

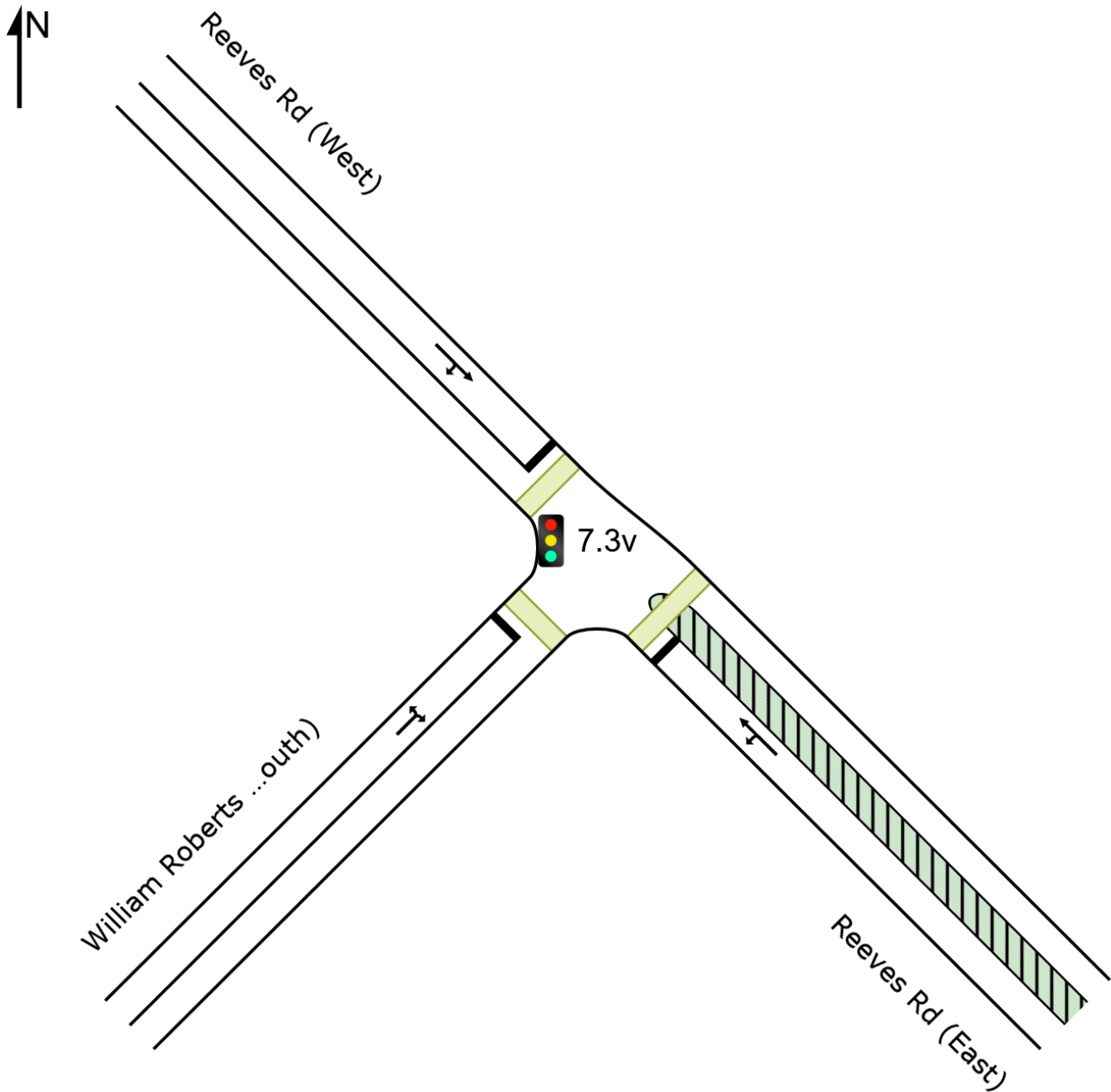
# SITE LAYOUT

Site: 7.3v [7.3 William Roberts Rd / Reeves Rd signalised (Site Folder: AM)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# CCG LANE SUMMARY

Common Control Group: CCG3 [Aylesbury/ WR/ Reeves Rd]

Network: N101 [PM - Continuous Lane & Phase & Single lane (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (CCG Practical Cycle Time)

Lane Use and Performance (CCG)															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m	m	%	%	
Site: 5.2v [5.2 Aylesbury St/ Reeves Rd/ Busway Link signalised]															
SouthEast: Reeves Road (East)															
Lane 1	72	6.9	72	6.9	1772	0.041	100	1.9	LOS A	0.0	0.0	Full	27	0.0	0.0
Approach	72	6.9	72	6.9		0.041		1.9	LOS A	0.0	0.0				
East: Pakuranga Rd Busway Link (Southbound)															
Lane 1 (B)	28	100.0	28	100.0	122	0.229	100	64.4	LOS E	1.5	19.9	Full	203	0.0	0.0
Approach	28	100.0	28	100.0		0.229		64.4	LOS E	1.5	19.9				
NorthWest: Aylesbury Street															
Lane 1	118	5.1	118	5.1	127	0.927	100	83.2	LOS F	8.0	58.5	Full	284	-9.1 <sup>N7</sup>	0.0
Approach	118	5.1	118	5.1		0.927		83.2	LOS F	8.0	58.5				
SouthWest: Reeves Road (South)															
Lane 1	114	14.1	113	14.1	134	0.845	100	75.3	LOS E	7.2	56.2	Full	180	-8.4 <sup>N7</sup>	0.0
Approach	114	14.1	113	14.1		0.845		75.3	LOS E	7.2	56.2				
Intersection	332	16.6	331	16.6		0.927		61.2	LOS E	8.0	58.5				
Site: 7.3v [7.3 William Roberts Rd / Reeves Rd signalised]															
SouthEast: Reeves Rd (East)															
Lane 1	131	5.3	131	5.3	154	0.851	100	76.4	LOS E	8.2	60.0	Full	810	0.0	0.0
Approach	131	5.3	131	5.3		0.851		76.4	LOS E	8.2	60.0				
NorthWest: Reeves Rd (West)															
Lane 1	200	6.5	200	6.5	654	0.306	100	22.1	LOS C	5.3 <sup>N4</sup>	39.5 <sup>N4</sup>	Full	27	0.0	50.0
Approach	200	6.5	200	6.5		0.306		22.1	LOS C	5.3	39.5				
SouthWest: William Roberts Road (South)															
Lane 1	437	6.9	437	6.9	477	0.917	100	66.1	LOS E	27.9	206.7	Full	223	0.0	8.1
Approach	437	6.9	437	6.9		0.917		66.1	LOS E	27.9	206.7				
Intersection	768	6.5	768	6.5		0.917		56.4	LOS E	27.9	206.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

Queue Model: SIDRA Standard.

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

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

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

## Approach Lane Flows (CCG) (veh/h)

Site: 5.2v [5.2 Aylesbury St/ Reeves Rd/ Busway Link signalised]										
SouthEast: Reeves Road (East)										
Mov. From SE To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	55	17	72	6.9	1772	0.041	100	NA	NA	
Approach	55	17	72	6.9		0.041				
East: Pakuranga Rd Busway Link (Southbound)										
Mov. From E To Exit:	L1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
Lane 1	28	28	100.0	122	0.229	100	NA	NA		
Approach	28	28	100.0		0.229					
NorthWest: Aylesbury Street										
Mov. From NW To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	107	11	118	5.1	127	0.927	100	NA	NA	
Approach	107	11	118	5.1		0.927				
SouthWest: Reeves Road (South)										
Mov. From SW To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	9	94	113	14.1	134	0.845	100	NA	NA
Approach	11	9	94	113	14.1		0.845			
Total		%HV		Deg.Satn (v/c)						
Intersection	331	16.6	0.927							
Site: 7.3v [7.3 William Roberts Rd / Reeves Rd signalised]										
SouthEast: Reeves Rd (East)										
Mov. From SE To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	86	45	131	5.3	154	0.851	100	NA	NA	
Approach	86	45	131	5.3		0.851				
NorthWest: Reeves Rd (West)										
Mov. From NW To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	162	38	200	6.5	654	0.306	100	NA	NA	
Approach	162	38	200	6.5		0.306				
SouthWest: William Roberts Road (South)										
Mov. From SW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	26	411	437	6.9	477	0.917	100	NA	NA	

Approach	26	411	437	6.9	0.917
	Total	%HV	Deg.Satn	(v/c)	
Intersection	768	6.5		0.917	

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

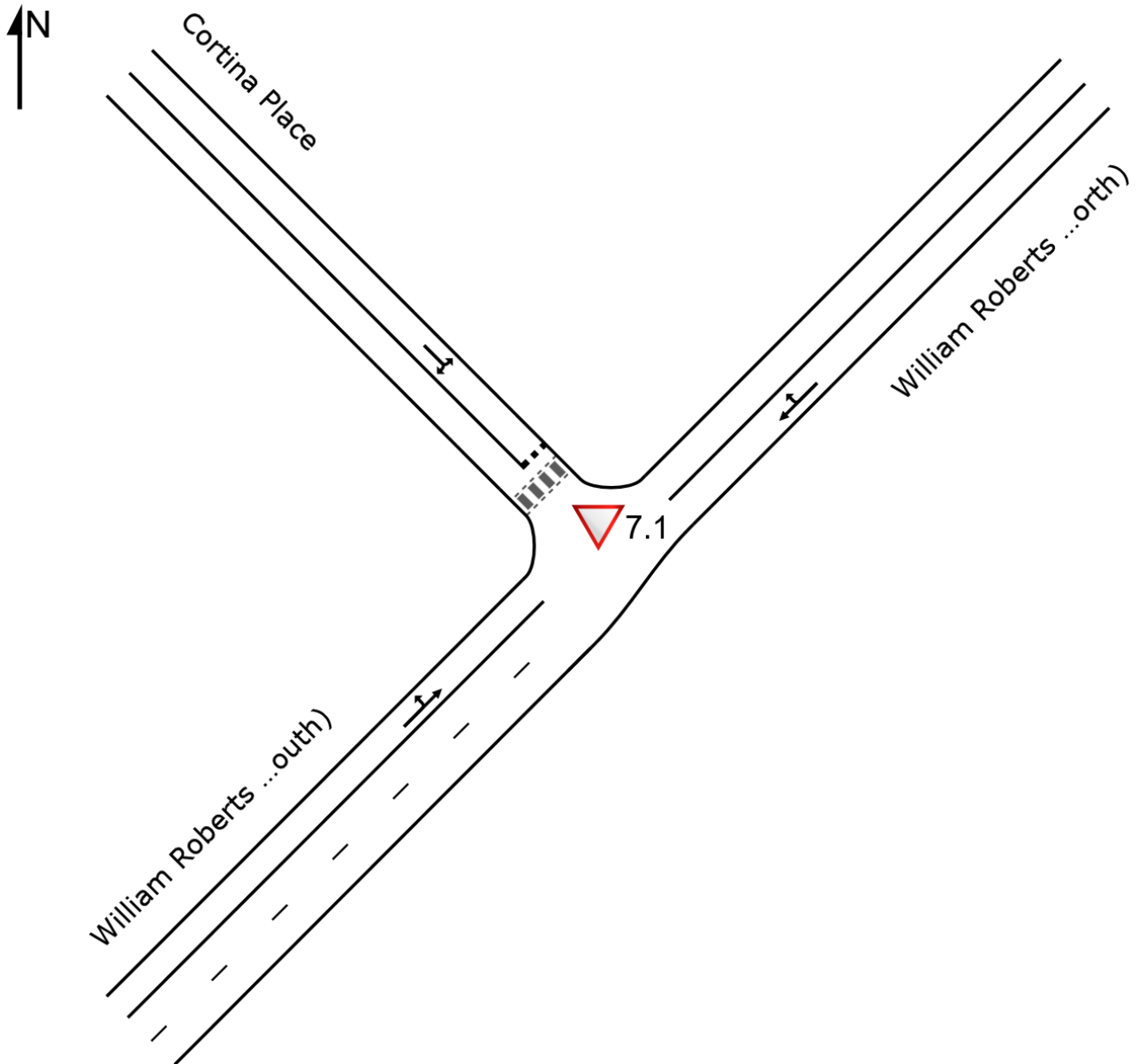
Merge Analysis (CCG)												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
Site: 5.2v [5.2 Aylesbury St/ Reeves Rd/ Busway Link signalised]												
SouthEast Exit: Reeves Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthEast Exit: Pakuranga Rd Busway Link (Northbound)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Aylesbury Street												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
SouthWest Exit: Reeves Road (South)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Site: 7.3v [7.3 William Roberts Rd / Reeves Rd signalised]												
SouthEast Exit: Reeves Rd (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Reeves Rd (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
SouthWest Exit: William Roberts Road (South)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

# SITE LAYOUT

▼ Site: 7.1 [7.1 William Roberts Rd / Cortina PI (Site Folder: AM)]

Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI (Site Folder: AM)]

Network: N101 [PM - Continuous Lane & Phase & Single lane (Network Folder: General)]

Site Category: (None)  
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
NorthEast: William Roberts Road (North)															
Lane 1	139	6.5	139	6.5	1580	0.088	100	1.8	LOS A	0.2	1.6	Full	223	0.0	0.0
Approach	139	6.5	139	6.5		0.088		1.8	NA	0.2	1.6				
NorthWest: Cortina Place															
Lane 1	276	8.3	276	8.3	899	0.307	100	3.3	LOS A	1.1	7.9	Full	177	-3.0 <sup>N7</sup>	0.0
Approach	276	8.3	276	8.3		0.307		3.3	LOS A	1.1	7.9				
SouthWest: William Roberts Road (South)															
Lane 1	416	7.7	416	7.7	1510	0.275	100	0.9	LOS A	0.5	4.0	Full	110	-4.3 <sup>N7</sup>	0.0
Approach	416	7.7	416	7.7		0.275		0.9	NA	0.5	4.0				
Intersection	831	7.7	831	7.7		0.307		1.9	NA	1.1	7.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov. From NE To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	106	33	139	6.5	1580	0.088	100	NA	NA	
Approach	106	33	139	6.5		0.088				
NorthWest: Cortina Place										
Mov. From NW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	144	132	276	8.3	899	0.307	100	NA	NA	
Approach	144	132	276	8.3		0.307				
SouthWest: William Roberts Road (South)										
Mov. From SW To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	101	315	416	7.7	1510	0.275	100	NA	NA	

Approach	101	315	416	7.7	0.275
Total %HV Deg.Satn (v/c)					
Intersection	831	7.7	0.307		

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
NorthWest Exit: Cortina Place											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
SouthWest Exit: William Roberts Road (South)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.

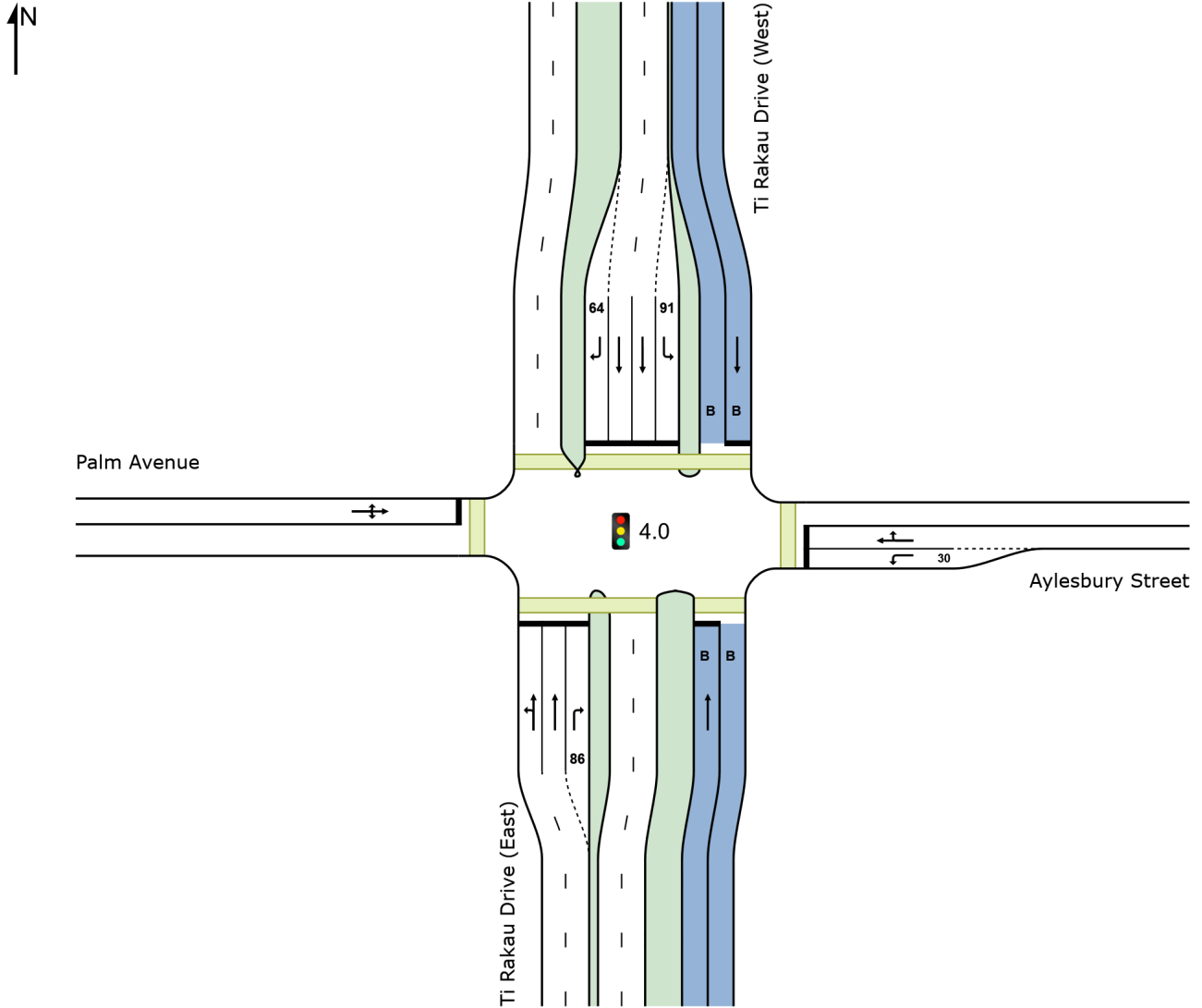
# SITE LAYOUT

 Site: 4.0 [4.0 Palm Ave / Aylesbury St (Site Folder: AM)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\Operational\2028 EB2-EB3R-Final-Xroads-PM.sip9





Lane 1	80	313	-	393	8.0	390	1.007	100	NA	NA
Lane 2	-	742	-	742	7.1	737 <sup>1</sup>	1.007	100	NA	NA
Lane 3	-	-	65	65	4.6	68	0.952	100	0.0	2
Lane 4	-	53	-	53	100.0	613	0.086	100	NA	NA
Approach	80	1108	65	1253	11.2		1.007			
East: Aylesbury Street										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W	N							
Lane 1	49	-	-	49	8.2	125	0.393	100	0.0	2
Lane 2	-	15	87	102	8.8	199 <sup>1</sup>	0.512	100	NA	NA
Approach	49	15	87	151	8.6		0.512			
North: Ti Rakau Drive (West)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	-	23	-	23	100.0	613	0.038	100	NA	NA
Lane 2	256	-	-	256	7.4	1004	0.255	100	0.0	3
Lane 3	-	268	-	268	7.8	687	0.390	100	NA	NA
Lane 4	-	268	-	268	7.8	687	0.390	100	NA	NA
Lane 5	-	-	31	31	3.2	69	0.450	100	0.0	4
Approach	256	559	31	845	10.1		0.450			
West: Palm Avenue										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	36	21	33	90	4.4	173	0.521	100	NA	NA
Approach	36	21	33	90	4.4		0.521			
Total %HV Deg. Satn (v/c)										
Intersection	2339	10.3		1.007						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
East Exit: Aylesbury Street											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
North Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
West Exit: Palm Avenue											
Merge Type: <b>Not Applied</b>											

Full Length Lane      1      Merge Analysis not applied.

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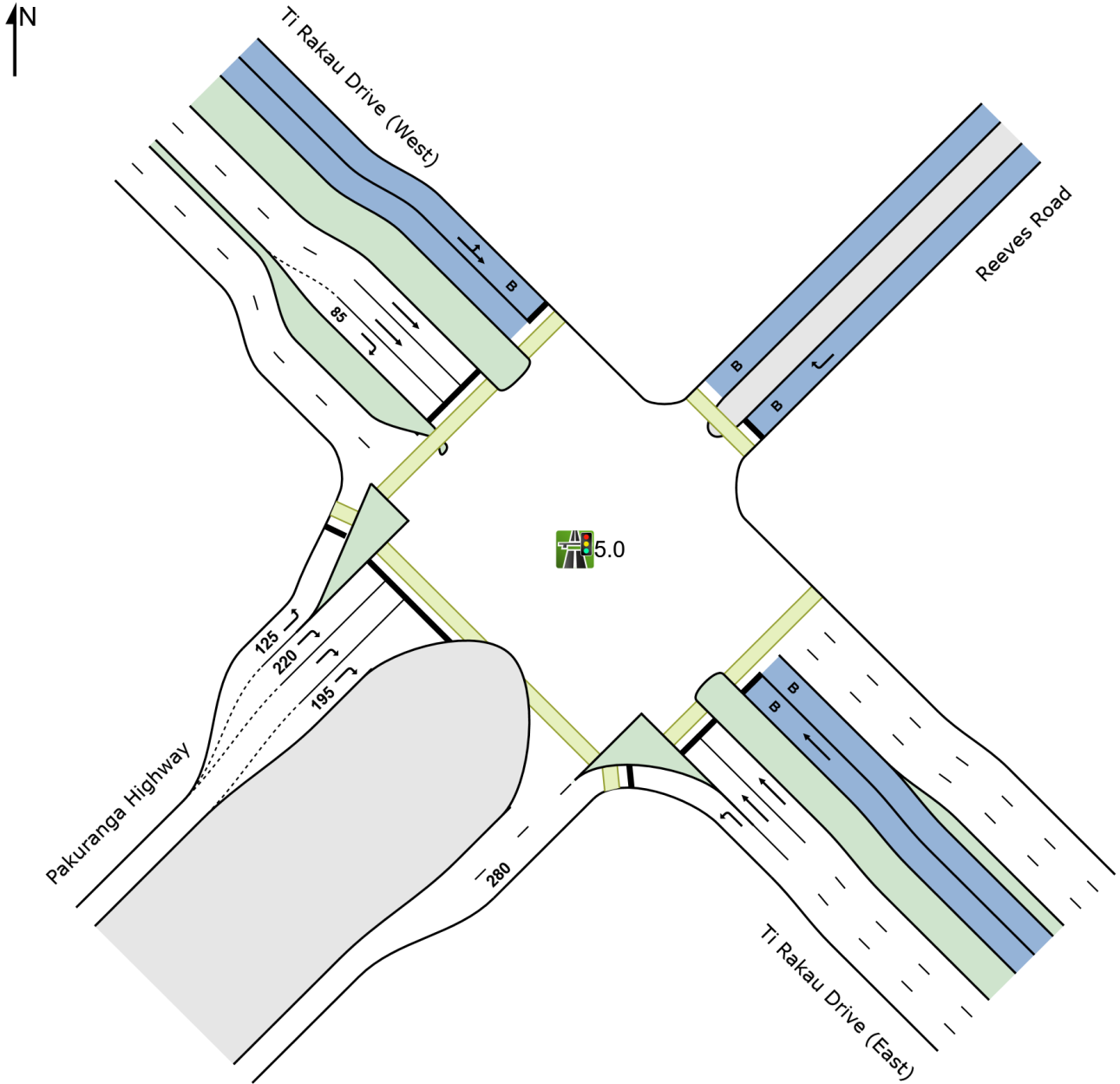
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# SITE LAYOUT

 Site: 5.0 [5.0 Pakuranga Highway / Reeves Rd (Site Folder: AM)]

Site Category: (None)  
Single Point Interchange (Signals) - EQUISAT (Fixed-Time/SCATS) Coordinated

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To Exit:	SW	NW				veh/h	v/c	%	%	No.
Lane 1	817	-	817	8.2		1420	0.575	100	NA	NA
Lane 2	-	432	432	7.2		482	0.896	100	NA	NA
Lane 3	-	432	432	7.2		482	0.896	100	NA	NA
Lane 4	-	13	13	100.0		279	0.047	100	NA	NA
Approach	817	877	1694	8.4			0.896			
NorthEast: Reeves Road										
Mov.	R2	Total	%HV			Cap.	Deg.	Lane	Prob.	Ov.
From NE						veh/h	Satn	Util.	SL	Lane
To Exit:	NW						v/c	%	%	No.
Lane 1	9	9	100.0			190	0.047	100	NA	NA
Approach	9	9	100.0				0.047			
NorthWest: Ti Rakau Drive (West)										
Mov.	L2	T1	R2	Total	%HV		Cap.	Deg.	Lane	Prob.
From NW							veh/h	Satn	Util.	SL
To Exit:	NE	SE	SW					v/c	%	%
Lane 1	28	25	-	53	100.0		319	0.166	100	NA
Lane 2	-	243	-	243	7.4		259	0.939	100	NA
Lane 3	-	243	-	243	7.4		259	0.939	100	NA
Lane 4	-	-	75	75	12.0		136	0.551	100	0.0
Approach	28	512	75	615	15.9			0.939		
SouthWest: Pakuranga Highway										
Mov.	L2	R2	Total	%HV			Cap.	Deg.	Lane	Prob.
From SW							veh/h	Satn	Util.	SL
To Exit:	NW	SE						v/c	%	%
Lane 1	289	-	289	7.6			344	0.840	100	31.2
Lane 2	-	376	376	7.5			451	0.833	100	0.0
Lane 3	-	376	376	7.5			451	0.833	100	NA
Lane 4	-	376	376	7.5			451	0.833	100	10.6
Approach	289	1128	1417	7.6				0.840		
Total %HV Deg.Satn (v/c)										
Intersection	3735	9.5						0.939		

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay Rate sec
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
Full Length Lane	3	Merge Analysis not applied.									
Full Length Lane	4	Merge Analysis not applied.									
NorthEast Exit: Reeves Road											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
Full Length Lane	3	Merge Analysis not applied.									

SouthWest Exit: Pakuranga Highway

Merge Type: **Zipper**

Exit Short Lane	1	280	50.0	37	40	2.50	2.00	817	1756	0.465	0.0	0.0
Merge Lane	2	-	50.0	408	425	2.50	2.00	75	1248	0.060	0.4	0.5

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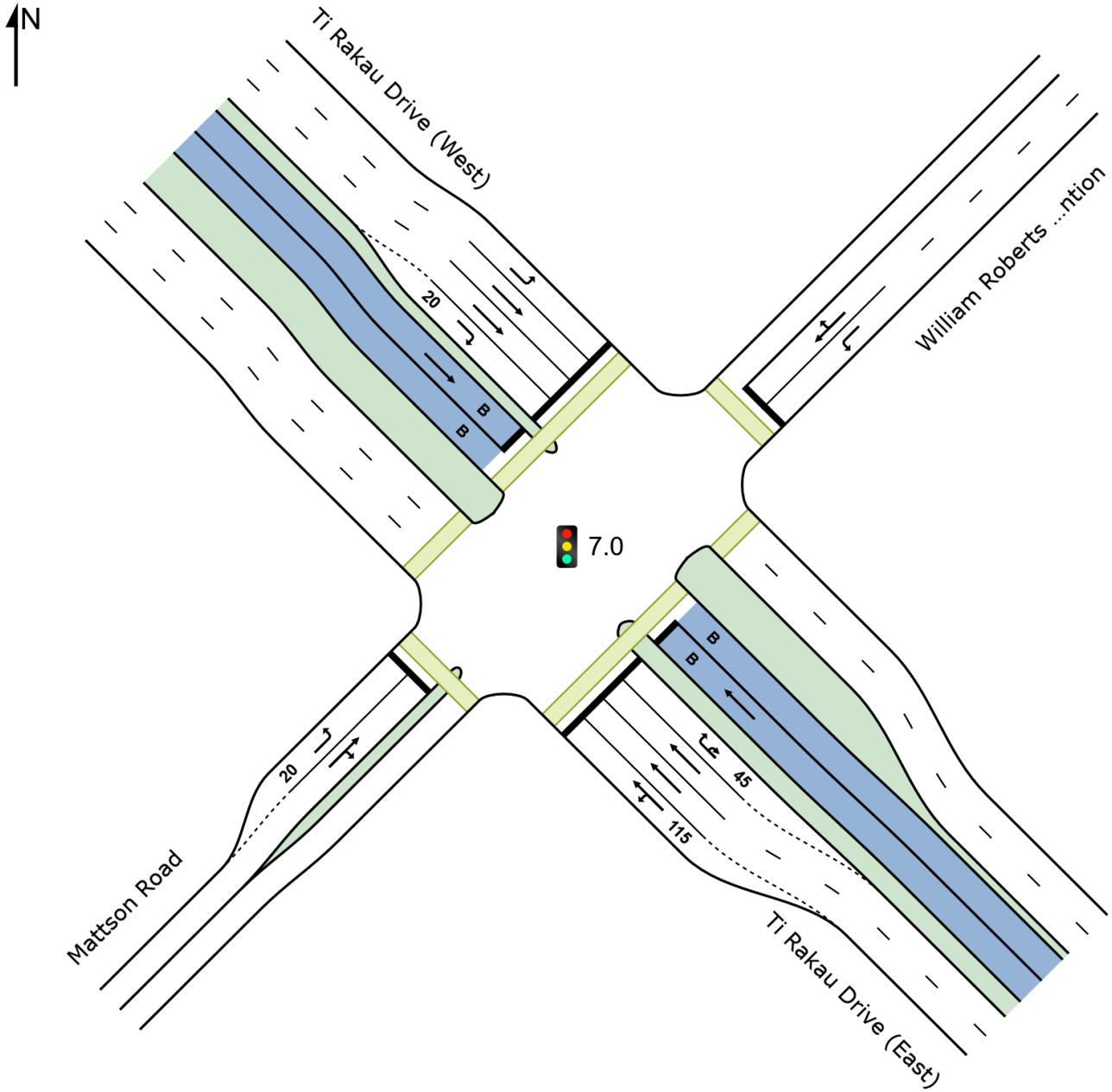
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# SITE LAYOUT

**Site: 7.0 [7.0 William Roberts Rd/ Mattson Rd/ Ti Rakau Drive  
(Site Folder: AM)]**

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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Full Length Lane	4	Merge Analysis not applied.
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SouthWest Exit: Mattson Road		
Merge Type: <b>Not Applied</b>		

Full Length Lane	1	Merge Analysis not applied.
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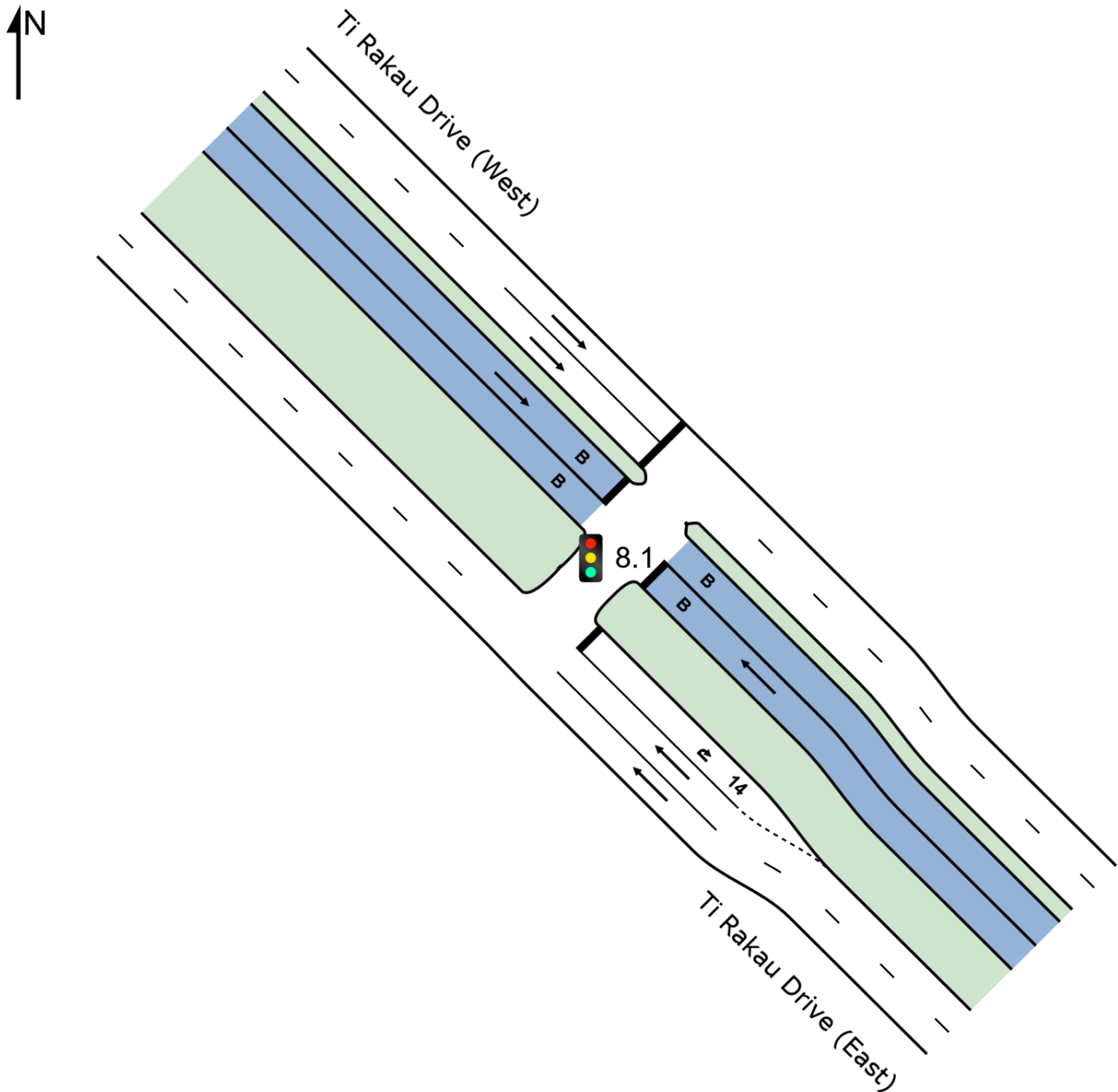
# SITE LAYOUT

## Site: 8.1 [8.1 U-turn - West of Marriot Rd (Site Folder: AM)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 8.1 [8.1 U-turn - West of Marriot Rd (Site Folder: AM)]

Network: N101 [PM - Continuous Lane & Phase & Single lane (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 40 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]	veh/h	v/c	%	sec		[ Veh ]	[ Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	926	7.6	899	7.6	1848	0.486	100	0.1	LOS A	0.0	0.0	Full	147	0.0	0.0
Lane 2	926	7.6	899	7.6	1848	0.486	100	0.1	LOS A	0.0	0.0	Full	147	0.0	0.0
Lane 3	75	6.7	73	6.7	199	0.365	100	24.4	LOS C	1.3	9.4	Short	14	0.0	NA
Lane 4 (B)	13	100.0	13	100.0	657	0.020	100	0.2	LOS A	0.0	0.1	Full	147	0.0	0.0
Approach	1940	8.2	1884 <sup>N</sup> <sub>1</sub>	8.2		0.486		1.0	LOS A	1.3	9.4				
NorthWest: Ti Rakau Drive (West)															
Lane 1	726	7.4	726	7.4	1018	0.713	100	8.4	LOS A	10.3	76.6	Full	73	0.0	19.4
Lane 2	726	7.4	726	7.4	1018	0.713	100	8.4	LOS A	10.3	76.6	Full	73	0.0	19.4
Lane 3 (B)	25	100.0	25	100.0	657	0.038	100	0.2	LOS A	0.0	0.1	Full	73	0.0	0.0
Approach	1477	9.0	1477	9.0		0.713		8.3	LOS A	10.3	76.6				
Intersection	3417	8.5	3360 <sup>N</sup> <sub>1</sub>	8.7		0.713		4.2	LOS A	10.3	76.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	T1	U	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From SE To Exit:	NW	SE			veh/h	v/c	%	%		
Lane 1	899	-	899	7.6	1848	0.486	100	NA	NA	
Lane 2	899	-	899	7.6	1848	0.486	100	NA	NA	
Lane 3	-	73	73	6.7	199	0.365	100	0.0	2	
Lane 4	13	-	13	100.0	657	0.020	100	NA	NA	
Approach	1811	73	1884	8.2		0.486				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.	
From NW To Exit:	SE			veh/h	v/c	%	%			
Lane 1	726	726	7.4	1018	0.713	100	NA	NA		
Lane 2	726	726	7.4	1018	0.713	100	NA	NA		
Lane 3	25	25	100.0	657	0.038	100	NA	NA		
Approach	1477	1477	9.0		0.713					

	Total	%HV	Deg.Satn (v/c)
Intersection	3360	8.7	0.713

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

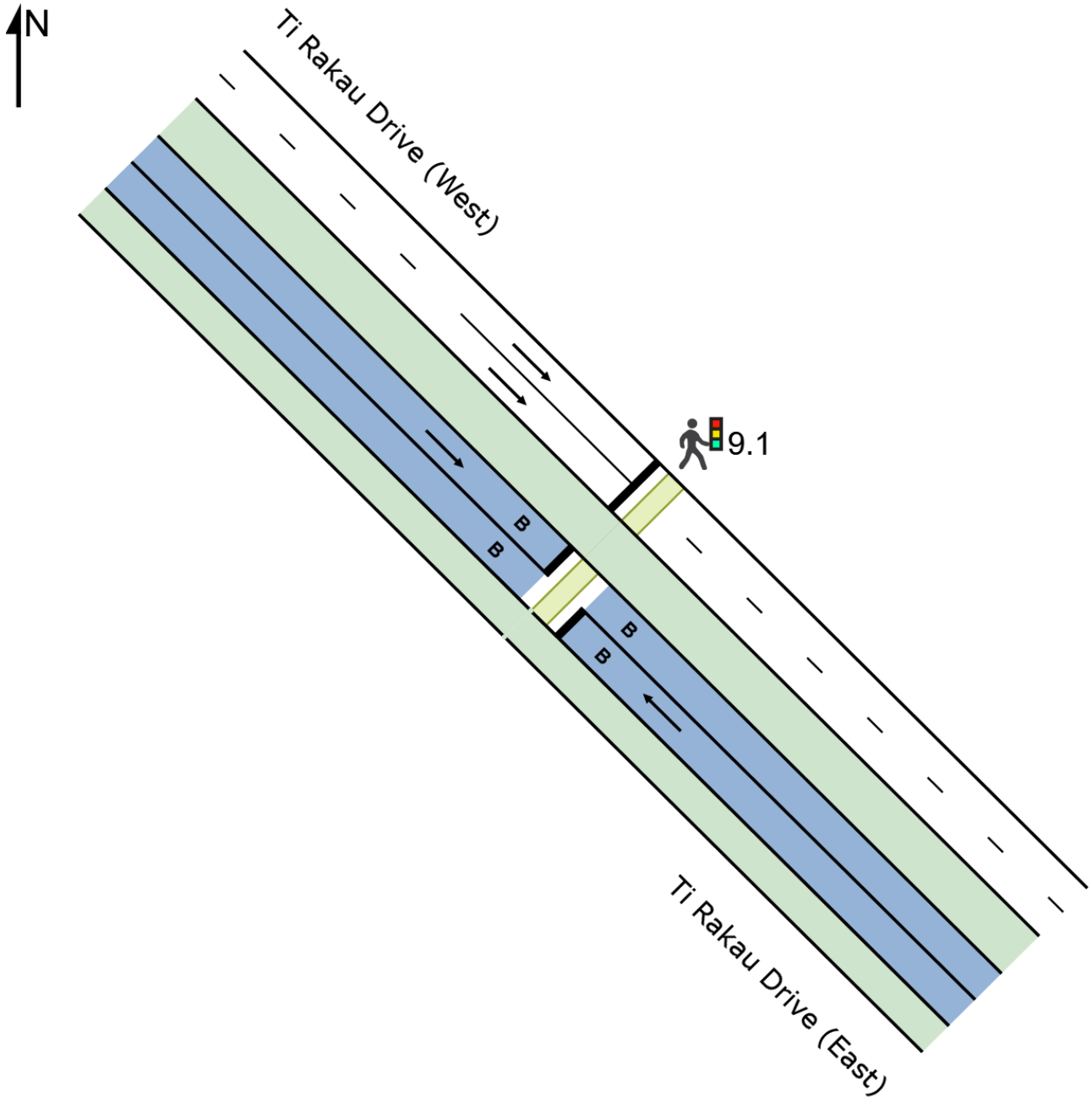
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.

# SITE LAYOUT

 Site: 9.1 [9.1 Staggered Crossing - East of Marriot Rd (Site Folder: AM)]

Site Category: (None)  
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

 Site: 9.1 [9.1 Staggered Crossing - East of Marriot Rd (Site Folder: AM)]

 Network: N101 [PM - Continuous Lane & Phase & Single lane (Network Folder: General)]

Site Category: (None)

Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 50 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
SouthEast: Ti Rakau Drive (East)															
Lane 1 (B)	13	100.0	13	100.0	433	0.030	100	4.2	LOS A	0.1	0.9	Full	45	0.0	0.0
Approach	13	100.0	13	100.0		0.030		4.2	LOS A	0.1	0.9				
NorthWest: Ti Rakau Drive (West)															
Lane 1	741	7.6	740	7.6	952	0.777	100	12.9	LOS B	2.4 <sup>N4</sup>	17.5 <sup>N4</sup>	Full	12	0.0	50.0
Lane 2	741	7.6	740	7.6	952	0.777	100	12.9	LOS B	2.4 <sup>N4</sup>	17.5 <sup>N4</sup>	Full	12	0.0	50.0
Lane 3 (B)	25	100.0	25	100.0	433	0.058	100	4.2	LOS A	0.1	1.8	Full	12	0.0	0.0
Approach	1506	9.1	1506	9.1		0.777		12.8	LOS B	2.4	17.5				
Intersection	1519	9.9	1519	9.9		0.777		12.7	LOS B	2.4	17.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Prob. Ov. %	Ov. Lane No.
Lane 1	13	13	100.0	433	0.030	100	NA	NA	
Approach	13	13	100.0		0.030				
NorthWest: Ti Rakau Drive (West)									
Mov. From NW To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Prob. Ov. %	Ov. Lane No.
Lane 1	740	740	7.6	952	0.777	100	NA	NA	
Lane 2	740	740	7.6	952	0.777	100	NA	NA	
Lane 3	25	25	100.0	433	0.058	100	NA	NA	
Approach	1506	1506	9.1		0.777				
Total %HV Deg. Satn (v/c)									
Intersection	1519	9.9			0.777				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.



Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
Full Length Lane	3	Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									

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 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\Operational\2028 EB2-EB3R-Final-Xroads-PM.sip9

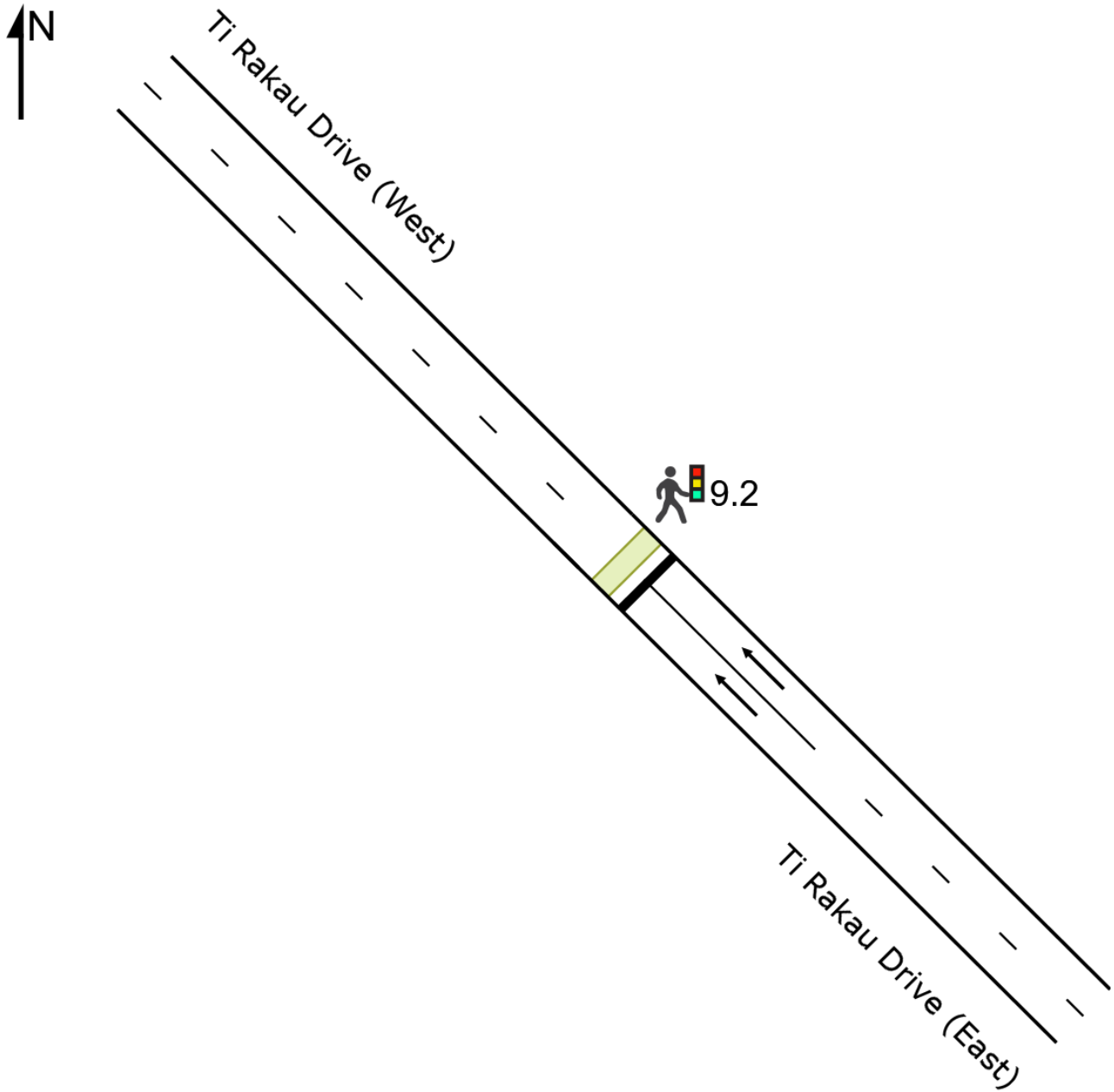
# SITE LAYOUT

 Site: 9.2 [9.2 Staggered Crossing - East of Marriot Rd (Site Folder: AM)]

---

Site Category: (None)  
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

 Site: 9.2 [9.2 Staggered Crossing - East of Marriot Rd (Site Folder: AM)]

 Network: N101 [PM - Continous Lane & Phase & Single lane (Network Folder: General)]

Site Category: (None)

Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
SouthEast: Ti Rakau Drive (East)															
Lane 1	957	7.6	890	7.6	1087	0.819	100	16.6	LOS B	8.8 <sup>N4</sup>	65.8 <sup>N4</sup>	Full	45	0.0	50.0
Lane 2	957	7.6	890	7.6	1087	0.819	100	16.6	LOS B	8.8 <sup>N4</sup>	65.8 <sup>N4</sup>	Full	45	0.0	50.0
Approach	1914	7.6	1780 <sup>N1</sup>	7.6		0.819		16.6	LOS B	8.8	65.8				
Intersection	1914	7.6	1780 <sup>N1</sup>	8.1		0.819		16.6	LOS B	8.8	65.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	890	890	7.6	1087	0.819	100	NA	NA	
Lane 2	890	890	7.6	1087	0.819	100	NA	NA	
Approach	1780	1780	7.6		0.819				
Total %HV Deg. Satn (v/c)									
Intersection	1780		8.1		0.819				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

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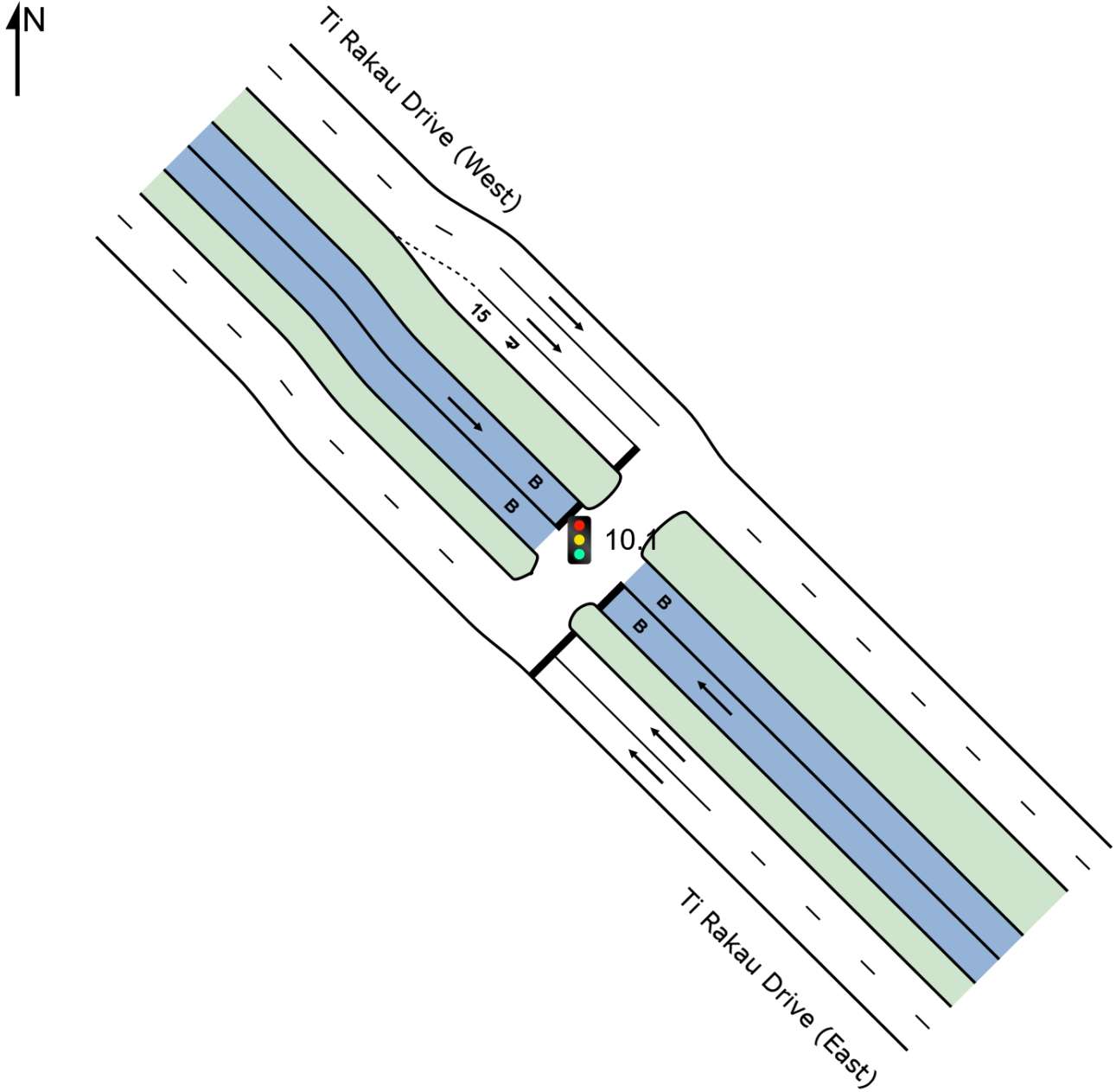
Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Wednesday, 1 February 2023 10:49:27 am  
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport  
Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\Operational\2028 EB2-EB3R-Final-Xroads-PM.sip9

# SITE LAYOUT

Site: 10.1 [10.1 U-turn - East of Edgewater Dr (West) (Site Folder: AM)]

Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 10.1 [10.1 U-turn - East of Edgewater Dr (West) (Site Folder: AM)]

Network: N101 [PM - Continous Lane & Phase & Single lane (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 50 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	1023	7.6	1016	7.6	1161	0.875	100	18.1	LOS B	12.5 <sup>N4</sup>	93.5 <sup>N4</sup>	Full	64	-1.9 <sup>N7</sup>	50.0
Lane 2	868	7.6	863	7.6	986	0.875	100	19.8	LOS B	12.5 <sup>N4</sup>	93.5 <sup>N4</sup>	Full	64	-16.7 <sup>N7</sup>	50.0
Lane 3 (B)	13	100.0	13	100.0	764	0.017	100	0.2	LOS A	0.0	0.1	Full	64	0.0	0.0
Approach	1904	8.2	1892 <sup>N1</sup>	8.2		0.875		18.8	LOS B	12.5	93.5				
NorthWest: Ti Rakau Drive (West)															
Lane 1	694	7.9	694	7.9	1846	0.376	100	0.0	LOS A	0.0	0.0	Full	81	0.0	0.0
Lane 2	694	7.9	694	7.9	1846	0.376	100	0.0	LOS A	0.0	0.0	Full	81	0.0	0.0
Lane 3	97	3.1	97	3.1	136	0.714	100	33.8	LOS C	2.4	17.5	Short	15	-16.7 <sup>N7</sup>	NA
Lane 4 (B)	25	100.0	25	100.0	764	0.033	100	0.2	LOS A	0.0	0.1	Full	81	0.0	0.0
Approach	1509	9.1	1509	9.1		0.714		2.2	LOS A	2.4	17.5				
Intersection	3413	8.6	3401 <sup>N1</sup>	8.6		0.875		11.4	LOS B	12.5	93.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N4** Average back of queue has been restricted to the available queue storage space.

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV		Deg. Cap. veh/h	Lane Satn v/c	Prob. Util. %	SL Ov. %	Ov. Lane No.
Lane 1	1016	1016	7.6		1161	0.875	100	NA	NA
Lane 2	863	863	7.6		986	0.875	100	NA	NA
Lane 3	13	13	100.0		764	0.017	100	NA	NA
Approach	1892	1892	8.2			0.875			
NorthWest: Ti Rakau Drive (West)									
Mov. From NW To Exit:	T1	U	Total	%HV	Deg. Cap. veh/h	Lane Satn v/c	Prob. Util. %	SL Ov. %	Ov. Lane No.
Lane 1	694	-	694	7.9	1846	0.376	100	NA	NA
Lane 2	694	-	694	7.9	1846	0.376	100	NA	NA
Lane 3	-	97	97	3.1	136	0.714	100	29.1	2
Lane 4	25	-	25	100.0	764	0.033	100	NA	NA

Approach	1412	97	1509	9.1	0.714
Total %HV Deg.Satn (v/c)					
Intersection	3401	8.6		0.875	

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.

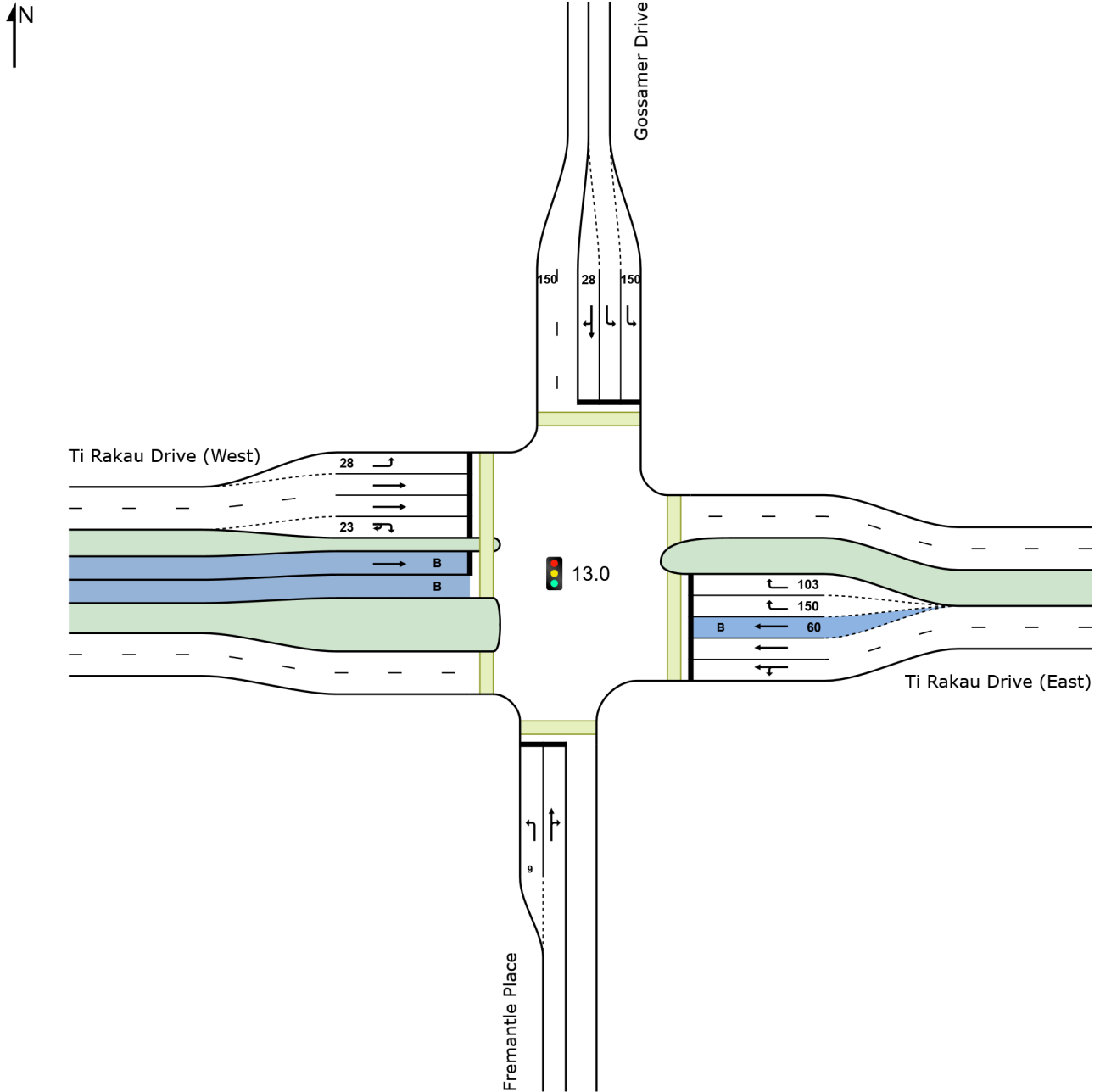
# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: AM)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: AM)]

Network: N101 [PM - Continuous Lane & Phase & Single lane (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 160 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
South: Fremantle Place															
Lane 1	10	0.0	10	0.0	27	0.369	100	98.3	LOS F	0.8	5.5	Short	9	-19.1 <sup>N7</sup>	NA
Lane 2	24	4.2	24	4.2	88	0.272	100	87.2	LOS F	1.7	12.3	Full	285	0.0	0.0
Approach	34	2.9	34	2.9		0.369		90.5	LOS F	1.7	12.3				
East: Ti Rakau Drive (East)															
Lane 1	874	7.6	874	7.6	892	0.980	100	74.1	LOS E	69.3	516.7	Full	636	-18.7 <sup>N7</sup>	0.0
Lane 2	955	7.6	955	7.6	974 <sup>1</sup>	0.980	100	70.0	LOS E	72.6	541.8	Full	636	-10.6 <sup>N7</sup>	0.5
Lane 3 (B)	13	100.0	13	100.0	272	0.048	100	37.8	LOS D	0.5	7.1	Short	60	0.0	NA
Lane 4	210	5.6	210	5.6	180	1.168	82 <sup>6</sup>	242.5	LOS F	28.1	206.3	Short	150	0.0	NA
Lane 5	257	5.6	257	5.6	180	1.425	100	456.9	LOS F	48.0	351.7	Short	103	0.0	NA
Approach	2309	7.7	2309	7.7		1.425		130.1	LOS F	72.6	541.8				
North: Gossamer Drive															
Lane 1	200	8.7	200	8.7	257	0.779	100	67.7	LOS E	11.2	84.4	Short	150	0.0	NA
Lane 2	202	8.7	202	8.7	259	0.779	100	67.6	LOS E	11.3	85.2	Full	1010	0.0	0.0
Lane 3	101	5.0	101	5.0	78	1.292	100	346.1	LOS F	16.4	119.3	Short	28	-9.0 <sup>N7</sup>	NA
Approach	503	8.0	503	8.0		1.292		123.6	LOS F	16.4	119.3				
West: Ti Rakau Drive (West)															
Lane 1	126	4.8	126	4.8	959	0.131	100	12.6	LOS B	2.2	15.8	Short	28	0.0	NA
Lane 2	594	8.1	594	8.1	529 <sup>1</sup>	1.123	100	199.7	LOS F	76.2	570.3	Full	479	0.0	30.9
Lane 3	641	8.1	641	8.1	571 <sup>1</sup>	1.123	100	198.3	LOS F	81.9	613.1	Full	479	0.0	37.6
Lane 4	53	7.5	53	7.5	140	0.378	100	78.3	LOS E	3.6	26.7	Short	23	0.0	NA
Lane 5 (B)	25	100.0	25	100.0	276	0.091	100	38.3	LOS D	1.1	13.9	Full	479	0.0	0.0
Approach	1439	9.4	1439	9.4		1.123		175.4	LOS F	81.9	613.1				
Intersection	4285	8.3	4285	8.3		1.425		144.2	LOS F	81.9	613.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- <sup>6</sup> Lane under-utilisation due to downstream effects
- <sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)									
South: Fremantle Place									
Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From S To Exit:	W	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.	
Lane 1	10	-	-	10	0.0	27	0.369	100	0.0	2	
Lane 2	-	10	14	24	4.2	88	0.272	100	NA	NA	
Approach	10	10	14	34	2.9		0.369				
East: Ti Rakau Drive (East)											
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	23	851	-	874	7.6	892	0.980	100	NA	NA	
Lane 2	-	955	-	955	7.6	974 <sup>1</sup>	0.980	100	NA	NA	
Lane 3	-	13	-	13	100.0	272	0.048	100	0.0	2	
Lane 4	-	-	210	210	5.6	180	1.168	82 <sup>6</sup>	95.8	2	
Lane 5	-	-	257	257	5.6	180	1.425	100	100.0	4	
Approach	23	1819	467	2309	7.7		1.425				
North: Gossamer Drive											
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	200	-	-	200	8.7	257	0.779	100	0.0	2	
Lane 2	202	-	-	202	8.7	259	0.779	100	NA	NA	
Lane 3	-	17	84	101	5.0	78	1.292	100	100.0	2	
Approach	402	17	84	503	8.0		1.292				
West: Ti Rakau Drive (West)											
Mov. From W To Exit:	L2 N	T1 E	R2 S	U W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	126	-	-	-	126	4.8	959	0.131	100	0.0	2
Lane 2	-	594	-	-	594	8.1	529 <sup>1</sup>	1.123	100	NA	NA
Lane 3	-	641	-	-	641	8.1	571 <sup>1</sup>	1.123	100	NA	NA
Lane 4	-	-	10	43	53	7.5	140	0.378	100	28.5	3
Lane 5	-	25	-	-	25	100.0	276	0.091	100	NA	NA
Approach	126	1260	10	43	1439	9.4		1.123			
Total %HV Deg. Satn (v/c)											
Intersection	4285	8.3		1.425							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: Gossamer Drive											

Merge Type: <b>Zipper</b>												
Exit Short Lane	1	150	50.0	90	93	2.50	2.00	316	1695	0.186	0.0	0.0
Merge Lane	2	-	50.0	158	162	2.50	2.00	180	1611	0.112	0.0	0.1
West Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

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 Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\Operational\2028 EB2-EB3R-Final-Xroads-PM.sip9

# Appendix J

## Base 2018 Model Update Report

# Eastern Busway - Base 2018 Model Update Report

Prepared for Auckland Transport (AT)  
Prepared by Beca Limited

28 February 2019



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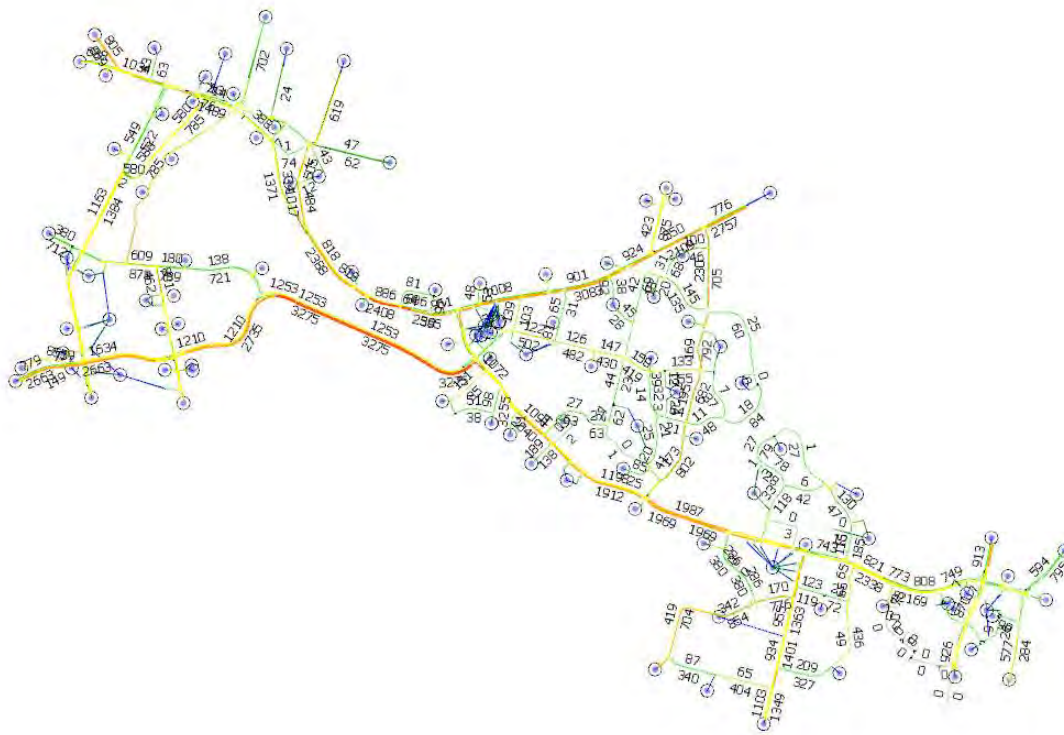
## List of Abbreviations

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Abbreviation	
ADTA	Auckland Dynamic Traffic Assignment (model)
AFC	Auckland Forecasting Centre
AMETI	Auckland-Manuka Eastern Transport Initiative
AT	Auckland Transport
GEH	Gesellschaft zur Erhaltung alter und gefährdeter Haustierrassen (statistic)
JDF	Junction Delay Function
MSM	Macro Strategic Model
NZTA	New Zealand Transport Agency
QLD	Queensland model (Aimsun model in Australia)
SCATS	Sydney Coordinated Adaptive Traffic System
TPF	Turn Delay Function
VDF	Volume Delay Function
EB	Eastern Busway

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## Revision History

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## Document Acceptance

Action	Name	Signed	Date
Prepared by	Ling Hoong	<i>Ling Hoong</i>	1 March 2019
Reviewed by	Caleb Deverell / Nyan Aung Lin	<i>Deverell</i>	1 March 2019
Approved by	Andrew Murray	<i>Andrew Murray</i>	1 March 2019
on behalf of	Beca Limited		

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## Executive Summary

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This report details the update and calibration/validation of the Aimsun model for the Eastern Busway Project. The purpose of this model is to provide a consistent and common base for project developments in the East Auckland Area, primarily along Ti Rakau Drive for the EB 2 and EB3 detailed design work.

The model covers two three-hour peak periods (6.30 am – 9.30 am, and 3.30 pm – 6.30 pm). The modelled periods were chosen to capture the congestion typically experienced in the modelled area.

The model consists of macro and micro tiers with the respective assignment methods: static assignment and microscopic dynamic assignment (DTA). The macro tier provides an interim stage to calibrate the demand through demand adjustment and to generate 80% of paths for the micro DTA. Based on previous modelling of the area, an 80-to-20 split in static versus dynamic path assignment was considered appropriate. This gave better control of modelling route choice in the area and sense-checks during the model development process showed that route distribution in the model is reasonable.

Various observed data were provided by Auckland Transport (AT) for the model development. These included traffic counts, travel time, public transport timing, and signal timing.

The traffic demands come from the AMETI EMME traffic model and were processed before assigning to the Aimsun model. This demand interface process includes a minor refinement of AMETI traffic model zones and application of 2-to-3 hour expansion factors to fit the Aimsun model period. Demand adjustment as part of the validation process was done manually.

The model network was developed in line with the Auckland Dynamic Traffic Assignment Model (ADTA) network coding guideline, which sets out the recommended network coding methodology for Aimsun models in Auckland. This included a standard system of classification and labelling of different turn movement types which were important function variables in the ADTA-developed cost functions also adopted in this model for calculating junction and turn delays.

Model validation showed that the model meets the validation target criteria for Category C: Urban Area in NZTA Model Development Guidelines on individual link flows and turn flows for each hour between 7am – 9am, and 4pm – 6pm. Travel times in the model fit reasonably well with the observed.

Overall, the base year model is considered acceptably calibrated and validated for the purposes of the EB2/3 design work.

# 1 Introduction

## 1.1 Background

This report documents the calibration and validation of the Aimsun model to the year 2018.

The Eastern Busway project is focused on developing an integrated multi-modal transport system that supports population and economic growth in East Auckland and Manukau. This involves providing more and better transport choices and aims to significantly enhance the safety, quality and attractiveness of passenger transport, walking and cycling environments.

Beca Ltd (Beca) was commissioned by the Auckland Transport (AT) to update the existing microsimulation model in Aimsun software for testing scenarios relating to the Eastern Busway project. Figure 1 shows the extent of the model. The model was calibrated to 2018 observations and will be used to forecast operational performance for various future scenarios in 2026.

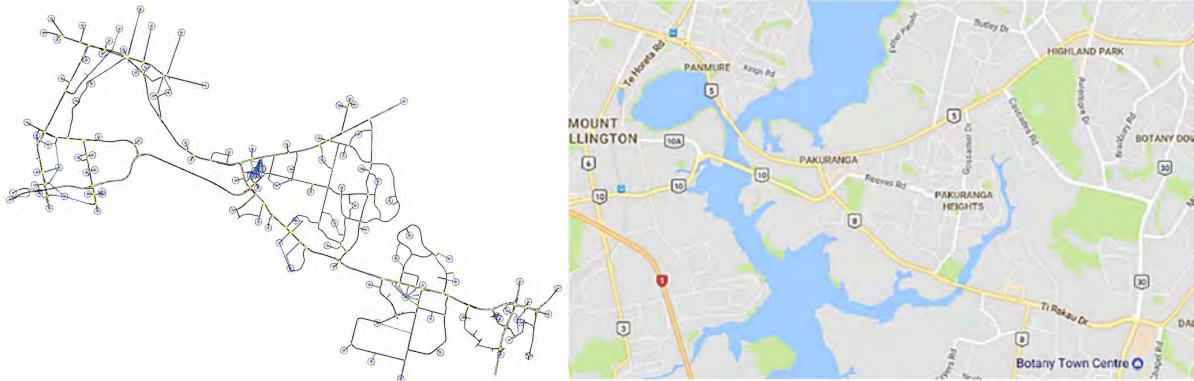


Figure 1 - Snapshot of Aimsun model network and zone structure

## 1.2 Report Structure

The remainder of this report is structured as follows:

- Chapter 2 Describes the model's background and structure;
- Chapter 3 Details the model's data inputs;
- Chapter 4 Details the model's parameter inputs;
- Chapter 5 Presents the calibration and validation results;
- Chapter 6 Presents conclusions of this report;

## 2 Model Background and Structure

### 2.1 Background and Focus

Previously, an update of the Base model had been undertaken in 2017, focusing on the area around the Panmure Town Centre, including the Panmure roundabout, King's Roundabout and Lagoon Drive, which were of interest for the EB1 project. SCATS and manual traffic counts and observed travel time data were used to validate the model to a 2016 base year for EB1 option-testing.

This update focuses on the EB2/3 corridor which is along Ti Rakau Drive from Pakuranga Highway to Botany (Figure 2). This base year for this model update is 2018 where 2018 input demand were sourced from the AMETI traffic model and calibration/validation process used 2018 counts and travel time information.

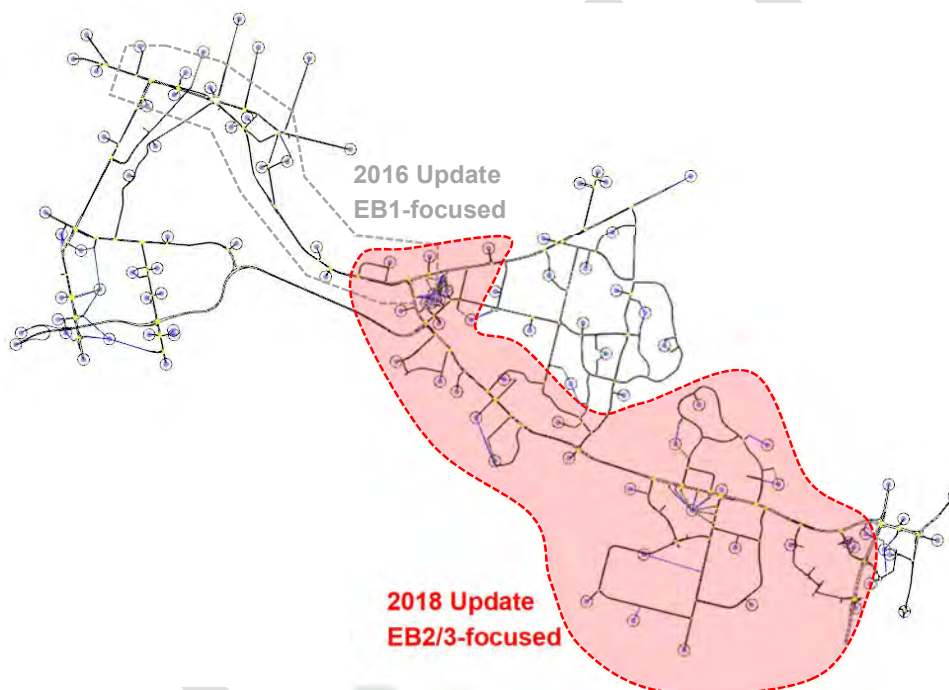


Figure 2 - Aimsun model focus areas: 2016/ EB1-focused (grey) and 2018/ EB2/3-focused (red)

## 2.2 Model Structure

The Aimsun model follows the hierarchical modelling structure that has been used successfully on other major projects in Auckland since the early 1990's. This involves the following three components:

- A strategic multi-modal **Demand (Macro Strategic Model, MSM)** model (an EMME model developed by AFC) that relates forecast land use (such as population and employment), to travel patterns at a strategic, region-wide level;
- A **Traffic Assignment** model (an EMME model developed by Arup) that has a more refined network representation for the wider study area. It takes the demand matrices from the Demand model and is calibrated to match traffic conditions particularly in the study area of interest. This model provides the cordon matrices for the Project Operational model.
- A **Project Operational** model (an Aimsun model and the focus of this report) that has a more refined network in a smaller project area. This model loads the vehicle trip patterns predicted by the assignment model onto the road network to test various options and investigate the traffic effects at a more detailed level.

It is the **project operational** model, developed in Aimsun that is detailed in this report.

The **demand** model was developed in EMME and is the Macro Strategic Model (MSM) developed by AFC. Also AMETI traffic assignment model was developed in EMME software.

The overall model structure is shown schematically in Figure 3 which comprises a hierarchical structure with the MSM model providing the multi-modal demand forecasts, and the EMME traffic assignment model and the Aimsun project model used for assignment and network performance modelling.

