.126	7.8	LOS A	0.0	0.0	0.00	0.00	88.5
8	T1	236	5.1	0.126	0.0	LOS A	0.0	0.0	0.00	0.00	99.7
Approach		237	5.1	0.126	0.0	NA	0.0	0.0	0.00	0.00	99.6
All Vehicles		427	7.3	0.126	0.4	NA	0.1	0.8	0.02	0.03	95.4

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2024 AM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	160	3.8	0.084	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	263	4.2	0.194	5.7	LOS A	0.9	6.5	0.14	0.57	53.7
Approach		423	4.0	0.194	3.5	NA	0.9	6.5	0.09	0.35	65.1
East: Saraji Mine Entrance											
4	L2	69	1.4	0.081	5.6	LOS A	0.3	2.2	0.05	0.56	53.9
6	R2	14	21.4	0.081	10.7	LOS B	0.3	2.2	0.05	0.56	51.8
Approach		83	4.8	0.081	6.5	LOS A	0.3	2.2	0.05	0.56	53.6
North: Dysart Rd_North											
7	L2	23	13.0	0.014	5.7	LOS A	0.0	0.0	0.00	0.57	53.1
8	T1	16	12.5	0.009	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		39	12.8	0.014	3.4	NA	0.0	0.0	0.00	0.34	67.4
All Vehicles		545	4.8	0.194	4.0	NA	0.9	6.5	0.07	0.38	63.2

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2024 PM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	83	7.2	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	101	6.9	0.080	5.9	LOS A	0.3	2.4	0.21	0.57	53.4
Approach		184	7.1	0.080	3.3	NA	0.3	2.4	0.11	0.31	67.6
East: Saraji Mine Entrance											
4	L2	184	2.2	0.192	6.0	LOS A	0.8	5.7	0.22	0.56	53.9
6	R2	28	14.3	0.192	8.4	LOS A	0.8	5.7	0.22	0.56	52.1
Approach		212	3.8	0.192	6.3	LOS A	0.8	5.7	0.22	0.56	53.7
North: Dysart Rd_North											
7	L2	3	33.3	0.002	5.9	LOS A	0.0	0.0	0.00	0.57	52.2
8	T1	88	8.0	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		91	8.8	0.047	0.2	NA	0.0	0.0	0.00	0.02	97.5
All Vehicles		487	6.0	0.192	4.0	NA	0.8	5.7	0.14	0.37	64.1

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2024 AM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	121	3.3	0.127	6.3	LOS A	0.5	3.7	0.31	0.59	52.6
3	R2	36	13.9	0.127	6.8	LOS A	0.5	3.7	0.31	0.59	51.6
Approach		157	5.7	0.127	6.4	LOS A	0.5	3.7	0.31	0.59	52.3
East: Dysart Rd_East											
4	L2	36	16.7	0.125	8.0	LOS A	0.0	0.0	0.00	0.11	75.2
5	T1	194	5.2	0.125	0.0	LOS A	0.0	0.0	0.00	0.11	91.2
Approach		230	7.0	0.125	1.3	NA	0.0	0.0	0.00	0.11	88.2
West: Peak Downs Mine Entrance											
11	T1	19	5.3	0.016	6.1	LOS A	0.1	0.4	0.21	0.80	81.3
12	R2	8	12.5	0.016	8.1	LOS A	0.1	0.4	0.21	0.80	60.7
Approach		27	7.4	0.016	6.7	NA	0.1	0.4	0.21	0.80	73.9
All Vehicles		414	6.5	0.127	3.6	NA	0.5	3.7	0.13	0.33	69.3

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2024 PM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	51	7.8	0.084	5.9	LOS A	0.3	2.3	0.20	0.58	52.7
3	R2	45	8.9	0.084	6.9	LOS A	0.3	2.3	0.20	0.58	52.1
Approach		96	8.3	0.084	6.4	LOS A	0.3	2.3	0.20	0.58	52.4
East: Dysart Rd_East											
4	L2	34	20.6	0.067	7.8	LOS A	0.0	0.0	0.00	0.19	69.3
5	T1	85	9.4	0.067	0.0	LOS A	0.0	0.0	0.00	0.19	84.6
Approach		119	12.6	0.067	2.2	NA	0.0	0.0	0.00	0.19	79.6
West: Peak Downs Mine Entrance											
11	T1	119	10.1	0.113	8.2	LOS A	0.4	3.3	0.19	1.00	78.0
12	R2	76	2.6	0.113	7.3	LOS A	0.4	3.3	0.19	1.00	59.5
Approach		195	7.2	0.113	7.8	NA	0.4	3.3	0.19	1.00	69.6
All Vehicles		410	9.0	0.113	5.9	NA	0.4	3.3	0.14	0.67	66.9

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2024 AM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	3	0.0	0.042	6.3	LOS A	0.2	1.2	0.46	0.66	51.3
23	R2	23	17.4	0.042	9.2	LOS A	0.2	1.2	0.46	0.66	50.3
Approach		26	15.4	0.042	8.9	LOS A	0.2	1.2	0.46	0.66	50.4
NorthEast: Peak Downs Hwy_North											
24	L2	260	9.2	0.149	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	186	9.1	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		446	9.2	0.149	3.3	NA	0.0	0.0	0.00	0.33	66.1
SouthWest: Peak Downs Hwy_South											
31	T1	51	27.5	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	2	0.0	0.002	7.4	LOS A	0.0	0.1	0.46	0.58	51.7
Approach		53	26.4	0.031	0.3	NA	0.0	0.1	0.02	0.02	96.6
All Vehicles		525	11.2	0.149	3.3	NA	0.2	1.2	0.02	0.32	67.2

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2024 PM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	6	0.0	0.201	5.9	LOS A	0.8	6.1	0.45	0.69	51.6
23	R2	138	4.3	0.201	8.4	LOS A	0.8	6.1	0.45	0.69	51.2
Approach		144	4.2	0.201	8.3	LOS A	0.8	6.1	0.45	0.69	51.2
NorthEast: Peak Downs Hwy_North											
24	L2	126	9.5	0.072	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	74	13.5	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		200	11.0	0.072	3.6	NA	0.0	0.0	0.00	0.36	64.3
SouthWest: Peak Downs Hwy_South											
31	T1	162	15.4	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	7	14.3	0.006	6.5	LOS A	0.0	0.2	0.31	0.56	51.7
Approach		169	15.4	0.091	0.3	NA	0.0	0.2	0.01	0.02	96.2
All Vehicles		513	10.5	0.201	3.8	NA	0.8	6.1	0.13	0.34	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2024 AM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	56	19.6	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	57	45.6	0.053	6.5	LOS A	0.2	2.1	0.21	0.57	50.6
Approach		113	32.7	0.053	3.3	NA	0.2	2.1	0.10	0.29	67.0
NorthWest: Moranbah											
27	L2	152	19.7	0.614	7.9	LOS A	6.8	51.8	0.43	0.69	50.0
29	R2	392	7.7	0.614	10.1	LOS B	6.8	51.8	0.43	0.69	50.3
Approach		544	11.0	0.614	9.5	LOS A	6.8	51.8	0.43	0.69	50.2
SouthWest: Peak Downs Hwy_South											
30	L2	22	9.1	0.013	5.6	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	53	30.2	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		75	24.0	0.033	1.7	NA	0.0	0.0	0.00	0.17	79.4
All Vehicles		732	15.7	0.614	7.7	NA	6.8	51.8	0.33	0.58	54.3

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2024 PM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	61	16.4	0.035	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	172	20.3	0.186	7.6	LOS A	0.8	6.5	0.44	0.68	50.9
Approach		233	19.3	0.186	5.6	NA	0.8	6.5	0.33	0.50	58.4
NorthWest: Moranbah											
27	L2	104	36.5	0.328	6.4	LOS A	1.5	12.4	0.25	0.64	50.0
29	R2	135	7.4	0.328	10.6	LOS B	1.5	12.4	0.25	0.64	50.9
Approach		239	20.1	0.328	8.7	LOS A	1.5	12.4	0.25	0.64	50.5
SouthWest: Peak Downs Hwy_South											
30	L2	248	9.7	0.143	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	45	37.8	0.029	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		293	14.0	0.143	4.8	NA	0.0	0.0	0.00	0.49	57.3
All Vehicles		765	17.5	0.328	6.3	NA	1.5	12.4	0.18	0.54	55.3

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2041 AM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	484	3.7	0.257	0.0	LOS A	0.0	0.2	0.00	0.01	99.6
3	R2	4	0.0	0.257	7.7	LOS A	0.0	0.2	0.00	0.01	71.5
Approach		488	3.7	0.257	0.1	NA	0.0	0.2	0.00	0.01	99.3
East: Lake Vermont Rd											
4	L2	1	0.0	0.005	5.8	LOS A	0.0	0.1	0.28	0.57	51.4
6	R2	2	50.0	0.005	10.4	LOS B	0.0	0.1	0.28	0.57	48.9
Approach		3	33.3	0.005	8.9	LOS A	0.0	0.1	0.28	0.57	49.7
North: Dysart Rd_North											
7	L2	1	0.0	0.044	7.8	LOS A	0.0	0.0	0.00	0.01	88.2
8	T1	83	3.6	0.044	0.0	LOS A	0.0	0.0	0.00	0.01	99.2
Approach		84	3.6	0.044	0.1	NA	0.0	0.0	0.00	0.01	99.1
All Vehicles		575	3.8	0.257	0.1	NA	0.0	0.2	0.01	0.01	98.7

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

MOVEMENT SUMMARY

Site: [Intersection 1 - Background 2041 PM]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	201	7.0	0.108	0.0	LOS A	0.0	0.1	0.00	0.00	99.7
3	R2	1	0.0	0.108	8.4	LOS A	0.0	0.1	0.00	0.00	71.5
Approach		202	6.9	0.108	0.0	NA	0.0	0.1	0.00	0.00	99.5
East: Lake Vermont Rd											
4	L2	9	0.0	0.035	6.4	LOS A	0.1	1.1	0.43	0.64	51.6
6	R2	15	60.0	0.035	9.9	LOS A	0.1	1.1	0.43	0.64	48.7
Approach		24	37.5	0.035	8.6	LOS A	0.1	1.1	0.43	0.64	49.7
North: Dysart Rd_North											
7	L2	1	0.0	0.148	7.8	LOS A	0.0	0.0	0.00	0.00	88.5
8	T1	279	5.0	0.148	0.0	LOS A	0.0	0.0	0.00	0.00	99.7
Approach		280	5.0	0.148	0.0	NA	0.0	0.0	0.00	0.00	99.7
All Vehicles		506	7.3	0.148	0.5	NA	0.1	1.1	0.02	0.03	95.1

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2041 AM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	190	4.2	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
3	R2	311	4.2	0.231	5.7	LOS A	1.1	8.1	0.16	0.57	53.6
Approach		501	4.2	0.231	3.6	NA	1.1	8.1	0.10	0.35	65.0
East: Saraji Mine Entrance											
4	L2	81	1.2	0.102	5.6	LOS A	0.4	2.8	0.06	0.56	53.7
6	R2	17	23.5	0.102	12.5	LOS B	0.4	2.8	0.06	0.56	51.5
Approach		98	5.1	0.102	6.8	LOS A	0.4	2.8	0.06	0.56	53.4
North: Dysart Rd_North											
7	L2	28	14.3	0.017	5.7	LOS A	0.0	0.0	0.00	0.57	53.0
8	T1	19	15.8	0.011	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		47	14.9	0.017	3.4	NA	0.0	0.0	0.00	0.34	67.1
All Vehicles		646	5.1	0.231	4.0	NA	1.1	8.1	0.09	0.38	63.1

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

MOVEMENT SUMMARY

Site: [Intersection 2 - Background 2041 PM]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	100	8.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	121	7.4	0.097	6.0	LOS A	0.4	3.0	0.23	0.57	53.3
Approach		221	7.7	0.097	3.3	NA	0.4	3.0	0.13	0.31	67.6
East: Saraji Mine Entrance											
4	L2	219	2.3	0.237	6.1	LOS A	1.0	7.3	0.25	0.58	53.8
6	R2	34	14.7	0.237	9.3	LOS A	1.0	7.3	0.25	0.58	52.0
Approach		253	4.0	0.237	6.5	LOS A	1.0	7.3	0.25	0.58	53.6
North: Dysart Rd_North											
7	L2	4	25.0	0.003	5.8	LOS A	0.0	0.0	0.00	0.57	52.6
8	T1	105	8.6	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		109	9.2	0.057	0.2	NA	0.0	0.0	0.00	0.02	97.3
All Vehicles		583	6.3	0.237	4.1	NA	1.0	7.3	0.16	0.37	64.1

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2041 AM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	143	3.5	0.156	6.4	LOS A	0.6	4.6	0.34	0.61	52.4
3	R2	42	14.3	0.156	7.1	LOS A	0.6	4.6	0.34	0.61	51.5
Approach		185	5.9	0.156	6.6	LOS A	0.6	4.6	0.34	0.61	52.2
East: Dysart Rd_East											
4	L2	43	18.6	0.147	8.0	LOS A	0.0	0.0	0.00	0.11	74.3
5	T1	228	4.8	0.147	0.0	LOS A	0.0	0.0	0.00	0.11	91.1
Approach		271	7.0	0.147	1.3	NA	0.0	0.0	0.00	0.11	88.0
West: Peak Downs Mine Entrance											
11	T1	22	4.5	0.020	6.5	LOS A	0.1	0.5	0.24	0.80	80.6
12	R2	10	10.0	0.020	8.1	LOS A	0.1	0.5	0.24	0.80	60.5
Approach		32	6.3	0.020	7.0	NA	0.1	0.5	0.24	0.80	73.0
All Vehicles		488	6.6	0.156	3.7	NA	0.6	4.6	0.15	0.34	69.1

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

MOVEMENT SUMMARY

Site: [Intersection 3 - Background 2041 PM]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	60	8.3	0.104	6.0	LOS A	0.4	2.9	0.24	0.59	52.5
3	R2	54	9.3	0.104	7.3	LOS A	0.4	2.9	0.24	0.59	51.9
Approach		114	8.8	0.104	6.6	LOS A	0.4	2.9	0.24	0.59	52.2
East: Dysart Rd_East											
4	L2	40	22.5	0.081	7.9	LOS A	0.0	0.0	0.00	0.19	68.8
5	T1	102	9.8	0.081	0.0	LOS A	0.0	0.0	0.00	0.19	84.9
Approach		142	13.4	0.081	2.2	NA	0.0	0.0	0.00	0.19	79.6
West: Peak Downs Mine Entrance											
11	T1	141	9.9	0.136	8.3	LOS A	0.5	4.1	0.21	0.98	77.9
12	R2	91	3.3	0.136	7.4	LOS A	0.5	4.1	0.21	0.98	59.4
Approach		232	7.3	0.136	7.9	NA	0.5	4.1	0.21	0.98	69.4
All Vehicles		488	9.4	0.136	6.0	NA	0.5	4.1	0.16	0.66	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2041 AM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	4	0.0	0.057	6.5	LOS A	0.2	1.7	0.50	0.70	50.6
23	R2	28	17.9	0.057	10.2	LOS B	0.2	1.7	0.50	0.70	49.7
Approach		32	15.6	0.057	9.7	LOS A	0.2	1.7	0.50	0.70	49.8
NorthEast: Peak Downs Hwy_North											
24	L2	308	9.4	0.177	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	220	9.1	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		528	9.3	0.177	3.3	NA	0.0	0.0	0.00	0.33	66.0
SouthWest: Peak Downs Hwy_South											
31	T1	60	26.7	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	3	0.0	0.004	7.9	LOS A	0.0	0.1	0.50	0.61	51.3
Approach		63	25.4	0.036	0.4	NA	0.0	0.1	0.02	0.03	95.7
All Vehicles		623	11.2	0.177	3.3	NA	0.2	1.7	0.03	0.32	67.0

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

MOVEMENT SUMMARY

Site: [Intersection 4 - Background 2041 PM]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	8	0.0	0.261	5.9	LOS A	1.1	8.1	0.50	0.74	51.0
23	R2	164	4.9	0.261	9.2	LOS A	1.1	8.1	0.50	0.74	50.6
Approach		172	4.7	0.261	9.1	LOS A	1.1	8.1	0.50	0.74	50.6
NorthEast: Peak Downs Hwy_North											
24	L2	149	9.4	0.086	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	86	12.8	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		235	10.6	0.086	3.6	NA	0.0	0.0	0.00	0.36	64.2
SouthWest: Peak Downs Hwy_South											
31	T1	192	15.6	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
32	R2	9	11.1	0.008	6.6	LOS A	0.0	0.2	0.34	0.57	51.7
Approach		201	15.4	0.108	0.3	NA	0.0	0.2	0.02	0.03	95.9
All Vehicles		608	10.5	0.261	4.1	NA	1.1	8.1	0.15	0.36	66.4

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

MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2041 AM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	66	19.7	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	58	37.9	0.054	6.4	LOS A	0.2	2.0	0.23	0.57	50.9
Approach		124	28.2	0.054	3.0	NA	0.2	2.0	0.11	0.27	68.9
NorthWest: Moranbah											
27	L2	172	15.7	0.737	9.9	LOS A	11.9	90.3	0.56	0.82	48.3
29	R2	464	7.5	0.737	13.1	LOS B	11.9	90.3	0.56	0.82	48.4
Approach		636	9.7	0.737	12.3	LOS B	11.9	90.3	0.56	0.82	48.4
SouthWest: Peak Downs Hwy_South											
30	L2	27	11.1	0.016	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	63	30.2	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		90	24.4	0.039	1.7	NA	0.0	0.0	0.00	0.17	79.0
All Vehicles		850	14.0	0.737	9.8	NA	11.9	90.3	0.43	0.67	52.8

