

# TECHNICAL NOTE

## Transport Engineering



**Project Code:** N171073

**Date:** 8 December 2021

**Version No.** 2

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**Reviewer:** Brett Maynard

**SUBJECT:** INDUSTRIAL DEVELOPMENT – 1134 JOHN RENSHAW DRIVE, BLACK HILL  
DA 8/2018/539/1 – ADDITIONAL TRAFFIC MODELLING

**Page 1 of** 12 plus attachments

## Overview

The purpose of this technical note is to provide the updated traffic modelling and associated electronic files that the Applicant intends to rely upon for the purposes of the current Land and Environment Court Class 1 Appeal proceedings (Case number 2020/00332596). The Appeal relates to the development of the proposed Broaden Management large lot industrial development on land at DP1057179 on John Renshaw Drive, Black Hill, also known as the 40-Lot subdivision proposal.

The primary components of the revised traffic modelling are:

- Updated SIDRA Intersection analysis of John Renshaw Drive to assess the full site development impacts and include the western traffic signals.
- Updated VISSIM modelling incorporating the proposed eastern traffic signals for the subject site (i.e. three sets of traffic signals for the Black Hill Precinct).

This technical note is focussed on providing the traffic modelling inputs and outputs, with further analysis and discussion of the modelling results to be included in the subsequent individual expert report of Mr Brett Maynard and the subsequent joint report of the traffic experts.

The model files and relevant summary outputs can be downloaded via the following link:

[https://stantec-my.sharepoint.com/:f/p/brett\\_maynard/Epf3E\\_kWd3NFvSsl48qc\\_WcBFMZSEoqo3izg7wFVBPWWWWQ?e=eAVz9r](https://stantec-my.sharepoint.com/:f/p/brett_maynard/Epf3E_kWd3NFvSsl48qc_WcBFMZSEoqo3izg7wFVBPWWWWQ?e=eAVz9r)

## Road Network Summary

The industrial precinct comprises both the Broaden site (subject site) and the adjacent Coal and Allied Land site (herein referred to as the “BHI site”). The Industrial Precinct is on John Renshaw Drive in Black Hill and close to the northern end of the M1 Motorway. The key road corridors that surround the Industrial Precinct include:

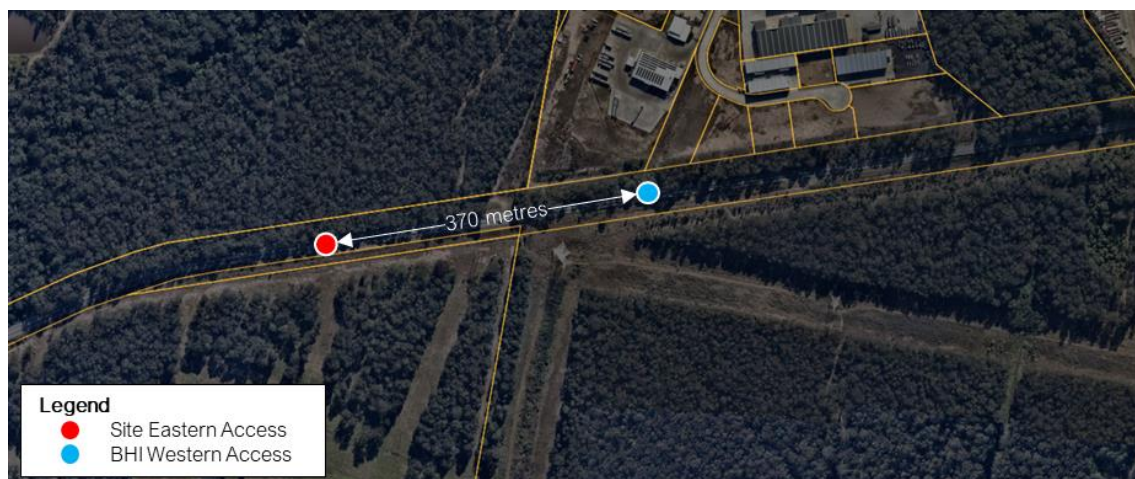
- Pacific Motorway (M1): north-south motorway that runs along the eastern boundary of the Industrial Precinct.
- John Renshaw Drive: east-west road which runs along the northern boundary of the Industrial Precinct which also provides a connection between the Hunter Expressway (M15) and the Pacific Motorway (M1) / New England Highway (A43).
- Weakleys Drive: north-south continuation of the M1 corridor to connect with the New England Highway (A43).

The M1/ John Renshaw Drive/ Weakleys Drive signalised intersection is also centrally located within the study area, immediately north-east of the Industrial Precinct.

An additional signalised intersection on John Renshaw Drive close to the eastern site boundary is also necessary to ensure appropriate site access to the entire site. The new intersection (herein referred to as the ‘eastern access’) is proposed about 230 metres west of the BHI site boundary.

It is understood that the approved BHI Stage 1A/1B development also includes a new signalised intersection on John Renshaw Drive (herein referred to as the ‘BHI western access’) located about 140 metres east of the site boundary, and a new left-in intersection (herein referred to as the ‘BHI eastern access’) located close to the M1/ John Renshaw Drive/ Weakleys Drive intersection. The two proposed signalised intersections would be about 370 metres apart, as shown in Figure 1.

Figure 1: Proposed signalised intersection locations



Base image source: Nearmap

The proposed development staging plan and intersection layouts used for the updated modelling are included in Attachment 1.

## SIDRA Intersection Analysis

SIDRA Network modelling has been prepared to demonstrate satisfactory operation of the proposed intersections (including BHI intersection) with full precinct development traffic and the interaction between the traffic signals. The SIDRA Network modelling includes the following signalised intersections:

- John Renshaw Drive/ Weakleys Drive/ M1 intersection
- BHI western access
- Subject site eastern access
- Subject site western access.

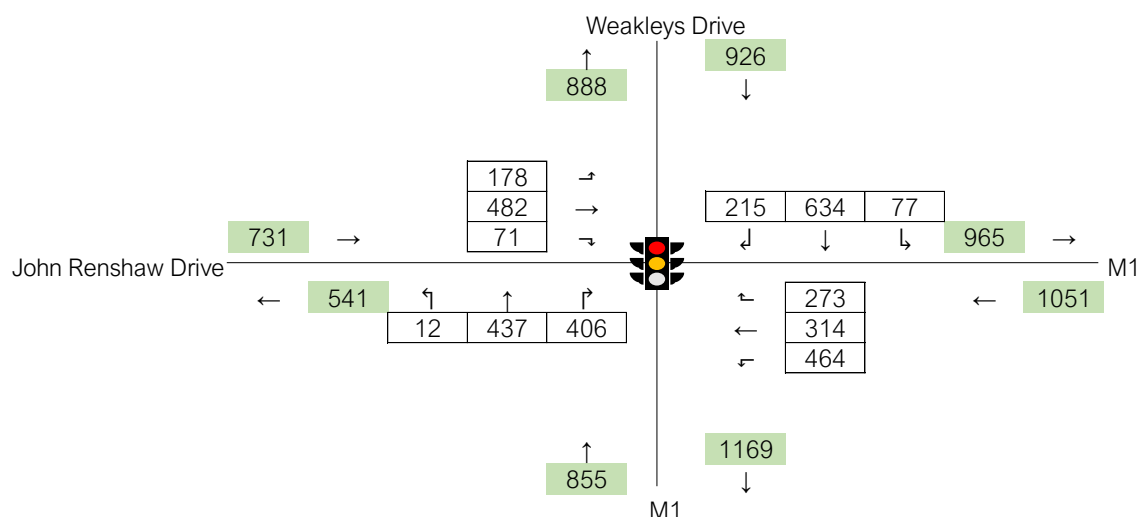
While it is recognised that VISSIM modelling should also be referenced with respect to operation of the John Renshaw Drive/ Weakleys Drive/ M1 intersection, the SIDRA Network modelling allows the potential coordination between the four John Renshaw Drive signalised intersections to be assessed.