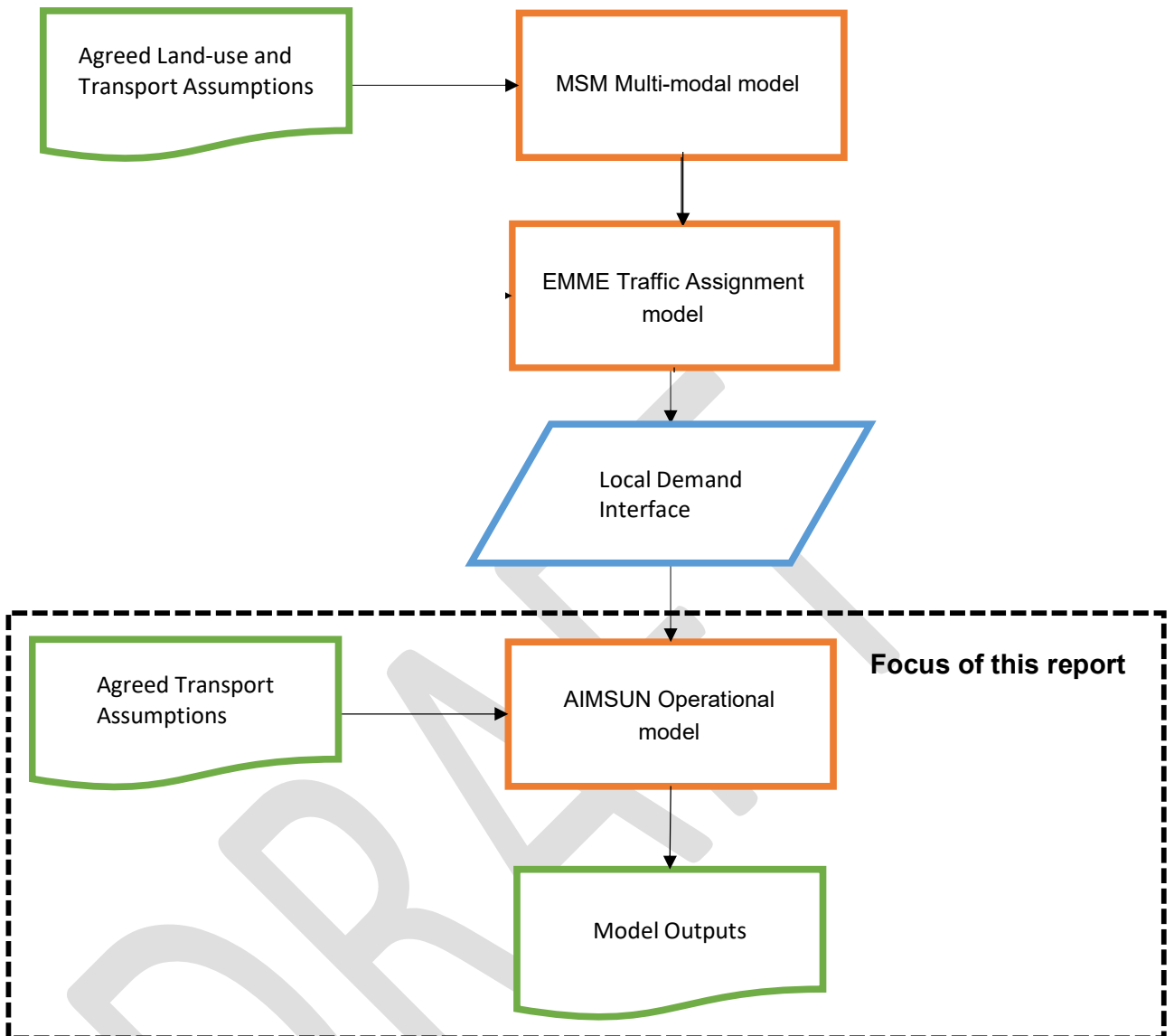


Figure 3 - Model Structure

### 2.2.1 MSM Demand Model

The MSM model is a traditional 4-step multi-modal model. The original model was developed for the year 2006, using the 2006 Census data and observed travel data. The model was updated in 2017/ 2018 using Census data from 2013, and validated to 2016 conditions. Separate models exist for the morning and evening commuter peaks and weekday inter-peak periods.

The model itself comprises the following key modules:

- **Trip Generation.** This is where the number of person-trips are estimated as a function of the land use data (population, employment, school roll etc.);
- **Mode Choice.** This is where the choice of preferred travel mode is determined, based on the relative attractiveness of the various modes. The key modes are car-driver, car passenger, bus passenger, train passenger and ferry passenger. A process is used to also consider 'slow' modes, such as walking and cycling;

- **Trip Distribution.** This is where the trips produced in each zone (generally by the households), are matched to a preferred destination. This distribution is predicted as a function of the relative attractiveness of each destination zone (generally related to employment), and the travel costs to reach each destination;
- **Time of Day.** This is where the proportion of daily trips occur in each peak. The proportion occurring in each peak changes in future-year models in response to the changes in travel time and costs; and
- **Trip Assignment.** This is where the resulting travel demands, in the form of origin to destination trip tables, are loaded to the road and public transport networks. An iterative process is used to firstly identify the lowest-cost route between each origin and destination, followed by an estimation of the speeds and delays on each route associated with the predicted traffic flows on the route.

The MSM model is operated by AFC and is implemented in the EMME software, which is a well-used and proven platform for this kind of analysis.

It is therefore the MSM model that predicts the overall regional traffic patterns, based on the inputs and forecasts of population and employment growth, together with the assumed level of road and public transport infrastructure.

The MSM standard model years are 2016, 2026 and so on. To get the 2018 regional demand, a demand interpolation process was undertaken between 2016 and 2026 scenarios. The 2016 scenario is the validated MSM base year scenario. As part of this project, a 2026 scenario was developed using the today network layout and bus service patterns.

### 2.2.2 EMME Traffic Assignment Model

This model was originally developed by Arup in 2010 and was peer-reviewed. This peer-reviewed model was used as the traffic assignment model for the previous AMETI project. The model takes its traffic demands from the MSM model and has the same model extent as MSM but has a more refined network representation in the wider study area of interest (Manukau and Auckland City areas). A zone refinement process was undertaken as an interface between the MSM and traffic assignment models.

### 2.2.3 Aimsun Operational Model

The Aimsun model is only a traffic operational model in that it takes the localised traffic demands from the EMME traffic assignment model, assigns them to the road network and tests the operation of the network. Land use data is not directly used in this part of the model, and it only considers vehicle traffic i.e. it represents bus vehicles but not passengers.

## 2.3 Model Time Period

The Aimsun model models two peak periods:

- AM: 6.30am – 9.30am
- PM: 3.30pm – 6.30pm

The traffic counts and typical traffic conditions were evaluated to determine that these time periods are suitable to capture the peak traffic on the network and ending at a time when traffic cooldown is typically observed. Each peak consists of a 15 minute warm-up prior to the peak start time in order to generate an appropriate level of demand inside the network before the official start of the peak.



## 3 Model Data Inputs

---

### 3.1 Network

Most of the road network was formed from the previous version of the Aimsun model (updated for 2016 base year). Additional road network was added in around Cryers Road and Burswood Road in the South East area of the model. Further refinements or error-checking over the whole model were conducted based on ADTA network coding conventions (Ref. 160520\_DTA\_Template\_JMAC\_v2.1.3). Network parameters are detailed in Chapter 4.1.

### 3.2 Demand

The initial demand was from the AMETI assignment model (refer to Chapter 2.2.2) and restructured to match the zone structure in the Aimsun model.

#### 3.2.1 Demand Expansion

The two-hour to three-hour demand expansion factor for each peak was 1.38. This has been applied to the two-hour EMME demands to create a three-hour demand as a starting point for model calibration/validation.

#### 3.2.2 Zone Disaggregation

As discussed earlier, most of the zone refinement was undertaken between the MSM and AMETI traffic assignment models. Only a very limited zone was further refined in the demand interface process between the AMETI traffic and Aimsun models. This process was retained from the previous base model 2016. A zone to zone correlation table is provided in Appendix A.

### 3.2.3 Demand Release Profiles

For developing traffic release profiles, the zones in the Aimsun model were grouped into six sectors: Panmure, West, Internal, North, East and South (Figure 4). Within the Internal sector, a subset of zones was created to separately represent the region nearest the Panmure Bridge and assigned its own demand profile.

Figure 5 and Figure 6 show the sector-to-sector profiles applied in the Aimsun model. Traffic count profiles at key locations on the network were used as a guideline to develop these demand profiles.

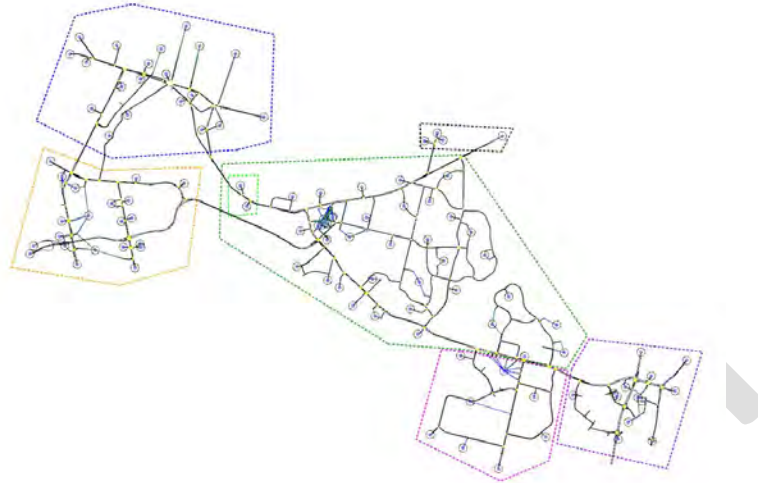


Figure 4 - Aimsun model sectors: Panmure (blue), West (yellow), Internal (dark green) with Panmure Bridge subset (light green), North (black), South (Pink), and East (purple)

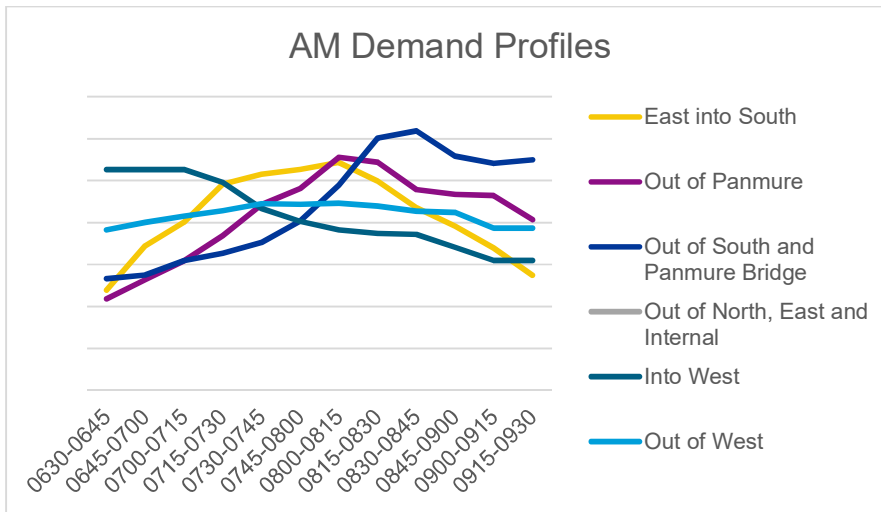


Figure 5 - AM Demand Profiles

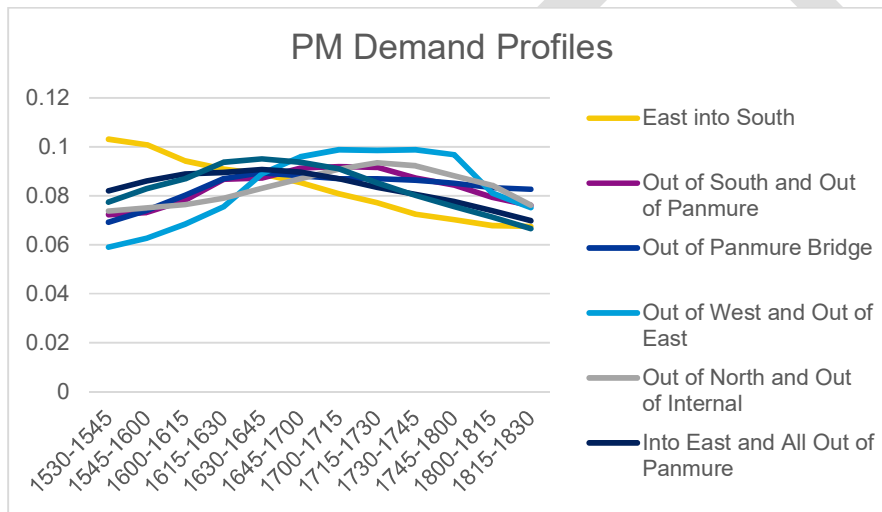


Figure 6 - PM Demand Profiles

### 3.3 Count Data

All count data for 2018 were provided by AFC, including SCATS detector counts and some manual counts. The locations of these counts used for link validation and turn validation (refer to Chapter 5) are shown in Figure 7 and Figure 8 respectively.

Link validation data was based on the average SCATS data of Tuesdays to Thursdays in March 2018. Turn validation data was based on the average of manual counts taken between Tuesday 12 June 2018 to Thursday 14 June 2018.

A sense-check of count continuity across the network was carried out and only counts that were consistent with adjacent counts were retained. This consisted of the majority of counts. All manual turn counts were checked for continuity with adjacent relevant SCATS counts and all were retained regardless of continuity since manual counts are considered more robust in general and these had been specifically provided by AFC for turn validation in the focus area. All counts used in validation were used as-is, without any further smoothing or processing.

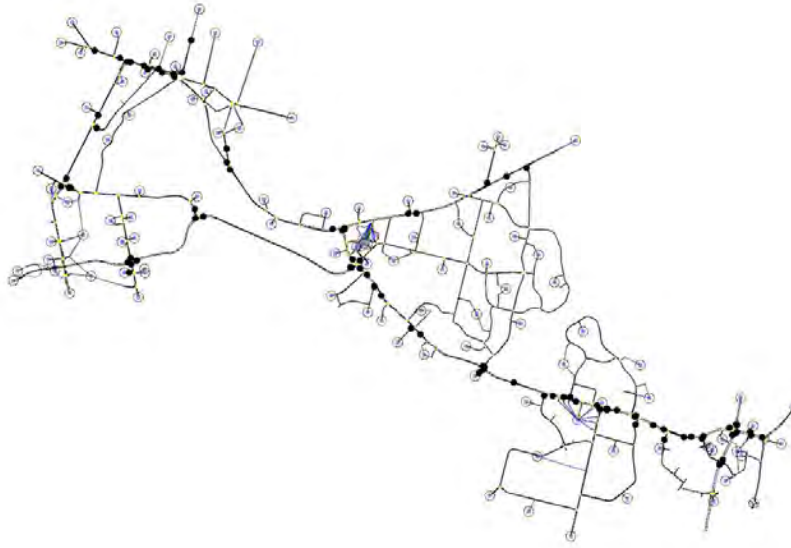


Figure 7 - Count locations used for link validation

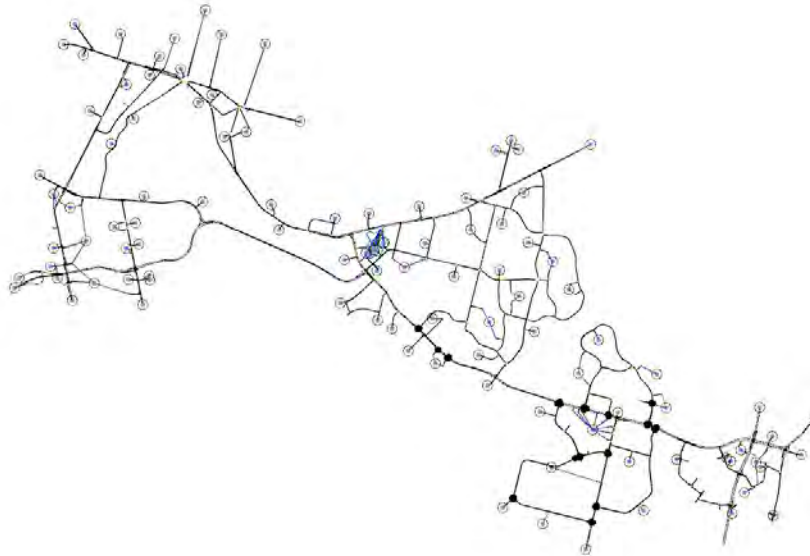


Figure 8 - Count locations used for turn validation, specifically for the model's focus area

### 3.4 Travel Time Data

The general traffic travel time data for key routes on the network (Figure 9) of Tuesdays to Thursdays in June 2018 was provided by AFC as summarised by Snitch GPS data. The full routes were provided in segments in order to understand the travel time and condition along the route. Following a sense-check of the travel times on Google, only the mean travel time on Ti Rakau Drive between Pakuranga Road and Pakuranga Highway was adjusted. All other travel times were accepted and retained for use in the validation.

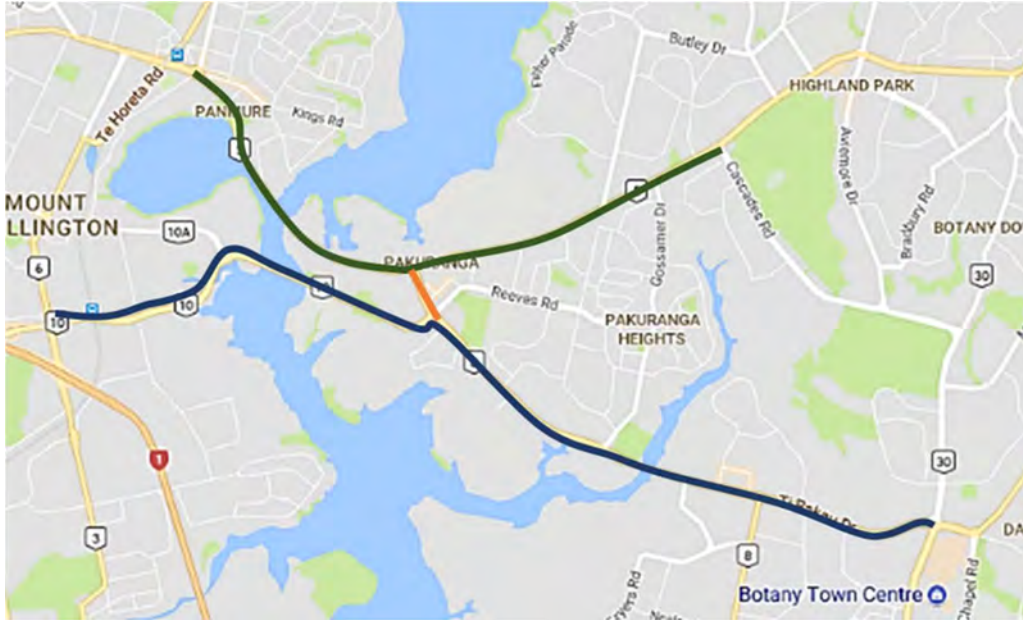


Figure 9 - Travel time routes from Snitch GPS data for reporting travel time validation in Chapter 5

### 3.5 Public Transport Data

All bus schedules and bus routes were obtained from the Auckland Transport (AT) website. Bus dwell time at bus stops were fixed at 30 sec mean stop time and deviation of 5. Bus travel time data was provided by AFC for March 2018 which included detailed timing of when each bus arrives and leaves each bus stop for each route. Following a sense-check of the travel times calculated from the raw data against AT's Journey Planner App, the average and maximum travel time of the routes were adjusted. The full list of bus services in the model is provided in Appendix D.

### 3.6 Signal Timing Data

The SCATS signal timing data of 7 March 2018 was provided by AFC for every signalised intersection within the model area. This was used to derive the signal timing coded into the model.

Average of maximum and minimum green times was used to develop the actuated control plan used in the dynamic assignment and initially used in the static assignment. During the model development process, it was noted that a fixed signal plan was more appropriate for model stability in the static assignment. Average green time from the single-day SCATS data was used as a starting point for developing the fixed control plan. Priority was placed on obtaining realistic turn delays and ensuring appropriate route choice distribution across the network rather than strict adherence to the average green times reported from that single day.

## 4 Model Parameter Inputs

### 4.1 Network Parameters

#### 4.1.1 Road-Type Parameters

Road type distribution on the model network is summarised in Figure 10. Road type parameters were mostly retained from the ADTA model and provided in Appendix B. Adjustments were made to user-defined cost, third user-defined costs and capacity as part of the calibration process of route choice on the network. Lane-changing cooperation was also adjusted on certain road types to reflect the level of congestion as seen on Google's traffic view modes, and the travel time data.

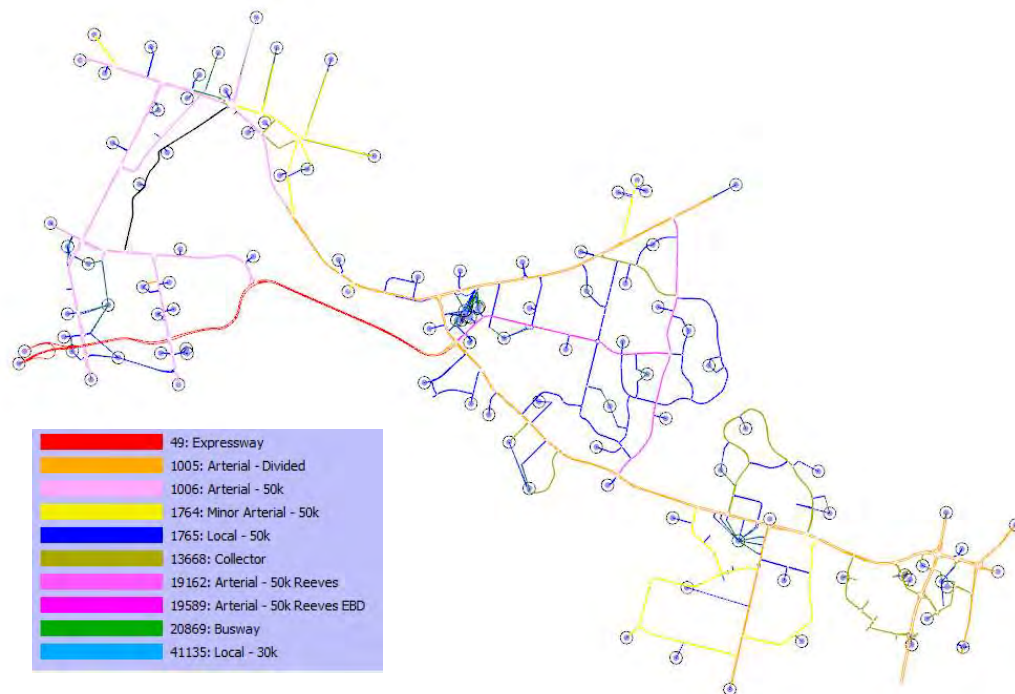


Figure 10 - Road Type Definition in the Aimsun Model

#### 4.1.2 Attribute Overrides

The parameters of some sections and turns were controlled during assignment runs using Aimsun's attribute override functionality. This approach allows parameter values to be adjusted to a value more suitable than the default calculations at a particular section or turn. The parameter values that have been adjusted using attribute overrides are:

- Section maximum speed
- Turn capacity
- Turn look-ahead distance
- Lane-changing cooperation

The full list of these attribute overrides applied in the model is provided in Appendix E.

#### 4.1.3 Traffic Management

Traffic management schemes on the network were applied using Aimsun's traffic management functionality. This approach also allows certain conditions of the road to be applied when they are typically observed during the modelled period and not necessarily throughout the period. Traffic management schemes in the model applied are:

- Panmure Bridge Eastbound Lane Closure: 1 Lane Closed, 6 am – 11 am
- Panmure Bridge Westbound Lane Closure: 1 Lane Closed, 3 pm – 8 pm
- Pakuranga Highway Maximum Speed Change to 55 km/h: 7.15 am – 8.45 am
- Pakuranga Highway Maximum Speed Change to 60 km/h: 4.15 pm – 6.15 pm

Ideally the speed reduction on Pakuranga Highway should be reflected by the model response, rather than the inputs. However this behaviour is hard to replicate in the model due to the unique nature of the road. For example, there is a hidden queue extended from the Pakuranga Highway and Carbine Road intersection to the Wipuna Road in the AM peak. The local drivers reduce their speeds on the bridge accordingly as they know there is a hidden queue in the downstream at the sharp corner. This traffic management inputs were not introduced in this update, they are inherited from the previous model.

## 4.2 Vehicle Parameters

Vehicle parameters were determined based on comparison and sensitivity testing with those adopted in existing Aimsun models such as ADTA (AFC), and QLD (Aecom) as well as input from the NZTA Axle Classification system. List of key vehicle parameters in the model are provided in Appendix C.

## 4.3 Cost Calculation

All functions related to calculating the cost of travel time and travel distance in the model were adopted from the ADTA model and used in the static assignment only. The travel time component consists of 1) link travel times, represented by a Volume Delay Function (VDF) on Sections, and 2) delays associated with making a turn at an intersection, represented by a Turn Penalty Function (TPF) and Junction Delay Function (JDF). Cost function scripts used in the model are provided in Appendix G.

The travel distance component reflects perceived vehicle operating costs and helps stabilise the traffic assignment.

### 4.3.1 Volume Delay Function

The VDF is based on the Akçelik VDF, which is widely adopted by strategic models in New Zealand, including MSM. Its formulation is as follows:

$$t = t_0 \{ 1 + 0.25 r_f [ z + (z^2 + 8 J_A x / (Q t_0 r_f))^{0.5} ] \}$$

where:

t = average travel time per unit distance (seconds per km)

t<sub>0</sub> = free flow travel time per unit distance (seconds per km)

J<sub>A</sub> = Akçelik friction parameter

z = x - 1

x = q / Q = degree of saturation

q = demand flow rate (pcu/hr)

Q = capacity (pcu/hr)

r<sub>f</sub> = the ratio of flow period to minimum travel time

The distance component, which is added to the travel time cost, is as follows:

$$d = d_f \times r_f \times L$$

where:

d = the distance cost

d<sub>f</sub> = distance factor (0.5 for cars and 1.0 for Trucks)

r<sub>f</sub> = road type factor

L = length of the section

This function was applied to every Section in the model, including centroid connectors. Different values of free flow speed, link capacity and Akçelik friction factors were defined by road type using Section attributes (Appendix B).



### 4.3.2 Intersection Delays – Signalised Movements

Aimsun provides default TPFs for signalised turning movements based on their respective green time split, adopting the procedures from Chapter 18 of the Highway Capacity Manual (HCM) 2010.

This procedure requires a movement capacity as an input and in the model this was estimated based on the following formula:

$$Q = Q_s \times I \times g / C$$

where:

**Q** = capacity of the turning movement (pcu/hr)

**Q<sub>s</sub>** = saturation flow at signal for the turning movement (pcu/hr/lane)

**I** = number of lanes for the turning movement

**g** = green time for the turning movement

**C** = cycle time at the signal

The saturation flow  $Q_s$  estimation was adopted from the ADTA model and is based on the relationship between saturation flow and turning speed from simulation tests conducted in Aimsun (Figure 11).

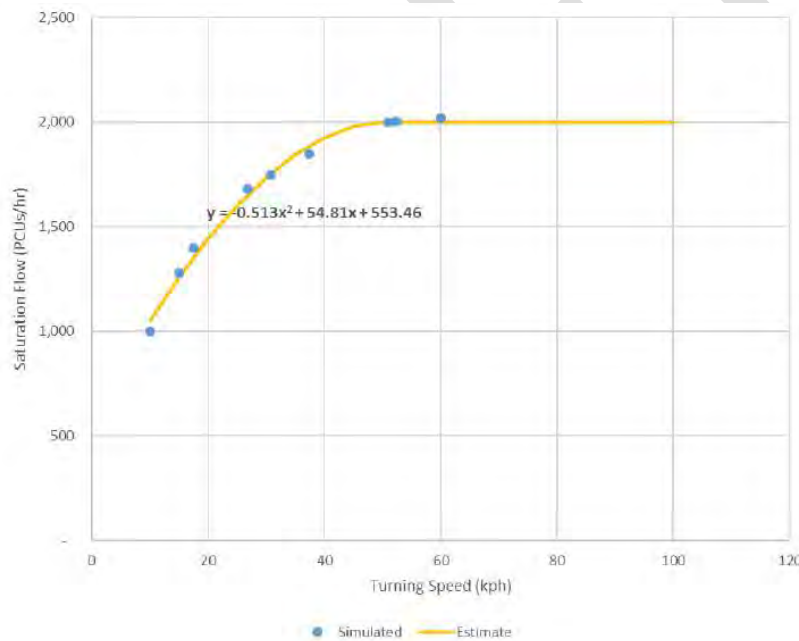


Figure 11 - Adopted Relationship between Signal Saturation Flow and Turning Speed. The line of best fit through the simulated saturation flows for turning speeds between 10 and 50 km/hr, where 10 km/hr is the minimum turning speed applied in ADTA. The saturation flow was capped at 2,000 pcu/hr/lane for turning speeds higher than 50 km/hr.

### 4.3.3 Intersection Delays – Priority Movements

Delays at priority-controlled intersections were represented by JDFs.

Relationships between the capacity of priority movements and the opposing flow were estimated using a linear relationship:

$$Q = Q_s - r \times f_o$$

where:

**Q** = capacity of the turning movement (pcu/hr)

**Q<sub>s</sub>** = saturation flow for the turning movement i.e. capacity of the turning movement at zero opposing flow (pcu/hr); intercept

**r** = the rate at which the capacity decreases as opposing flow increases; slope

**f<sub>o</sub>** = the flow opposing this turning movement (pcu/hr)

The resulting turn capacity **Q** was applied to the Akçelik VDF formula from Chapter 4.3.1 assuming a friction factor of 1.0 to calculate the corresponding turning delay for the priority movement.

The calibrated capacity intercepts and slopes for all priority turning movement types as used in the ADTA model is provided in Appendix F.

## 4.4 Model Assignment Parameters

### 4.4.1 Assignment Methodology

Based on previous modelling, an 80-to-20 split in static versus dynamic path assignment was considered appropriate for the microscopic simulation. This gave better control of modelling route choice in the area and sense-checks during the model development process showed that route distribution in the model was reasonable and supported the use of the method.

### 4.4.2 Static Assignment Parameters

Table 1 shows the key parameters of the static assignment used in the Aimsun model.

Table 1 - Key Static Assignment Parameters

Static Assignment Parameters	
<b>Assignment Engine</b>	Frank and Wolf Assignment
<b>Maximum Iterations</b>	50
<b>Relative Gap</b>	0.1 %

### 4.4.3 Dynamic Assignment Parameters

All dynamic assignment parameters (Table 2 and Table 3) were determined based on comparison and sensitivity testing with those adopted in existing Aimsun models such as ADTA (AFC), and QLD (Aecom).

Table 2 - Key Dynamic Assignment Parameters

Dynamic Assignment Parameters		
Main		
<b>Network Loading</b>	Microscopic Simulator	
<b>Assignment Approach</b>	Stochastic Route Choice	
<b>Using Warm-Up</b>	(5% of demand, 15 min)	
<b>Using a Saved Initial State</b>	No	
<b>Attributes Overrides</b>	(refer to Appendix E)	
<b>Performance Settings:</b>		
<b>Simulation Threads</b>	4	
<b>Route Choice Threads</b>	4	
Behaviour		
<b>Car Following:</b>		
Two-Lane Car-Following Model	No	
Apply Slope Model	No	
Lane Changing:		
Distance Zone Variability	40%	
Two-Way Two-Lane Overtaking Model	No	
<b>Queue Speeds:</b>		
Queue Entry Speed	1 m/s	
Queue Exit Speed	1 m/s	

Table 3 - Key Dynamic Assignment Parameters continued

Dynamic Assignment Parameters					
<b>Reaction Time</b>					
Simulation Step	0.8 sec				
Reaction Time Settings	Fixed				
Reaction Time at Stop	1.15 sec				
Reaction Time at Traffic Light	1.35 sec				
<b>Arrivals</b>					
Global Arrivals	Normal				
<b>Dynamic Traffic Assignment</b>					
<b>Costs:</b>					
Cycle	5 min				
Number of Intervals	3				
Attractiveness Weight	5				
User-Defined Cost Weight	1				
Use Link Costs from Replication	None				
Group Route Choice Intervals	No				
<b>Fixed Routes:</b>	Following OD Routes	Following Input Path Assignment			
Car	100%	80%			
Truck	100%	100%			
Max. Paths to Use From Input Path Assignment	All				
<b>Stochastic Route Choice:</b>					
Model	C-Logit				
Enroute	No				
Enroute After Virtual Queue	No				
<b>Stochastic Route Choice - Basic:</b>					
Path Calculation	Source	Max. Number of Initial Paths to Consider			
	K-SP	1			
Max. Paths per Interval	For All Veh	3			
<b>Stochastic Route Choice – Parameters:</b>	Origin	Destination	Scale	Beta	Gamma
	All	All	12	0.15	1

## 5 Calibration and Validation Results

### 5.1 General Approach

Calibration and validation for the model were undertaken with reference to criteria for Category C: Urban Area in NZTA Model Development Guidelines (Criteria) on individual link flows, turn flows and travel time for each hour between 7am – 9am, and 4pm – 6pm.

Adjustments to demand and network during the calibration process were carefully considered with respect to implications on model response and forecasting.

Several sense-checks were made as part of the calibration process including checks on route-choice, turn delays in the static assignment, demand profiles, HCV counts and visual congestion on the network.

### 5.2 Demand Adjustment

#### 5.2.1 Manual Adjustment

All demand adjustments for the model were done manually and summarised in Table 4 - Table 9. During the demand adjustment, care was taken to retain the demand distribution from the strategic model. Adjustments were made to resolve majority of the network issues in the first instance, before demand adjustments were made.

Table 4 – AM Post-Adjusted Sector-to-Sector Demands

	East	Internal	North	South	Panmure	West	
East	3,465	1,664	210	6,545	940	2,889	15,713
Internal	965	1,101	1,160	1,922	1,570	2,769	9,487
North	520	1,301	0	860	4,128	3,451	10,260
South	3,716	1,268	90	2,865	374	499	8,811
Panmure	493	558	982	448	4,957	5,700	13,137
West	1,177	1,001	1,039	992	3,931	8,024	16,164
Total	10,336	6,892	3,481	13,632	15,900	23,331	73,572

Table 7 - PM Post-Adjusted Sector-to-Sector Demands

	East	Internal	North	South	Panmure	West	
East	4,374	2,299	916	3,808	1,104	1,881	14,382
Internal	2,293	1,224	1,867	1,239	733	1,431	8,787
North	131	1,582	0	169	1,296	1,319	4,498
South	8,000	2,248	229	3,166	873	793	15,310
Panmure	928	1,671	3,528	507	4,548	4,777	15,958
West	1,867	3,065	4,493	375	5,892	7,621	23,314
Total	17,592	12,089	11,033	9,264	14,447	17,823	82,249

Table 5 - AM Sector-to-Sector Demand Adjustment

	East	Internal	North	South	Panmure	West	Total
East	-651	-77	-37	21	74	217	-454
Internal	-506	-68	17	-180	-154	12	-880
North	-397	-50	0	-104	-576	0	-1,128
South	-537	-192	-185	64	2	117	-731
Panmure	-99	-85	230	-417	-1,187	-433	-1,991
West	-25	-6	-3	172	-198	-276	-336
Total	-2,216	-478	22	-444	-2,040	-364	-5,520

Table 8 - PM Sector-to-Sector Demand Adjustment

	East	Internal	North	South	Panmure	West	Total
East	800	420	162	-218	420	299	1,882
Internal	-216	-21	566	-348	-131	-36	-185
North	-370	356	0	-341	99	-432	-688
South	11	378	-471	599	134	126	778
Panmure	-216	42	976	-129	-335	425	763
West	2	593	-269	-20	141	-1,035	-586
Total	11	1,768	964	-456	329	-653	1,963

Table 6 - AM Sector-to-Sector Demand Percent Adjustment

	East	Internal	North	South	Panmure	West	Total
East	-16%	-4%	-15%	0%	8%	8%	-3%
Internal	-34%	-6%	2%	-9%	-9%	0%	-8%
North	-43%	-4%	0%	-11%	-12%	0%	-10%
South	-13%	-13%	-67%	2%	1%	30%	-8%
Panmure	-17%	-13%	31%	-48%	-19%	-7%	-13%
West	-2%	-1%	0%	21%	-5%	-3%	-2%
Total	-18%	-6%	1%	-3%	-11%	-2%	-7%

Table 9 - PM Sector-to-Sector Demand Percent Adjustment

	East	Internal	North	South	Panmure	West	Total
East	22%	22%	21%	-5%	61%	19%	15%
Internal	-9%	-2%	44%	-22%	-15%	-2%	-2%
North	-74%	29%	0%	-67%	8%	-25%	-13%
South	0%	20%	-67%	23%	18%	19%	5%
Panmure	-19%	3%	38%	-20%	-7%	10%	5%
West	0%	24%	-6%	-5%	2%	-12%	-2%
Total	0%	17%	10%	-5%	2%	-4%	2%

### 5.2.2 Turn Delay Check

Turn delays from the static assignment were monitored to ensure that no major delays were adversely affecting path assignment and route distribution, as well as to gauge model stability.

To facilitate stability of the static assignment, a fixed signal control plan was used (whereas an actuated control plan was used in the dynamic assignment). Priority was placed on reducing turn delay and ensuring appropriate route choice distribution across the network rather than strict adherence to the maximum green times reported from the single-day SCATS data.

## 5.3 Static Assignment Results

### 5.3.1 Convergence

The static assignment for each modelled period was stable and attained the relative gap (rgap) before 50 iterations (Figure 12 and Figure 13). 80% of the path assignments from the static assignment was set to be retained during the dynamic assignment.

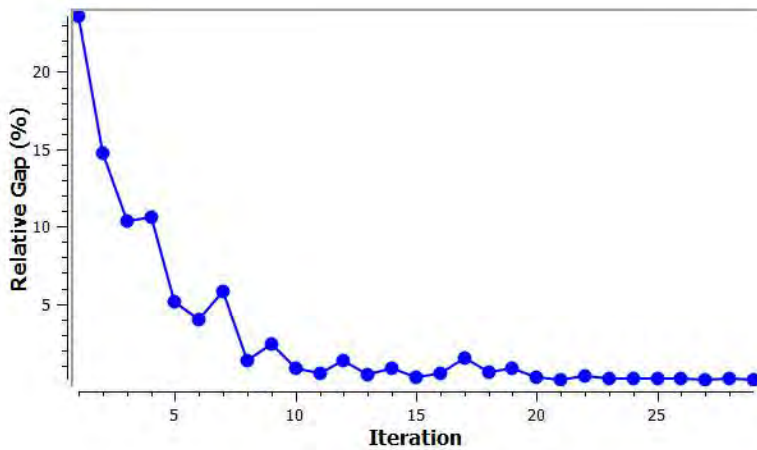


Figure 12 - AM Peak Static Assignment Convergence

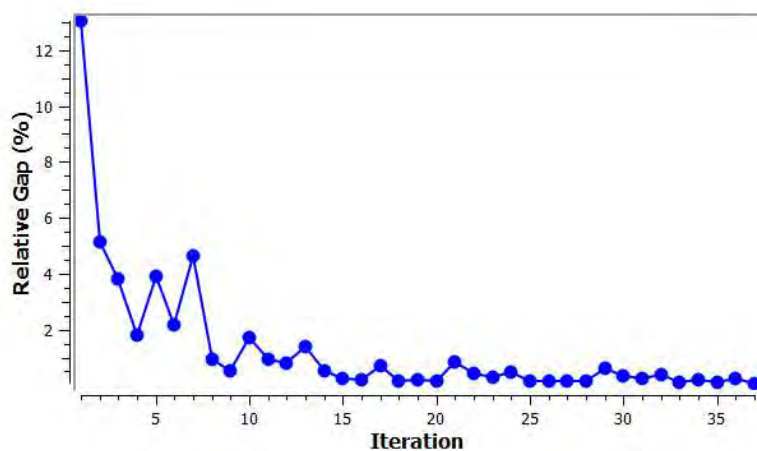


Figure 13 - PM Peak Static Assignment Convergence

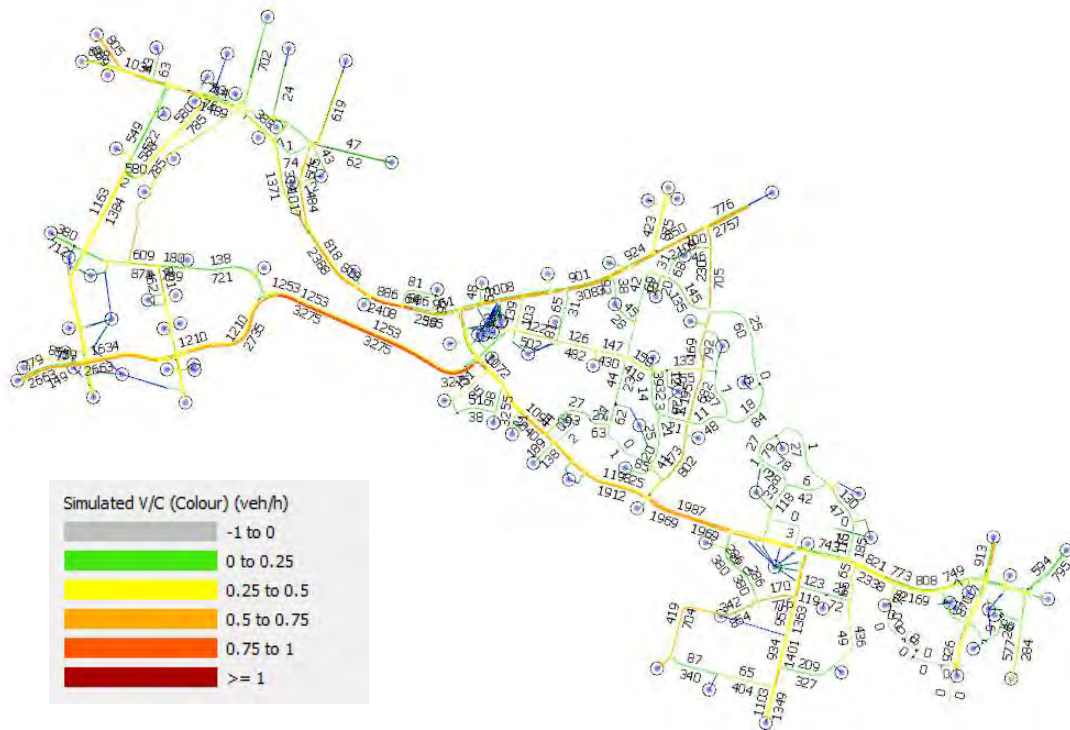


Figure 14 - AM Peak Assigned Flow in PCU/hr (6.15 am – 9.30 am)

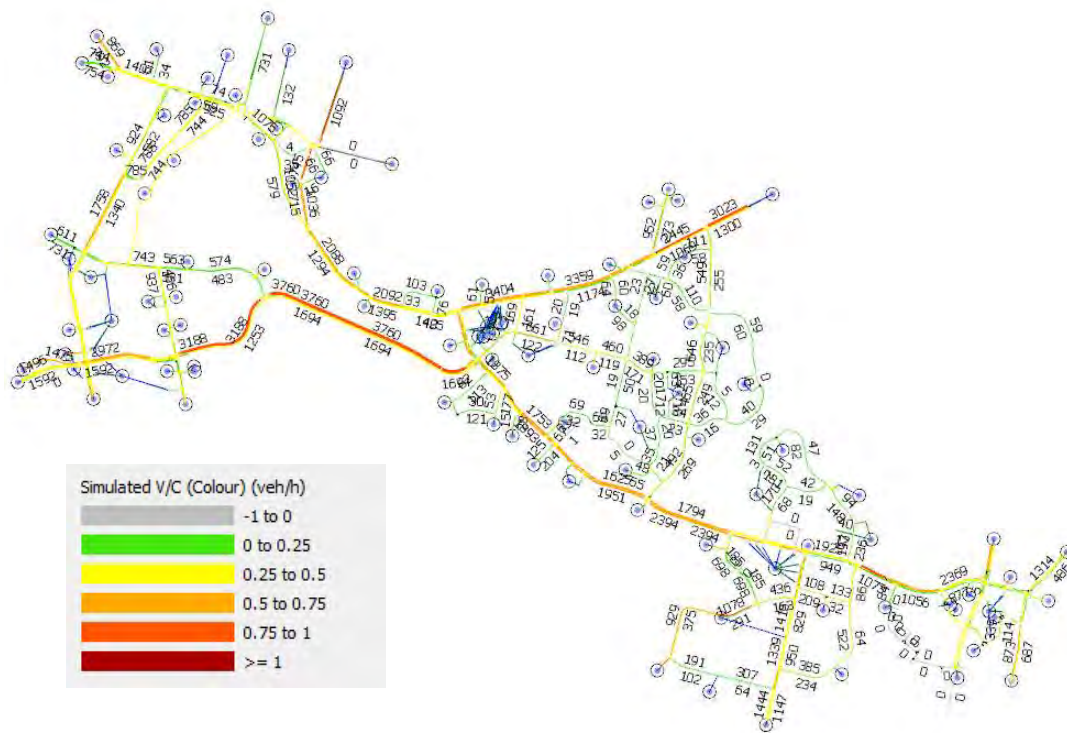


Figure 15 - PM Peak Assigned Flow in PCU/hr (3.15 pm – 6.30 pm)

## 5.4 Validation Results

### 5.4.1 Link Counts Validation

Results for individual link counts (Table 10 and Figure 16) network-wide show that the model satisfies the validation criteria for GEH, R<sup>2</sup> and RMSE.

Table 10 - Summary of Individual Link Counts Validation Results across Network

	AM (%)		PM (%)		NZTA Guideline
	7am - 8am	8am - 9am	4pm - 5pm	5pm - 6pm	Category C
GEH <5	85	85	91	87	>80%
GEH <7.5	94	95	98	99	>85%
GEH <10	99	98	99	100	>90%
R <sup>2</sup>	0.98	0.98	0.99	0.99	>0.95
RMSE	12	13	10	9	<20%



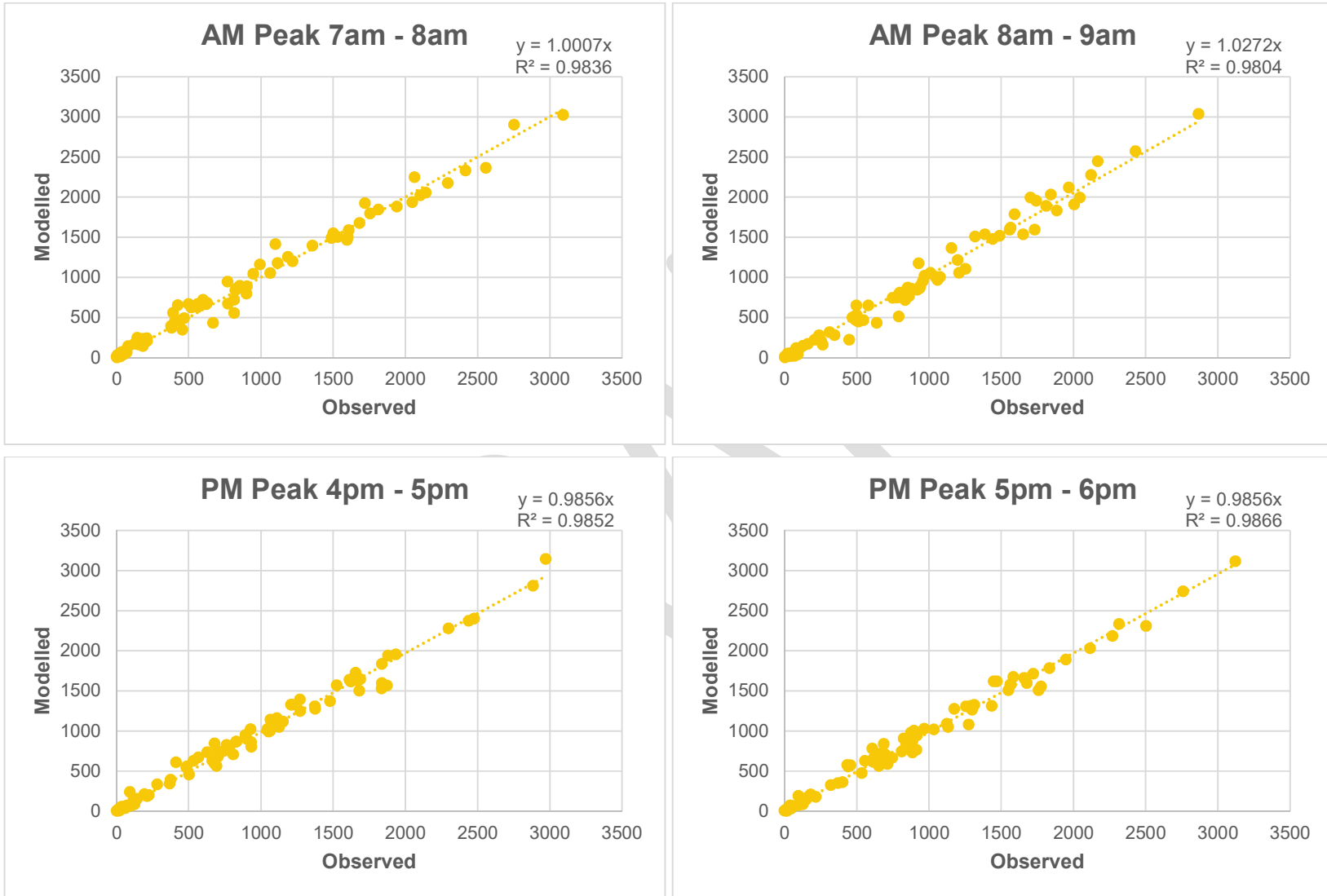


Figure 16 - Link Counts Validation Scatter Plots

## 5.4.2 Turn Counts Validation

Results for individual turn counts (Table 11) in the focus area show that the model satisfies the validation criteria for GEH,  $R^2$  and RMSE. Where the modelled counts did not meet the GEH <5 criteria, the manual counts at that turn were either found to be unreasonable when cross-checked with adjacent counts or there was lack of information on reliability and therefore given less priority for validation.

Table 11 - Summary of Individual Turn Counts Validation Results in Focused Area

	AM (%)		PM (%)		NZTA Guideline
	7am - 8am	8am - 9am	4pm - 5pm	5pm - 6pm	Category C
GEH <5	84	85	78	84	>80%
GEH <7.5	93	91	94	94	>85%
GEH <10	96	98	99	100	>90%
$R^2$	0.99	0.98	0.99	0.99	>0.95
RMSE	19	19	19	14	<20%

## 5.5 Flow Profile Validation

Flow profiles at key locations across the network (Figure 17) were monitored. Overall, the modelled flow profiles follow the observed profiles reasonably well (Figure 18 and Figure 19).

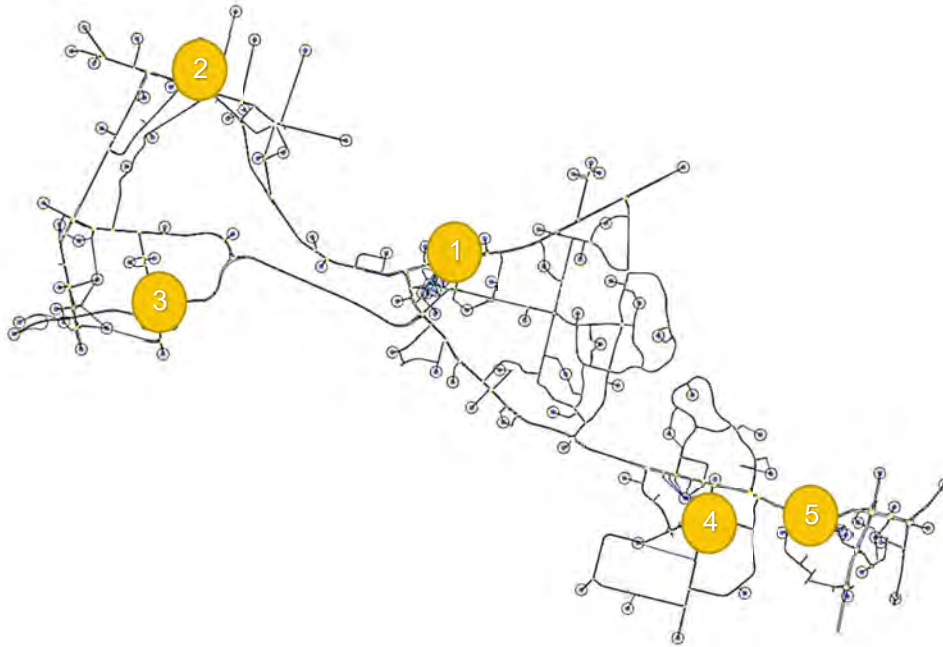
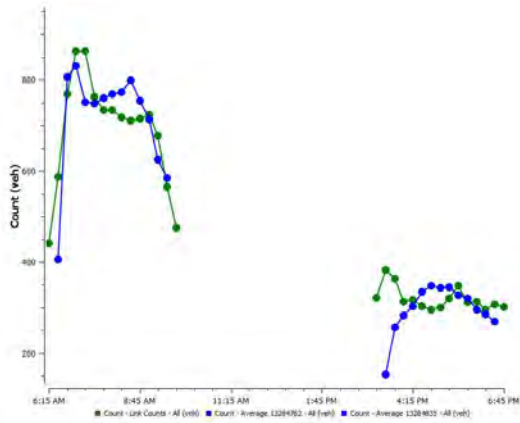


Figure 17 - Profile Validation Locations

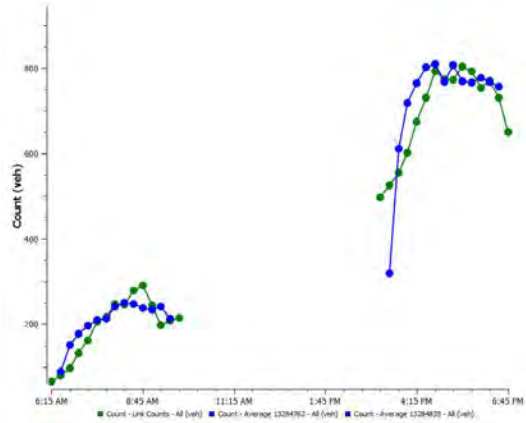
**1 – Pakuranga Road / Lewis Road**

**Westbound**



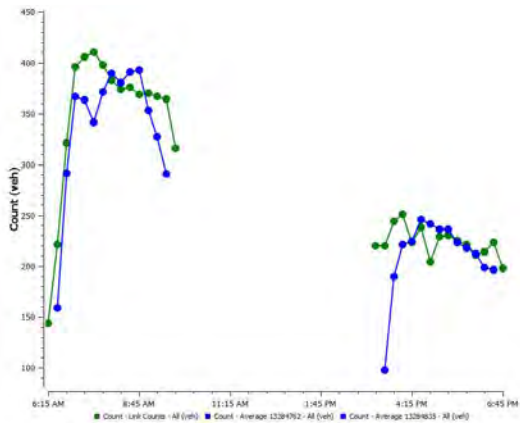
**1 – Pakuranga Road / Lewis Road**

**Eastbound**



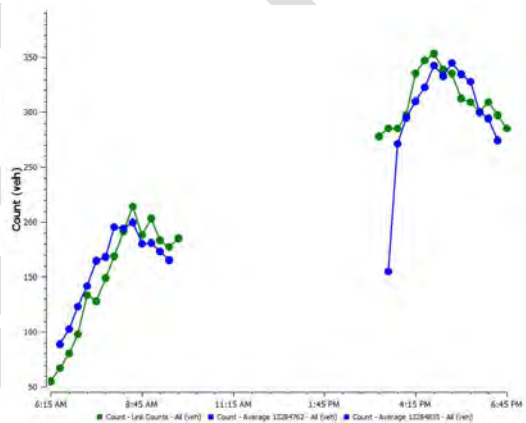
**2 – Panmure Roundabout, Mount Wellington Approach**

**Westbound**



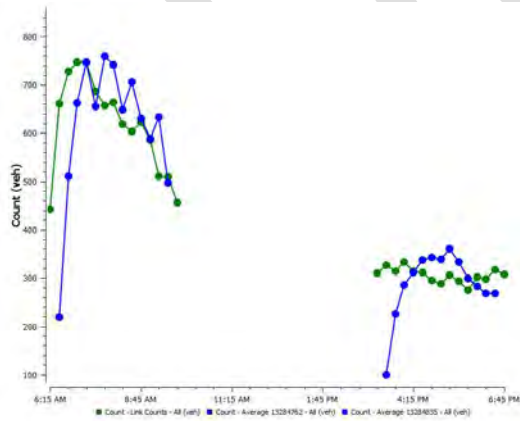
**2 – Panmure Roundabout, Mount Wellington Approach**

**Eastbound**



**3 – South-Eastern Highway / Carbine Road**

**Westbound**



**3 – South-Eastern Highway / Carbine Road**

**Eastbound**

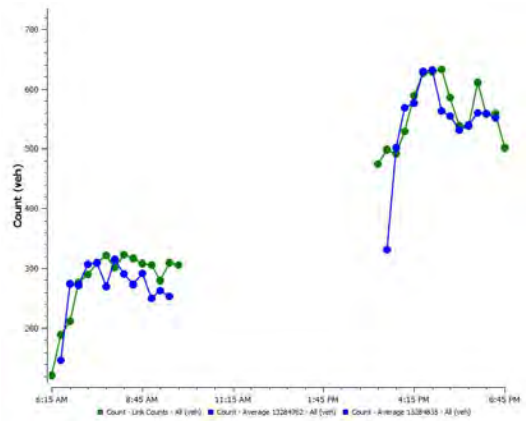
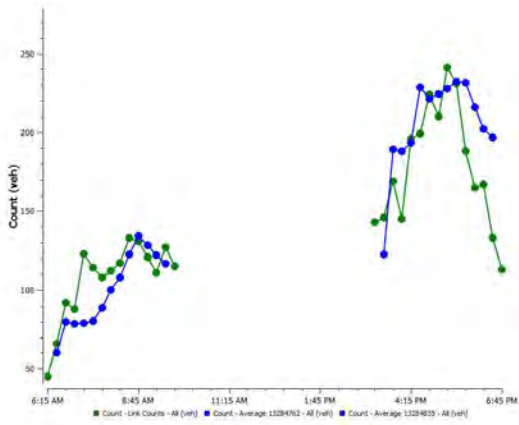
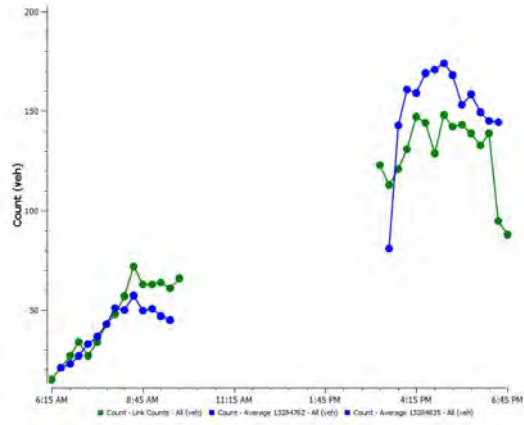


Figure 18 - Flow Profile Validation (modelled in blue, observed in green)

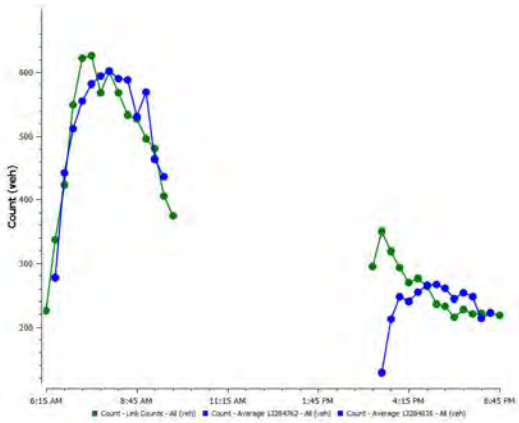
**4 –Ti Rakau Drive / Harris Road  
Harris Road Westbound**



**4 –Ti Rakau Drive / Harris Road  
Harris Road Eastbound**



**5 – Ti Rakau Drive / Huntington Drive  
Westbound**



**5 – Ti Rakau Drive / Huntington Drive  
Eastbound**

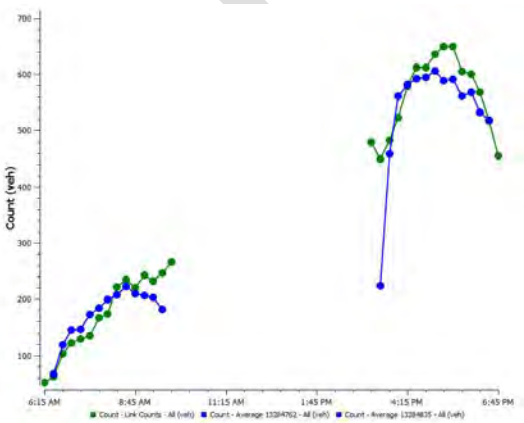


Figure 19 - Flow Profile Validation (modelled in blue, observed in green) continued

## 5.6 HCV Count Validation

A sense-check of the modelled proportion of vehicles assigned as NZTA Axel Class 4 and above (medium and heavy vehicles) was made at key locations across the network. Estimates of car to HCV proportions were made based on available tube count data and judgement. Overall, the modelled proportions match the estimates reasonably well (Figure 20).

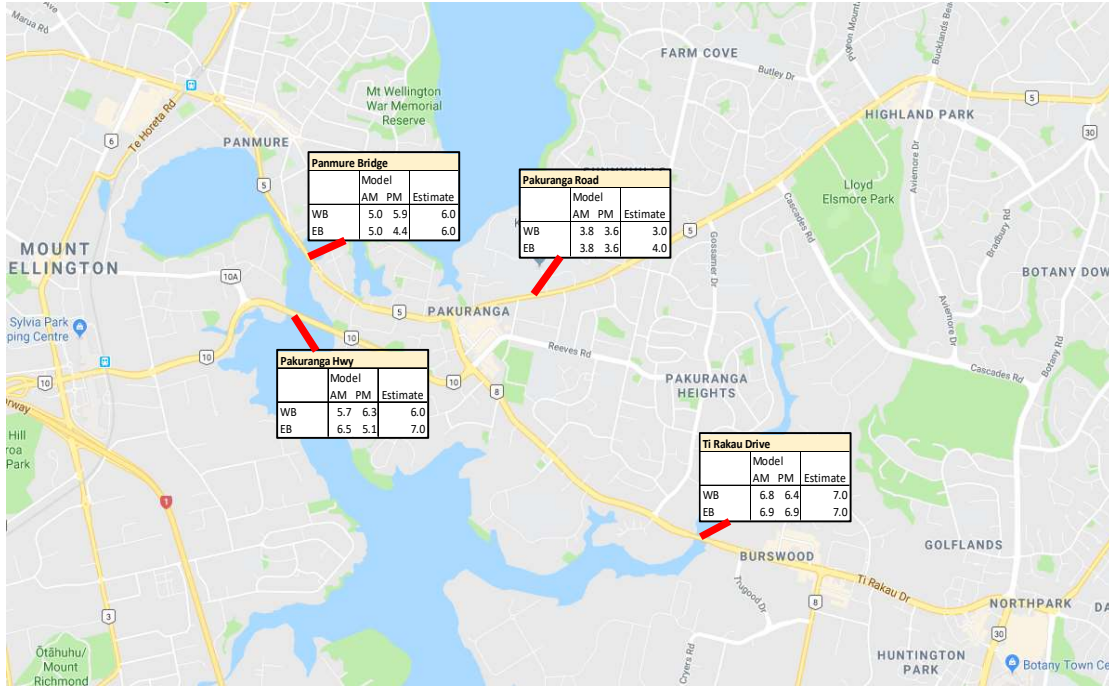


Figure 20 - Comparison of HCV percentage at key locations on the network

As described, the HCV includes MCV counts and we understand the survey at intersections only include pure HCV and hence this data was not used in this validation.

## 5.7 Travel Time Validation

Journey time versus distance graphs show that the modelled travel times were generally a good fit to the observed travel time (Figure 22 - **Error! Reference source not found.**). Signals at the modelled intersections were actuated based on minimum and maximum green times provided from the SCATS data of 7 March 2018. Adjustments were made up to five seconds above and below the maximum green time where required to calibrate travel times. Despite these adjustments, it is noted that:

- For the AM peak, modelled travel time from Edgewater Drive to Pakuranga Highway on Ti Rakau Drive is slightly low in the second hour. Overall 92% of the routes meet the Criteria for the AM peak.
- For the PM peak, modelled travel time from Jellicoe Road to Ti Rakau Drive is slightly low in the second hour. Overall 92% of the routes meet the Criteria for the PM peak.

Nevertheless, all modelled travel times (routes summarised in Figure 21) were within the 15<sup>th</sup> and 85<sup>th</sup> percentile of observed travel time. Therefore, the model is considered acceptably validated for travel time.

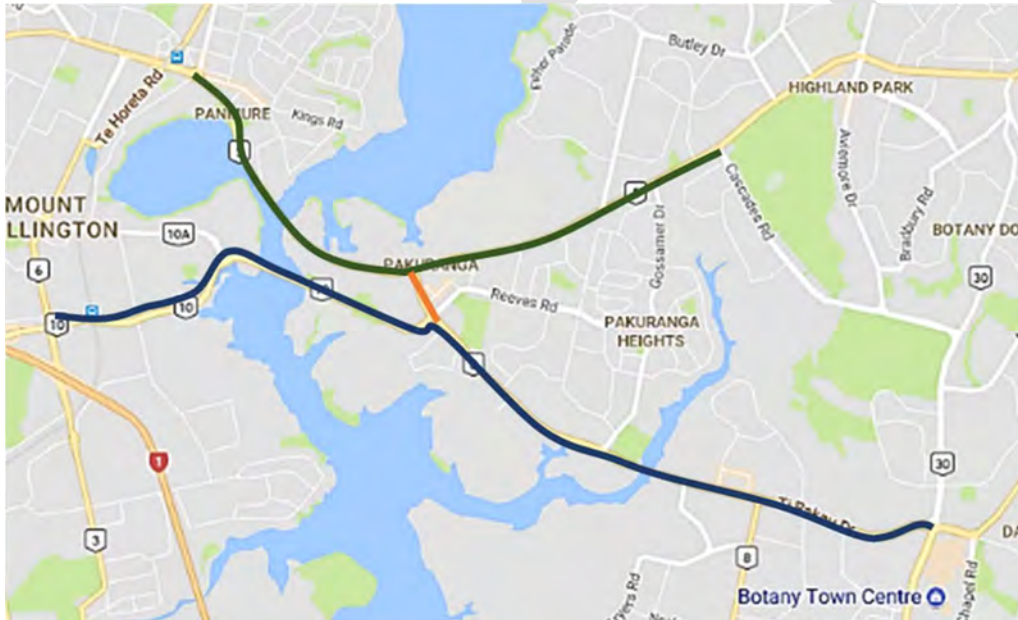


Figure 21 - Travel time routes (traffic) from Snitch GPS data for reporting travel time validation in Chapter 5

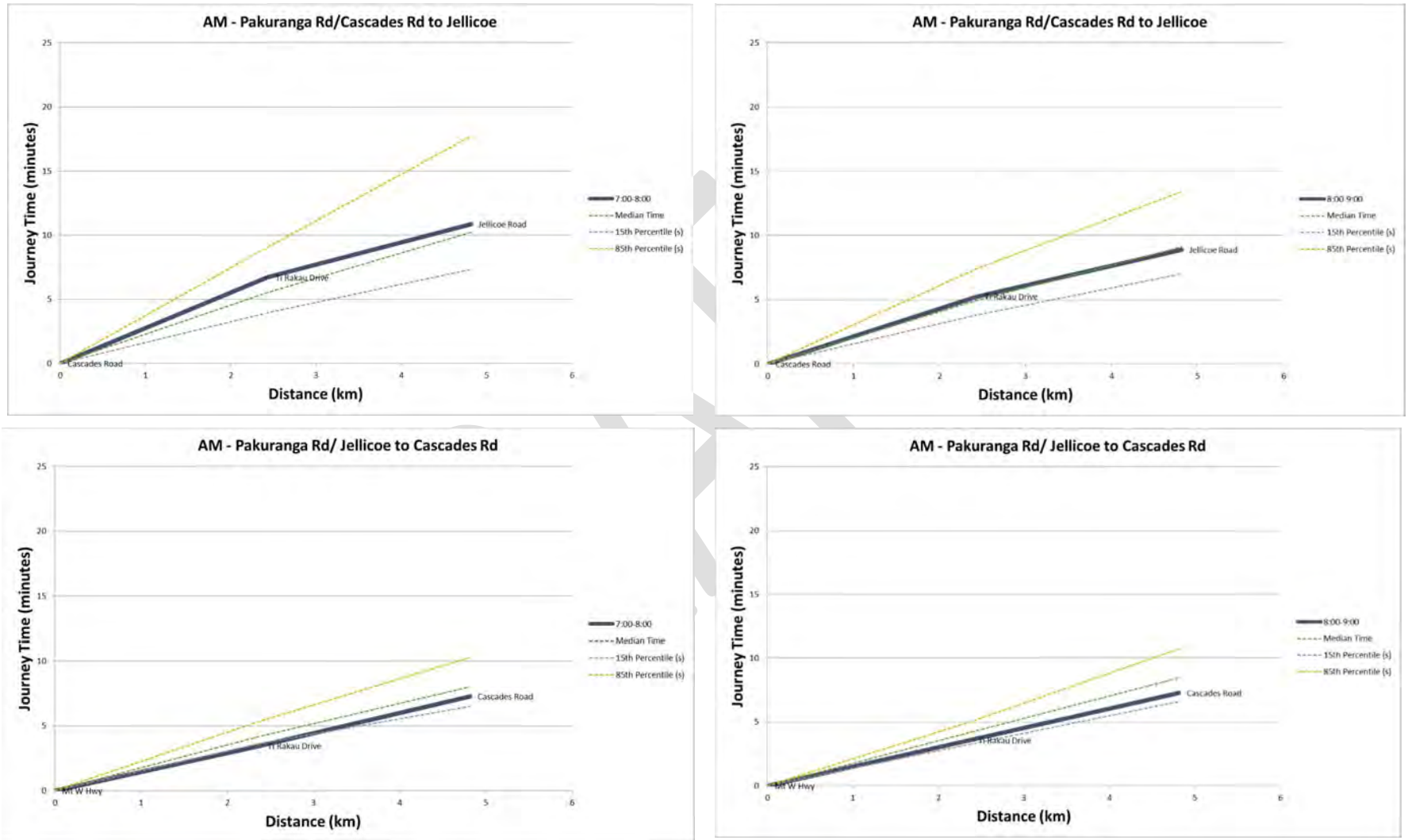


Figure 22 - Travel Time Validation Graphs: AM Pakuranga Road/ Cascades Road to Mount Wellington Highway

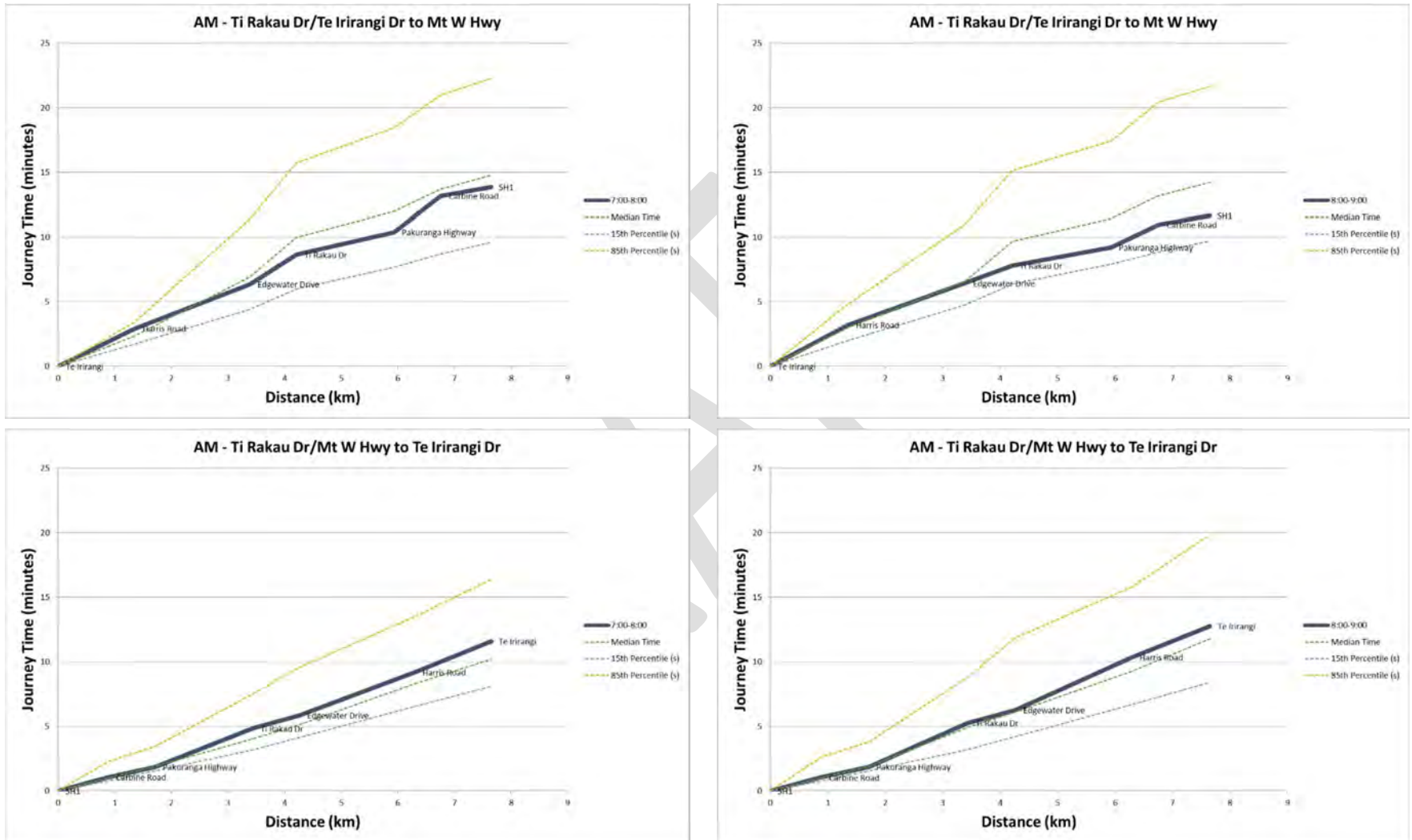


Figure 23 - Travel Time Validation Graphs: AM Ti Rakau Drive/ Te Iirangi Drive to Mount Wellington Highway