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

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MOVEMENT SUMMARY

Site: [Intersection 5 - Background 2041 PM]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	71	15.5	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	191	15.2	0.215	7.9	LOS A	0.9	7.3	0.49	0.72	50.8
Approach		262	15.3	0.215	5.8	NA	0.9	7.3	0.35	0.52	58.6
NorthWest: Moranbah											
27	L2	114	31.6	0.401	7.1	LOS A	2.3	18.6	0.30	0.68	49.2
29	R2	159	6.9	0.401	12.4	LOS B	2.3	18.6	0.30	0.68	49.8
Approach		273	17.2	0.401	10.2	LOS B	2.3	18.6	0.30	0.68	49.6
SouthWest: Peak Downs Hwy_South											
30	L2	294	9.9	0.169	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	53	37.7	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		347	14.1	0.169	4.8	NA	0.0	0.0	0.00	0.49	57.3
All Vehicles		882	15.4	0.401	6.8	NA	2.3	18.6	0.20	0.56	55.0

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

MOVEMENT SUMMARY

Site: [Intersection 1 - TOTAL 2022 AM_Ordinary days]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	434	8.1	0.236	0.0	LOS A	0.0	0.2	0.00	0.01	99.6
3	R2	3	0.0	0.236	7.9	LOS A	0.0	0.2	0.00	0.01	71.5
Approach		437	8.0	0.236	0.1	NA	0.0	0.2	0.00	0.01	99.4
East: Lake Vermont Rd											
4	L2	1	0.0	0.018	5.8	LOS A	0.1	0.7	0.46	0.61	49.8
6	R2	7	85.7	0.018	12.5	LOS B	0.1	0.7	0.46	0.61	46.2
Approach		8	75.0	0.018	11.6	LOS B	0.1	0.7	0.46	0.61	46.6
North: Dysart Rd_North											
7	L2	6	83.3	0.065	9.9	LOS A	0.0	0.0	0.00	0.04	57.2
8	T1	102	21.6	0.065	0.0	LOS A	0.0	0.0	0.00	0.04	97.5
Approach		108	25.0	0.065	0.6	NA	0.0	0.0	0.00	0.04	93.8
All Vehicles		553	12.3	0.236	0.3	NA	0.1	0.7	0.01	0.02	96.7

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

MOVEMENT SUMMARY

Site: [Intersection 1 - TOTAL 2022 PM_Ordinary days]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	199	15.6	0.113	0.0	LOS A	0.0	0.1	0.00	0.00	99.7
3	R2	1	0.0	0.113	8.4	LOS A	0.0	0.1	0.00	0.00	71.5
Approach		200	15.5	0.113	0.0	NA	0.0	0.1	0.00	0.00	99.5
East: Lake Vermont Rd											
4	L2	7	0.0	0.039	6.4	LOS A	0.1	1.3	0.45	0.65	51.2
6	R2	17	70.6	0.039	10.5	LOS B	0.1	1.3	0.45	0.65	48.0
Approach		24	50.0	0.039	9.3	LOS A	0.1	1.3	0.45	0.65	48.9
North: Dysart Rd_North											
7	L2	6	83.3	0.151	10.0	LOS A	0.0	0.0	0.00	0.01	58.1
8	T1	264	11.7	0.151	0.0	LOS A	0.0	0.0	0.00	0.01	98.9
Approach		270	13.3	0.151	0.2	NA	0.0	0.0	0.00	0.01	97.4
All Vehicles		494	16.0	0.151	0.6	NA	0.1	1.3	0.02	0.04	93.7

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

MOVEMENT SUMMARY

Site: [Intersection 2 - TOTAL 2022 AM_Ordinary days]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	195	15.9	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
3	R2	257	3.9	0.198	5.9	LOS A	0.9	6.6	0.22	0.57	53.5
Approach		452	9.1	0.198	3.4	NA	0.9	6.6	0.13	0.33	66.9
East: Saraji Mine Entrance											
4	L2	68	1.5	0.085	5.8	LOS A	0.3	2.3	0.16	0.56	53.7
6	R2	13	23.1	0.085	12.3	LOS B	0.3	2.3	0.16	0.56	51.5
Approach		81	4.9	0.085	6.9	LOS A	0.3	2.3	0.16	0.56	53.4
North: Dysart Rd_North											
7	L2	23	13.0	0.014	5.7	LOS A	0.0	0.0	0.00	0.57	53.1
8	T1	54	50.0	0.037	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		77	39.0	0.037	1.7	NA	0.0	0.0	0.00	0.17	81.1
All Vehicles		610	12.3	0.198	3.6	NA	0.9	6.6	0.12	0.34	66.1

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

MOVEMENT SUMMARY

Site: [Intersection 2 - TOTAL 2022 PM_Ordinary days]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	120	25.8	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	100	7.0	0.083	6.1	LOS A	0.3	2.5	0.26	0.58	53.3
Approach		220	17.3	0.083	2.8	NA	0.3	2.5	0.12	0.26	71.5
East: Saraji Mine Entrance											
4	L2	181	2.2	0.202	6.2	LOS A	0.8	6.0	0.29	0.59	53.7
6	R2	28	14.3	0.202	9.6	LOS A	0.8	6.0	0.29	0.59	51.9
Approach		209	3.8	0.202	6.7	LOS A	0.8	6.0	0.29	0.59	53.5
North: Dysart Rd_North											
7	L2	3	33.3	0.002	5.9	LOS A	0.0	0.0	0.00	0.57	52.2
8	T1	124	25.8	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		127	26.0	0.074	0.1	NA	0.0	0.0	0.00	0.01	98.2
All Vehicles		556	14.2	0.202	3.6	NA	0.8	6.0	0.15	0.33	67.3

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

MOVEMENT SUMMARY

Site: [Intersection 3 - TOTAL 2022 AM_Shifting changing days]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	118	3.4	0.176	6.3	LOS A	0.7	5.6	0.33	0.61	52.5
3	R2	72	40.3	0.176	7.6	LOS A	0.7	5.6	0.33	0.61	50.4
Approach		190	17.4	0.176	6.8	LOS A	0.7	5.6	0.33	0.61	51.7
East: Dysart Rd_East											
4	L2	72	41.7	0.150	8.3	LOS A	0.0	0.0	0.00	0.18	63.0
5	T1	189	4.8	0.150	0.0	LOS A	0.0	0.0	0.00	0.18	86.0
Approach		261	14.9	0.150	2.3	NA	0.0	0.0	0.00	0.18	78.1
West: Peak Downs Mine Entrance											
11	T1	19	5.3	0.017	6.2	LOS A	0.1	0.4	0.24	0.79	81.2
12	R2	8	12.5	0.017	8.2	LOS A	0.1	0.4	0.24	0.79	60.7
Approach		27	7.4	0.017	6.8	NA	0.1	0.4	0.24	0.79	73.8
All Vehicles		478	15.5	0.176	4.3	NA	0.7	5.6	0.14	0.38	64.7

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

MOVEMENT SUMMARY

Site: [Intersection 3 - TOTAL 2022 PM_Shifting changing days]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	50	8.0	0.141	5.9	LOS A	0.5	4.3	0.25	0.60	52.3
3	R2	83	33.7	0.141	7.8	LOS A	0.5	4.3	0.25	0.60	50.7
Approach		133	24.1	0.141	7.1	LOS A	0.5	4.3	0.25	0.60	51.3
East: Dysart Rd_East											
4	L2	70	44.3	0.095	7.9	LOS A	0.0	0.0	0.00	0.29	57.6
5	T1	84	9.5	0.095	0.0	LOS A	0.0	0.0	0.00	0.29	77.6
Approach		154	25.3	0.095	3.6	NA	0.0	0.0	0.00	0.29	67.0
West: Peak Downs Mine Entrance											
11	T1	116	9.5	0.113	8.3	LOS A	0.4	3.3	0.22	0.97	77.9
12	R2	75	2.7	0.113	7.5	LOS A	0.4	3.3	0.22	0.97	59.4
Approach		191	6.8	0.113	8.0	NA	0.4	3.3	0.22	0.97	69.4
All Vehicles		478	17.6	0.141	6.3	NA	0.5	4.3	0.16	0.65	62.5

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

MOVEMENT SUMMARY

Site: [Intersection 4 - TOTAL 2022 AM_Shifting changing days]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	3	0.0	0.132	6.3	LOS A	0.5	4.9	0.54	0.76	49.9
23	R2	60	46.7	0.132	11.4	LOS B	0.5	4.9	0.54	0.76	48.0
Approach		63	44.4	0.132	11.1	LOS B	0.5	4.9	0.54	0.76	48.1
NorthEast: Peak Downs Hwy_North											
24	L2	292	16.4	0.176	5.7	LOS A	0.0	0.0	0.00	0.57	52.9
25	T1	182	9.3	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		474	13.7	0.176	3.5	NA	0.0	0.0	0.00	0.35	64.5
SouthWest: Peak Downs Hwy_South											
31	T1	50	28.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	2	0.0	0.002	7.6	LOS A	0.0	0.1	0.48	0.59	51.5
Approach		52	26.9	0.030	0.3	NA	0.0	0.1	0.02	0.02	96.5
All Vehicles		589	18.2	0.176	4.1	NA	0.5	4.9	0.06	0.37	64.0

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

MOVEMENT SUMMARY

Site: [Intersection 4 - TOTAL 2022 PM_Shifting changing days]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	6	0.0	0.278	5.9	LOS A	1.2	9.8	0.50	0.74	51.0
23	R2	172	17.4	0.278	9.4	LOS A	1.2	9.8	0.50	0.74	50.1
Approach		178	16.9	0.278	9.3	LOS A	1.2	9.8	0.50	0.74	50.1
NorthEast: Peak Downs Hwy_North											
24	L2	159	22.0	0.099	5.8	LOS A	0.0	0.0	0.00	0.57	52.7
25	T1	71	12.7	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		230	19.1	0.099	4.0	NA	0.0	0.0	0.00	0.40	61.7
SouthWest: Peak Downs Hwy_South											
31	T1	159	15.7	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
32	R2	7	14.3	0.007	6.7	LOS A	0.0	0.2	0.34	0.57	51.6
Approach		166	15.7	0.090	0.3	NA	0.0	0.2	0.01	0.02	59.6
All Vehicles		574	17.4	0.278	4.6	NA	1.2	9.8	0.16	0.39	57.0

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

MOVEMENT SUMMARY

Site: [Intersection 5 - TOTAL 2022 AM_Shifting changing days]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	74	40.5	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	33	9.1	0.027	6.1	LOS A	0.1	0.8	0.24	0.57	52.1
Approach		107	30.8	0.048	1.9	NA	0.1	0.8	0.07	0.17	77.9
NorthWest: Moranbah											
27	L2	127	5.5	0.623	8.2	LOS A	6.9	51.5	0.51	0.76	50.0
29	R2	402	8.5	0.623	10.9	LOS B	6.9	51.5	0.51	0.76	49.7
Approach		529	7.8	0.623	10.3	LOS B	6.9	51.5	0.51	0.76	49.7
SouthWest: Peak Downs Hwy_South											
30	L2	40	17.5	0.024	5.7	LOS A	0.0	0.0	0.00	0.57	52.9
31	T1	71	49.3	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		111	37.8	0.048	2.1	NA	0.0	0.0	0.00	0.21	75.6
All Vehicles		747	15.5	0.623	7.8	NA	6.9	51.5	0.37	0.59	55.4

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

MOVEMENT SUMMARY

Site: [Intersection 5 - TOTAL 2022 PM_Shifting changing days]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	78	35.9	0.049	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	143	6.3	0.149	7.4	LOS A	0.6	4.5	0.45	0.68	51.5
Approach		221	16.7	0.149	4.8	NA	0.6	4.5	0.29	0.44	62.1
NorthWest: Moranbah											
27	L2	80	18.8	0.337	6.5	LOS A	1.7	12.9	0.35	0.69	50.1
29	R2	150	9.3	0.337	11.1	LOS B	1.7	12.9	0.35	0.69	50.2
Approach		230	12.6	0.337	9.5	LOS A	1.7	12.9	0.35	0.69	50.1
SouthWest: Peak Downs Hwy_South											
30	L2	262	11.1	0.152	5.7	LOS A	0.0	0.0	0.00	0.57	53.1
31	T1	63	57.1	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		325	20.0	0.152	4.6	NA	0.0	0.0	0.00	0.46	58.4
All Vehicles		776	16.9	0.337	6.1	NA	1.7	12.9	0.19	0.52	56.6

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

MOVEMENT SUMMARY

Site: [Intersection A - TOTAL 2022 AM_Shifting changing days]

Dysart Rd / Proposed Saraji East Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	154	5.8	0.082	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	33	60.6	0.034	6.8	LOS A	0.1	1.4	0.23	0.57	49.9
Approach		187	15.5	0.082	1.2	NA	0.1	1.4	0.04	0.10	84.9
East: Saraji Mine Entrance											
4	L2	33	60.6	0.105	6.5	LOS A	0.4	4.4	0.20	0.58	49.7
6	R2	37	64.9	0.105	10.0	LOS A	0.4	4.4	0.20	0.58	49.2
Approach		70	62.9	0.105	8.4	LOS A	0.4	4.4	0.20	0.58	49.4
North: Dysart Rd_North											
7	L2	37	64.9	0.029	6.3	LOS A	0.0	0.0	0.00	0.57	51.0
8	T1	43	16.3	0.024	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		80	38.8	0.029	2.9	NA	0.0	0.0	0.00	0.26	69.1
All Vehicles		337	30.9	0.105	3.1	NA	0.4	4.4	0.06	0.24	70.6

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

MOVEMENT SUMMARY

Site: [Intersection A - TOTAL 2022 PM_Shifting changing days]

Dysart Rd / Proposed Saraji East Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	94	8.5	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	33	60.6	0.036	7.2	LOS A	0.1	1.5	0.31	0.59	49.7
Approach		127	22.0	0.051	1.9	NA	0.1	1.5	0.08	0.15	79.2
East: Saraji Mine Entrance											
4	L2	33	60.6	0.108	7.0	LOS A	0.4	4.5	0.34	0.61	49.5
6	R2	37	64.9	0.108	10.0	LOS B	0.4	4.5	0.34	0.61	49.1
Approach		70	62.9	0.108	8.6	LOS A	0.4	4.5	0.34	0.61	49.3
North: Dysart Rd_North											
7	L2	37	64.9	0.029	6.3	LOS A	0.0	0.0	0.00	0.57	51.0
8	T1	108	8.3	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		145	22.8	0.058	1.6	NA	0.0	0.0	0.00	0.14	80.2
All Vehicles		342	30.7	0.108	3.1	NA	0.4	4.5	0.10	0.24	70.8

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

MOVEMENT SUMMARY

Site: [Intersection 1 - TOTAL 2024 AM_Ordinary days]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	476	8.2	0.259	0.0	LOS A	0.0	0.2	0.00	0.00	99.7
3	R2	3	0.0	0.259	8.1	LOS A	0.0	0.2	0.00	0.00	71.5
Approach		479	8.1	0.259	0.1	NA	0.0	0.2	0.00	0.00	99.4
East: Lake Vermont Rd											
4	L2	1	0.0	0.038	6.0	LOS A	0.1	1.4	0.58	0.67	48.3
6	R2	12	91.7	0.038	14.7	LOS B	0.1	1.4	0.58	0.67	44.7
Approach		13	84.6	0.038	14.0	LOS B	0.1	1.4	0.58	0.67	44.9
North: Dysart Rd_North											
7	L2	11	90.9	0.089	10.0	LOS A	0.0	0.0	0.00	0.05	55.0
8	T1	137	19.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.05	96.8
Approach		148	24.3	0.089	0.8	NA	0.0	0.0	0.00	0.05	91.6
All Vehicles		640	13.4	0.259	0.5	NA	0.1	1.4	0.02	0.03	95.2

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

MOVEMENT SUMMARY

Site: [Intersection 1 - TOTAL 2024 PM_Ordinary days]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	237	15.2	0.134	0.0	LOS A	0.0	0.1	0.00	0.00	99.7
3	R2	1	0.0	0.134	8.7	LOS A	0.0	0.1	0.00	0.00	71.5
Approach		238	15.1	0.134	0.0	NA	0.0	0.1	0.00	0.00	99.6
East: Lake Vermont Rd											
4	L2	7	0.0	0.058	6.6	LOS A	0.2	2.0	0.51	0.69	50.2
6	R2	22	77.3	0.058	12.1	LOS B	0.2	2.0	0.51	0.69	46.9
Approach		29	58.6	0.058	10.8	LOS B	0.2	2.0	0.51	0.69	47.6
North: Dysart Rd_North											
7	L2	11	90.9	0.177	10.1	LOS B	0.0	0.0	0.00	0.02	56.0
8	T1	303	11.9	0.177	0.0	LOS A	0.0	0.0	0.00	0.02	98.4
Approach		314	14.6	0.177	0.4	NA	0.0	0.0	0.00	0.02	95.9
All Vehicles		581	17.0	0.177	0.8	NA	0.2	2.0	0.03	0.05	92.6