### Traffic Volumes

For the purposes of this assessment, 2038 traffic volumes have been adopted from the BHI site Stage 2-7 Traffic Assessment<sup>1</sup> (Colston Budd Rogers & Kafes, September 2021). It is understood these traffic volumes have been supplied by TfNSW and consider the effects of the proposed Pacific Highway M1 Extension to Raymond Terrace, known as the M12RT link, that is planned to be operating by 2028 and expected to result in a significant redistribution of traffic at the John Renshaw Drive/ Weakleys Drive/ M1 intersection.

The weekday AM and PM peak hour traffic volumes are summarised in Figure 2 and Figure 3.

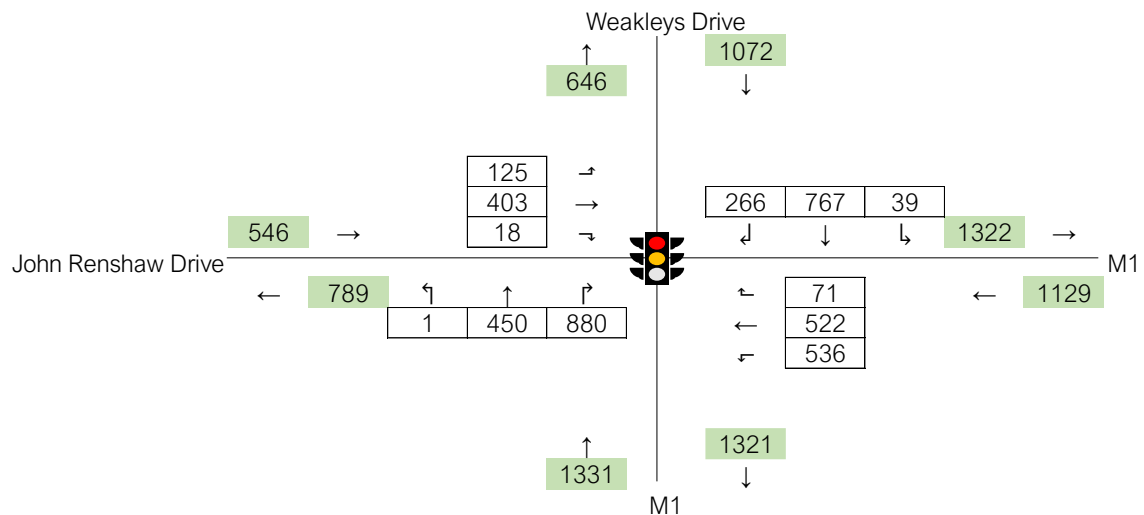
Figure 2: 2038 AM peak hour traffic volumes



[1] Source: Page 32, Figure 2 2038 "Weekday morning peak hour traffic flows plus Stages 1-7 development traffic plus M12RT Bypass", Barr Property and Planning Pty Ltd V Cessnock City Council & ORS Statement of Evidence – Land and Environment Court Proceedings 2020/331104, Traffic Matters Evidence, Colston Budd Rogers & Kafes Pty Ltd, November 2021.

<sup>1</sup> Attachment B, Barr Property and Planning Pty Ltd V Cessnock City Council & ORS Statement of Evidence – Land and Environment Court Proceedings 2020/331104, Traffic Matters Evidence, Colston Budd Rogers & Kafes Pty Ltd, November 2021.

Figure 3: 2038 PM peak hour traffic volumes



[1] Source: Page 33, Figure 2 2038 "Weekday afternoon peak hour traffic flows plus Stages 1-7 development traffic plus M12RT Bypass", Barr Property and Planning Pty Ltd V Cessnock City Council & ORS Statement of Evidence – Land and Environment Court Proceedings 2020/331104, Traffic Matters Evidence, Colston Budd Rogers & Kafes Pty Ltd, November 2021.

## Traffic Generation and Distribution

The following traffic generation rates and distribution assumptions have been adopted for the subject site and the BHI site. These assumptions reflect those provided by TfNSW.

- Trip generation rate:
  - AM 0.38 vehicles per 100 square metres GFA
  - PM 0.40 vehicles per 100 square metres GFA
- Lot yield of 26 per cent GFA of total Net Developable Area
- Entry/ exit movements from the site:
  - AM 66.3% (entry), 33.7% (exit)
  - PM 36.3% (entry), 63.7% (exit)
- Heavy vehicle percentages:
  - AM 20%
  - PM 15.5%
- AM trip distribution (opposite in the PM):
  - South 35% (entry), 20% (exit)
  - West 20% (entry), 20% (exit)
  - East 25% (entry), 40% (exit)
  - North 20% (entry), 20% (exit).

Based on the above, an estimate of weekday AM and PM peak period traffic demands is set out in Table 2, indicating that the proposed stages 1 to 6 are forecast to generate 1,598 and 1,682 vehicle trips during the AM and PM peak periods respectively.

Table 1: Stage 1 to 6 traffic generation and distribution

Stage	Developable Area (ha)	Lot Yield (sq.m)	Traffic Generation	
			AM Peak	PM Peak
1	18.1	47,060	179	188
2	28.4	73,840	281	295
3	29.8	77,480	294	310
4	30.1	78,260	297	313
5	27.2	70,720	269	283
6	28.1	73,060	278	292
<b>Total</b>	<b>161.7</b>	<b>420,420</b>	<b>1,598</b>	<b>1,682</b>

Table 2: Stage 1 to 6 traffic generation and distribution

Direction	AM				PM			
	Entry		Exit		Entry		Exit	
	Distribution	Generation	Distribution	Generation	Distribution	Generation	Distribution	Generation
South	35%	371	20%	108	20%	122	35%	375
West	20%	212	20%	108	20%	122	20%	214
East	25%	265	40%	215	40%	244	25%	268
North	20%	212	20%	108	20%	122	20%	214
<b>Total</b>	<b>1,598</b>				<b>1,682</b>			

For the purposes of this assessment, vehicles accessing Stage 1 to 3 are assumed to use the eastern access and vehicles accessing Stage 4 to 6 are assumed to use the western access. No vehicles are assumed to use the BHI site access for this analysis, however there will obviously be some reciprocal use of the two eastern traffic signals for entry/ exit to the two sites.

Based on the above, Figure 4 and Figure 5 have been prepared to show the estimated increase in turning movements near the subject site following development in the AM and PM peak hours respectively.