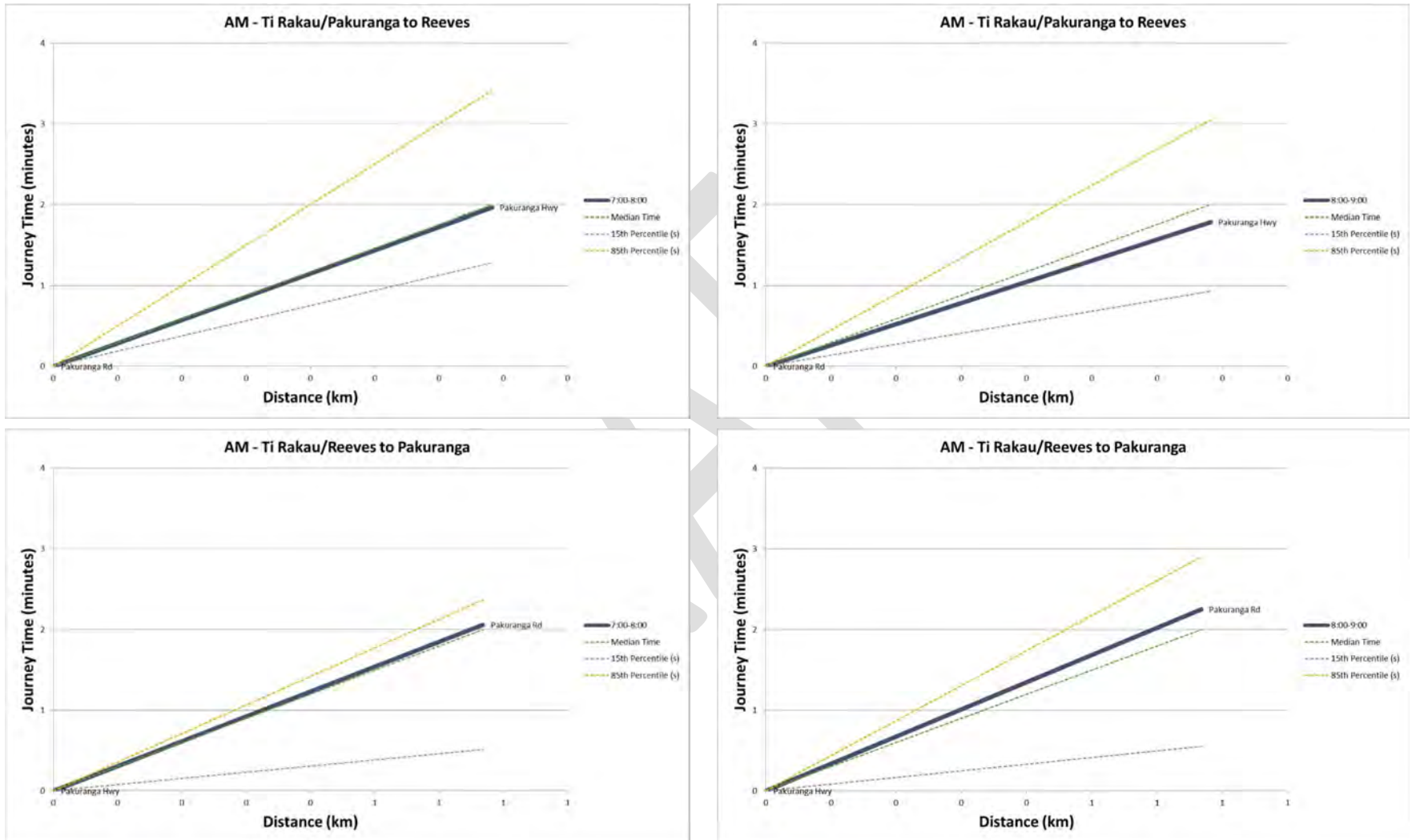


Figure 24 - Travel Time Validation Graphs: AM Ti Rakau Drive/ Pakuranga Road to Reeves Road

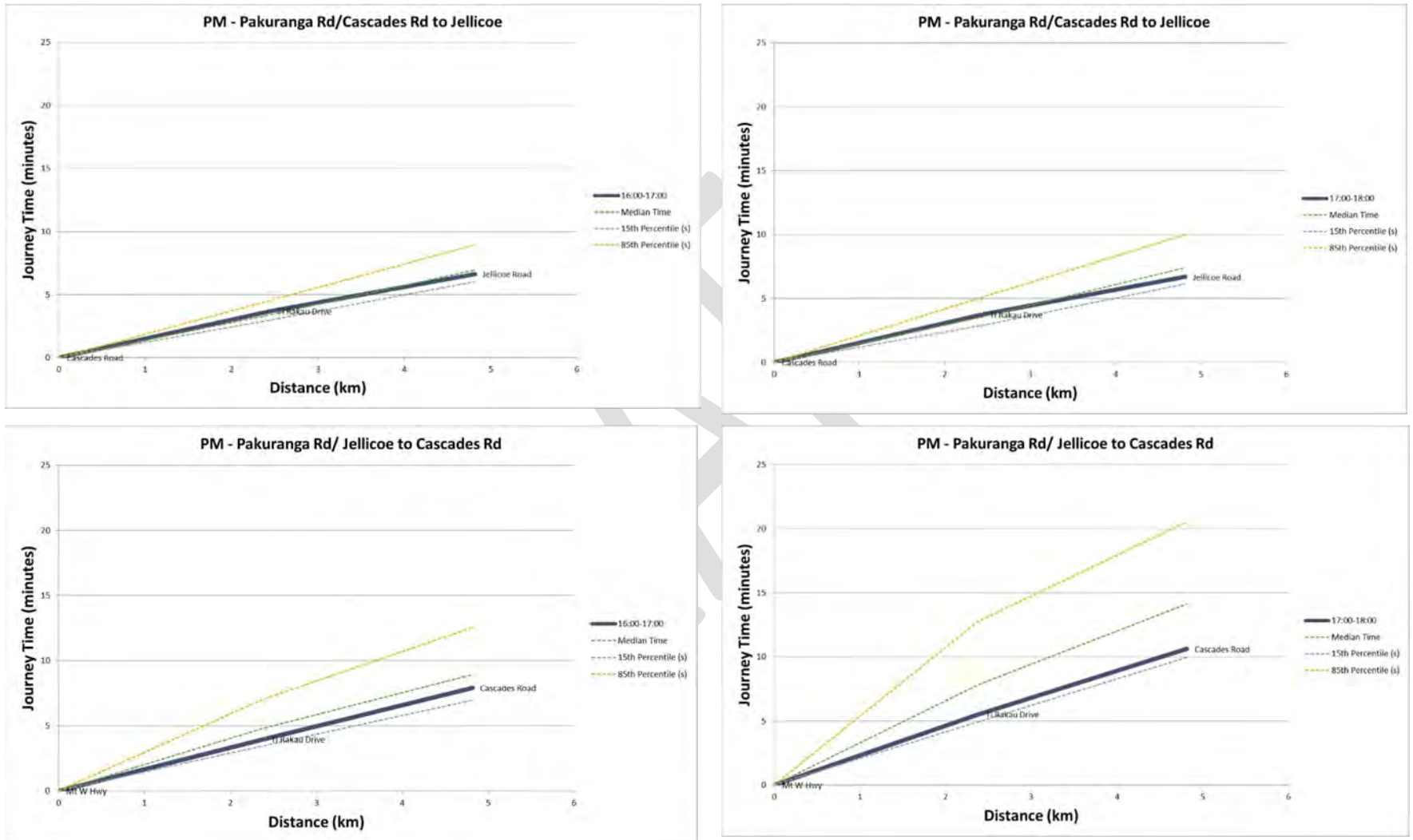


Figure 25 - Travel Time Validation Graphs: PM Pakuranga Road/ Cascades Road to Mount Wellington Highway

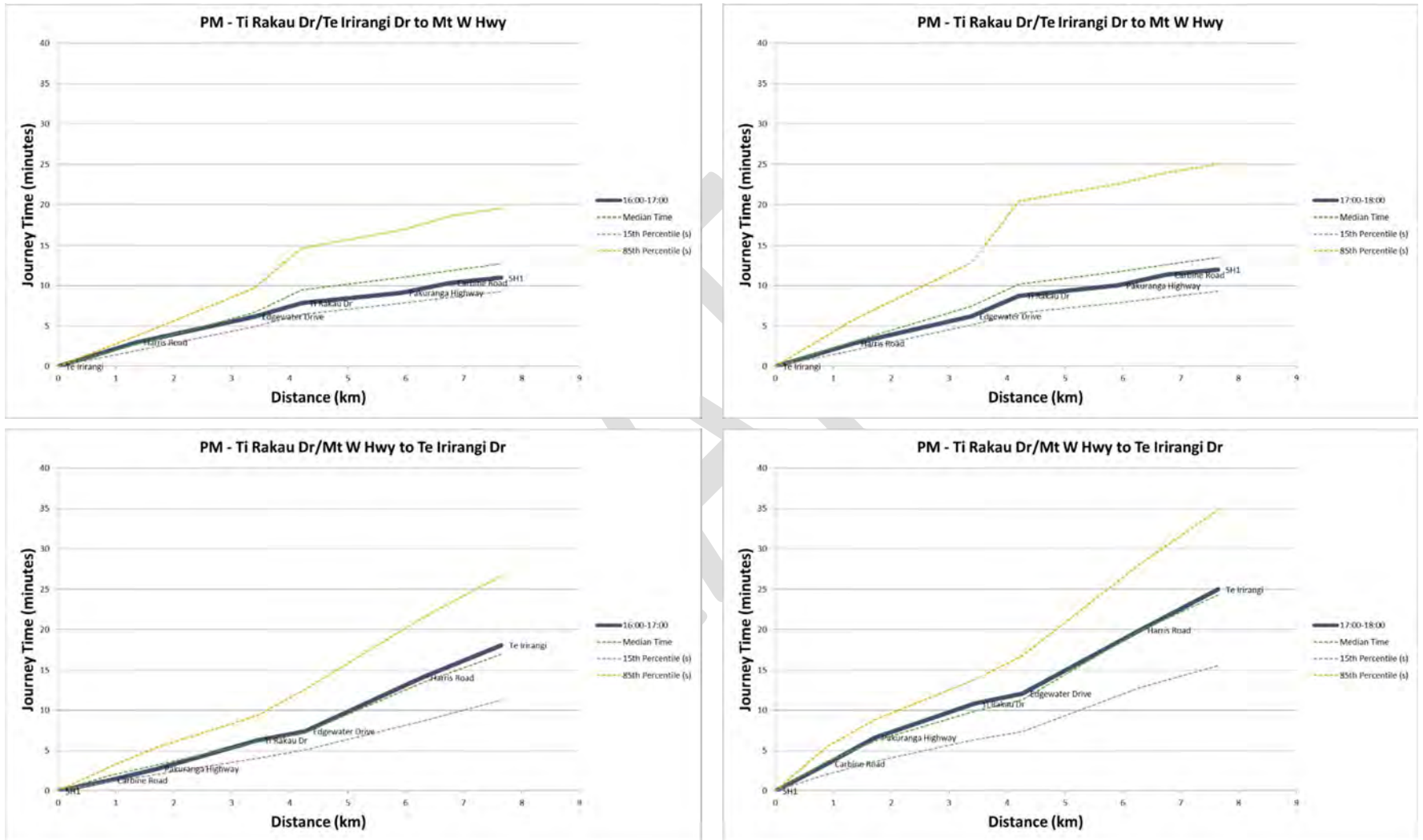


Figure 26 - Travel Time Validation Graphs: PM Ti Rakau Drive/ Te Iirangi Drive to Mount Wellington Highway

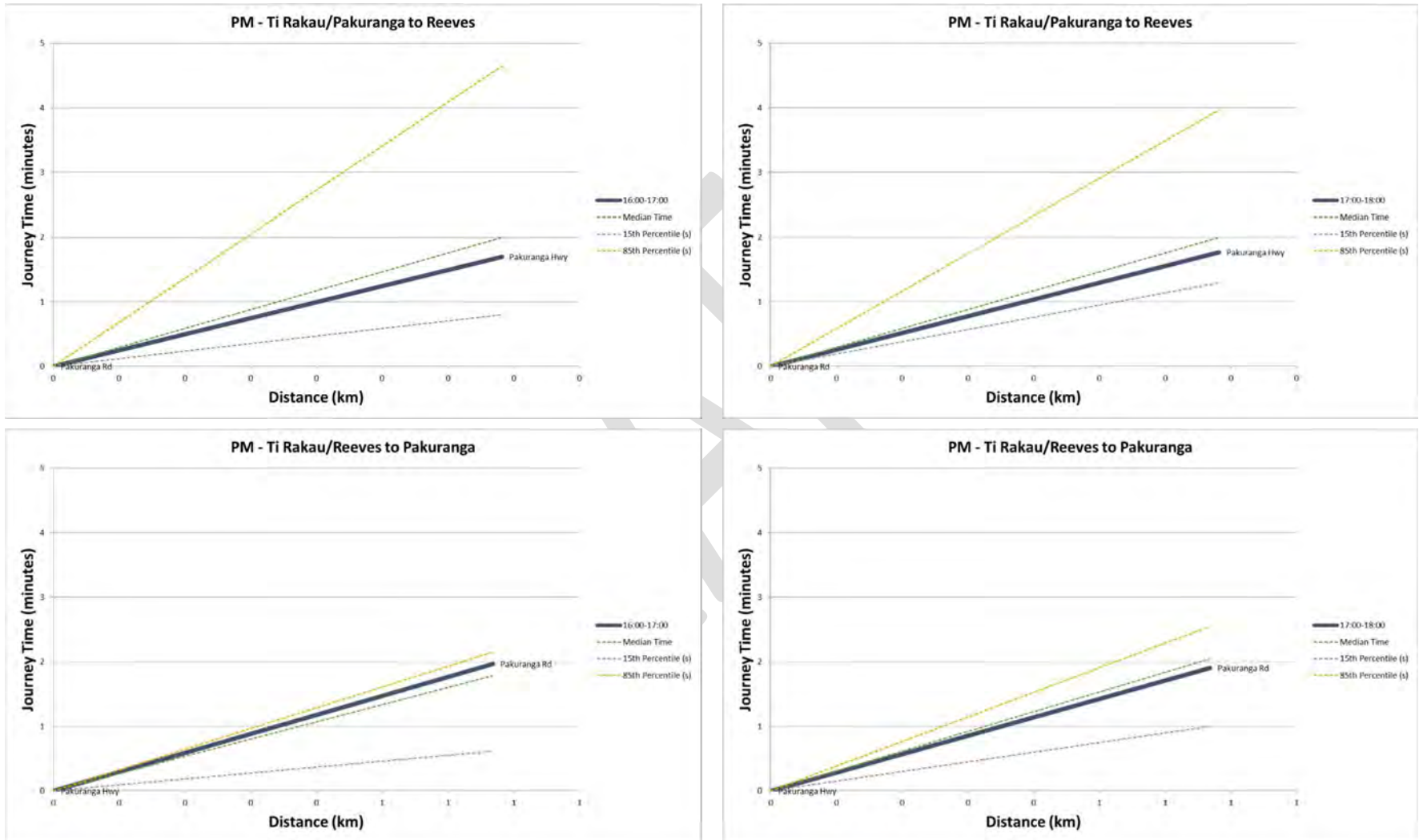


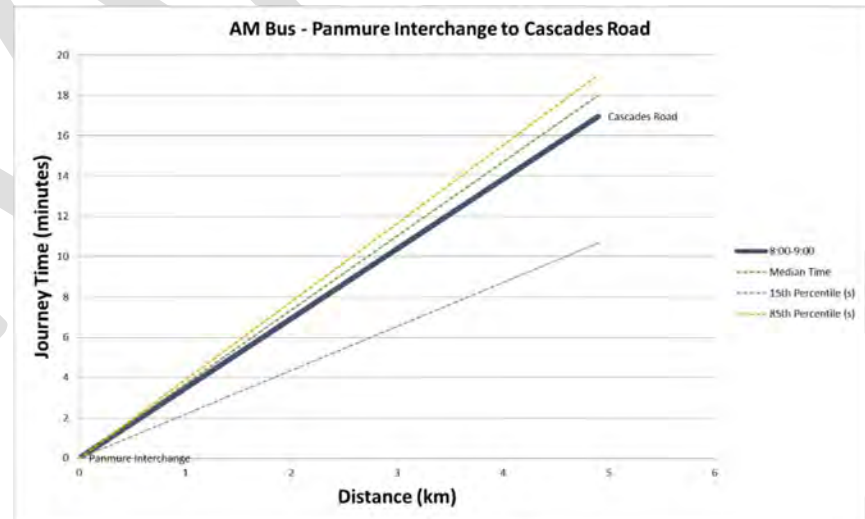
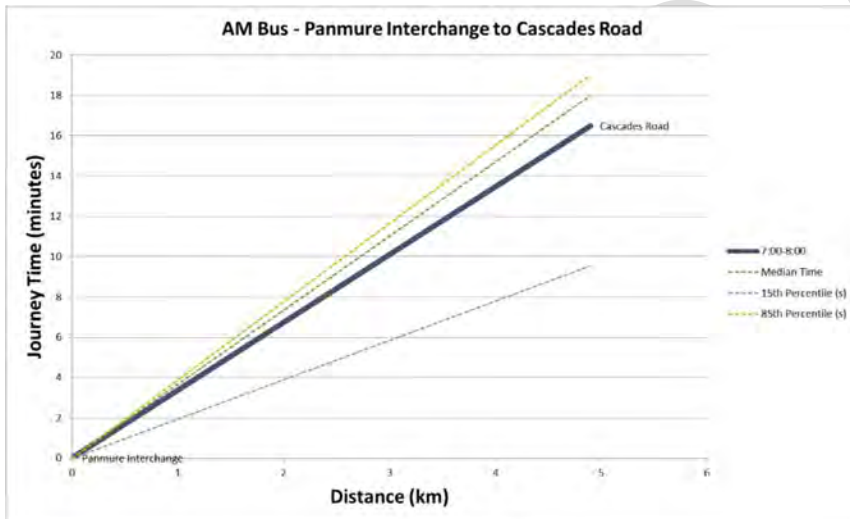
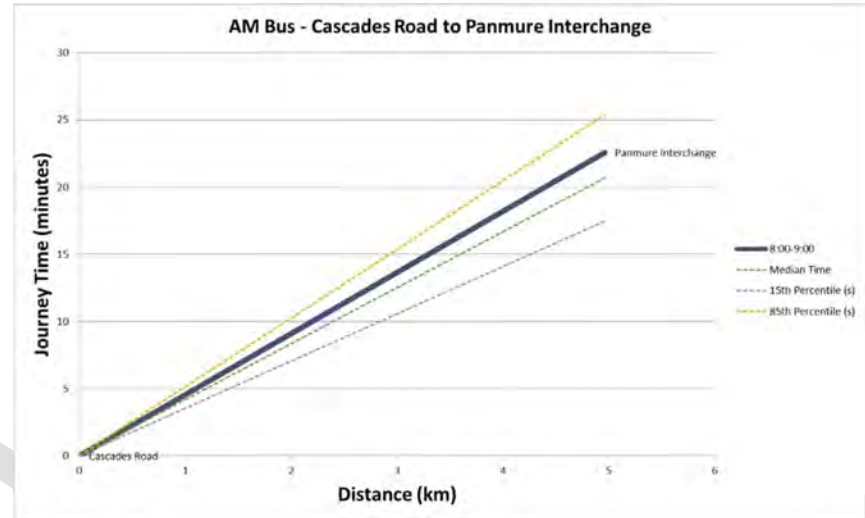
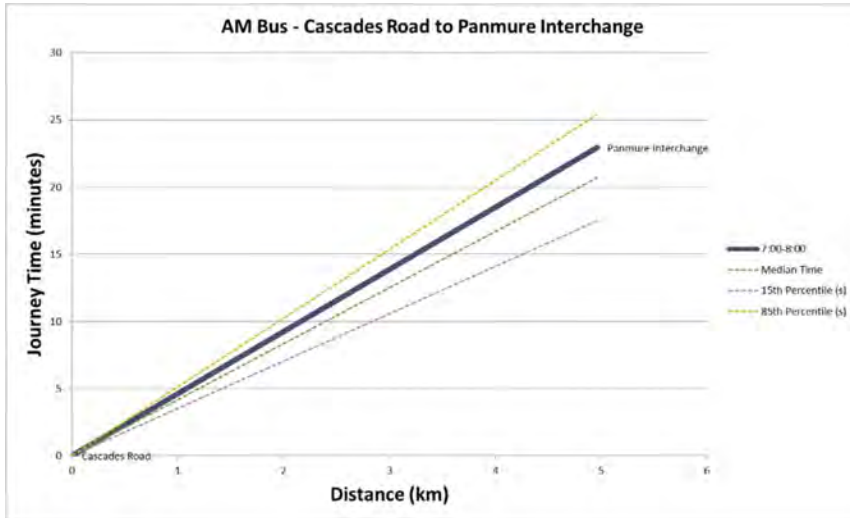
Figure 27 - Travel Time Validation Graphs: PM Ti Rakau Drive/ Pakuranga Road to Reeves Road

Bus travel time for key corridors in the model also fit reasonably well with observed (Figure 28 - Figure 29). The routes are:

- Bus Route 70 – between Botany Town Centre and Panmure Interchange.
- Bus Route 72 – between Cascades Road and Panmure Interchange.

From the bus journey time graphs, it is noted that

- For the AM peak, modelled travel time from the Botany to Panmure Town Centre is low in the first hour. Overall 88% of the routes meet the Criteria for the AM peak.
- For the PM peak, modelled travel time between the Botany and Panmure from Jellicoe Road to Ti Rakau Drive is high in the second hour. The additional travel time is occurring in the Panmure area and does not impact on the focus area. For the future year, the bus travel time along this route will be monitored to ensure it does not increase unrealistically. Overall 75% of the routes meet the Criteria for the PM peak which is below the target 85%.



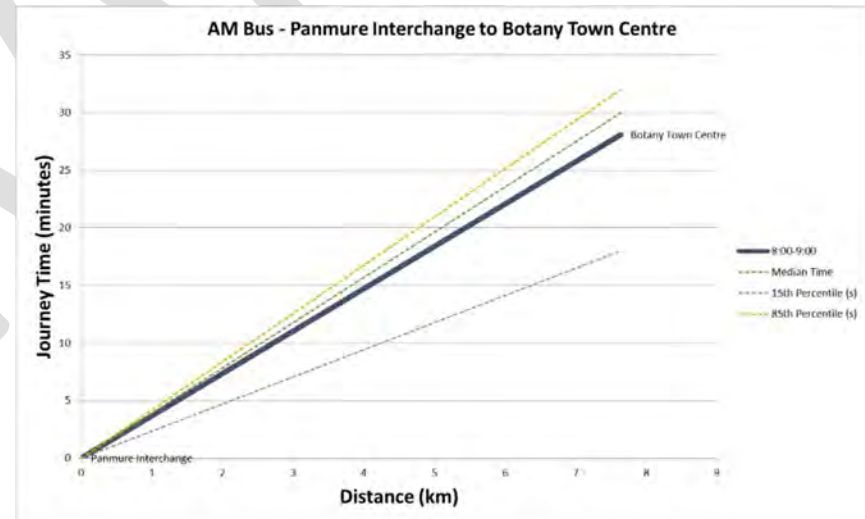
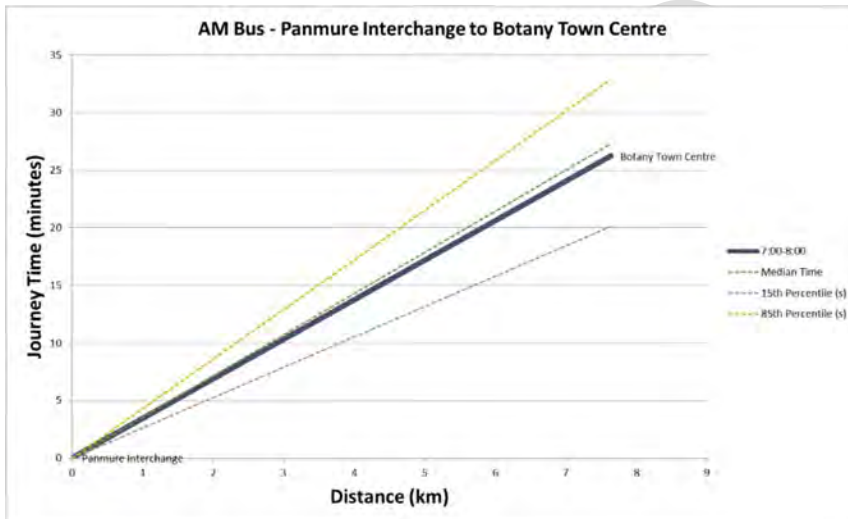
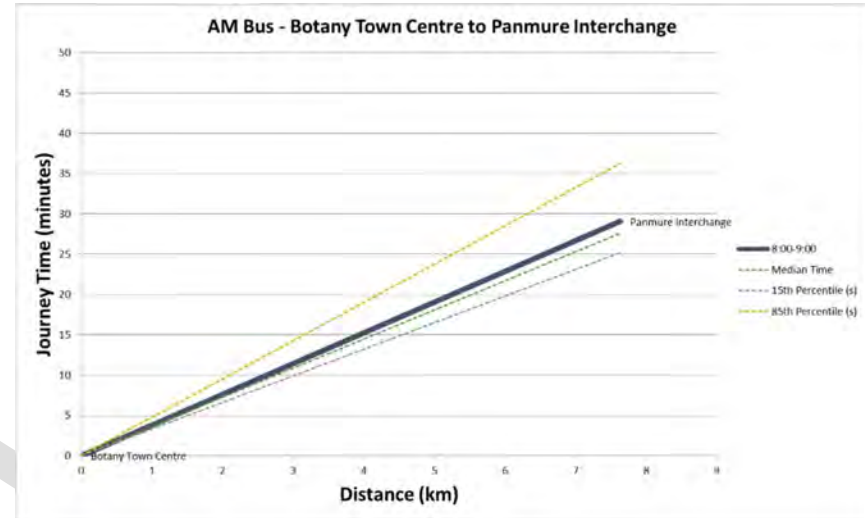
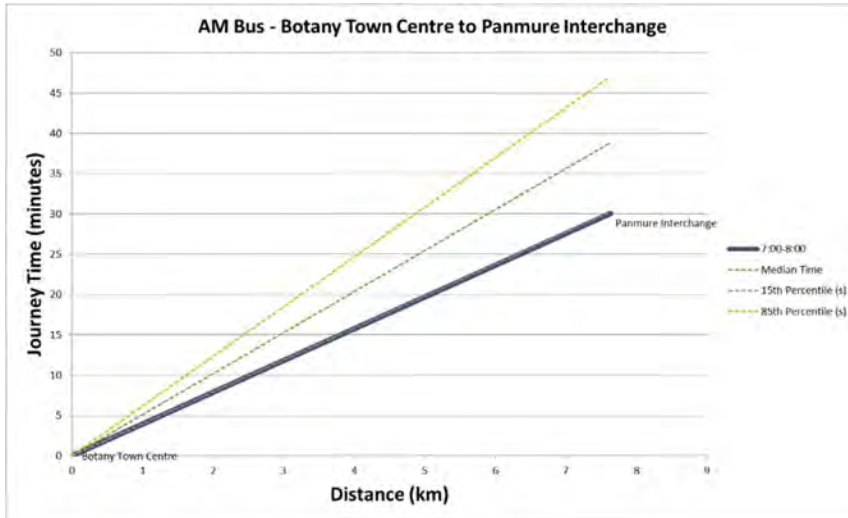
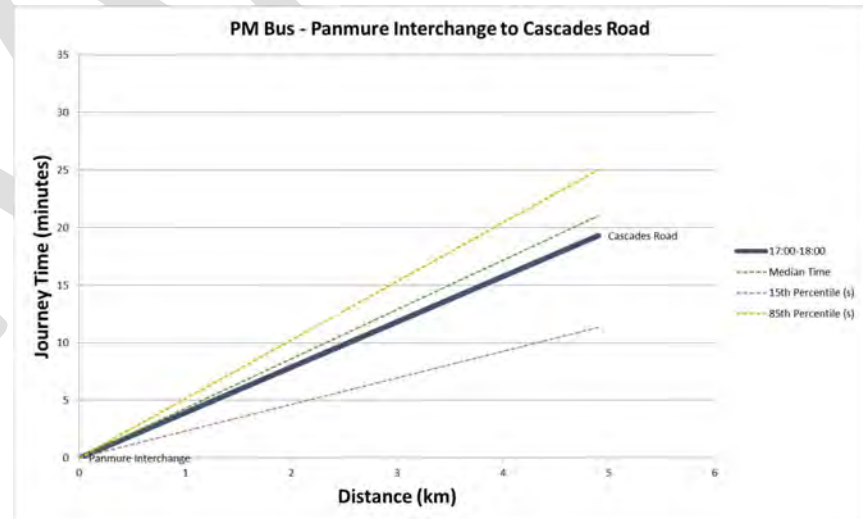
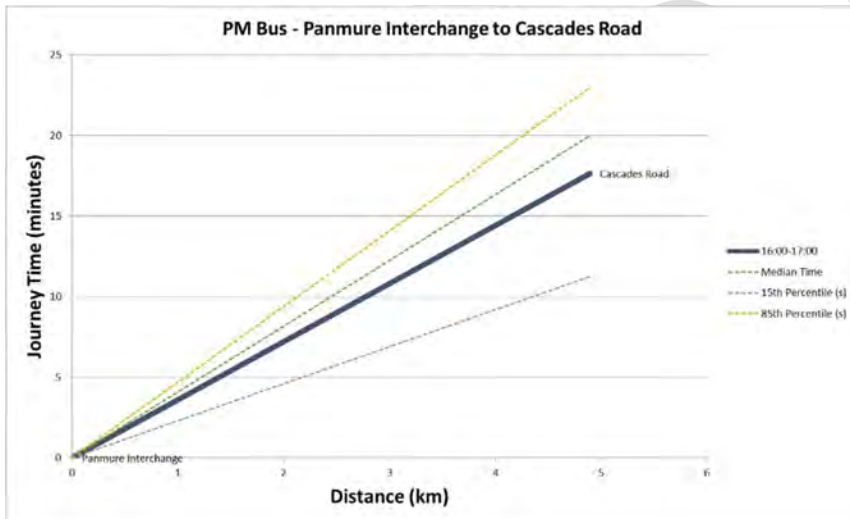
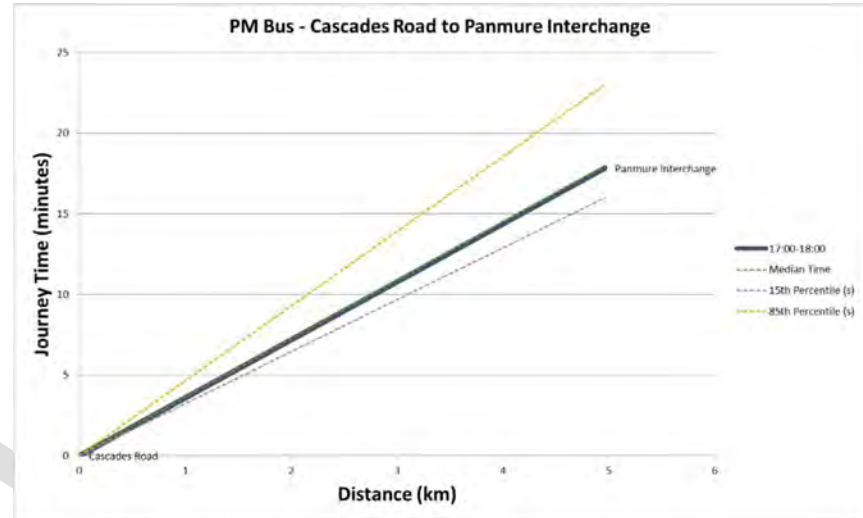
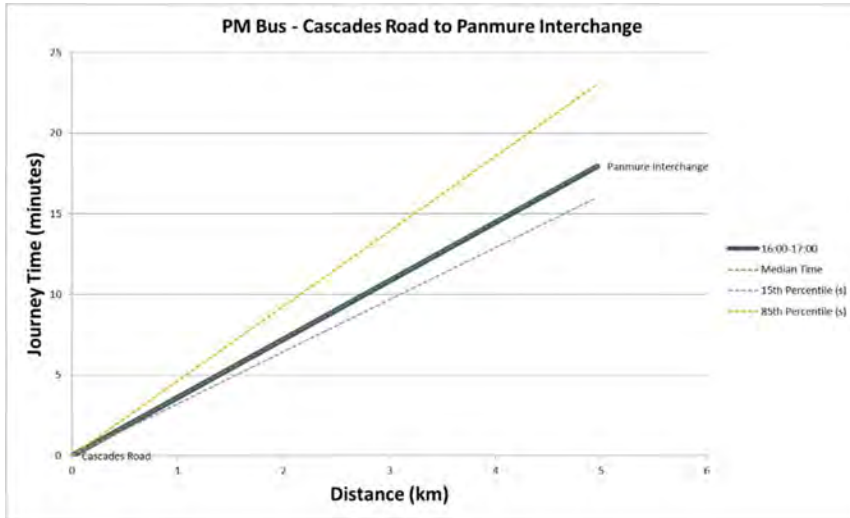


Figure 28 – Travel Time Validation: AM Bus





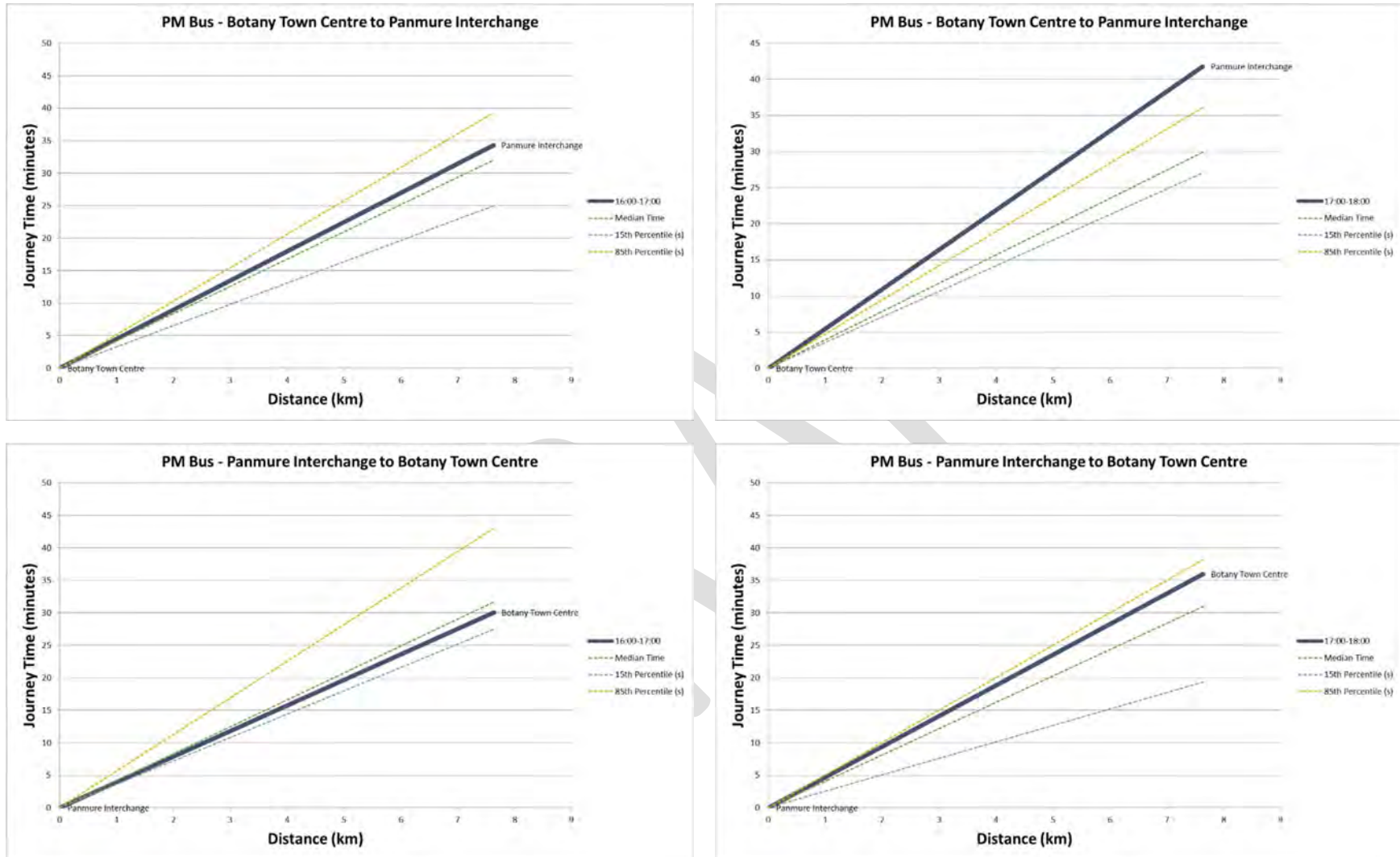


Figure 29 - Travel Time Validation: PM Bus

## 5.8 Traffic Congestion Check

Traffic count and travel time data are the principle measures of the model performance. Traffic congestion on the network was monitored as an additional sense-check of model performance.

Side-by-side comparison to Google's live traffic view-mode for Thursday 21 February 2019 show that the model represents congestion on the network reasonably well (Figure 30 and Figure 31). In the AM peak, less congestion was seen on Ti Rakau Drive Northbound in the model compared to observed, and this was reflected in the faster travel time for that segment. However, also in the AM, although less congestion was seen on Pakuranga Highway Westbound in the model compared to observed, this was not reflected in the travel time validation. In the PM peak, less congestion was seen on Ti Rakau Eastbound in the model, however this was not reflected in the travel time validation.

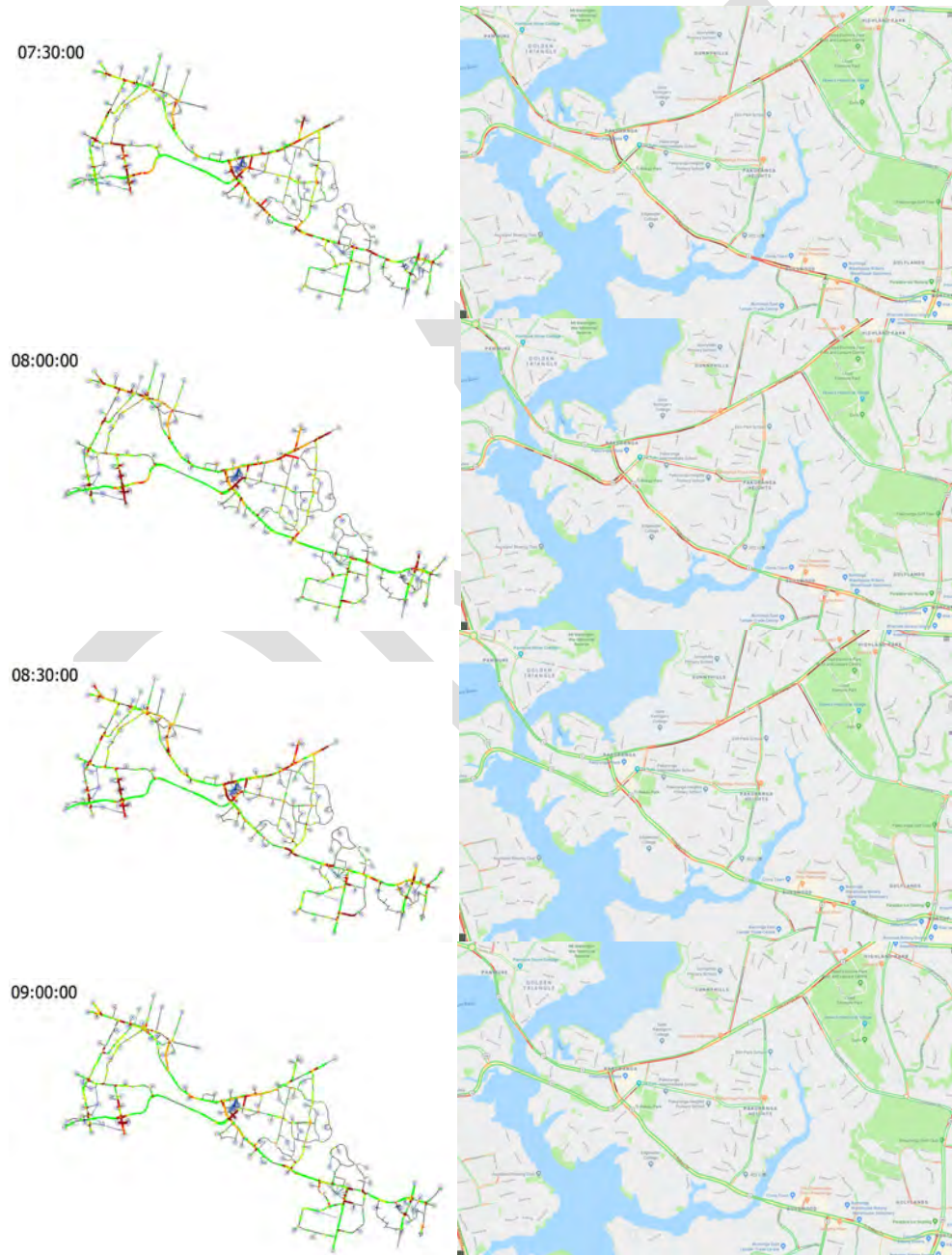


Figure 30 – AM Modelled Congestion versus Observed

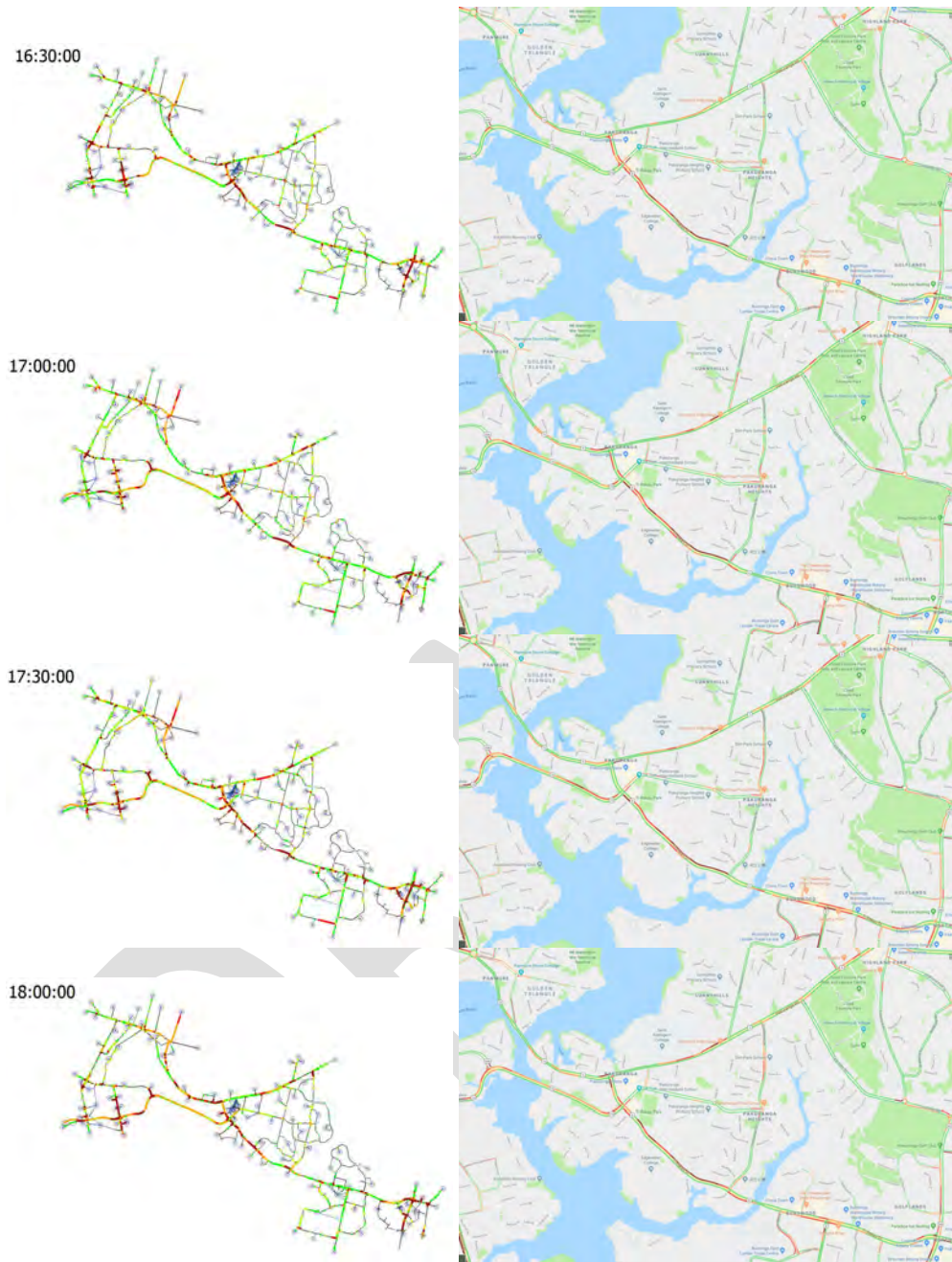


Figure 31 - PM Modelled Congestion versus Observed

This comparison is useful to understand the location of the congestion however the exact definition of congestion in Google's traffic is unknown. Hence it is used as an indication.

## 5.9 Route Choice Sense Check

Route choice in the model could not be directly calibrated and/or validated because there was no available data. However, sense-checks were made in the **static** model (which contributes 80% of the route choice) using previous experiences and observed traffic count-split information at intersections. Overall, route distribution in the model appears reasonable (Figure 32 - Figure 34).

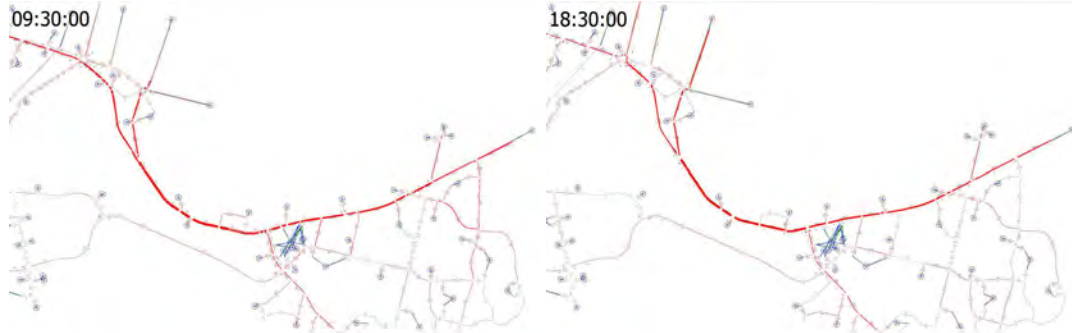


Figure 32 - Route Choice Split: AM Panmure Bridge Westbound (left) and PM Panmure Bridge Eastbound (right)

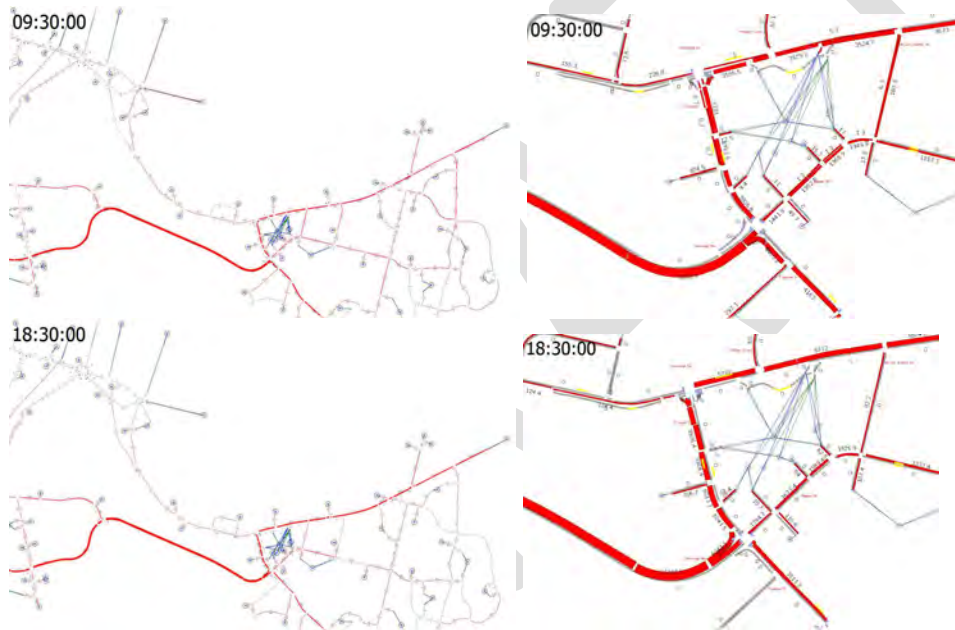


Figure 33 - Route Choice Split: AM Pakuranga Highway Westbound (above) and PM Pakuranga Highway Eastbound (below)

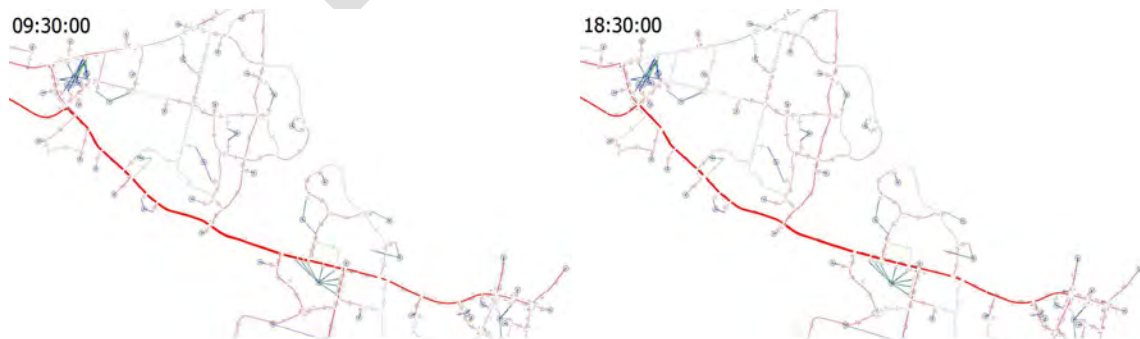


Figure 34 - Route Choice Split: AM Pakuranga Highway Westbound (above) and PM Pakuranga Highway Eastbound (below)

### 5.10 Model Stability

Model stability was monitored and found to be within acceptable thresholds of a coefficient of variance (COV) <5% across the modelled periods, except in the AM past 9am (Figure 35). However, since the demand and the total travel time are falling at approximately the same profile, this is not an issue.

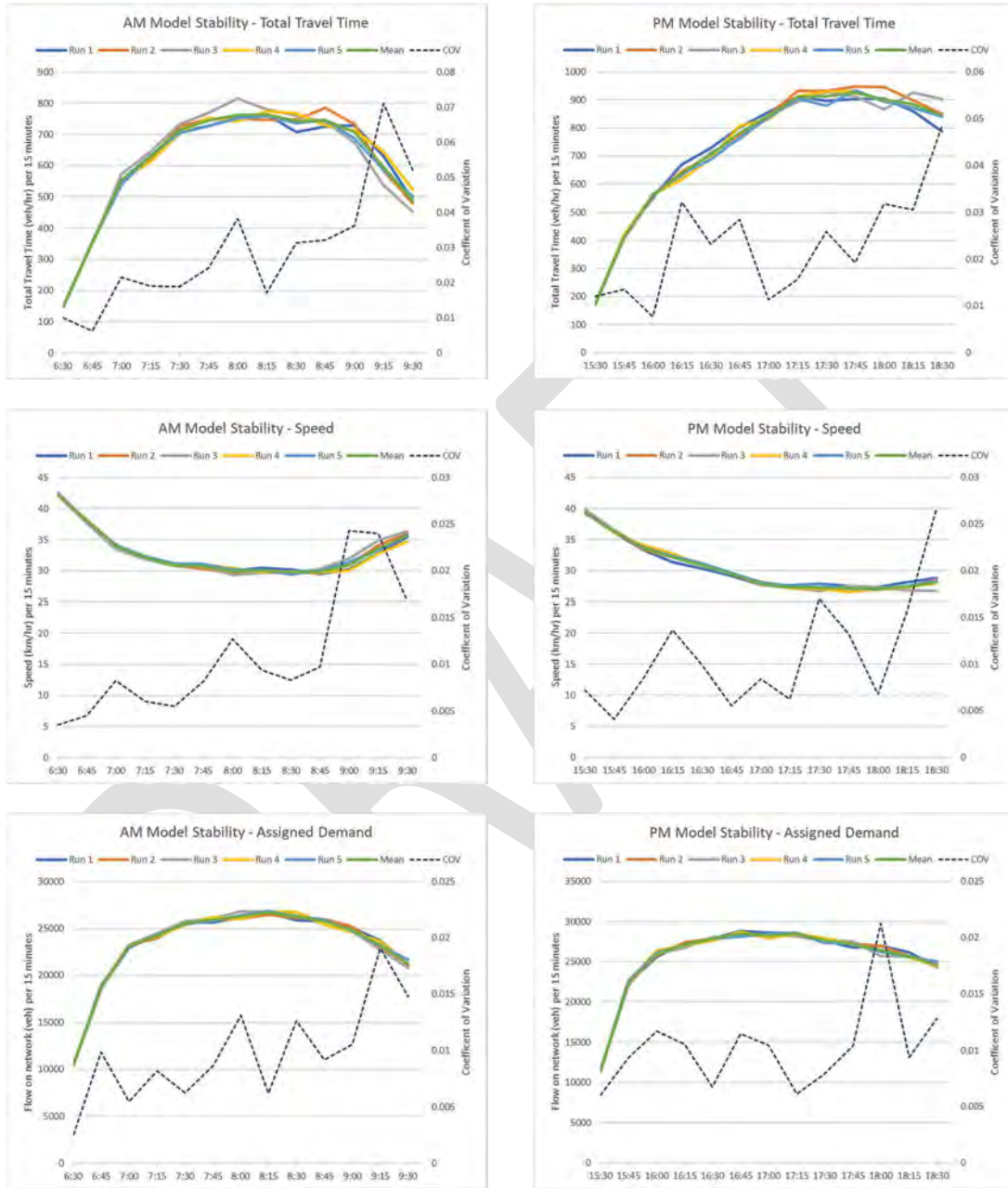


Figure 35 - Model Stability: Total Travel Time, Speed and Flow Plots

## 6 Conclusion

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This report details the update and calibration/validation of the Aimsun model for the Eastern Busway Project. The purpose of this model is to provide a consistent and common base for project developments in the East Auckland Area, primarily along Ti Rakau Drive for the EB 2 and EB3 detailed design work.

The model covers two three-hour peak periods (6.30 am – 9.30 am, and 3.30 pm – 6.30 pm). The modelled periods were chosen to capture the congestion typically experienced in the modelled area.

The model consists of macro and micro tiers with the respective assignment methods: static assignment and microscopic dynamic assignment (DTA). The macro tier provides an interim stage to calibrate the demand through demand adjustment and to generate 80% of paths for the micro DTA. Based on previous modelling of the area, an 80-to-20 split in static versus dynamic path assignment was considered appropriate. This gave better control of modelling route choice in the area and sense-checks during the model development process showed that route distribution in the model is reasonable.

Various observed data were provided by Auckland Transport (AT) for the model development. These included traffic counts, travel time, public transport timing, and signal timing.

The traffic demands come from the AMETI EMME traffic model and were processed before assigning to the Aimsun model. This demand interface process includes a minor refinement of AMETI traffic model zones and application of 2-to-3 hour expansion factors to fit the Aimsun model period. Demand adjustment as part of the validation process was done manually.

The model network was developed in line with the Auckland Dynamic Traffic Assignment Model (ADTA) network coding guideline, which sets out the recommended network coding methodology for Aimsun models in Auckland. This included a standard system of classification and labelling of different turn movement types which were important function variables in the ADTA-developed cost functions also adopted in this model for calculating junction and turn delays.

Model validation showed that the model meets the validation target criteria for Category C: Urban Area in NZTA Model Development Guidelines on individual link flows and turn flows for each hour between 7am – 9am, and 4pm – 6pm. Travel times in the model fit reasonably well with the observed.

Overall, the base year model is considered acceptably calibrated and validated for the purposes of the EB2/3 design work.

Appendix A

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## **Traffic to Aimsun Zone Correspondence**

Aimsun Zone	NEW CORDON Aimsun-EMME REF
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
205	205
210	210
286	286
296	296
297	297
412	412
540	540
545	545
546	546
547	547
548	548
555	555
560	560
561	561
562	562
563	563
568	568
572	572
582	582
583	583
599	599
649	649
650	650
651	651
652	652
653	653
654	654
655	655
656	656
657	657
658	658
659	659
660	660
662	662
663	663
664	664

Aimsun Zone	NEW CORDON Aimsun-EMME REF
665	665
666	666
667	667
668	668
669	669
670	670
671	671
672	672
673	673
677	677
678	678
693	693
694	694
695	695
697	697
698	698
699	699
705	705
706	706
865	865
867	867
868	868
869	869
870	870
871	871
873	873
896	896
897	897
900	900
901	901
902	902
903	903
1013	13
1017	17
1654	654
1656	656
1902	902
1903	903
2903	903



## Appendix B

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# Road Parameters

Table B1 – Key Road Type Parameters: Main

	Maximum Speed (km/h)	User-Defined Cost	Third User-Defined Cost	Capacity per Lane (PCUs/h)
Arterial	50	1.4	1.2	1600
Arterial - 50k Reeves	50	1.6	1.4	1200
Arterial - 50k Reeves EBD	50	1.6	1.4	1200
Arterial - Divided	60	1.2	1.1	1600
Busway	60	1	1.2	1600
Collector	50	2	1.4	900
Collector - Ireland	50	2	1.4	900
Expressway	80	0.9	0.2	2100
Local - 30k	30	5	2	500
Local - 50k	50	3	1.6	500
Minor Arterial	50	1.4	1.2	1400

Table B2 - Key Road Type Parameters: Dynamic Models

Road-Type Parameters								
Dynamic Models - Section Parameters								
	Lane Changing				Side Lane			Consider Two-Lane Car Following Model
	Cooperation (%)	Aggressiveness (%)	Breaking Intensity	Imprudent Lane Changing	Cooperation Distance	Merging Distance	Merge: First veh on is first veh off	
Arterial	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Arterial - 50k Reeves	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Arterial - 50k Reeves EBD	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Arterial - Divided	80	0	Regular	No	Whole Lane	Default	Yes	Yes
Busway	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Collector	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Collector - Ireland	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Expressway	80	0	Regular	No	Whole Lane	Default	Yes	Yes
Local - 30k	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Local - 50k	50	0	Regular	No	Whole Lane	Default	Yes	Yes
Minor Arterial	50	0	Regular	No	Whole Lane	Default	Yes	Yes
	Queue Discharge							
	Acceleration Factor	Additional Reaction Time at Stop (sec)	Additional Reaction Time at Traffic Light (sec)					
Arterial	No Change	0	0					
Arterial - 50k Reeves	No Change	0	0					
Arterial - 50k Reeves EBD	No Change	0	0					
Arterial - Divided	No Change	0	0					
Busway	No Change	0	0					
Collector	No Change	0	0					
Collector - Ireland	No Change	0	0					
Expressway	No Change	0	0					
Local - 30k	No Change	0	0					
Local - 50k	No Change	0	0					
Minor Arterial	No Change	0	0					

Table B3 - Key Road Type Parameters: Dynamic Models continued

Road-Type Parameters						
Dynamic Models - Turn Parameters						
	Microscopic Model					
	Distance Zone 1 (m)	Distance Zone 2 (m)	Additional Waiting Time Before Losing Turn (sec)	Yellow Box Speed (km/h)		
Arterial	333.3	166.67	0	10		
Arterial - 50k Reeves	333.3	166.67	0	10		
Arterial - 50k Reeves EBD	333.3	166.67	0	10		
Arterial - Divided	333.3	166.67	0	10		
Busway	333.3	166.67	0	10		
Collector	277.78	138.89	0	10		
Collector - Ireland	277.78	138.89	0	10		
Expressway	555.56	277.78	0	10		
Local - 30k	277.78	138.89	0	10		
Local - 50k	277.78	138.89	0	10		
Minor Arterial	277.78	138.89	0	10		
	Giveaway Model					
	Initial Safety Margin (sec)	Initial Giveaway Time Factor	Visibility to Give Way (m)	Final Safety Margin (sec)	Final Give Way Time Factor	Visibility along Main Stream (m)
Arterial	3	1	25	1	2	60
Arterial - 50k Reeves	3	1	25	1	2	60
Arterial - 50k Reeves EBD	3	1	25	1	2	60
Arterial - Divided	3	1	25	1	2	60
Busway	3	1	25	1	2	60
Collector	3	1	25	1	2	60
Collector - Ireland	3	1	25	1	2	60
Expressway	3	1	25	1	2	100
Local - 30k	3	1	25	1	2	60
Local - 50k	3	1	25	1	2	60
Minor Arterial	3	1	25	1	2	60

Appendix C

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## Vehicle Parameters

Table C1 - Key Vehicle Parameters

Vehicle Parameters				
Main				
Length (m)	Mean	Deviation	Minimum	Maximum
Car	4.5	0.4	3.3	5.3
Truck	11.3	4.3	6.5	19.1
Bus	13	1	12.6	13.5
Width (m)	Mean	Deviation	Minimum	Maximum
Car	1.75	0	1.75	1.75
Truck	2.4	0	2.4	2.4
Bus	2.4	0	2.4	2.4
Max Desired Speed (km/h)	Mean	Deviation	Minimum	Maximum
Car	110	10	80	120
Truck	100	5	80	110
Bus	90	10	70	100
Dynamic Models - Main				
Speed Acceptance	Mean	Deviation	Minimum	Maximum
Car	1.05	0.1	0.9	1.3
Truck	1.05	0.1	1	1.1
Bus	1	0.1	0.9	1.1
Clearance (m)	Mean	Deviation	Minimum	Maximum
Car	1.5	0.5	1	2.3
Truck	2	0.5	1.5	3
Bus	1.5	0.5	1	2.5
Max Give Way Time (secs)	Mean	Deviation	Minimum	Maximum
Car	10	2.5	5	15
Truck	25	5	10	35
Bus	35	10	20	60
Dynamic Models - Experiment Defaults				
	Reaction Time	Reaction Time at Stop	Reaction Time for Front Veh	Probability
Car	0.8	1.15	1.35	1
Truck	0.8	1.3	1.7	1
Bus	0.8	1.3	1.7	1

Table C1 - Key Vehicle Parameters continued

Vehicle Parameters				
Microscopic Model - Main				
<b>Max Acceleration (m/s<sup>2</sup>)</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	2.7	0.2	2.2	3.5
Truck	1.45	0.6	0.5	2.4
Bus	1	0.3	0.8	1.8
<b>Normal Deceleration (m/s<sup>2</sup>)</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	3.5	0.2	3	4
Truck	3	0.3	2	3.5
Bus	2	1	1.5	4.5
<b>Max Deceleration (m/s<sup>2</sup>)</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	6	0.5	5	7
Truck	5	0.5	4	6
Bus	5	1	4	6
<b>Sensitivity Factor</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	1.1	0	1.1	1.1
Truck	1.1	0	1.1	1.1
Bus	1	0	1	1
<b>Gap (secs)</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	1.1	0.2	0.5	2
Truck	1.3	0.2	0.5	2.5
Bus	1.1	0.2	0.5	2.5
<b>Headway Aggressiveness</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	0	0	-1	1
Truck	0	0	-1	1
Bus	0	0	-1	1
<b>Favours Stop and Go</b>				
Car	No			
Truck	No			
Bus	No			
<b>Lane-Changing Model</b>	<b>Staying in Overtaking Lane</b>	<b>Imprudent Lane Changing</b>		
Car	No	No		
Truck	No	No		
Bus	No	No		
<b>Margin for Overtaking Manouver (secs)</b>	<b>Mean</b>	<b>Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Car	5	3	1	10
Truck	5	3	1	10
Bus	5	3	1	10

Table C1 - Key Vehicle Parameters continued

Vehicle Parameters			
Static Models			
	Transportation Mode	PCUs	
<b>Car</b>	None	1	
<b>Truck</b>	None	2.5	
<b>Bus</b>	None	2.5	

Appendix D

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## **Bus Services List**



**Base 2018 Bus Services**

31

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35

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70

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72X

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72M

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72C

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352

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351

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353

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711

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355

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739

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712

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735

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733

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734

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323

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743

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751

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Appendix E

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## **Attribute Overrides and Applicability**

**Attribute Overrides and Applicability**

Attribute Override Name	AM	PM	Static	Dynamic
Base 2016 Yellow Box	√	√	√	√
Base 2018 Section Speed	√	√	√	√
Base 2018 Turn Capacity	√	√	√	√
Harris Rd Lane Cooperation	√	√	√	√
Ti Rakau Lane Cooperation	√		√	√
Pakuranga Rd Look Aheads	√		√	√
Pakuranga Rd Section Speed		√	√	√

Appendix F

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## **Junction and Turn Delay Calculation Parameters**

## Intersection Coding Adopted from ADTA

To assist with scripting and automation, a classification system was applied to turn movements to signify different conflict situations at intersections. The external ID of each turn movement was set to a 4-digit code following the convention below:

XYZZ

where **X** = intersection type

**Y** = number of approaches/legs

**ZZ** = movement type

These 4-digit codes were used in each JDF and TPF cost function scripts to allocate the correct calibration parameters to each turn at the calibration stage

<b>X</b>	<b>INTERSECTION TYPE</b>
1	Signalised
2	Roundabout
3	Priority intersection – Give-way sign at Minor Road
4	Priority intersection – Stop sign at Minor Road
5	Two-way one lane bridge
6	Zebra pedestrian crossing
<b>Y</b>	<b>NUMBER OF APPROACHES</b>
<b>ZZ</b>	<b>MOVEMENT TYPE<sup>1</sup></b>
00	Unopposed Turn (e.g. Through and left turn on Major Road, as well as signalised movements)
01	Left Turn – 1-lane opposing
02	Left Turn – 2-lane or more opposing
03	Through Movement Crossing One-way Road – 2-lane one-way
04	Through Movement Crossing One-way Road – 3-lane one-way
05	Through Movement Crossing One-way Road – 4-lane one-way
06	Through Movement Crossing Two-way Road – 2-lane two-way
07	Through Movement Crossing Two-way Road – 4-lane two-way
08	Through Movement Crossing Two-way Road – 6-lane two-way
09	Right Turn from Major Road - Across 1 lane
10	Right Turn from Major Road - Across 2 lanes
11	Right Turn from Major Road - Across 3 lanes
12	Right Turn from Minor Road – One-way
13	Right Turn from Minor Road – 2-lane two-way Major Road / Across 1 lane
14	Right Turn from Minor Road – 4-lane two-way Major Road / Across 2 lanes
15	Right Turn from Minor Road – 6-lane two-way Major Road / Across 3 lanes
16	Staged Right Turn from Minor Road – Across 1 lane with flush median or merge lane in the middle
17	Staged Right Turn from Minor Road – Across 2 lanes with flush median or merge lane in the middle
18	Staged Right Turn from Minor Road – Across 3 lanes with flush median or merge lane in the middle

### ADTA-Calibrated Intercept and Slope Values for turn types used in JDF

Turn External Id	Number of Approach lanes for this Movement	Intercept	Slope
1x01	x	735	0.37
1x02	x	925	0.35
1x03	x	400	0.18
1x04	x	330	0.15
1x06	x	300	0.08
1x07	x	225	0.05
1x09	x	595	0.29
1x10	x	595	0.25
1x11	x	630	0.27
1x13	x	300	0.08
1x14	x	225	0.05
1x15	x	225	0.05
2xxx	1	1,200	0.7
2xxx	2	2,500	0.8
2xxx	3	3,100	0.8
3x01	x	735	0.37
3x02	x	925	0.35
3x03	x	400	0.18
3x04	x	330	0.15
3x05	x	330	0.15
3x06	x	300	0.08
3x07	x	225	0.05
3x08	x	225	0.05
3x09	x	595	0.29
3x10	x	595	0.25
3x11	x	630	0.27
3x12	x	400	0.18
3x13	x	300	0.08
3x14	x	225	0.05
3x15	x	225	0.05
3x16	x	400	0.18
3x17	x	330	0.15
3x18	x	330	0.15
4x01	x	510	0.21
4x02	x	505	0.09
4x03	x	355	0.15
4x04	x	310	0.14
4x05	x	310	0.14
4x06	x	230	0.05
4x07	x	230	0.05
4x08	x	230	0.05
4x09	x	595	0.29
4x10	x	595	0.25
4x11	x	630	0.27
4312	x	355	0.15
4313	x	230	0.05
4314	x	230	0.05
4315	x	230	0.05
4316	x	355	0.15
4317	x	310	0.14
4318	x	310	0.14
4412	x	355	0.15
4413	x	235	0.16
4414	x	235	0.16
4415	x	230	0.05
4416	x	355	0.15
4417	x	310	0.14
4418	x	310	0.14
5x03	x	500	0.2

Appendix G

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## **Cost Function Scripts**

## Volume Delay Function

```
model = None
tollCarColumn = None
tollTruckColumn = None
assignedVolColumn = None
laneCapacityColumn = None

def checkExperimentContext(context, turning):
    global model
    global tollCarColumn
    global tollTruckColumn
    global assignedVolColumn
    global laneCapacityColumn
    if model == None:
        model = context.experiment.getModel()

    # get the section type
    sectionType = model.getType('GKSection')
    if tollCarColumn == None:
        tollCarColumn = sectionType.getColumnByExternalName ("TOLL - CAR", 0)
    if tollTruckColumn == None:
        tollTruckColumn = sectionType.getColumnByExternalName ("TOLL - TRUCK", 0)

    # get the road type
    roadType = model.getType('GKRoadType')
    if laneCapacityColumn == None:
        laneCapacityColumn = roadType.getColumnByExternalName('Lane Capacity',0)

    turnType = model.getType('GKTurning')
    if assignedVolColumn == None:
        assignedVolColumn = turnType.getColumn('MACRO:!' + str(context.experiment.getId()) + '_GKTurning_macroAssignedVolume_0', 0)

def travelTime(context, section, funcVolume):

    global model

    #define the peak hour factor based on peak
    # get the experiment
    experiment = context.experiment
    # get the scenario
    scenario = experiment.getScenario()
    # get the traffic demand
    trafficDemand = scenario.getDemand()
    # get the start time of the demand
    startTime = trafficDemand.initialTime()
    # get the duration of the demand
    assignmentDuration = trafficDemand.duration().hour()

    #set parameters from sections
    speed = section.getSpeed()
    volume = funcVolume.getVolume()
    length = section.length3D()
    capacity = section.getCapacity()
    capacityperlane = section.getRoadType().getDataValueDouble(laneCapacityColumn)
    JA = section.getUserDefinedCost3()

    # assign volume peak hour factor based on peak
    phfVol = 1.0

    # fixed, global factor
    if startTime.hour() == 6:
        phfVol = 1.15
    elif startTime.hour() == 11:
        phfVol = 1.02
    elif startTime.hour() == 15:
        phfVol = 1.05

    # assign speed peak hour factor based on peak
    phfSpeed = 1.0
    """
    # fixed, global factor
    if startTime.hour() == 6:
        phfSpeed = 1.1595
    elif startTime.hour() == 11:
        phfSpeed = 1.0707
    elif startTime.hour() == 15:
        phfSpeed = 1.1422
    """

    #calculate additional parameters
    #apply peak volume factor when calculating degree of saturation
    X = (volume * phfVol) / capacity
    T0 = 1000 / (speed / 3.6) # minimum travel time for section

    #calculate dealy based of the Akcelik delay function

    Tf = 1.0 # Analysis Flow Period, taken as 1 hour
    Rf = (Tf*3600) / T0 # unitless ratio
    #JA = 0.2
    eightX = (8.0 * JA * X ) / (capacityperlane * Tf)

    Time = T0 * ( 1 + 0.25*Rf*((X-1.0)+(X-1.0)**2 + eightX)**0.5) #give seconds per Km

    # peak hour travel time in seconds
    peakHourTravelTime = (Time * (length / 1000))
```



```

# peak hour speed in m/s
peakHourSpeed = length / peakHourTravelTime
# three hour average speed in m/s
threeHourAveSpeed = peakHourSpeed * phfSpeed
# cap the speed at the section maximum speed
if threeHourAveSpeed > (speed / 3.6):
    threeHourAveSpeed = (speed / 3.6)
# four hour average travel time in seconds
threeHourAveTravelTime = length / threeHourAveSpeed

return (threeHourAveTravelTime / 60)

def distCost(context, section, funcVolume):
    """
    The distance factor adopted from Wellington N2A model
    P:\429\4291565\Technical\300 Technical\320 Models\321 Network Build\N2A_GeneralisedCostDistanceFactor.xlsx

    Assumptions
    Fuel cost                1.75    $/litre
    fuel consumption         9.5     l/100km
    fuel rate                0.16625 $/km
    Assume gc is just fuel cost

    Assumed acg Value of time    16.27    $/hr, 2002 (EEM urban arterial)
    Update factor to 2015        1.44     EEM
    VoT 2015                    23.43    $/hr
    Update factor 2016 estimated 1.01
    VoT 2016 est                23.66    $/hr, 2002 (EEM urban arterial)
    Value of time               2.536    min/$
    gc of fuel                  0.422    mins per km

    Assume 0.4 for Car

    Truck factor was agreed to be 1.0
    """

    # get the length of the section
    length = section.length3D()/1000 # length in km

    # factor for the distance component (unit: mins/km)
    className = str(context.userClass.getName())
    if className[0:3] == "Car":
        distFactor = 0.5
    else:
        distFactor = 1.0

    # get the user defined cost of the section
    roadTypeFactor = section.getUserDefinedCost()

    # calculate the distance cost
    distanceCost = distFactor * roadTypeFactor * length

    return distanceCost

# this function calculates the speed in km/hr of the section
def calculateSpeed(context, section, funcVolume):
    # convert travel time to seconds
    tTime = travelTime(context, section, funcVolume) * 60.0
    # get the section length in metres
    length = section.length3D()
    # calculate and return the speed in km/hr
    return (length / tTime)*3.6

# this function calculates the truck percentage
def calculateTruckPercentage(context, section, funcVolume):
    # get the car volume
    carVolume = (funcVolume.getVolume(model.getCatalog().findByName('Car - ALL', model.getType('GKVehicle')))) +
                funcVolume.getVolume(model.getCatalog().findByName('Car - L - LOV',
model.getType('GKVehicle')))) +
                funcVolume.getVolume(model.getCatalog().findByName('Car - L - HOV',
model.getType('GKVehicle')))) +
                funcVolume.getVolume(model.getCatalog().findByName('Car - M - LOV',
model.getType('GKVehicle')))) +
                funcVolume.getVolume(model.getCatalog().findByName('Car - M - HOV',
model.getType('GKVehicle')))) +
                funcVolume.getVolume(model.getCatalog().findByName('Car - H - LOV',
model.getType('GKVehicle')))) +
                funcVolume.getVolume(model.getCatalog().findByName('Car - H - HOV',
model.getType('GKVehicle'))))
    # get the truck volume
    truckVolume = funcVolume.getVolume(model.getCatalog().findByName('Truck', model.getType('GKVehicle')))

    # error handling for zero volume
    if (carVolume + truckVolume) > 0:
        truckPercentage = (truckVolume / (carVolume + truckVolume)) * 100
    else:
        truckPercentage = 0
    # return the truck percentage
    return truckPercentage

def vdf(context, section, funcVolume):
    # assign the global variables
    checkExperimentContext(context, section)

    # calculate average section speed in km/hr
    speed = calculateSpeed(context, section, funcVolume)

```

```

# calculate the truck percentage on this section
truckPercentage = calculateTruckPercentage(context, section, funcVolume)

# calculate total cost
totalCost = travelTime(context, section, funcVolume) + distCost(context, section, funcVolume)

return totalCost

```

## Volume Delay Function (Connector)

```

def travelTimeConnector(context, connection, funcVolume):

    # work out the time period
    experiment = context.experiment
    scenario = experiment.getScenario()
    trafficDemand = scenario.getDemand()
    duration = trafficDemand.duration()
    durationInHours = duration.toHours()

    #set parameters
    speed = 30.0
    capacity = 200.0 * durationInHours # set to 200 veh/hr, capacity need to be total over three hours
    capacityperlane = 200.0
    JA = 10.0

    volume = funcVolume.getVolume()
    length = connection.length3D()
    totalVolume = volume

    #calculate additional parameters

    X = totalVolume / capacity
    T0 = 1000 / (speed / 3.6) # minimum travel time for section

    #calculate dealy based of the Akcelik delay function

    Tf = 1.0 # Analysis Flow Period, taken as 1 hour
    Rf = (Tf*3600) / T0 # unitless ratio
    #JA = 0.2
    eightX = (8.0 * JA * X) / (capacityperlane * Tf)

    Time = T0 * ( 1 + 0.25*Rf*((X-1.0)+((X-1.0)**2 + eightX)**0.5)) #give seconds per Km

    TotalTravelTime = (Time * (length / 1000))/60

    return TotalTravelTime

def distCostConnector(context, connection, funcVolume):

    """
    The distance factor adopted from Wellington N2A model
    P:\429\4291565\Technical\300 Technical\320 Models\321 Network Build\N2A_GeneralisedCostDistanceFactor.xlsx

    Assumptions
    Fuel cost                                1.75      $/litre
    fuel consumption                          9.5        l/100km
    fuel rate                                 0.16625    $/km
    Assume gc is just fuel cost

    Assumed acg Value of time                16.27      $/hr, 2002 (EEM urban arterial)
    Update factor to 2015                    1.44       EEM
    VoT 2015                                 23.43      $/hr
    Update factor 2016 estimated 1.01
    VoT 2016 est                             23.66      $/hr, 2002 (EEM urban arterial)
    Value of time                            2.536      min/$
    gc of fuel                                0.422      mins per km

    Assume 0.4 for Car

    Truck factor was agreed to be 1.0
    """

    # get the length of the section
    length = connection.length3D()/1000 # length in km

    # factor for the distance component (unit: mins/km)
    className = str(context.userClass.getName())
    dashIndex = className.find("-")
    vehName = className[dashIndex:]
    if vehName == "Car" :
        distFactor = 0.5
    elif vehName == "Truck":
        distFactor = 1.0
    else:
        distFactor = 0.0

    # calculate the distance cost
    distanceCost = distFactor * length

    return distanceCost

def vdf(context, connection, funcVolume):