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

MOVEMENT SUMMARY

Site: [Intersection 2 - TOTAL 2024 AM_Ordinary days]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	237	16.9	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
3	R2	263	4.2	0.212	6.1	LOS A	1.0	7.1	0.28	0.59	53.3
Approach		500	10.2	0.212	3.2	NA	1.0	7.1	0.15	0.31	68.5
East: Saraji Mine Entrance											
4	L2	69	1.4	0.095	6.0	LOS A	0.3	2.5	0.24	0.57	53.4
6	R2	14	21.4	0.095	14.0	LOS B	0.3	2.5	0.24	0.57	51.2
Approach		83	4.8	0.095	7.3	LOS A	0.3	2.5	0.24	0.57	53.0
North: Dysart Rd_North											
7	L2	23	13.0	0.014	5.7	LOS A	0.0	0.0	0.00	0.57	53.1
8	T1	93	38.7	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		116	33.6	0.060	1.1	NA	0.0	0.0	0.00	0.11	86.8
All Vehicles		699	13.4	0.212	3.4	NA	1.0	7.1	0.13	0.31	68.5

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

MOVEMENT SUMMARY

Site: [Intersection 2 - TOTAL 2024 PM_Ordinary days]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	160	25.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
3	R2	101	6.9	0.088	6.4	LOS A	0.4	2.6	0.31	0.60	53.2
Approach		261	18.0	0.095	2.5	NA	0.4	2.6	0.12	0.23	74.6
East: Saraji Mine Entrance											
4	L2	184	2.2	0.219	6.5	LOS A	0.9	6.5	0.34	0.62	53.5
6	R2	28	14.3	0.219	11.0	LOS B	0.9	6.5	0.34	0.62	51.7
Approach		212	3.8	0.219	7.1	LOS A	0.9	6.5	0.34	0.62	53.3
North: Dysart Rd_North											
7	L2	3	33.3	0.002	5.9	LOS A	0.0	0.0	0.00	0.57	52.2
8	T1	166	25.3	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		169	25.4	0.099	0.1	NA	0.0	0.0	0.00	0.01	98.6
All Vehicles		642	15.3	0.219	3.4	NA	0.9	6.5	0.16	0.30	69.9

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

MOVEMENT SUMMARY

Site: [Intersection 3 - TOTAL 2024 AM_Shift changing days]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	121	3.3	0.230	6.4	LOS A	0.9	7.5	0.36	0.63	52.4
3	R2	113	34.5	0.230	7.8	LOS A	0.9	7.5	0.36	0.63	50.6
Approach		234	18.4	0.230	7.0	LOS A	0.9	7.5	0.36	0.63	51.5
East: Dysart Rd_East											
4	L2	113	35.4	0.179	7.9	LOS A	0.0	0.0	0.00	0.24	62.3
5	T1	194	5.2	0.179	0.0	LOS A	0.0	0.0	0.00	0.24	81.3
Approach		307	16.3	0.179	2.9	NA	0.0	0.0	0.00	0.24	73.1
West: Peak Downs Mine Entrance											
11	T1	19	5.3	0.017	6.4	LOS A	0.1	0.5	0.26	0.77	81.2
12	R2	8	12.5	0.017	8.5	LOS A	0.1	0.5	0.26	0.77	60.7
Approach		27	7.4	0.017	7.0	NA	0.1	0.5	0.26	0.77	73.8
All Vehicles		568	16.7	0.230	4.8	NA	0.9	7.5	0.16	0.43	62.3

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

MOVEMENT SUMMARY

Site: [Intersection 3 - TOTAL 2024 PM_Shift changing days]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	51	7.8	0.194	6.0	LOS A	0.7	6.1	0.29	0.63	52.1
3	R2	122	31.1	0.194	8.0	LOS A	0.7	6.1	0.29	0.63	50.6
Approach		173	24.3	0.194	7.4	LOS A	0.7	6.1	0.29	0.63	51.0
East: Dysart Rd_East											
4	L2	111	36.9	0.122	7.4	LOS A	0.0	0.0	0.00	0.36	56.5
5	T1	85	9.4	0.122	0.0	LOS A	0.0	0.0	0.00	0.36	72.3
Approach		196	25.0	0.122	4.2	NA	0.0	0.0	0.00	0.36	62.4
West: Peak Downs Mine Entrance											
11	T1	119	10.1	0.117	8.4	LOS A	0.5	3.5	0.26	0.94	78.0
12	R2	76	2.6	0.117	7.6	LOS A	0.5	3.5	0.26	0.94	59.5
Approach		195	7.2	0.117	8.1	NA	0.5	3.5	0.26	0.94	69.5
All Vehicles		564	18.6	0.194	6.5	NA	0.7	6.1	0.18	0.64	60.4

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

MOVEMENT SUMMARY

Site: [Intersection 4 - TOTAL 2024 AM_Shift changing days]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	3	0.0	0.216	6.4	LOS A	0.9	7.9	0.57	0.81	49.6
23	R2	100	38.0	0.216	11.7	LOS B	0.9	7.9	0.57	0.81	48.0
Approach		103	36.9	0.216	11.5	LOS B	0.9	7.9	0.57	0.81	48.0
NorthEast: Peak Downs Hwy_North											
24	L2	337	17.2	0.204	5.8	LOS A	0.0	0.0	0.00	0.57	52.9
25	T1	186	9.1	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		523	14.3	0.204	3.7	NA	0.0	0.0	0.00	0.37	63.5
SouthWest: Peak Downs Hwy_South											
31	T1	51	27.5	0.031	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	2	0.0	0.003	8.0	LOS A	0.0	0.1	0.50	0.61	51.2
Approach		53	26.4	0.031	0.3	NA	0.0	0.1	0.02	0.02	96.5
All Vehicles		679	18.7	0.216	4.6	NA	0.9	7.9	0.09	0.41	62.1

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

MOVEMENT SUMMARY

Site: [Intersection 4 - TOTAL 2024 PM_Shift changing days]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	6	0.0	0.366	6.6	LOS A	2.0	16.0	0.56	0.83	50.0
23	R2	215	18.6	0.366	10.8	LOS B	2.0	16.0	0.56	0.83	49.1
Approach		221	18.1	0.366	10.7	LOS B	2.0	16.0	0.56	0.83	49.1
NorthEast: Peak Downs Hwy_North											
24	L2	203	22.7	0.127	5.8	LOS A	0.0	0.0	0.00	0.57	52.7
25	T1	74	13.5	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		277	20.2	0.127	4.3	NA	0.0	0.0	0.00	0.42	60.2
SouthWest: Peak Downs Hwy_South											
31	T1	162	15.4	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
32	R2	7	14.3	0.007	7.0	LOS A	0.0	0.2	0.38	0.58	51.5
Approach		169	15.4	0.091	0.3	NA	0.0	0.2	0.02	0.02	59.6
All Vehicles		667	18.3	0.366	5.4	NA	2.0	16.0	0.19	0.46	55.9

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

MOVEMENT SUMMARY

Site: [Intersection 5 - TOTAL 2024 AM_Shift changing days]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	78	42.3	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	34	8.8	0.029	6.3	LOS A	0.1	0.9	0.28	0.58	52.0
Approach		112	32.1	0.051	1.9	NA	0.1	0.9	0.09	0.17	78.1
NorthWest: Moranbah											
27	L2	129	5.4	0.712	9.8	LOS A	9.9	74.7	0.60	0.88	48.4
29	R2	447	9.4	0.712	13.4	LOS B	9.9	74.7	0.60	0.88	48.1
Approach		576	8.5	0.712	12.6	LOS B	9.9	74.7	0.60	0.88	48.2
SouthWest: Peak Downs Hwy_South											
30	L2	77	18.2	0.047	5.8	LOS A	0.0	0.0	0.00	0.57	52.8
31	T1	75	50.7	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		152	34.2	0.051	2.9	NA	0.0	0.0	0.00	0.29	68.8
All Vehicles		840	16.3	0.712	9.4	NA	9.9	74.7	0.42	0.68	53.8

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

MOVEMENT SUMMARY

Site: [Intersection 5 - TOTAL 2024 PM_Shift changing days]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	82	37.8	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	147	6.8	0.163	7.7	LOS A	0.7	4.9	0.48	0.71	51.2
Approach		229	17.9	0.163	5.0	NA	0.7	4.9	0.31	0.46	62.0
NorthWest: Moranbah											
27	L2	81	18.5	0.434	7.5	LOS A	2.7	20.8	0.42	0.75	48.8
29	R2	190	11.6	0.434	13.1	LOS B	2.7	20.8	0.42	0.75	48.8
Approach		271	13.7	0.434	11.5	LOS B	2.7	20.8	0.42	0.75	48.8
SouthWest: Peak Downs Hwy_South											
30	L2	303	11.9	0.177	5.7	LOS A	0.0	0.0	0.00	0.57	53.1
31	T1	67	58.2	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		370	20.3	0.177	4.7	NA	0.0	0.0	0.00	0.47	58.0
All Vehicles		870	17.6	0.434	6.9	NA	2.7	20.8	0.21	0.56	55.7

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

MOVEMENT SUMMARY

Site: [Intersection A - TOTAL 2024 AM_Shift changing days]

Dysart Rd / Proposed Saraji East Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	158	6.3	0.084	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	66	34.8	0.063	6.6	LOS A	0.3	2.3	0.27	0.58	50.9
Approach		224	14.7	0.084	2.0	NA	0.3	2.3	0.08	0.17	77.8
East: Saraji Mine Entrance											
4	L2	66	34.8	0.206	6.2	LOS A	0.8	8.0	0.21	0.59	50.4
6	R2	77	44.2	0.206	10.5	LOS B	0.8	8.0	0.21	0.59	49.7
Approach		143	39.9	0.206	8.5	LOS A	0.8	8.0	0.21	0.59	50.0
North: Dysart Rd_North											
7	L2	77	44.2	0.055	6.1	LOS A	0.0	0.0	0.00	0.57	51.8
8	T1	44	15.9	0.025	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		121	33.9	0.055	3.9	NA	0.0	0.0	0.00	0.36	62.7
All Vehicles		488	26.8	0.206	4.3	NA	0.8	8.0	0.10	0.34	63.6

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

MOVEMENT SUMMARY

Site: [Intersection A - TOTAL 2024 PM_Shift changing days]

Dysart Rd / Proposed Saraji East Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	96	8.3	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	66	34.8	0.068	7.0	LOS A	0.3	2.5	0.34	0.61	50.7
Approach		162	19.1	0.068	2.9	NA	0.3	2.5	0.14	0.25	71.6
East: Saraji Mine Entrance											
4	L2	66	34.8	0.211	6.6	LOS A	0.9	8.2	0.36	0.64	50.2
6	R2	77	44.2	0.211	10.5	LOS B	0.9	8.2	0.36	0.64	49.6
Approach		143	39.9	0.211	8.7	LOS A	0.9	8.2	0.36	0.64	49.9
North: Dysart Rd_North											
7	L2	77	44.2	0.055	6.1	LOS A	0.0	0.0	0.00	0.57	51.8
8	T1	111	9.0	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		188	23.4	0.060	2.5	NA	0.0	0.0	0.00	0.23	72.3
All Vehicles		493	26.8	0.211	4.4	NA	0.9	8.2	0.15	0.35	63.8

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

MOVEMENT SUMMARY

Site: [Intersection 1 - TOTAL 2041 AM_Ordinary days]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	523	4.4	0.278	0.0	LOS A	0.0	0.2	0.01	0.01	99.6
3	R2	4	0.0	0.278	7.9	LOS A	0.0	0.2	0.01	0.01	71.5
Approach		527	4.4	0.278	0.1	NA	0.0	0.2	0.01	0.01	99.3
East: Lake Vermont Rd											
4	L2	1	0.0	0.005	5.9	LOS A	0.0	0.2	0.36	0.58	50.9
6	R2	2	50.0	0.005	11.5	LOS B	0.0	0.2	0.36	0.58	48.4
Approach		3	33.3	0.005	9.6	LOS A	0.0	0.2	0.36	0.58	49.2
North: Dysart Rd_North											
7	L2	1	0.0	0.066	7.8	LOS A	0.0	0.0	0.00	0.01	88.3
8	T1	122	6.6	0.066	0.0	LOS A	0.0	0.0	0.00	0.01	99.5
Approach		123	6.5	0.066	0.1	NA	0.0	0.0	0.00	0.01	99.4
All Vehicles		653	4.9	0.278	0.1	NA	0.0	0.2	0.01	0.01	98.9

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

MOVEMENT SUMMARY

Site: [Intersection 1 - TOTAL 2041 PM_Ordinary days]

Dysart Rd / Lake Vermont Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	240	7.9	0.130	0.0	LOS A	0.0	0.1	0.00	0.00	99.8
3	R2	1	0.0	0.130	8.7	LOS A	0.0	0.1	0.00	0.00	71.5
Approach		241	7.9	0.130	0.0	NA	0.0	0.1	0.00	0.00	99.6
East: Lake Vermont Rd											
4	L2	9	0.0	0.039	6.6	LOS A	0.1	1.2	0.47	0.66	51.1
6	R2	15	60.0	0.039	10.9	LOS B	0.1	1.2	0.47	0.66	48.3
Approach		24	37.5	0.039	9.3	LOS A	0.1	1.2	0.47	0.66	49.3
North: Dysart Rd_North											
7	L2	1	0.0	0.170	7.8	LOS A	0.0	0.0	0.00	0.00	88.5
8	T1	318	6.0	0.170	0.0	LOS A	0.0	0.0	0.00	0.00	99.7
Approach		319	6.0	0.170	0.0	NA	0.0	0.0	0.00	0.00	99.7
All Vehicles		584	8.0	0.170	0.4	NA	0.1	1.2	0.02	0.03	95.6

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

MOVEMENT SUMMARY

Site: [Intersection 2 - TOTAL 2041 AM_Ordinary days]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	229	5.7	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
3	R2	311	4.2	0.241	5.9	LOS A	1.2	8.4	0.23	0.57	53.4
Approach		540	4.8	0.241	3.4	NA	1.2	8.4	0.13	0.33	66.6
East: Saraji Mine Entrance											
4	L2	81	1.2	0.110	5.8	LOS A	0.4	3.0	0.16	0.56	53.4
6	R2	17	23.5	0.110	14.1	LOS B	0.4	3.0	0.16	0.56	51.2
Approach		98	5.1	0.110	7.2	LOS A	0.4	3.0	0.16	0.56	53.1
North: Dysart Rd_North											
7	L2	28	14.3	0.017	5.7	LOS A	0.0	0.0	0.00	0.57	53.0
8	T1	58	13.8	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		86	14.0	0.032	1.9	NA	0.0	0.0	0.00	0.19	79.6
All Vehicles		724	5.9	0.241	3.8	NA	1.2	8.4	0.12	0.34	65.6

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

MOVEMENT SUMMARY

Site: [Intersection 2 - TOTAL 2041 PM_Ordinary days]

Dysart Rd / Existing Saraji Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	139	9.4	0.076	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	121	7.4	0.102	6.2	LOS A	0.4	3.1	0.28	0.59	53.2
Approach		260	8.5	0.102	2.9	NA	0.4	3.1	0.13	0.27	70.9
East: Saraji Mine Entrance											
4	L2	219	2.3	0.251	6.3	LOS A	1.1	7.7	0.31	0.60	53.6
6	R2	34	14.7	0.251	10.5	LOS B	1.1	7.7	0.31	0.60	51.8
Approach		253	4.0	0.251	6.9	LOS A	1.1	7.7	0.31	0.60	53.4
North: Dysart Rd_North											
7	L2	4	25.0	0.003	5.8	LOS A	0.0	0.0	0.00	0.57	52.6
8	T1	144	9.7	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		148	10.1	0.079	0.2	NA	0.0	0.0	0.00	0.02	97.9
All Vehicles		661	7.1	0.251	3.8	NA	1.1	7.7	0.17	0.34	66.8

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

MOVEMENT SUMMARY

Site: [Intersection 3 - TOTAL 2041 AM_Shifting changing days]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	143	3.5	0.202	6.5	LOS A	0.8	6.1	0.36	0.63	52.4
3	R2	82	14.6	0.202	7.3	LOS A	0.8	6.1	0.36	0.63	51.4
Approach		225	7.6	0.202	6.8	LOS A	0.8	6.1	0.36	0.63	52.0
East: Dysart Rd_East											
4	L2	82	15.9	0.170	7.8	LOS A	0.0	0.0	0.00	0.18	71.8
5	T1	228	4.8	0.170	0.0	LOS A	0.0	0.0	0.00	0.18	85.6
Approach		310	7.7	0.170	2.1	NA	0.0	0.0	0.00	0.18	81.4
West: Peak Downs Mine Entrance											
11	T1	22	4.5	0.020	6.6	LOS A	0.1	0.5	0.27	0.79	80.6
12	R2	10	10.0	0.020	8.3	LOS A	0.1	0.5	0.27	0.79	60.5
Approach		32	6.3	0.020	7.1	NA	0.1	0.5	0.27	0.79	73.0
All Vehicles		567	7.6	0.202	4.2	NA	0.8	6.1	0.16	0.39	66.2

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

MOVEMENT SUMMARY

Site: [Intersection 3 - TOTAL 2041 PM_Shifting changing days]