Figure 4: Stage 1 to 6 AM peak hour traffic volumes

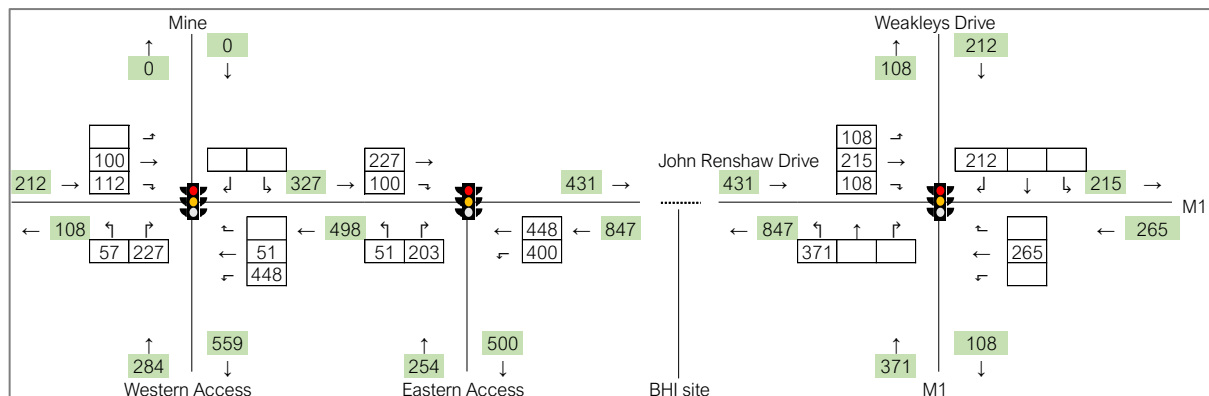
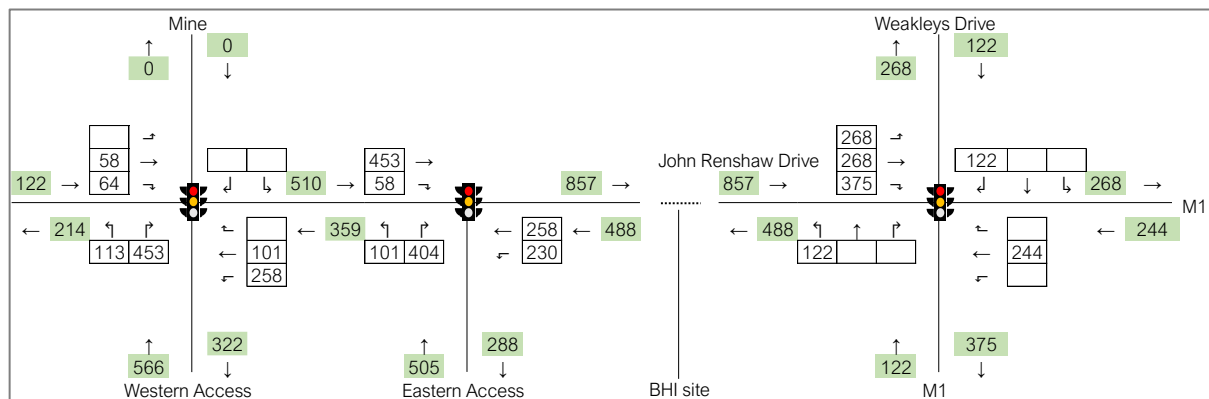


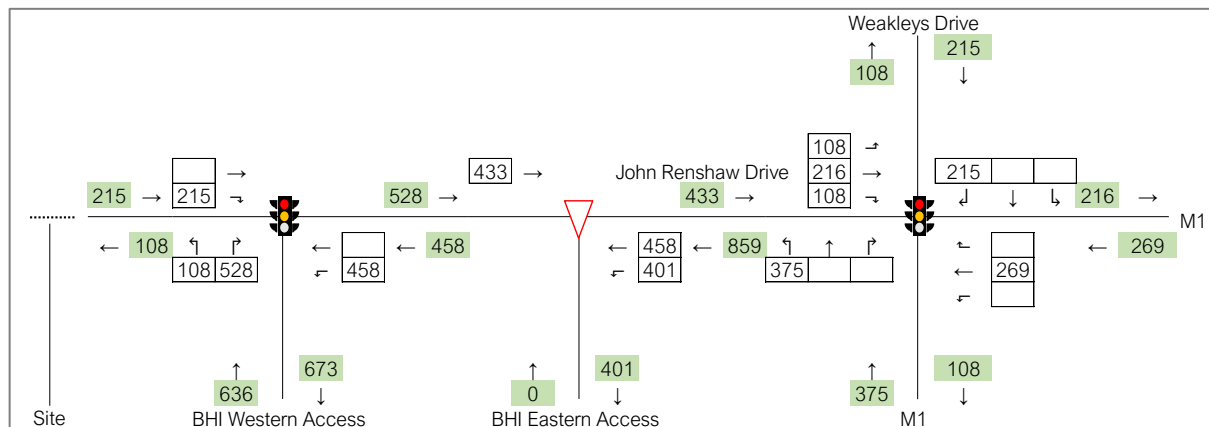
Figure 5 – Stage 1 to 6 PM peak hour traffic volumes



## BHI Development

Traffic volume estimates for the adjacent BHI site have been sourced from the Stage 2-7 Traffic Assessment (CBRK, 2021), noting these are understood to be based on the TfNSW traffic generation, distribution and assignment assumptions. Figure 6 and Figure 7 have been prepared to show the estimated increase in turning movements near the subject site following development of the BHI site in the AM and PM peak hours respectively.

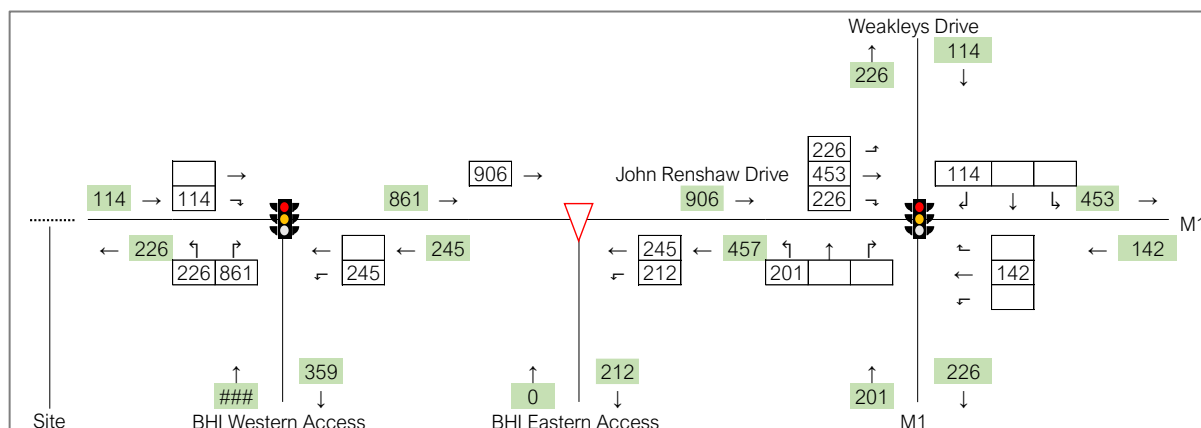
Figure 6: BHI Stage 1 to 7 AM peak hour traffic volumes [1][2]



[1] Source: Page 32, Figure 2 2038 "Weekday morning peak hour traffic flows plus Stages 1-7 development traffic plus M12RT Bypass", Barr Property and Planning Pty Ltd V Cessnock City Council & ORS Statement of Evidence – Land and Environment Court Proceedings 2020/331104, Traffic Matters Evidence, Colston Budd Rogers & Kafes Pty Ltd, November 2021

[2] Note minor error for left in volume at the eastern BHI access, shown as 265 vehicles. This should be 401 vehicles as detailed in Table 1 on page 27 of the source document. Note error was not carried through to volumes elsewhere on the diagrams.

Figure 7: BHI Stage 1 to 7 PM peak hour traffic volumes [1]



[1] Source: Page 33, Figure 2 2038 "Weekday afternoon peak hour traffic flows plus Stages 1-7 development traffic plus M12RT Bypass", Barr Property and Planning Pty Ltd V Cessnock City Council & ORS Statement of Evidence – Land and Environment Court Proceedings 2020/331104, Traffic Matters Evidence, Colston Budd Rogers & Kafes Pty Ltd, November 2021.