```

```

# calculate total cost
totalCost = travelTimeConnector(context, connection, funcVolume) + distCostConnector(context, connection, funcVolume)

return totalCost

```

## Junction Delay Function

```

def travelTime( context, turn, volume, ownVolume, conflictVolume ):
    model = context.experiment.getModel()
    # work out the time period
    experiment = context.experiment
    scenario = experiment.getScenario()
    trafficDemand = scenario.getDemand()
    duration = trafficDemand.duration()
    durationInHours = duration.toHours()

    #define the peak hour factor based on peak
    # get the experiment
    experiment = context.experiment
    # get the scenario
    scenario = experiment.getScenario()
    # get the traffic demand
    trafficDemand = scenario.getDemand()
    # get the start time of the demand
    startTime = trafficDemand.initialTime()
    # assign peak hour factor based on peak
    # use 1.0 to start adjust as required during calibration - base on observed data
    phfVol = 1.0

    if startTime.hour() == 6:
        phfVol = 1.15
    elif startTime.hour() == 11:
        phfVol = 1.02
    elif startTime.hour() == 15:
        phfVol = 1.05

    # assign travel time factor to reduce peak hour travel time to three hour average travel time
    phfTT = 1.0
    """
    if startTime.hour() == 6:
        phfTT = 0.6946
    elif startTime.hour() == 11:
        phfTT = 0.8726
    elif startTime.hour() == 15:
        phfTT = 0.7902
    """

    turnType = model.getType('GKTurning')
    userSlopeColumn = turnType.getColumnByExternalName("Turn Capacity Slope'0)

    #set give-way linear parameters and calculate give-way turn capacity
    Slope = turn.getDataValueDouble(userSlopeColumn)
    Intercept = turn.getCapacity ()
    OpposingFlow = (conflictVolume.getVolume() * phfVol) / durationInHours # AIMSUN return total volume over the time period

    overrides = experiment.getNetworkAttributesOverrides()
    targetId = turn.getId()
    for override in overrides:
        objects = override.getObjects()
        for object in objects:
            if object.getId() == targetId:
                for column, value in override.getObjectData(object).iteritems():
                    if column.getName() == 'GKTurning::capacityAtt':
                        Intercept = int(value)

    Capacity = (Intercept - Slope * OpposingFlow) # per hour

```

```

#calculate dealy based of the Akcelik dealy function
turnFlow = volume.getVolume()
if Capacity < 50:
    if Intercept < 50:
        Capacity = Intercept
    else:
        Capacity = 50

X = (turnFlow * phfVol) / (Capacity * durationInHours)
TurnLength = turn.length3D()
TurnSpeed = turn.getSpeed()
T0 = 1
Tf = 1.0
Rf = (Tf*3600) / T0
JA = 1.0 # Curve Parameter
eightX = 8.0 * JA * X / (Capacity * Tf)

Time = (T0 * ( 1 + 0.25*Rf*((X-1.0)+((X-1.0)**2 + eightX)**0.5)))/60

return Time * phfTT

def jdf( context, turn, volume, ownVolume, conflictVolume ):

    TT = travelTime( context, turn, volume, ownVolume, conflictVolume )

    #debugging
    #print 'JDF of turn %i with volume of %f and opposing volume of %f calculated the travel time at %f % (turn.getId(), volume.getVolume(),
conflictVolume.getVolume(), TT)

    return TT

```

## Turn Delay Function

```

'''
Updated 04/05/2017
From built-in Aimsun 8.2 TPF - Example for Signalized Intersection

Updated 01/08/2017
Refined turn saturation flow to be a function of turn speed
'''

experimentId = None
analysisPeriod = 0.0 # [h]
phfVol = 1.0
phfTT = 1.0

def initialiseContext(context):
    global experimentId
    global analysisPeriod
    global phfVol
    global phfTT
    if context.experiment.getId() != experimentId:
        experimentId = context.experiment.getId()
        analysisPeriod = context.experiment.getScenario().getDemand().duration().toHours()
    #define the peak hour factor based on peak
    # get the experiment
    experiment = context.experiment
    # get the scenario
    scenario = experiment.getScenario()
    # get the traffic demand
    trafficDemand = scenario.getDemand()
    # get the start time of the demand
    startTime = trafficDemand.initialTime()
    # assign peak hour factor based on peak
    phfVol = 1

    if startTime.hour() == 6:
        phfVol = 1.15
    elif startTime.hour() == 10:

```

```

        phfVol = 1.02
    elif startTime.hour() == 15:
        phfVol = 1.05

    # assign travel time factor to reduce peak hour travel time to four hour average travel time
    phfTT = 1
    """
    if startTime.hour() == 6:
        phfTT = 0.6946
    elif startTime.hour() == 10:
        phfTT = 0.8726
    elif startTime.hour() == 15:
        phfTT = 0.7902
    """

# free flow travel time [min]
def freeFlowTravelTime(turn):
    return turn.length3D()/1000.0 * 60.0/turn.getSpeed()

# actual green duration for actuated phases [s]
# calculated considering the demand and the queue discharge rate
def actualGreen(turn, volume):
    dischargeRate = 0.5 # [veh/s]
    requiredGreen = volume / dischargeRate # [s]
    numberOfCycles = 3600.0 * analysisPeriod / turn.getCycle()
    return min(max(requiredGreen / numberOfCycles, turn.getMinGreenTime()), turn.getMaxGreenTime())

# HCM2010 progression adjustment factor
def progressionAdjustmentFactor(green, cycle):
    g_over_c = green / cycle
    P = min(1.33 * g_over_c, 1.0)
    top_part = (1.0 - P)
    bottom_part = 1.0 - g_over_c
    return top_part / bottom_part

# HCM2010 uniform control delay (quick estimation method) [s]
def uniformControlDelay(volume, capacity, green, cycle):
    g_over_c = green / cycle
    X = (volume * phfVol) / (capacity * analysisPeriod)
    top_part = 0.5 * cycle * (1.0 - g_over_c)**2
    bottom_part = 1.0 - (min(1.0, X) * g_over_c)
    return top_part / bottom_part

# HCM2010 incremental delay (quick estimation method) [s]
def incrementalDelay(volume, capacity):
    X = (volume * phfVol) / (capacity * analysisPeriod)
    return 900.0 * analysisPeriod * ((X - 1.0) + ((X - 1.0)**2 + (4.0 * X / (capacity * analysisPeriod)))**0.5)

# HCM2010 control delay (quick estimation method) [min]
def controlDelay(volume, capacity, green, cycle):
    pf = progressionAdjustmentFactor(green, cycle)
    d_one = uniformControlDelay(volume, capacity, green, cycle)
    d_two = incrementalDelay(volume, capacity)
    res = (pf * d_one) + d_two
    return res / 60.0 * phfTT

def calculateCapacity(turn):
    # get the speed of the turn
    speed = turn.getSpeed()
    # if the speed is less than 50 km/hr
    if speed < 50:
        # calculate saturation flow based on speed
        s = -0.513*speed**2 + 54.81*speed + 553.46
    # else
    else:
        # saturation flow (PCUs/hr)
        s = 2000.0
    # get the turn object as coded (GKTurn)
    turnObject = turn.getMaster()

```

```

# get the index of the left most lane for this turn
leftMostLanes = turnObject.getOriginFromLane()
# get the index of the right most lane for this turn
rightMostLanes = turnObject.getOriginToLane()
# calculate number of lanes
lanes = rightMostLanes - leftMostLanes + 1
# the capacity is saturation flow * lanes * green / cycle
capacity = s * lanes * (turn.getGreenTime() / turn.getCycle())

return capacity

def tpf(context, turn, volume):
    initialiseContext(context)
    res = freeFlowTravelTime(turn)
    if turn.getCycle() > 0.0:
        green = turn.getGreenTime()
        if turn.getControlJunctionType() == 4: # actuated
            green = actualGreen(turn, volume.getVolume())
        # error handling for 0 green time in control plan for this turn
        if green > 0:
            if green < turn.getCycle():
                res += controlDelay(volume.getVolume(), calculateCapacity(turn), green, turn.getCycle())
            else:
                print 'turn %u in node %u has no green time in the control plan used' % (turn.getMaster().getld(), turn.getMaster().getNode().getld())
    return res

```

Appendix H

---

## **Count Validation Tables**











Appendix I

---

## **Travel Time Validation Tables**

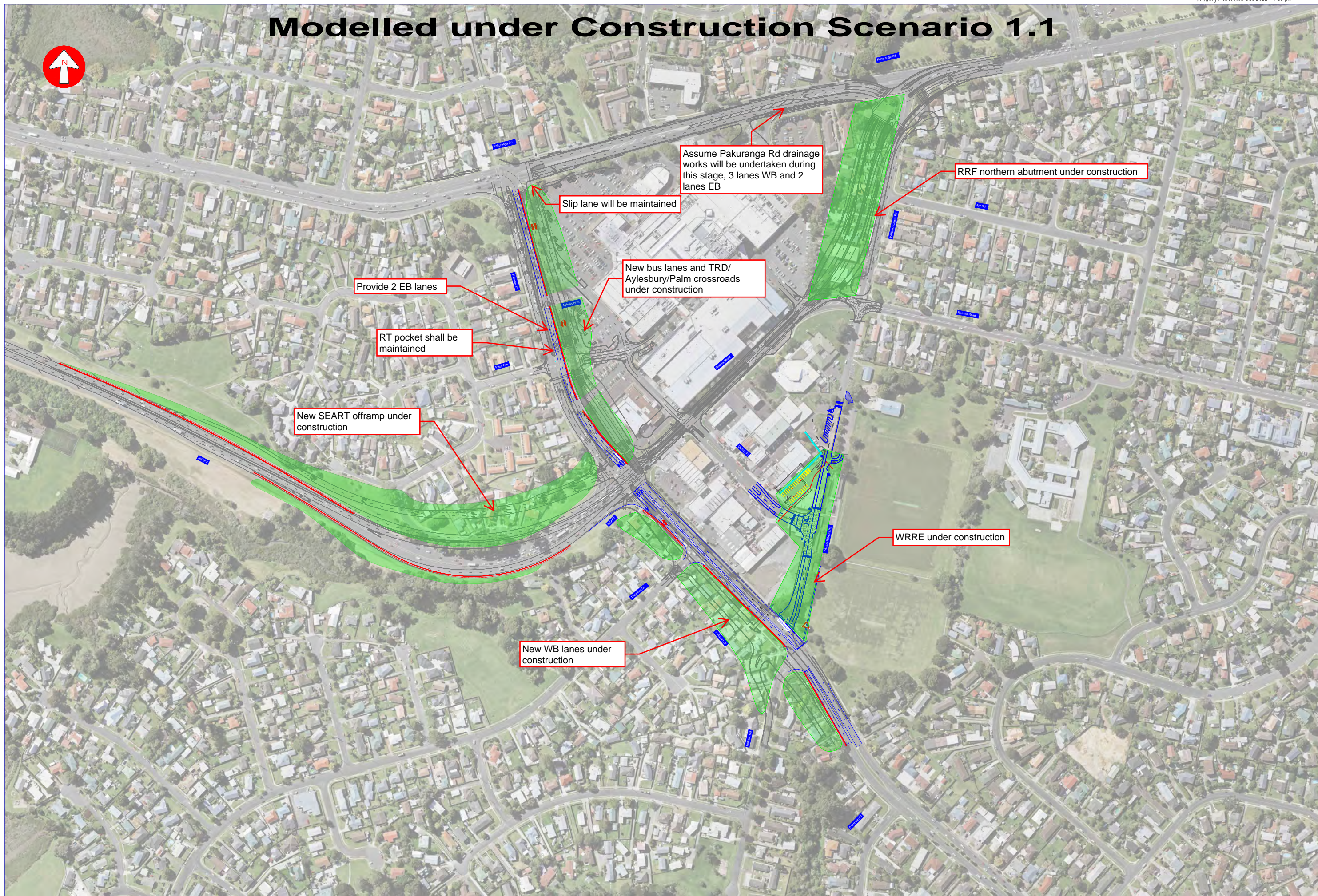




# Appendix K

## EB2 – Indicative Construction Staging Diagrams

# Modelled under Construction Scenario 1.1



Stage-1

Design	
Drawn	
Dsg Verifier	
Dwg Check	
Original Scale (A3)	

Title

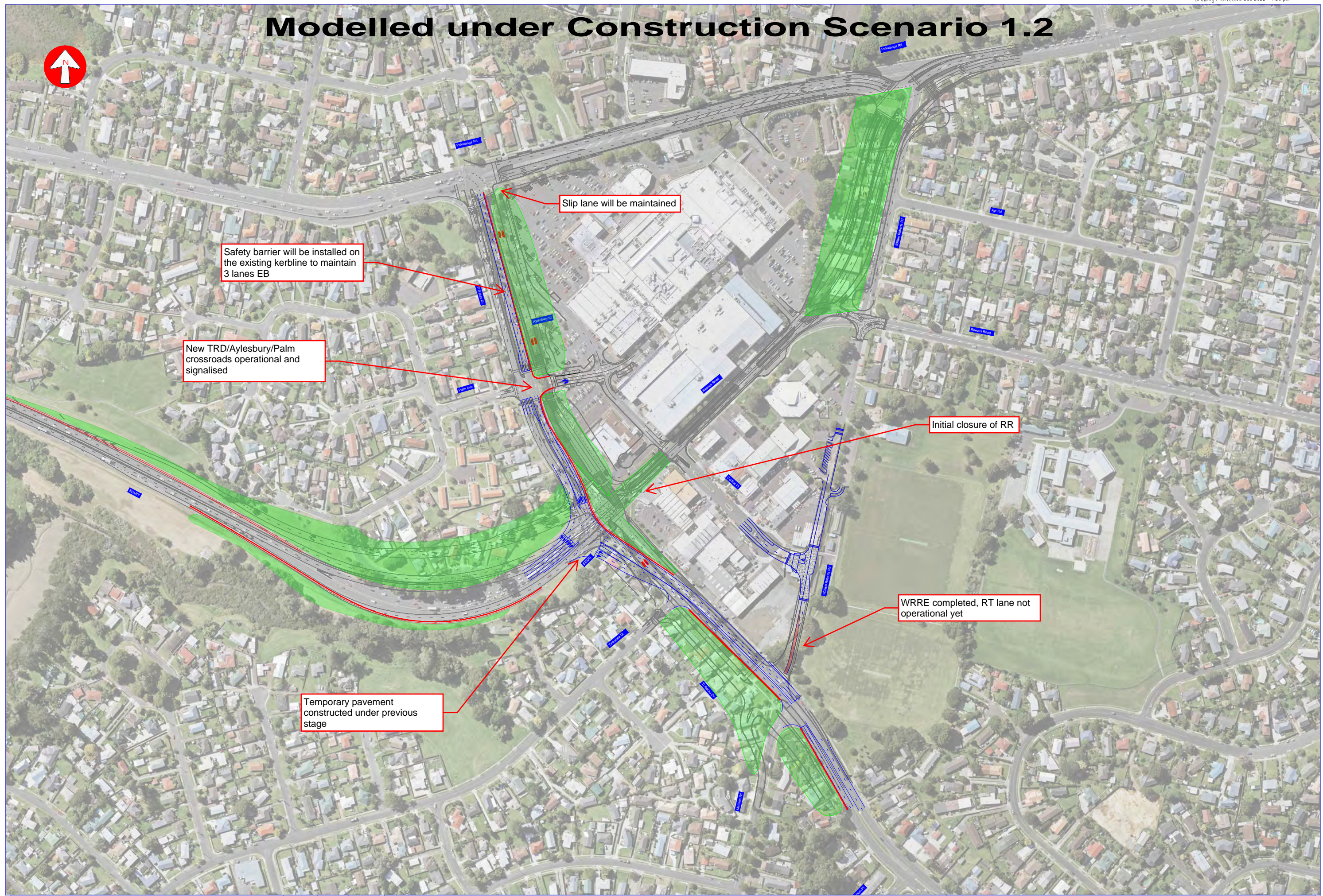
Discipline

Drawing No

Rev



# Modelled under Construction Scenario 1.2



Stage-2

Design	
Drawn	
Dsg Verifier	
Dwg Check	
Original Scale (A3)	

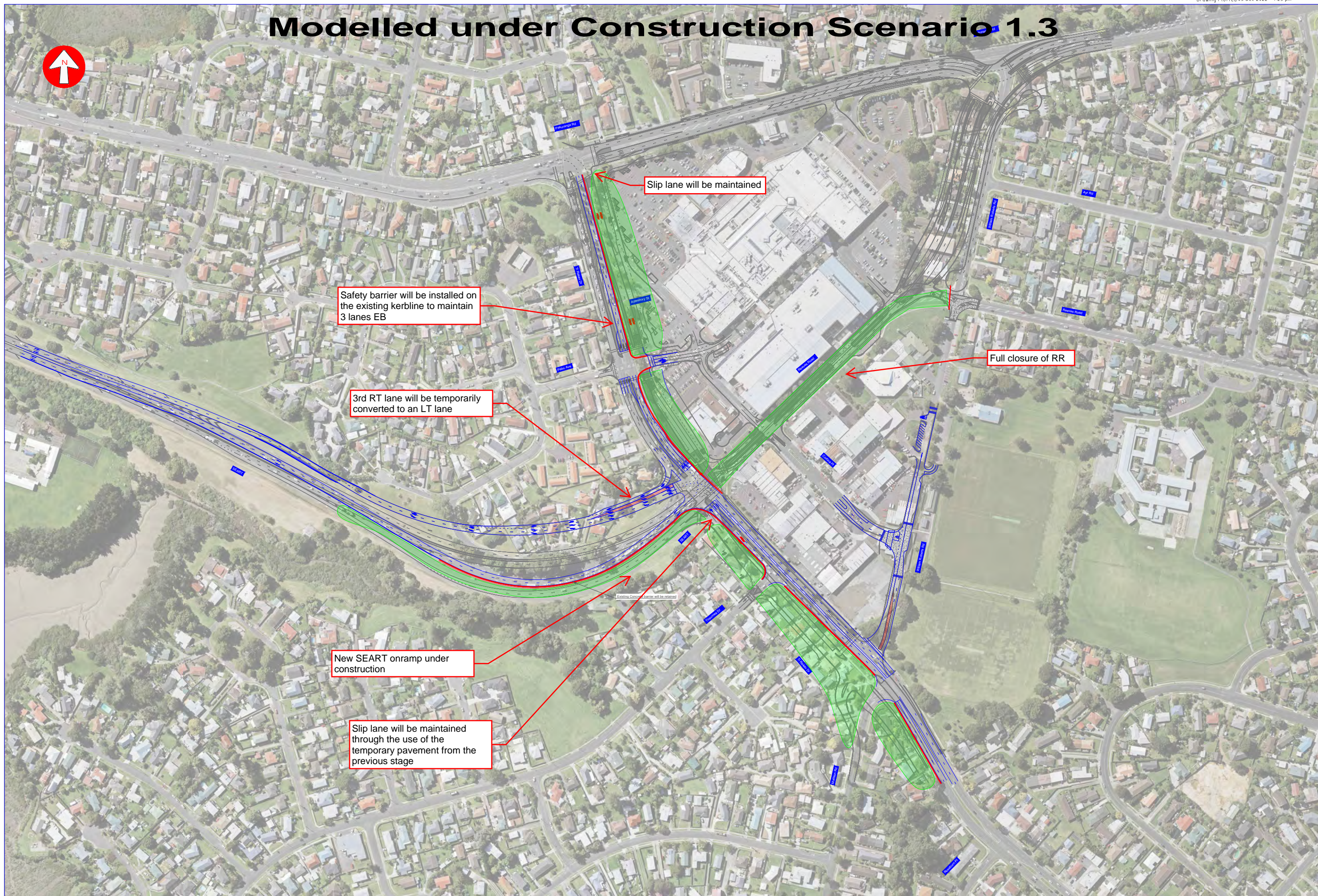
Title

Discipline

Drawing No

Rev

# Modelled under Construction Scenario 1.3



Slip lane will be maintained

Safety barrier will be installed on the existing kerbline to maintain 3 lanes EB

3rd RT lane will be temporarily converted to an LT lane

Full closure of RR

Existing Concrete barrier will be retained

New SEART onramp under construction

Slip lane will be maintained through the use of the temporary pavement from the previous stage

Stage-3

Design		
Drawn		
Dsg Verifier		
Dwg Check		
Original Scale (A3)		

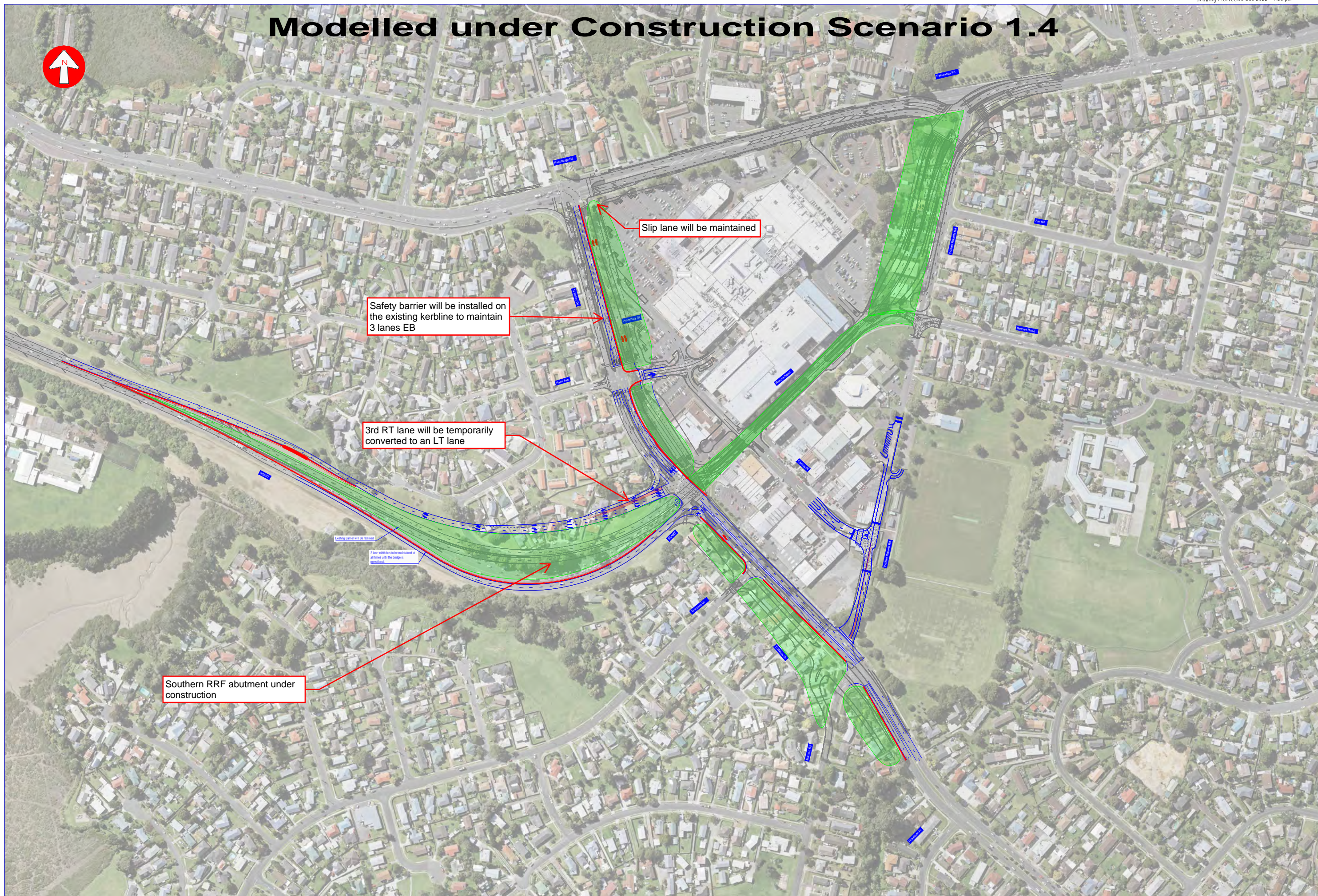
Title

Discipline

Drawing No

Rev

# Modelled under Construction Scenario 1.4



Stage-4

Design		
Drawn		
Dsg Verifier		
Dwg Check		
Original Scale (A3)		

Title

Discipline

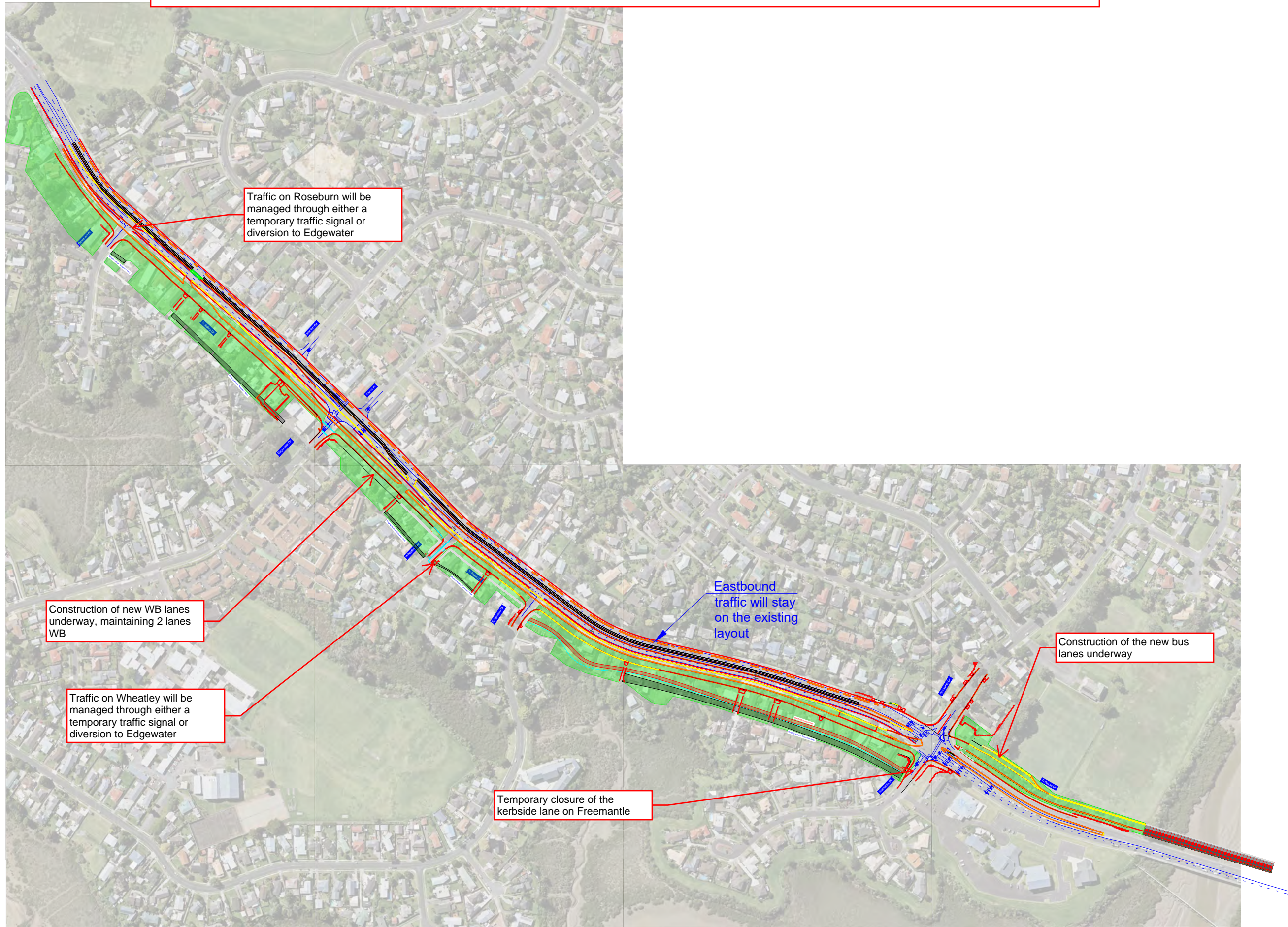
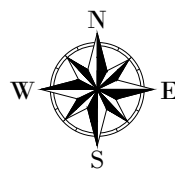
Drawing No

Rev

# Appendix L

## EB3R – Indicative Construction Staging Diagrams

# Modelled under Construction Scenario 1.1



Construction of new WB lanes underway, maintaining 2 lanes WB

Traffic on Wheatley will be managed through either a temporary traffic signal or diversion to Edgewater

Traffic on Roseburn will be managed through either a temporary traffic signal or diversion to Edgewater

Temporary closure of the kerbside lane on Freemantle

Eastbound traffic will stay on the existing layout

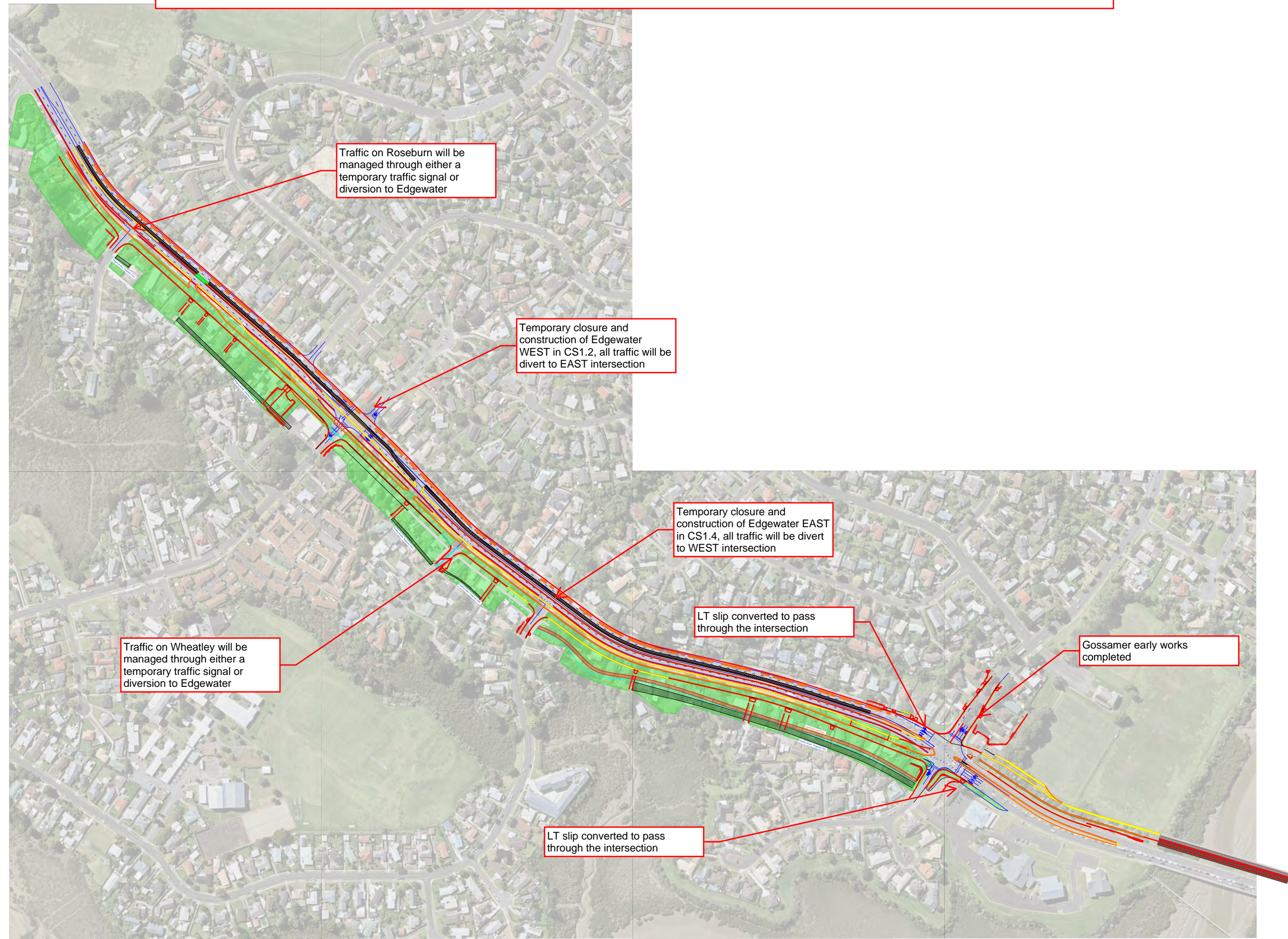
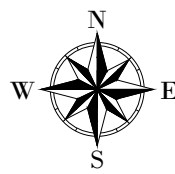
Construction of the new bus lanes underway

Design	PN	#####
Drawn	##	#####
Dsg Verifier	###	#####
Dwg Check	###	#####
Original Scale (A3)		

Title	TRW-3
	Page 1 of 6

Discipline	Traffic
Drawing No	EB3R Staging
Rev	#

# Modelled under Construction Scenario 1.2, 1.3 and 1.4



\\A:\MapCAD\Bentley\MS CAD\USER\NBA Logg Rev 2.dwg

Design	PN	#####
Drawn	##	#####
Dsg Verifier	###	#####
Dwg Check	###	#####
Original Scale (A3)		#####

Title TRW-33  
Page 4 of 6

Discipline	Traffic	
Drawing No	EB3R Staging	Rev #

DO NOT SCALE

# IN DOUBT ASK

Document No: EB3R-STAGING REV02.DWG

# Appendix M

## Construction Scenario 1.2 – Phasing Diagrams

# PHASING SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

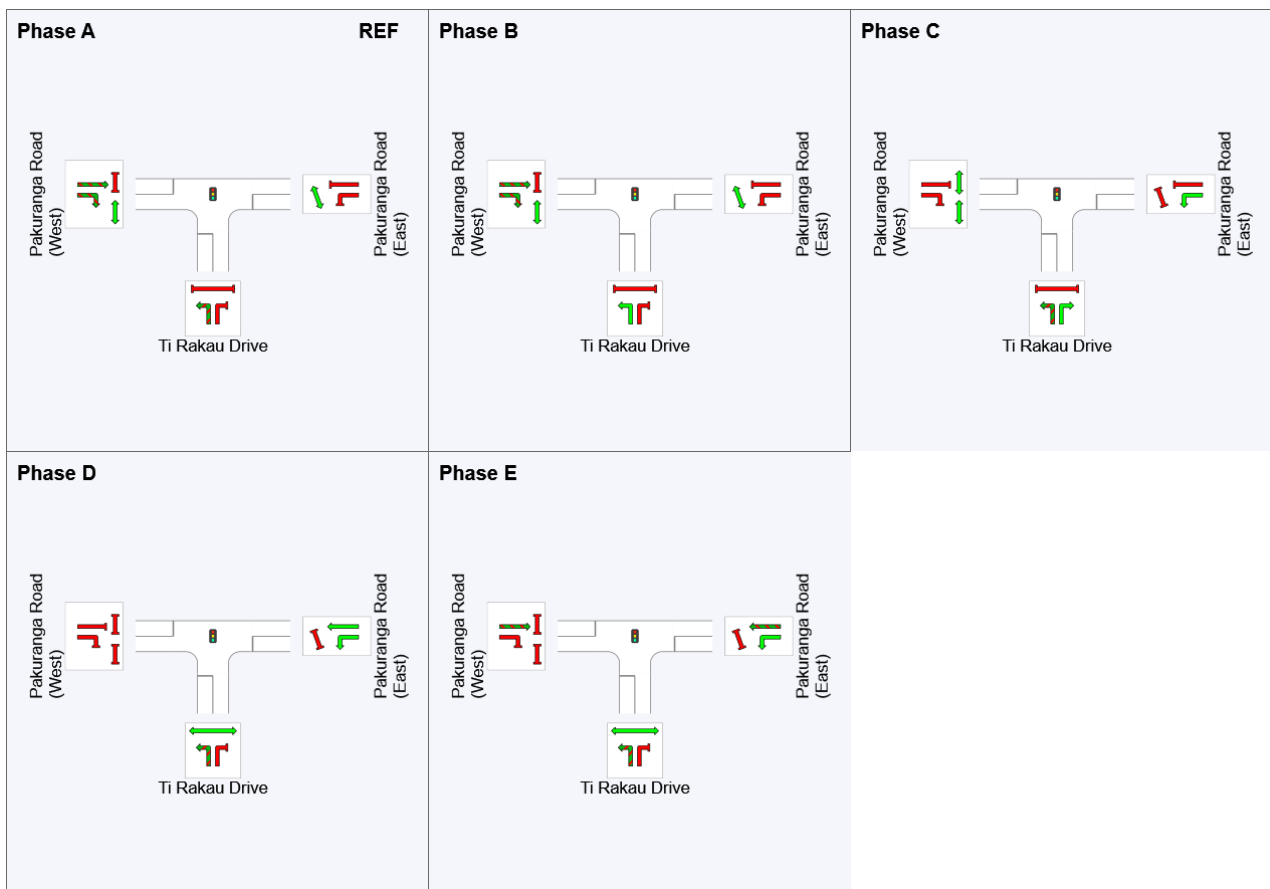
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	13	25	47	59
Green Time (sec)	7	6	16	6	19
Phase Time (sec)	13	12	22	12	25
Phase Split	15%	14%	26%	14%	30%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.













## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Convert Function Default

Reference Phase: Phase B

Input Phase Sequence: A, B, C

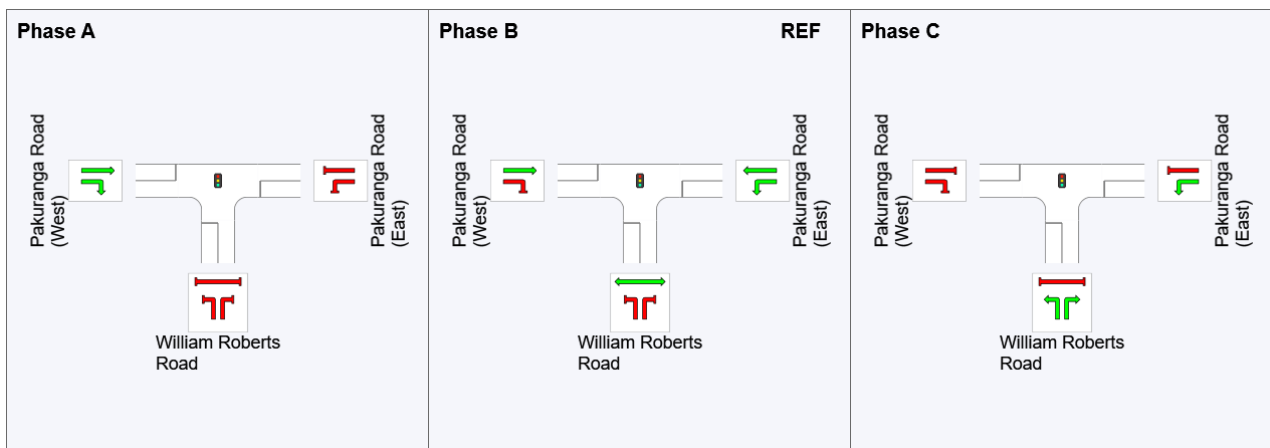
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	49	0	32
Green Time (sec)	6	26	11
Phase Time (sec)	12	32	17
Phase Split	20%	52%	28%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 88 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

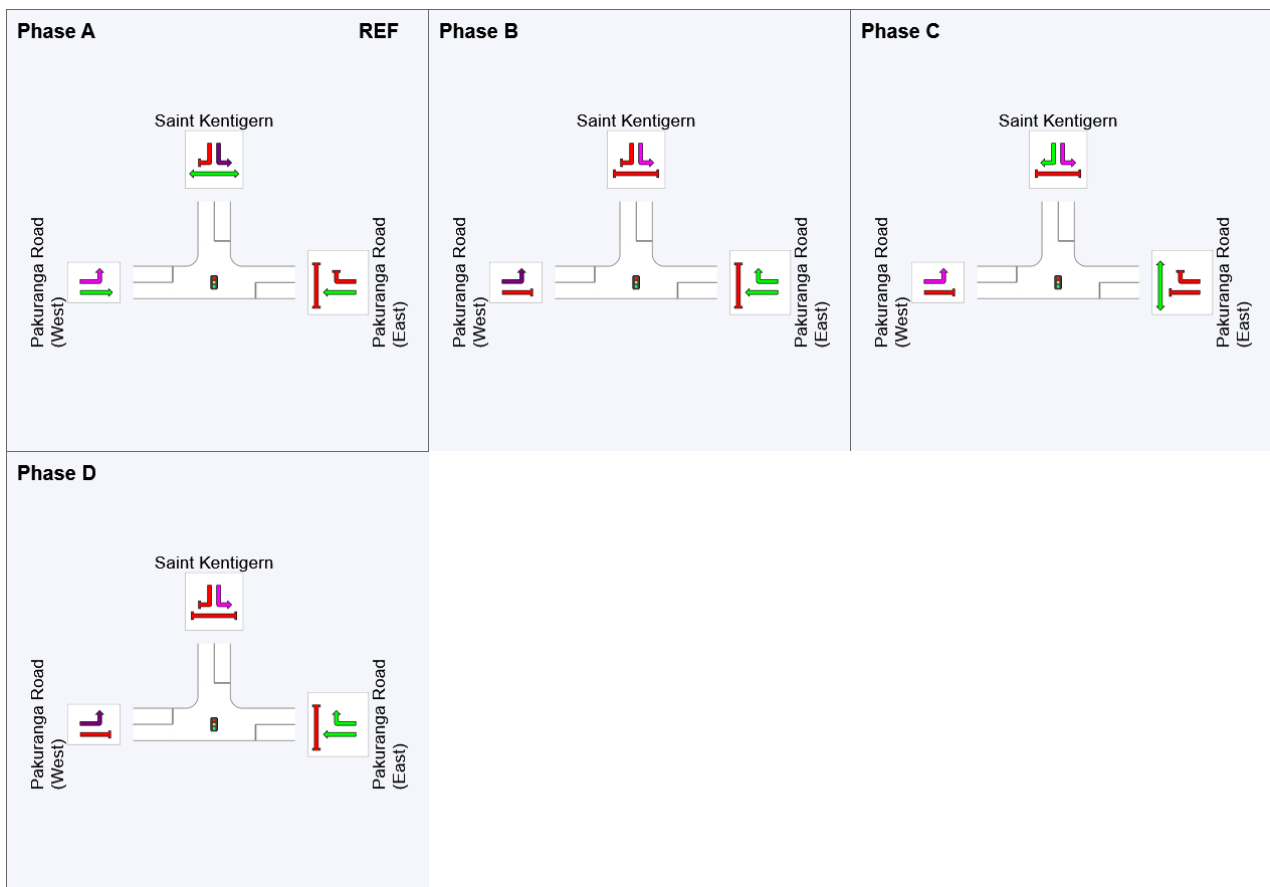
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	36	48	76
Green Time (sec)	30	6	22	6
Phase Time (sec)	36	12	28	12
Phase Split	41%	14%	32%	14%












See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:34:48 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 AM-V1.sip9

# PHASING SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 80 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Green Split Priority has been specified

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

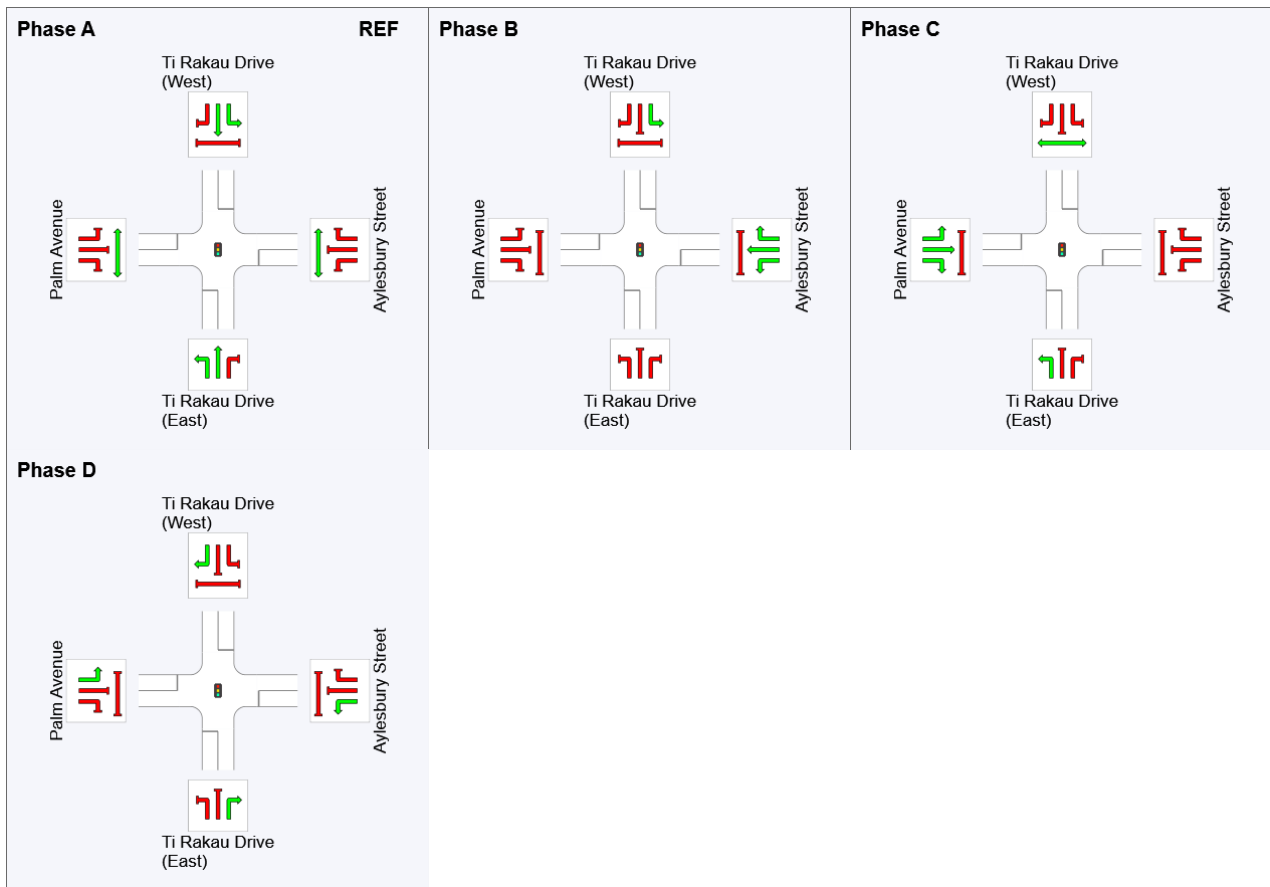
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	28	40	68
Green Time (sec)	22	6	22	6
Phase Time (sec)	28	12	28	12
Phase Split	35%	15%	35%	15%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

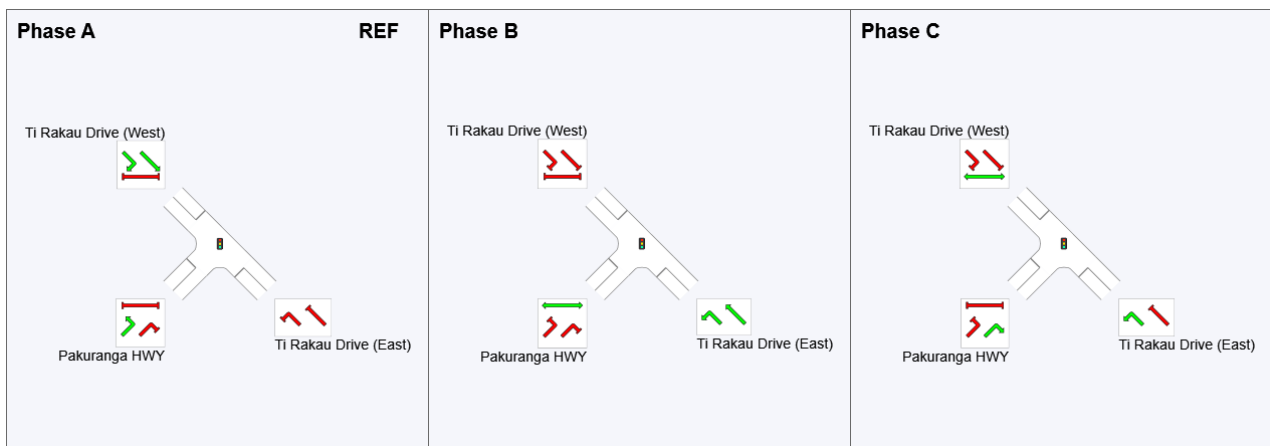
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	25	44
Green Time (sec)	19	13	11
Phase Time (sec)	25	19	17
Phase Split	41%	31%	28%

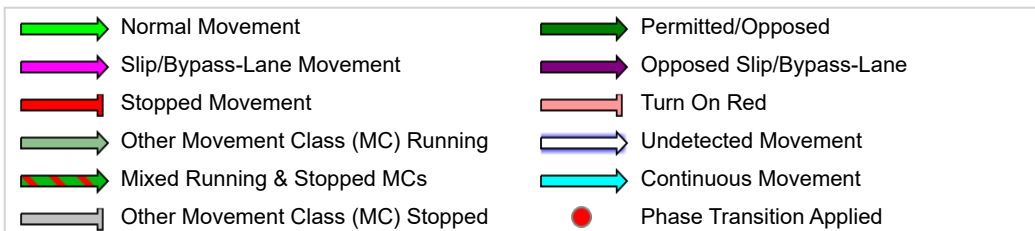
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

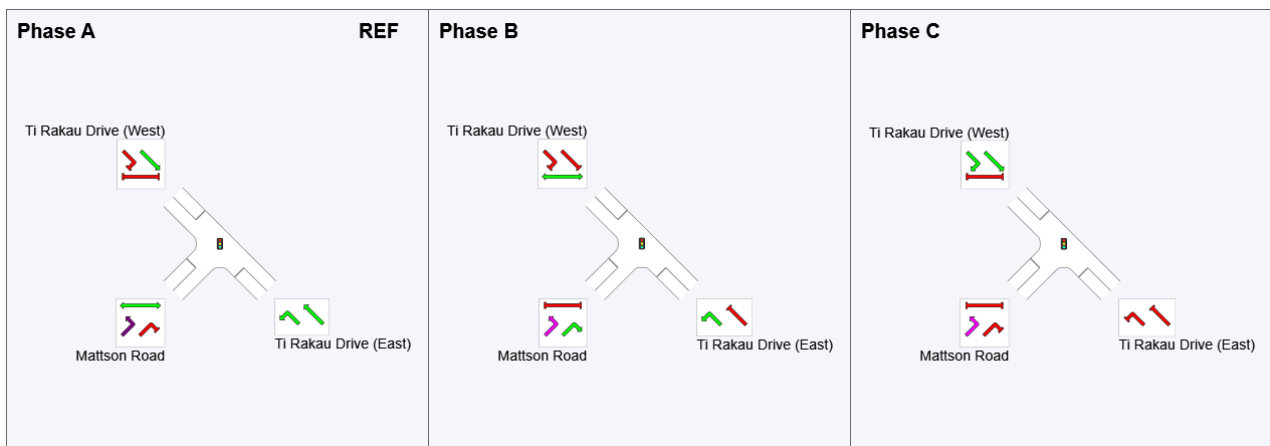
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	50	68
Green Time (sec)	44	12	6
Phase Time (sec)	50	18	12
Phase Split	63%	23%	15%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C

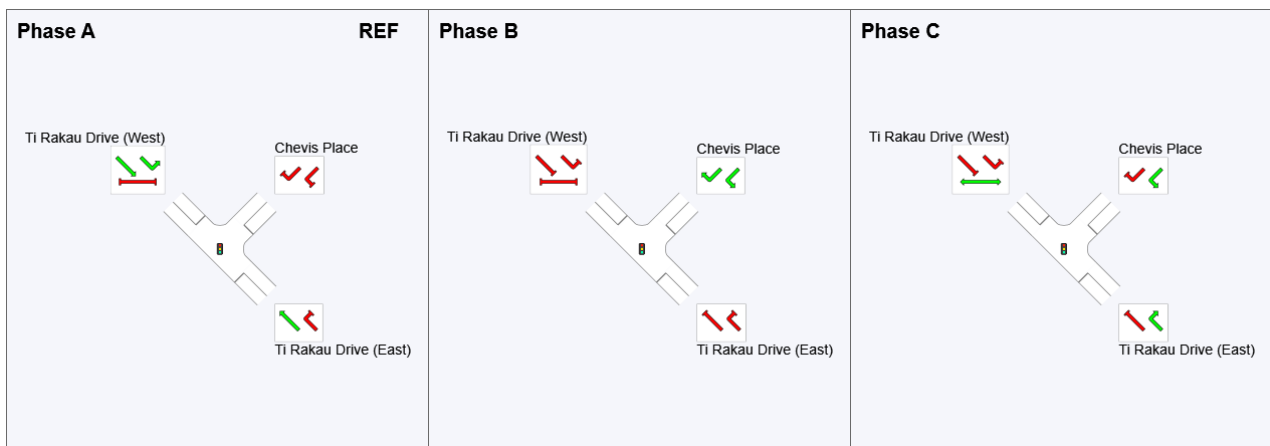
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	42	54
Green Time (sec)	36	6	10
Phase Time (sec)	42	12	16
Phase Split	60%	17%	23%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

**Site:** 12.0v [12.0 Edgewater Dr (East) / Ti Rakau Dr - Conversion (Site Folder: General)]

**Network:** N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 67 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Convert Function Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

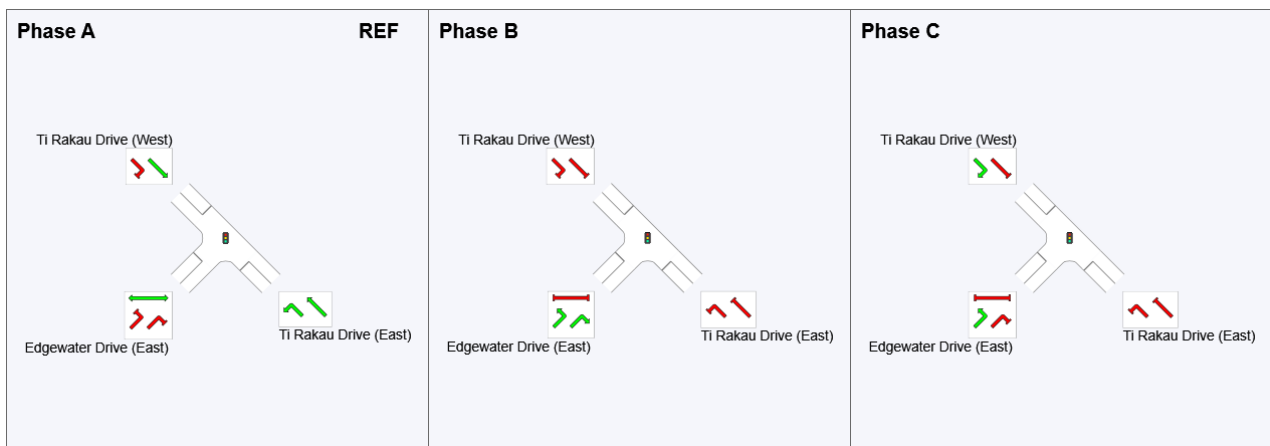
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	43	55
Green Time (sec)	37	6	6
Phase Time (sec)	43	12	12
Phase Split	64%	18%	18%

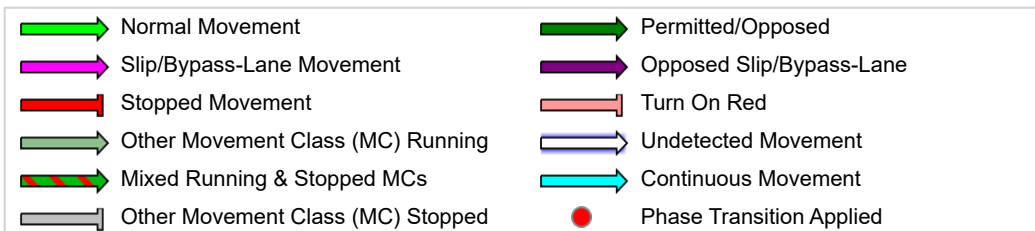
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 160 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

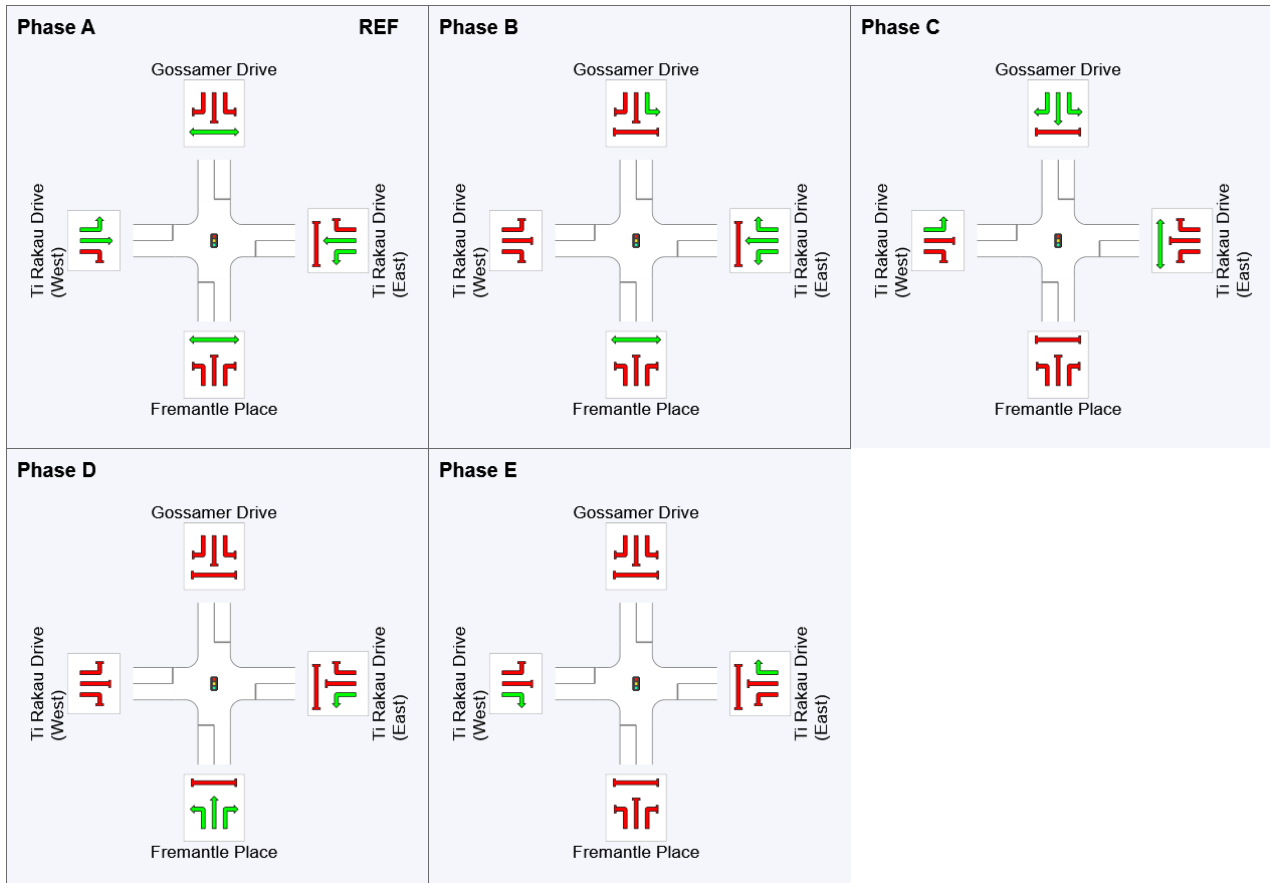
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	58	72	117	129
Green Time (sec)	52	8	39	6	25
Phase Time (sec)	58	14	45	12	31
Phase Split	36%	9%	28%	8%	19%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 77 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

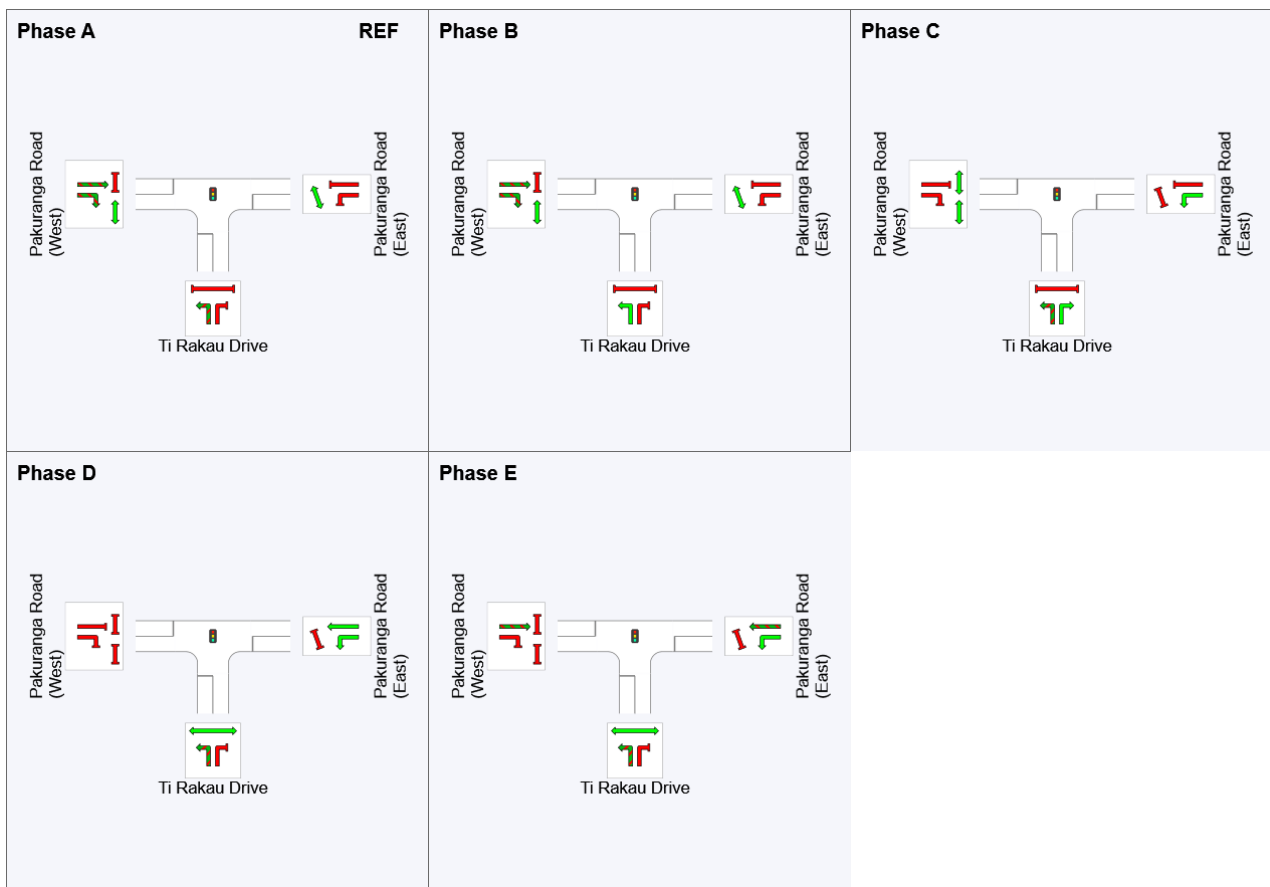
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	17	29	53	65
Green Time (sec)	11	6	18	6	6
Phase Time (sec)	17	12	24	12	12
Phase Split	22%	16%	31%	16%	16%









See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:23:42 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 PM -V1.sip9

# TIME - DISTANCE DIAGRAM

Time – Distance Diagram for the Selected Route

Movement Class: Light Vehicles

➡ Route: R101 [Route1]

■ Network: N101 [PM (Network Folder: General)]

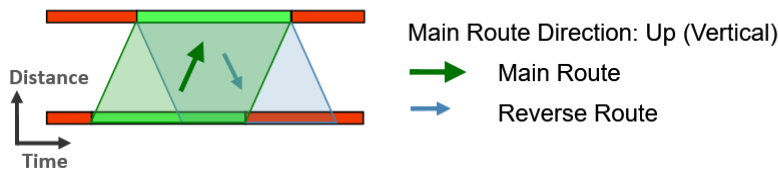
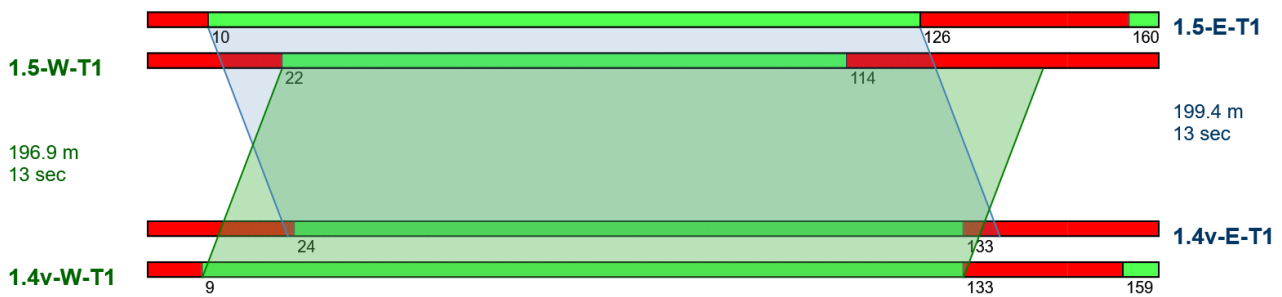
New Route

Network Category: (None)

Network Cycle Time = 150 seconds (Network User-Given Cycle Time)

Signal Offsets option used: User

## Interactive Offsets



# PHASING SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Timings based on settings in the Network Timing dialog

Phase Times specified by the user

Phase Sequence: Convert Function Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

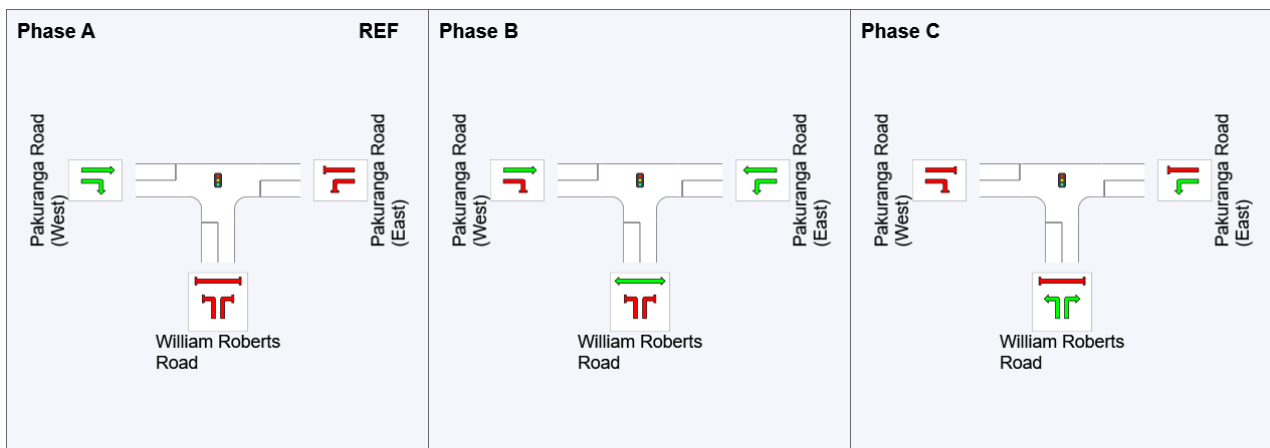
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	15	130
Green Time (sec)	9	109	14
Phase Time (sec)	15	115	20
Phase Split	10%	77%	13%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: Network: N101 [PM (Network General) Folder: General])

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

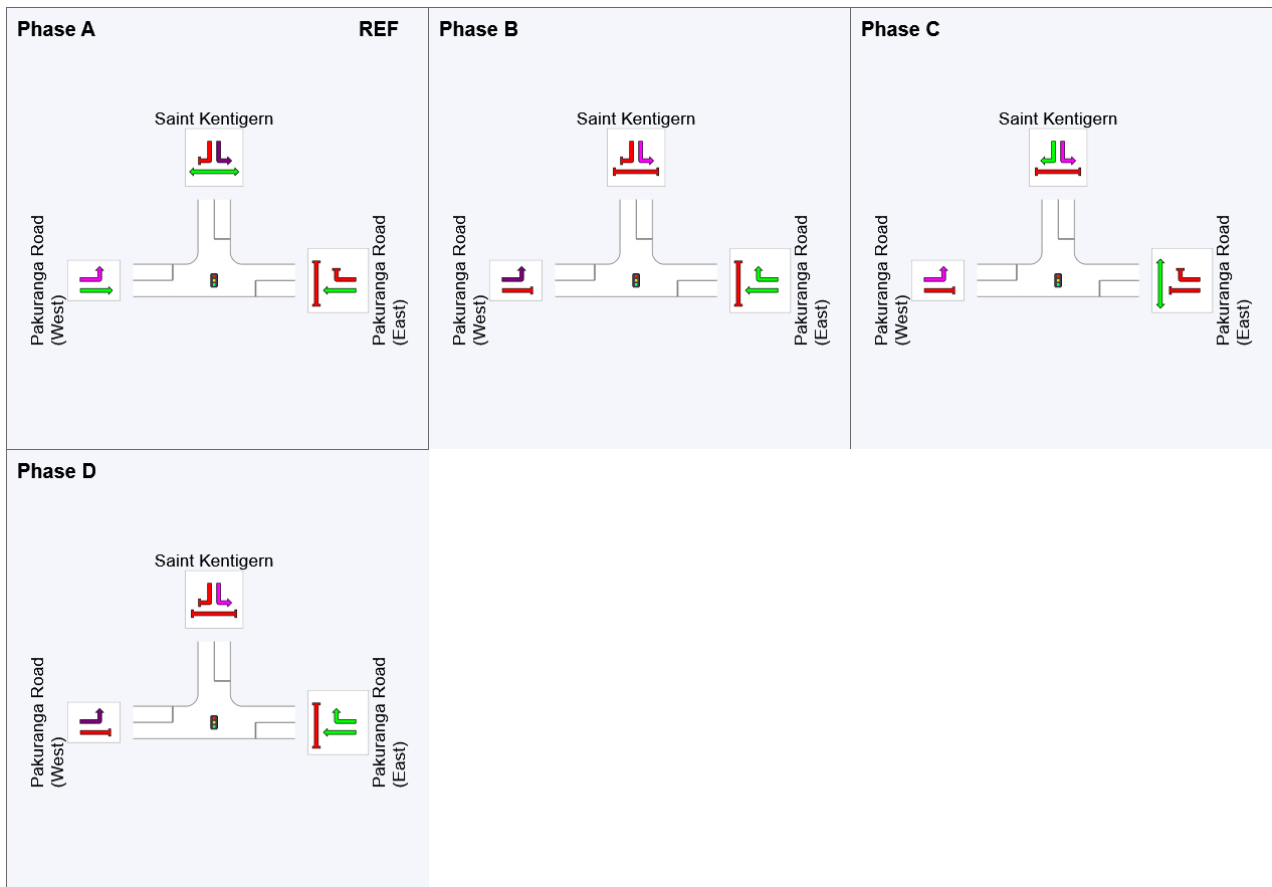
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	13	111	123	1
Green Time (sec)	92	6	22	6
Phase Time (sec)	98	12	28	12
Phase Split	65%	8%	19%	8%











See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:23:42 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 PM -V1.sip9

# PHASING SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

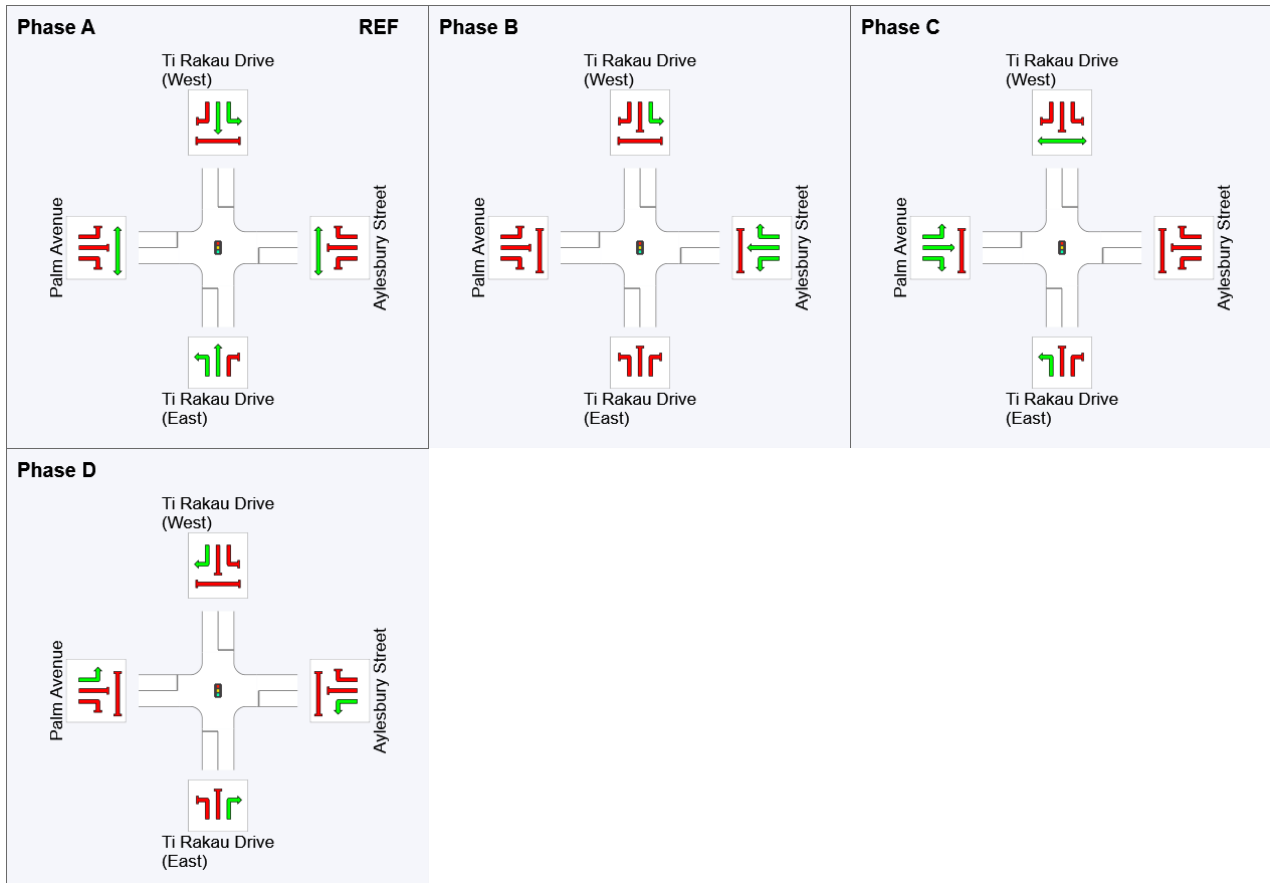
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	103	115	133
Green Time (sec)	97	6	12	14
Phase Time (sec)	103	12	15	20
Phase Split	69%	8%	10%	13%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