Dysart Rd / Peak Downs Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
1	L2	60	8.3	0.155	6.0	LOS A	0.6	4.4	0.27	0.62	52.3
3	R2	94	11.7	0.155	7.6	LOS A	0.6	4.4	0.27	0.62	51.6
Approach		154	10.4	0.155	7.0	LOS A	0.6	4.4	0.27	0.62	51.8
East: Dysart Rd_East											
4	L2	80	18.8	0.104	7.4	LOS A	0.0	0.0	0.00	0.29	65.1
5	T1	102	9.8	0.104	0.0	LOS A	0.0	0.0	0.00	0.29	77.3
Approach		182	13.7	0.104	3.3	NA	0.0	0.0	0.00	0.29	71.4
West: Peak Downs Mine Entrance											
11	T1	141	9.9	0.139	8.4	LOS A	0.6	4.2	0.25	0.95	77.9
12	R2	91	3.3	0.139	7.6	LOS A	0.6	4.2	0.25	0.95	59.4
Approach		232	7.3	0.139	8.1	NA	0.6	4.2	0.25	0.95	69.4
All Vehicles		568	10.2	0.155	6.2	NA	0.6	4.4	0.17	0.65	64.1

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

MOVEMENT SUMMARY

Site: [Intersection 4 - TOTAL 2041 AM_Shifting changing days]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	4	0.0	0.137	6.5	LOS A	0.5	4.1	0.55	0.77	50.1
23	R2	68	16.2	0.137	10.7	LOS B	0.5	4.1	0.55	0.77	49.3
Approach		72	15.3	0.137	10.5	LOS B	0.5	4.1	0.55	0.77	49.3
NorthEast: Peak Downs Hwy_North											
24	L2	348	10.1	0.201	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	220	9.1	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
Approach		568	9.7	0.201	3.5	NA	0.0	0.0	0.00	0.35	64.9
SouthWest: Peak Downs Hwy_South											
31	T1	60	26.7	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
32	R2	3	0.0	0.004	8.2	LOS A	0.0	0.1	0.52	0.63	51.1
Approach		63	25.4	0.036	0.4	NA	0.0	0.1	0.02	0.03	95.6
All Vehicles		703	11.7	0.201	3.9	NA	0.5	4.1	0.06	0.37	64.7

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

MOVEMENT SUMMARY

Site: [Intersection 4 - TOTAL 2041 PM_Shifting changing days]

Peak Downs Hwy / Dysart Rd
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd											
21	L2	8	0.0	0.335	6.4	LOS A	1.7	12.4	0.55	0.81	50.3
23	R2	203	6.4	0.335	10.3	LOS B	1.7	12.4	0.55	0.81	49.8
Approach		211	6.2	0.335	10.1	LOS B	1.7	12.4	0.55	0.81	49.8
NorthEast: Peak Downs Hwy_North											
24	L2	189	10.6	0.109	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
25	T1	86	12.8	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		275	11.3	0.109	3.9	NA	0.0	0.0	0.00	0.39	62.2
SouthWest: Peak Downs Hwy_South											
31	T1	192	15.6	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
32	R2	9	11.1	0.009	6.8	LOS A	0.0	0.3	0.37	0.58	51.6
Approach		201	15.4	0.108	0.3	NA	0.0	0.3	0.02	0.03	59.5
All Vehicles		687	10.9	0.335	4.8	NA	1.7	12.4	0.17	0.42	57.1

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

MOVEMENT SUMMARY

Site: [Intersection 5 - TOTAL 2041 AM_Shifting changing days]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	68	22.1	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	40	10.0	0.034	6.1	LOS A	0.1	1.0	0.25	0.57	52.0
Approach		108	17.6	0.040	2.3	NA	0.1	1.0	0.09	0.21	74.5
NorthWest: Moranbah											
27	L2	154	5.8	0.763	10.4	LOS B	13.4	99.3	0.61	0.86	48.1
29	R2	501	7.6	0.763	13.9	LOS B	13.4	99.3	0.61	0.86	47.8
Approach		655	7.2	0.763	13.1	LOS B	13.4	99.3	0.61	0.86	47.9
SouthWest: Peak Downs Hwy_South											
30	L2	64	9.4	0.037	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	66	33.3	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		130	21.5	0.041	2.8	NA	0.0	0.0	0.00	0.28	69.7
All Vehicles		893	10.5	0.763	10.3	NA	13.4	99.3	0.46	0.70	52.6

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

MOVEMENT SUMMARY

Site: [Intersection 5 - TOTAL 2041 PM_Shifting changing days]

Peak Downs Hwy / Moranbah
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Peak Downs Hwy_North											
25	T1	74	18.9	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
26	R2	173	6.4	0.193	7.8	LOS A	0.8	5.9	0.50	0.73	51.1
Approach		247	10.1	0.193	5.5	NA	0.8	5.9	0.35	0.51	59.9
NorthWest: Moranbah											
27	L2	96	18.8	0.448	7.4	LOS A	2.8	21.8	0.36	0.72	48.9
29	R2	196	7.1	0.448	13.0	LOS B	2.8	21.8	0.36	0.72	49.1
Approach		292	11.0	0.448	11.2	LOS B	2.8	21.8	0.36	0.72	49.1
SouthWest: Peak Downs Hwy_South											
30	L2	331	9.7	0.191	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
31	T1	56	41.1	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		387	14.2	0.191	4.9	NA	0.0	0.0	0.00	0.49	57.0
All Vehicles		926	12.1	0.448	7.0	NA	2.8	21.8	0.20	0.57	54.9

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

MOVEMENT SUMMARY

Site: [Intersection A - TOTAL 2041 AM_Shifting changing days]

Dysart Rd / Proposed Saraji East Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	186	5.9	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	99.9
3	R2	37	8.1	0.029	5.9	LOS A	0.1	0.9	0.20	0.56	52.2
Approach		223	6.3	0.099	1.0	NA	0.1	0.9	0.03	0.09	86.8
East: Saraji Mine Entrance											
4	L2	37	8.1	0.090	5.9	LOS A	0.3	2.7	0.20	0.58	52.1
6	R2	40	15.0	0.090	8.4	LOS A	0.3	2.7	0.20	0.58	51.6
Approach		77	11.7	0.090	7.2	LOS A	0.3	2.7	0.20	0.58	51.9
North: Dysart Rd_North											
7	L2	40	15.0	0.024	5.7	LOS A	0.0	0.0	0.00	0.57	53.0
8	T1	53	17.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		93	16.1	0.030	2.5	NA	0.0	0.0	0.00	0.25	72.3
All Vehicles		393	9.7	0.099	2.6	NA	0.3	2.7	0.06	0.22	73.6

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

MOVEMENT SUMMARY

Site: [Intersection A - TOTAL 2041 PM_Shifting changing days]

Dysart Rd / Proposed Saraji East Mine Entrance
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dysart Rd_South											
2	T1	114	8.8	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
3	R2	37	8.1	0.032	6.3	LOS A	0.1	0.9	0.28	0.58	52.0
Approach		151	8.6	0.062	1.5	NA	0.1	0.9	0.07	0.14	81.5
East: Saraji Mine Entrance											
4	L2	37	8.1	0.093	6.2	LOS A	0.4	2.7	0.33	0.60	52.0
6	R2	40	15.0	0.093	8.4	LOS A	0.4	2.7	0.33	0.60	51.5
Approach		77	11.7	0.093	7.4	LOS A	0.4	2.7	0.33	0.60	51.7
North: Dysart Rd_North											
7	L2	40	15.0	0.024	5.7	LOS A	0.0	0.0	0.00	0.57	53.0
8	T1	130	8.5	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	100.0
Approach		170	10.0	0.070	1.4	NA	0.0	0.0	0.00	0.13	82.6
All Vehicles		398	9.8	0.093	2.6	NA	0.4	2.7	0.09	0.23	73.7

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

MOVEMENT SUMMARY

Site: [LC-1 Lake Vermont Rd_Rail crossing 2022 AM Peak_Ordinary]

Existing Lake Vermont Road / Norwich Park Branch Rail Line Open Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Lake Vermont Rd (E)											
8	T1	8	75.0	0.007	2.6	LOS A	0.5	6.1	0.04	0.03	88.3
Approach		8	75.0	0.007	2.6	LOS A	0.5	6.1	0.04	0.03	88.3
West: Lake Vermont Rd (W)											
2	T1	9	55.6	0.007	2.6	LOS A	0.6	6.1	0.04	0.03	88.3
Approach		9	55.6	0.007	2.6	LOS A	0.6	6.1	0.04	0.03	88.3
All Vehicles		18	64.7	0.007	2.6	LOS A	0.6	6.1	0.04	0.03	88.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	1	1815.7	LOS F	29.7	29.7	1.01	1.01
All Pedestrians		1	1815.7	LOS F			1.01	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-1 Lake Vermont Rd_Rail crossing 2022 PM Peak_Ordinary]

Existing Lake Vermont Road / Norwich Park Branch Rail Line Open Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Lake Vermont Rd (E)											
8	T1	25	50.0	0.019	2.6	LOS A	1.6	16.0	0.04	0.03	88.1
Approach		25	50.0	0.019	2.6	LOS A	1.6	16.0	0.04	0.03	88.1
West: Lake Vermont Rd (W)											
2	T1	7	71.4	0.006	2.6	LOS A	0.5	5.2	0.04	0.03	88.3
Approach		7	71.4	0.006	2.6	LOS A	0.5	5.2	0.04	0.03	88.3
All Vehicles		33	54.8	0.019	2.6	LOS A	1.6	16.0	0.04	0.03	88.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	1	1815.7	LOS F	29.7	29.7	1.01	1.01
All Pedestrians		1	1815.7	LOS F			1.01	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-2 Dysart Rd_Rail crossing 2022 AM Peak_Shift changing]

Existing Dysart Road / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd (SE)											
2	T1	66	44.4	0.045	3.1	LOS A	4.6	44.7	0.05	0.04	74.9
Approach		66	44.4	0.045	3.1	LOS A	4.6	44.7	0.05	0.04	74.9
NorthWest: Dysart Rd (NW)											
8	T1	309	16.3	0.181	3.6	LOS A	25.0	199.4	0.05	0.05	74.1
Approach		309	16.3	0.181	3.6	LOS A	25.0	199.4	0.05	0.05	74.1
All Vehicles		376	21.3	0.181	3.5	LOS A	25.0	199.4	0.05	0.05	74.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	SouthEast Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-2 Dysart Rd_Rail crossing 2022 PM Peak_Shift changing]

Existing Dysart Road / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd (SE)											
2	T1	187	16.9	0.110	3.5	LOS A	14.4	115.0	0.05	0.05	74.2
Approach		187	16.9	0.110	3.5	LOS A	14.4	115.0	0.05	0.05	74.2
NorthWest: Dysart Rd (NW)											
8	T1	176	21.6	0.106	3.5	LOS A	13.4	111.2	0.05	0.05	74.3
Approach		176	21.6	0.106	3.5	LOS A	13.4	111.2	0.05	0.05	74.3
All Vehicles		363	19.1	0.110	3.5	LOS A	14.4	115.0	0.05	0.05	74.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	SouthEast Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-A Proposed Access_Rail crossing 2022 AM Peak_Ordinary / Shift changing]

Proposed Access B / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Proposed Access B (E)											
8	T1	74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
Approach		74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
West: Proposed Access B (W)											
2	T1	74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
Approach		74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
All Vehicles		147	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-A Proposed Access_Rail crossing 2022 PM Peak_Ordinary / Shift changing]

Proposed Access B / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Proposed Access B (E)											
8	T1	74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
Approach		74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
West: Proposed Access B (W)											
2	T1	74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
Approach		74	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8
All Vehicles		147	62.9	0.055	3.2	LOS A	5.2	55.9	0.05	0.04	70.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-1 Lake Vermont Rd_Rail crossing 2024 AM Peak_Ordinary]

Existing Lake Vermont Road / Norwich Park Branch Rail Line Open Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Lake Vermont Rd (E)											
8	T1	14	84.6	0.012	2.6	LOS A	0.9	10.4	0.04	0.03	88.2
Approach		14	84.6	0.012	2.6	LOS A	0.9	10.4	0.04	0.03	88.2
West: Lake Vermont Rd (W)											
2	T1	15	71.4	0.012	2.6	LOS A	0.9	10.4	0.04	0.03	88.2
Approach		15	71.4	0.012	2.6	LOS A	0.9	10.4	0.04	0.03	88.2
All Vehicles		28	77.8	0.012	2.6	LOS A	0.9	10.4	0.04	0.03	88.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	1	1815.7	LOS F	29.7	29.7	1.01	1.01
All Pedestrians		1	1815.7	LOS F			1.01	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-1 Lake Vermont Rd_Rail crossing 2024 PM Peak_Ordinary]

Existing Lake Vermont Road / Norwich Park Branch Rail Line Open Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Lake Vermont Rd (E)											
8	T1	31	58.6	0.023	2.6	LOS A	1.9	20.4	0.04	0.03	88.1
Approach		31	58.6	0.023	2.6	LOS A	1.9	20.4	0.04	0.03	88.1
West: Lake Vermont Rd (W)											
2	T1	13	83.3	0.011	2.6	LOS A	0.8	9.5	0.04	0.03	88.2
Approach		13	83.3	0.011	2.6	LOS A	0.8	9.5	0.04	0.03	88.2
All Vehicles		43	65.9	0.023	2.6	LOS A	1.9	20.4	0.04	0.03	88.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	1	1815.7	LOS F	29.7	29.7	1.01	1.01
All Pedestrians		1	1815.7	LOS F			1.01	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-2 Dysart Rd_Rail crossing 2024 AM Peak_Shift changing]

Existing Dysart Road / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd (SE)											
2	T1	108	36.9	0.071	3.2	LOS A	7.8	71.5	0.05	0.04	74.7
Approach		108	36.9	0.071	3.2	LOS A	7.8	71.5	0.05	0.04	74.7
NorthWest: Dysart Rd (NW)											
8	T1	357	17.1	0.210	3.7	LOS A	29.8	239.3	0.06	0.05	73.9
Approach		357	17.1	0.210	3.7	LOS A	29.8	239.3	0.06	0.05	73.9
All Vehicles		465	21.7	0.210	3.6	LOS A	29.8	239.3	0.05	0.05	74.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	SouthEast Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-2 Dysart Rd_Rail crossing 2024 PM Peak_Shift changing]

Existing Dysart Road / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd (SE)											
2	T1	233	18.1	0.138	3.6	LOS A	18.4	148.5	0.05	0.05	74.1
Approach		233	18.1	0.138	3.6	LOS A	18.4	148.5	0.05	0.05	74.1
NorthWest: Dysart Rd (NW)											
8	T1	221	22.4	0.134	3.6	LOS A	17.4	145.1	0.05	0.05	74.1
Approach		221	22.4	0.134	3.6	LOS A	17.4	145.1	0.05	0.05	74.1
All Vehicles		454	20.2	0.138	3.6	LOS A	18.4	148.5	0.05	0.05	74.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	SouthEast Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-A Proposed Access_Rail crossing 2024 PM Peak_Ordinary / Shift changing]

Proposed Access B / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Proposed Access B (E)											
8	T1	151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
Approach		151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
West: Proposed Access B (W)											
2	T1	151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
Approach		151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
All Vehicles		301	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-A Proposed Access_Rail crossing 2024 AM Peak_Ordinary / Shift changing]

Proposed Access B / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Proposed Access B (E)											
8	T1	151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
Approach		151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
West: Proposed Access B (W)											
2	T1	151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
Approach		151	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4
All Vehicles		301	39.9	0.100	3.3	LOS A	11.1	104.4	0.05	0.04	70.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-1 Lake Vermont Rd_Rail crossing 2041 AM Peak_Ordinary]

Existing Lake Vermont Road / Norwich Park Branch Rail Line Open Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Lake Vermont Rd (E)											
8	T1	3	33.3	0.002	2.6	LOS A	0.2	1.8	0.04	0.03	88.3
Approach		3	33.3	0.002	2.6	LOS A	0.2	1.8	0.04	0.03	88.3
West: Lake Vermont Rd (W)											
2	T1	5	0.0	0.003	2.6	LOS A	0.3	2.3	0.04	0.03	88.3
Approach		5	0.0	0.003	2.6	LOS A	0.3	2.3	0.04	0.03	88.3
All Vehicles		8	12.5	0.003	2.6	LOS A	0.3	2.3	0.04	0.03	88.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	1	1815.7	LOS F	29.7	29.7	1.01	1.01
All Pedestrians		1	1815.7	LOS F			1.01	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-1 Lake Vermont Rd_Rail crossing 2041 PM Peak_Ordinary]

Existing Lake Vermont Road / Norwich Park Branch Rail Line Open Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Lake Vermont Rd (E)											
8	T1	25	37.5	0.017	2.6	LOS A	1.6	14.8	0.04	0.03	88.2
Approach		25	37.5	0.017	2.6	LOS A	1.6	14.8	0.04	0.03	88.2
West: Lake Vermont Rd (W)											
2	T1	2	0.0	0.001	2.6	LOS A	0.1	0.9	0.04	0.03	88.3
Approach		2	0.0	0.001	2.6	LOS A	0.1	0.9	0.04	0.03	88.3
All Vehicles		27	34.6	0.017	2.6	LOS A	1.6	14.8	0.04	0.03	88.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	1	1815.7	LOS F	29.7	29.7	1.01	1.01
All Pedestrians		1	1815.7	LOS F			1.01	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-2 Dysart Rd_Rail crossing 2041 AM Peak_Shift changing]

Existing Dysart Road / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd (SE)											
2	T1	75	15.5	0.044	3.1	LOS A	5.2	41.2	0.05	0.04	74.9
Approach		75	15.5	0.044	3.1	LOS A	5.2	41.2	0.05	0.04	74.9
NorthWest: Dysart Rd (NW)											
8	T1	369	10.0	0.208	3.7	LOS A	30.8	234.1	0.06	0.05	73.9
Approach		369	10.0	0.208	3.7	LOS A	30.8	234.1	0.06	0.05	73.9
All Vehicles		444	10.9	0.208	3.6	LOS A	30.8	234.1	0.05	0.05	74.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	SouthEast Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-2 Dysart Rd_Rail crossing 2041 PM Peak_Shift changing]