## Model Calibration

### Pedestrians

Pedestrian volumes for all relevant movements are set at 50 pedestrians per hour as per the default settings within SIDRA. Each signalised intersection has been coded with full pedestrian protection, resulting in late starts for vehicles conflicting with the pedestrian movement and in turn, reducing the capacity of said movement. This includes the south approach right turn movement at the site's eastern intersection and BHI sites western intersection. Given an approximate 25 metre walking distance, pedestrian timings of 27 seconds are required for full protection (six seconds walk and 23 seconds clearance). Noting the low frequency of pedestrian movements expected, they have been coded to occur in 25 per cent of cycles, resulting in an average pedestrian time of seven seconds per cycle. This has been applied using the Gap Acceptance – Opposing Peds (Signals) parameter in the model.

This is a key difference between the SIDRA model prepared by GTA, now Stantec and SIDRA model prepared by CBRK, noting the CBRK model results in an average pedestrian time of three seconds per cycle. Assuming full pedestrian protection is provided during each pedestrian movement, this implies pedestrian movements occur in 10 per cent of cycles.

### Signal Timing

The eastern access, BHI western access and John Renshaw Drive/ M1/ Weakleys Drive intersections have been set up as being coordinated, with Signal Offsets set to program and therefore calculated by SIDRA. The coordination was observed to have limited benefit to the performance of the John Renshaw Drive/ M1/ Weakleys Drive intersection and rather, the primary benefit was observed at the BHI site western access, with significant improvements to the performance of the westbound through movement.

The western access has been set to have a minimum cycle length of 80 seconds, 30 seconds above SIDRA calculated cycle time of 50 seconds, to maintain priority for through traffic movements along John Renshaw Drive.

## SIDRA Network Modelling Results

The commonly used measure of intersection performance is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service. Table 3 shows the criteria that SIDRA INTERSECTION software adopts in assessing the level of service.

**Table 3: SIDRA INTERSECTION Level of Service criteria**

Level of service (LOS)	Average delay per vehicle (secs/veh)	Traffic signals, roundabouts & give ways
A	Less than 14	Good operation
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity, at signals incidents will cause excessive delays
F	Greater than 70	Extreme delay, major treatment required

### Primary Modelling Scenarios

The primary modelling scenarios assessed are described in **Error! Reference source not found.** Each scenario considers the cumulative impact of full development of the subject site in combination with full development of the adjacent BHI site for the project study year 2038.

**Table 4: Scenario analysis for modelling traffic impacts**

#	Scenario	Description
1	2038 with Development and BHI, and SMEC Stage 2 road network upgrades	2038 base volumes, incorporating traffic effects associated with M1RT, plus site development traffic and adjacent BHI site with upgrades to John Renshaw Drive/ Weakleys Drive/ M1 intersection based on the Stage 2 mitigation works <sup>[1]</sup> .
2	2038 with Development and BHI, and extension of SMEC Stage 2 road network upgrades	Scenario 1 with additional upgrades as follows: <ul style="list-style-type: none"> <li>Extend the short departure lane on John Renshaw Drive westbound direction.</li> <li>Introduce an additional right-turn movement lane on the John Renshaw Drive' eastbound direction.</li> </ul>

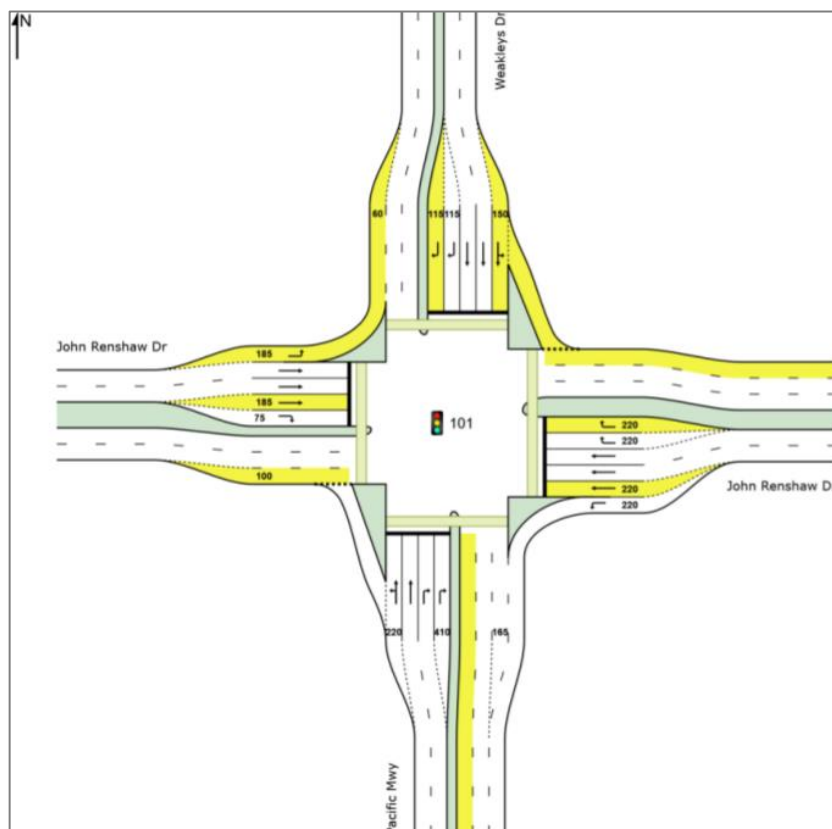
[1] As recommended in the Black Hill Traffic Modelling & Traffic Analysis Report (SMEC – 9 October 2020) and illustrated in Figure 4

### Scenario 1

Given that the John Renshaw Drive/ M1/ Weakleys Drive intersection is expected to operate over capacity in 2038, the following road network upgrades are considered necessary. These upgrades are based on the Stage 2 mitigation works as recommended in the Black Hill Traffic Modelling & Traffic Analysis Report (SMEC – 9 October 2020). The works are shown in Figure 4 and defined as follows:

- Introduce an additional through movement lane on the John Renshaw Drive eastbound direction.
- Introduce an additional through movement lane on the John Renshaw Drive westbound direction.
- Introduce an additional through movement lane on the Weakleys Drive's southbound direction.
- Introduce an additional right-turn movement lane on the Weakleys Drive's southbound direction.
- Introduce an additional right-turn movement lane on the John Renshaw Drive westbound direction.
- Convert the left-turn movement on the John Renshaw Drive's eastbound to a free-flow slip-lane.

Figure 8: SMEC Stage 2 Mitigation works John Renshaw Drive/ M1/ Weakleys Drive intersection



[1] Source: Figure 5-5 Mitigation Works – Change #5 (Stage 2), The Black Hill Traffic Modelling & Traffic Analysis Report prepared by SMEC, dated 9 October 2020

Table 5 presents a summary of the operation of the key intersections in the 2038 growth year, assuming full development of the subject site and adjacent BHI site, and Stage 2 upgrades to the John Renshaw Drive/ M1/ Weakleys Drive intersection as recommended by SMEC.

Table 5: 2038 with development site traffic and BHI site traffic plus Stage 2 SMEC intersection upgrades

Intersection	Peak Period	Degree of Saturation (DOS)	Average Delay (sec)	Average Queue (m)	Level of Service (LOS)
John Renshaw Drive/ M1/ Weakleys Drive	Overall	1.04	67	312	E
	Overall	1.38	184	578	F
John Renshaw Drive/ BHI Site Western Access	Overall	0.90	26	187	C
	Overall	0.86	26	155	C
John Renshaw Drive/ Site Eastern Access	Overall	0.60	12	67	B
	Overall	0.63	17	87	B
John Renshaw Drive/ Site Western Access	Overall	0.57	13	39	B
	Overall	0.59	16	70	B

## Scenario 2

Given that the John Renshaw Drive/ M1/ Weakleys Drive intersection is expected to operate over capacity in 2038, modifications to the suite of road network upgrades proposed by SMEC are considered necessary. The additional works are shown in Figure 9 and defined as follows:

- Extend the short departure lane on John Renshaw Drive westbound direction.
- Introduce an additional right-turn movement lane on the John Renshaw Drive' eastbound direction.