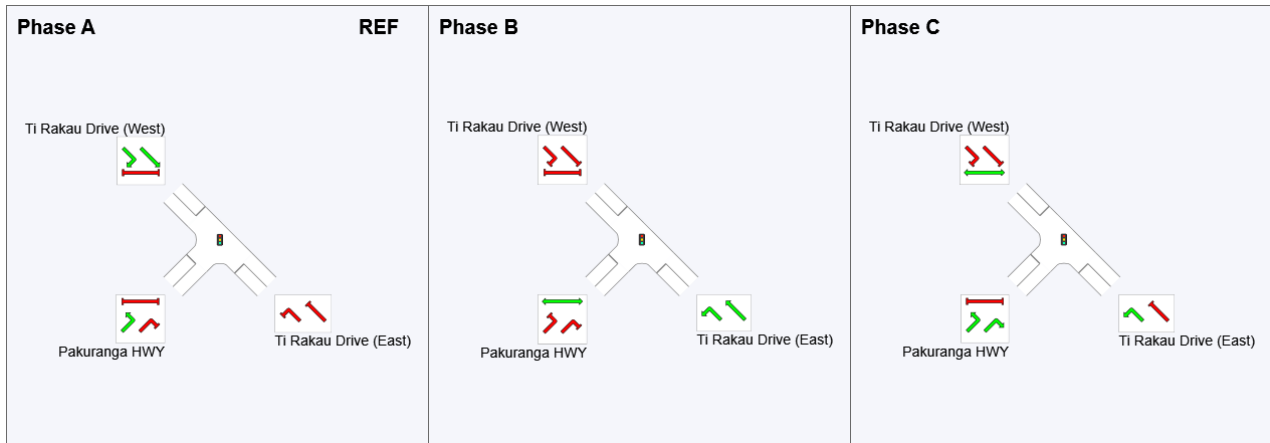
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	45	108
Green Time (sec)	39	57	36
Phase Time (sec)	45	63	42
Phase Split	30%	42%	28%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 69 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

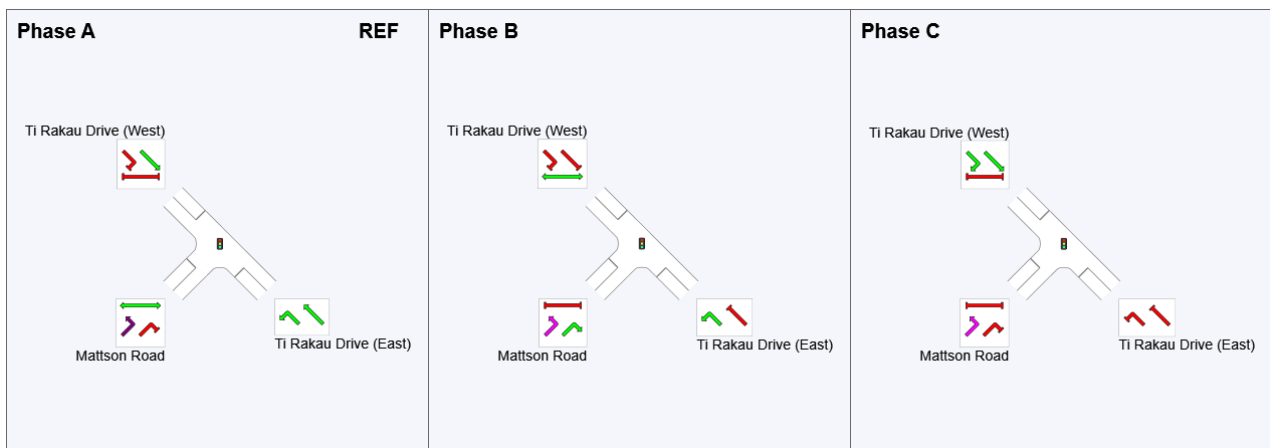
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	41	57
Green Time (sec)	35	10	6
Phase Time (sec)	41	16	12
Phase Split	59%	23%	17%

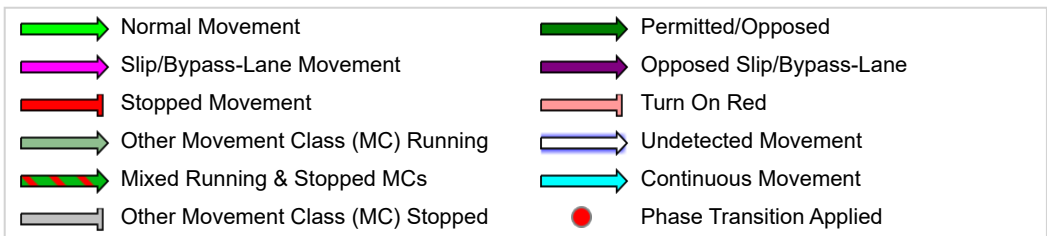
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 64 seconds (Site Practical Cycle Time)

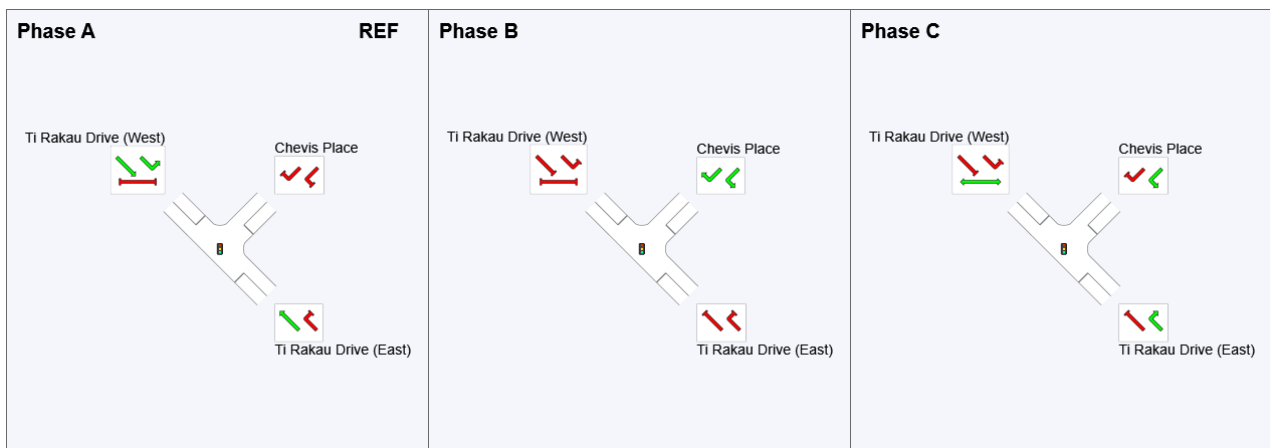
Timings based on settings in the Site Phasing & Timing dialog  
 Phase Times determined by the program  
 Downstream lane blockage effects included in determining phase times  
 Phase Sequence: Variable Phasing  
 Reference Phase: Phase A  
 Input Phase Sequence: A, B, C  
 Output Phase Sequence: A, B, C

## Phase Timing Summary

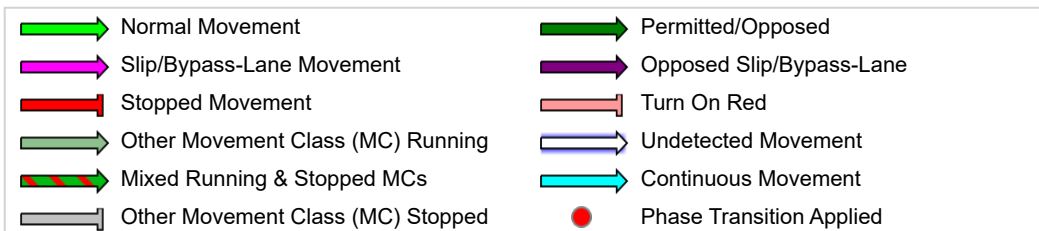
Phase	A	B	C
Phase Change Time (sec)	0	37	49
Green Time (sec)	31	6	9
Phase Time (sec)	37	12	15
Phase Split	58%	19%	23%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase  
 VAR: Variable Phase



# PHASING SUMMARY

Site: 12.0v [12.0 Edgewater Dr (East) / Ti Rakau Dr - Conversion (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 67 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Convert Function Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

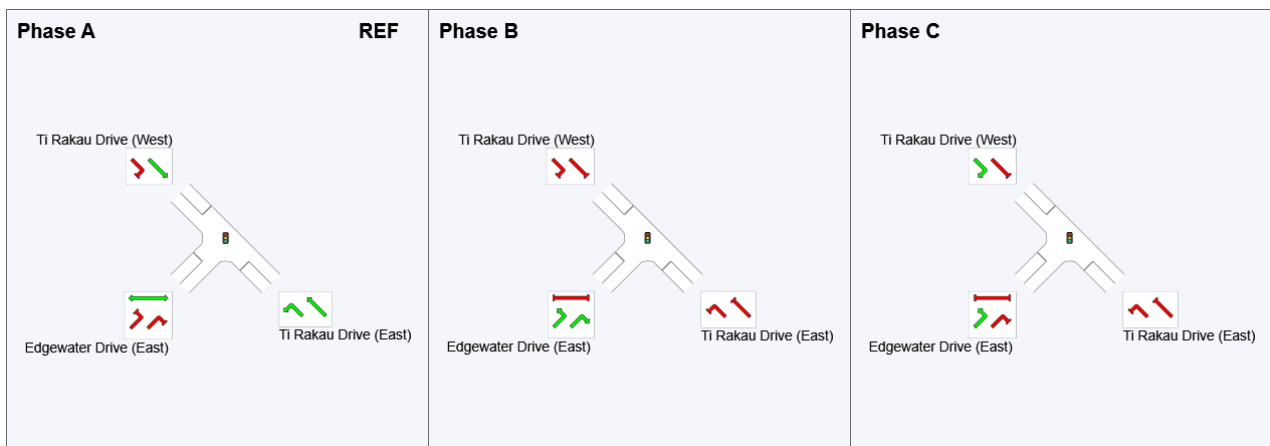
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	43	55
Green Time (sec)	37	6	6
Phase Time (sec)	43	12	12
Phase Split	64%	18%	18%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

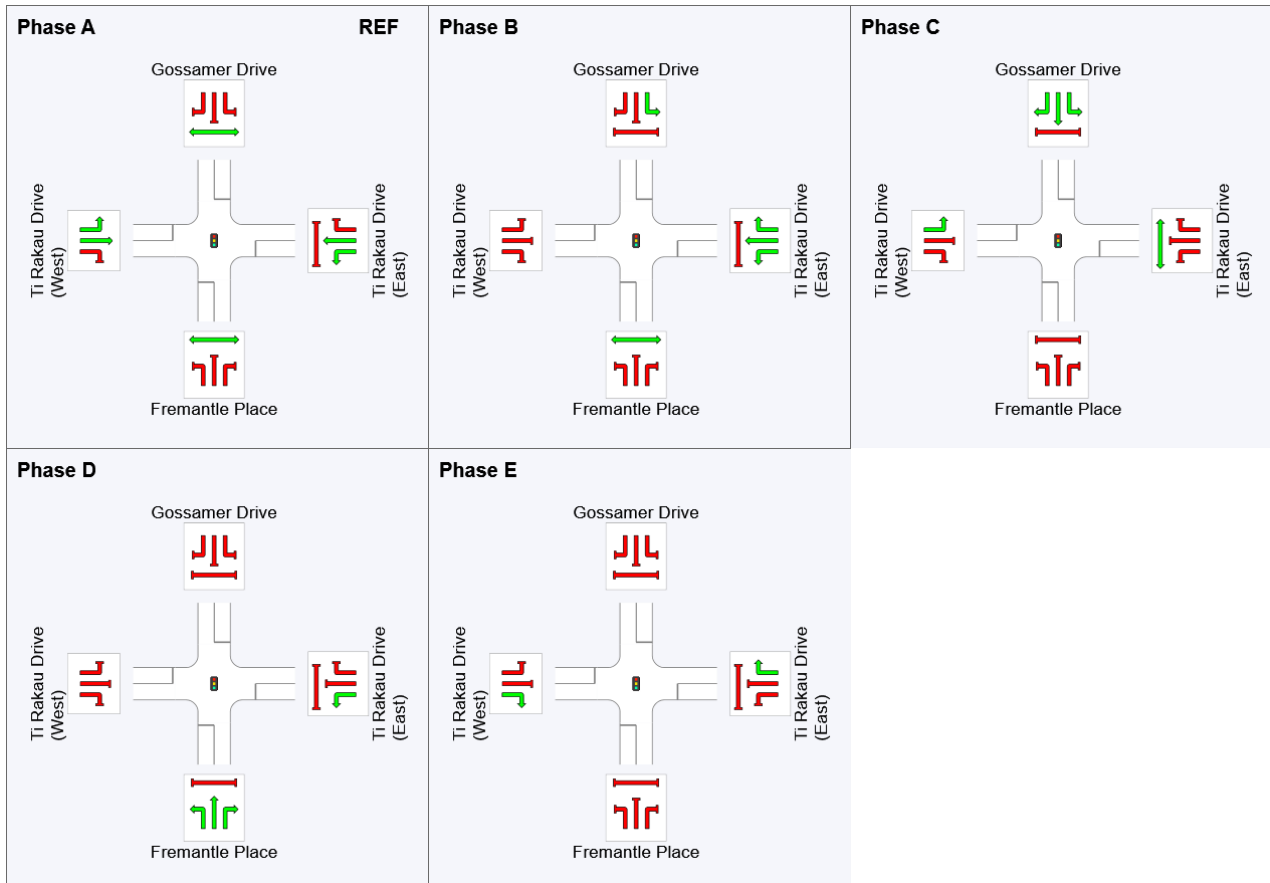
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	55	79	105	118
Green Time (sec)	49	18	20	8	26
Phase Time (sec)	55	24	25	14	32
Phase Split	37%	16%	17%	9%	21%











See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:23:42 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 PM -V1.sip9

# Appendix N

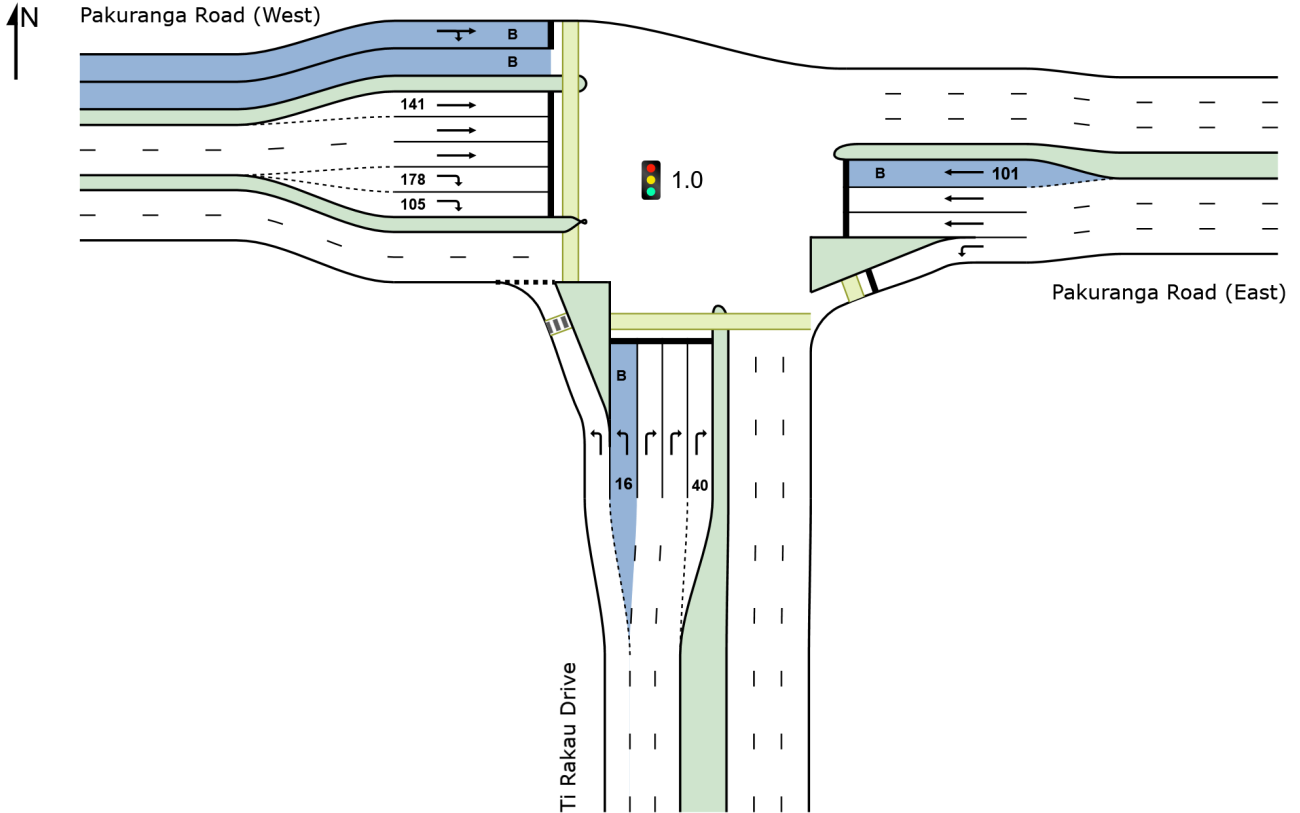
## Construction Scenario 1.2 – Lane Performance Summaries

# SITE LAYOUT

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
South: Ti Rakau Drive															
Lane 1	579	8.6	567	8.5	896 <sup>1</sup>	0.632	100	13.7	LOS B	13.8	103.8	Full	174	0.0	0.0
Lane 2 (B)	17	100.0	17	100.0	121	0.141	100	47.3	LOS D	0.7	9.1	Short	16	0.0	NA
Lane 3	191	4.0	187	4.0	342	0.546	100	38.7	LOS D	7.1	51.7	Full	174	0.0	0.0
Lane 4	191	4.0	187	4.0	342	0.546	100	38.7	LOS D	7.1	51.7	Full	174	0.0	0.0
Lane 5	191	4.0	187	4.0	342	0.546	100	38.7	LOS D	7.1	51.7	Short	40	0.0	NA
Approach	1168	7.7	1144 <sup>N</sup> <sub>1</sub>	7.7		0.632		26.4	LOS C	13.8	103.8				
East: Pakuranga Road (East)															
Lane 1	832	4.8	812	4.8	1127	0.720	100	16.9	LOS B	22.4	163.4	Full	113	0.0	38.7
Lane 2	626	6.1	611	6.0	689	0.887	100	38.5	LOS D	25.0 <sup>N4</sup>	184.4 <sup>N4</sup>	Full	113	0.0	50.0
Lane 3	626	6.1	611	6.0	689	0.887	100	38.5	LOS D	25.0 <sup>N4</sup>	184.4 <sup>N4</sup>	Full	113	0.0	50.0
Lane 4 (B)	25	100.0	25	100.0	85	0.293	100	45.6	LOS D	1.1	14.0	Short	101	0.0	NA
Approach	2109	6.7	2059 <sup>N</sup> <sub>1</sub>	6.7		0.887		30.0	LOS C	25.0	184.4				
West: Pakuranga Road (West)															
Lane 1 (B)	24	100.0	24	100.0	81	0.297	100	44.1	LOS D	1.0	12.7	Full	388	0.0	0.0
Lane 2	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	9.8	74.6	Short	141	0.0	NA
Lane 3	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	9.8	74.6	Full	388	0.0	0.0
Lane 4	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	9.8	74.6	Full	388	0.0	0.0
Lane 5	126	7.9	126	7.9	146	0.865	100	56.2	LOS E	6.0	44.9	Short	178	0.0	NA
Lane 6	126	7.9	126	7.9	146	0.865	100	56.2	LOS E	6.0	44.9	Short	105	0.0	NA
Approach	1231	11.0	1231	11.0		0.865		28.7	LOS C	9.8	74.6				
Intersection	4508	8.1	4433 <sup>N</sup> <sub>1</sub>	8.3		0.887		28.8	LOS C	25.0	184.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	W	E								
Lane 1	567	-	567	8.5	896 <sup>1</sup>	0.632	100	NA	NA	
Lane 2	17	-	17	100.0	121	0.141	100	0.0	1	
Lane 3	-	187	187	4.0	342	0.546	100	NA	NA	

Lane 4	-	187	187	4.0	342	0.546	100	NA	NA
Lane 5	-	187	187	4.0	342	0.546	100	28.4	4
Approach	584	560	1144	7.7		0.632			
East: Pakuranga Road (East)									
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W							
Lane 1	812	-	812	4.8	1127	0.720	100	NA	NA
Lane 2	-	611	611	6.0	689	0.887	100	NA	NA
Lane 3	-	611	611	6.0	689	0.887	100	NA	NA
Lane 4	-	25	25	100.0	85	0.293	100	0.0	3
Approach	812	1247	2059	6.7		0.887			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	9	15	24	100.0	81	0.297	100	NA	NA
Lane 2	318	-	318	9.6	695	0.458	100	0.0	3
Lane 3	318	-	318	9.6	695	0.458	100	NA	NA
Lane 4	318	-	318	9.6	695	0.458	100	NA	NA
Lane 5	-	126	126	7.9	146	0.865	100	0.0	4
Lane 6	-	126	126	7.9	146	0.865	100	0.0	5
Approach	964	267	1231	11.0		0.865			
Total %HV Deg. Satn (v/c)									
Intersection	4433	8.3		0.887					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

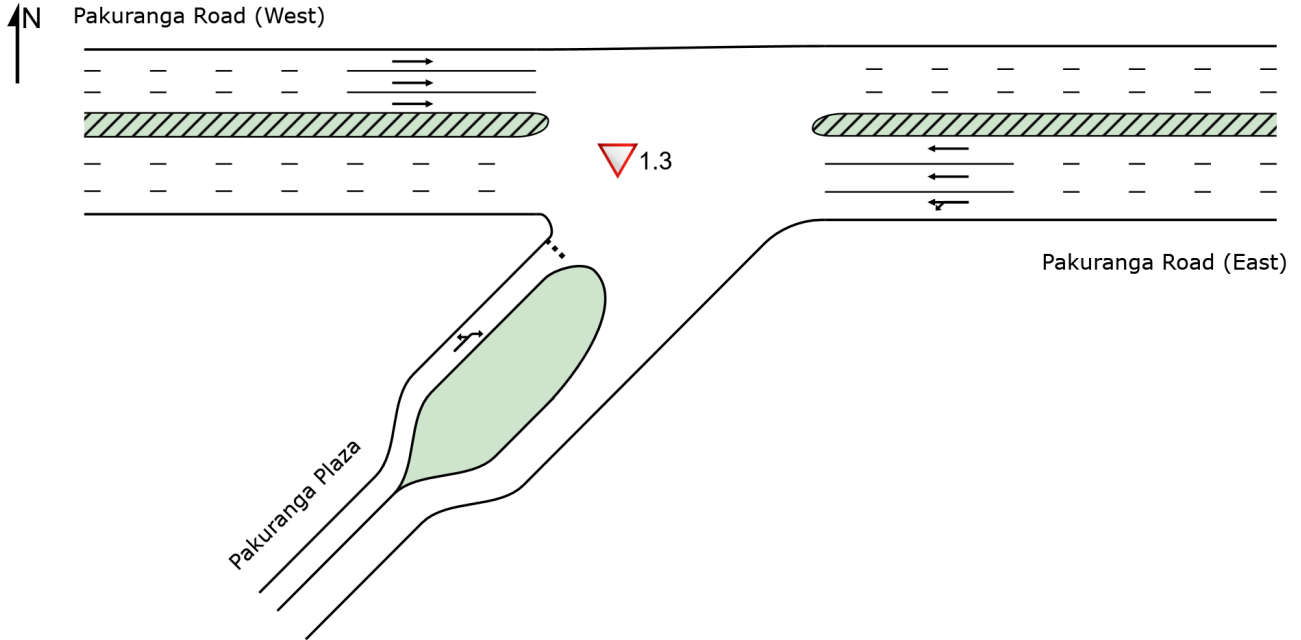
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Ti Rakau Drive											
Merge Type: <b>Not Applied</b>											
	Full Length Lane	1	Merge Analysis not applied.								
	Full Length Lane	2	Merge Analysis not applied.								
	Full Length Lane	3	Merge Analysis not applied.								
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
	Full Length Lane	1	Merge Analysis not applied.								
	Full Length Lane	2	Merge Analysis not applied.								
	Full Length Lane	3	Merge Analysis not applied.								
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
	Full Length Lane	1	Merge Analysis not applied.								
	Full Length Lane	2	Merge Analysis not applied.								
	Full Length Lane	3	Merge Analysis not applied.								

# SITE LAYOUT

▽ Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM  
(Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
East: Pakuranga Road (East)															
Lane 1	719	8.5	719	8.5	1844	0.390	100	1.4	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 2	737	5.6	737	5.6	1892	0.390	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 3	737	5.6	737	5.6	1892	0.390	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Approach	2193	6.5	2193	6.5		0.390		0.5	NA	0.0	0.0				
West: Pakuranga Road (West)															
Lane 1	509	8.1	505	8.1	1785	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 2	509	8.1	505	8.1	1785	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 3	506	8.1	503	8.1	1775	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Approach	1524	8.1	1514 <sup>N1</sup>	8.1		0.283		0.0	NA	0.0	0.0				
SouthWest: Pakuranga Plaza															
Lane 1	54	5.6	54	5.6	11	4.753	100	3585.9	LOS F	35.6	261.0	Full	196	-11.7 <sup>N7</sup>	14.2
Approach	54	5.6	54	5.6		4.753		3585.9	LOS F	35.6	261.0				
Intersection	3771	7.2	3761 <sup>N1</sup>	7.2		4.753		51.8	NA	35.6	261.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	L1	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	W								
Lane 1	180	539	719	8.5	1844	0.390	100	NA	NA	
Lane 2	-	737	737	5.6	1892	0.390	100	NA	NA	
Lane 3	-	737	737	5.6	1892	0.390	100	NA	NA	
Approach	180	2013	2193	6.5		0.390				
West: Pakuranga Road (West)										
Mov. From W To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
	E									
Lane 1	505	505	8.1	1785	0.283	100	NA	NA		
Lane 2	505	505	8.1	1785	0.283	100	NA	NA		



Lane 3	503	503	8.1		1775	0.283	100	NA	NA
Approach	1514	1514	8.1			0.283			
SouthWest: Pakuranga Plaza									
Mov. From SW To Exit:	L3 W	R1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	29	25	54	5.6	11	4.753	100	NA	NA
Approach	29	25	54	5.6		4.753			
Total %HV Deg. Satn (v/c)									
Intersection	3761	7.2		4.753					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

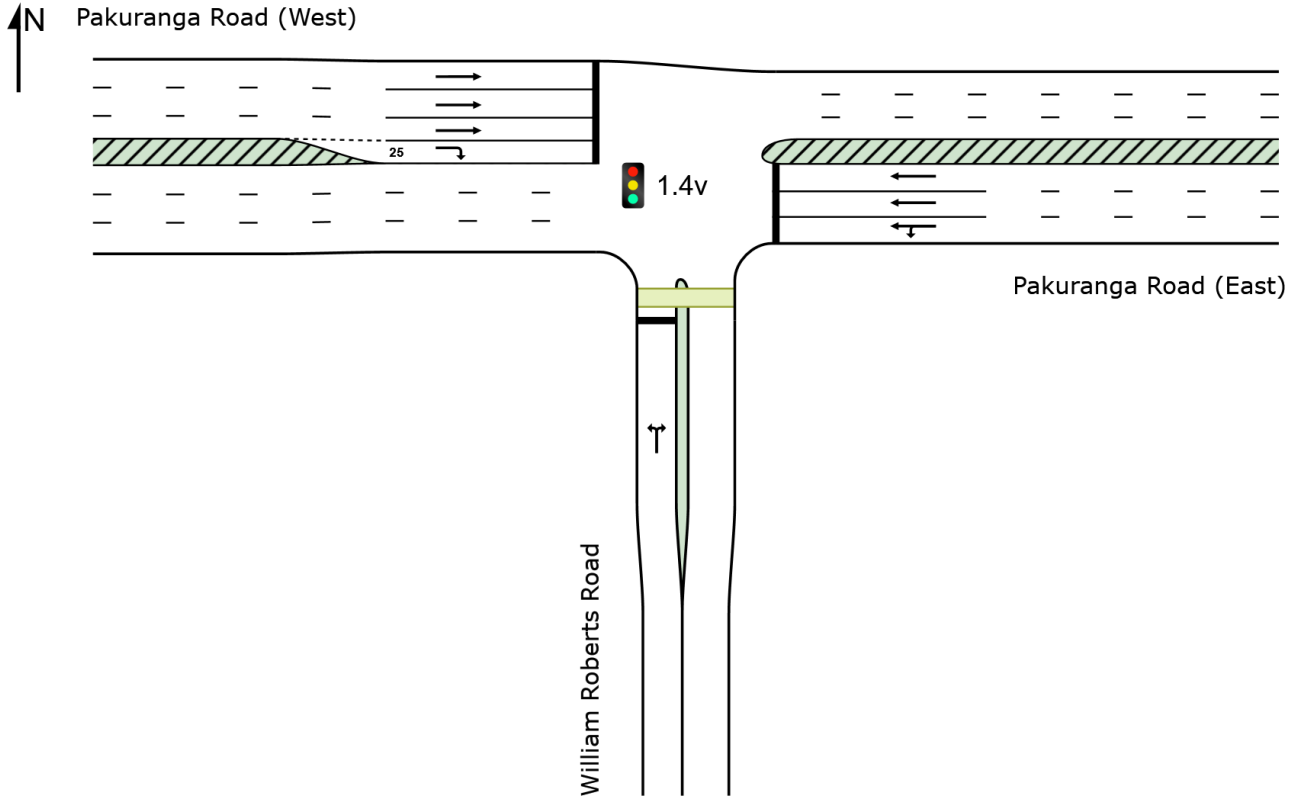
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
SouthWest Exit: Pakuranga Plaza											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

 Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [ Veh Dist ] m		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: William Roberts Road															
Lane 1	287	8.7	287	8.7	329	0.871	100	40.0	LOS D	10.3	77.1	Full	244	-0.7 <sup>N7</sup>	0.0
Approach	287	8.7	287	8.7		0.871		40.0	LOS D	10.3	77.1				
East: Pakuranga Road (East)															
Lane 1	699	6.0	699	6.0	790	0.885	100	29.7	LOS C	25.3	185.9	Full	184	0.0	5.9
Lane 2	688	6.2	688	6.2	778	0.885	100	28.9	LOS C	24.9	183.3	Full	184	0.0	4.6
Lane 3	696	6.2	696	6.2	786	0.885	100	28.8	LOS C	25.1	184.9	Full	184	0.0	5.4
Approach	2083	6.1	2083	6.1		0.885		29.1	LOS C	25.3	185.9				
West: Pakuranga Road (West)															
Lane 1	558	8.1	551	8.1	1142	0.483	100	6.7	LOS A	8.9	66.5	Full	152	0.0	0.0
Lane 2	527	8.1	520	8.1	1077	0.483	100	6.7	LOS A	8.4	62.9	Full	152	-5.7 <sup>N3</sup>	0.0
Lane 3	466	8.1	460	8.1	953 <sup>1</sup>	0.483	100	6.5	LOS A	7.2	53.7	Full	152	-5.7 <sup>N3</sup>	0.0
Lane 4	54	13.0	53	13.0	160	0.333	100	35.8	LOS D	1.6	12.5	Short	25	0.0	NA
Approach	1605	8.2	1585 <sup>N1</sup>	8.3		0.483		7.6	LOS A	8.9	66.5				
Intersection	3975	7.2	3955 <sup>N1</sup>	7.2		0.885		21.3	LOS C	25.3	185.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Road										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	W	E								
Lane 1	253	34	287	8.7	329	0.871	100	NA	NA	
Approach	253	34	287	8.7		0.871				
East: Pakuranga Road (East)										
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	S	W								
Lane 1	143	556	699	6.0	790	0.885	100	NA	NA	
Lane 2	-	688	688	6.2	778	0.885	100	NA	NA	

Lane 3	-	696	696	6.2	786	0.885	100	NA	NA
Approach	143	1940	2083	6.1		0.885			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	551	-	551	8.1	1142	0.483	100	NA	NA
Lane 2	520	-	520	8.1	1077	0.483	100	NA	NA
Lane 3	460	-	460	8.1	953 <sup>1</sup>	0.483	100	NA	NA
Lane 4	-	53	53	13.0	160	0.333	100	0.0	3
Approach	1532	53	1585	8.3		0.483			
Total %HV Deg. Satn (v/c)									
Intersection	3955	7.2		0.885					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

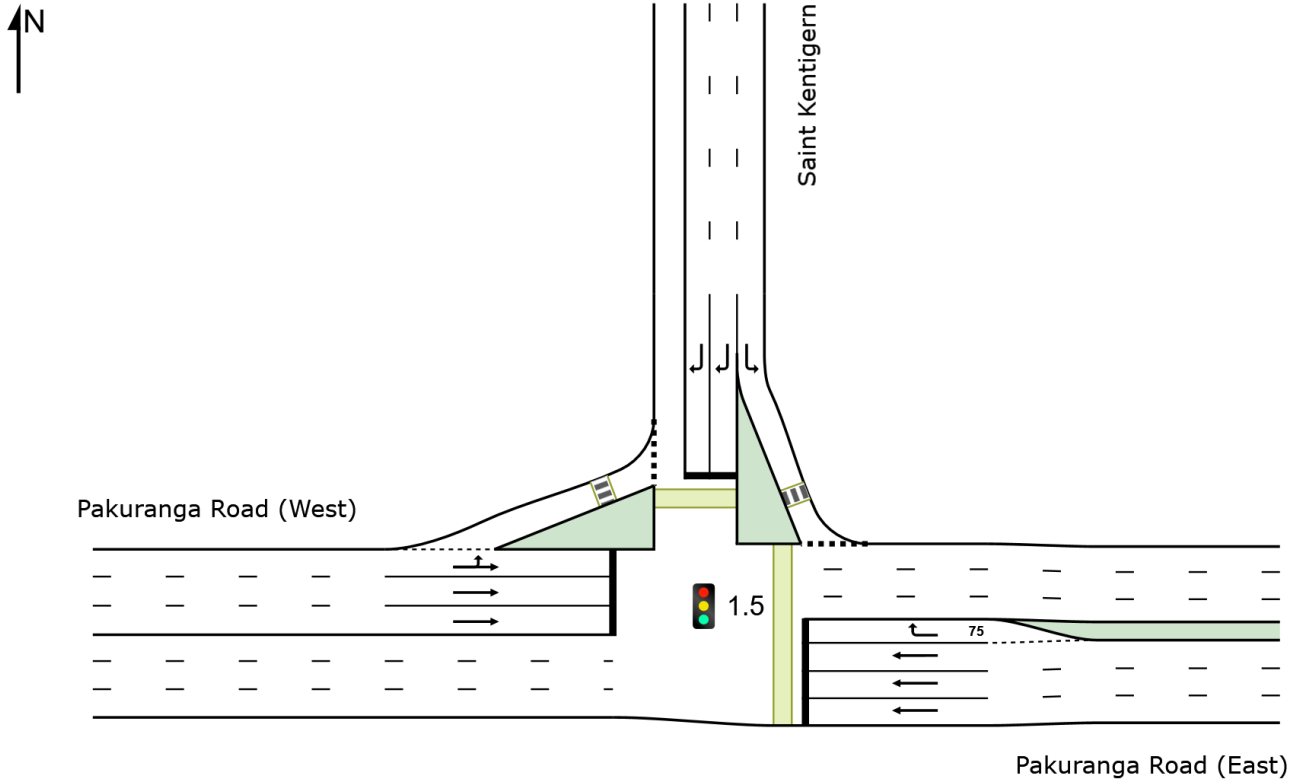
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 88 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
East: Pakuranga Road (East)															
Lane 1	685	6.3	685	6.3	1065	0.644	100	11.6	LOS B	18.7	138.0	Full	87	-5.9 <sup>N3</sup>	47.3
Lane 2	695	6.3	695	6.3	1079	0.644	100	11.6	LOS B	18.9	139.8	Full	87	-4.6 <sup>N3</sup>	48.5
Lane 3	672	6.3	672	6.3	1045	0.644	100	11.4	LOS B	18.0	132.8	Full	87	-5.4 <sup>N3</sup>	43.7
Lane 4	72	2.8	72	2.8	239	0.301	100	26.0	LOS C	1.7	12.0	Short	75	0.0	NA
Approach	2124	6.2	2124	6.2		0.644		12.0	LOS B	18.9	139.8				
North: Saint Kentigern															
Lane 1	13	0.0	13	0.0	938	0.014	100	5.8	LOS A	0.2	1.3	Full	96	0.0	0.0
Lane 2	20	10.0	20	10.0	407	0.050	100	27.1	LOS C	0.7	5.0	Full	96	-4.6 <sup>N3</sup>	0.0
Lane 3	20	10.0	20	10.0	397	0.050	100	27.1	LOS C	0.6	4.9	Full	96	-5.4 <sup>N3</sup>	0.0
Approach	53	7.5	53	7.5		0.050		21.9	LOS C	0.7	5.0				
West: Pakuranga Road (West)															
Lane 1	505	7.2	499	7.3	586	0.853	100	33.1	LOS C	21.0	156.0	Full	184	0.0	0.0
Lane 2	541	8.4	535	8.4	627	0.853	100	36.8	LOS D	24.7	185.3	Full	184	0.0	5.7
Lane 3	541	8.4	535	8.4	627	0.853	100	36.8	LOS D	24.7	185.3	Full	184	0.0	5.7
Approach	1587	8.0	1569 <sup>N1</sup>	8.1		0.853		35.6	LOS D	24.7	185.3				
Intersection	3764	7.0	3746 <sup>N1</sup>	7.0		0.853		22.0	LOS C	24.7	185.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	685	-	685	6.3	1065	0.644	100	NA	NA	
Lane 2	695	-	695	6.3	1079	0.644	100	NA	NA	
Lane 3	672	-	672	6.3	1045	0.644	100	NA	NA	
Lane 4	-	72	72	2.8	239	0.301	100	0.0	3	
Approach	2052	72	2124	6.2		0.644				
North: Saint Kentigern										
Mov. From N To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	13	-	13	0.0	938	0.014	100	NA	NA	

Lane 2	-	20	20	10.0	407	0.050	100	NA	NA
Lane 3	-	20	20	10.0	397	0.050	100	NA	NA
Approach	13	40	53	7.5		0.050			
West: Pakuranga Road (West)									
Mov. From W To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
	N	E							
Lane 1	127	372	499	7.3	586	0.853	100	NA	NA
Lane 2	-	535	535	8.4	627	0.853	100	NA	NA
Lane 3	-	535	535	8.4	627	0.853	100	NA	NA
Approach	127	1441	1569	8.1		0.853			
Total %HV Deg. Satn (v/c)									
Intersection	3746	7.0		0.853					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

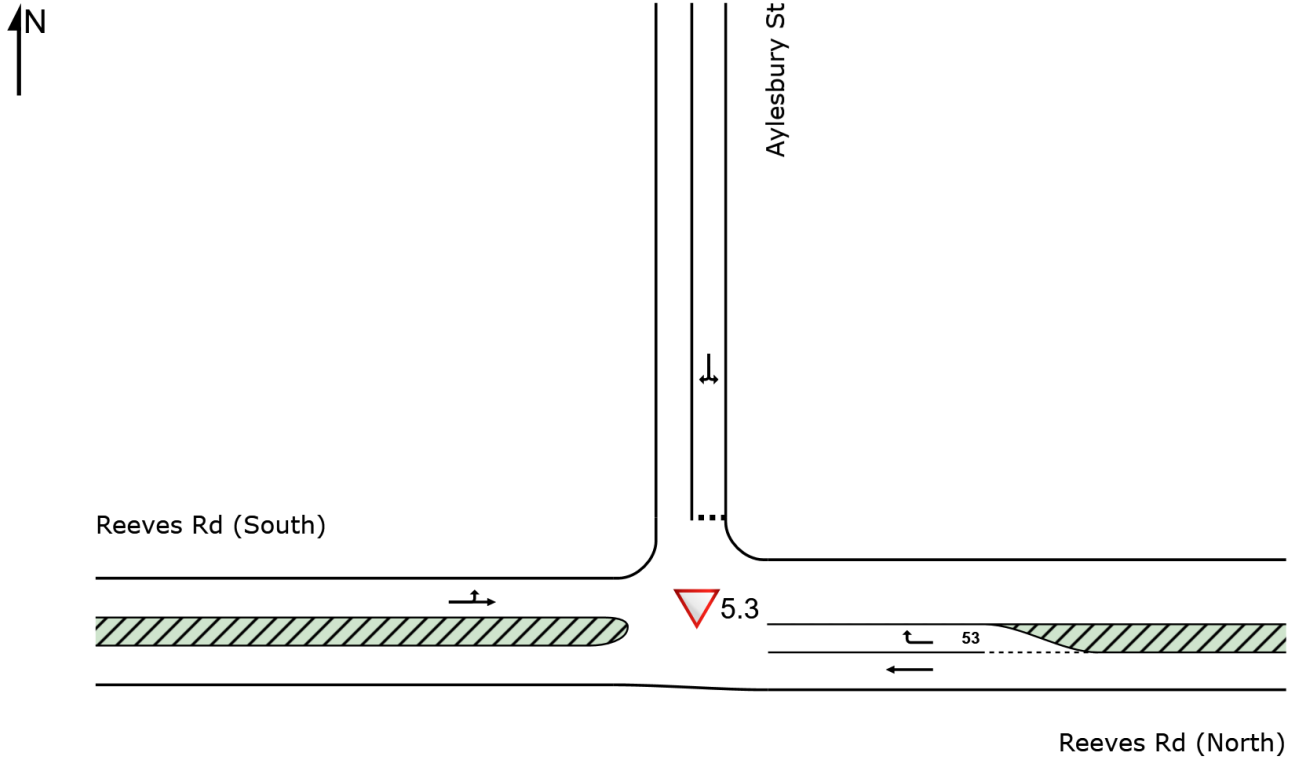
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
North Exit: Saint Kentigern												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

▽ Site: 5.3 [5.3 Reeves Rd/ Aylesbury St (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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





# LANE SUMMARY

Site: 5.3 [5.3 Reeves Rd/ Aylesbury St (Site Folder: General)]

Network: N101 [AM  
(Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%							m				
East: Reeves Rd (North)															
Lane 1	33	9.1	33	9.1	1894	0.017	100	0.0	LOS A	0.0	0.0	Full	60	0.0	0.0
Lane 2	16	6.3	16	6.3	1680	0.010	100	4.6	LOS A	0.0	0.3	Short	53	0.0	NA
Approach	49	8.2	49	8.2		0.017		1.5	NA	0.0	0.3				
North: Aylesbury St															
Lane 1	22	9.1	22	9.1	1243	0.018	100	0.4	LOS A	0.1	0.5	Full	193	0.0	0.0
Approach	22	9.1	22	9.1		0.018		0.4	LOS A	0.1	0.5				
West: Reeves Rd (South)															
Lane 1	42	9.5	42	9.5	1872	0.022	100	2.2	LOS A	0.0	0.0	Full	175	0.0	0.0
Approach	42	9.5	42	9.5		0.022		2.2	NA	0.0	0.0				
Intersection	113	8.8	113	8.9		0.022		1.6	NA	0.1	0.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
East: Reeves Rd (North)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Prob. Ov.	Ov. Lane No.
From E To Exit:	W	N			veh/h	v/c	%	%		
Lane 1	33	-	33	9.1	1894	0.017	100	NA	NA	
Lane 2	-	16	16	6.3	1680	0.010	100	0.0	1	
Approach	33	16	49	8.2		0.017				
North: Aylesbury St										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Prob. Ov.	Ov. Lane No.
From N To Exit:	E	W			veh/h	v/c	%	%		
Lane 1	11	11	22	9.1	1243	0.018	100	NA	NA	
Approach	11	11	22	9.1		0.018				
West: Reeves Rd (South)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Prob. Ov.	Ov. Lane No.
From W To Exit:	N	E			veh/h	v/c	%	%		
Lane 1	20	22	42	9.5	1872	0.022	100	NA	NA	
Approach	20	22	42	9.5		0.022				

	Total	%HV	Deg.Satn (v/c)
Intersection	113	8.9	0.022

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

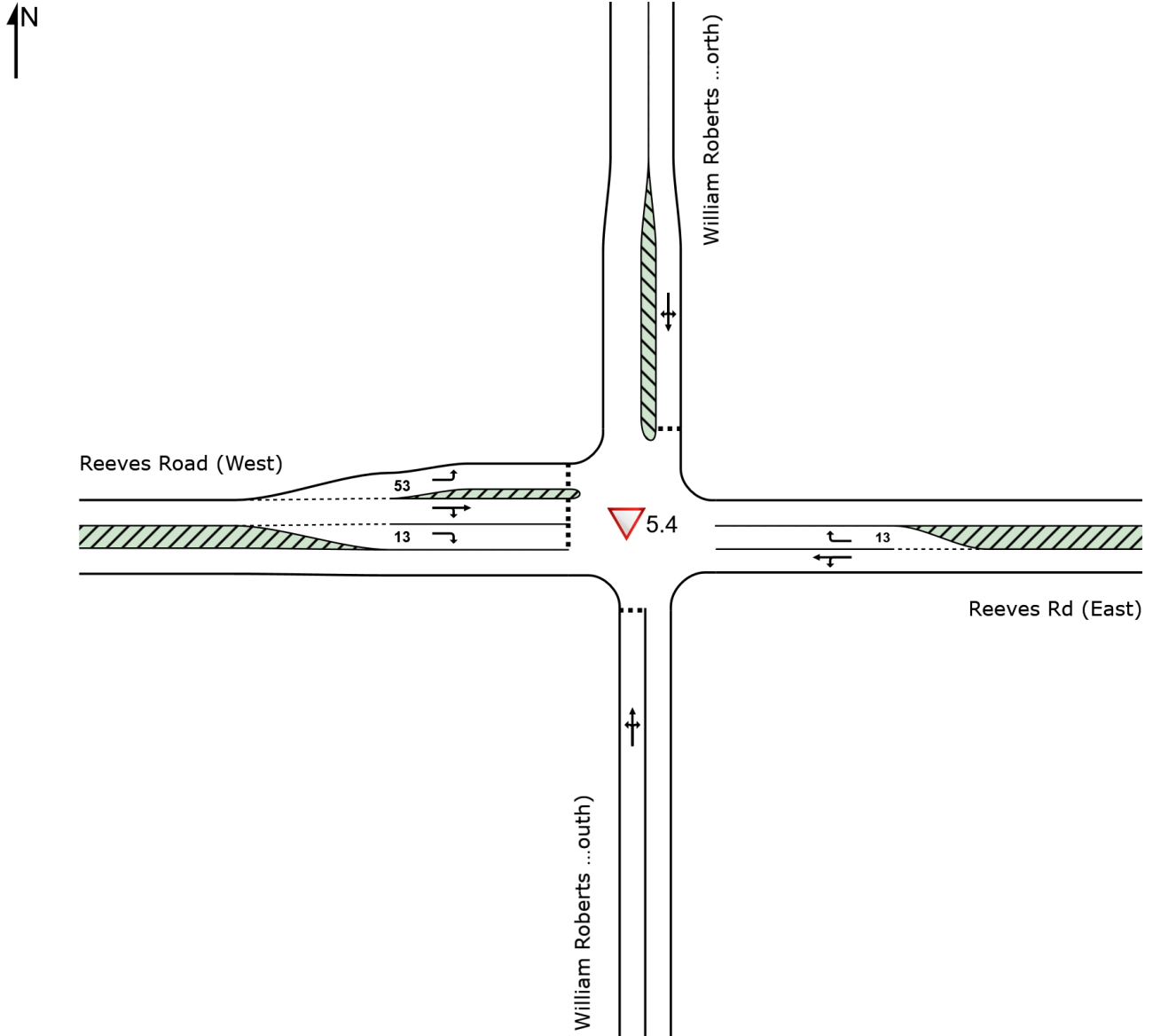
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Reeves Rd (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
North Exit: Aylesbury St Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
West Exit: Reeves Rd (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

▽ Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [ Veh Dist ] m		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: William Roberts Rd (South)															
Lane 1	214	8.9	213	8.9	851	0.251	100	4.2	LOS A	1.0	7.3	Full	243	0.0	0.0
Approach	214	8.9	213 <sup>N1</sup>	8.9		0.251		4.2	LOS A	1.0	7.3				
East: Reeves Rd (East)															
Lane 1	142	7.2	142	7.2	1770	0.080	100	3.3	LOS A	0.0	0.0	Full	266	0.0	0.0
Lane 2	231	8.7	231	8.7	1722	0.134	100	4.7	LOS A	0.0	0.0	Short	13	0.0	NA
Approach	373	8.1	373	8.1		0.134		4.2	NA	0.0	0.0				
North: William Roberts Rd (North)															
Lane 1	107	4.7	106	4.7	1057	0.100	100	5.4	LOS A	0.3	2.3	Full	244	0.0	0.0
Approach	107	4.7	106 <sup>N1</sup>	4.7		0.100		5.4	LOS A	0.3	2.3				
West: Reeves Road (West)															
Lane 1	23	9.1	23	9.1	1174	0.020	100	5.4	LOS A	0.1	0.6	Short	53	0.0	NA
Lane 2	23	9.1	23	9.1	1088	0.021	100	4.1	LOS A	0.1	0.6	Full	60	0.0	0.0
Lane 3	12	9.1	12	9.1	781	0.015	70 <sup>5</sup>	6.2	LOS A	0.0	0.4	Short	13	0.0	NA
Approach	58	9.1	58	9.1		0.021		5.0	LOS A	0.1	0.6				
Intersection	751	7.9	751	7.9		0.251		4.4	NA	1.0	7.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>5</sup> Lane under-utilisation found by the program

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: William Roberts Rd (South)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	W	N	E								
Lane 1	11	60	143	213	8.9	851	0.251	100	NA	NA	
Approach	11	60	143	213	8.9		0.251				
East: Reeves Rd (East)											
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	S	W	N								
Lane 1	96	46	-	142	7.2	1770	0.080	100	NA	NA	
Lane 2	-	-	231	231	8.7	1722	0.134	100	0.0	1	

Approach	96	46	231	373	8.1		0.134				
North: William Roberts Rd (North)											
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	E	S	W								
Lane 1	21	75	10	106	4.7	1057	0.100	100	NA	NA	
Approach	21	75	10	106	4.7		0.100				
West: Reeves Road (West)											
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	N	E	S								
Lane 1	23	-	-	23	9.1	1174	0.020	100	0.0	2	
Lane 2	-	23	-	23	9.1	1088	0.021	100	NA	NA	
Lane 3	-	-	12	12	9.1	781	0.015	70 <sup>5</sup>	0.0	2	
Approach	23	23	12	58	9.1		0.021				
Total %HV Deg.Satn (v/c)											
Intersection	751	7.9		0.251							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: William Roberts Rd (South) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Reeves Rd (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
North Exit: William Roberts Rd (North) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Reeves Road (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

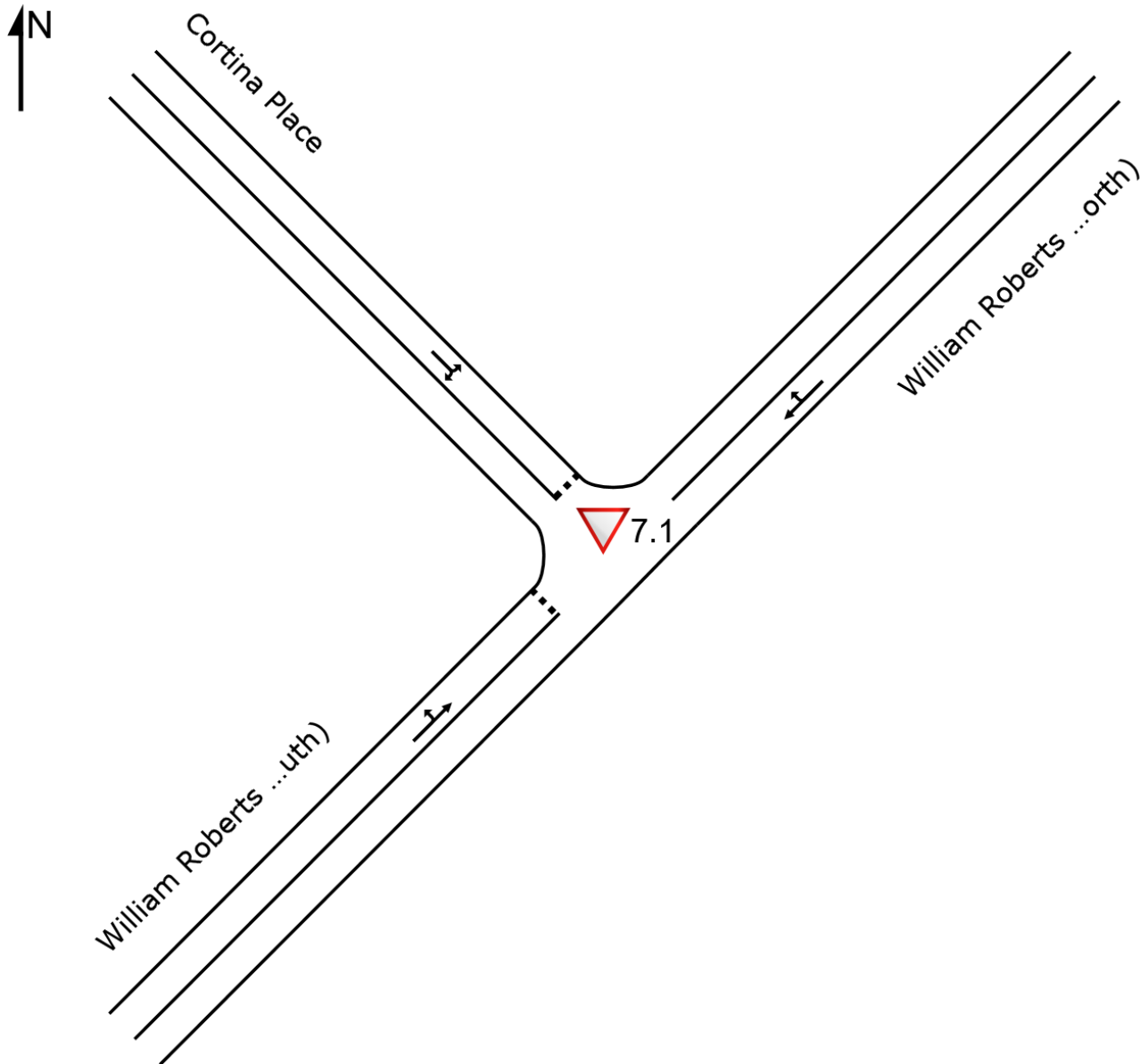
# SITE LAYOUT

▽ Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

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Scheme Design  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
NorthEast: William Roberts Road (North)															
Lane 1	306	7.9	306	7.9	1834	0.167	100	0.5	LOS A	0.0	0.0	Full	243	0.0	0.0
Approach	306	7.9	306	7.9		0.167		0.5	NA	0.0	0.0				
NorthWest: Cortina Place															
Lane 1	32	6.5	32	6.5	990	0.032	100	4.4	LOS A	0.1	0.8	Full	140	0.0	0.0
Approach	32	6.5	32	6.5		0.032		4.4	LOS A	0.1	0.8				
SouthWest: William Roberts Road (South)															
Lane 1	215	8.8	214	8.8	1258	0.170	100	4.0	LOS A	0.7	5.1	Full	110	0.0	0.0
Approach	215	8.8	214 <sup>N1</sup>	8.8		0.170		4.0	LOS A	0.7	5.1				
Intersection	553	8.2	552 <sup>N1</sup>	8.2		0.170		2.1	NA	0.7	5.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov. From NE To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	NW								
Lane 1	269	37	306	7.9	1834	0.167	100	NA	NA	
Approach	269	37	306	7.9		0.167				
NorthWest: Cortina Place										
Mov. From NW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NE	SW								
Lane 1	20	12	32	6.5	990	0.032	100	NA	NA	
Approach	20	12	32	6.5		0.032				
SouthWest: William Roberts Road (South)										
Mov. From SW To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NW	NE								
Lane 1	25	189	214	8.8	1258	0.170	100	NA	NA	
Approach	25	189	214	8.8		0.170				
Total %HV Deg. Satn (v/c)										

Intersection	552	8.2	0.170
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Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
NorthWest Exit: Cortina Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
SouthWest Exit: William Roberts Road (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.



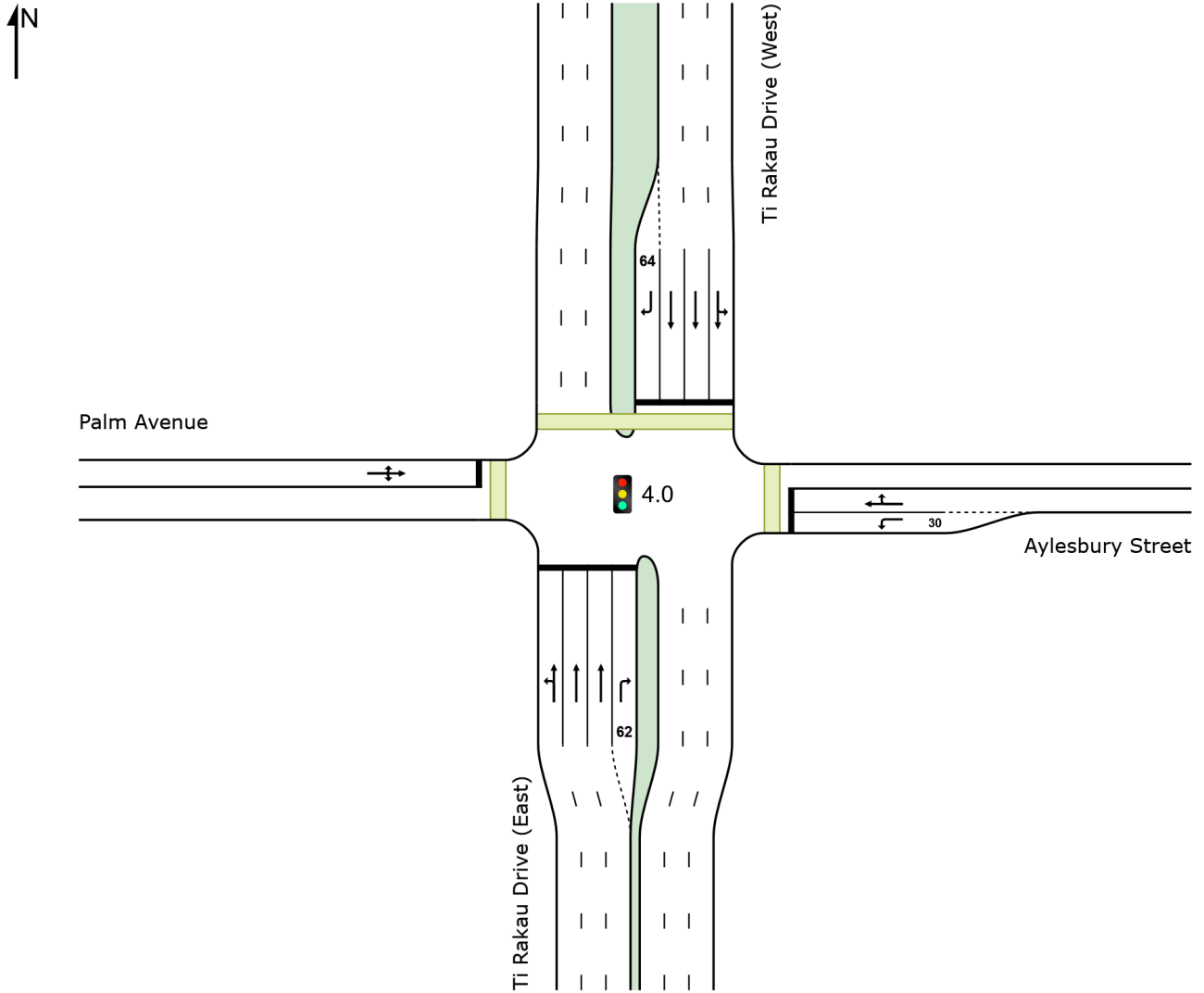
# SITE LAYOUT

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 9:39:18 am  
Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 AM-V1.sip9

# LANE SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 80 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
South: Ti Rakau Drive (East)															
Lane 1	368	7.5	352	7.3	466	0.756	100	36.7	LOS D	13.5	100.2	Full	110	0.0	0.0
Lane 2	383	7.9	366	7.8	484	0.756	100	34.8	LOS C	14.1	105.2	Full	110	0.0	1.0
Lane 3	383	7.9	366	7.8	484	0.756	100	34.8	LOS C	14.1	105.2	Full	110	0.0	1.0
Lane 4	23	4.3	22	4.3	128	0.171	100	43.7	LOS D	0.9	6.3	Short	62	0.0	NA
Approach	1157	7.7	1106 <sup>N1</sup>	7.5		0.756		35.6	LOS D	14.1	105.2				
East: Aylesbury Street															
Lane 1	10	0.0	10	0.0	257	0.039	100	17.5	LOS B	0.2	1.2	Short	30	0.0	NA
Lane 2	20	0.0	20	0.0	135	0.148	100	40.8	LOS D	0.8	5.4	Full	40	0.0	0.0
Approach	30	0.0	30	0.0		0.148		33.0	LOS C	0.8	5.4				
North: Ti Rakau Drive (West)															
Lane 1	412	7.8	404	7.9	485	0.835	100	39.2	LOS D	17.1	128.1	Full	174	0.0	0.0
Lane 2	333	7.8	327	7.9	392	0.835	100	41.0	LOS D	14.2	106.1	Full	174	-19.1 <sup>N3</sup>	0.0
Lane 3	341	7.8	335	7.9	402	0.835	100	40.8	LOS D	14.5	108.5	Full	174	-17.0 <sup>N3</sup>	0.0
Lane 4	21	0.0	21	0.0	132	0.156	100	43.5	LOS D	0.8	5.6	Short	64	0.0	NA
Approach	1107	7.7	1087 <sup>N1</sup>	7.7		0.835		40.3	LOS D	17.1	128.1				
West: Palm Avenue															
Lane 1	135	4.4	135	4.4	473	0.285	100	27.3	LOS C	4.1	29.9	Full	87	-8.6 <sup>N3</sup>	0.0
Approach	135	4.4	135	4.4		0.285		27.3	LOS C	4.1	29.9				
Intersection	2429	7.4	2358 <sup>N1</sup>	7.6		0.835		37.3	LOS D	17.1	128.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)											
South: Ti Rakau Drive (East)											
Mov. From S To Exit:	L2			T1			R2			Total	%HV
	W	N	E	W	N	E	W	N	E		
Lane 1	33	319	-	352	7.3	466	0.756	100	NA	NA	
Lane 2	-	366	-	366	7.8	484	0.756	100	NA	NA	
Lane 3	-	366	-	366	7.8	484	0.756	100	NA	NA	
Lane 4	-	-	22	22	4.3	128	0.171	100	0.0	3	
Approach	33	1051	22	1106	7.5		0.756				

East: Aylesbury Street										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	-	-	10	0.0	257	0.039	100	0.0	2
Lane 2	-	10	10	20	0.0	135	0.148	100	NA	NA
Approach	10	10	10	30	0.0		0.148			
North: Ti Rakau Drive (West)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	394	-	404	7.9	485	0.835	100	NA	NA
Lane 2	-	327	-	327	7.9	392	0.835	100	NA	NA
Lane 3	-	335	-	335	7.9	402	0.835	100	NA	NA
Lane 4	-	-	21	21	0.0	132	0.156	100	0.0	3
Approach	11	1056	21	1087	7.7		0.835			
West: Palm Avenue										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	10	62	135	4.4	473	0.285	100	NA	NA
Approach	63	10	62	135	4.4		0.285			
Total %HV Deg. Satn (v/c)										
Intersection	2358	7.6					0.835			

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

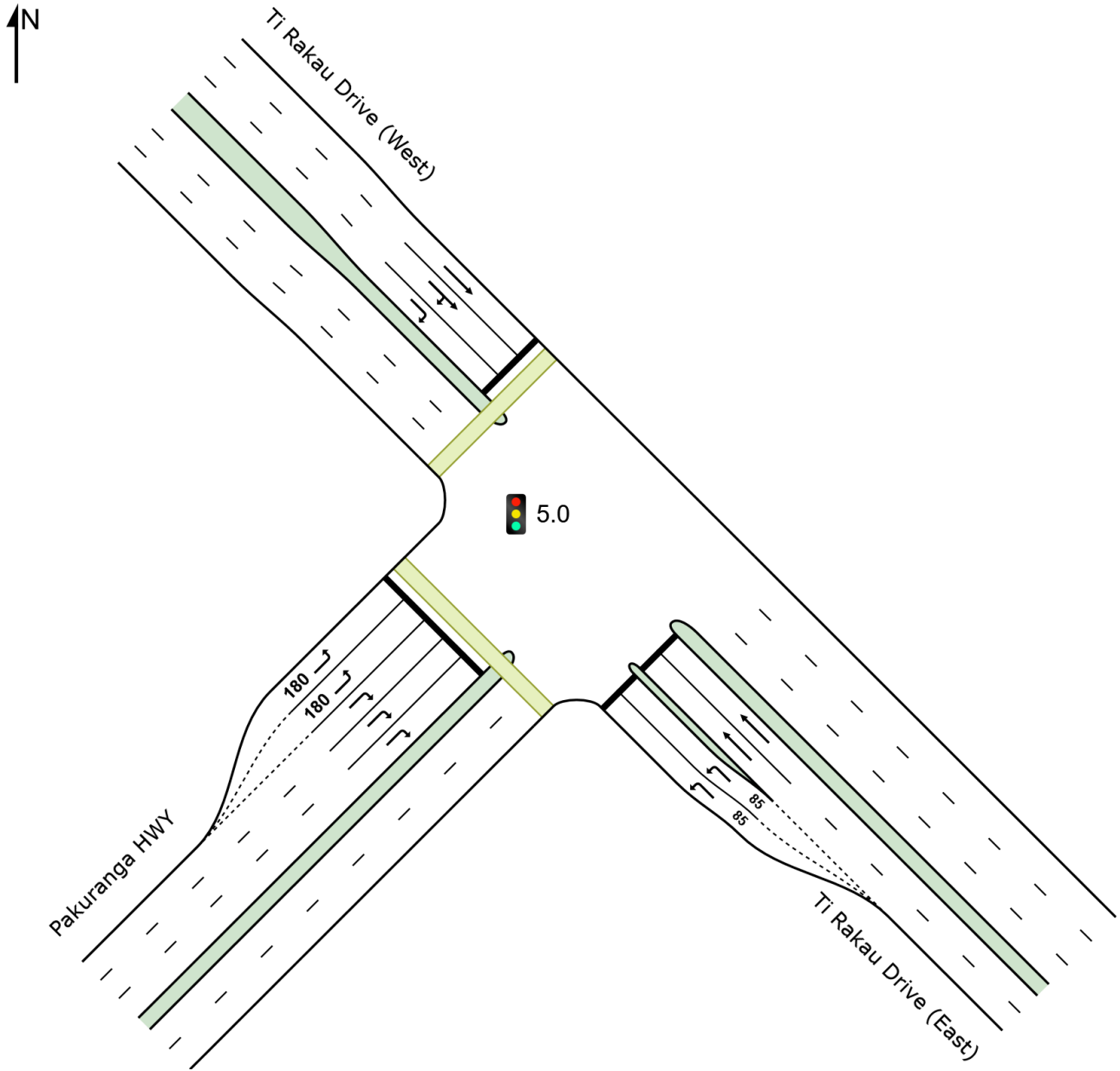
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
East Exit: Aylesbury Street Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
North Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
West Exit: Palm Avenue Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	786	9.6	706	9.5	838	0.842	100	26.4	LOS C	19.6 <sup>N4</sup>	148.5 <sup>N4</sup>	Short	85	0.0	NA
Lane 2	786	9.6	706	9.5	838	0.842	100	26.4	LOS C	19.6 <sup>N4</sup>	148.5 <sup>N4</sup>	Short	85	0.0	NA
Lane 3	258	11.3	232	11.3	383	0.605	100	24.6	LOS C	6.6	50.4	Full	91	0.0	50.0 <sup>8</sup>
Lane 4	256	11.3	231	11.3	381	0.605	100	24.6	LOS C	6.5	50.2	Full	91	0.0	0.0
Approach	2086	10.0	1874 <sup>N1</sup>	9.9		0.842		26.0	LOS C	19.6	148.5				
NorthWest: Ti Rakau Drive (West)															
Lane 1	154	24.0	152	24.2	519	0.292	33 <sup>5</sup>	17.6	LOS B	3.5	29.7	Full	110	0.0	0.0
Lane 2	499	5.2	490	5.2	561	0.875	100	36.1	LOS D	17.6	128.5	Full	110	0.0	19.1
Lane 3	486	5.2	478	5.2	546	0.875	100	36.3	LOS D	17.2	125.7	Full	110	0.0	17.0
Approach	1139	7.7	1120 <sup>N1</sup>	7.8		0.875		33.7	LOS C	17.6	128.5				
SouthWest: Pakuranga HWY															
Lane 1	324	4.9	324	4.9	568	0.571	100	26.5	LOS C	8.3	60.7	Short	180	0.0	NA
Lane 2	324	4.9	324	4.9	568	0.571	100	26.5	LOS C	8.3	60.7	Short	180	0.0	NA
Lane 3	287	9.3	287	9.3	313	0.917	100	48.9	LOS D	11.3	85.2	Full	1650	0.0	0.0
Lane 4	287	9.3	287	9.3	313	0.917	100	48.9	LOS D	11.3	85.2	Full	1650	0.0	0.0
Lane 5	290	9.3	290	9.3	316	0.917	100	48.9	LOS D	11.4	86.0	Full	1650	0.0	0.0
Approach	1511	7.4	1511	7.4		0.917		39.3	LOS D	11.4	86.0				
Intersection	4736	8.6	4504 <sup>N1</sup>	9.1		0.917		32.4	LOS C	19.6	148.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>5</sup> Lane under-utilisation found by the program

<sup>8</sup> Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov. From SE To Exit:	L2		Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	SW	NW								
Lane 1	706	-	706	9.5	838	0.842	100	56.4	2	
Lane 2	706	-	706	9.5	838	0.842	100	56.4	3	
Lane 3	-	232	232	11.3	383	0.605	100	NA	NA	
Lane 4	-	231	231	11.3	381	0.605	100	NA	NA	
Approach	1411	462	1874	9.9		0.842				

NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SE	SW								
Lane 1	152	-	152	24.2	519	0.292	33 <sup>5</sup>	NA	NA	
Lane 2	-	490	490	5.2	561	0.875	100	NA	NA	
Lane 3	-	478	478	5.2	546	0.875	100	NA	NA	
Approach	152	968	1120	7.8		0.875				
SouthWest: Pakuranga HWY										
Mov. From SW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NW	SE								
Lane 1	324	-	324	4.9	568	0.571	100	0.0	2	
Lane 2	324	-	324	4.9	568	0.571	100	0.0	4	
Lane 3	-	287	287	9.3	313	0.917	100	NA	NA	
Lane 4	-	287	287	9.3	313	0.917	100	NA	NA	
Lane 5	-	290	290	9.3	316	0.917	100	NA	NA	
Approach	648	863	1511	7.4		0.917				
Total		%HV Deg. Satn (v/c)								
Intersection	4504	9.1	0.917							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

<sup>5</sup> Lane under-utilisation found by the program

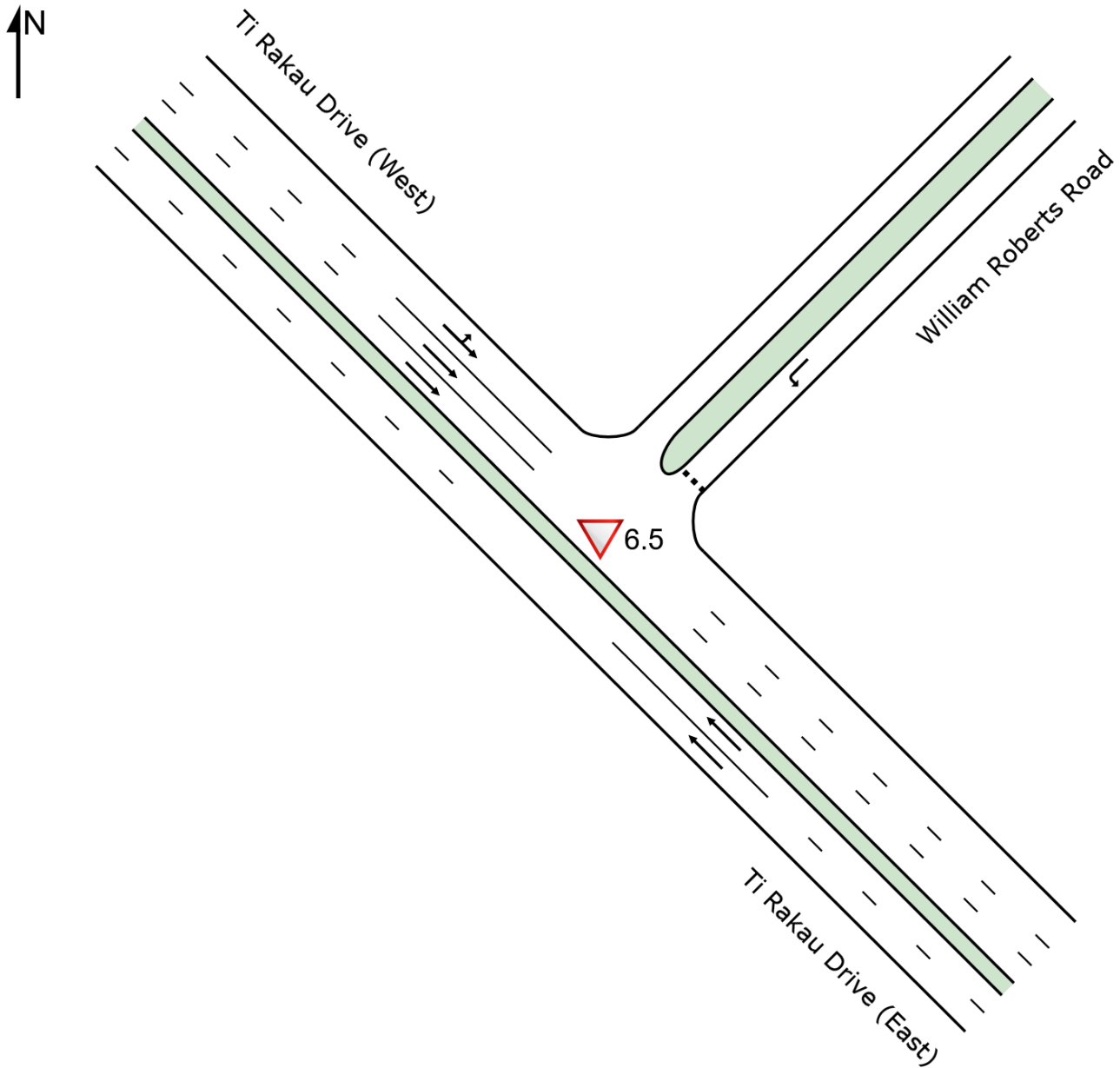
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
SouthWest Exit: Pakuranga HWY												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

# SITE LAYOUT

▽ Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	1002	10.1	894	10.0	1783	0.501	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Lane 2	991	10.1	884	10.0	1764	0.501	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	1993	10.1	1778 <sup>N1</sup>	10.0		0.501		0.0	NA	0.0	0.0				
NorthEast: William Roberts Road															
Lane 1	263	8.0	263	8.0	541	0.486	100	3.3	LOS A	3.2 <sup>N5</sup>	24.0 <sup>N5</sup>	Full	110	-50.0 <sup>N3</sup>	0.0
Approach	263	8.0	263	8.0		0.486		3.3	LOS A	3.2	24.0				
NorthWest: Ti Rakau Drive (West)															
Lane 1	369	10.3	368	10.3	1829	0.201	100	2.6	LOS A	3.1 <sup>N5</sup>	23.3 <sup>N5</sup>	Full	97	0.0	14.1
Lane 2	352	12.1	351	12.1	1742	0.201	100	0.0	LOS A	4.7 <sup>N5</sup>	36.2 <sup>N5</sup>	Full	97	0.0	0.0
Lane 3	293	12.1	292	12.1	1450	0.201	100	0.0	LOS A	0.0	0.0	Full	97	-16.8 <sup>N3</sup>	0.0
Approach	1013	11.5	1011 <sup>N1</sup>	11.5		0.201		0.9	NA	4.7	36.2				
Intersection	3269	10.3	3051 <sup>N1</sup>	11.1		0.501		0.6	NA	4.7	36.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N5</sup> Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov.	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From SE				Cap. veh/h	v/c	%	%		
To Exit:	NW								
Lane 1	894	894	10.0	1783	0.501	100	NA	NA	
Lane 2	884	884	10.0	1764	0.501	100	NA	NA	
Approach	1778	1778	10.0		0.501				
NorthEast: William Roberts Road									
Mov.	L2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From NE				Cap. veh/h	v/c	%	%		
To Exit:	SE								
Lane 1	263	263	8.0	541	0.486	100	NA	NA	
Approach	263	263	8.0		0.486				
NorthWest: Ti Rakau Drive (West)									