Existing Dysart Road / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Dysart Rd (SE)											
2	T1	221	6.2	0.122	3.6	LOS A	17.1	126.4	0.05	0.05	74.2
Approach		221	6.2	0.122	3.6	LOS A	17.1	126.4	0.05	0.05	74.2
NorthWest: Dysart Rd (NW)											
8	T1	207	10.7	0.117	3.5	LOS A	16.0	122.3	0.05	0.05	74.2
Approach		207	10.7	0.117	3.5	LOS A	16.0	122.3	0.05	0.05	74.2
All Vehicles		428	8.4	0.122	3.6	LOS A	17.1	126.4	0.05	0.05	74.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	SouthEast Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-A Proposed Access_Rail crossing 2041 AM Peak_Ordinary / Shift changing]

Proposed Access B / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Proposed Access B (E)											
8	T1	82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
Approach		82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
West: Proposed Access B (W)											
2	T1	82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
Approach		82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
All Vehicles		164	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: [LC-A Proposed Access_Rail crossing 2041 PM Peak_Ordinary / Shift changing]

Proposed Access B / Norwich Park Branch Level Crossing
Pedestrian Crossing (Signals) - Fixed Time Isolated Cycle Time = 3600 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Proposed Access B (E)											
8	T1	82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
Approach		82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
West: Proposed Access B (W)											
2	T1	82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
Approach		82	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9
All Vehicles		164	12.8	0.047	3.1	LOS A	5.7	44.5	0.05	0.04	70.9

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

Movement Performance - Pedestrians

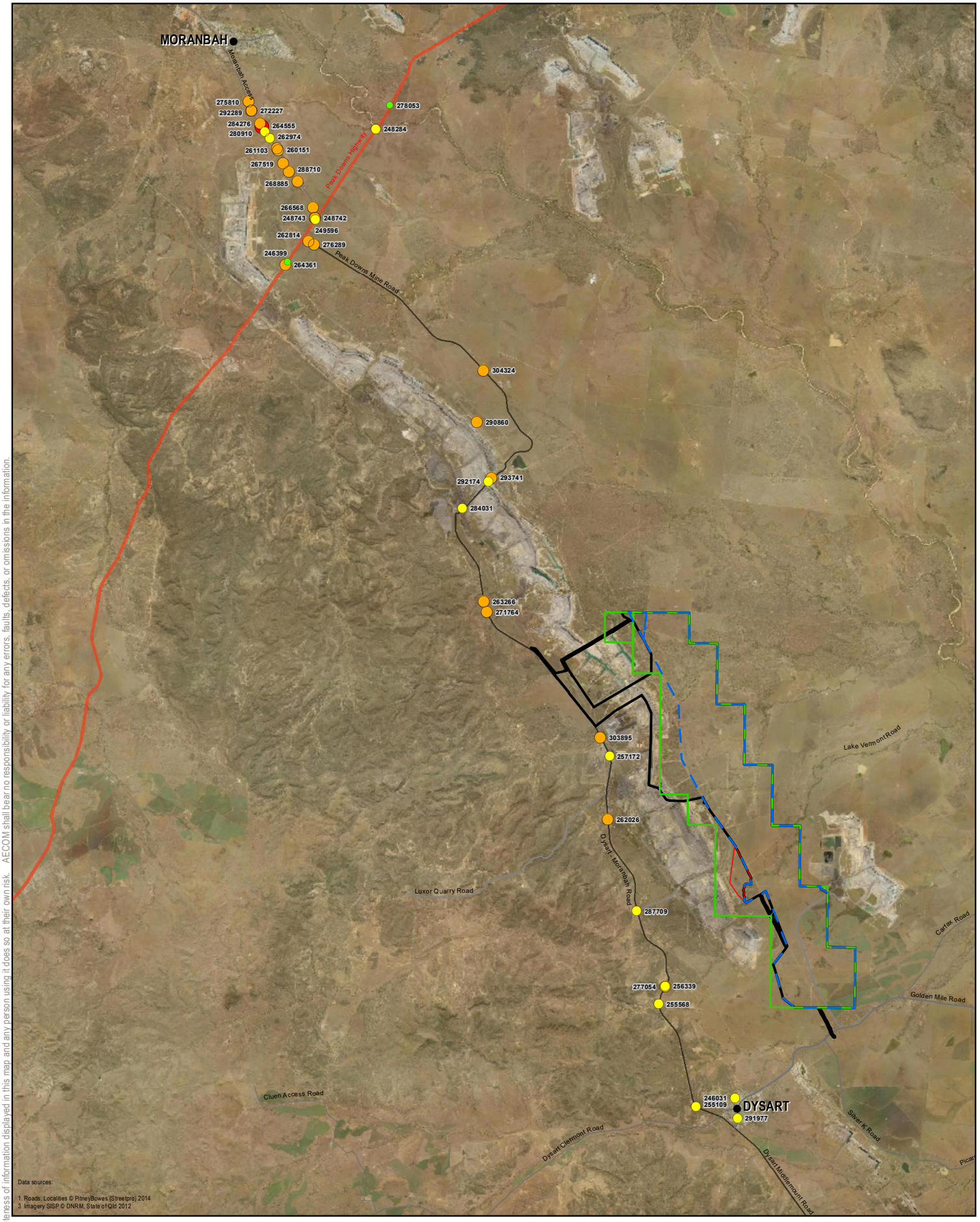
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	West Full Crossing	53	3588.0	LOS F	2931.2	2931.2	2.00	2.00
All Pedestrians		53	3588.0	LOS F			2.00	2.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Appendix F

Crash Data



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LEGEND

- Project Site
- Exploration Permit Coal (EPC)
- Mining Lease (ML)
- Mining Lease Application (MLA)
- Locality
- Highway
- Major Road
- Other Road

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury

N

Figure 1
Crash Data

Environmental Impact Statement
Saraji East Mining Lease Project

0 1.5 3 6
Kilometres

Scale: 1:300,000 (when printed at A4)

Projection: Map Grid of Australia - Zone 55 (GDA94)

BMA
BHP Mitsubishi Alliance

DATE: 12/04/2023 VERSION: 0

Filename: L:\Secure\Projects\605X\60507031\4. Tech Work Area\4.98 GIS 2021\02_MXDs\01 Environmental Impact Statement\14 Transport and Traffic\60507031_G221_v1_A4P.mxd

Saraji East Mining Lease Project
Accident data (June 2012 to June 2017) in Study Area

Crash_Year	Crash_Month	Crash_Day_Of_Week	Crash_Hour	Crash_Street	Crash_Nature	Crash_Type	Crash_Severity	Crash_DCA_Description	Crash_DCA_Group_Description
2012	June	Wednesday	5	Hannah Cres	Hit pedestrian	Hit pedestrian	Medical treatment	Ped'N: Hit Facing Traffic	Pedestrian
2012	June	Sunday	19	Peak Downs Hwy	Hit object	Single Vehicle	Minor injury	Off Path-Straight:Right Off Cway Hit Obj	Off carriageway on straight hit object
2012	August	Tuesday	7	Peak Downs Hwy	Hit object	Single Vehicle	Medical treatment	Off Path-Straight:Right Off Cway Hit Obj	Off carriageway on straight hit object
2012	August	Tuesday	5	Moranbah Access Rd	Rear-end	Multi-Vehicle	Hospitalisation	Veh'S Same Direction: Rear End	Rear-end
2012	August	Tuesday	5	Moranbah Access Rd	Rear-end	Multi-Vehicle	Hospitalisation	Veh'S Same Direction: Rear End	Rear-end
2012	September	Wednesday	4	Moranbah Access Rd	Hit object	Single Vehicle	Medical treatment	Off Path-Curve: Off Cway Lt Bend Hit Obj	Off carriageway on curve hit object
2013	March	Tuesday	6	Peak Downs - Dysart Rd	Rear-end	Multi-Vehicle	Medical treatment	Veh'S Same Direction: Rear End	Rear-end
2013	March	Monday	15	Peak Downs - Dysart Rd	Overturned	Single Vehicle	Medical treatment	Off Path-Curve: Other	Other
2013	April	Wednesday	6	Peak Downs - Dysart Rd	Rear-end	Multi-Vehicle	Medical treatment	Veh'S Same Direction: Rear End	Rear-end
2013	May	Thursday	14	Peak Downs - Dysart Rd	Hit object	Single Vehicle	Medical treatment	Veh'S On Path: Temporary Object On C'Way	Other
2013	July	Monday	18	Moranbah Access Rd	Hit animal	Other	Hospitalisation	Pass & Misc: Hit Animal	Hit animal
2013	August	Friday	0	Moranbah Access Rd	Hit object	Single Vehicle	Hospitalisation	Off Path-Straight: Other	Other
2013	September	Tuesday	22	Peak Downs - Dysart Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Straight: Other	Other
2013	October	Wednesday	18	Peak Downs - Dysart Rd	Hit object	Single Vehicle	Hospitalisation	Veh'S Overtaking: Out Of Control	Off carriageway on straight
2013	October	Monday	18	Moranbah Access Rd	Fall from vehicle	Single Vehicle	Medical treatment	Pass & Misc: Fell In/From Vehicle	Other
2013	October	Tuesday	4	Peak Downs - Dysart Rd	Hit object	Single Vehicle	Hospitalisation	Veh'S Overtaking: Other	Other
2013	November	Saturday	17	Peak Downs Hwy	Overturned	Single Vehicle	Hospitalisation	Off Path-Straight:Right Off Cway Hit Obj	Off carriageway on straight hit object
2013	November	Friday	17	Moranbah Access Rd	Overturned	Single Vehicle	Medical treatment	Off Path-Straight:Right Off Cway Hit Obj	Off carriageway on straight hit object
2014	January	Friday	21	Moranbah Access Rd	Head-on	Multi-Vehicle	Hospitalisation	Veh'S Opposite Approach: Head On	Head-on
2014	February	Saturday	22	Moranbah Access Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Straight: Right Off Cway	Off carriageway on straight
2014	April	Tuesday	23	Moranbah Access Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Straight:Out Of Control On Cway	Out of control on straight
2014	June	Friday	2	Peak Downs - Dysart Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Left Bend	Off carriageway on curve
2014	July	Thursday	9	Moranbah Access Rd	Hit object	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Rt Bend Hit Obj	Off carriageway on curve hit object
2014	October	Wednesday	21	Invalid Street From Police	Hit animal	Other	Hospitalisation	Pass & Misc: Hit Animal	Hit animal
2014	October	Wednesday	5	Peak Downs - Dysart Rd	Angle	Multi-Vehicle	Hospitalisation	Veh'S Same Direction: Right Turn S/Swipe	Parallel lanes turning
2014	November	Thursday	18	Peak Downs - Dysart Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Right Bend	Off carriageway on curve
2014	December	Thursday	23	Peak Downs Hwy	Overturned	Single Vehicle	Minor injury	Off Path-Straight:Out Of Control On Cway	Out of control on straight
2015	March	Friday	4	Moranbah Access Rd	Head-on	Multi-Vehicle	Fatal	Veh'S Opposite Approach: Head On	Head-on
2015	June	Wednesday	5	Peak Downs - Dysart Rd	Rear-end	Multi-Vehicle	Medical treatment	Veh'S Same Direction: Rear End	Rear-end
2015	June	Friday	16	Moranbah Access Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Straight: Left Off Cway	Off carriageway on straight
2015	October	Wednesday	5	Peak Downs - Dysart Rd	Rear-end	Multi-Vehicle	Medical treatment	Veh'S Same Direction: Rear End	Rear-end
2015	November	Friday	5	Moranbah Access Rd	Hit object	Single Vehicle	Hospitalisation	Off Path-Straight:Right Off Cway Hit Obj	Off carriageway on straight hit object
2016	January	Friday	11	Peak Downs - Dysart Rd	Overturned	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Right Bend	Off carriageway on curve
2016	February	Saturday	21	Beardmore Cres	Hit object	Single Vehicle	Medical treatment	Off Path-Straight:Right Off Cway Hit Obj	Off carriageway on straight hit object
2016	February	Friday	7	Peak Downs - Dysart Rd	Hit object	Single Vehicle	Medical treatment	Off Path-Straight: Other	Other
2016	February	Monday	17	Moranbah Access Rd	Hit object	Single Vehicle	Hospitalisation	Off Path-Curve: Off Cway Rt Bend Hit Obj	Off carriageway on curve hit object
2016	April	Tuesday	16	Peak Downs - Dysart Rd	Rear-end	Multi-Vehicle	Hospitalisation	Veh'S Same Direction: Rear End	Rear-end
2017	February	Thursday	5	Peak Downs - Dysart Rd	Hit object	Single Vehicle	Hospitalisation	Off Path-Straight: Left Off Cway Hit Obj	Off carriageway on straight hit object
2017	February	Wednesday	6	Peak Downs - Dysart Rd	Hit object	Single Vehicle	Hospitalisation	Off Path-Straight: Left Off Cway Hit Obj	Off carriageway on straight hit object

Appendix G

Level Crossing Concept Design

Prepared for
BMA Alliance Coal Operations Pty Ltd
ABN: 67 096 412 752

Rail Interface Concept Design

01-Apr-2022
Saraji East Mining Lease Project
Doc No. REP-00001

aecom.com

Delivering a better world

Rail Interface Concept Design

Client: BMA Alliance Coal Operations Pty Ltd

ABN: 67 096 412 752

Prepared by

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01-Apr-2022

Job No.: 60676090

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Quality Information

Document Rail Interface Concept Design

Ref 60676090

Date 01-Apr-2022

Prepared by Matthew Huff

Reviewed by Alan Bolton

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
B	01-Apr-2022	Final Issue	Chris Brown Project Manager	

Table of Contents

1.0 Executive Summary 1
2.0 Project Overview 2
2.1 Project Background 2
2.2 Purpose of the Report 4
2.3 Referenced Data 4
2.4 Abbreviations 4
2.5 Limitations 4
2.6 Exclusions 4
2.7 Assumptions 5
3.0 Target Design Criteria 6
3.1 General Criteria 6
3.2 Cross Section 6
3.3 Intersection 7
3.4 Rail Level Crossing 8
4.0 Mine Access Location 9
4.1 Alignment Constraints 9
4.2 Short Stacking Assessment 11
4.3 Horizontal Alignment Shift 12
5.0 Intersection Development 12
6.0 Concept Cost Estimate 13
7.0 Conclusions 14
8.0 Recommendations 14

Appendix A
Concept Drawings A

Appendix B
Concept Cost Estimate B

1.0 Executive Summary

AECOM Australia Pty Ltd was engaged by BMA Coal Alliance Operations Pty Ltd (BMA) to undertake a concept design for a rail level crossing for a proposed new access to the Saraji Mine. The concept design was undertaken in response to the Queensland Department of Transport and Main Roads (TMR) queries to a broader Environmental Impact Statement (EIS) for the Saraji East Mining Lease expansion project. The TMR queries specific to this report related to the geometric requirements for safe operation of a rail level crossing by demonstrating that there is space between the existing roadway (Saraji Road) and the existing rail line (Goonyella System Rail line) to facilitate safe storage and turning paths for vehicles at the intersection and rail crossing.

The concept design was undertaken in two phases; identifying a suitable access location in the vicinity of the location nominated in the EIS and preparing a concept design for the intersection. The initial phase to identify a suitable location highlighted that there was insufficient space between the existing roadway and rail line to accommodate traffic stopped at a rail level crossing (referred to as “short stacking by TMR). To meet current road design standards, the existing roadway would need to incorporate a horizontal shift to the west of approximately 10m. This shift can be accommodated within the existing road reserve.

The design undertaken for the intersection is only at a concept level and a series of recommendations, including topographic survey, has been made to assist the progression of this project through to subsequent stages of design.