Figure 9: Extension of SMEC Stage 2 Mitigation works John Renshaw Drive/ M1/ Weakleys Drive intersection

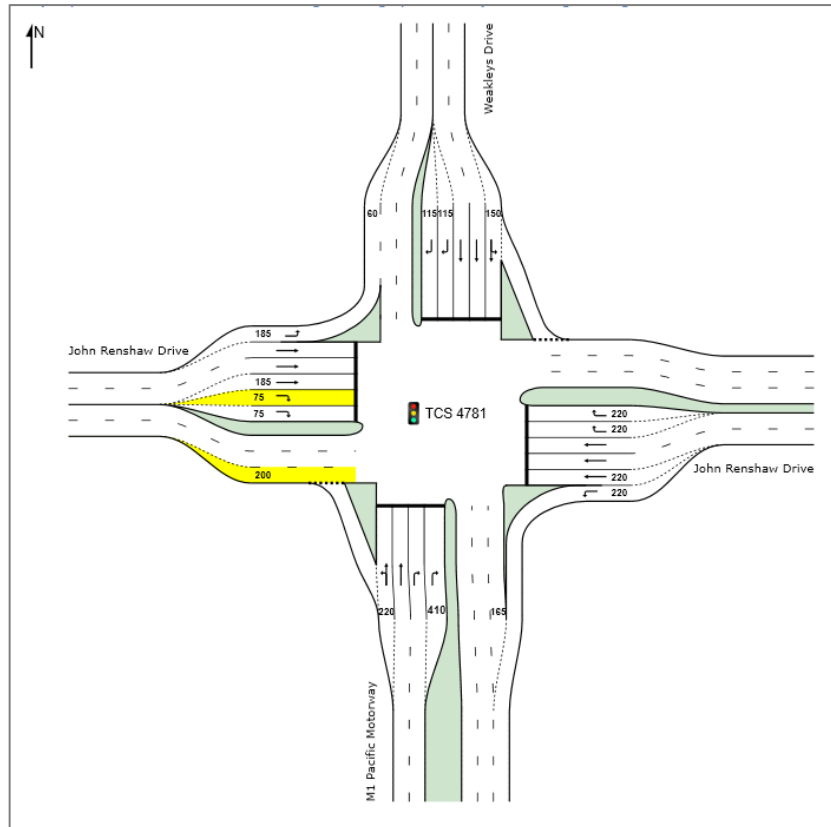


Table 5 presents a summary of the operation of the key intersections in the 2038 growth year, assuming full development of the subject site and adjacent BHI site, Stage 2 upgrades to the John Renshaw Drive/ M1/ Weakleys Drive intersection as recommended by SMEC and the above additional upgrade works.

Table 6: 2038 with development site traffic and BHI site traffic plus Stage 2 SMEC intersection upgrades

Intersection	Peak Period	Degree of Saturation (DOS)	Average Delay (sec)	Average Queue (m)	Level of Service (LOS)
John Renshaw Drive/ M1/ Weakleys Drive	Overall	0.94	56	207	E
	Overall	1.03	63	201	E
John Renshaw Drive/ BHI Site Western Access	Overall	0.94	28	197	C
	Overall	0.93	28	146	C
John Renshaw Drive/ Site Eastern Access	Overall	0.64	12	65	B
	Overall	0.68	17	82	B

Intersection	Peak Period	Degree of Saturation (DOS)	Average Delay (sec)	Average Queue (m)	Level of Service (LOS)
John Renshaw Drive/ Site Western Access	Overall	0.57	13	40	B
	Overall	0.63	16	76	B

Scenario 2 demonstrates practical intersection operation at John Renshaw Drive/ M1/ Weakleys Drive, with the intersection close to capacity, however all vehicle approach demand being met.

#### Additional Modelling Scenarios

In addition to the above, additional modelling scenarios have been prepared to assist the Court and traffic experts' joint reporting, described in Table 7.

**Table 7: Scenario analysis for modelling traffic impacts**

#	Scenario	Description
3	2038 without proposed development, but with SMEC Stage 2 road network upgrades	2038 base volumes, plus BHI site Stage 1 development traffic only, with upgrades to John Renshaw Drive/ Weakleys Drive/ M1 intersection based on the SMEC Stage 2 mitigation works <sup>[1]</sup> .
4	2038 with Development and BHI Stages 1-7, and SMEC Stage 2 road network upgrades including Black Hill Road ramps	Scenario 1 with new south-facing ramps at the Black Hill Road interchange with M1, resulting in a redistribution of development and BHI traffic travelling to/ from the south to approach via the Black Hill Road ramps.
5	2038 with Development and BHI Stage 1, and SMEC Stage 2 road network upgrades	2038 base volumes, plus 50 per cent of Emerging Black Hill Precinct developed, including Stage 1 to 4 of the development site and Stage 1 BHI site, with upgrades to John Renshaw Drive/ Weakleys Drive/ M1 intersection based on the Stage 2 mitigation works <sup>[1]</sup> .

[1] As recommended in the Black Hill Traffic Modelling & Traffic Analysis Report (SMEC – 9 October 2020) and illustrated in Figure 4

In relation to Scenario 5, it is understood that 50 per cent of the Emerging Black Hill Precinct equates to around 150 hectares. Noting approved Stage 1 of the BHI site comprises 49.2 hectares, development of Stage 1 to 4 of site would result in a total of 155.6 hectares, effectively 50 per cent of the precinct. In this scenario, the western access would service Stage 4 only, with Stage 1-3 traffic using the eastern access only. The SMEC VISSIM Modelling (October 2020) indicates that the potential Black Hill Road south facing ramps are not required until between 50-75 per cent development of the Precinct and hence this mitigation measure is not included in Scenario 5.

Relevant SIDRA summaries of results and models themselves are available at following link:

[https://stantec-my.sharepoint.com/:f/p/brett\\_maynard/Epf3E\\_kWd3NFvSsl48qc\\_WcBFMZSEoqo3izg7wFVBPWWWWQ?e=eAVz9r](https://stantec-my.sharepoint.com/:f/p/brett_maynard/Epf3E_kWd3NFvSsl48qc_WcBFMZSEoqo3izg7wFVBPWWWWQ?e=eAVz9r).

## VISSIM Modelling

The Black Hill Traffic Modelling & Traffic Analysis Report prepared by SMEC, dated 9 October 2020 is the TfNSW preferred reference document when considering the traffic effects associated with the Industrial Precinct on the surrounding road network.

The SMEC VISSIM models were provided via the data transmittal in Attachment 2. To better understand the impact of the proposed second signalised intersection to site, GTA, now Stantec have revised the 2048 model (20-2048 Combination + Sr100 – mit) to include the additional signalised intersection to the subject site (eastern site access), noting the SMEC model previously included a single access to site, being the western signalised intersection.

Note the model includes the Stage 2 mitigation works as recommended in the Black Hill Traffic Modelling & Traffic Analysis Report (SMEC – 9 October 2020) and illustrated in Figure 4, as well as the introduction of south-facing ramps at the Black Hill Road interchange with M1.

The results indicate that the additional signalised intersection does not negatively impact John Renshaw Drive operation. In the critical PM peak, eastbound John Renshaw Drive travel times are very similar with the additional traffic signals, while there is a travel time reduction in the westbound direction.