Mov. From NW To Exit:	L2 NE	T1 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	204	165	368	10.3	1829	0.201	100	NA	NA
Lane 2	-	351	351	12.1	1742	0.201	100	NA	NA
Lane 3	-	292	292	12.1	1450	0.201	100	NA	NA
Approach	204	807	1011	11.5		0.201			
Total %HV Deg.Satn (v/c)									
Intersection	3051	11.1		0.501					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
NorthEast Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# SITE LAYOUT

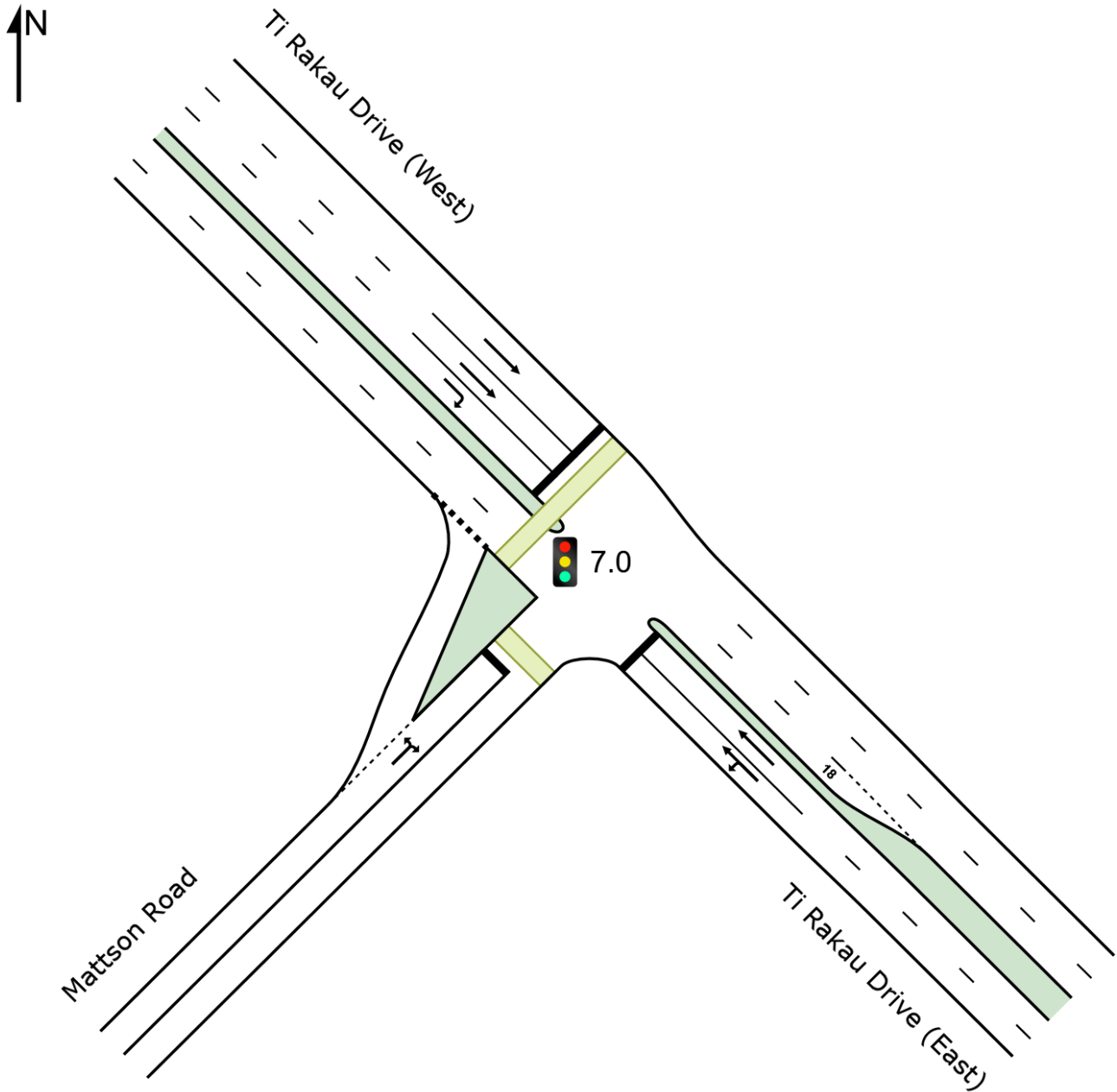
 Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM  
(Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	969	10.3	861	10.2	963	0.894	100	30.0	LOS C	38.3	291.8	Full	187	0.0	45.8
Lane 2	976	10.3	866	10.3	969	0.894	100	30.1	LOS C	38.5	293.4	Full	187	0.0	46.3
Approach	1945	10.3	1727 <sup>N</sup>	10.2		0.894		30.1	LOS C	38.5	293.4				
NorthWest: Ti Rakau Drive (West)															
Lane 1	525	11.3	524	11.3	1318	0.398	100	5.3	LOS A	3.8 <sup>N4</sup>	29.4 <sup>N4</sup>	Full	18	0.0	50.0
Lane 2	494	11.3	493	11.3	1239	0.398	100	5.3	LOS A	3.8 <sup>N4</sup>	29.4 <sup>N4</sup>	Full	18	0.0	50.0
Lane 3	52	7.7	52	7.7	129	0.401	100	43.5	LOS D	2.1	15.6	Full	18	0.0	0.0
Approach	1071	11.1	1069 <sup>N</sup>	11.1		0.401		7.2	LOS A	3.8	29.4				
SouthWest: Mattson Road															
Lane 1	136	4.4	136	4.4	515	0.264	100	25.0	LOS C	4.3	31.0	Full	282	0.0	0.0
Approach	136	4.4	136	4.4		0.264		25.0	LOS C	4.3	31.0				
Intersection	3152	10.3	2932 <sup>N</sup>	11.1		0.894		21.5	LOS C	38.5	293.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From SE To Exit:	SW	NW			veh/h	v/c	%	%		
Lane 1	21	839	861	10.2	963	0.894	100	NA	NA	
Lane 2	-	866	866	10.3	969	0.894	100	NA	NA	
Approach	21	1705	1727	10.2		0.894				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From NW To Exit:	SE	SW			veh/h	v/c	%	%		
Lane 1	524	-	524	11.3	1318	0.398	100	NA	NA	
Lane 2	493	-	493	11.3	1239	0.398	100	NA	NA	
Lane 3	-	52	52	7.7	129	0.401	100	NA	NA	
Approach	1017	52	1069	11.1		0.401				
SouthWest: Mattson Road										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From SW To Exit:	SE	SW			veh/h	v/c	%	%		
Lane 1	136	-	136	4.4	515	0.264	100	NA	NA	
Approach	136	-	136	4.4		0.264				

From SW To Exit:	NW	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	72	64	136	4.4	515	0.264	100	NA	NA
Approach	72	64	136	4.4		0.264			
Total %HV Deg. Satn (v/c)									
Intersection	2932	11.1		0.894					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Priority</b>												
Exit Short Lane	3	18	0.0	493	521	3.00	2.00	64	1265	0.051	0.9	1.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				493	1800	0.274	0.0	0.0
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
SouthWest Exit: Mattson Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										

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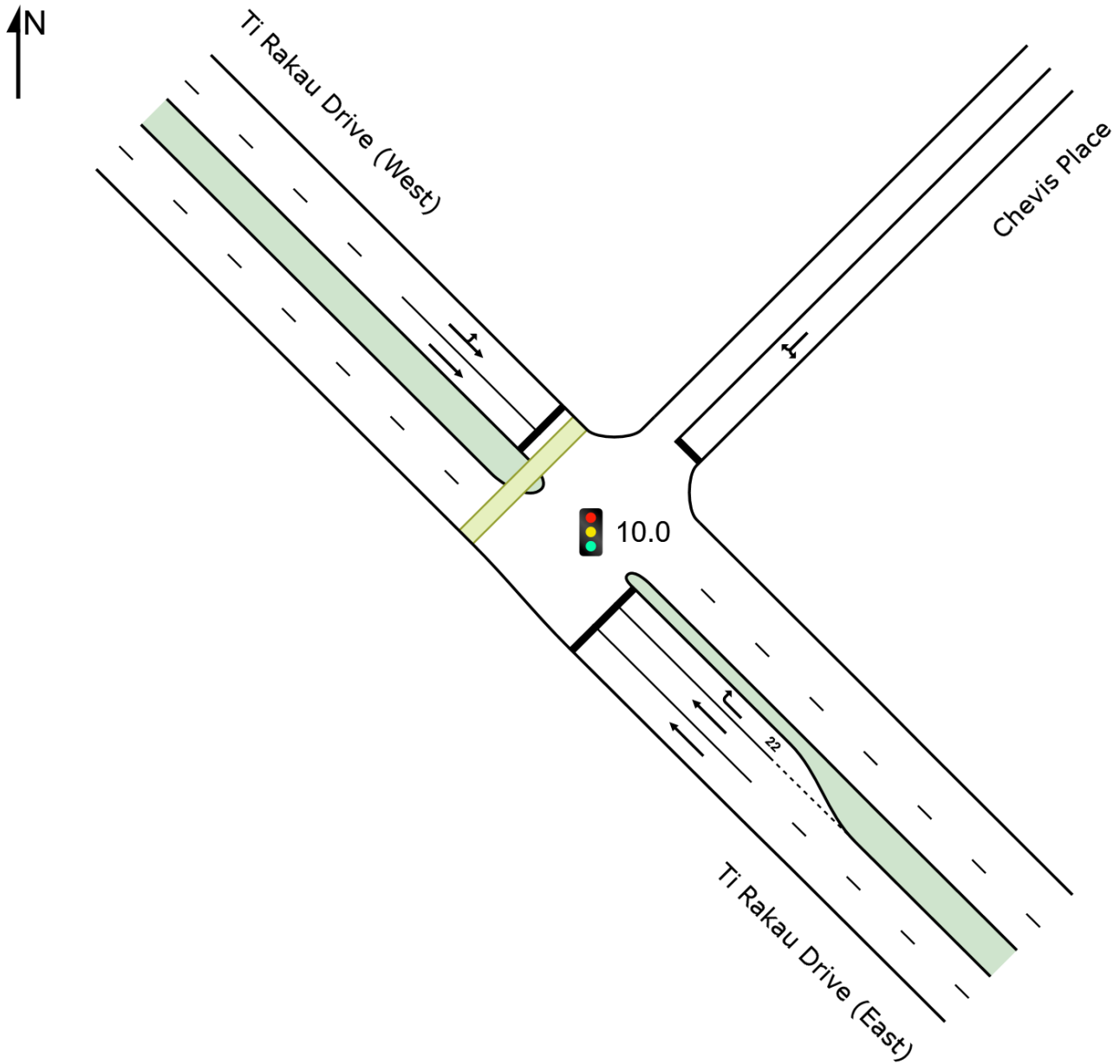
Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:34:48 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 AM-V1.sip9

# SITE LAYOUT

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	878	10.4	817	10.5	949	0.861	100	24.1	LOS C	29.7	226.8	Full	162	0.0	35.7
Lane 2	855	10.4	795	10.5	923 <sup>1</sup>	0.861	100	24.2	LOS C	28.9	220.2	Full	162	0.0	33.0
Lane 3	11	9.1	10	9.1	239	0.043	100	33.4	LOS C	0.3	2.3	Short	22	0.0	NA
Approach	1744	10.4	1622 <sup>N</sup>	10.4		0.861		24.2	LOS C	29.7	226.8				
NorthEast: Chevis Place															
Lane 1	29	6.9	29	6.9	183	0.158	100	36.6	LOS D	0.9	7.0	Full	138	0.0	0.0
Approach	29	6.9	29	6.9		0.158		36.6	LOS D	0.9	7.0				
NorthWest: Ti Rakau Drive (West)															
Lane 1	466	11.6	448	11.6	956	0.469	100	11.9	LOS B	9.8	75.6	Full	68	0.0	14.6
Lane 2	440	11.6	423	11.6	903	0.469	100	11.8	LOS B	9.3	71.7	Full	68	0.0	9.7
Approach	906	11.6	871 <sup>N1</sup>	11.6		0.469		11.8	LOS B	9.8	75.6				
Intersection	2679	10.8	2522 <sup>N</sup>	11.4		0.861		20.1	LOS C	29.7	226.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From SE					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	NW	NE				v/c	%	%		No.
Lane 1	817	-	817	10.5	949	0.861	100	NA	NA	
Lane 2	795	-	795	10.5	923 <sup>1</sup>	0.861	100	NA	NA	
Lane 3	-	10	10	9.1	239	0.043	100	0.0	2	
Approach	1612	10	1622	10.4		0.861				
NorthEast: Chevis Place										
Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From NE					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	SE	NW				v/c	%	%		No.
Lane 1	11	18	29	6.9	183	0.158	100	NA	NA	
Approach	11	18	29	6.9		0.158				
NorthWest: Ti Rakau Drive (West)										
Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From NW					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	SE	NE				v/c	%	%		No.

From NW To Exit:	NE	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	11	437	448	11.6	956	0.469	100	NA	NA
Lane 2	-	423	423	11.6	903	0.469	100	NA	NA
Approach	11	861	871	11.6		0.469			
Total		%HV Deg. Satn (v/c)							
Intersection	2522	11.4		0.861					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

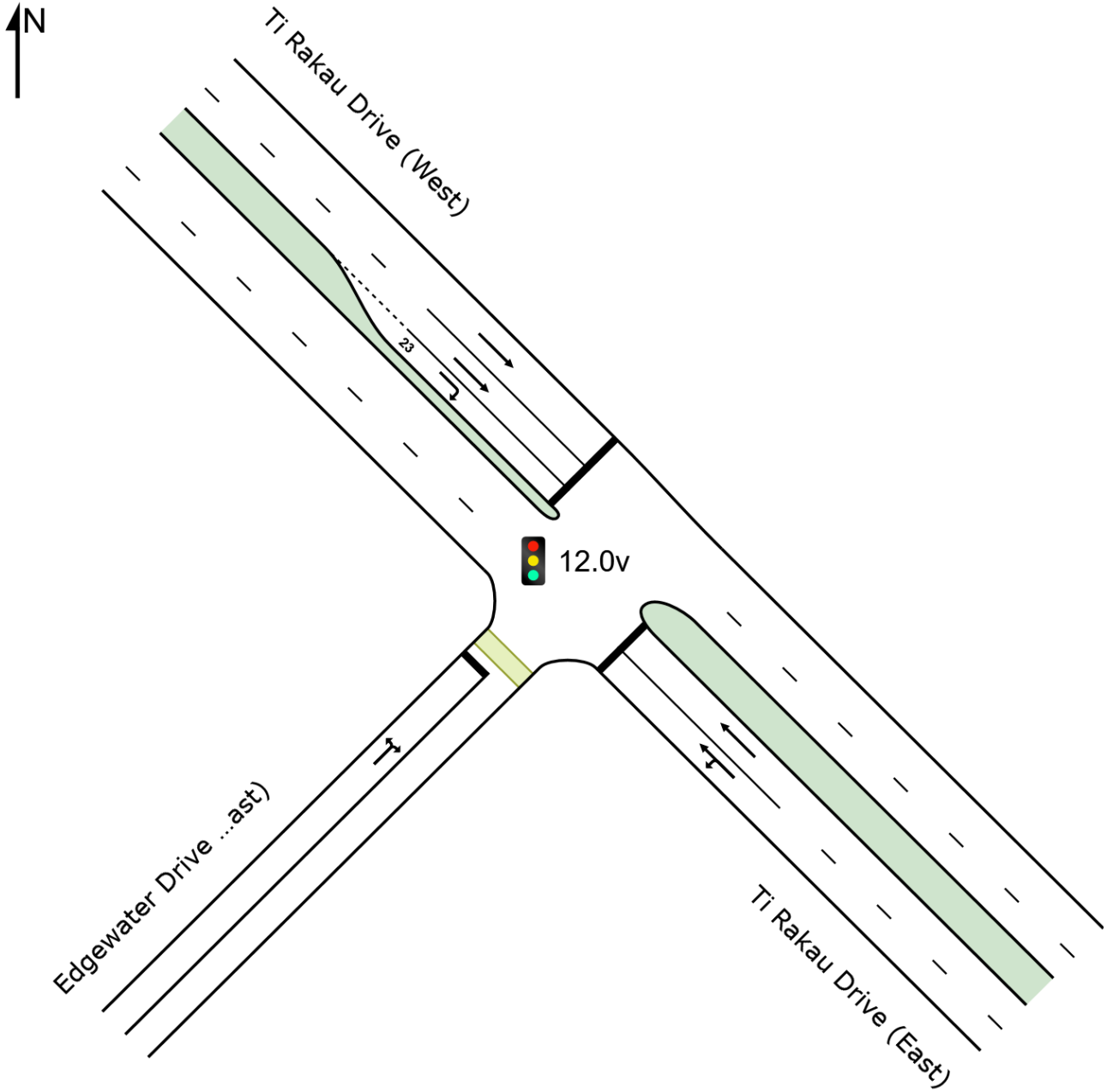
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
NorthEast Exit: Chevis Place												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# SITE LAYOUT

Site: 12.0v [12.0 Edgewater Dr (East) / Ti Rakau Dr - Conversion (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





# LANE SUMMARY

Site: 12.0v [12.0 Edgewater Dr (East) / Ti Rakau Dr - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 67 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%											
SouthEast: Ti Rakau Drive (East)															
Lane 1	955	9.3	887	9.3	997	0.890	100	27.3	LOS C	33.9	256.0	Full	479	0.0	0.0
Lane 2	977	10.1	908	10.2	1021	0.890	100	26.2	LOS C	34.5	262.5	Full	479	0.0	0.0
Approach	1932	9.7	1795 <sup>N</sup> <sub>1</sub>	9.7		0.890		26.8	LOS C	34.5	262.5				
NorthWest: Ti Rakau Drive (West)															
Lane 1	474	11.3	456	11.4	1050	0.434	100	9.5	LOS A	8.8	67.5	Full	103	0.0	0.0
Lane 2	400	11.3	384	11.4	886 <sup>1</sup>	0.434	100	9.3	LOS A	7.2	55.4	Full	103	0.0	0.0
Lane 3	48	13.0	47	13.0	145	0.321	100	39.1	LOS D	1.6	12.1	Short	23	0.0	NA
Approach	922	11.4	887 <sup>N1</sup>	11.4		0.434		11.0	LOS B	8.8	67.5				
SouthWest: Edgewater Drive (East)															
Lane 1	191	8.3	191	8.3	263	0.724	100	37.9	LOS D	6.6	49.2	Full	500	0.0	0.0
Approach	191	8.3	191	8.3		0.724		37.9	LOS D	6.6	49.2				
Intersection	3045	10.1	2873 <sup>N</sup> <sub>1</sub>	10.7		0.890		22.6	LOS C	34.5	262.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From SE To Exit:	SW	NW			veh/h	v/c	%	%		
Lane 1	134	753	887	9.3	997	0.890	100	NA	NA	
Lane 2	-	908	908	10.2	1021	0.890	100	NA	NA	
Approach	134	1661	1795	9.7		0.890				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From NW To Exit:	SE	SW			veh/h	v/c	%	%		
Lane 1	456	-	456	11.4	1050	0.434	100	NA	NA	
Lane 2	384	-	384	11.4	886 <sup>1</sup>	0.434	100	NA	NA	
Lane 3	-	47	47	13.0	145	0.321	100	0.0	2	
Approach	840	47	887	11.4		0.434				
SouthWest: Edgewater Drive (East)										

Mov. From SW To Exit:	L2 NW	R2 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	132	59	191	8.3	263	0.724	100	NA	NA
Approach	132	59	191	8.3		0.724			
Total %HV Deg. Satn (v/c)									
Intersection	2873	10.7		0.890					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
SouthWest Exit: Edgewater Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

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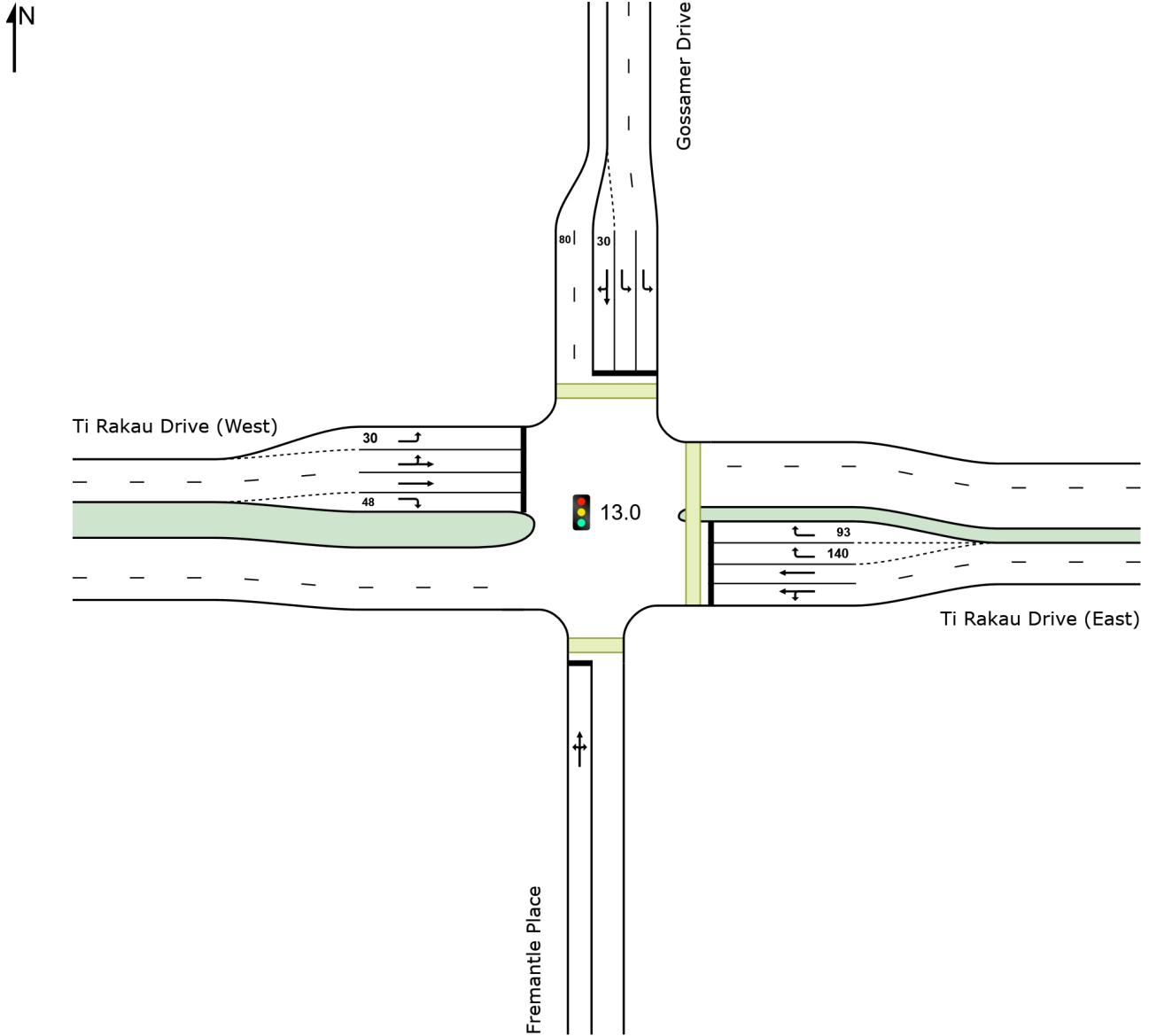
Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:34:48 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 AM-V1.sip9

# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 160 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
South: Fremantle Place															
Lane 1	51	7.8	51	7.8	67	0.764	100	94.5	LOS F	4.3	32.4	Full	285	0.0	0.0
Approach	51	7.8	51	7.8		0.764		94.5	LOS F	4.3	32.4				
East: Ti Rakau Drive (East)															
Lane 1	791	10.7	791	10.7	745	1.063	100	117.2	LOS F	79.4	607.0	Full	636	0.0	0.8
Lane 2	723	10.8	723	10.8	680 <sup>1</sup>	1.063	100	144.9	LOS F	91.2	697.7	Full	636	0.0	13.4
Lane 3	128	7.8	128	7.8	357	0.358	47 <sup>6</sup>	35.2	LOS D	4.6	34.6	Short	140	0.0	NA
Lane 4	271	7.8	271	7.8	357	0.759	100	51.0	LOS D	13.9	103.4	Short	93	0.0	NA
Approach	1913	10.1	1913	10.1		1.063		112.8	LOS F	91.2	697.7				
North: Gossamer Drive															
Lane 1	571	8.9	571	8.9	569	1.004	100	116.6	LOS F	62.3	469.6	Full	1010	0.0	0.0
Lane 2	359	8.9	359	8.9	357 <sup>1</sup>	1.004	100	127.1	LOS F	40.8	307.1	Full	1010	0.0	0.0
Lane 3	291	5.8	291	5.8	241 <sup>1</sup>	1.208	100	278.9	LOS F	48.1	353.3	Short	30	0.0	NA
Approach	1221	8.2	1221	8.2		1.208		158.3	LOS F	62.3	469.6				
West: Ti Rakau Drive (West)															
Lane 1	55	9.1	53	9.1	965	0.055	8 <sup>5</sup>	14.9	LOS B	1.3	10.1	Short	30	0.0	NA
Lane 2	395	11.4	380	11.5	530 <sup>1</sup>	0.718	100	49.3	LOS D	25.2	193.6	Full	479	0.0	0.0
Lane 3	419	11.4	405	11.5	564 <sup>1</sup>	0.718	100	50.5	LOS D	27.4	210.9	Full	479	0.0	0.0
Lane 4	11	9.1	11	9.1	264	0.040	100	66.0	LOS E	0.7	5.3	Short	48	0.0	NA
Approach	880	11.3	849 <sup>N1</sup>	11.3		0.718		47.9	LOS D	27.4	210.9				
Intersection	4065	9.8	4034 <sup>N1</sup>	9.8		1.208		112.7	LOS F	91.2	697.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

<sup>6</sup> Lane under-utilisation due to downstream effects

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: Fremantle Place											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. No.	Ov. Lane No.
Lane 1	23	11	17	51	7.8	67	0.764	100	NA	NA	
Approach	23	11	17	51	7.8		0.764				
East: Ti Rakau Drive (East)											

Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	18	773	-	791	10.7	745	1.063	100	NA	NA
Lane 2	-	723	-	723	10.8	680 <sup>1</sup>	1.063	100	NA	NA
Lane 3	-	-	128	128	7.8	357	0.358	47 <sup>6</sup>	0.0	2
Lane 4	-	-	271	271	7.8	357	0.759	100	14.6	3
Approach	18	1496	399	1913	10.1		1.063			
North: Gossamer Drive										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	571	-	-	571	8.9	569	1.004	100	NA	NA
Lane 2	359	-	-	359	8.9	357 <sup>1</sup>	1.004	100	NA	NA
Lane 3	-	11	280	291	5.8	241 <sup>1</sup>	1.208	100	100.0	2
Approach	930	11	280	1221	8.2		1.208			
West: Ti Rakau Drive (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	53	-	-	53	9.1	965	0.055	8 <sup>5</sup>	0.0	2
Lane 2	-	380	-	380	11.5	530 <sup>1</sup>	0.718	100	NA	NA
Lane 3	-	405	-	405	11.5	564 <sup>1</sup>	0.718	100	NA	NA
Lane 4	-	-	11	11	9.1	264	0.040	100	0.0	3
Approach	53	785	11	849	11.3		0.718			
Total %HV Deg. Satn (v/c)										
Intersection	4034	9.8		1.208						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Gossamer Drive Merge Type: <b>Zipper</b>												
Exit Short Lane	1	80	50.0	141	147	2.50	2.00	181	1630	0.111	0.0	0.1
Merge Lane	2	-	50.0	90	94	2.50	2.00	282	1693	0.167	0.0	0.0
West Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

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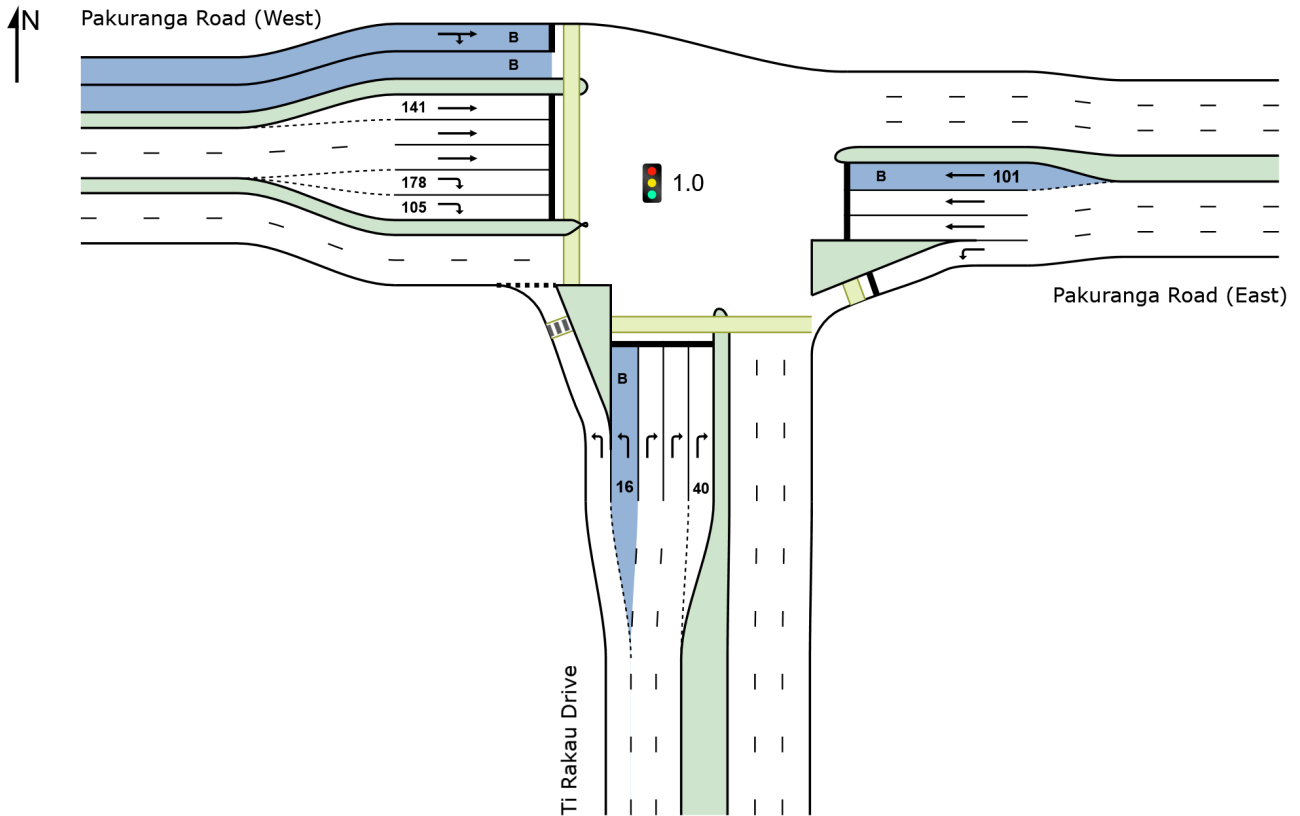
Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 AM-V1.sip9

# SITE LAYOUT

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 77 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m	m	%	%	
South: Ti Rakau Drive															
Lane 1	767	4.8	755	4.8	1144 <sup>1</sup>	0.660	100	8.6	LOS A	11.0	80.4	Full	174	0.0	0.0
Lane 2 (B)	13	100.0	13	100.0	132	0.099	100	43.0	LOS D	0.4	5.6	Short	16	0.0	NA
Lane 3	380	4.1	375	4.0	420	0.892	100	47.9	LOS D	15.3	110.5	Full	174	0.0	0.0
Lane 4	325	4.1	320	4.0	359 <sup>1</sup>	0.892	100	47.8	LOS D	12.8	92.8	Full	174	0.0	0.0
Lane 5	325	4.1	320	4.0	359 <sup>1</sup>	0.892	100	47.8	LOS D	12.8	92.8	Short	40	0.0	NA
Approach	1811	5.1	1784 <sup>N</sup> <sub>1</sub>	5.0		0.892		31.2	LOS C	15.3	110.5				
East: Pakuranga Road (East)															
Lane 1	787	4.7	723	4.7	975	0.742	100	20.3	LOS C	18.8	136.8	Full	113	0.0	32.5
Lane 2	406	10.2	373	10.3	425	0.877	100	41.2	LOS D	14.7	112.1	Full	113	0.0	14.3
Lane 3	406	10.2	373	10.3	425	0.877	100	41.2	LOS D	14.7	112.1	Full	113	0.0	14.3
Lane 4 (B)	11	100.0	11	100.0	93	0.118	100	40.4	LOS D	0.4	4.9	Short	101	0.0	NA
Approach	1609	8.1	1480 <sup>N</sup> <sub>1</sub>	8.2		0.877		31.0	LOS C	18.8	136.8				
West: Pakuranga Road (West)															
Lane 1 (B)	42	100.0	42	100.0	89	0.472	100	40.2	LOS D	1.4	18.8	Full	388	0.0	0.0
Lane 2	450	7.1	450	7.1	554	0.813	100	32.0	LOS C	15.8	117.3	Short	141	0.0	NA
Lane 3	450	7.1	450	7.1	554	0.813	100	32.0	LOS C	15.8	117.3	Full	388	0.0	0.0
Lane 4	450	7.1	450	7.1	554	0.813	100	32.0	LOS C	15.8	117.3	Full	388	0.0	0.0
Lane 5	228	8.8	228	8.8	248	0.916	100	56.1	LOS E	9.7	72.7	Short	178	0.0	NA
Lane 6	228	8.8	228	8.8	248	0.916	100	56.1	LOS E	9.7	72.7	Short	105	0.0	NA
Approach	1847	9.6	1847	9.6		0.916		38.1	LOS D	15.8	117.3				
Intersection	5267	7.6	5111 <sup>N</sup> <sub>1</sub>	7.8		0.916		33.6	LOS C	18.8	136.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	W	E								
Lane 1	755	-	755	4.8	1144 <sup>1</sup>	0.660	100	NA	NA	
Lane 2	13	-	13	100.0	132	0.099	100	0.0	1	
Lane 3	-	375	375	4.0	420	0.892	100	NA	NA	
Lane 4	-	320	320	4.0	359 <sup>1</sup>	0.892	100	NA	NA	



Lane 5	-	320	320	4.0	359 <sup>1</sup>	0.892	100	94.8	4
Approach	768	1016	1784	5.0		0.892			
East: Pakuranga Road (East)									
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W							
Lane 1	723	-	723	4.7	975	0.742	100	NA	NA
Lane 2	-	373	373	10.3	425	0.877	100	NA	NA
Lane 3	-	373	373	10.3	425	0.877	100	NA	NA
Lane 4	-	11	11	100.0	93	0.118	100	0.0	3
Approach	723	756	1480	8.2		0.877			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	21	21	42	100.0	89	0.472	100	NA	NA
Lane 2	450	-	450	7.1	554	0.813	100	0.0	3
Lane 3	450	-	450	7.1	554	0.813	100	NA	NA
Lane 4	450	-	450	7.1	554	0.813	100	NA	NA
Lane 5	-	228	228	8.8	248	0.916	100	0.0	4
Lane 6	-	228	228	8.8	248	0.916	100	0.0	5
Approach	1371	476	1847	9.6		0.916			
Total %HV Deg. Satn (v/c)									
Intersection	5111	7.8		0.916					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

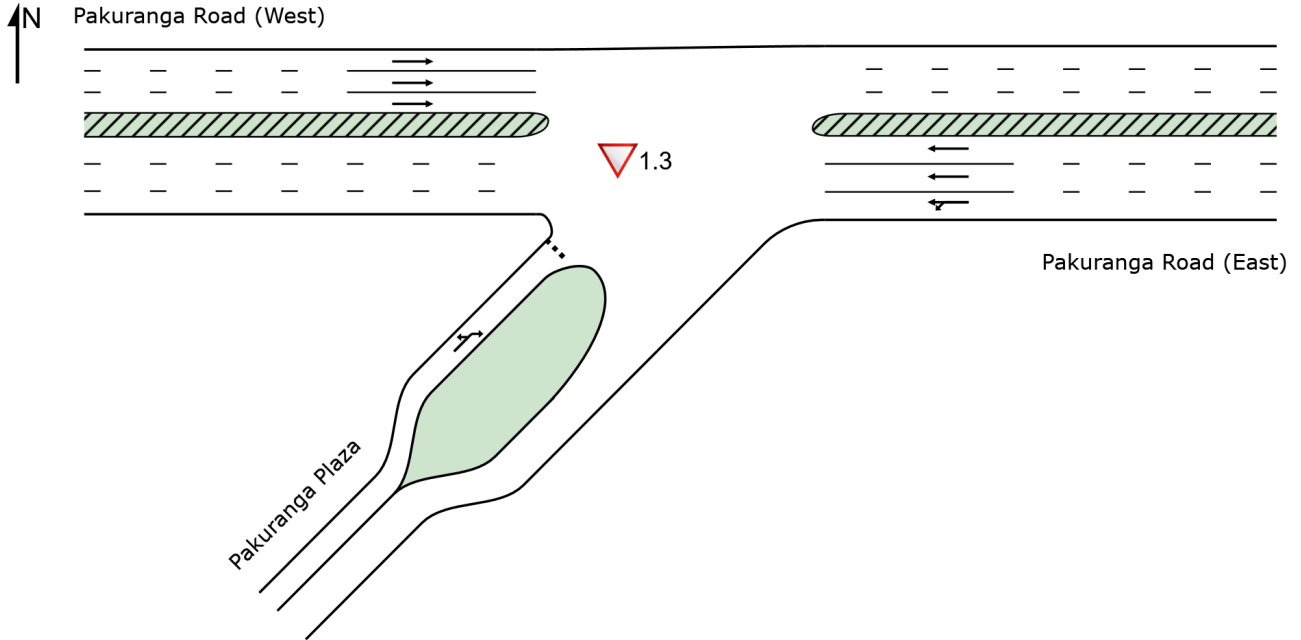
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
East Exit: Pakuranga Road (East) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
West Exit: Pakuranga Road (West) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										

# SITE LAYOUT

▽ Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
East: Pakuranga Road (East)															
Lane 1	508	8.7	488	8.6	1847	0.264	100	1.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 2	515	7.3	494	7.2	1872	0.264	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 3	515	7.3	494	7.2	1872	0.264	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Approach	1539	7.7	1476 <sup>N1</sup>	7.7		0.264		0.3	NA	0.0	0.0				
West: Pakuranga Road (West)															
Lane 1	797	6.6	792	6.6	1802	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 2	797	6.6	792	6.6	1802	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 3	792	6.6	787	6.6	1792	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Approach	2386	6.6	2371 <sup>N1</sup>	6.6		0.439		0.0	NA	0.0	0.0				
SouthWest: Pakuranga Plaza															
Lane 1	108	6.5	108	6.5	58	1.875	100	917.1	LOS F	27.5	203.5	Full	196	-5.9 <sup>N7</sup>	16.4
Approach	108	6.5	108	6.5		1.875		917.1	LOS F	27.5	203.5				
Intersection	4033	7.0	3955 <sup>N1</sup>	7.2		1.875		25.2	NA	27.5	203.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	L1	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	W								
Lane 1	90	398	488	8.6	1847	0.264	100	NA	NA	
Lane 2	-	494	494	7.2	1872	0.264	100	NA	NA	
Lane 3	-	494	494	7.2	1872	0.264	100	NA	NA	
Approach	90	1386	1476	7.7		0.264				
West: Pakuranga Road (West)										
Mov. From W To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
	E									
Lane 1	792	792	6.6	1802	0.439	100	NA	NA		
Lane 2	792	792	6.6	1802	0.439	100	NA	NA		

Lane 3	787	787	6.6		1792	0.439	100	NA	NA
Approach	2371	2371	6.6			0.439			
SouthWest: Pakuranga Plaza									
Mov. From SW To Exit:	L3 W	R1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	98	10	108	6.5	58	1.875	100	NA	NA
Approach	98	10	108	6.5		1.875			
Total %HV Deg. Satn (v/c)									
Intersection	3955	7.2		1.875					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

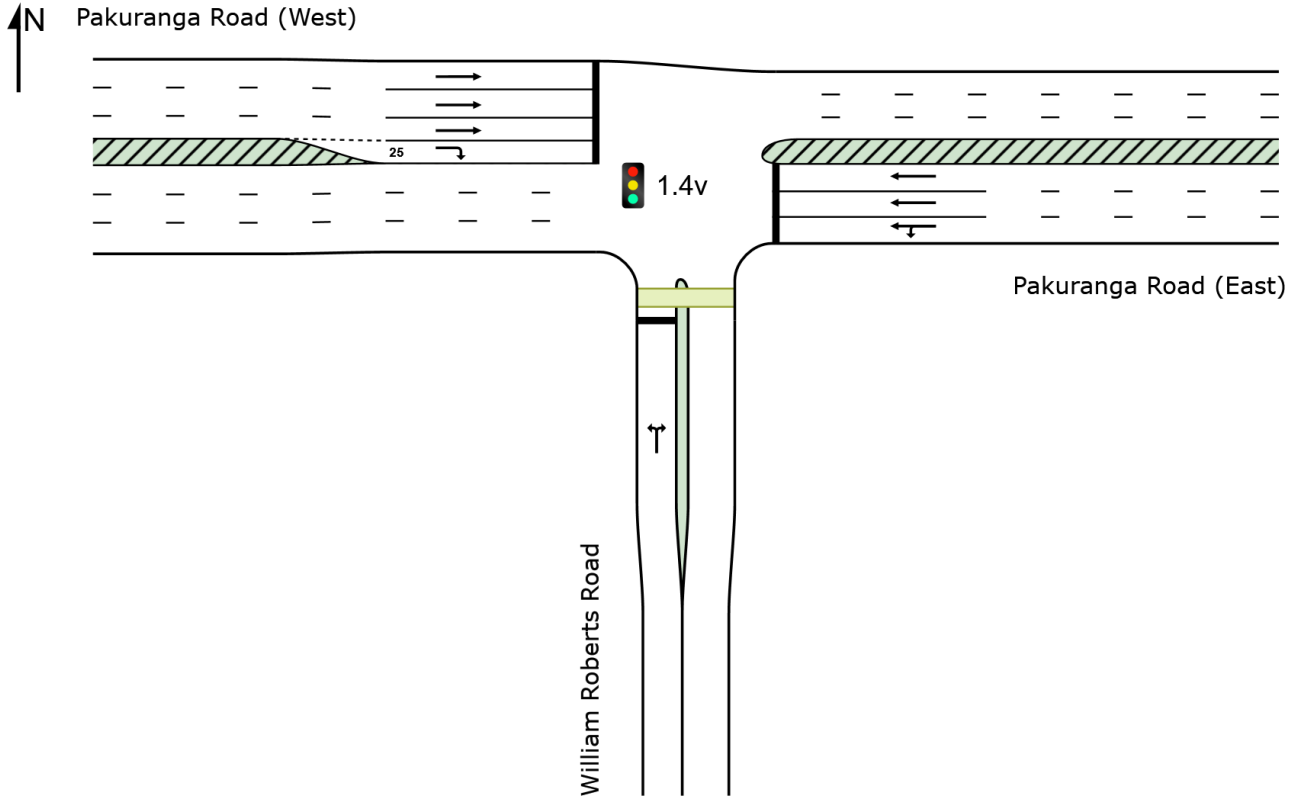
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
SouthWest Exit: Pakuranga Plaza												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

# SITE LAYOUT

 Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
South: William Roberts Road															
Lane 1	236	7.2	236	7.2	124	1.905	100	873.9	LOS F	48.0 <sup>N4</sup>	356.5 <sup>N4</sup>	Full	244	-28.7 <sup>N7</sup>	50.0
Approach	236	7.2	236	7.2		1.905		873.9	LOS F	48.0	356.5				
East: Pakuranga Road (East)															
Lane 1	489	7.3	489	7.3	1319	0.371	100	4.2	LOS A	4.8	35.5	Full	184	0.0	0.0
Lane 2	488	7.6	488	7.6	1315	0.371	100	6.3	LOS A	8.3	61.9	Full	184	0.0	0.0
Lane 3	493	7.6	493	7.6	1329	0.371	100	6.2	LOS A	8.3	62.1	Full	184	0.0	0.0
Approach	1471	7.5	1471	7.5		0.371		5.6	LOS A	8.3	62.1				
West: Pakuranga Road (West)															
Lane 1	1119	6.5	1116	6.6	1231	0.907	100	15.9	LOS B	30.0 <sup>N4</sup>	222.1 <sup>N4</sup>	Full	152	-19.6 <sup>N3</sup>	50.0
Lane 2	695	6.5	694	6.6	765	0.907	100	33.1	LOS C	30.0 <sup>N4</sup>	222.1 <sup>N4</sup>	Full	152	-50.0 <sup>N3</sup>	50.0
Lane 3	647	6.5	646	6.6	712 <sup>1</sup>	0.907	100	34.5	LOS C	30.0 <sup>N4</sup>	222.1 <sup>N4</sup>	Full	152	-50.0 <sup>N3</sup>	50.0
Lane 4	54	13.0	54	13.0	98	0.551	100	84.0	LOS F	3.6	28.3	Short	25	0.0	NA
Approach	2515	6.7	2510 <sup>N1</sup>	6.7		0.907		26.9	LOS C	30.0	222.1				
Intersection	4222	7.0	4216 <sup>N1</sup>	7.0		1.905		66.8	LOS E	48.0	356.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Road										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	141	95	236	7.2	124	1.905	100	NA	NA	
Approach	141	95	236	7.2		1.905				
East: Pakuranga Road (East)										
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	73	416	489	7.3	1319	0.371	100	NA	NA	

Lane 2	-	488	488	7.6	1315	0.371	100	NA	NA
Lane 3	-	493	493	7.6	1329	0.371	100	NA	NA
Approach	73	1398	1471	7.5		0.371			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	1116	-	1116	6.6	1231	0.907	100	NA	NA
Lane 2	694	-	694	6.6	765	0.907	100	NA	NA
Lane 3	646	-	646	6.6	712 <sup>1</sup>	0.907	100	NA	NA
Lane 4	-	54	54	13.0	98	0.551	100	26.5	3
Approach	2456	54	2510	6.7		0.907			
Total %HV Deg. Satn (v/c)									
Intersection	4216	7.0		1.905					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

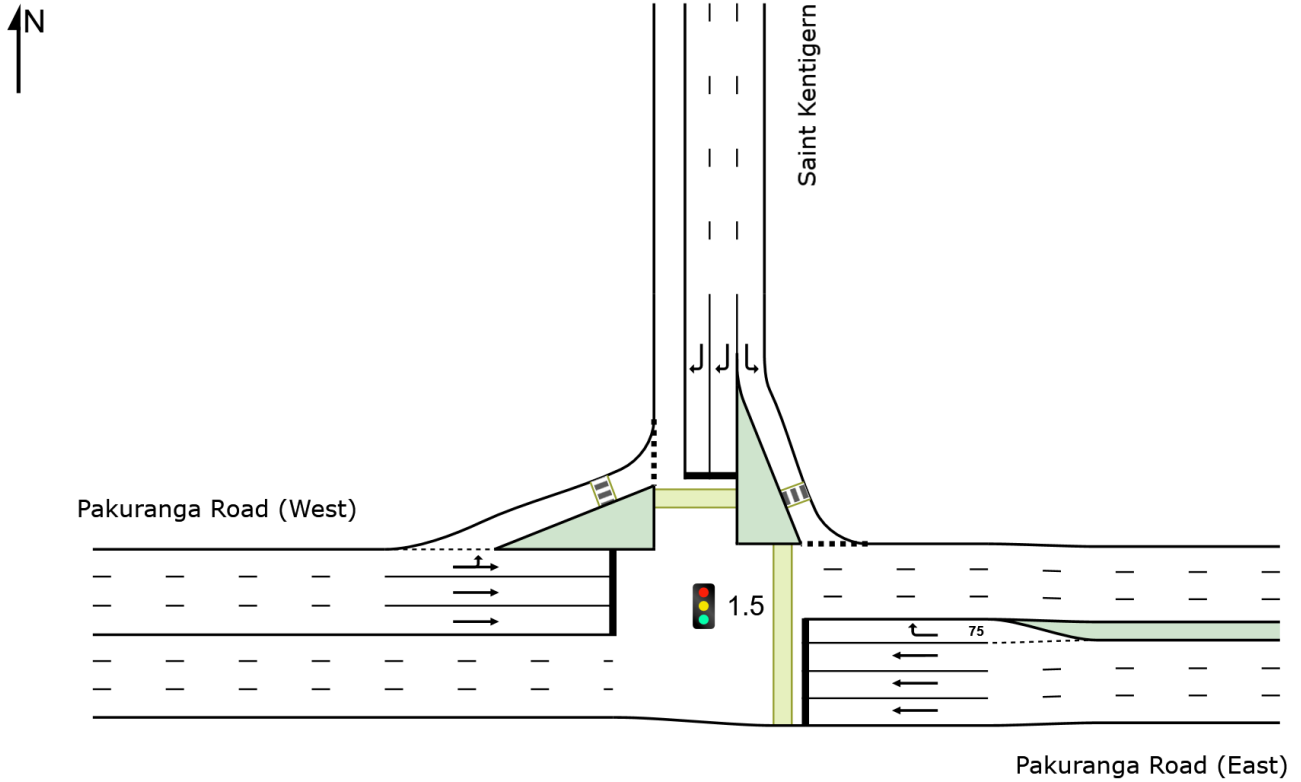
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

**Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]**

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





## LANE SUMMARY

**Site:** 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder:  Network: N101 [PM (Network General)] Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Pakuranga Road (East)															
Lane 1	458	7.6	458	7.6	1415	0.323	100	5.4	LOS A	8.8	65.6	Full	87	0.0	0.0
Lane 2	458	7.6	458	7.6	1415	0.323	100	5.4	LOS A	8.8	65.6	Full	87	0.0	0.0
Lane 3	460	7.6	460	7.6	1422	0.323	100	5.4	LOS A	8.8	65.9	Full	87	0.0	0.0
Lane 4	27	3.7	27	3.7	139	0.194	100	52.6	LOS D	1.3	9.7	Short	75	0.0	NA
Approach	1402	7.5	1402	7.5		0.323		6.3	LOS A	8.8	65.9				
North: Saint Kentigern															
Lane 1	57	3.5	57	3.5	544	0.105	100	15.9	LOS B	1.8	12.7	Full	96	0.0	0.0
Lane 2	47	7.5	47	7.5	254	0.184	100	60.9	LOS E	2.7	20.2	Full	96	0.0	0.0
Lane 3	46	7.5	46	7.5	250	0.184	100	61.0	LOS E	2.7	19.9	Full	96	0.0	0.0
Approach	150	6.0	150	6.0		0.184		43.8	LOS D	2.7	20.2				
West: Pakuranga Road (West)															
Lane 1	603	6.2	592	6.3	701	0.845	100	22.6	LOS C	26.2	193.5	Full	184	0.0	19.6
Lane 2	982	6.5	965	6.5	1141	0.845	100	16.9	LOS B	36.4 <sup>N4</sup>	268.9 <sup>N4</sup>	Full	184	0.0	50.0
Lane 3	982	6.5	965	6.5	1141	0.845	100	20.0	LOS C	36.4 <sup>N4</sup>	268.9 <sup>N4</sup>	Full	184	0.0	50.0
Approach	2568	6.4	2521 <sup>N</sup> 1	6.5		0.845		19.5	LOS B	36.4	268.9				
Intersection	4120	6.8	4073 <sup>N</sup> 1	6.8		0.845		15.8	LOS B	36.4	268.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From E To Exit:	W	N								
Lane 1	458	-	458	7.6	1415	0.323	100	NA	NA	
Lane 2	458	-	458	7.6	1415	0.323	100	NA	NA	
Lane 3	460	-	460	7.6	1422	0.323	100	NA	NA	
Lane 4	-	27	27	3.7	139	0.194	100	0.0	3	
Approach	1375	27	1402	7.5		0.323				
North: Saint Kentigern										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From N To Exit:	E	W								
Lane 1	57	-	57	3.5	544	0.105	100	NA	NA	

Lane 2	-	47	47	7.5	254	0.184	100	NA	NA
Lane 3	-	46	46	7.5	250	0.184	100	NA	NA
Approach	57	93	150	6.0		0.184			
West: Pakuranga Road (West)									
Mov. From W To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
	N	E							
Lane 1	53	539	592	6.3	701	0.845	100	NA	NA
Lane 2	-	965	965	6.5	1141	0.845	100	NA	NA
Lane 3	-	965	965	6.5	1141	0.845	100	NA	NA
Approach	53	2468	2521	6.5		0.845			
Total %HV Deg. Satn (v/c)									
Intersection	4073	6.8		0.845					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

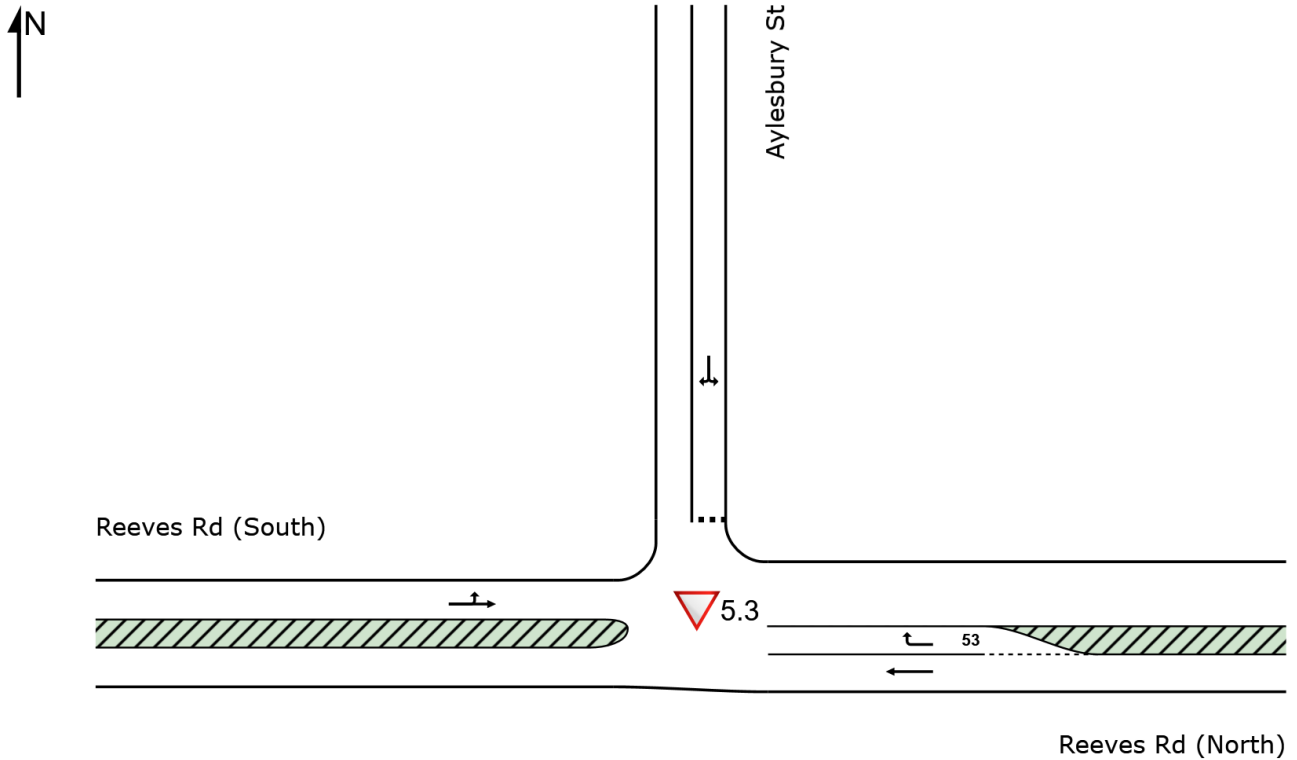
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
North Exit: Saint Kentigern												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

▽ Site: 5.3 [5.3 Reeves Rd/ Aylesbury St (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 5.3 [5.3 Reeves Rd/ Aylesbury St (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%							m				
East: Reeves Rd (North)															
Lane 1	15	0.0	15	0.0	2021	0.007	100	0.0	LOS A	0.0	0.0	Full	60	0.0	0.0
Lane 2	10	0.0	10	0.0	1743	0.006	100	4.6	LOS A	0.0	0.1	Short	53	0.0	NA
Approach	25	0.0	25	0.0		0.007		1.8	NA	0.0	0.1				
North: Aylesbury St															
Lane 1	56	5.4	56	5.4	1284	0.044	100	0.3	LOS A	0.1	0.9	Full	193	0.0	0.0
Approach	56	5.4	56	5.4		0.044		0.3	LOS A	0.1	0.9				
West: Reeves Rd (South)															
Lane 1	38	2.6	38	2.6	1932	0.020	100	3.4	LOS A	0.0	0.0	Full	175	0.0	0.0
Approach	38	2.6	38	2.6		0.020		3.4	NA	0.0	0.0				
Intersection	119	3.4	119	3.4		0.044		1.6	NA	0.1	0.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
East: Reeves Rd (North)										
Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N				v/c	%	%	%	No.
Lane 1	15	-	15	0.0	2021	0.007	100	NA	NA	
Lane 2	-	10	10	0.0	1743	0.006	100	0.0	1	
Approach	15	10	25	0.0		0.007				
North: Aylesbury St										
Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From N					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	E	W				v/c	%	%	%	No.
Lane 1	26	30	56	5.4	1284	0.044	100	NA	NA	
Approach	26	30	56	5.4		0.044				
West: Reeves Rd (South)										
Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From W					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	N	E				v/c	%	%	%	No.
Lane 1	28	10	38	2.6	1932	0.020	100	NA	NA	
Approach	28	10	38	2.6		0.020				

	Total	%HV	Deg.Satn (v/c)
Intersection	119	3.4	0.044

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

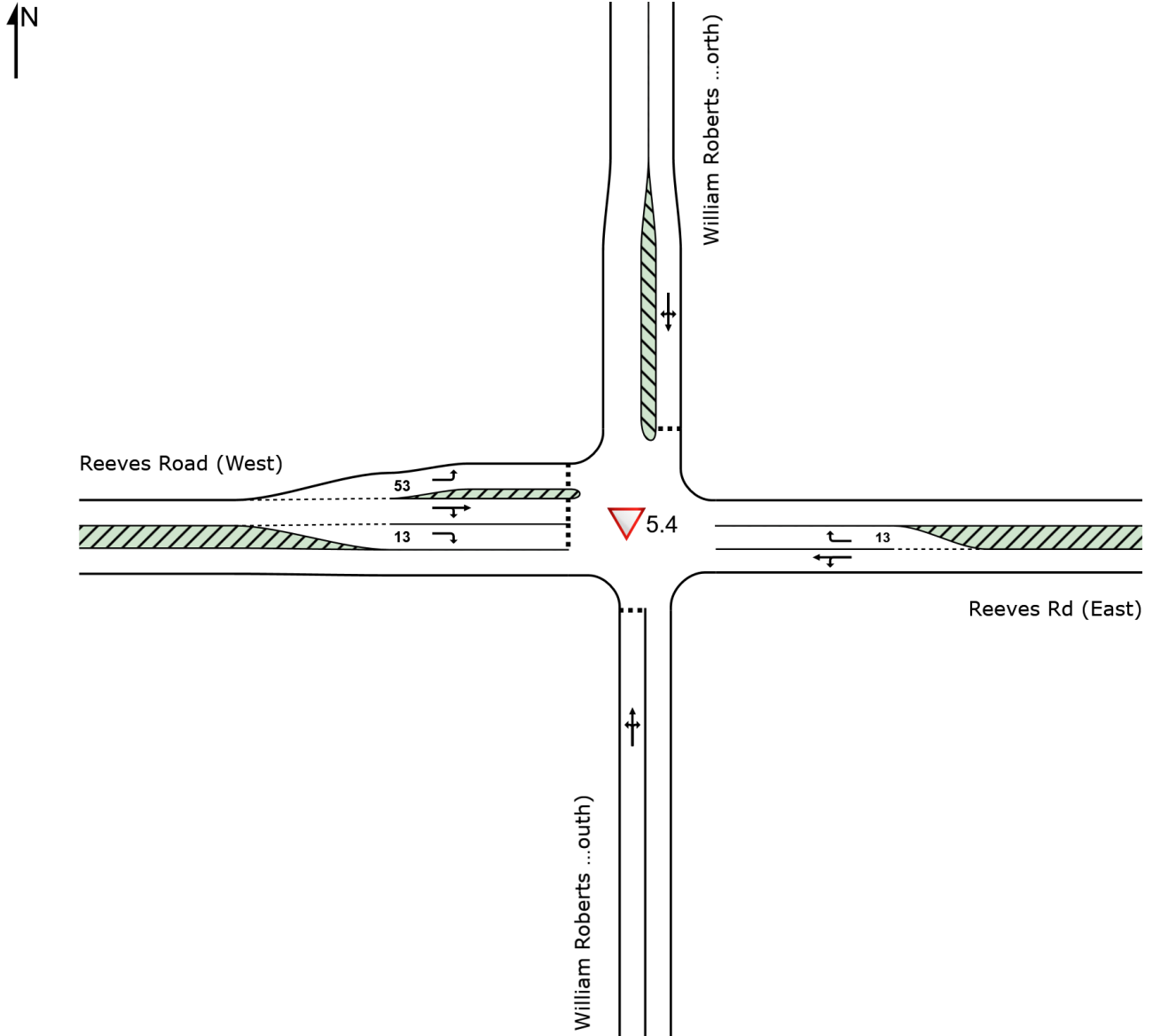
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Reeves Rd (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
North Exit: Aylesbury St Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
West Exit: Reeves Rd (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								

# SITE LAYOUT

▽ Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



## LANE SUMMARY

Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE [ Veh Dist ] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %	
South: William Roberts Rd (South)															
Lane 1	105	9.7	104	9.8	728	0.142	100	2.4	LOS A	0.2	1.8	Full	243	-37.2 <sup>N7</sup>	0.0
Approach	105	9.7	104 <sup>N1</sup>	9.8		0.142		2.4	LOS A	0.2	1.8				
East: Reeves Rd (East)															
Lane 1	101	10.9	101	10.9	1704	0.059	100	4.3	LOS A	0.0	0.0	Full	266	0.0	0.0
Lane 2	90	18.9	90	18.9	1611	0.056	100	4.7	LOS A	0.0	0.0	Short	13	0.0	NA
Approach	191	14.7	191	14.7		0.059		4.5	NA	0.0	0.0				
North: William Roberts Rd (North)															
Lane 1	51	2.0	50	2.0	1231	0.041	100	4.8	LOS A	0.1	0.7	Full	244	0.0	0.0
Approach	51	2.0	50	2.0		0.041		4.8	LOS A	0.1	0.7				
West: Reeves Road (West)															
Lane 1	11	0.0	11	0.0	713	0.015	100	4.8	LOS A	0.0	0.1	Short	53	-50.0 <sup>N7</sup>	NA
Lane 2	17	6.3	17	6.3	1265	0.013	100	3.6	LOS A	0.0	0.3	Full	60	0.0	0.0
Lane 3	11	0.0	11	0.0	1004	0.010	79 <sup>5</sup>	5.1	LOS A	0.0	0.2	Short	13	0.0	NA
Approach	38	2.8	38	2.8		0.015		4.3	LOS A	0.0	0.3				
Intersection	384	10.5	383 <sup>N1</sup>	10.5		0.142		4.0	NA	0.2	1.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>5</sup> Lane under-utilisation found by the program

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)											
South: William Roberts Rd (South)											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From S						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N	E				v/c	%	%	%	No.
Lane 1	10	61	32	104	9.8	728	0.142	100	NA	NA	
Approach	10	61	32	104	9.8		0.142				
East: Reeves Rd (East)											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	S	W	N				v/c	%	%	%	No.
Lane 1	90	11	-	101	10.9	1704	0.059	100	NA	NA	

Lane 2	-	-	90	90	18.9	1611	0.056	100	0.0	1
Approach	90	11	90	191	14.7		0.059			
North: William Roberts Rd (North)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	10	30	11	50	2.0	1231	0.041	100	NA	NA
Approach	10	30	11	50	2.0		0.041			
West: Reeves Road (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	11	-	-	11	0.0	713	0.015	100	0.0	2
Lane 2	-	17	-	17	6.3	1265	0.013	100	NA	NA
Lane 3	-	-	11	11	0.0	1004	0.010	79 <sup>5</sup>	0.0	2
Approach	11	17	11	38	2.8		0.015			
Total %HV Deg. Satn (v/c)										
Intersection	383	10.5		0.142						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: William Roberts Rd (South)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Reeves Rd (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
North Exit: William Roberts Rd (North)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Reeves Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											



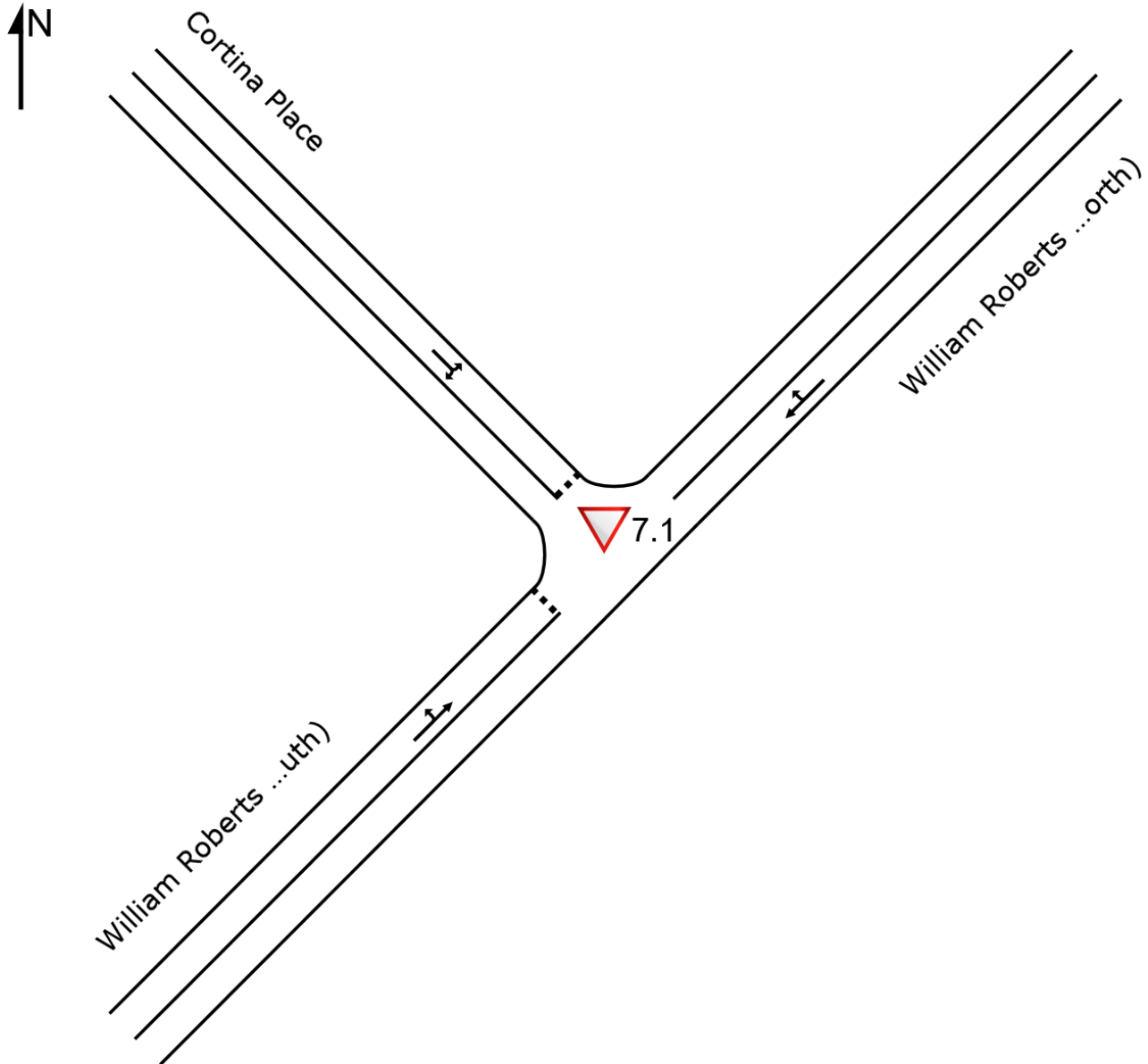
# SITE LAYOUT

▽ Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

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Scheme Design  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Scheme Design  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE [ Veh Dist ] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %	
NorthEast: William Roberts Road (North)															
Lane 1	116	5.2	116	5.2	1854	0.063	100	0.9	LOS A	0.0	0.0	Full	243	0.0	0.0
Approach	116	5.2	116	5.2		0.063		0.9	NA	0.0	0.0				
NorthWest: Cortina Place															
Lane 1	65	7.7	65	7.7	1072	0.061	100	4.0	LOS A	0.2	1.2	Full	140	0.0	0.0
Approach	65	7.7	65	7.7		0.061		4.0	LOS A	0.2	1.2				
SouthWest: William Roberts Road (South)															
Lane 1	276	8.4	273	8.4	1372	0.199	100	3.6	LOS A	0.6	4.6	Full	110	0.0	0.0
Approach	276	8.4	273 <sup>N1</sup>	8.4		0.199		3.6	LOS A	0.6	4.6				
Intersection	457	7.5	453 <sup>N1</sup>	7.5		0.199		3.0	NA	0.6	4.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov. From NE To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
	SW	NW								
Lane 1	91	25	116	5.2	1854	0.063	100	NA	NA	
Approach	91	25	116	5.2		0.063				
NorthWest: Cortina Place										
Mov. From NW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
	NE	SW								
Lane 1	45	20	65	7.7	1072	0.061	100	NA	NA	
Approach	45	20	65	7.7		0.061				
SouthWest: William Roberts Road (South)										
Mov. From SW To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
	NW	NE								
Lane 1	29	244	273	8.4	1372	0.199	100	NA	NA	
Approach	29	244	273	8.4		0.199				
Total %HV Deg. Satn (v/c)										

Intersection	453	7.5	0.199
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Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

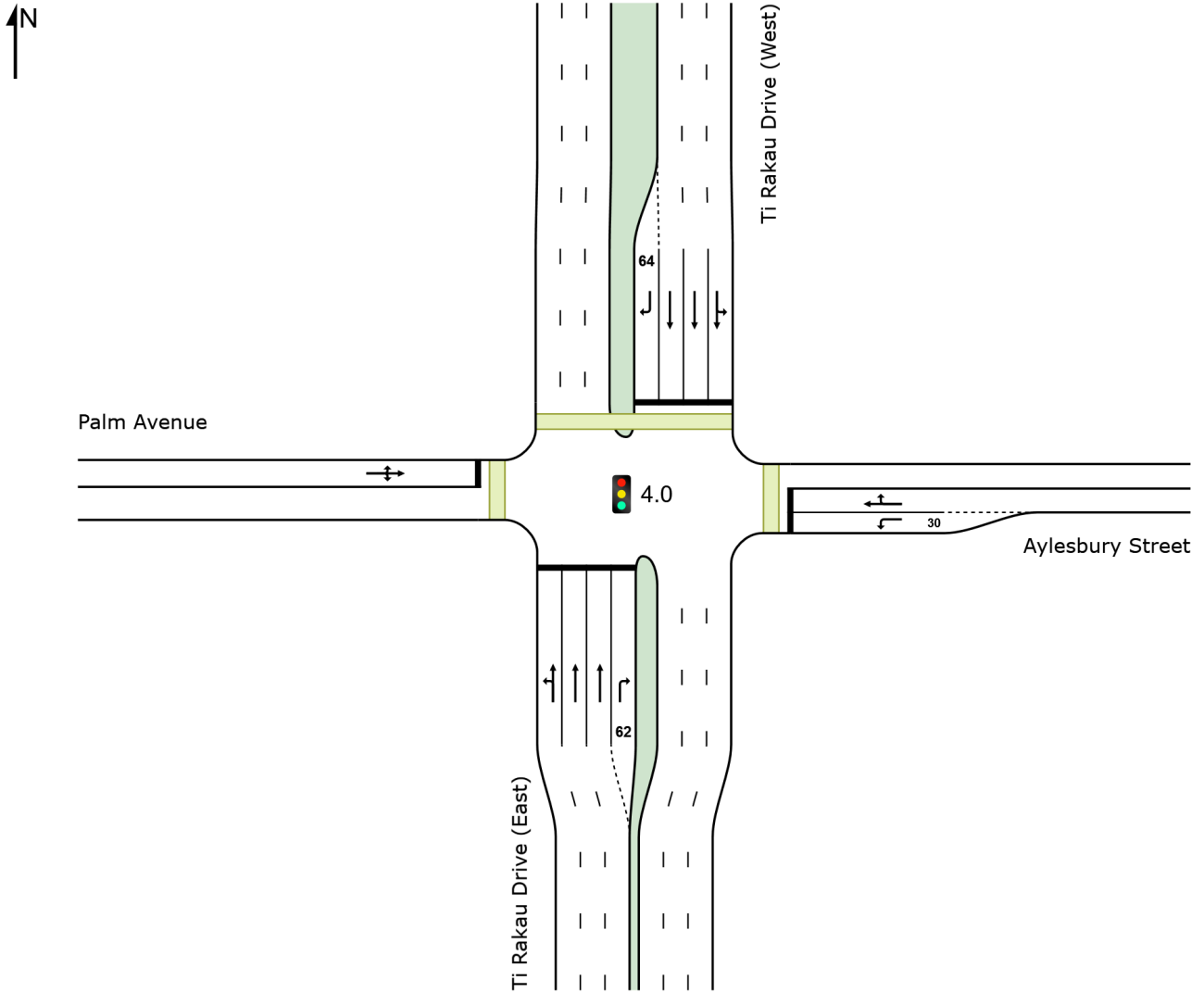
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
NorthWest Exit: Cortina Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
SouthWest Exit: William Roberts Road (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								

# SITE LAYOUT

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total HV ]	%	[ Total HV ]	%						[ Veh ]	[ Dist ]				
South: Ti Rakau Drive (East)															
Lane 1	595	4.9	585	4.9	1112	0.526	100	20.4	LOS C	20.5	149.5	Full	110	0.0	43.2
Lane 2	620	5.1	609	5.1	1158	0.526	100	18.2	LOS B	20.7	151.5	Full	110	0.0	44.5
Lane 3	611	5.1	601	5.1	1143 <sup>1</sup>	0.526	100	18.1	LOS B	20.3	148.4	Full	110	0.0	42.6
Lane 4	10	0.0	10	0.0	164	0.060	100	71.3	LOS E	0.6	4.2	Short	62	0.0	NA
Approach	1836	5.0	1805 <sup>N1</sup>	5.0		0.526		19.2	LOS B	20.7	151.5				
East: Aylesbury Street															
Lane 1	27	3.7	27	3.7	111	0.242	100	53.4	LOS D	1.5	11.1	Short	30	-50.0 <sup>N3</sup>	NA
Lane 2	21	4.8	21	4.8	69	0.303	100	81.6	LOS F	1.4	10.4	Full	40	0.0	0.0
Approach	48	4.2	48	4.2		0.303		65.8	LOS E	1.5	11.1				
North: Ti Rakau Drive (West)															
Lane 1	417	7.6	396	7.7	576	0.687	100	20.7	LOS C	16.0	119.8	Full	174	-49.4 <sup>N3</sup>	0.0
Lane 2	411	7.7	391	7.9	569	0.687	100	21.2	LOS C	16.0	119.7	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 3	397	7.7	378	7.9	550 <sup>1</sup>	0.687	100	20.7	LOS C	15.0	112.5	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 4	43	7.0	41	7.1	157	0.261	100	73.7	LOS E	2.6	19.0	Short	64	0.0	NA
Approach	1268	7.6	1205 <sup>N1</sup>	7.8		0.687		22.7	LOS C	16.0	119.8				
West: Palm Avenue															
Lane 1	95	4.2	95	4.2	112	0.848	100	88.8	LOS F	7.0	50.7	Full	87	-30.1 <sup>N3</sup>	0.0
Approach	95	4.2	95	4.2		0.848		88.8	LOS F	7.0	50.7				
Intersection	3247	6.0	3153 <sup>N1</sup>	6.2		0.848		23.3	LOS C	20.7	151.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive (East)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E							
Lane 1	63	522	-	585	4.9	1112	0.526	100	NA	NA
Lane 2	-	609	-	609	5.1	1158	0.526	100	NA	NA
Lane 3	-	601	-	601	5.1	1143 <sup>1</sup>	0.526	100	NA	NA
Lane 4	-	-	10	10	0.0	164	0.060	100	0.0	3