2.0 Project Overview

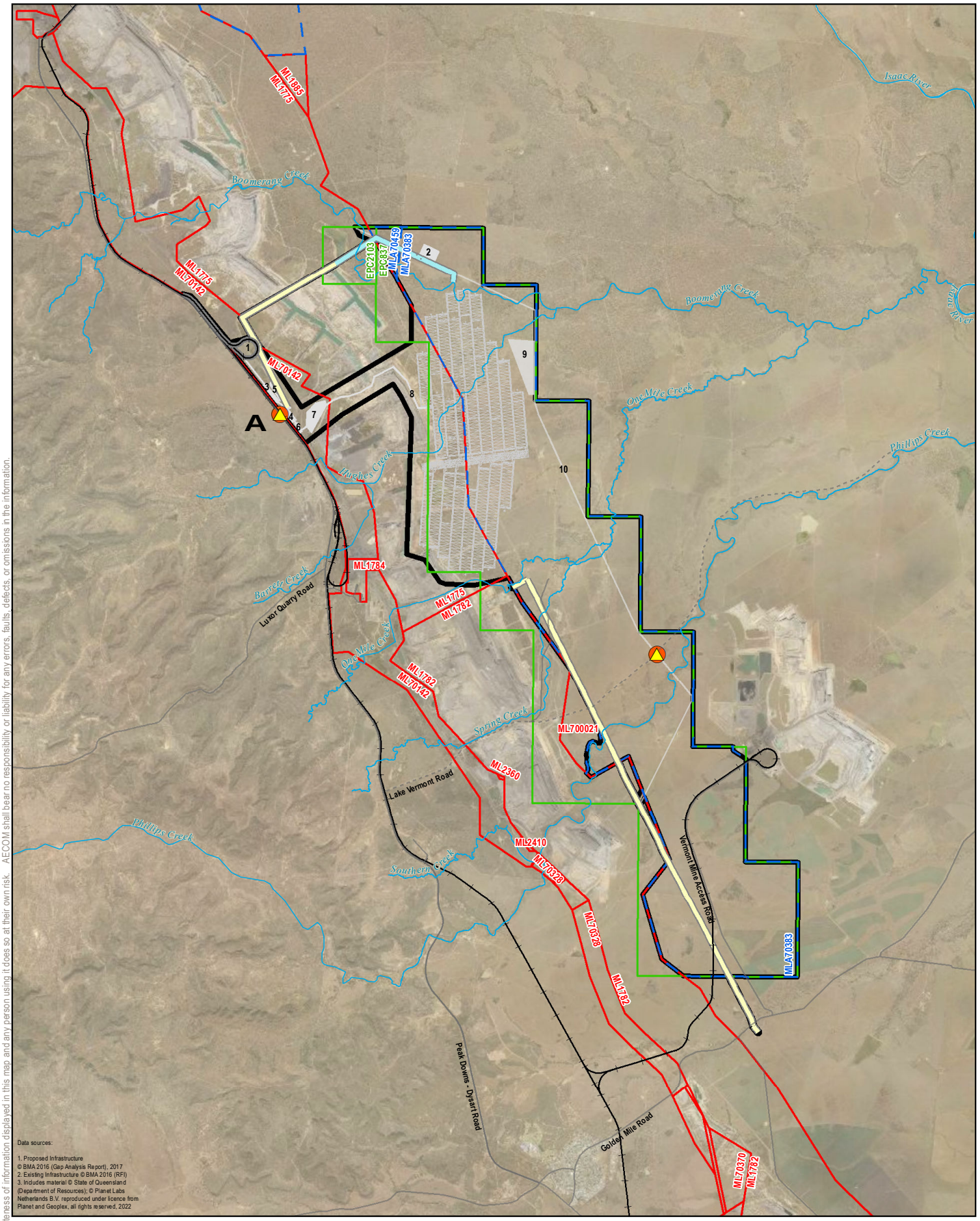
2.1 Project Background

The project is a greenfield single-seam underground mine development located in the Bowen Basin, approximately 30 kilometres (km) north of Dysart, and has the capacity to produce up to eight million tonnes per annum of product coal.

Recently the Saraji East Mining Lease Project (the project) Environmental Impact Statement (EIS) was publicly notified as a part of the process to allow an Environmental Authority (EA) to be granted for the Mining Lease Applications (MLA) 70383 and MLA 70459.

The project incorporated a new access to the mine from Saraji Road and crossed the Goonyella System Rail Line (refer to proposed Access Point A in Figure 1). During the EIS public notification period the Department of Transport and Main Roads (DTMR) made a submission which BMA will respond to through a revised EIS. DTMR have requested the supply of the following additional design information:

- Demonstrate sufficient clearance between each railway level crossing and the relevant intersection/vehicular access location to allow the maximum size of vehicle used in the operation to queue. The minimum clearance required is the design vehicle plus a safety factor of 5 metres (m) from the edge running rail (of the closest railway track) as per Section 5.4 – Short Stacking and Figure 3.2 – Yellow Box Marking of AS1742.7:2016 Manual of Uniform Traffic Control Devices, Part 7: Railway plus the length of the maximum design vehicle.
- Provide a plan accurately showing the available clearance between the railway level crossing and relevant intersection/access point and demonstrate how the maximum vehicle length can be accommodated along with the 5m setback from the closest track. Additionally, the vehicle must not encroach on any safety controls, such as pavement marking (for example, box marking), for the railway level crossing or road.
- Provide a RPEQ certified swept path analysis based on the maximum design vehicle for turns in and out of the railway level crossing. Over-dimensional Road Loads: Under the Transport Infrastructure (Rail) Regulation 2006, permission from the Railway Manager (Aurizon) is required to take over-dimensional road loads across Aurizon Infrastructure (e.g. rail level crossings). Further information can be obtained from Aurizon's website at: https://www.aurizon.com.au/what-we-deliver/network/over-dimensional-road-loads



Data sources:

1. Proposed Infrastructure
© BMA 2016 (Gap Analysis Report), 2017
2. Existing Infrastructure © BMA 2016 (RFI)
3. Includes material © State of Queensland (Department of Resources); © Planet Labs Netherlands B.V. reproduced under licence from Planet and Geoplex, all rights reserved, 2022

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LEGEND

- Project Site
- Exploration Permit Coal (EPC)
- Mining Lease (ML)
- Mining Lease Application (MLA)
- Underground Mine Plan
- Surface Infrastructure
- Intersection Upgrade Locations
- Entry/Access points and crossings
- Existing Railway
- Private Access Road
- Public Road
- 66kV Powerline
- Pipeline
- Rail Loop
- Watercourse

Surface Infrastructure

1 Rail Loading Balloon Loop
2 Process Water Dam
3 Product Stockpiles
4 CHPP
5 Raw Water Dam
6 ROM Pad
7 Future MIA
8 Conveyor
9 Construction Village
10 Transport and Infrastructure Corridor

N

Figure 1
Mine Access and Intersection Upgrade Locations

Environmental Impact Statement
Saraji East Mining Lease Project

0 0.75 1.5 3
Kilometres

Scale: 1:158,094 (when printed at A4)

Projection: Map Grid of Australia - Zone 55 (GDA94)

BMA
BHP Mitsubishi Alliance

DATE: 16/05/2023 VERSION: 5

Filename: L:\Secure\Projects\605X\60507031\4. Tech Work Area\4.98 GIS 2021\02_MXDs\01 Environmental Impact Statement\03 Project Description\60507031_G080_v9_A4P_MineAccessAndIntersection.mxd

2.2 Purpose of the Report

The objective of this report is to record the concept design process undertaken for a new rail level crossing to the Saraji Mine Site to address the concerns raised by DTMR as part of the EIS process.

As this report is limited to concept design, a series of recommendations have been included to capture issues that need to be carried through to subsequent stages of design development.

2.3 Referenced Data

Table 1 Data Sources

Data Identifier	Source
Chainages	Queensland Globe
Cadastre	Queensland Globe

2.4 Abbreviations

Table 2 Abbreviations

Abbreviation	Description
DTMR	Queensland Department of Transport and Main Roads
AECOM	AECOM Australia Pty Ltd
IRC	Isaac Regional Council
IFC	Issued for Construction
MUTCD	Manual of Uniform Traffic Control Devices
MRTS	Main Road Technical Specification
PUP	Public Utility Plant
EIS	Environmental Impact Study

2.5 Limitations

The report and concept design has the following limitations:

- No survey was utilised for the concept design. The concept design is limited to only layout design overlaid on publicly available aerial imagery. In the absence of survey data, qualitative assessment regarding vertical geometry have been derived from available public imagery on Google Street view. A series of recommendations to progress the project into detailed design, including survey, have been included in Section 8.0 below.
- Cost estimates have been developed from recent experience and rates for similar projects. Project specific quotes have not been sourced for this report.

2.6 Exclusions

The project is limited to concept design and many of the items excluded need to be undertaken as the project progresses in a detailed design phase. These recommended items are captured in Section 8.0 below. Additionally, some of these items, including liaison with municipal authorities and traffic studies have been undertaken as part of the broader EIS project, however they are not pertinent to this report.

The following items have been excluded from the scope of this report:

- No traffic or hydraulic modelling has been undertaken for the project.
- No liaison with local municipal, road or rail authorities has been undertaken.

- No electrical design (lighting, rail signals) has been undertaken.
- No ALCAM assessment has been undertaken.
- No environmental investigations were included in the scope.
- No pavement design was included in the scope.
- No geotechnical investigations or design was included in the scope.

2.7 Assumptions

No intersection modelling has been undertaken as part of this works covered under this report. It was noted that the existing Saraji Mine Access 5.5km to the south of the proposed new access location has a very long right turn lane (650m) associated with it. It has been assumed that this has been designed to cater for traffic at shift changes and when the rail crossing is closed for a passing train. When assessing the suitability of a new access location, the new intersection was assumed to require the same sized intersection as the existing mine access to replicate the traffic storage requirements of shift change and when the rail crossing is closed for a passing train. Utilising the long right turn lane allows for a “worst case scenario” with regards to space proofing and assessing impacts to existing road and rail assets. This was particularly pertinent with the presence of the Hughes Creek bridge and other drainage structures. The length of turn lanes, road lighting and other items assumed for this report will be refined in the detailed design phase of the project.

The Concept Design assumes the following:

- The sizing of the intersection (auxiliary lane lengths) has been adopted from the existing access which is located 5.5 kilometres to the south of the proposed new intersection.
- The existing mine access intersection has a posted speed limit of 80km/h. This has been adopted for the proposed intersection.
- All works to be contained within the existing road reserve.
- The access will match the existing height of the rail crossing. No geometric changes proposed to the rail.

3.0 Target Design Criteria

3.1 General Criteria

The base design parameters for this project are displayed in Table 3.The project has been designed in accordance with TMR's Road Planning and Design Manual (RPDM). This is the standard for rural road design in Queensland. The RPDM is a strongly cross referenced with the Austroads Guide to Road Design (AGRD), which is why is has also been referenced in Table 3.

Table 3 Base Design Parameters

Criteria	Functional Characteristics (Specification)	Reference
519 Peak Downs – Dysart Road (Saraji Road)		
Road Authority	Isaac Regional Council	
Maintenance Operator	Isaac Regional Council	
Road Classification	Rural Arterial Road Class 3 – Route Classification C	IRC Road Register Table 4.2 AGRD Part 1
Design Speed	Intersection - 90 km/h Approaches – 110km/h	Assumed from posted speed at existing intersection.
Posted Speed	Intersection - 80 km/h Approaches – 100km/h	Assumed from posted speed at existing intersection.
Design Vehicle	36.5m (Type 1 Road Train)	Current Road Designation (Qld Globe 2- 3 -2021)
AADT	600 veh/day (2016 Count)	EIS Traffic Report
Land Tenure Considerations	Desirable to keep all works within the existing rad reserve.	
Active Transport Inclusions	Nil	Rural arterial road with no existing active transport facilities.
Parking	Nil	
Over Size / Over Mass Considerations	10m Wide Check Vehicle	This accounts for occasional deliveries of dump truck trays and bodies.
Flood Immunity	Out of Scope	
Road Lighting	Required for the intersection	Existing intersection is fully lit.

3.2 Cross Section

The cross-section design parameters for this project are displayed in Table 4. These cross-section parameters are standard for a rural road design in Queensland in line with the Road Planning and Design Manual and Austroads Guide to Road Design. Some of items such as Clear Zone width are calculated based on the general parameters listed above.

Table 4 Cross Section Criteria

Item	Functional Characteristics (Specification)	Reference
519 Peak Downs – Dysart Road (Saraji Road)		
Clear Zone Width	5.5m (Assumed batter slope of 1:5 to 1:4)	RPDM Part 6 – Table 6-2
Traffic Lane Width (excluding curve widening)	3.5m	RPDM Part 3– Clause 4.2.5 AGRD Part 3 – Table 4.3
Turn Lane Width (excluding curve widening)	3.5m	AGRD Part 3 Figure 4.31 AGRD Part 4A Figure 7.8 AGRD Part 4A Figure 8.6
Bicycle Lane Width (on-road)	N/A	AGRD Part 3 –Table 4.18
Shoulder Width	Minimum 0.5m	AGRD Part 3 Table 4.7
General Crossfall	3% (Bituminous sprayed seal)	AGRD Part 3 – Table 4.2
Maximum Superelevation	6%	AGRD Part 3 – Table 7.8
Pavement Extents	Full width pavement Asphalt required for the throat of the intersection.	
Side Roads		
Rail Crossing on side road. Deceleration distances for turning lanes to assume vehicles are to come to a complete stop to account for rail crossing.		

3.3 Intersection

With reference to the assumptions noted in Section 2.7 above. The geometry of the intersection has been adopted to align with the requirements of the existing mine access 5.5km to the south of proposed new location. The intersection has a channelised right turn with a painted median that is 650m long. This is a very long right turn lane on a rural intersection, and it is assumed that this is to address the traffic peaks created by shift change at the mine. The intersection also has a 160m long left turn auxiliary lane. The intersection has full road lighting.

3.4 Rail Level Crossing

The new rail crossing level crossing has been assumed to be signalised rail crossing with boom gates, as per the corresponding crossing to the south. Whilst there are various other criteria that are applied to rail level crossing, the concept design has focussed on the short stacking requirements.

Table 5 Rail Level Crossing Criteria

Item	Functional Characteristics (Specification)	Reference
Boom Gate Clearance from the nearest rail	3.5m	Figure 4.7 AS1742.7: 2016.
Stop line setback from boom gates	3m	Figure 4.7 AS1742.7: 2016.
Design Vehicle	Type 1 Road Train – 36.5m Length	
Factor of Safety for short stacking	5m	Clause 5.4 AS1742.7: 2016.
Total minimum length required for Short Stacking (nearest rail to edge line of the nearest traffic lane)	48m	Clause 5.4 AS1742.7: 2016.

4.0 Mine Access Location

Whilst an access location has been indicatively nominated as part of the EIS process (refer Figure 1), a preliminary review was undertaken to determine the most suitable location for the access in relation to existing site constraints.

4.1 Alignment Constraints

The proposed indicative access is at approximately Chainage 42 on Saraji Road. Immediately south of Chainage 42 the vertical grade of Saraji Road drops down to a low lying area surrounding Hughes Creek (located at Chainage 43), with a significant height difference from the railway (refer Figure 3). The area is on a horizontal bend and the northbound lanes have a vertical crest that limits visibility on approach to Chainage 42. These factors combine to create an unfavourable road environment south of Chainage 42 to develop a channelised right turn on approach to an intersection.

To the north of Chainage 42, the horizontal alignment is straight and the road and rail are at approximately the same height (refer Figure 4). This is a more desirable road environment for establishing a new intersection. This is particularly important with ensuring that the required sight distances at the rail crossing and to the back of queue in the channelised right turn lane.

For the purposes of the concept design, the intersection has been place in the vicinity of Chainage 41 to take advantage of the best available road environment. This has been developed from qualitative assessment as part of the concept design. Items such as sight distance, horizontal and vertical geometry will be further refined in the detailed design phase when topographical survey is completed.

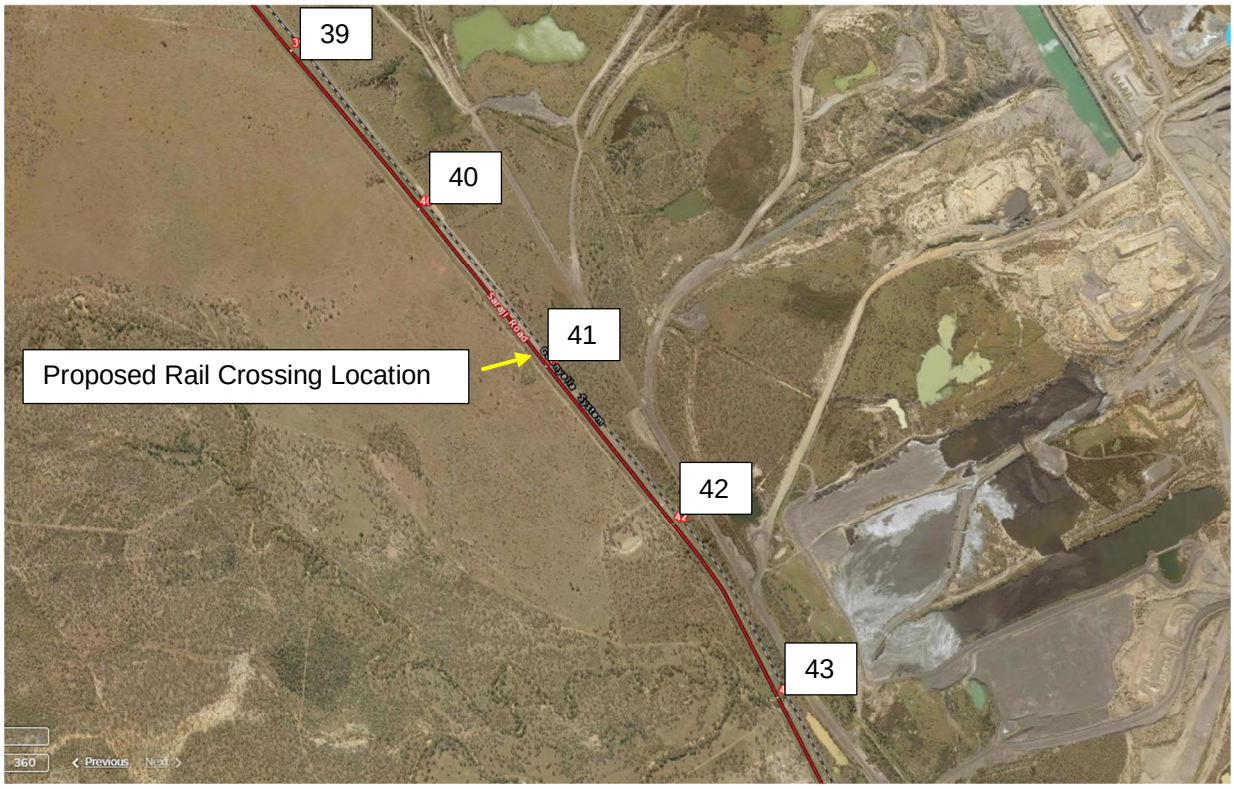


Figure 2 Aerial Image with Chainages



Figure 3 Google Street View capture facing north towards Chainage 42.