Relevant VISSIM summary tables and graphs of results and models themselves are available at following link:  
[https://stantec-my.sharepoint.com/:f/p/brett\\_maynard/Epf3E\\_kWd3NFvSsl48qc\\_WcBFMZSEogo3izg7wFVBPWWWQ?e=eAVz9r](https://stantec-my.sharepoint.com/:f/p/brett_maynard/Epf3E_kWd3NFvSsl48qc_WcBFMZSEogo3izg7wFVBPWWWQ?e=eAVz9r)

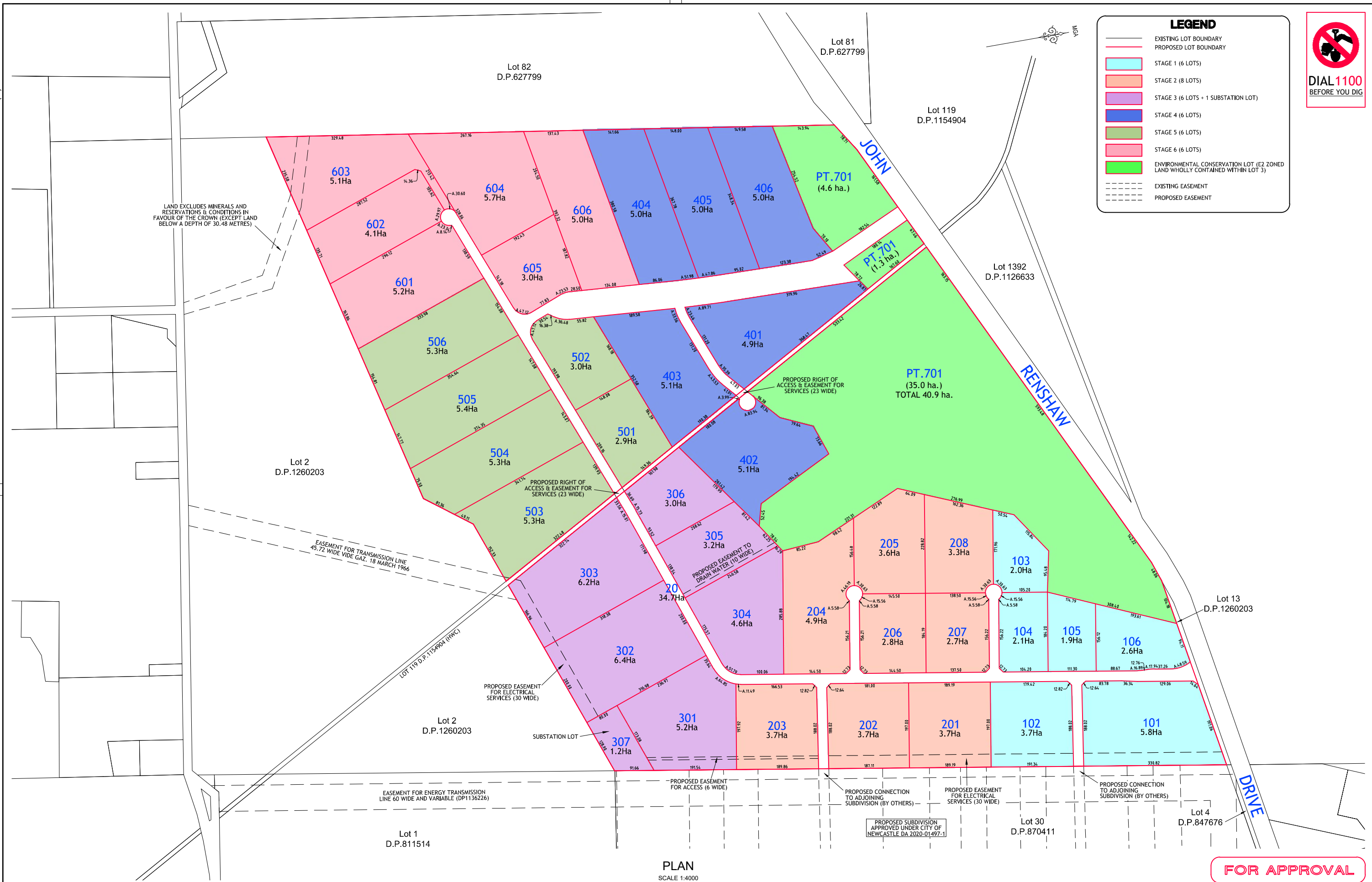
# ATTACHMENT 1

## Site Layout and Intersection Plans

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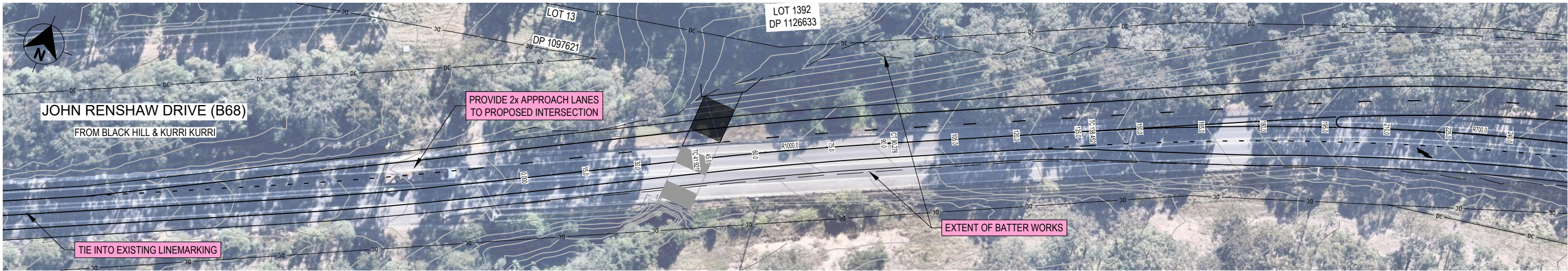
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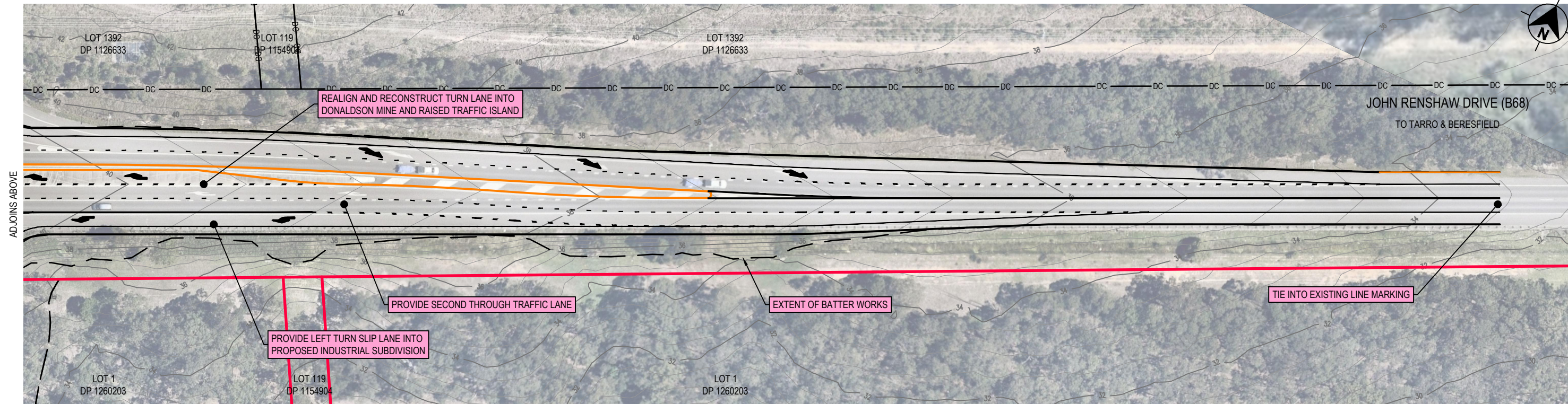
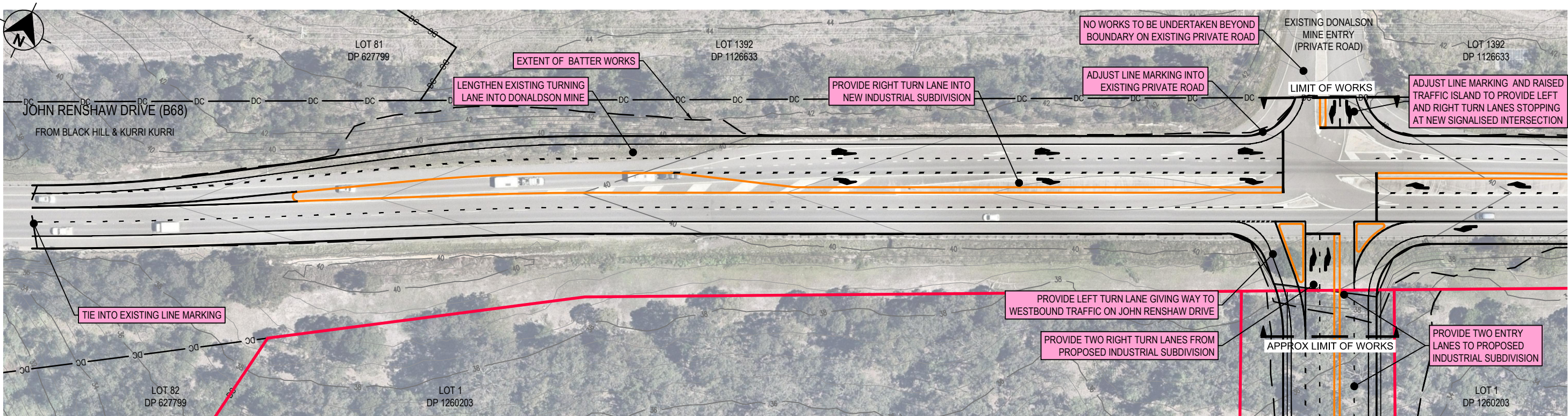
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LEGEND  
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— SITE BOUNDARY