Approach	63	1732	10	1805	5.0		0.526				
East: Aylesbury Street											
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	27	-	-	27	3.7	111	0.242	100	0.0	2	
Lane 2	-	10	11	21	4.8	69	0.303	100	NA	NA	
Approach	27	10	11	48	4.2		0.303				
North: Ti Rakau Drive (West)											
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	9	386	-	396	7.7	576	0.687	100	NA	NA	
Lane 2	-	391	-	391	7.9	569	0.687	100	NA	NA	
Lane 3	-	378	-	378	7.9	550 <sup>1</sup>	0.687	100	NA	NA	
Lane 4	-	-	41	41	7.1	157	0.261	100	0.0	3	
Approach	9	1155	41	1205	7.8		0.687				
West: Palm Avenue											
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	44	10	41	95	4.2	112	0.848	100	NA	NA	
Approach	44	10	41	95	4.2		0.848				
Total %HV Deg. Satn (v/c)											
Intersection	3153	6.2		0.848							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
East Exit: Aylesbury Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
North Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Palm Avenue Merge Type: <b>Not Applied</b>												
Full Length Lane	1											

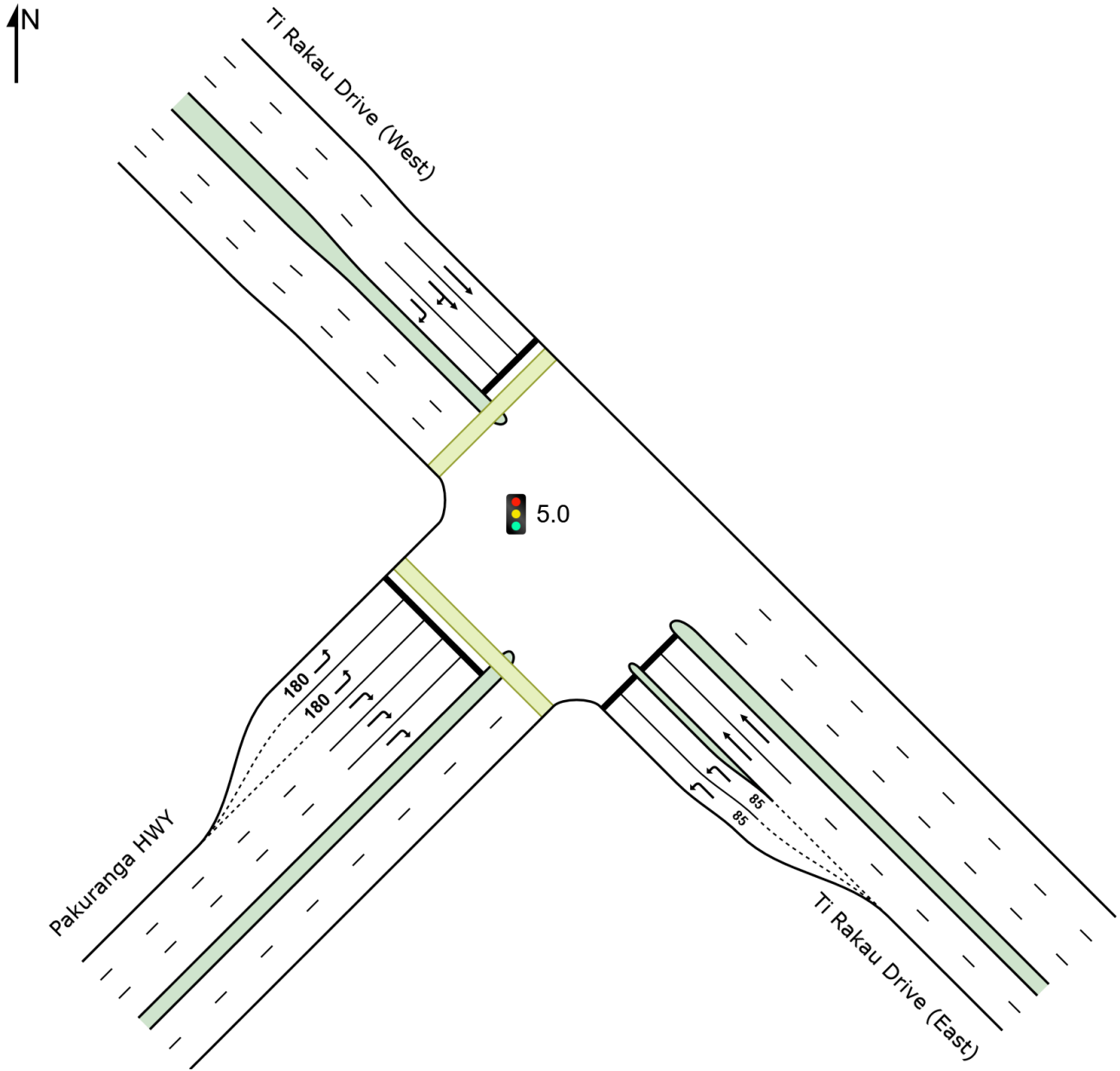
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 PM -V1.sip9

# SITE LAYOUT

 Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





# LANE SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	420	7.7	402	7.5	1139	0.353	100	16.5	LOS B	11.4	84.9	Short	85	0.0	NA
Lane 2	420	7.7	402	7.5	1139	0.353	100	16.5	LOS B	11.4	84.9	Short	85	0.0	NA
Lane 3	360	5.7	345	5.6	350 <sup>1</sup>	0.985	100	105.5	LOS F	18.1 <sup>N4</sup>	133.0 <sup>N4</sup>	Full	91	-43.2 <sup>N3</sup>	50.0
Lane 4	401	5.7	385	5.6	391	0.985	100	106.6	LOS F	18.1 <sup>N4</sup>	133.0 <sup>N4</sup>	Full	91	-44.5 <sup>N3</sup>	50.0
Approach	1601	6.7	1534 <sup>N</sup>	6.6		0.985		59.1	LOS E	18.1	133.0				
NorthWest: Ti Rakau Drive (West)															
Lane 1	441	9.0	421	9.2	473	0.890	100	69.7	LOS E	21.3 <sup>N4</sup>	160.7 <sup>N4</sup>	Full	110	0.0	50.0
Lane 2	433	6.9	413	7.0	464	0.890	100	74.1	LOS E	21.7 <sup>N4</sup>	160.7 <sup>N4</sup>	Full	110	0.0	50.0
Lane 3	420	6.7	401	6.8	451	0.890	100	74.9	LOS E	21.7 <sup>N4</sup>	160.7 <sup>N4</sup>	Full	110	0.0	50.0
Approach	1295	7.6	1236 <sup>N</sup>	7.7		0.890		72.8	LOS E	21.7	160.7				
SouthWest: Pakuranga HWY															
Lane 1	540	4.7	540	4.7	560	0.965	100	90.2	LOS F	48.4	352.6	Short	180	-43.2 <sup>N3</sup>	NA
Lane 2	528	4.7	528	4.7	547	0.965	100	90.8	LOS F	47.5	345.9	Short	180	-44.5 <sup>N3</sup>	NA
Lane 3	329	5.7	329	5.7	426	0.771	100	66.6	LOS E	20.7	151.6	Full	1650	0.0	0.0
Lane 4	329	5.7	329	5.7	426	0.771	100	66.6	LOS E	20.7	151.6	Full	1650	0.0	0.0
Lane 5	332	5.7	332	5.7	431	0.771	100	66.6	LOS E	20.9	153.0	Full	1650	0.0	0.0
Approach	2057	5.2	2057	5.2		0.965		79.0	LOS E	48.4	352.6				
Intersection	4953	6.3	4827 <sup>N</sup>	6.5		0.985		71.1	LOS E	48.4	352.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov. From SE To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	NW								
Lane 1	402	-	402	7.5	1139	0.353	100	14.9	2	
Lane 2	402	-	402	7.5	1139	0.353	100	14.9	3	
Lane 3	-	345	345	5.6	350 <sup>1</sup>	0.985	100	NA	NA	
Lane 4	-	385	385	5.6	391	0.985	100	NA	NA	

Approach	804	730	1534	6.6		0.985				
NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	T1 SE	R2 SW	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
Lane 1	421	-	421	9.2	473	0.890	100	NA	NA	
Lane 2	37	376	413	7.0	464	0.890	100	NA	NA	
Lane 3	-	401	401	6.8	451	0.890	100	NA	NA	
Approach	459	778	1236	7.7		0.890				
SouthWest: Pakuranga HWY										
Mov. From SW To Exit:	L2 NW	R2 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
Lane 1	540	-	540	4.7	560	0.965	100	78.0	2	
Lane 2	528	-	528	4.7	547	0.965	100	78.0	4	
Lane 3	-	329	329	5.7	426	0.771	100	NA	NA	
Lane 4	-	329	329	5.7	426	0.771	100	NA	NA	
Lane 5	-	332	332	5.7	431	0.771	100	NA	NA	
Approach	1068	989	2057	5.2		0.965				
Total %HV Deg. Satn (v/c)										
Intersection	4827	6.5		0.985						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

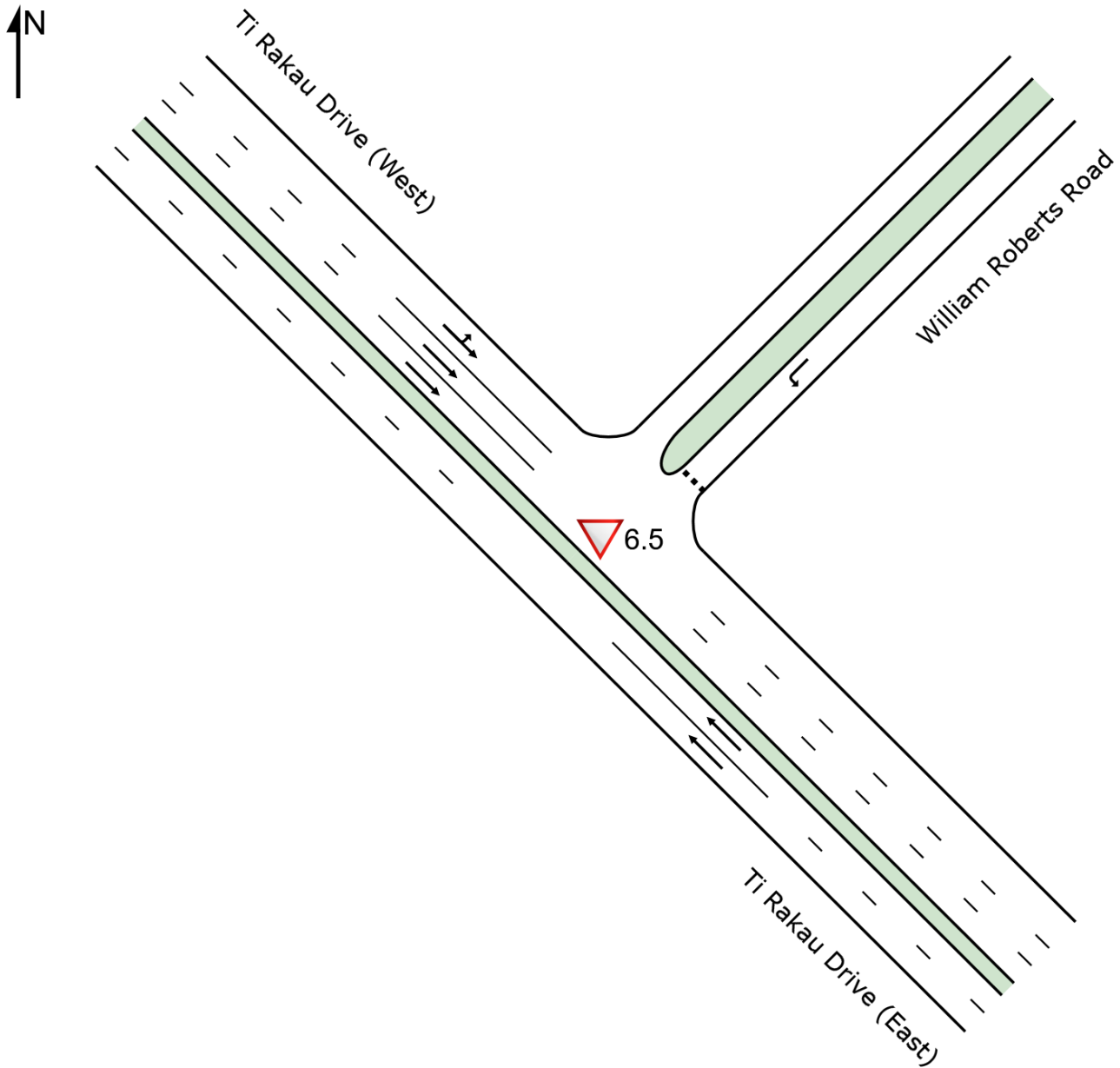
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
SouthWest Exit: Pakuranga HWY											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.

# SITE LAYOUT

▽ Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	835	6.4	799	6.2	1826	0.437	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Lane 2	826	6.4	790	6.2	1806	0.437	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	1661	6.4	1589 <sup>N1</sup>	6.2		0.437		0.0	NA	0.0	0.0				
NorthEast: William Roberts Road															
Lane 1	110	3.6	110	3.6	487	0.226	100	3.4	LOS A	1.4 <sup>N5</sup>	9.9 <sup>N5</sup>	Full	110	-50.0 <sup>N3</sup>	0.0
Approach	110	3.6	110	3.6		0.226		3.4	LOS A	1.4	9.9				
NorthWest: Ti Rakau Drive (West)															
Lane 1	567	7.3	559	7.3	1869	0.299	100	2.3	LOS A	4.5 <sup>N5</sup>	33.1 <sup>N5</sup>	Full	97	0.0	13.8
Lane 2	548	6.2	540	6.3	1805	0.299	100	0.0	LOS A	4.4 <sup>N5</sup>	32.7 <sup>N5</sup>	Full	97	0.0	0.0
Lane 3	347	6.2	342	6.3	1143	0.299	100	0.0	LOS A	0.0	0.0	Full	97	-36.7 <sup>N3</sup>	0.0
Approach	1461	6.7	1441 <sup>N1</sup>	6.7		0.299		0.9	NA	4.5	33.1				
Intersection	3232	6.4	3140 <sup>N1</sup>	6.6		0.437		0.5	NA	4.5	33.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Lane LOS values are based on average delay per lane.  
 Minor Road Approach LOS values are based on average delay for all lanes.  
 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 lanes.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

- N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
- N3** Capacity Adjustment due to downstream lane blockage determined by the program.
- N5** Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NW			Cap. veh/h					
Lane 1	799	799	6.2	1826	0.437	100	NA	NA	
Lane 2	790	790	6.2	1806	0.437	100	NA	NA	
Approach	1589	1589	6.2		0.437				
NorthEast: William Roberts Road									
Mov. From NE To Exit:	L2	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SE			Cap. veh/h					
Lane 1	110	110	3.6	487	0.226	100	NA	NA	
Approach	110	110	3.6		0.226				
NorthWest: Ti Rakau Drive (West)									

Mov. From NW To Exit:	L2 NE	T1 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	272	287	559	7.3	1869	0.299	100	NA	NA
Lane 2	-	540	540	6.3	1805	0.299	100	NA	NA
Lane 3	-	342	342	6.3	1143	0.299	100	NA	NA
Approach	272	1169	1441	6.7		0.299			
Total %HV Deg.Satn (v/c)									
Intersection	3140	6.6		0.437					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
NorthEast Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											

# SITE LAYOUT

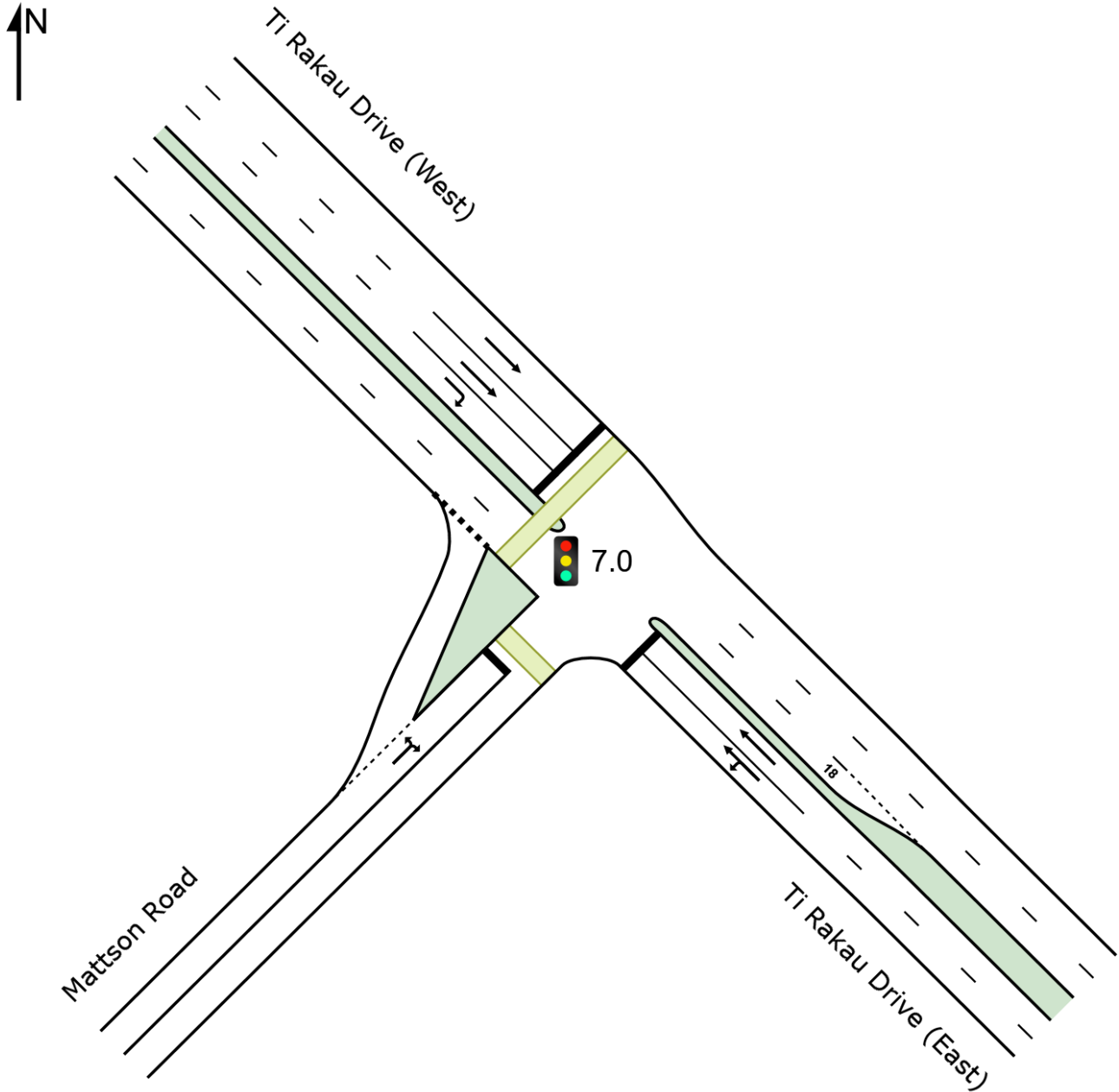
 Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 69 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	837	6.6	800	6.4	908	0.881	100	27.5	LOS C	27.7	204.7	Full	187	0.0	23.2
Lane 2	845	6.5	807	6.3	916	0.881	100	27.4	LOS C	27.9	205.8	Full	187	0.0	23.7
Approach	1682	6.5	1607 <sup>N</sup> <sub>1</sub>	6.4		0.881		27.4	LOS C	27.9	205.8				
NorthWest: Ti Rakau Drive (West)															
Lane 1	618	6.0	610	6.0	1325	0.461	100	5.5	LOS A	3.6 <sup>N4</sup>	26.3 <sup>N4</sup>	Full	18	0.0	50.0
Lane 2	580	6.0	573	6.0	1245	0.461	100	5.5	LOS A	3.6 <sup>N4</sup>	26.3 <sup>N4</sup>	Full	18	0.0	50.0
Lane 3	97	6.2	96	6.2	151	0.633	100	38.7	LOS D	3.1	22.8	Full	18	0.0	36.7
Approach	1295	6.0	1280 <sup>N</sup> <sub>1</sub>	6.1		0.633		8.0	LOS A	3.6	26.3				
SouthWest: Mattson Road															
Lane 1	71	1.4	71	1.4	399	0.178	100	24.4	LOS C	1.7	12.3	Full	282	0.0	0.0
Approach	71	1.4	71	1.4		0.178		24.4	LOS C	1.7	12.3				
Intersection	3048	6.2	2958 <sup>N</sup> <sub>1</sub>	6.4		0.881		18.9	LOS B	27.9	205.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From SE To Exit:	SW	NW			veh/h	v/c	%	%		
Lane 1	42	758	800	6.4	908	0.881	100	NA	NA	
Lane 2	-	807	807	6.3	916	0.881	100	NA	NA	
Approach	42	1565	1607	6.4		0.881				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From NW To Exit:	SE	SW			veh/h	v/c	%	%		
Lane 1	610	-	610	6.0	1325	0.461	100	NA	NA	
Lane 2	573	-	573	6.0	1245	0.461	100	NA	NA	
Lane 3	-	96	96	6.2	151	0.633	100	NA	NA	
Approach	1184	96	1280	6.1		0.633				
SouthWest: Mattson Road										
Mov.	L2	R2	Total	%HV	Deg.	Lane Util.	Prob.	Ov.		

From SW To Exit:	NW	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	23	48	71	1.4	399	0.178	100	NA	NA
Approach	23	48	71	1.4		0.178			
	Total	%HV	Deg.	Satn (v/c)					
Intersection	2958	6.4		0.881					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Priority</b>												
Exit Short Lane	3	18	0.0	573	591	3.00	2.00	48	1191	0.040	1.1	1.2
Merge Lane	2	-	100.0	Merge Lane is not Opposed				573	1800	0.319	0.0	0.0
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
SouthWest Exit: Mattson Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:23:42 pm  
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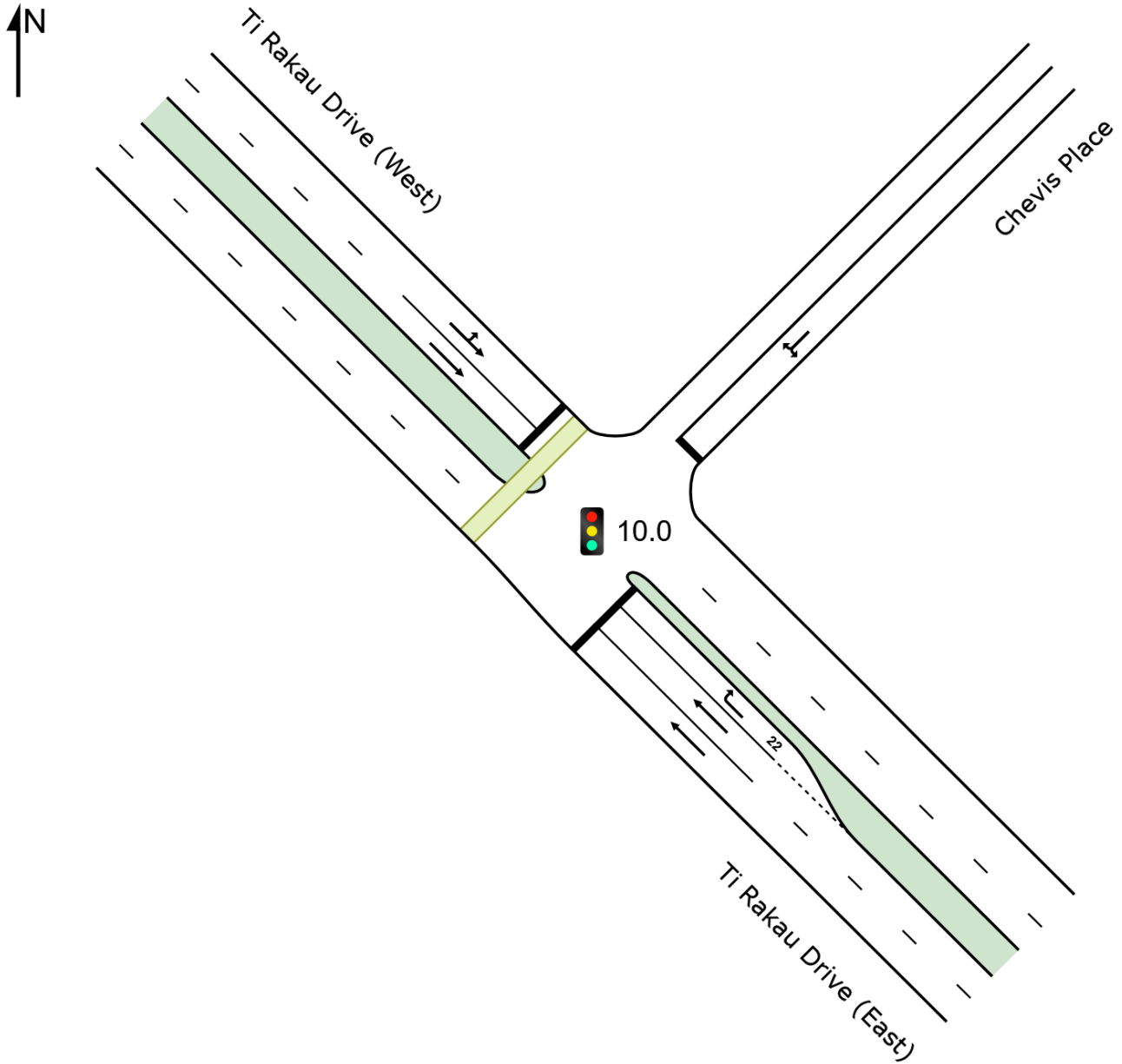


# SITE LAYOUT

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: Network: N101 [PM (Network General)]) Folder: General]]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 64 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE	OF Dist	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	m		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	814	6.4	810	6.4	916	0.884	100	27.0	LOS C	26.5	196.1	Full	162	0.0	32.5
Lane 2	793	6.4	789	6.4	893 <sup>1</sup>	0.884	100	27.2	LOS C	25.8	190.7	Full	162	0.0	29.9
Lane 3	10	0.0	10	0.0	250	0.040	100	31.0	LOS C	0.2	1.7	Short	22	0.0	NA
Approach	1617	6.4	1608 <sup>N</sup>	6.4		0.884		27.1	LOS C	26.5	196.1				
NorthEast: Chevis Place															
Lane 1	20	0.0	20	0.0	230	0.087	100	32.5	LOS C	0.5	3.6	Full	138	0.0	0.0
Approach	20	0.0	20	0.0		0.087		32.5	LOS C	0.5	3.6				
NorthWest: Ti Rakau Drive (West)															
Lane 1	535	2.7	518	2.5	952	0.544	100	12.6	LOS B	10.2	73.1	Full	68	0.0	21.6
Lane 2	506	2.7	490	2.6	900	0.544	100	12.6	LOS B	9.7	69.3	Full	68	0.0	16.7
Approach	1041	2.7	1008 <sup>N</sup>	2.6		0.544		12.6	LOS B	10.2	73.1				
Intersection	2678	4.9	2636 <sup>N</sup>	5.0		0.884		21.6	LOS C	26.5	196.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From SE To Exit:	NW	NE			veh/h	v/c	%	%		
Lane 1	810	-	810	6.4	916	0.884	100	NA	NA	
Lane 2	789	-	789	6.4	893 <sup>1</sup>	0.884	100	NA	NA	
Lane 3	-	10	10	0.0	250	0.040	100	0.0	2	
Approach	1598	10	1608	6.4		0.884				
NorthEast: Chevis Place										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From NE To Exit:	SE	NW			veh/h	v/c	%	%		
Lane 1	10	10	20	0.0	230	0.087	100	NA	NA	
Approach	10	10	20	0.0		0.087				
NorthWest: Ti Rakau Drive (West)										
Mov.	L2	T1	Total	%HV	Deg.	Lane Util.	Prob.	Ov.		
					v/c	%	%			

From NW To Exit:	NE	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	10	509	518	2.5	952	0.544	100	NA	NA
Lane 2	-	490	490	2.6	900	0.544	100	NA	NA
Approach	10	998	1008	2.6		0.544			
Total		%HV Deg. Satn (v/c)							
Intersection	2636	5.0		0.884					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

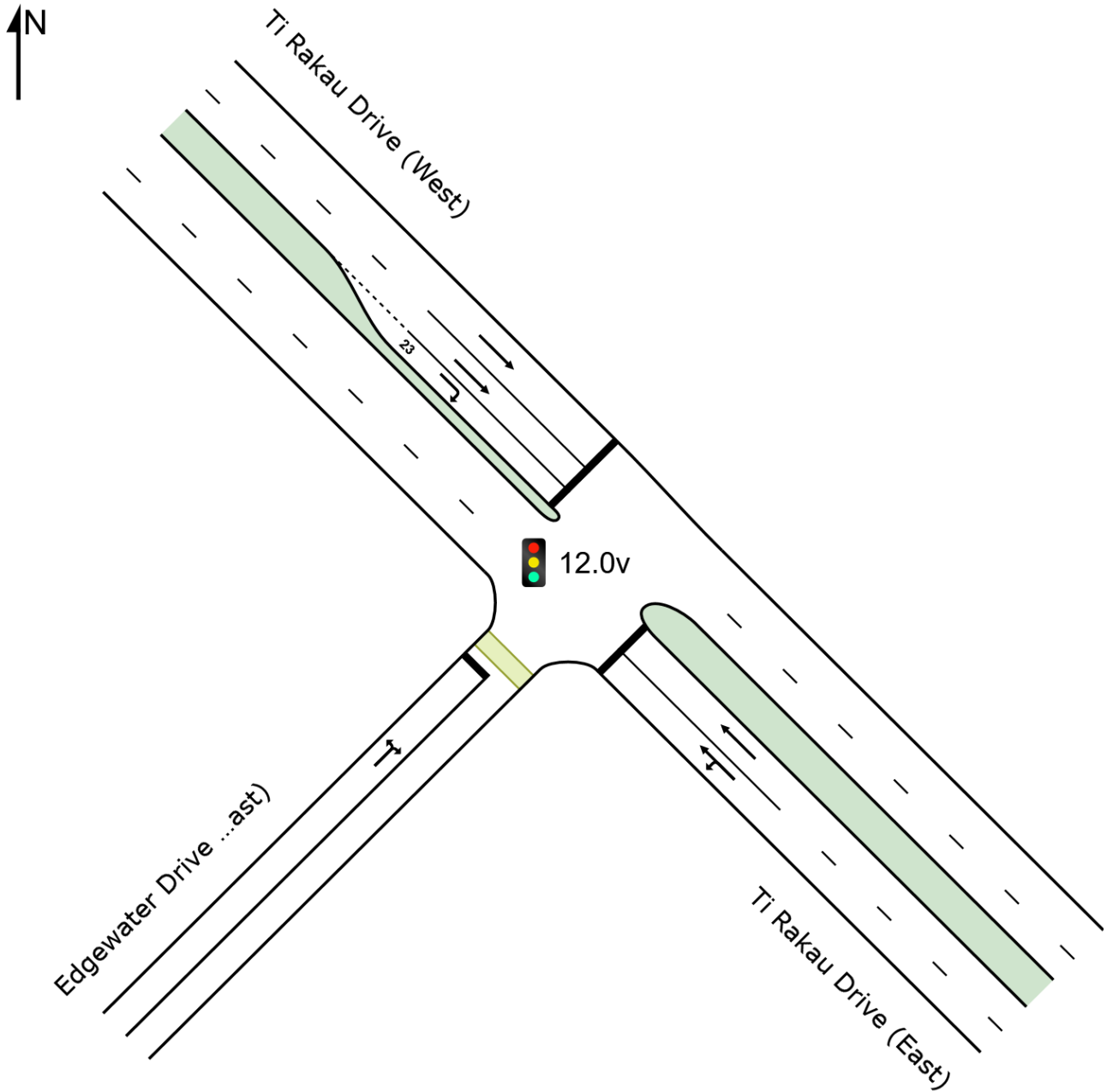
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
NorthEast Exit: Chevis Place												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											

# SITE LAYOUT

Site: 12.0v [12.0 Edgewater Dr (East) / Ti Rakau Dr - Conversion (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 12.0v [12.0 Edgewater Dr (East) / Ti Rakau Dr - Conversion (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 67 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	908	6.5	904	6.5	1013	0.892	100	27.7	LOS C	31.1	229.8	Full	479	0.0	0.0
Lane 2	936	6.4	932	6.4	1044	0.892	100	26.4	LOS C	31.8	235.1	Full	479	0.0	0.0
Approach	1845	6.5	1836 <sup>N</sup> <sub>1</sub>	6.5		0.892		27.1	LOS C	31.8	235.1				
NorthWest: Ti Rakau Drive (West)															
Lane 1	532	2.6	517	2.6	1109	0.466	100	9.7	LOS A	9.1	65.3	Full	103	0.0	0.0
Lane 2	421	2.6	410	2.6	878 <sup>1</sup>	0.466	100	9.3	LOS A	6.9	49.2	Full	103	0.0	0.0
Lane 3	86	7.3	83	6.4	152	0.549	100	40.1	LOS D	2.6	18.9	Short	23	0.0	NA
Approach	1039	3.0	1010 <sup>N</sup> <sub>1</sub>	2.9		0.549		12.0	LOS B	9.1	65.3				
SouthWest: Edgewater Drive (East)															
Lane 1	157	6.7	157	6.7	251	0.624	100	36.7	LOS D	4.6	34.4	Full	500	0.0	0.0
Approach	157	6.7	157	6.7		0.624		36.7	LOS D	4.6	34.4				
Intersection	3041	5.3	3003 <sup>N</sup> <sub>1</sub>	5.4		0.892		22.5	LOS C	31.8	235.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From SE	SW	NW			veh/h	v/c	%	%		
To Exit:										
Lane 1	153	751	904	6.5	1013	0.892	100	NA	NA	
Lane 2	-	932	932	6.4	1044	0.892	100	NA	NA	
Approach	153	1683	1836	6.5		0.892				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From NW	SE	SW			veh/h	v/c	%	%		
To Exit:										
Lane 1	517	-	517	2.6	1109	0.466	100	NA	NA	
Lane 2	410	-	410	2.6	878 <sup>1</sup>	0.466	100	NA	NA	
Lane 3	-	83	83	6.4	152	0.549	100	0.0	2	
Approach	927	83	1010	2.9		0.549				
SouthWest: Edgewater Drive (East)										

Mov. From SW To Exit:	L2 NW	R2 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	102	55	157	6.7	251	0.624	100	NA	NA
Approach	102	55	157	6.7		0.624			
Total %HV Deg. Satn (v/c)									
Intersection	3003	5.4		0.892					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

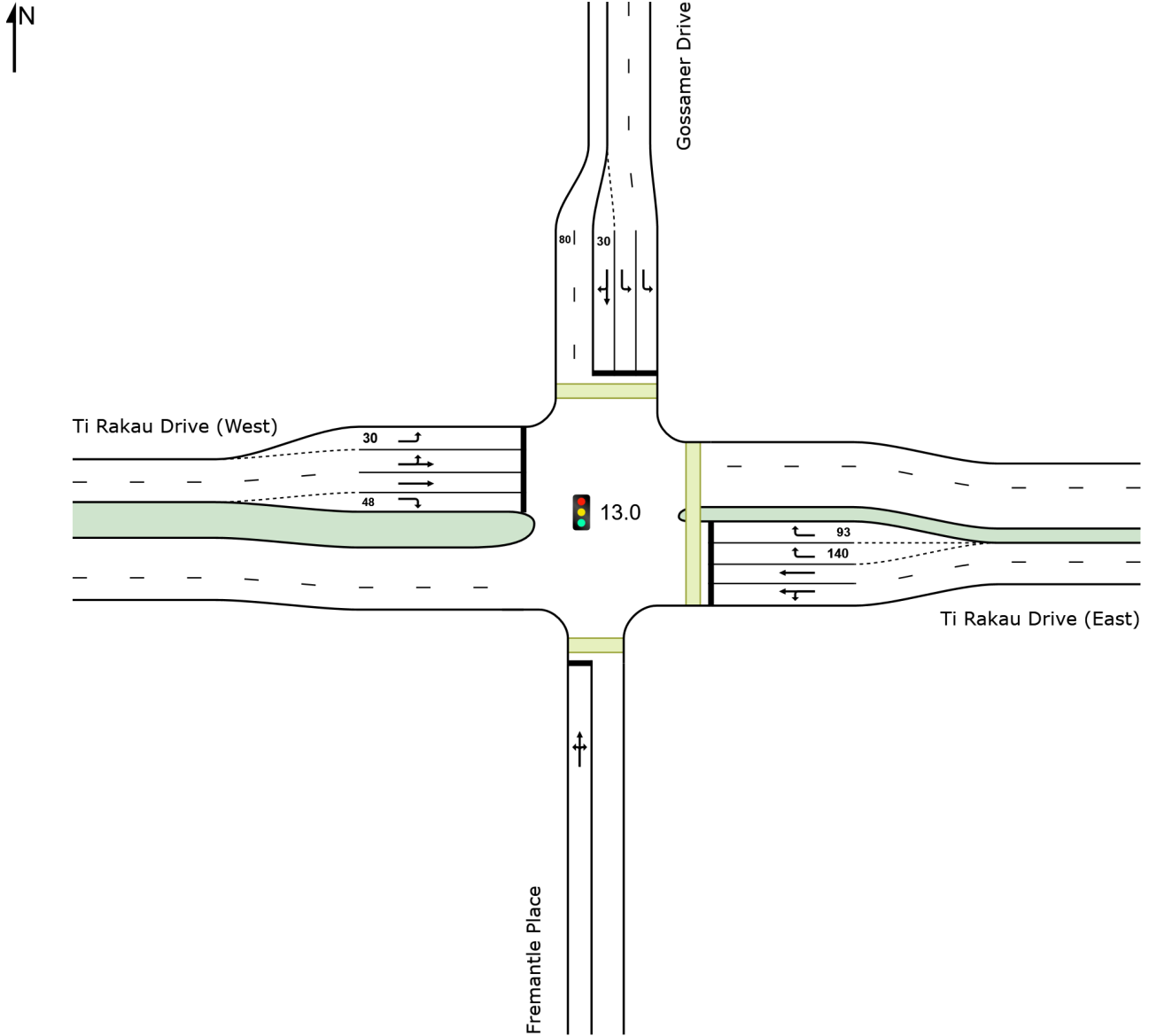
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
SouthWest Exit: Edgewater Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									

# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE [ Veh Dist ] m		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Fremantle Place															
Lane 1	40	5.0	40	5.0	97	0.412	100	81.4	LOS F	2.7	19.5	Full	285	0.0	0.0
Approach	40	5.0	40	5.0		0.412		81.4	LOS F	2.7	19.5				
East: Ti Rakau Drive (East)															
Lane 1	906	6.5	906	6.5	901	1.005	100	77.9	LOS E	71.7	530.0	Full	636	0.0	0.0
Lane 2	775	6.6	775	6.6	771 <sup>1</sup>	1.005	100	98.9	LOS F	73.5	543.3	Full	636	0.0	0.8
Lane 3	258	8.6	258	8.6	505	0.511	47 <sup>6</sup>	29.7	LOS C	8.4	62.8	Short	140	0.0	NA
Lane 4	548	8.6	548	8.6	505	1.084	100	141.5	LOS F	45.1	338.5	Short	93	0.0	NA
Approach	2487	7.2	2487	7.2		1.084		93.5	LOS F	73.5	543.3				
North: Gossamer Drive															
Lane 1	269	17.8	269	17.8	476	0.566	100	53.0	LOS D	14.9	120.6	Full	1010	0.0	0.0
Lane 2	236	17.8	236	17.8	416 <sup>1</sup>	0.566	100	51.8	LOS D	12.7	102.8	Full	1010	0.0	0.0
Lane 3	61	4.9	61	4.9	238	0.256	100	67.3	LOS E	3.6	26.5	Short	30	0.0	NA
Approach	566	16.4	566	16.4		0.566		54.0	LOS D	14.9	120.6				
West: Ti Rakau Drive (West)															
Lane 1	173	2.3	168	2.2	813	0.207	28 <sup>5</sup>	19.4	LOS B	4.2	30.3	Short	30	0.0	NA
Lane 2	346	3.3	338	3.3	461 <sup>1</sup>	0.732	100	44.4	LOS D	18.0	129.8	Full	479	0.0	0.0
Lane 3	447	3.3	435	3.3	594 <sup>1</sup>	0.732	100	47.4	LOS D	24.9	179.1	Full	479	0.0	0.0
Lane 4	14	7.1	14	6.7	298	0.046	100	59.9	LOS E	0.7	5.5	Short	48	0.0	NA
Approach	980	3.2	955 <sup>N1</sup>	3.1		0.732		41.6	LOS D	24.9	179.1				
Intersection	4073	7.5	4048 <sup>N1</sup>	7.5		1.084		75.6	LOS E	73.5	543.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

<sup>6</sup> Lane under-utilisation due to downstream effects

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: Fremantle Place											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
Lane 1	12	11	17	40	5.0	97	0.412	100	NA	NA	
Approach	12	11	17	40	5.0		0.412				
East: Ti Rakau Drive (East)											



Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	23	883	-	906	6.5	901	1.005	100	NA	NA
Lane 2	-	775	-	775	6.6	771 <sup>1</sup>	1.005	100	NA	NA
Lane 3	-	-	258	258	8.6	505	0.511	47 <sup>6</sup>	98.9	2
Lane 4	-	-	548	548	8.6	505	1.084	100	100.0	3
Approach	23	1658	806	2487	7.2		1.084			
North: Gossamer Drive										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	269	-	-	269	17.8	476	0.566	100	NA	NA
Lane 2	236	-	-	236	17.8	416 <sup>1</sup>	0.566	100	NA	NA
Lane 3	-	12	49	61	4.9	238	0.256	100	3.8	2
Approach	505	12	49	566	16.4		0.566			
West: Ti Rakau Drive (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	168	-	-	168	2.2	813	0.207	28 <sup>5</sup>	15.9	2
Lane 2	-	338	-	338	3.3	461 <sup>1</sup>	0.732	100	NA	NA
Lane 3	-	435	-	435	3.3	594 <sup>1</sup>	0.732	100	NA	NA
Lane 4	-	-	14	14	6.7	298	0.046	100	0.0	3
Approach	168	773	14	955	3.1		0.732			
Total %HV Deg. Satn (v/c)										
Intersection	4048	7.5		1.084						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Gossamer Drive Merge Type: <b>Zipper</b>												
Exit Short Lane	1	80	50.0	258	269	2.50	2.00	426	1473	0.289	0.0	0.2
Merge Lane	2	-	50.0	213	220	2.50	2.00	516	1539	0.336	0.0	0.1
West Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 2 February 2023 2:23:42 pm

Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.2\CS 1.2 PM -V1.sip9

# Appendix O

## Construction Scenario 1.3 – Phasing Diagrams

# PHASING SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 132 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

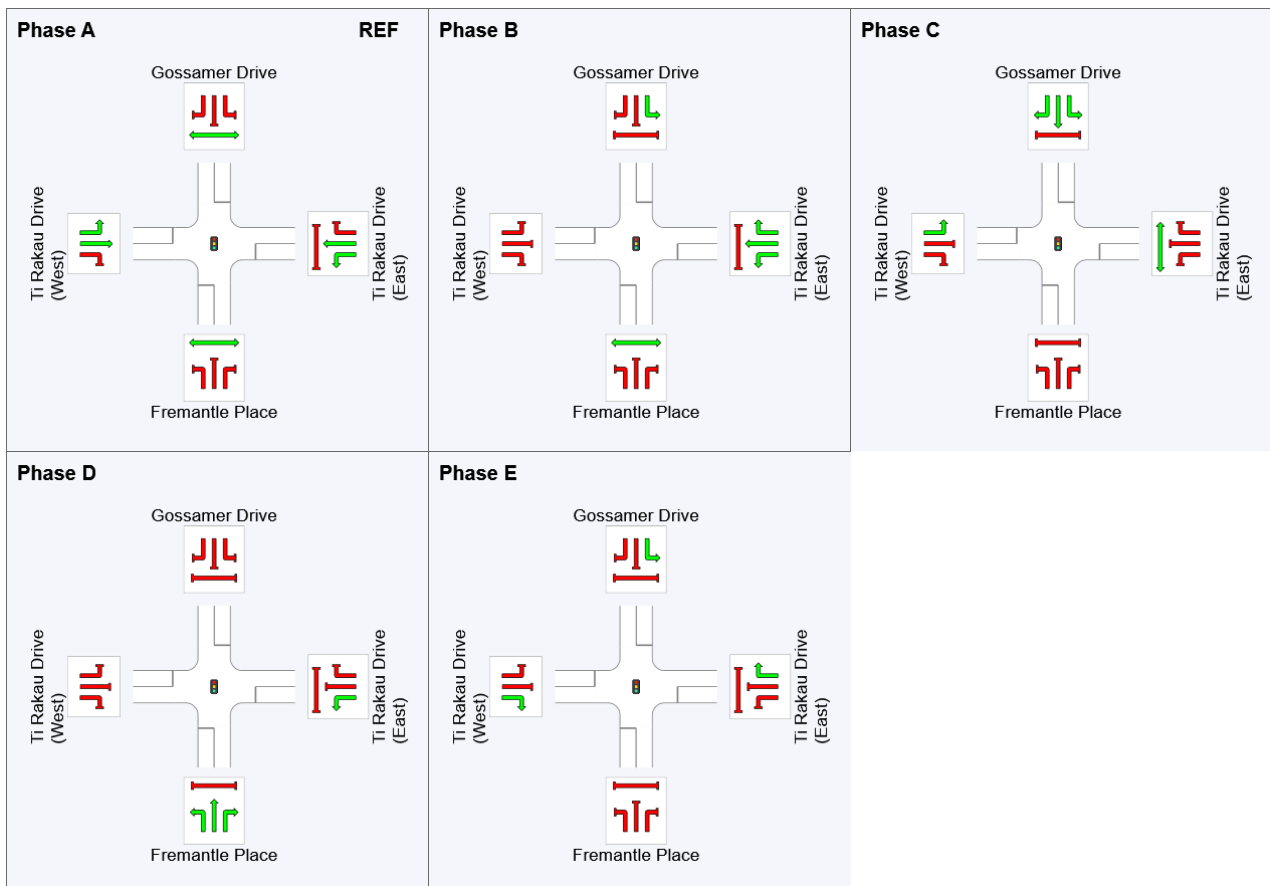
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	47	61	97	109
Green Time (sec)	41	8	30	6	17
Phase Time (sec)	47	14	36	12	23
Phase Split	36%	11%	27%	9%	17%












See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Friday, 3 February 2023 1:48:58 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9

# PHASING SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

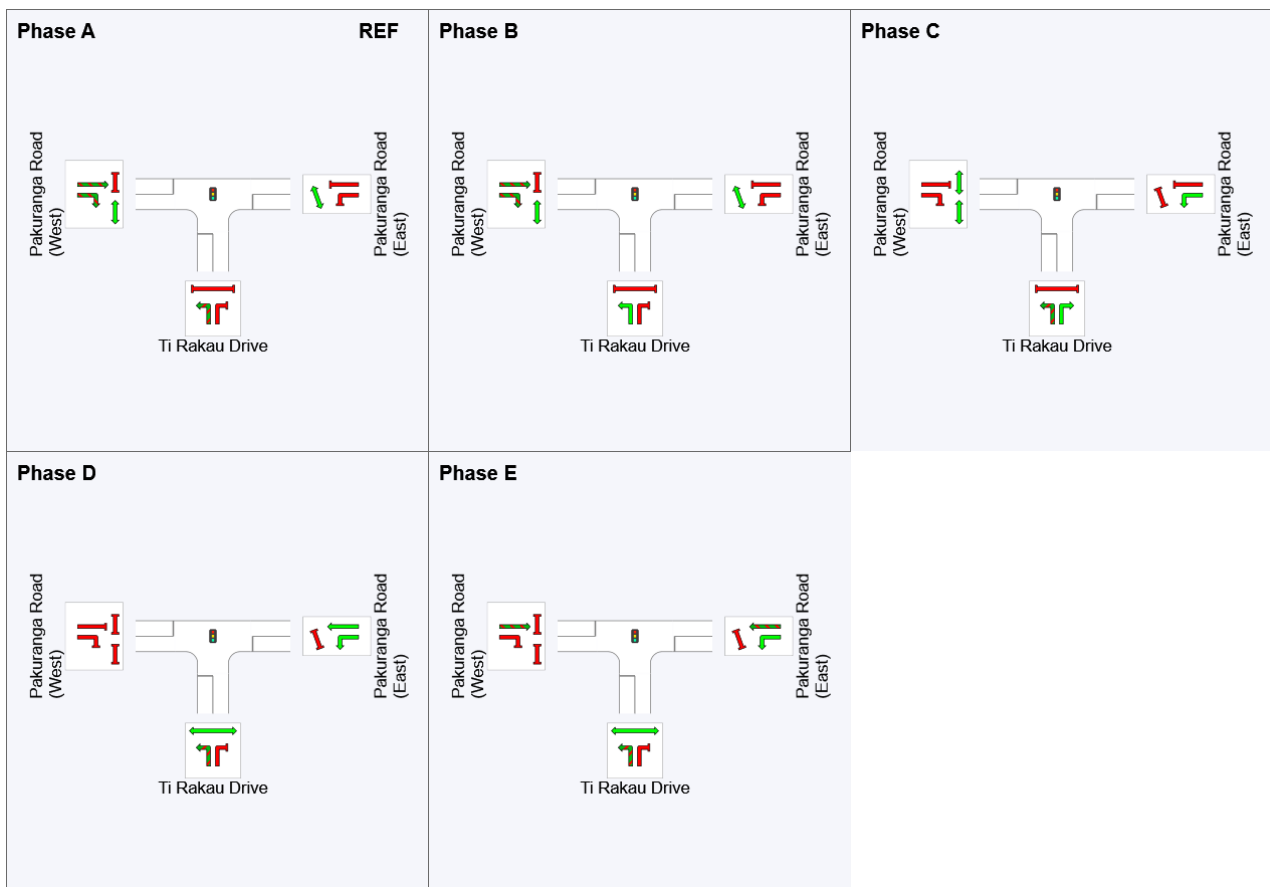
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	13	25	47	59
Green Time (sec)	7	6	16	6	19
Phase Time (sec)	13	12	22	12	25
Phase Split	15%	14%	26%	14%	30%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

**Site:** 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

**Network:** N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Convert Function Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

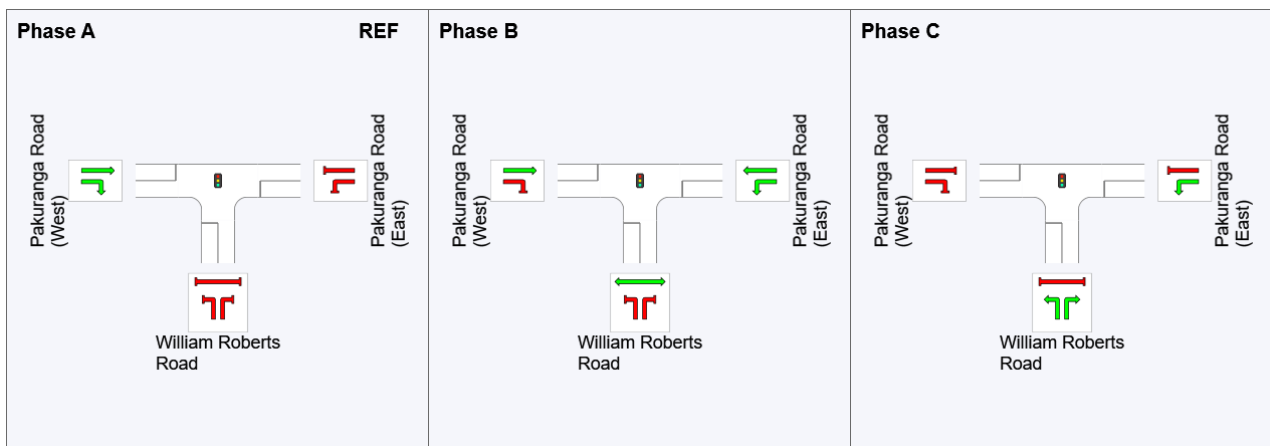
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	12	44
Green Time (sec)	6	26	11
Phase Time (sec)	12	32	17
Phase Split	20%	52%	28%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 88 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

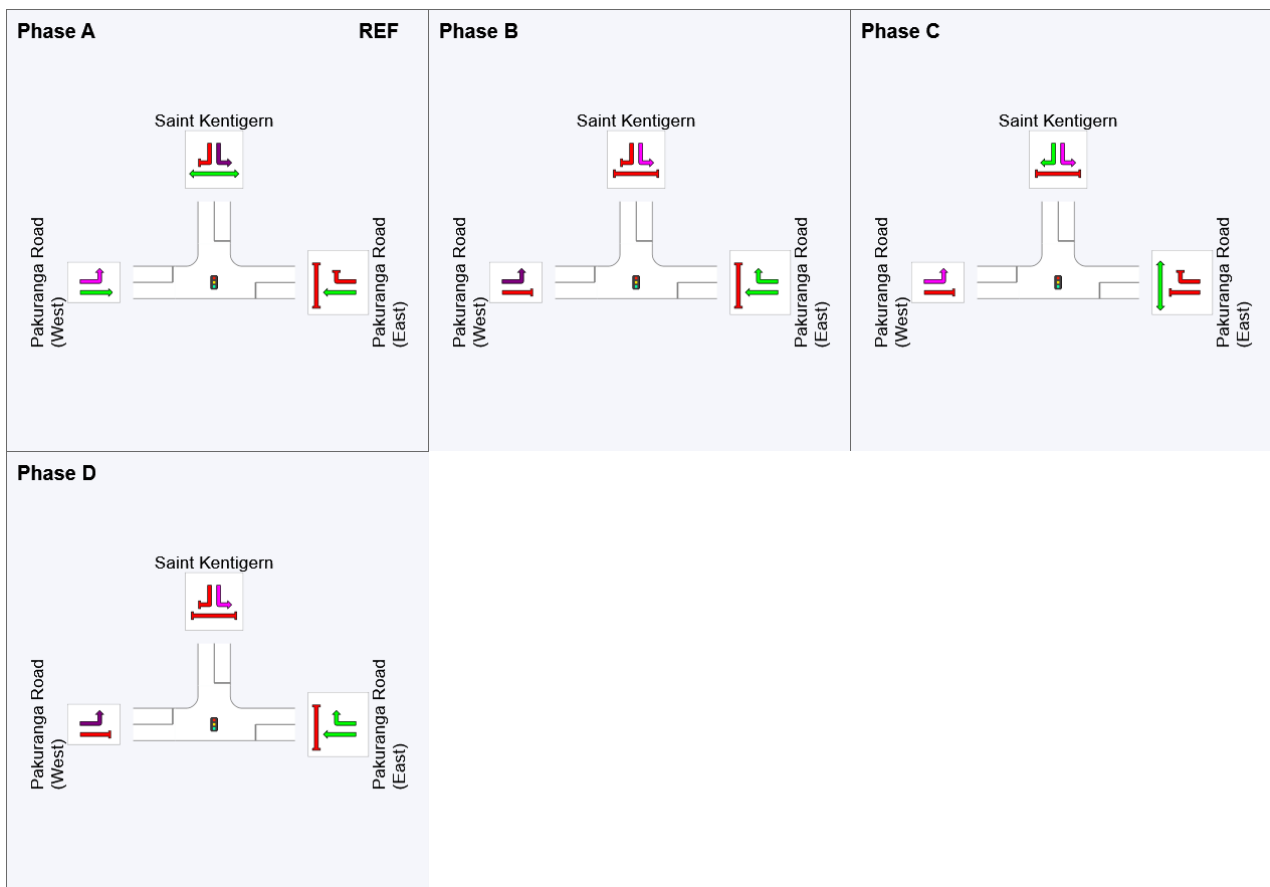
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	36	48	76
Green Time (sec)	30	6	22	6
Phase Time (sec)	36	12	28	12
Phase Split	41%	14%	32%	14%

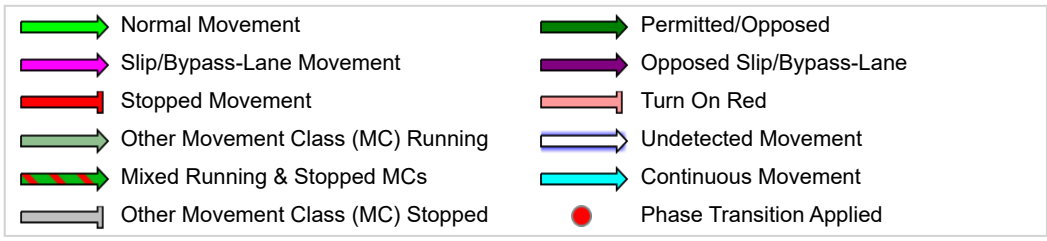
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 137 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	72	96	116
Green Time (sec)	66	18	14	18
Phase Time (sec)	72	24	17	24
Phase Split	53%	18%	12%	18%












See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Friday, 3 February 2023 1:48:58 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9

# PHASING SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 89 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

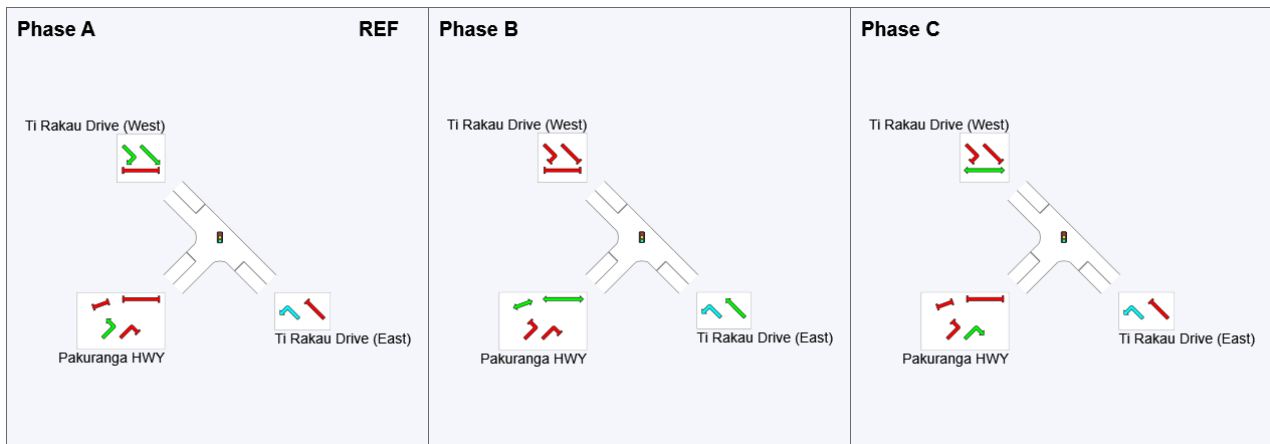
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	33	58
Green Time (sec)	27	19	25
Phase Time (sec)	33	25	31
Phase Split	37%	28%	35%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

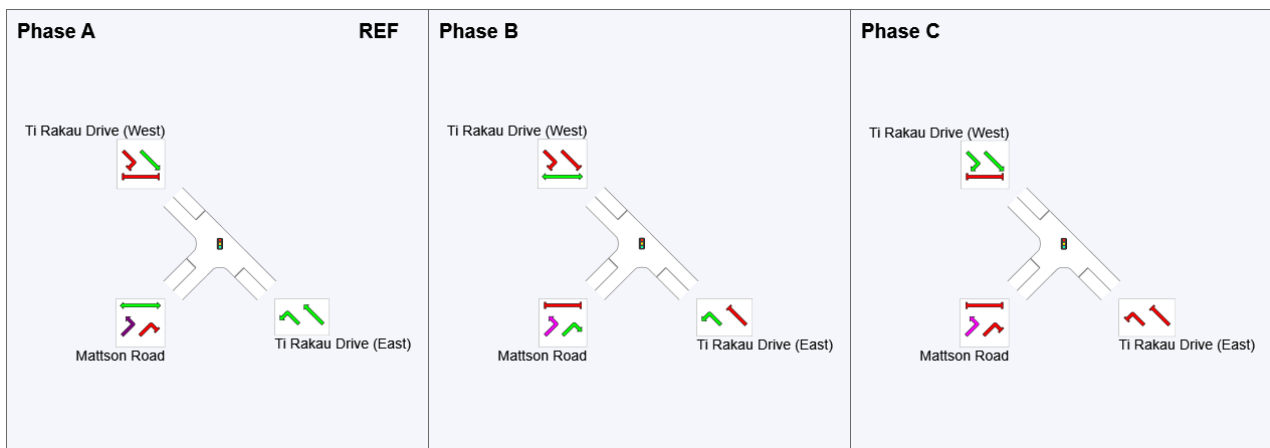
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	50	68
Green Time (sec)	44	12	6
Phase Time (sec)	50	18	12
Phase Split	63%	23%	15%

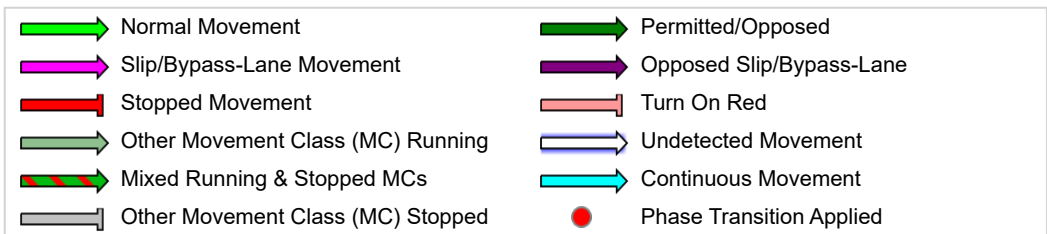
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 107 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

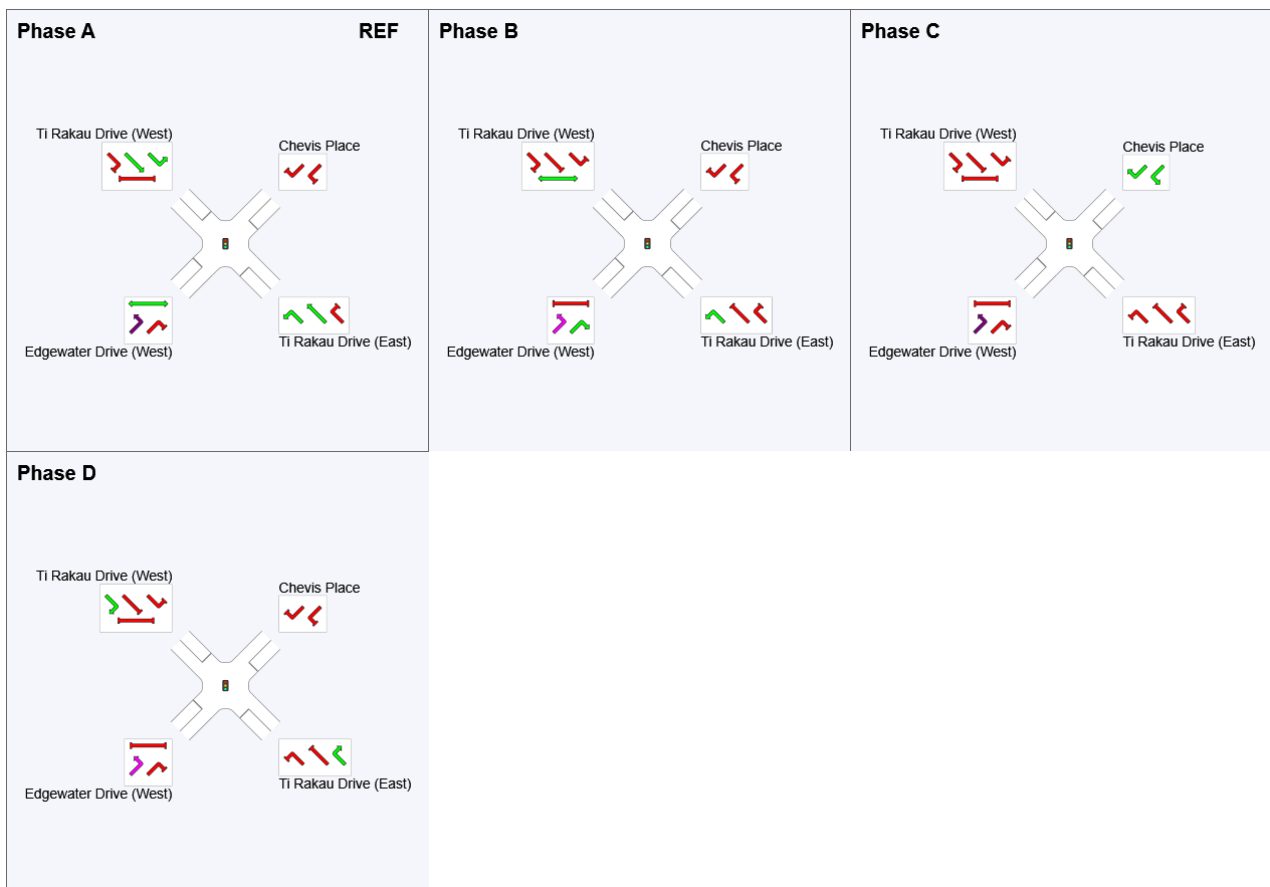
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	62	83	95
Green Time (sec)	56	15	6	6
Phase Time (sec)	62	21	12	12
Phase Split	58%	20%	11%	11%










See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Friday, 3 February 2023 1:48:58 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9



# PHASING SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 79 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

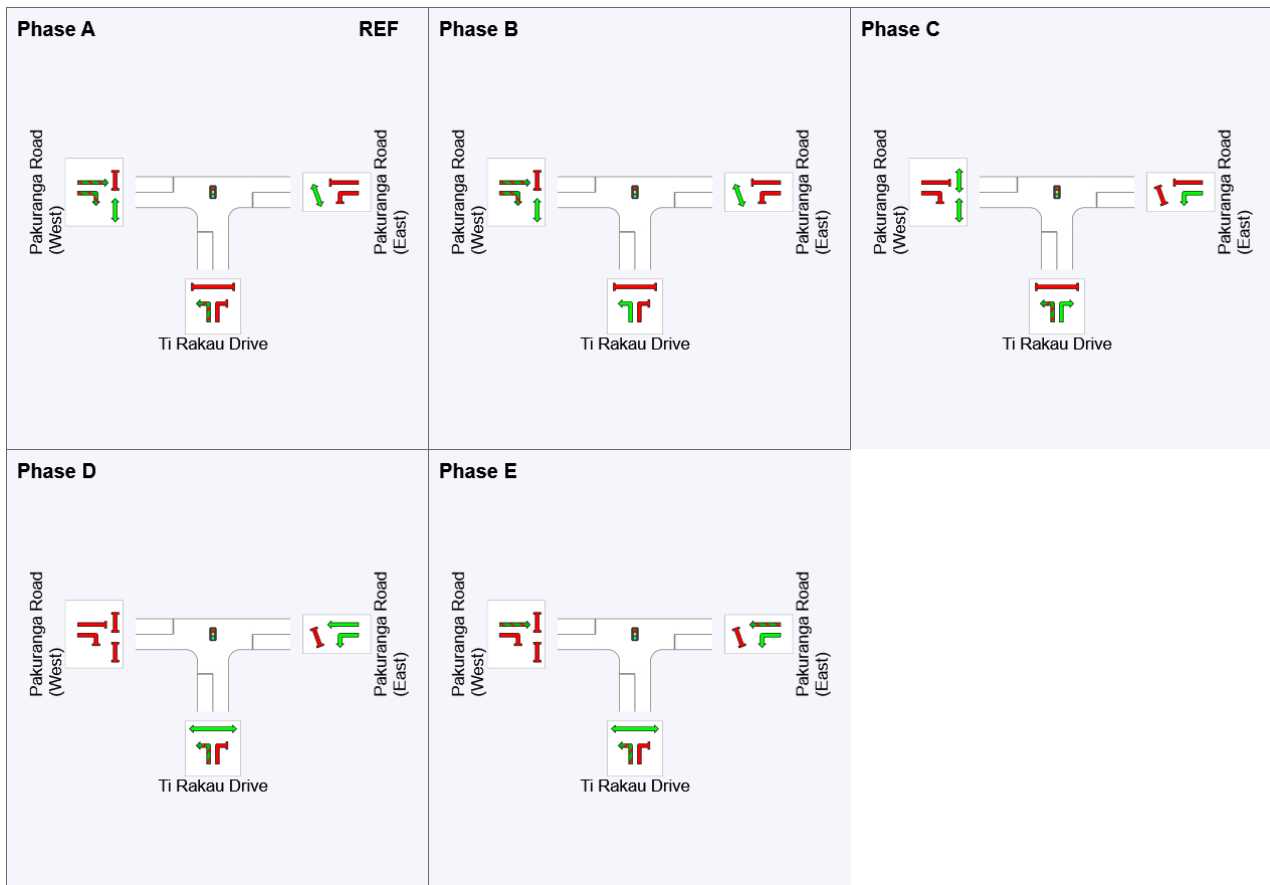
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	18	30	55	67
Green Time (sec)	12	6	19	6	6
Phase Time (sec)	18	12	25	12	12
Phase Split	23%	15%	32%	15%	15%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# TIME - DISTANCE DIAGRAM

Time – Distance Diagram for the Selected Route

Movement Class: Light Vehicles

➡ Route: R101 [Route1]

■ Network: N101 [AM  
(Network Folder: General)]

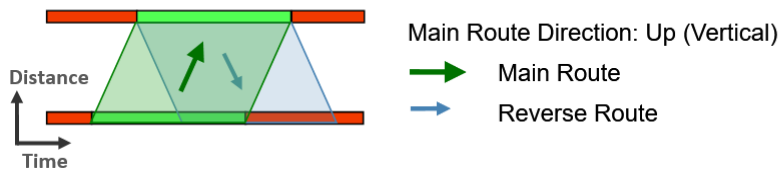
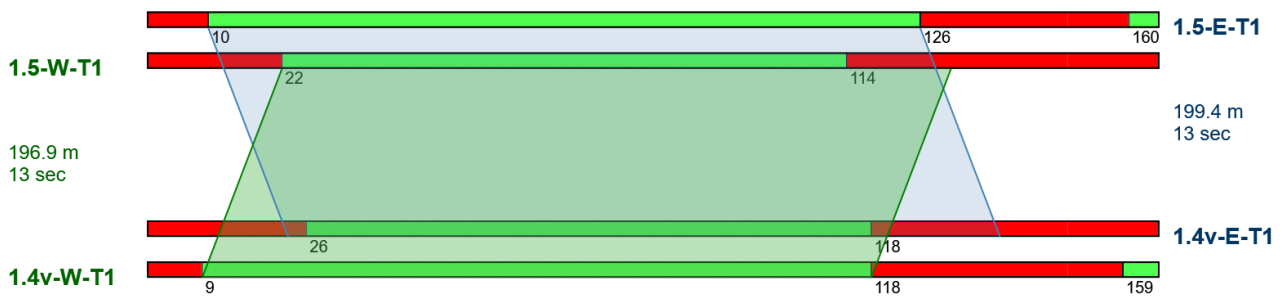
New Route

Network Category: (None)

Network Cycle Time = 150 seconds (Network User-Given Cycle Time)

Signal Offsets option used: User

Interactive Offsets



# PHASING SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Green Split Priority has been specified

Phase Sequence: Convert Function Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

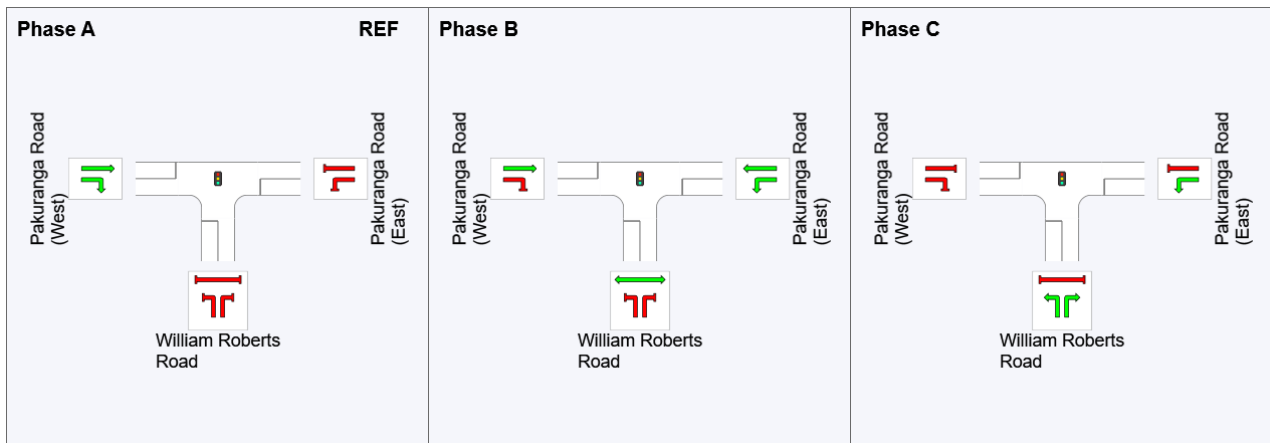
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	17	115
Green Time (sec)	11	92	29
Phase Time (sec)	17	98	35
Phase Split	11%	65%	23%

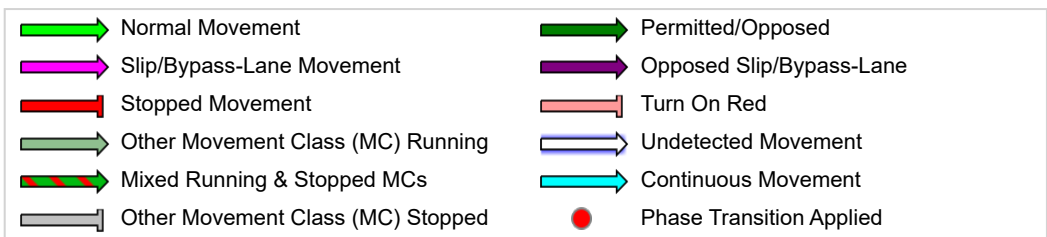
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