Figure 4 Google Street View capture facing north from Chainage 42.



Figure 5 Google Street View capture facing South from Chainage 41.



Figure 6 Google Street View capture facing North from Chainage 41.

4.2 Short Stacking Assessment

The short stacking requirement is a minimum distance of 48m (refer Table 5) between the edge line of the roadway to the nearest rail line. In the area nominated for a new access, Chainage 41, the road and rail run parallel with a constant offset of 43m between the edge line and the nearest rail. There is no location in the vicinity of the proposed access where the road and rail diverge enough to accommodate the required short stacking distance. A new intersection will have to incorporate a horizontal alignment shift of Saraji Road to accommodate an intersection large enough to accommodate short stacking.

4.3 Horizontal Alignment Shift

The horizontal alignment shift to accommodate the short stacking distance, requires utilising reverse curves. This creates another constraint as curves in the same direction need to be separated by a straight so that drivers can perceive changes in the radius of curves. For northbound vehicles on Saraji Road, there is an existing left-hand curve that ends 140m south of Chainage 42. Another left-hand curve is required to be developed north of this to accommodate the horizontal shift. The distance between these curves is dictated as being 440m with a posted speed of 100km/h and design speed of 110km/h (refer Clause 7.5.2 of Austroads Guide to Road Design). This constrains the point at which the development of the horizontal shift can commence to being 440m north of existing curve at Chainage 42.140km.

The horizontal alignment shift and intersection design was developed with a posted speed of 80km/h (design speed 90km/h).

The alignment shift and general intersection layout has been included in Appendix A. The drawings of the updated proposed intersection show that the works will be contained within the road reserve.

5.0 Intersection Development

The intersection was developed initially to meet the short stacking requirements. As the intersection was developed further and the turn paths added for the Type 1 Road trains the intersection had to be made bigger to accommodate these movements. These turn paths highlighted that the stop line for vehicle turning out of the mine access needed to be set back further from the intersection, which in turn required the intersection to be moved further away from the rail line to ensure short stacking of outbound vehicles was achieved.

The turn paths for the intersection have been included in Appendix A. The concept layout can accommodate the design and check vehicles and maintains the short stacking requirements.

6.0 Concept Cost Estimate

A concept cost estimate was prepared for the intersection and rail level crossing. The full cost estimate document is included in Appendix B. The concept cost estimate was undertaken to align with the TMR Cost Estimation Manual for the concept phase of a project. This is the typical standard utilised for cost estimation of road project in Queensland.

The Cost Estimate includes a contingency amount based on a strategic risk assessment. The higher limit of contingency has been shown in the cost estimate summary below in Table 6

Table 6 Concept Cost Estimate Summary

Item	Cost	Notes
Client Costs	$1,075,053.00	Includes Internal Project Management, Design & Development, Contract Administration, WH&S Fees & Obligations, Finalisation activities
Construction Costs	$3,948,724.00	
Contingency & Risk	$1,958,883.00	
Total	**$6,981,660.00**	

The Construction Costs are primarily driven by new pavement works and rail level crossing infrastructure (signals, boom gates and connecting into the existing signalling and control network). A breakdown of the construction costs is shown in Figure 7.

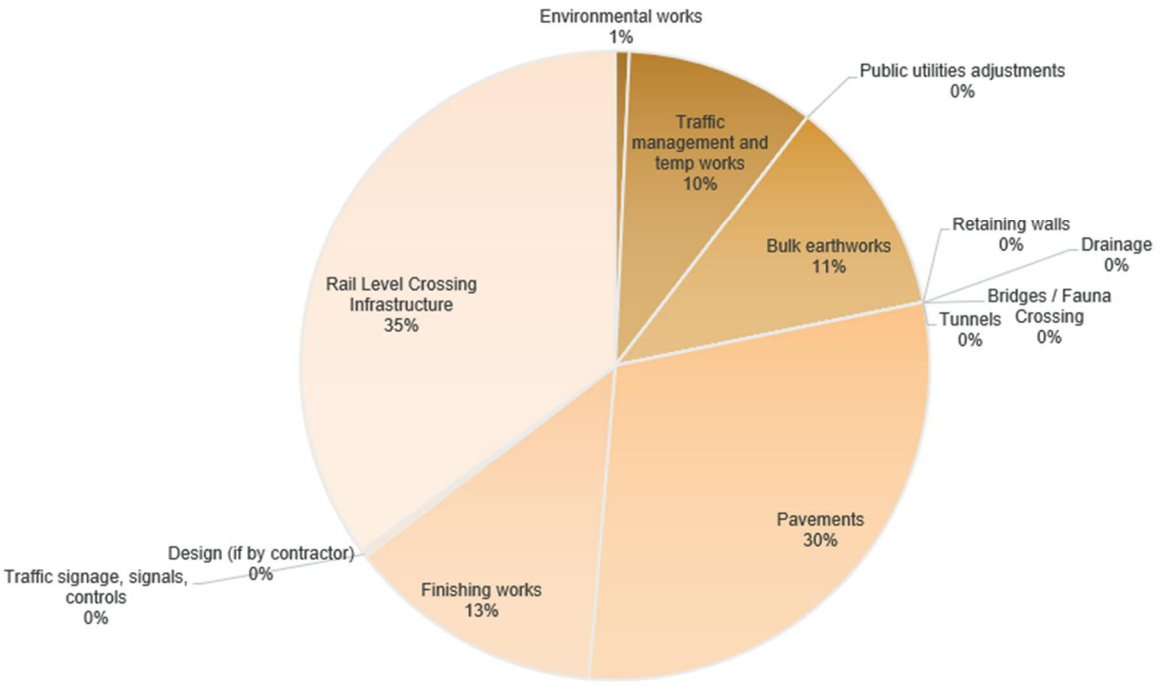


Figure 7 Construction Cost Breakdown

7.0 Conclusions

A new mine access and rail level crossing can fit geometrically and address the short stacking requirement between Saraji Road and the Goonyella Rail line if the horizontal alignment of Saraji Road can be realigned approximately 10m to the west. The new intersection will be contained within the existing road reserve.

If the new access intersection is located at approximately Chainage 41, there are no topographic features that are likely to constrain the design or require design elements that don't conform with the Road Planning and Design Manual Standards.

8.0 Recommendations

The following actions are recommended to assist the transition the project into a detailed design phase:

- Detailed Topographic Survey
- Liaison with Isaac Regional Council to with regards to the proposed speed zone changes.
- Liaison with the rail authority to confirm rail crossing signalling requirements and connection to the broader signalling network.
- Undertake an Australian Level Crossing Assessment Model (ALCAM) to quantify risks associated with the inclusion of a new level crossing on the rail network.
- Detailed intersection modelling to determine the storage requirements of the auxiliary lanes.
- Undertake Geotechnical and pavement investigations to inform pavement design.

BMA have noted their intention to explore these items further in subsequent project phases.

Appendix A

Concept Drawings

CONCEPT



This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
A			ISSUED FOR INFORMATION ONLY	

Scale

SCALE B 0 10 20 25m

1 : 1000 (A3) 1 : 500 (A1)

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DRAWN	M. Huff	CHECKED	C. Brown
APPROVED	C. Brown *	DATE	15/02/22

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Rtext (Rtext))

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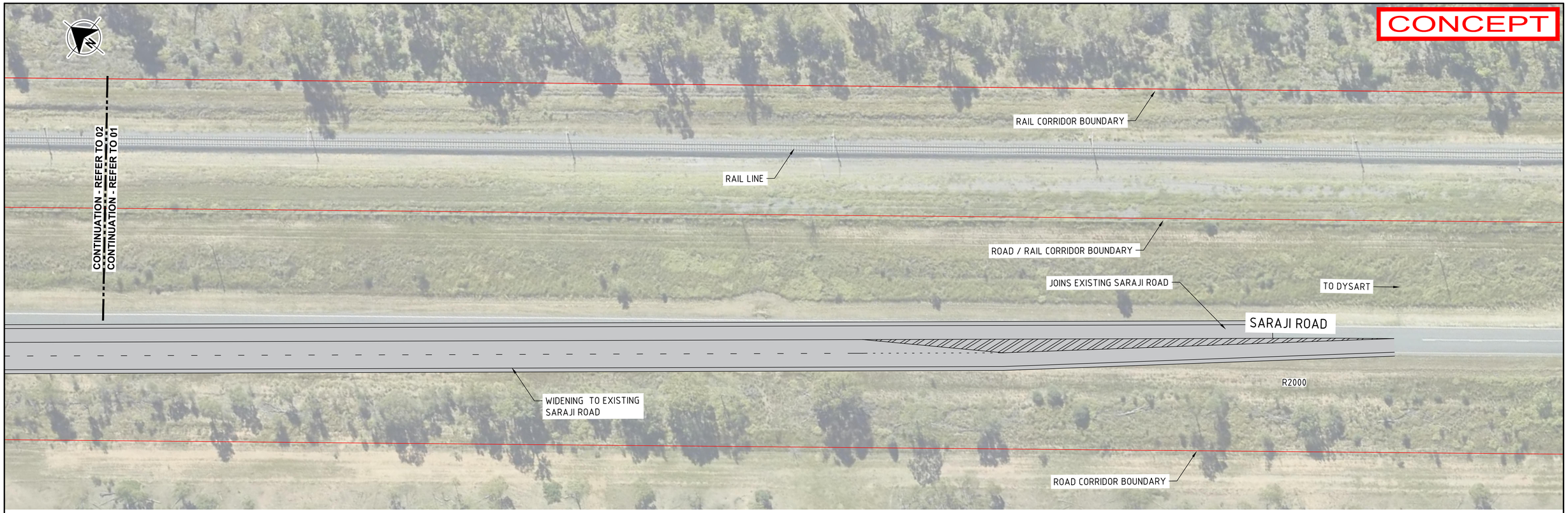
Plan 1 of 2

SARAJI EAST MINING LEASE
GENERAL ARRANGEMENT

Status: CONCEPT

Drg No.: 60676090-1000-01

Rev.: A



DESIGN NOTES:

- DESIGN SPEED = 90KM/H (80KM/H POSTED SPEED)
- THE DESIGN VEHICLE = TYPE 1 ROAD TRAIN
- CHECK VEHICLE = 10M WIDE OSOM VEHICLE

DESIGN IS A CONCEPT DESIGN AND IS PURELY 2D. NO VERTICAL DESIGN OR CHECKS HAVE BEEN COMPLETED. NO SURVEY DATA IS PRESENT AND THE DESIGN IS BASED ON AVAILABLE IMAGERY ONLY. PUP AND CADASTRAL BOUNDARIES NOT IDENTIFIED.
MEDIANS ARE ASSUMED TO BE PAINTED FOR THIS CONCEPT LAYOUT. NO LIGHTING CONSIDERED.

ACCESS TREATMENTS, CULVERT WIDENING AND OTHER ADDITIONAL DESIGN ITEMS ARE TO BE FURTHER INVESTIGATED IN THE NEXT STAGE OF DESIGN DEVELOPMENT.

RAIL NOTES:

A NEW RAIL CROSSING IS TO BE DESIGNED AND INSTALLED IN THIS LOCATION IN LATER DESIGN STAGES. THIS CONCEPT DESIGN SHOWS AN ACTIVE CONTROL CROSSING (HALF BOOM-GATES) AND SHOWS THE EXPECTED REALIGNMENT OF THE SARAJI ROAD.

This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
A			ISSUED FOR INFORMATION ONLY	

Scale

SCALE B 0 10 20 25m
1 : 1000 (A3) 1 : 500 (A1)

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Plan 2 of 2

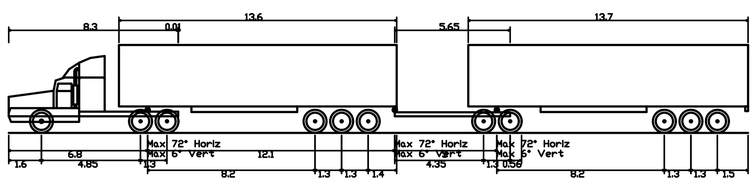
SARAJI EAST MINING LEASE
GENERAL ARRANGEMENT

Status: CONCEPT

Drg No.: 60676090-1000-02

Rev.: A

CONCEPT



A-Double (36.2m)

Overall Length	36.200m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

DESIGN VEHICLE DETAILS (1:150m SCALE)

RAIL LINE

ACTIVE RAIL CROSSING (HALF-BOOM GATE) DISPLAYED. RAIL CROSSING TO BE FURTHER DESIGNED IN NEXT DESIGN STAGE

52.92

10.22

36.20

3.00

3.50

A-Double (36.2m)

A-Double (36.2m)

2.00

3.50

1.00

11.00

NEW SHOULDER

3.00

36.20

5.00

8.82

PROPOSED MINE ACCESS

ROAD / RAIL CORRIDOR BOUNDARY

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
A			ISSUED FOR INFORMATION ONLY	

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Scale

SCALE E 0 1 2 3 4 5m
1 : 200 (A3) 1 : 100 (A1)

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APPROVED	C. Brown *	DATE	15/02/22

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Plan 1 of 1

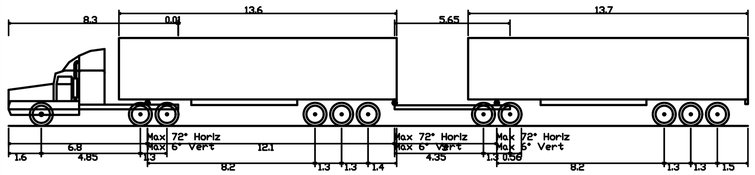
SARAJI EAST MINING LEASE
SHORT STACKING PLAN

Status: CONCEPT

Drg No.: 60676090-1000-03

Rev.: A

CONCEPT



A-Double (36.2m)

Overall Length	36.200m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

DESIGN VEHICLE DETAILS (1:150m SCALE)

RAIL CORRIDOR BOUNDARY

RAIL LINE

PROPOSED MINE ACCESS

ROAD /RAIL CORRIDOR BOUNDARY

A-Double (36.2m)

A-Double (36.2m)

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REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
A			ISSUED FOR INFORMATION ONLY	

Scale

SCALE C 0 5 10 12.5m

1 : 500 (A3) 1 : 250 (A1)

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APPROVED	C. Brown * xxxxx	DATE	15/02/22

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Plan 1 of 1

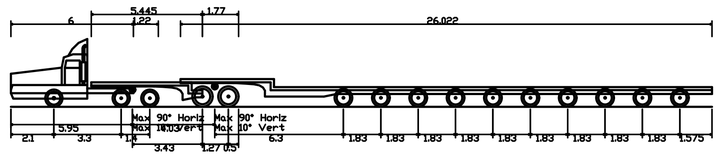
SARAJI EAST MINING LEASE
DESIGN VEHICLE PATHS

Status: CONCEPT

Drg No.: 60676090-1000-04

Rev.: A

CONCEPT



ISCIM Based TMR Requirements

Overall Length	34.325m
Overall Width	10.000m
Overall Body Height	3.323m
Min Body Ground Clearance	0.340m
Max Track Width	3.400m
Lock-to-lock time	6.90s
Max Steering Angle (Virtual)	45.00°

CHECK VEHICLE DETAILS (1:150m SCALE)

RAIL CORRIDOR BOUNDARY

RAIL LINE

PROPOSED MINE ACCESS

MINE ENTRY MOVEMENTS

ROAD /RAIL CORRIDOR BOUNDARY

ISCIM Based TMR Requirements

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REVISIONS				
No.	BY	DATE	DESCRIPTION	APPD
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Scale

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1 : 500 (A3) 1 : 250 (A1)

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DRAWN	M. Huff	CHECKED	C. Brown
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Plan 1 of 2

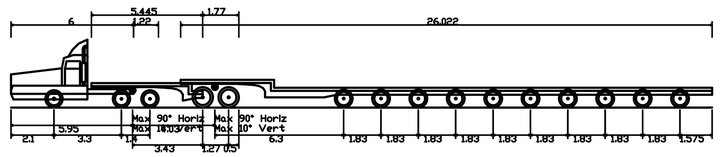
SARAJI EAST MINING LEASE
CHECK VEHICLE PATHS

Status: CONCEPT

Drg No.: 60676090-1000-05

Rev.: A

CONCEPT



SDM Based TMR Requirements

Overall Length	34.325m
Overall Width	10.000m
Overall Body Height	3.323m
Min Body Ground Clearance	0.340m
Max Track Width	3.400m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	45.00°

CHECK VEHICLE DETAILS (1:150m SCALE)

RAIL CORRIDOR BOUNDARY

RAIL LINE

PROPOSED MINE ACCESS

MINE EXIT MOVEMENTS

ROAD /RAIL CORRIDOR BOUNDARY

This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
A			ISSUED FOR INFORMATION ONLY	

Scale

SCALE C 0 5 10 12.5m
1 : 500 (A3) 1 : 250 (A1)

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APPROVED	C. Brown * xxxxx	DATE	15/02/22