- NOTES:
- INTERSECTION LAYOUT AND LANE CONFIGURATION BASED ON FIGURE3-8 FROM HYDER TRAFFIC AND TRANSPORT REPORT DATED SEPTEMBER 2013.
  - THE REQUIREMENT FOR MEDIAN ISLANDS, INCLUDING WIDTHS, IS SUBJECT TO A TRAFFIC CONTROL SIGNAL (TCS) DESIGN TO CONFIRM THE LOCATION OF SIGNAL POSTS.
  - A DEDICATED ON ROAD CYCLEWAY HAS NOT BEEN PROVIDED AS THERE IS NO CYCLEWAY NETWORK ON THE EXISTING ROAD NETWORK.

NOT FOR CONSTRUCTION

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EXTERNAL REFERENCE FILES				REV	DATE	AMENDMENT / REVISION DESCRIPTION		WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING		DRAWINGS / DESIGN PREPARED BY		RMS REGISTRATION No. TBC		PART 1	
				1	17.05.21	PRELIMINARY ISSUE				HORIZONTAL SCALE 1:1000m		HUNTER OFFICE Unit 7/335 Hillborough Rd Warners Bay N.S.W. 2282 Phone: (02) 4978 5100 Fax: (02) 4978 5199 email: hunter@adwjohnson.com.au www.adwjohnson.com.au ADN 62 129 445 398		PREPARED FOR		ISSUE STATUS CONCEPT DESIGN	
										CO-ORDINATE SYSTEM GDA94 MGA ZONE 56		HEIGHT DATUM AHD		EDMS No.		SHEET No. RD-0701	
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										DRAWN		S.HODGES		17.05.21		1	
										DRG CHECK		R.KERR		17.05.21		1	
										DESIGN		Z.JARVIE		03.08.18		1	
										DESIGN CHECK							
										DESIGN MNGR							
										PROJECT MNGR		R.KERR				1	



# ATTACHMENT 2

## SMEC Model Data Transmittal

# 1 Model Data Transmittal

This document provides a summary of the models provided for Black Hill and Stage 1. The models can be downloaded from here:

[https://surbanajurong-my.sharepoint.com/:f:/g/personal/danny\\_frahm\\_smeccom/EiRcKMAaR-IKj0R-oSpEKMoBS\\_ARX8W\\_42XnBrwrJnZZeQ?e=4hNz9r](https://surbanajurong-my.sharepoint.com/:f:/g/personal/danny_frahm_smeccom/EiRcKMAaR-IKj0R-oSpEKMoBS_ARX8W_42XnBrwrJnZZeQ?e=4hNz9r)

This link will expire 5/12/2021.

## 1.1 VISSIM version number

All Black Hill models in this transmittal were run in VISSIM 2020.

## 1.2 Black Hill Traffic Modelling, September 2020 Models

### 1.2.1 Project file location

The VISSIM models are divided into two time periods – AM and PM. Figure 1 shows the folder name.

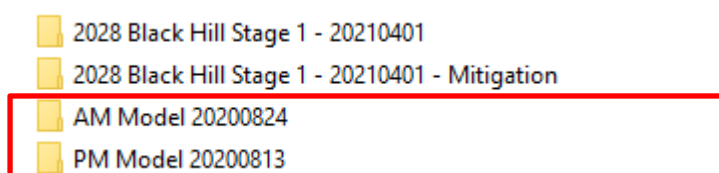


Figure 1 – Folders for Sept 2020 models

In these folders is a “project file”. This contains all of the different scenarios. The file name for the project is – “Blackhill AM.vissimpdb” and “Blackhill PM.vissimpdb”, shown figure 2.

Blackhill AM.inpx	✓	11/09/2020 10:48 AM	Vissim input file	3,136 KB
Blackhill AM.layx	✓	24/08/2020 9:13 AM	LAYX File	129 KB
Blackhill AM.vissimpdb	✓	12/10/2021 2:56 PM	Vissim project file	72 KB
DF layouts.layx	✓	29/06/2021 2:13 PM	LAYX File	831 KB
RMS_5_Seeds.vbs	✓	17/08/2020 12:57 PM	VBScript Script File	5 KB
Blackhill PM.layx	✓	11/09/2020 11:02 AM	LAYX File	124 KB
Blackhill PM.vissimpdb	↻	5/11/2021 3:55 PM	Vissim project file	68 KB
defaults_Node Results_000.att	✓	4/09/2020 9:25 AM	ATT File	3 KB
defaults_Vehicle Network Performance E	✓	4/09/2020 9:25 AM	ATT File	5 KB

Figure 2 – Run files for Sept 2020 models

### 1.2.2 Scenario list

The following are a list of the models in both the AM and PM models

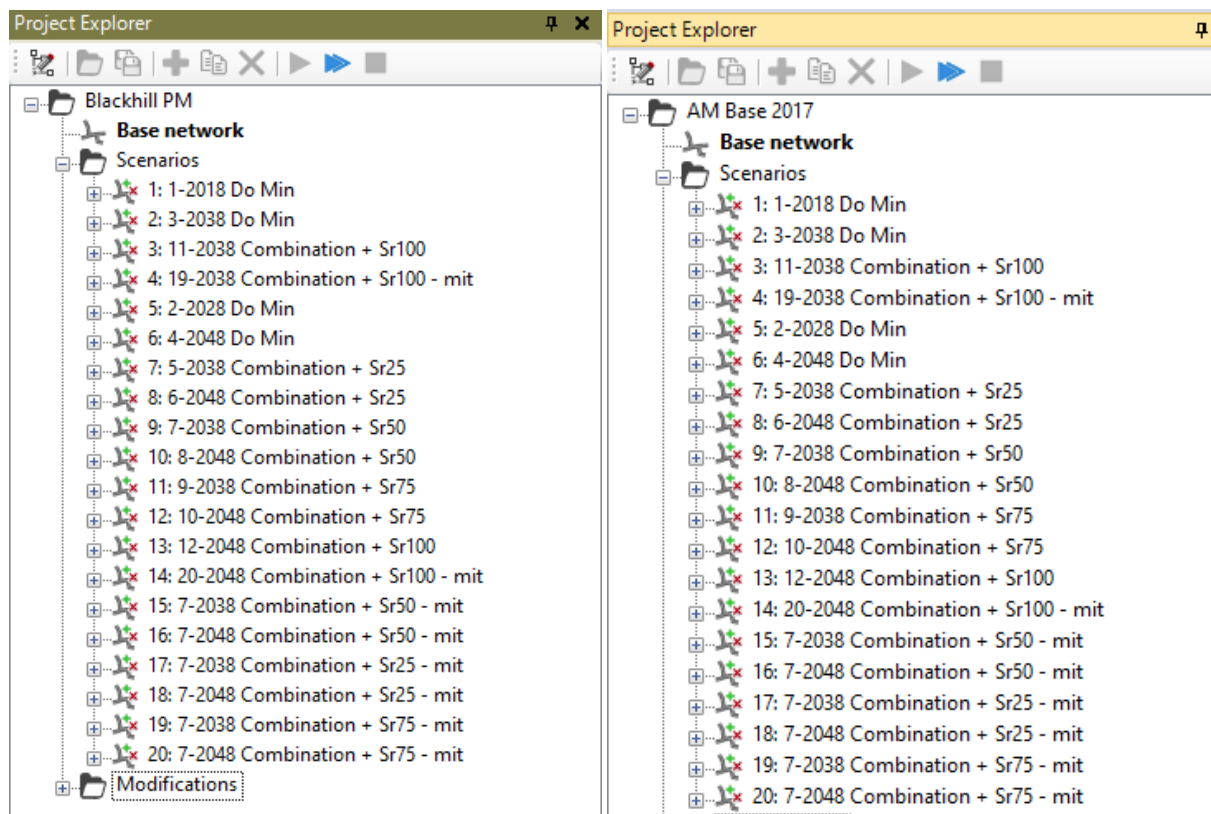


Figure 3 – Scenario list Sept 2020 models

## 1.3 Stage 1 – BHI Development traffic impact, 14 April 2021

### 1.3.1 VISSIM models

The VISSIM models are divided into two folders – Base and Mitigation. Figure below shows the folder names.

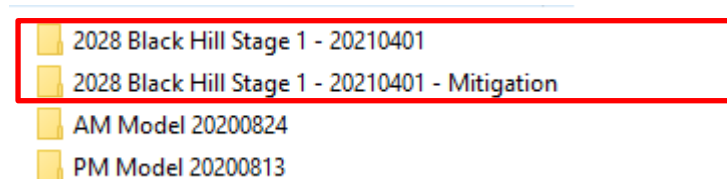


Figure 4 – Folders for April 2021 models

In these folders is a “project file”. This contains all of the different scenarios. The file name for the project is – “Blackhill variation.vissimpdb”, shown figure 2.

Blackhill Variation.inpx	✓	1/03/2021 11:05 AM	Vissim input file	2,475 KB
Blackhill Variation.layx	✓	22/03/2021 1:42 PM	LAYX File	166 KB
Blackhill Variation.vissimpdb	↻	5/11/2021 4:18 PM	Vissim project file	96 KB
MatrixExtractionVissim.py	✓	17/08/2020 5:42 PM	Python File	2 KB
MoveNetworkDataToExcel2.py	✓	18/08/2020 4:27 PM	Python File	2 KB






 Blackhill Variation.inpx	✓	1/03/2021 11:05 AM	Vissim input file	2,475 KB
 Blackhill Variation.layx	✓	22/03/2021 3:23 PM	LAYX File	166 KB
 Blackhill Variation.vissimpdb	✓	5/11/2021 4:18 PM	Vissim project file	92 KB
 DF layouts.layx	✓	29/06/2021 2:13 PM	LAYX File	831 KB
 MatrixExtractionVissim.py	✓	17/08/2020 5:42 PM	Python File	2 KB

Figure 5 – Folders for April 2021 models

### 1.3.2 Scenario list

The following are a list of the scenarios in both the Base and Mitigation models.

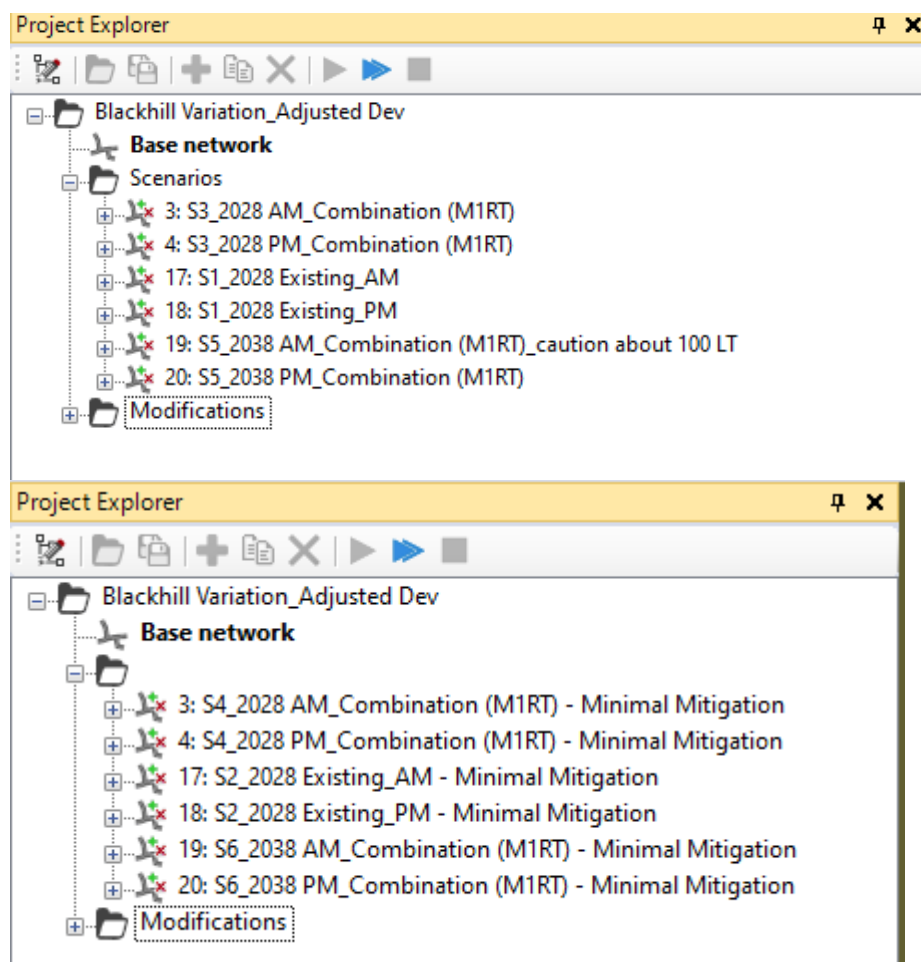


Figure 6 – Scenarios for April 2021 models