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Plan 2 of 2

SARAJI EAST MINING LEASE
CHECK VEHICLE PATHS

Status: CONCEPT

Drg No.: 60676090-1000-06

Rev.: A

Appendix B

Concept Cost Estimate

Project #	F2220
Project name	Saraji East Level Crossing
Document	Cover

Project information

Client	Aecom
Previous versions	v01

Index

1	-	Cover	General project information and workbook layout
2	-	Summary	Project summary
3	-	App A	Information Received
4	-	App B	Project Cost Summary
5	-	App C	Construction Estimate Summary
6	-	App D1	Construction Estimate Submission Schedule - Detailed construction estimate output from Expert Estimation - Including assumptions
8	-	App D2	Detailed construction estimate output from Expert Estimation for Segment 2 Option 2 including property
7	-	App E	TMR Strategic Risk Table

Project #	F2220
Project name	Saraji East Level Crossing
Document	Summary

		Saraji East Level Crossing	
		Low Amount	High Amount
	CLIENT COST		
1	SECTION 1 - CLIENT COSTS	$ 1,074,053	$ 1,074,053
2	SECTION 2 - PROPERTY & PUP	$ -	$ -
	CONSTRUCTION COST		
3	SECTION 3 - CONSTRUCTION COSTS	$ 3,948,724	$ 3,948,724
4	**SECTION 4 - BASE COSTS**	**$ 5,022,777**	**$ 5,022,777**
	CONTINGENT RISKS		
5	SECTION 5 - CONTINGENT RISKS	$ 1,077,386	$ 1,958,883
		21%	39%
	PROJECT TOTALS	**$ 6,100,163**	**$ 6,981,660**

Appendix A - Information Received

Saraji East Level Crossing

Date	Document Description	Dwg / Sketch Details if applicable		
		Dwg Number	Rev	Format
21-Mar-22	SEML Concept Rail Crossing - BOQ	REP-00001		
		BOQ		

Appendix B - Project Cost Summary

				Saraji East Level Crossing			
	Summary Basis of estimate: :: Build up in first principles using expert estimating 2014 :: Base date of March 2022 :: Based on Design provided by Aecom :: Deterministic Risk allowance :: Estimate expressed as real dollars						
		Base	**Unit**	**Qty**	**Amount Low**	**Amount High**	**Notes**
1	**SECTION 1 - CLIENT COSTS**						
1.1	Scoping	2.00%	%			$ 78,974	Percentage is based on historically known costs for scope development for a TMR project of this scope
1.1	Development	8.00%	%			$ 315,898	Percentage is based on historically known costs to design and award a construction contract for a TMR project of this scope
1.2	Implementation	15.00%	%			$ 592,309	Percentage is based on historically known costs to externally administer the construction contract for a TMR project of this scope
1.2	Work place health and safety fee, and Training Levy (PAI)	1.25%	%			$ 49,359	Queenland State Government Work Health and Safety Levy
1.2	Portable long service levy + Construction Skills Queensland Levy	0.45%	%			$ 17,769	Queenland State Government Portable Long Service Leave Levy and Construction Skills Queensland Levy
1.2	Finalisation	0.50%	%			$ 19,744	Percentage is based on historically known costs to finalise and complete a TMR project of this scope
	Sub Total - Section 1					**$ 1,074,053**	
2	**SECTION 2 - PROPERTY & PUP**						
2.1	Property	$ -	m²	-		$ -	Nil Allowance at this Stage
2.2	PUP - Power Pole Relocations	$ -	each	-		$ -	Nil Allowance at this Stage
2.3	PUP - Water Main Relocations	$ -	m	-		$ -	Nil Allowance at this Stage
2.4	PUP - Telstra Relocations	$ -	m	-		$ -	Nil Allowance at this Stage
	Sub Total - Section 2					**$ -**	
3	**SECTION 3 - CONSTRUCTION COSTS**						
3.01	Environmental works			1%		$ 28,300	Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.02	Traffic management and temp works			10%		$ 385,114	Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.03	Public utilities adjustments			0%			Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.04	Bulk earthworks			11%		$ 446,624	Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.05	Retaining walls			0%			Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.06	Drainage			0%			Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.07	Bridges / Fauna Crossing			0%			Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.08	Tunnels			0%			Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.09	Pavements			30%		$ 1,167,221	Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.10	Finishing works			13%		$ 522,519	Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.11	Traffic signage, signals, controls			0%		$ 13,598	Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.12	Design (if by contractor)			0%			Categories are as per the DITRDC Project Cost Breakdown and inaccordance with TMR PCEM
3.13	Rail Level Crossing Infrastructure			35%		$ 1,385,348	
	Sub Total - Section 3					**$ 3,948,724**	
4	**SECTION 4 - BASE COSTS**						
4.1	Principal's Costs					$ 1,074,053	
4.2	Property & PUP Relocations					$ -	
4.3	Construction costs					$ 3,948,724	
	Sub Total - Section 4					**$ 5,022,777**	
5	**SECTION 5 - CONTINGENT RISKS**						
5.1	Principal's Costs	21.45%	39.00%		$ 230,384	$ 418,881	As per Appendix E which the the TMR Strategic Risk Table from the PCEM
5.2	Property & PUP Relocations	21.45%	39.00%		$ -	$ -	As per Appendix E which the the TMR Strategic Risk Table from the PCEM
5.3	Construction costs as per TMR Matrix (App E)	21.45%	39.00%	%	$ 847,001	$ 1,540,002	As per Appendix E which the the TMR Strategic Risk Table from the PCEM
			% of base cost		21%	39%	
	Sub Total - Section 5				**$ 1,077,386**	**$ 1,958,883**	

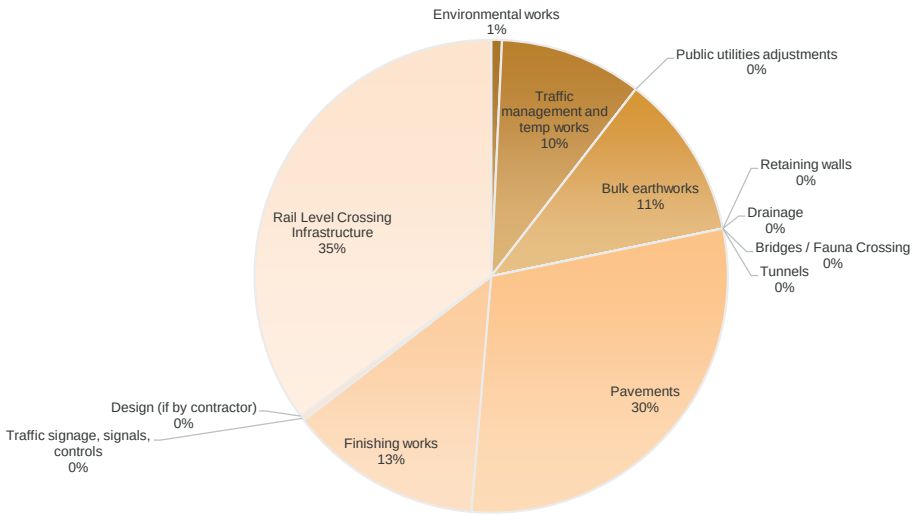
Appendix C - Construction Estimate Summary

Saraji East Level Crossing

	Labour	Material	Plant	Subcontract	Total	% CV	% TC	% DC
Direct costs	**551,146.79**	**982,661.44**	**183,181.76**	**1,014,826.21**	**2,731,816.21**	**69.18**	**76.10**	**100.00**
Overhead costs	531,226	198,150	93,144	35,410	857,930	21.73	23.90	31.41
Sub total, costs	1,082,373	1,180,811	276,326	1,050,236	3,589,746	90.91	100.00	131.41
Risks and opportunities								
Preadjustments								
Cost Total	1,082,373	1,180,811	276,326	1,050,236	3,589,746	90.91	100.00	131.41
Overall margin	10	on total cost			358,975	9.09	10.00	13.14
Corporate margin		on total cost						
Margins on direct costs (%)								
Margins on overhead costs (%)								
Margins on risks and opportunities (%)								
Margins on preadjustments (%)								
Defined margin								
Margins on provisional sums (%)								
Margins total					358,975	9.09	10.00	13.14
Items on which no margin is calculated								
Post adjustments								
Provisional sums								
Anticipated Direct Costs								
Anticipated Overhead Costs								
Project Total					**3,948,721**	100.00	110.00	144.55
GST amount					394,872	10.00	11.00	14.45
Project total including GST					**4,343,593**	110.00	121.00	159.00

Appendix D1 - Construction Estimate Submission Schedule

Saraji East Level Crossing



Summary by DIRDC Project Cost Breakdown Classification (Department Infrastructure and Regional Development and Cities)						
1	Environmental works				$	28,300
2	Traffic management and temp works				$	385,114
3	Public utilities adjustments					
4	Bulk earthworks				$	446,624
5	Retaining walls					
6	Drainage					
7	Bridges / Fauna Crossing					
8	Tunnels					
9	Pavements				$	1,167,221
10	Finishing works				$	522,519
11	Traffic signage, signals, controls				$	13,598
12	Design (if by contractor)					
13	Rail Level Crossing Infrastructure				$	1,385,348
	Total Construction Cost				**$**	**3,948,724**

TRUE

Construction Cost - Submission schedule

Item	Description	Unit	Quantity	Unit Rate	Amount	Code	Assumptions
Item	**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**		
MRS02Mar2021	**Provision for Traffic**						
20016	Traffic management inspections	LSUM	1	$ 3,076.00	$ 3,076.00	2	
20017	Planning of temporary traffic management (TMP)	LSUM	1	$ 7,805.00	$ 7,805.00	2	
20018	Design of temporary traffic management (TGS)	LSUM	1	$ 4,683.00	$ 4,683.00	2	
20019	Implementation, maintenance and removal of temporary traffic management	LSUM	1	$ 351,604.00	$ 351,604.00	2	
20020	Administration of temporary traffic management	LSUM	1	$ 17,946.00	$ 17,946.00	2	
MRS04Nov2020	**General Earthworks**						
	Preparation						
32001	Clearing and grubbing	m2	21,165	$ 0.94	$ 19,895.00	4	
32007	Ground surface treatment under embankment, standard	m2	14,635	$ 1.46	$ 21,367.00	4	
32014	Excavation and disposal of Unsuitable Material with individual excavation </= 10m³ (Provisional Quantity, as directed)	m3	146	$ 99.80	$ 14,571.00	4	
32018	Excavation and disposal of Unsuitable Material with individual excavation > 10m³ (Provisional Quantity, as directed)	m3	1,464	$ 22.31	$ 32,662.00	4	
	Excavation						
32101	Excavation, all materials	m3	660	$ 18.61	$ 12,283.00	4	
	Embankment						
32201	Embankment	m3	2,927	$ 66.28	$ 194,002.00	4	
	Existing Subgrade Testing and Treatments						
32306	Subgrade treatment Type A (Provisional Quantity, if ordered)	m2	14,635	$ 2.92	$ 42,734.00	4	
	Backfill						
32402	Backfill with select backfill material to [Unsuitable] (Provisional Quantity, as directed)	m³	1,610	$ 67.77	$ 109,110.00	4	
MRS05Nov2020	**Unbound Pavements**						
	Unbound Pavements						
40002	Subtype 2.1, Unbound pavement, [layer/location]	m³	2,927	$ 148.84	$ 435,655.00	9	
40004	Subtype 2.3, Unbound pavement, [layer/location]	m³	2,927	$ 139.65	$ 408,756.00	9	
MRS11Jul2019	**Sprayed Bituminous Treatments (Excluding Emulsion)**						
	Sprayed Bituminous Treatments (excluding Emulsion)						
40721	Spraying bituminous material, treatment type [I-S/S, primer seal], binder [AMC7], spray rate [1.3L/m2], [All Pavement]	litre	19,026	$ 2.17	$ 41,286.00	9	
40721	Spraying bituminous material, treatment type [S/S, seal], binder [C170], spray rate [0.7L/m2], [All Pavement]	litre	10,245	$ 2.89	$ 29,608.00	9	
40723	Spreading cover aggregate [14mm precoated], [105m2/m3], [including] supply of cover aggregate, [All Pavement]	m3	139	$ 505.89	$ 70,319.00	9	
40723	Spreading cover aggregate [10mm precoated], [255m2/m3], [including] supply of cover aggregate, [All Pavement]	m3	57	$ 650.43	$ 37,075.00	9	
40725	Supply and addition of adhesion agent (Provisional Quantity) - Adhesion agent for AMC7 and C170	litre	878	$ 1.73	$ 1,519.00	9	
MRTS14Mar21	**Road Furniture**						
	Road Furniture						
50001	Demolition of road furniture, as listed in Clause 3 of Annexure MRTS14.1	each	1	$ 179.00	$ 179.00	11	
	Guidance and Information Systems						
50051	Road edge guide posts	each	15	$ 106.10	$ 1,592.00	11	
50052	Supply of regulatory, warning and hazard sign faces, as listed in Clause 1.3 of Annexure MRS14.1	LSUM	1	$ 2,371.00	$ 2,371.00	11	
50054	Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1	LSUM	1	$ 1,185.00	$ 1,185.00	11	
50056	Installation of regulatory, warning and hazard signs, as listed in Clause 1.3 of Annexure MRS14.1	LSUM	1	$ 5,514.00	$ 5,514.00	11	
50058	Installation of direction and information signs, as listed in Clause 2.3 of Annexure MRS14.1	LSUM	1	$ 2,757.00	$ 2,757.00	11	
MRS16Jul2017	**Landscape and Revegetation Works**						
	Landscape and Revegetation - Sampling and Testing						
50601	Preparation of a Soil Management Plan - Construction - Form A		1	$ 2,257.00	$ 2,257.00	10	
50602	Topsoil sampling and testing - Form C (Provisional Quantity)		1	$ 1,084.00	$ 1,084.00	10	
50606	Manufactured site topsoil sampling and testing - Form D (Provisional Quantity)		1	$ 1,084.00	$ 1,084.00	10	
50610	Subsoil sampling and testing - Form E (Provisional Quantity)		1	$ 795.00	$ 795.00	10	
50614	Drainage basin soil sampling and testing - Form F (Provisional Quantity)		1	$ 1,012.00	$ 1,012.00	10	
MRS28Nov2019	**Contractors Site Facilities and Camp**						
20101	Contractor's site facilities	LSUM	1	INCLUDED			
20102	Contractor's camp	LSUM	1	INCLUDED			
MRS30Jul2020	**Asphalt Pavements**						
	Preparation of the Existing Surface						
41701	Preparation of the existing surface	m2	2,085	$ 0.72	$ 1,501.00	9	
41710	Tack coat, residual bitumen (Provisional Quantity)	litre	834	$ 1.73	$ 1,443.00	9	
	Medium Duty Dense Graded Asphalt						
41754	Medium duty dense graded asphalt in surfacing course, AC [14] M mix	t	240	$ 583.58	$ 140,059.00	9	
MRS45Nov2020	**Road Surface Delineation**						
52101	Spotting only for longitudinal lines	m	4,859	$ 0.29	$ 1,409.00	10	
52102	Dividing line, broken 100mm wide, [3000] mm line length, [9000] mm gap legth,colour [white], material [waterbourne paint]	m	364	$ 1.16	$ 422.00	10	
52105	Barrier line, one direction, 80 mm wide each line, 80 mm lateral gap between lines, 3000 mm line length, and 9000 mm gap, with 80 mm wide each line, colour [colour], material [material]	m	300	$ 1.16	$ 348.00	10	
52106	[Barrier line, one direction, 80 mm wide each line, 80 mm lateral gap between lines, 3000 mm line length, and 9000 mm gap, with 80 mm wide each line, colour [colour], material [material]	m	735	$ 1.16	$ 853.00	10	
52110	Edge line, 150 mm wide, colour [colour], material [material]	m	168	$ 1.45	$ 244.00	10	
52111	Continuity line, 200 mm wide, colour [colour], material [material]	m	2,187	$ 2.60	$ 5,686.00	10	
52113	Outline, 150 mm wide, colour [colour], material [material]	m	1,105	$ 1.45	$ 1,602.00	10	
52117	Transverse lines (diagonal and chevron markings, parking areas and kerb markings), colour [colour], material [material]	m2	1,252	$ 27.10	$ 33,929.00	10	
	Raised Pavement Markers						
52201	Retroreflective raised pavement markers - Dividing Line - Yellow Bi	each	542	$ 8.24	$ 4,466.00	10	
52201	Retroreflective raised pavement markers - Edge Line - Red Uni	each	137	$ 8.24	$ 1,129.00	10	
MRS50Mar21	**Specific Quality System Requirements**						
	Specific Quality System Requirements						
20151	Supply of As Constructed documents	item	1	$ 6,667.00	$ 6,667.00	10	
MRS51Jul2020	**Environmental Management**						
20202	Develop Environmental Management Plan (Construction)	LSUM	1	$ 2,821.00	$ 2,821.00	1	
20203	Implement Environmental Management Plan (Construction)	LSUM	1	$ 18,426.00	$ 18,426.00	1	
MRSJul2018	**Erosion and Sediment Control**						
20501	Erosion and Sediment Control Plan/s	LSUM	1	$ 7,053.00	$ 7,053.00	1	
MRS91 Mar 21	**Conduits and Pits**						
	Conduit and Conduit Fittings Underground						
60007.01	Supply and installation of [1] of [80] mm, [HDuPVC], [Elec] conduit(s), in [Earth]	m	1,100	$ 92.04	$ 101,244.00	10	
	Cable Jointing Pits						
60204	Supply and installation of cable jointing pit [600mm diameter circular]	each	22	$ 1,499.90	$ 32,998.00	10	
60206	Supply of maintenance marker post	each	22	$ 106.10	$ 2,334.00	10	
MRS92 Mar 18	**Traffic Signal and Road Lighting Footings**						
	Road Lighting Footings						