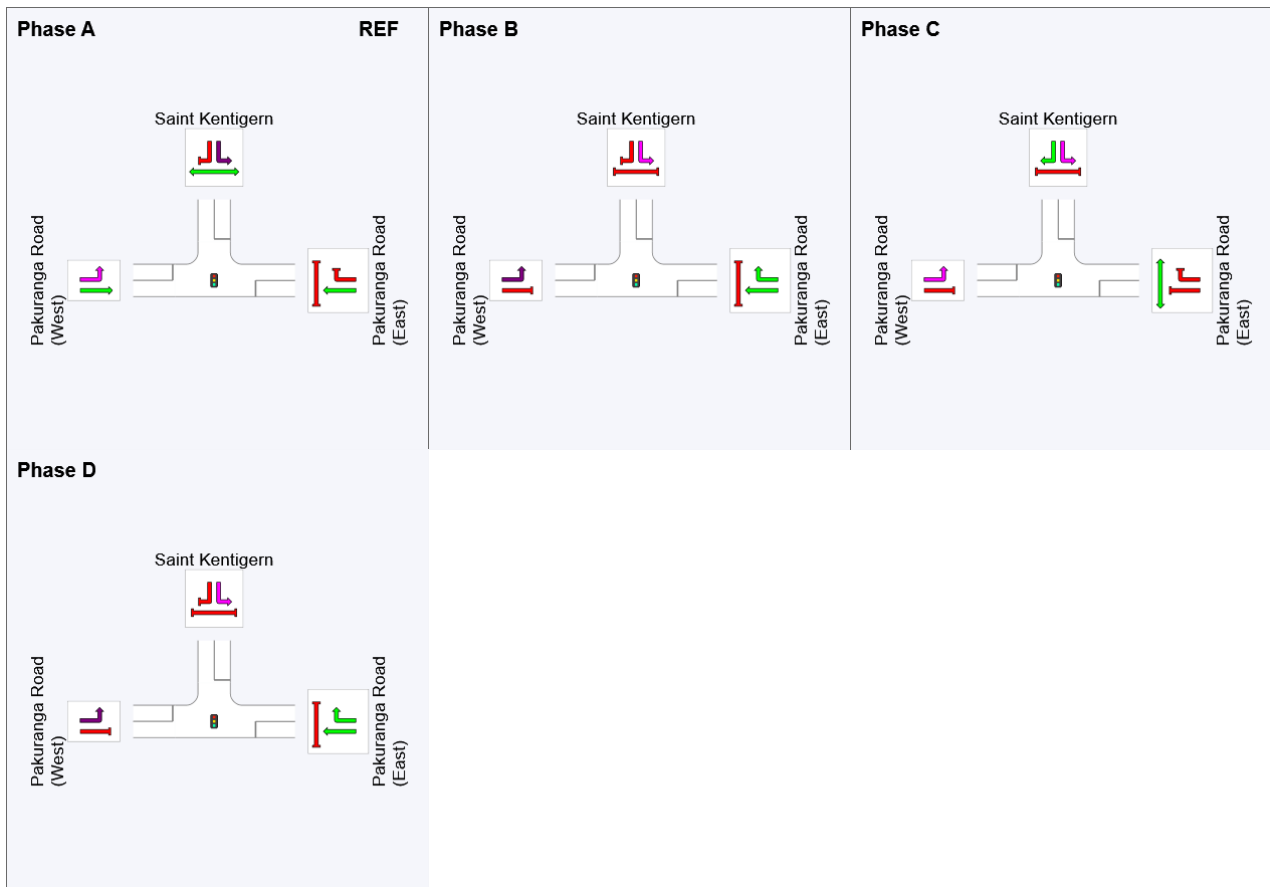
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	13	111	123	1
Green Time (sec)	92	6	22	6
Phase Time (sec)	98	12	28	12
Phase Split	65%	8%	19%	8%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

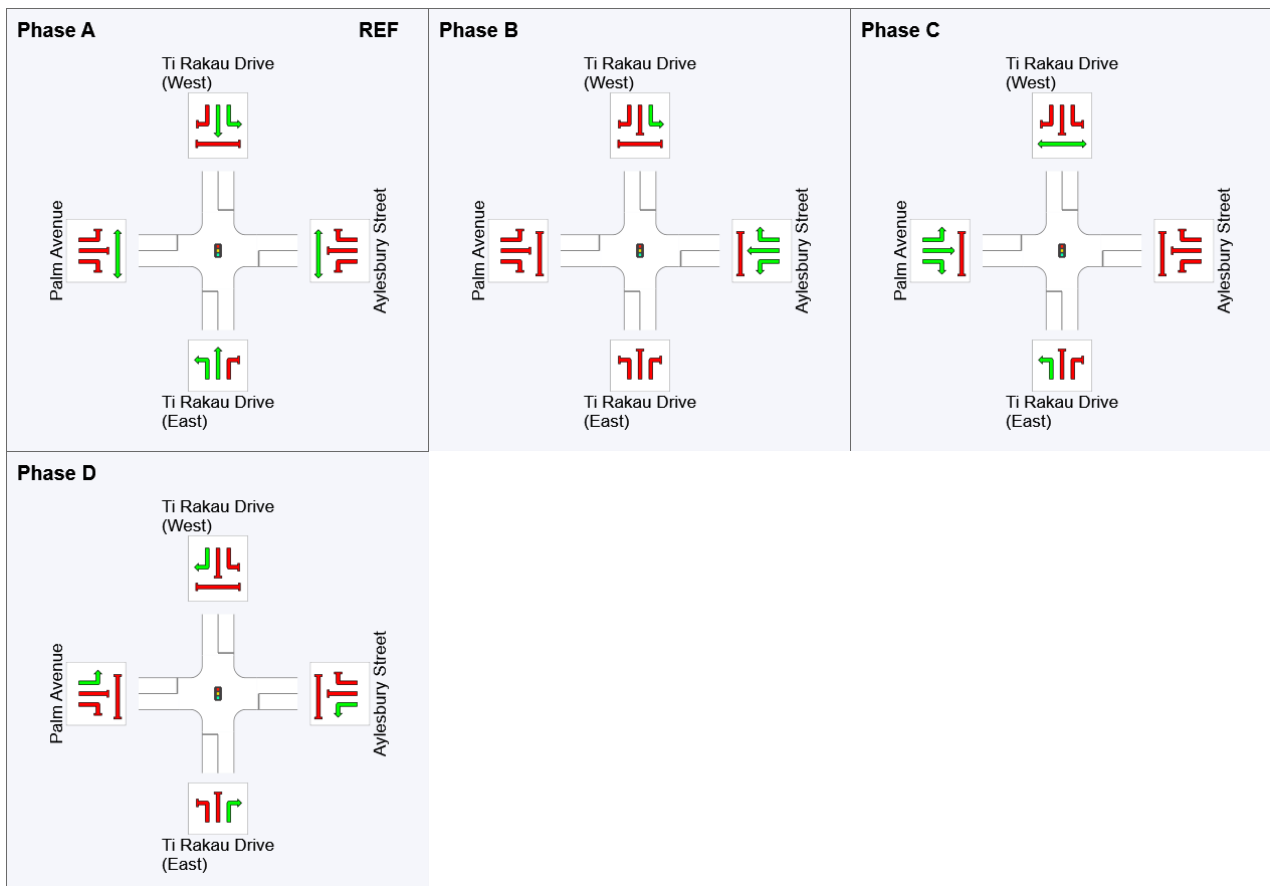
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	111	123	141
Green Time (sec)	105	6	12	6
Phase Time (sec)	111	12	15	12
Phase Split	74%	8%	10%	8%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

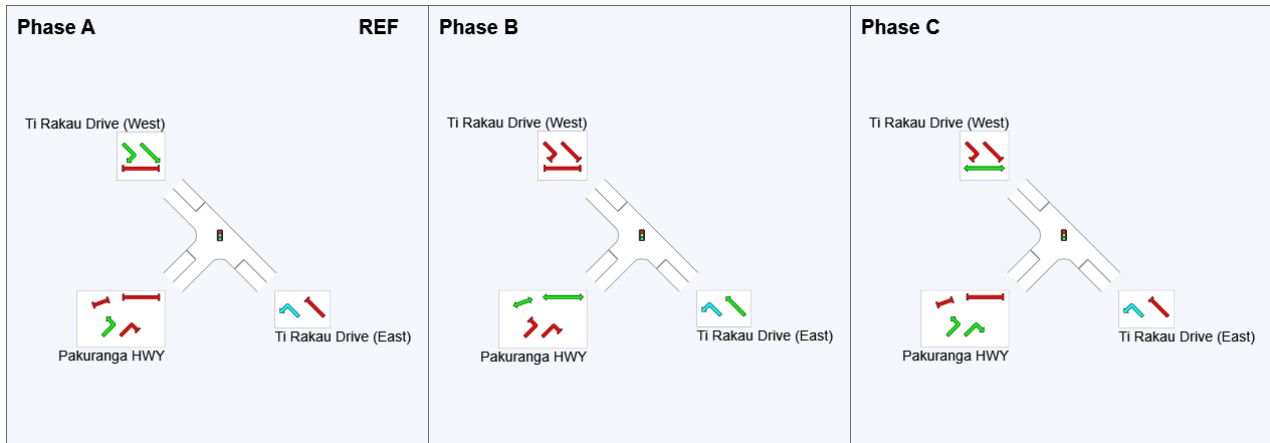
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	50	100
Green Time (sec)	44	44	44
Phase Time (sec)	50	50	50
Phase Split	33%	33%	33%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 68 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

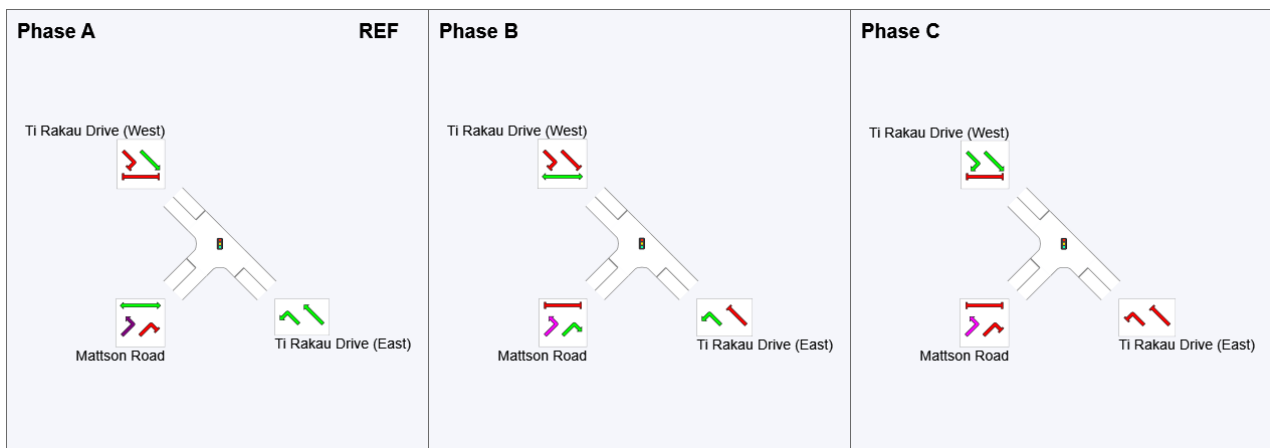
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	40	56
Green Time (sec)	34	10	6
Phase Time (sec)	40	16	12
Phase Split	59%	24%	18%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

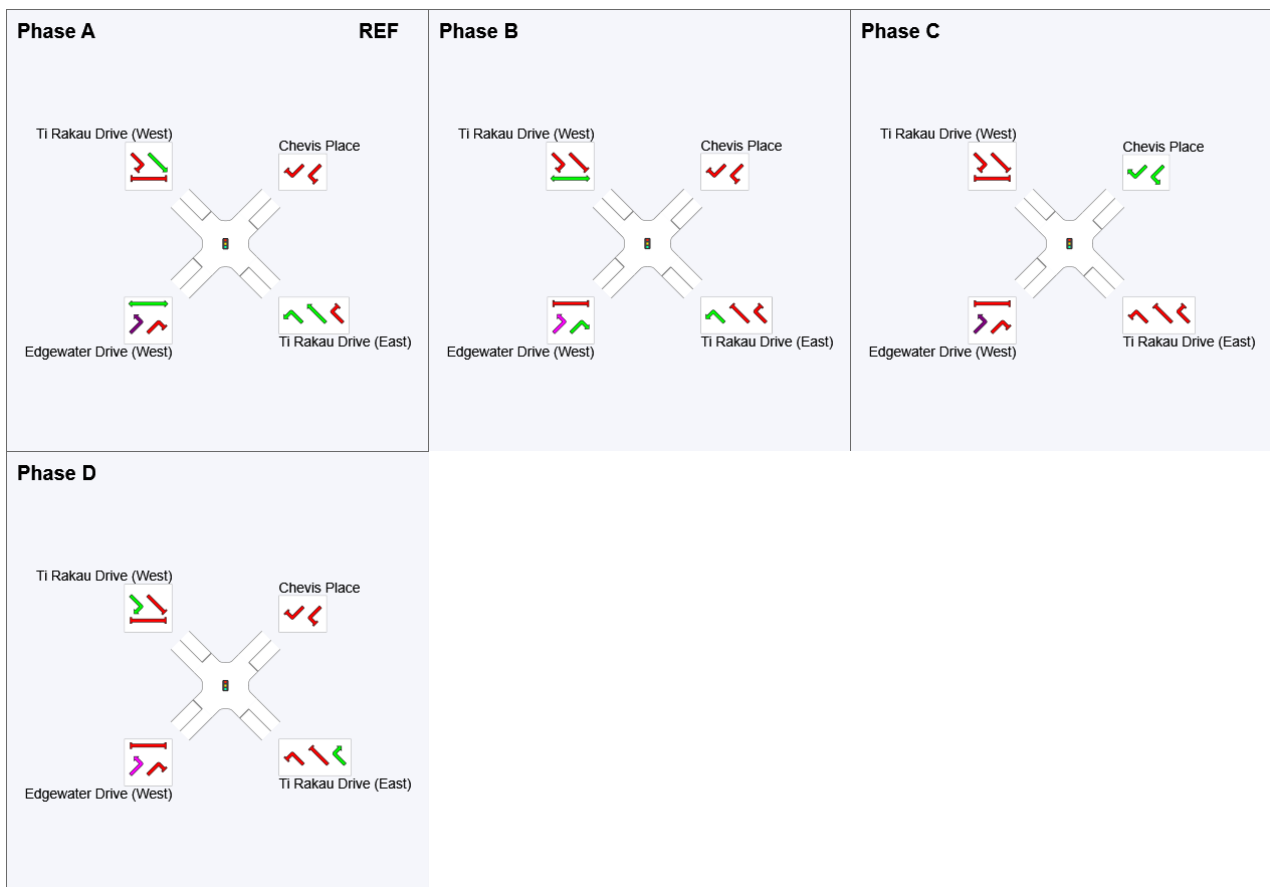
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	60	81	93
Green Time (sec)	54	15	6	6
Phase Time (sec)	60	21	12	12
Phase Split	57%	20%	11%	11%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

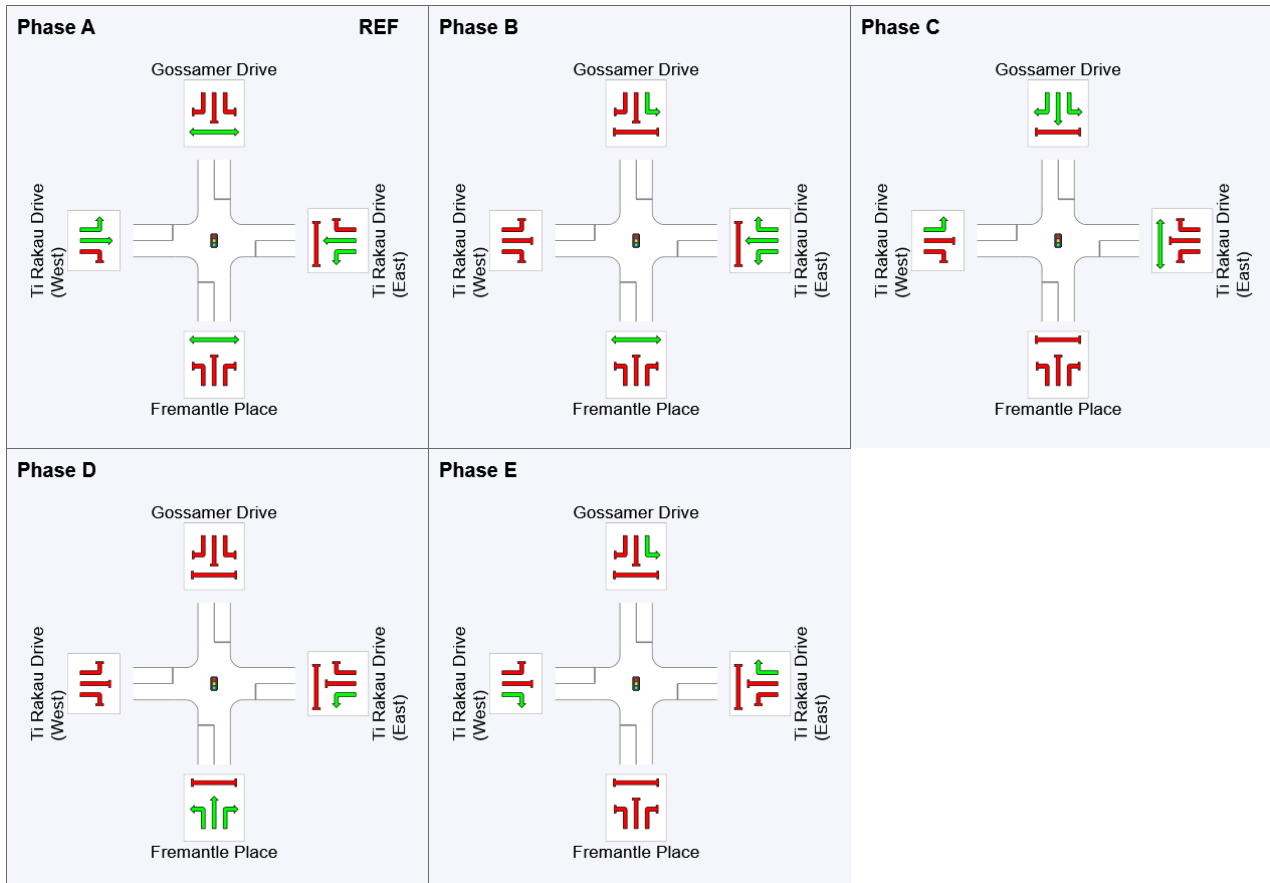
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	55	79	105	118
Green Time (sec)	49	18	20	8	26
Phase Time (sec)	55	24	25	14	32
Phase Split	37%	16%	17%	9%	21%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# Appendix P

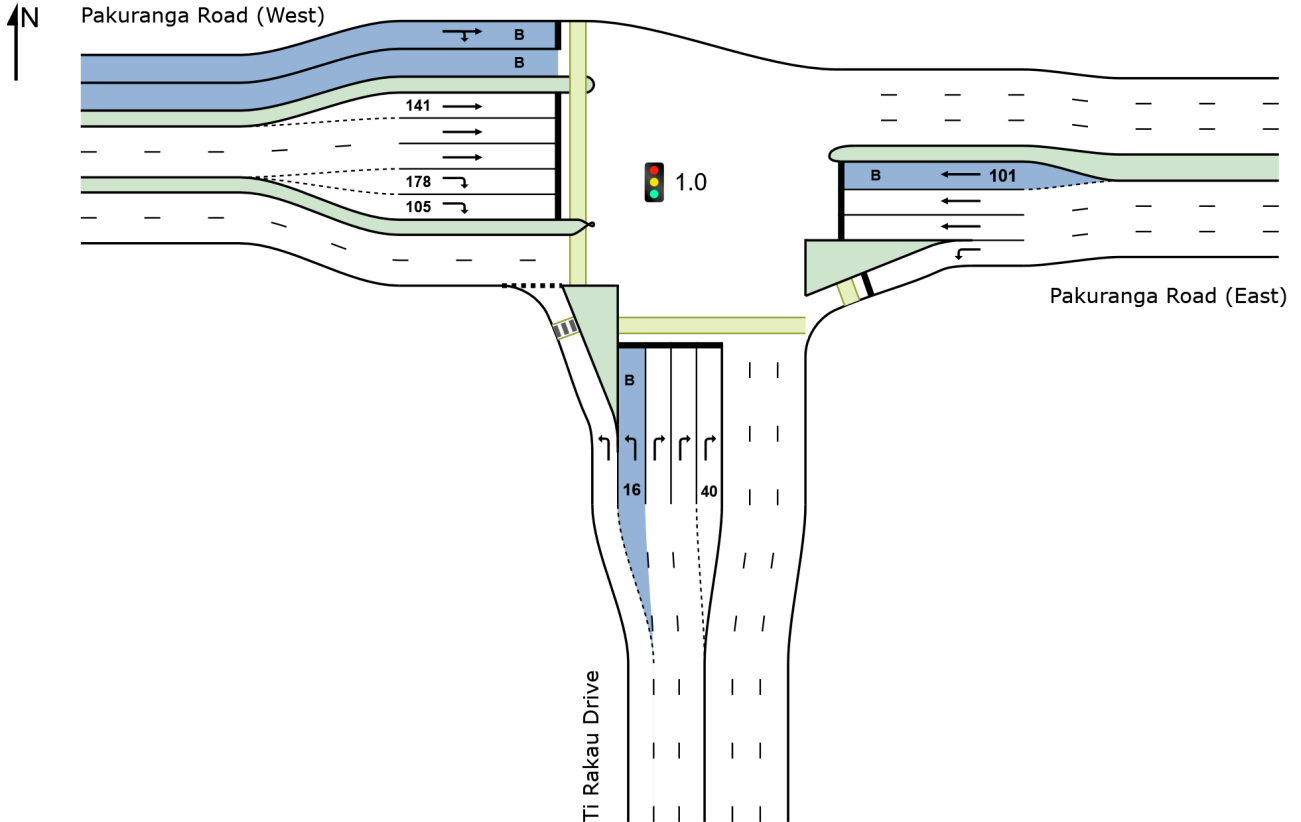
## Construction Scenario 1.3 – Lane Performance Summaries

# SITE LAYOUT

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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





# LANE SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total HV ]	%	[ Total HV ]	%						[ Veh ]	[ Dist ]				
South: Ti Rakau Drive															
Lane 1	579	8.6	566	8.5	896 <sup>1</sup>	0.632	100	13.7	LOS B	13.8	103.5	Full	174	0.0	0.0
Lane 2 (B)	17	100.0	17	100.0	121	0.141	100	47.3	LOS D	0.7	9.1	Short	16	0.0	NA
Lane 3	191	4.0	186	4.0	342	0.545	100	38.7	LOS D	7.1	51.7	Full	174	0.0	0.0
Lane 4	191	4.0	186	4.0	342	0.545	100	38.7	LOS D	7.1	51.7	Full	174	0.0	0.0
Lane 5	191	4.0	186	4.0	342	0.545	100	38.7	LOS D	7.1	51.7	Short	40	0.0	NA
Approach	1168	7.7	1142 <sup>N</sup> <sub>1</sub>	7.7		0.632		26.4	LOS C	13.8	103.5				
East: Pakuranga Road (East)															
Lane 1	832	4.8	812	4.8	1062	0.764	100	17.7	LOS B	23.8	173.6	Full	113	-5.8 <sup>N3</sup>	44.4
Lane 2	626	6.1	611	6.0	689	0.887	100	38.5	LOS D	25.0 <sup>N4</sup>	184.4 <sup>N4</sup>	Full	113	0.0	50.0
Lane 3	626	6.1	611	6.0	689	0.887	100	38.5	LOS D	25.0 <sup>N4</sup>	184.4 <sup>N4</sup>	Full	113	0.0	50.0
Lane 4 (B)	25	100.0	25	100.0	85	0.293	100	45.6	LOS D	1.1	14.0	Short	101	0.0	NA
Approach	2109	6.7	2059 <sup>N</sup> <sub>1</sub>	6.7		0.887		30.4	LOS C	25.0	184.4				
West: Pakuranga Road (West)															
Lane 1 (B)	24	100.0	24	100.0	78	0.309	100	44.3	LOS D	1.0	12.8	Full	388	-3.7 <sup>N3</sup>	0.0
Lane 2	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	9.8	74.6	Short	141	0.0	NA
Lane 3	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	9.8	74.6	Full	388	0.0	0.0
Lane 4	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	9.8	74.6	Full	388	0.0	0.0
Lane 5	131	11.5	131	11.5	142	0.920	100	62.1	LOS E	6.7	51.3	Short	178	0.0	NA
Lane 6	131	11.5	131	11.5	142	0.920	100	62.1	LOS E	6.7	51.3	Short	105	0.0	NA
Approach	1241	11.8	1241	11.8		0.920		30.2	LOS C	9.8	74.6				
Intersection	4518	8.3	4442 <sup>N</sup> <sub>1</sub>	8.5		0.920		29.3	LOS C	25.0	184.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	W	E								
Lane 1	566	-	566	8.5	896 <sup>1</sup>	0.632	100	NA	NA	
Lane 2	17	-	17	100.0	121	0.141	100	0.0	1	

Lane 3	-	186	186	4.0	342	0.545	100	NA	NA
Lane 4	-	186	186	4.0	342	0.545	100	NA	NA
Lane 5	-	186	186	4.0	342	0.545	100	28.3	4
Approach	583	559	1142	7.7		0.632			
East: Pakuranga Road (East)									
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	812	-	812	4.8	1062	0.764	100	NA	NA
Lane 2	-	611	611	6.0	689	0.887	100	NA	NA
Lane 3	-	611	611	6.0	689	0.887	100	NA	NA
Lane 4	-	25	25	100.0	85	0.293	100	0.0	3
Approach	812	1247	2059	6.7		0.887			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	9	15	24	100.0	78	0.309	100	NA	NA
Lane 2	318	-	318	9.6	695	0.458	100	0.0	3
Lane 3	318	-	318	9.6	695	0.458	100	NA	NA
Lane 4	318	-	318	9.6	695	0.458	100	NA	NA
Lane 5	-	131	131	11.5	142	0.920	100	0.0	4
Lane 6	-	131	131	11.5	142	0.920	100	0.0	5
Approach	964	277	1241	11.8		0.920			
Total %HV Deg. Satn (v/c)									
Intersection	4442	8.5		0.920					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										

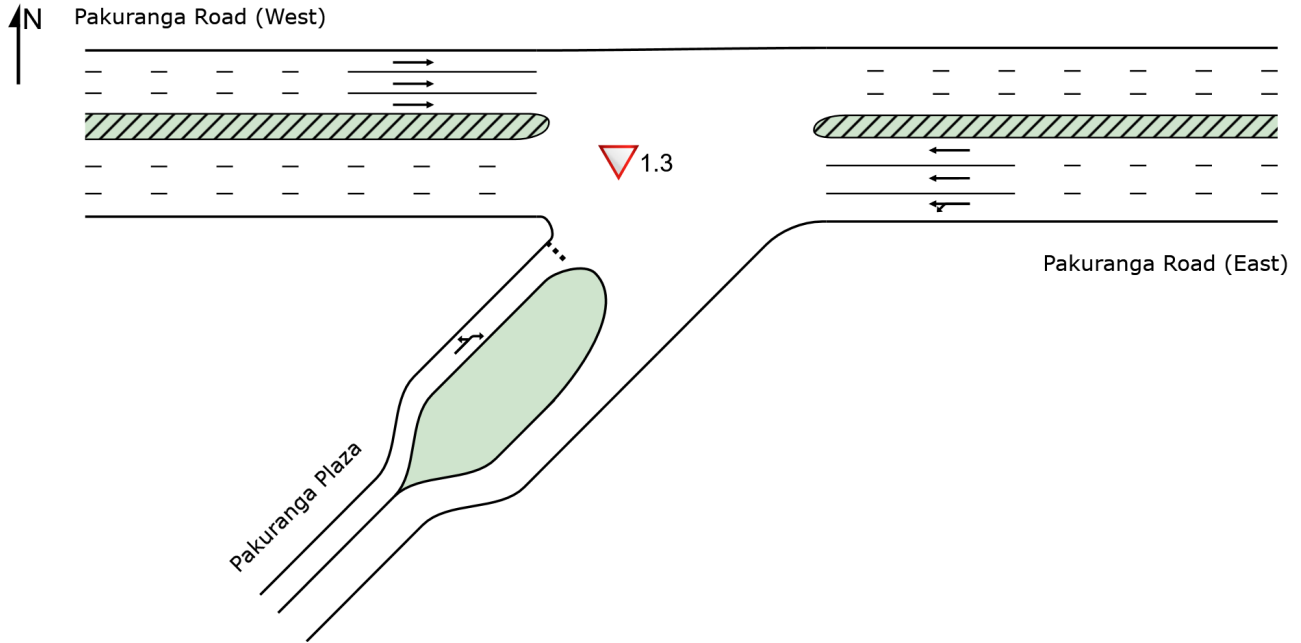


# SITE LAYOUT

## ▽ Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM  
(Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
East: Pakuranga Road (East)															
Lane 1	719	8.5	719	8.5	1844	0.390	100	1.4	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 2	737	5.6	737	5.6	1892	0.390	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 3	737	5.6	737	5.6	1892	0.390	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Approach	2193	6.5	2193	6.5		0.390		0.5	NA	0.0	0.0				
West: Pakuranga Road (West)															
Lane 1	509	8.1	505	8.1	1785	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 2	509	8.1	505	8.1	1785	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 3	506	8.1	503	8.1	1775	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Approach	1524	8.1	1514 <sup>N1</sup>	8.1		0.283		0.0	NA	0.0	0.0				
SouthWest: Pakuranga Plaza															
Lane 1	54	5.6	54	5.6	11	4.740	100	3575.0	LOS F	35.6	260.8	Full	196	-11.4 <sup>N7</sup>	14.2
Approach	54	5.6	54	5.6		4.740		3575.0	LOS F	35.6	260.8				
Intersection	3771	7.2	3761 <sup>N1</sup>	7.2		4.740		51.6	NA	35.6	260.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	L1	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	W								
Lane 1	180	539	719	8.5	1844	0.390	100	NA	NA	
Lane 2	-	737	737	5.6	1892	0.390	100	NA	NA	
Lane 3	-	737	737	5.6	1892	0.390	100	NA	NA	
Approach	180	2013	2193	6.5		0.390				
West: Pakuranga Road (West)										
Mov. From W To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
	E									
Lane 1	505	505	8.1	1785	0.283	100	NA	NA		
Lane 2	505	505	8.1	1785	0.283	100	NA	NA		

Lane 3	503	503	8.1		1775	0.283	100	NA	NA
Approach	1514	1514	8.1			0.283			
SouthWest: Pakuranga Plaza									
Mov. From SW To Exit:	L3 W	R1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	29	25	54	5.6	11	4.740	100	NA	NA
Approach	29	25	54	5.6		4.740			
Total %HV Deg. Satn (v/c)									
Intersection	3761	7.2		4.740					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

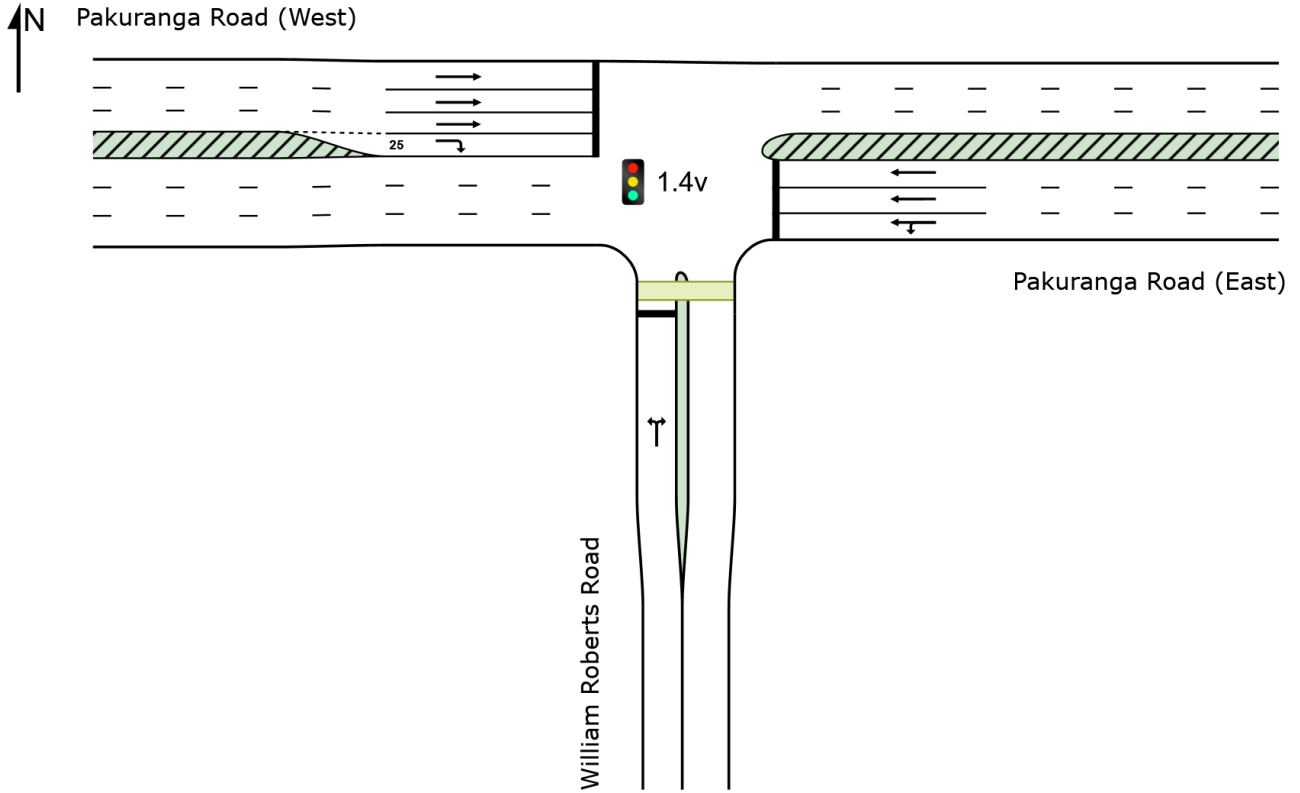
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
SouthWest Exit: Pakuranga Plaza												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

# SITE LAYOUT

 Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: William Roberts Road															
Lane 1	287	8.7	287	8.7	329	0.871	100	40.0	LOS D	10.3	77.1	Full	244	-0.7 <sup>N7</sup>	0.0
Approach	287	8.7	287	8.7		0.871		40.0	LOS D	10.3	77.1				
East: Pakuranga Road (East)															
Lane 1	699	6.0	699	6.0	790	0.885	100	29.7	LOS C	25.3	185.9	Full	184	0.0	5.9
Lane 2	688	6.2	688	6.2	778	0.885	100	28.9	LOS C	24.9	183.3	Full	184	0.0	4.6
Lane 3	696	6.2	696	6.2	786	0.885	100	28.8	LOS C	25.1	184.9	Full	184	0.0	5.4
Approach	2083	6.1	2083	6.1		0.885		29.1	LOS C	25.3	185.9				
West: Pakuranga Road (West)															
Lane 1	565	8.1	558	8.1	1142	0.489	100	6.7	LOS A	9.0	67.7	Full	152	0.0	0.0
Lane 2	516	8.1	510	8.1	1043	0.489	100	6.8	LOS A	8.3	62.0	Full	152	-5.6 <sup>N3</sup>	0.0
Lane 3	470	8.1	464	8.1	949 <sup>1</sup>	0.489	100	6.5	LOS A	7.3	54.4	Full	152	-5.6 <sup>N3</sup>	0.0
Lane 4	54	13.0	53	13.0	160	0.333	100	35.8	LOS D	1.6	12.5	Short	25	0.0	NA
Approach	1605	8.2	1585 <sup>N1</sup>	8.3		0.489		7.7	LOS A	9.0	67.7				
Intersection	3975	7.2	3955 <sup>N1</sup>	7.2		0.885		21.3	LOS C	25.3	185.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Road										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	W	E								
Lane 1	253	34	287	8.7	329	0.871	100	NA	NA	
Approach	253	34	287	8.7		0.871				
East: Pakuranga Road (East)										
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	S	W								
Lane 1	143	556	699	6.0	790	0.885	100	NA	NA	
Lane 2	-	688	688	6.2	778	0.885	100	NA	NA	



Lane 3	-	696	696	6.2	786	0.885	100	NA	NA
Approach	143	1940	2083	6.1		0.885			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	558	-	558	8.1	1142	0.489	100	NA	NA
Lane 2	510	-	510	8.1	1043	0.489	100	NA	NA
Lane 3	464	-	464	8.1	949 <sup>1</sup>	0.489	100	NA	NA
Lane 4	-	53	53	13.0	160	0.333	100	0.0	3
Approach	1532	53	1585	8.3		0.489			
Total %HV Deg. Satn (v/c)									
Intersection	3955	7.2		0.885					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

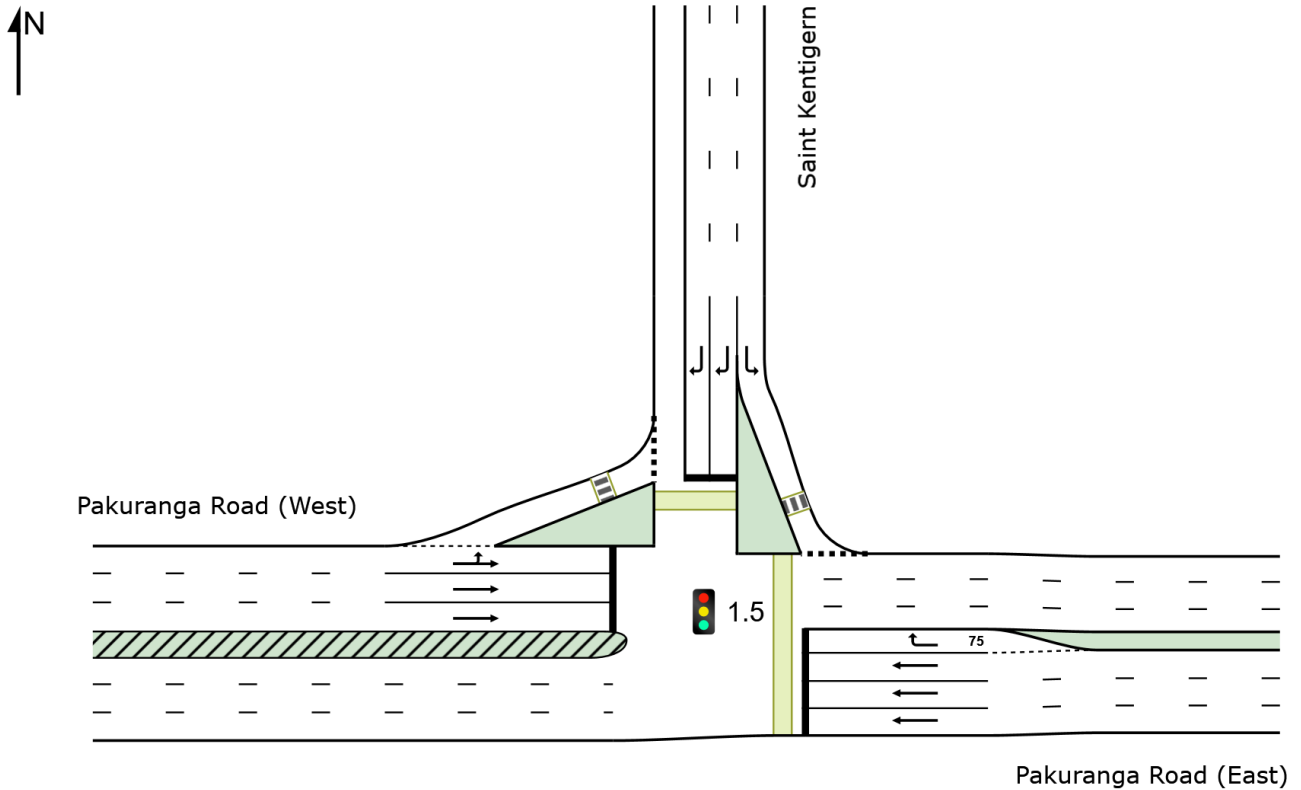
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 88 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Pakuranga Road (East)															
Lane 1	685	6.3	685	6.3	1065	0.644	100	11.6	LOS B	18.7	138.0	Full	87	-5.9 <sup>N7</sup>	47.3
Lane 2	695	6.3	695	6.3	1079	0.644	100	11.6	LOS B	18.9	139.8	Full	87	-4.6 <sup>N3</sup>	48.5
Lane 3	672	6.3	672	6.3	1045	0.644	100	11.4	LOS B	18.0	132.8	Full	87	-5.4 <sup>N3</sup>	43.7
Lane 4	72	2.8	72	2.8	239	0.301	100	26.0	LOS C	1.7	12.0	Short	75	0.0	NA
Approach	2124	6.2	2124	6.2		0.644		12.0	LOS B	18.9	139.8				
North: Saint Kentigern															
Lane 1	13	0.0	13	0.0	938	0.014	100	5.8	LOS A	0.2	1.3	Full	96	0.0	0.0
Lane 2	20	10.0	20	10.0	407	0.050	100	27.1	LOS C	0.7	5.0	Full	96	-4.6 <sup>N3</sup>	0.0
Lane 3	20	10.0	20	10.0	397	0.050	100	27.1	LOS C	0.6	4.9	Full	96	-5.4 <sup>N3</sup>	0.0
Approach	53	7.5	53	7.5		0.050		21.9	LOS C	0.7	5.0				
West: Pakuranga Road (West)															
Lane 1	505	7.2	499	7.3	586	0.853	100	33.1	LOS C	21.0	156.0	Full	184	0.0	0.0
Lane 2	541	8.4	535	8.4	627	0.853	100	36.8	LOS D	24.7	185.3	Full	184	0.0	5.6
Lane 3	541	8.4	535	8.4	627	0.853	100	36.8	LOS D	24.7	185.3	Full	184	0.0	5.6
Approach	1587	8.0	1569 <sup>N1</sup>	8.1		0.853		35.6	LOS D	24.7	185.3				
Intersection	3764	7.0	3746 <sup>N1</sup>	7.0		0.853		22.0	LOS C	24.7	185.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N3** Capacity Adjustment due to downstream lane blockage determined by the program.

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	685	-	685	6.3	1065	0.644	100	NA	NA	
Lane 2	695	-	695	6.3	1079	0.644	100	NA	NA	
Lane 3	672	-	672	6.3	1045	0.644	100	NA	NA	
Lane 4	-	72	72	2.8	239	0.301	100	0.0	3	
Approach	2052	72	2124	6.2		0.644				
North: Saint Kentigern										
Mov. From N	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane	

To Exit:	E	W			veh/h	v/c	%	%	No.
Lane 1	13	-	13	0.0	938	0.014	100	NA	NA
Lane 2	-	20	20	10.0	407	0.050	100	NA	NA
Lane 3	-	20	20	10.0	397	0.050	100	NA	NA
Approach	13	40	53	7.5		0.050			
West: Pakuranga Road (West)									
Mov.	L2	T1	Total	%HV		Deg.	Lane	Prob.	Ov.
From W					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E			veh/h	v/c	%	%	No.
Lane 1	127	372	499	7.3	586	0.853	100	NA	NA
Lane 2	-	535	535	8.4	627	0.853	100	NA	NA
Lane 3	-	535	535	8.4	627	0.853	100	NA	NA
Approach	127	1441	1569	8.1		0.853			
Total %HV Deg.Satn (v/c)									
Intersection	3746	7.0		0.853					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

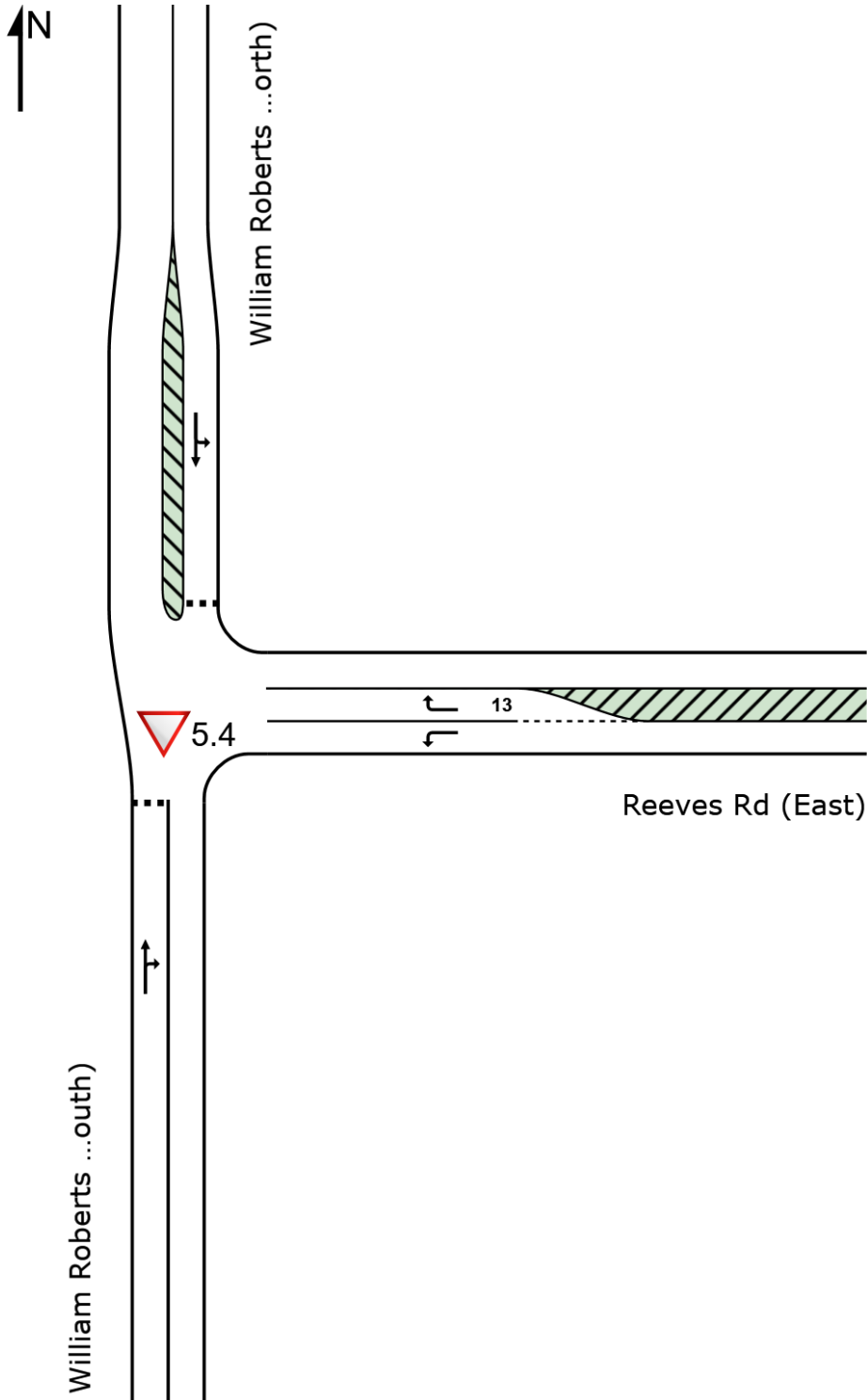
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
North Exit: Saint Kentigern												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

▽ Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 9:48:19 am  
Project: C:\Users\jacques.vandenhoeffer\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport  
Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9

# LANE SUMMARY

Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: William Roberts Rd (South)															
Lane 1	219	7.8	219	7.8	831	0.263	100	4.2	LOS A	1.0	7.6	Full	243	0.0	0.0
Approach	219	7.8	219	7.8		0.263		4.2	LOS A	1.0	7.6				
East: Reeves Rd (East)															
Lane 1	215	9.3	215	9.3	1714	0.125	100	4.7	LOS A	0.0	0.0	Full	266	0.0	0.0
Lane 2	222	9.0	222	9.0	1718	0.129	100	4.7	LOS A	0.0	0.0	Short	13	0.0	NA
Approach	437	9.2	437	9.2		0.129		4.7	NA	0.0	0.0				
North: William Roberts Rd (North)															
Lane 1	141	5.0	141	5.0	1113	0.126	100	5.7	LOS A	0.5	3.4	Full	244	0.0	0.0
Approach	141	5.0	141	5.0		0.126		5.7	LOS A	0.5	3.4				
Intersection	797	8.0	796 <sup>N1</sup>	8.1		0.263		4.7	NA	1.0	7.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
South: William Roberts Rd (South)										
Mov. From S To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	66	153	219	7.8	831	0.263	100	NA	NA	
Approach	66	153	219	7.8		0.263				
East: Reeves Rd (East)										
Mov. From E To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	215	-	215	9.3	1714	0.125	100	NA	NA	
Lane 2	-	222	222	9.0	1718	0.129	100	0.0	1	
Approach	215	222	437	9.2		0.129				
North: William Roberts Rd (North)										
Mov. From N To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	42	99	141	5.0	1113	0.126	100	NA	NA	
Approach	42	99	141	5.0		0.126				

	Total	%HV	Deg.Satn (v/c)
Intersection	796	8.1	0.263

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: William Roberts Rd (South)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
East Exit: Reeves Rd (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
North Exit: William Roberts Rd (North)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.



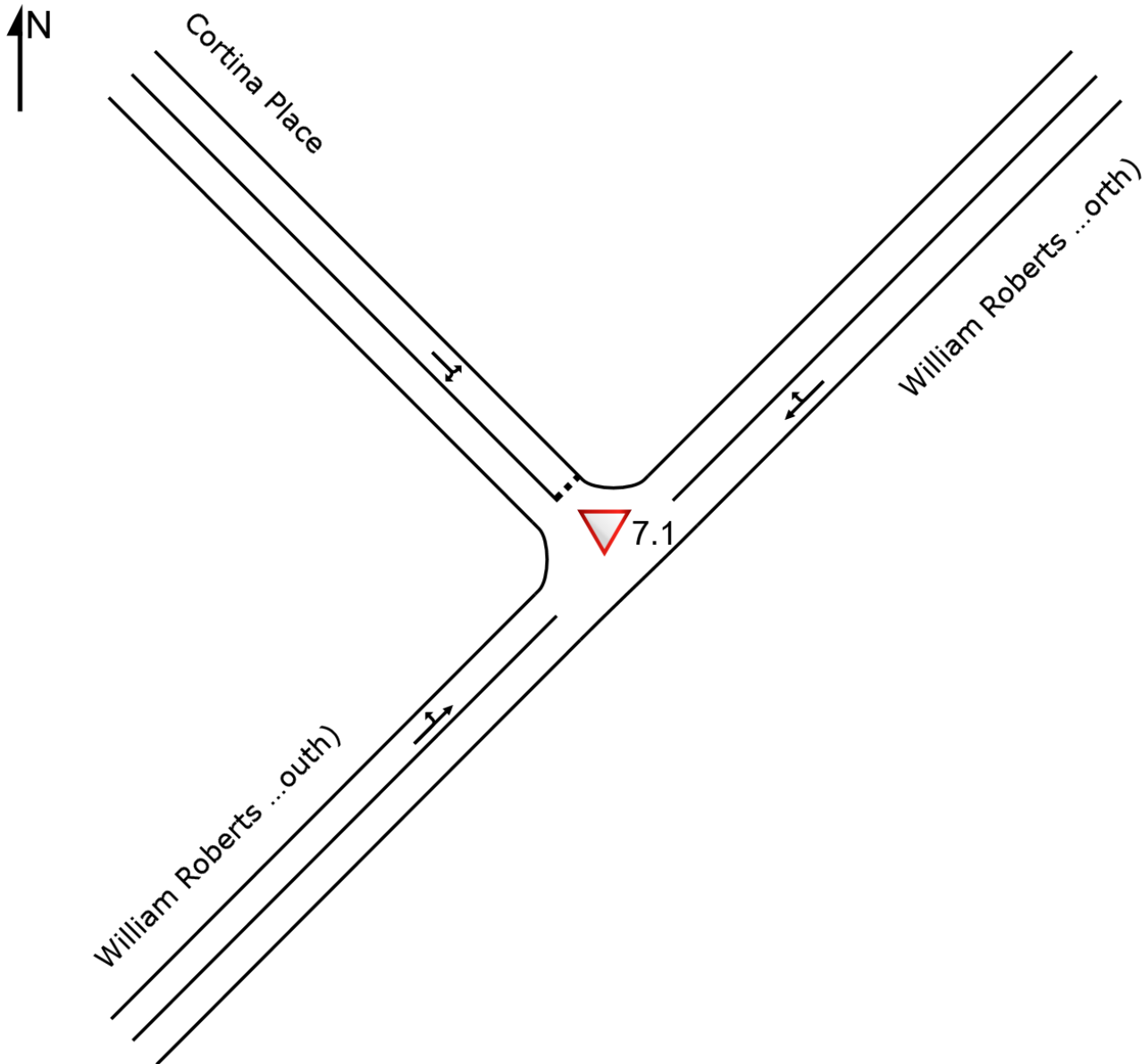
# SITE LAYOUT

▽ Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

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Scheme Design  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
NorthEast: William Roberts Road (North)															
Lane 1	293	7.8	293	7.9	1772	0.165	100	0.5	LOS A	0.3	2.2	Full	243	0.0	0.0
Approach	293	7.8	293	7.9		0.165		0.5	NA	0.3	2.2				
NorthWest: Cortina Place															
Lane 1	31	6.5	31	6.5	1051	0.029	100	3.3	LOS A	0.1	0.8	Full	177	0.0	0.0
Approach	31	6.5	31	6.5		0.029		3.3	LOS A	0.1	0.8				
SouthWest: William Roberts Road (South)															
Lane 1	204	8.8	204	8.8	1785	0.114	100	0.2	LOS A	0.0	0.0	Full	110	0.0	0.0
Approach	204	8.8	204	8.8		0.114		0.2	NA	0.0	0.0				
Intersection	528	8.2	527 <sup>N1</sup>	8.2		0.165		0.6	NA	0.3	2.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From NE To Exit:	SW	NW			Cap. veh/h	v/c	%	%	No.	
Lane 1	256	37	293	7.9	1772	0.165	100	NA	NA	
Approach	256	37	293	7.9		0.165				
NorthWest: Cortina Place										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From NW To Exit:	NE	SW			Cap. veh/h	v/c	%	%	No.	
Lane 1	20	11	31	6.5	1051	0.029	100	NA	NA	
Approach	20	11	31	6.5		0.029				
SouthWest: William Roberts Road (South)										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From SW To Exit:	NW	NE			Cap. veh/h	v/c	%	%	No.	
Lane 1	24	180	204	8.8	1785	0.114	100	NA	NA	
Approach	24	180	204	8.8		0.114				
Total %HV Deg. Satn (v/c)										

Intersection	527	8.2	0.165
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Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

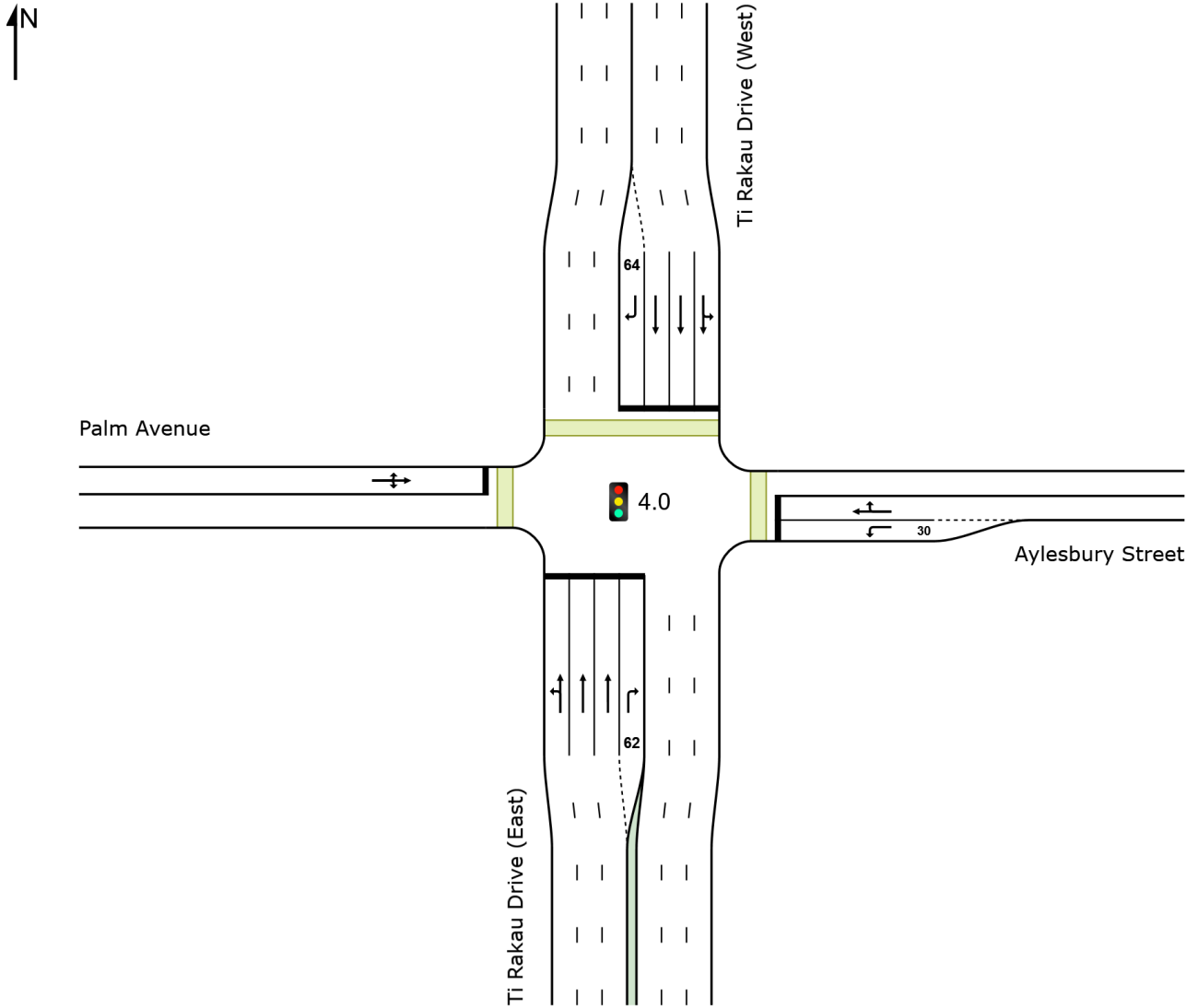
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
NorthWest Exit: Cortina Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
SouthWest Exit: William Roberts Road (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 137 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
South: Ti Rakau Drive (East)															
Lane 1	374	6.1	357	6.1	820	0.435	100	31.8	LOS C	15.5	114.3	Full	110	0.0	8.5
Lane 2	380	10.6	363	10.6	834	0.435	100	27.1	LOS C	15.0	114.8	Full	110	0.0	8.9
Lane 3	380	6.5	362	6.4	833 <sup>1</sup>	0.435	100	27.9	LOS C	15.5	114.6	Full	110	0.0	8.7
Lane 4	23	4.3	22	4.3	225	0.098	100	60.7	LOS E	1.3	9.5	Short	62	0.0	NA
Approach	1157	7.7	1104 <sup>N1</sup>	7.6		0.435		29.5	LOS C	15.5	114.8				
East: Aylesbury Street															
Lane 1	10	0.0	10	0.0	451	0.022	100	27.2	LOS C	0.4	2.7	Short	30	0.0	NA
Lane 2	20	0.0	20	0.0	236	0.085	100	57.8	LOS E	1.2	8.3	Full	40	0.0	0.0
Approach	30	0.0	30	0.0		0.085		47.6	LOS D	1.2	8.3				
North: Ti Rakau Drive (West)															
Lane 1	540	8.3	531	8.4	845	0.628	100	30.3	LOS C	25.3	190.0	Full	174	0.0	12.9
Lane 2	271	7.8	266	7.9	424	0.628	100	31.7	LOS C	13.2	98.7	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 3	273	6.5	268	6.5	428	0.628	100	32.1	LOS C	13.5	99.6	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 4	21	0.0	21	0.0	232	0.089	100	60.5	LOS E	1.2	8.6	Short	64	0.0	NA
Approach	1106	7.6	1086 <sup>N1</sup>	7.6		0.628		31.7	LOS C	25.3	190.0				
West: Palm Avenue															
Lane 1	135	4.4	135	4.4	138	0.981	100	111.4	LOS F	12.3	89.6	Full	87	-31.5 <sup>N3</sup>	7.7
Approach	135	4.4	135	4.4		0.981		111.4	LOS F	12.3	89.6				
Intersection	2428	7.4	2355 <sup>N1</sup>	7.6		0.981		35.4	LOS D	25.3	190.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)											
South: Ti Rakau Drive (East)											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	Ov. Lane No.
	W	N	E								
Lane 1	32	324	-	357	6.1	820	0.435	100	NA	NA	NA
Lane 2	-	363	-	363	10.6	834	0.435	100	NA	NA	NA
Lane 3	-	362	-	362	6.4	833 <sup>1</sup>	0.435	100	NA	NA	NA
Lane 4	-	-	22	22	4.3	225	0.098	100	0.0	3	3

Approach	32	1049	22	1104	7.6		0.435				
East: Aylesbury Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From E						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	%	No.
Lane 1	10	-	-	10	0.0	451	0.022	100	0.0	2	
Lane 2	-	10	10	20	0.0	236	0.085	100	NA	NA	
Approach	10	10	10	30	0.0		0.085				
North: Ti Rakau Drive (West)											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	%	No.
Lane 1	10	521	-	531	8.4	845	0.628	100	NA	NA	
Lane 2	-	266	-	266	7.9	424	0.628	100	NA	NA	
Lane 3	-	268	-	268	6.5	428	0.628	100	NA	NA	
Lane 4	-	-	21	21	0.0	232	0.089	100	0.0	3	
Approach	10	1056	21	1086	7.6		0.628				
West: Palm Avenue											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	%	No.
Lane 1	63	10	62	135	4.4	138	0.981	100	NA	NA	
Approach	63	10	62	135	4.4		0.981				
Total %HV Deg. Satn (v/c)											
Intersection	2355	7.6		0.981							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
East Exit: Aylesbury Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
North Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Palm Avenue Merge Type: <b>Not Applied</b>												
Full Length Lane	1											

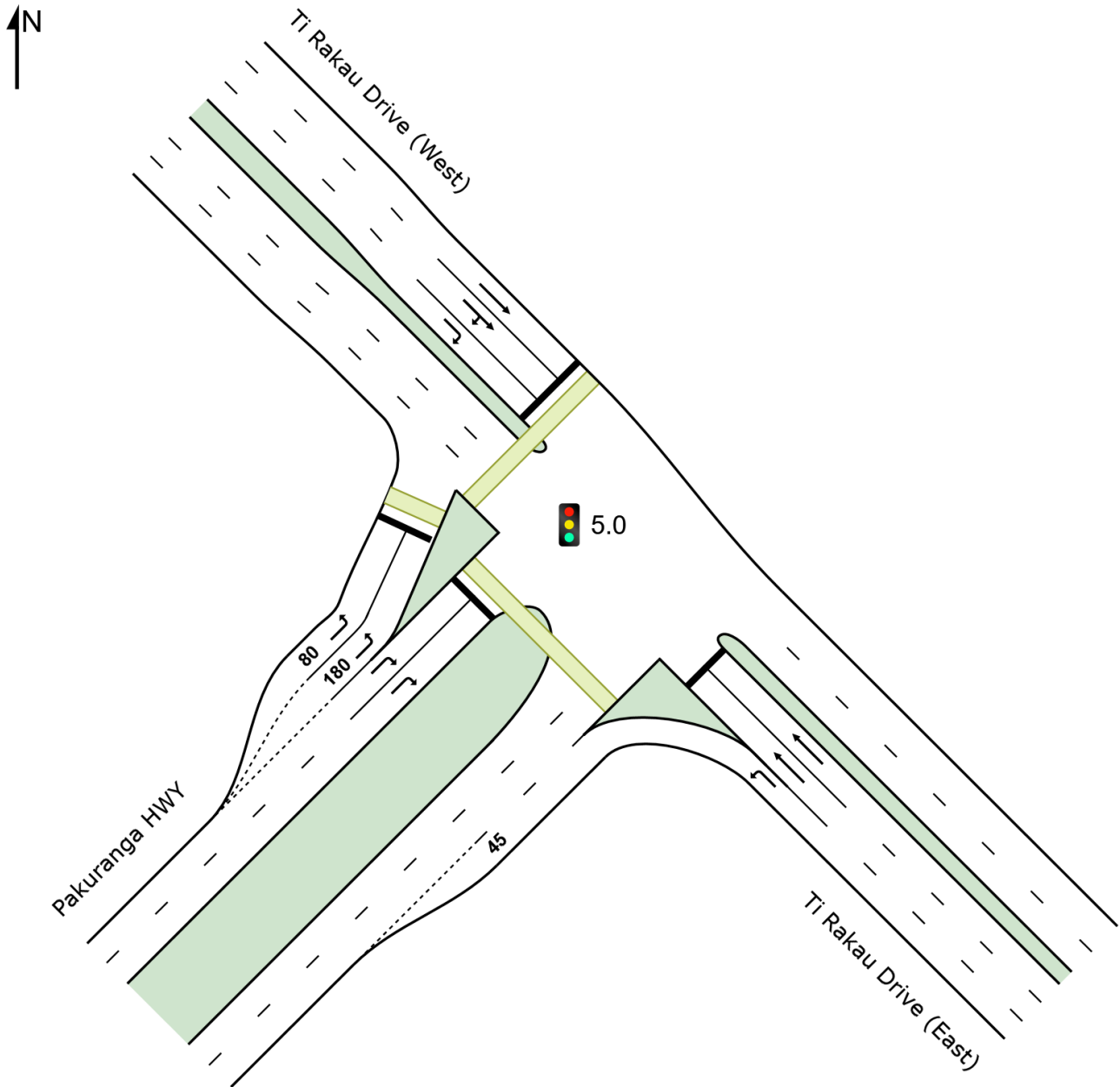
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9

# SITE LAYOUT

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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







Lane 1	152	-	152	24.2	506	0.300	33 <sup>5</sup>	NA	NA
Lane 2	-	490	490	5.2	546	0.898	100	NA	NA
Lane 3	-	478	478	5.2	532	0.898	100	NA	NA
Approach	152	968	1120	7.8		0.898			
SouthWest: Pakuranga HWY									
Mov. From SW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	325	-	325	4.9	506	0.642	100	16.3	2
Lane 2	323	-	323	4.9	504	0.642	100	0.0	4
Lane 3	-	429	429	9.3	487	0.882	100	NA	NA
Lane 4	-	434	434	9.3	492	0.882	100	NA	NA
Approach	648	863	1511	7.4		0.882			
Total %HV Deg. Satn (v/c)									
Intersection	4496	9.1		0.898					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

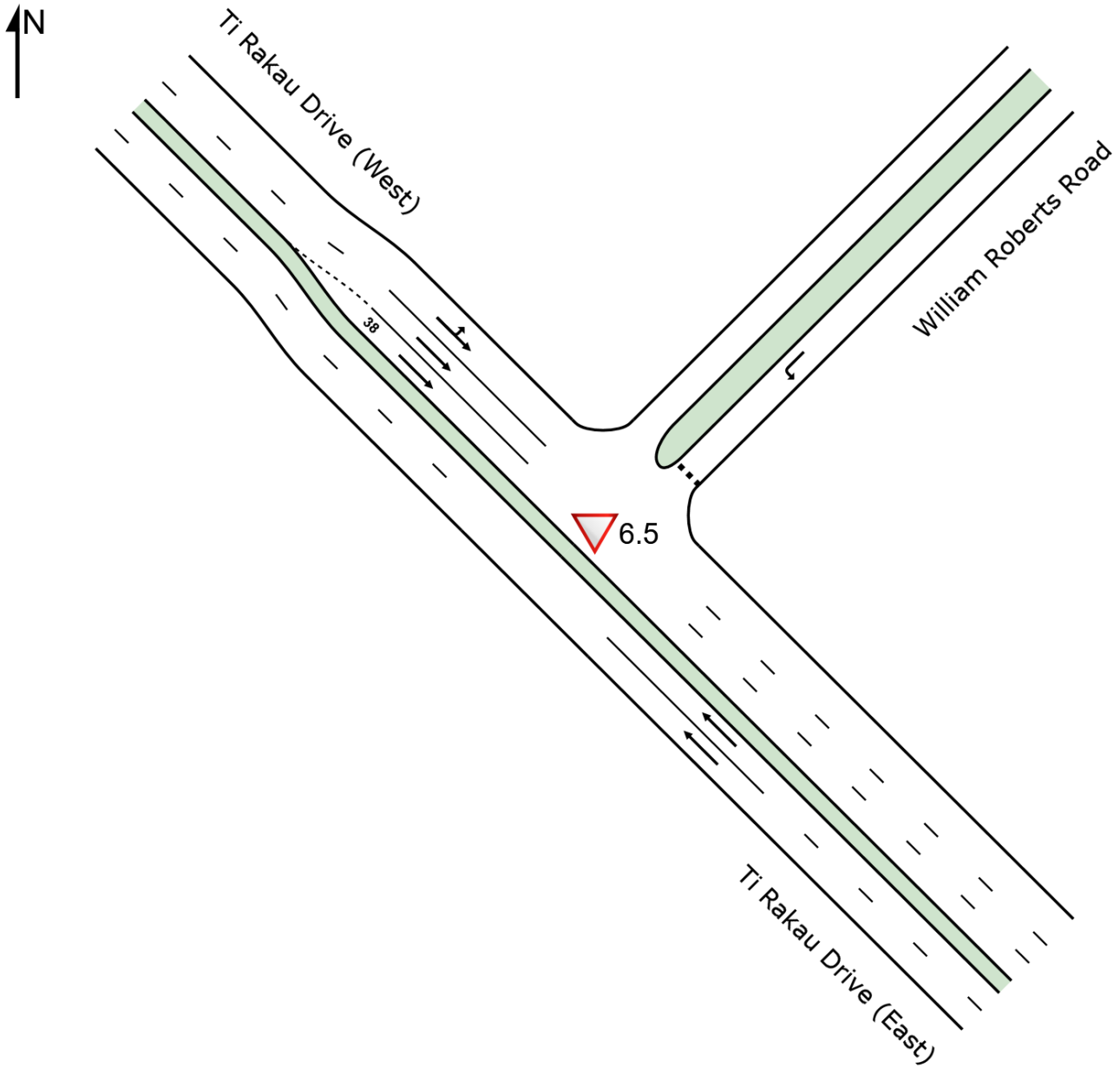
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
Full Length Lane	3		Merge Analysis not applied.									
SouthWest Exit: Pakuranga HWY Merge Type: <b>Priority</b>												
Exit Short Lane	1	45	0.0	490	503	3.00	2.00	1405	1283	1.095	0.8	93.7
Merge Lane	2	-	100.0	Merge Lane is not Opposed			490	1800	0.272	0.0	0.0	

# SITE LAYOUT

▽ Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
SouthEast: Ti Rakau Drive (East)															
Lane 1	998	10.1	885	10.2	1781	0.497	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Lane 2	987	10.1	875	10.2	1762	0.497	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	1985	10.1	1760 <sup>N1</sup>	10.2		0.497		0.0	NA	0.0	0.0				
NorthEast: William Roberts Road															
Lane 1	263	8.0	263	8.0	553	0.475	100	2.9	LOS A	1.1	8.1	Full	110	-50.0 <sup>N7</sup>	0.0
Approach	263	8.0	263	8.0		0.475		2.9	LOS A	1.1	8.1				
NorthWest: Ti Rakau Drive (West)															
Lane 1	348	10.2	348	10.2	1827	0.190	100	2.7	LOS A	0.0	0.0	Full	97	0.0	0.0
Lane 2	332	12.1	332	12.1	1742	0.190	100	0.0	LOS A	4.1 <sup>N5</sup>	31.7 <sup>N5</sup>	Full	97	0.0	0.0
Lane 3	332	12.1	332	12.1	1742	0.190	100	0.0	LOS A	0.0	0.0	Short	38	0.0	NA
Approach	1013	11.5	1011 <sup>N1</sup>	11.5		0.190		0.9	NA	4.1	31.7				
Intersection	3261	10.4	3034 <sup>N1</sup>	11.1		0.497		0.6	NA	4.1	31.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N5** Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV		Deg. Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	NW								
Lane 1	885	885	10.2		1781	0.497	100	NA	NA
Lane 2	875	875	10.2		1762	0.497	100	NA	NA
Approach	1760	1760	10.2			0.497			
NorthEast: William Roberts Road									
Mov. From NE To Exit:	L2	Total	%HV		Deg. Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	SE								
Lane 1	263	263	8.0		553	0.475	100	NA	NA
Approach	263	263	8.0			0.475			

NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NE	SE								
Lane 1	204	144	348	10.2	1827	0.190	100	NA	NA	
Lane 2	-	332	332	12.1	1742	0.190	100	NA	NA	
Lane 3	-	332	332	12.1	1742	0.190	100	0.0	2	
Approach	204	807	1011	11.5		0.190				
Total %HV Deg. Satn (v/c)										
Intersection	3034	11.1		0.497						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
NorthEast Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# SITE LAYOUT

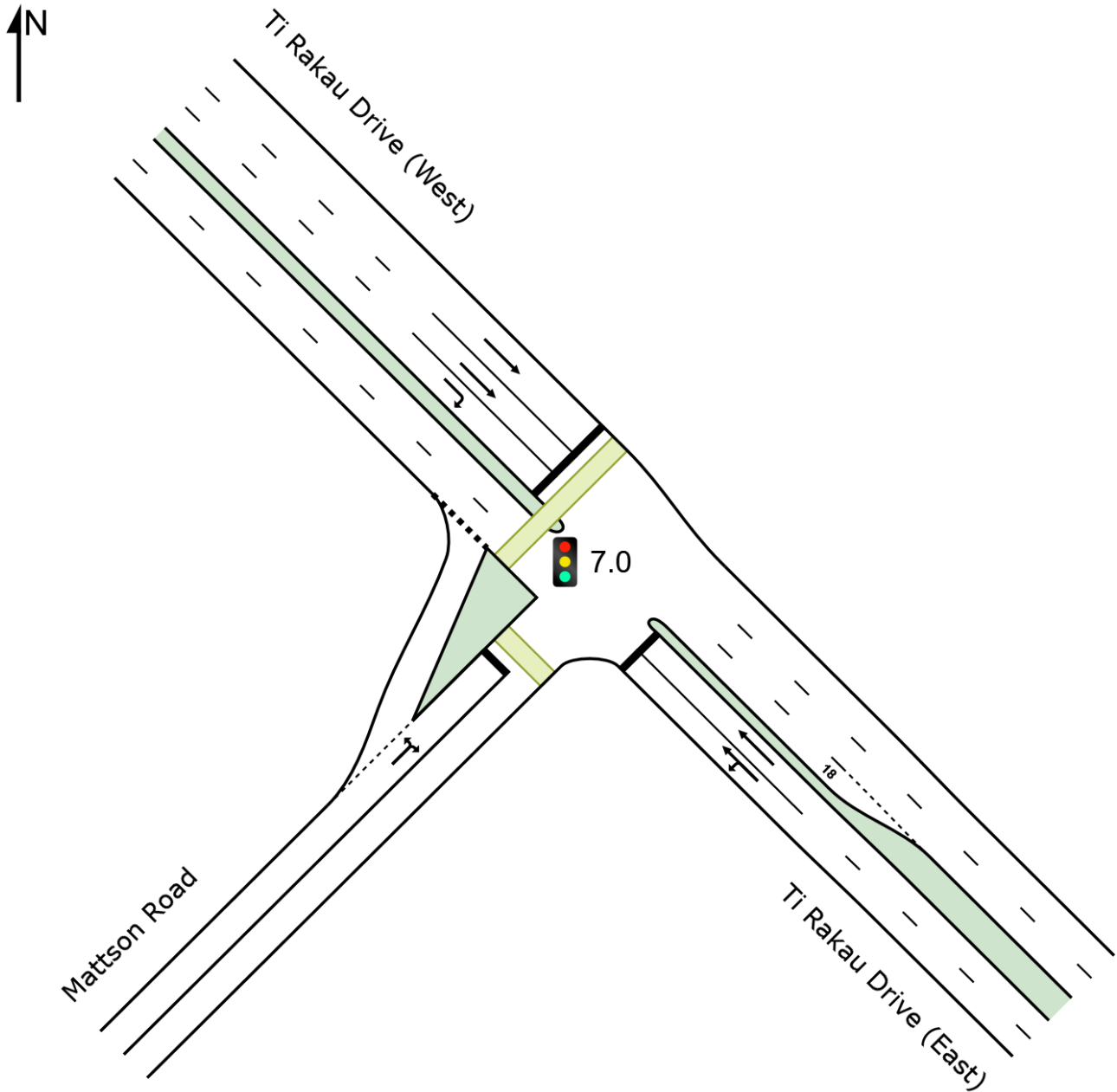
 Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





From SW To Exit:	NW	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	72	64	136	4.4	515	0.264	100	NA	NA
Approach	72	64	136	4.4		0.264			
Total %HV Deg. Satn (v/c)									
Intersection	2921	11.1		0.889					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East) Merge Type: <b>Priority</b>												
Exit Short Lane	3	18	0.0	493	521	3.00	2.00	64	1265	0.051	0.9	1.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				493	1800	0.274	0.0	0.0
NorthWest Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
SouthWest Exit: Mattson Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Friday, 3 February 2023 1:48:58 pm  
Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9

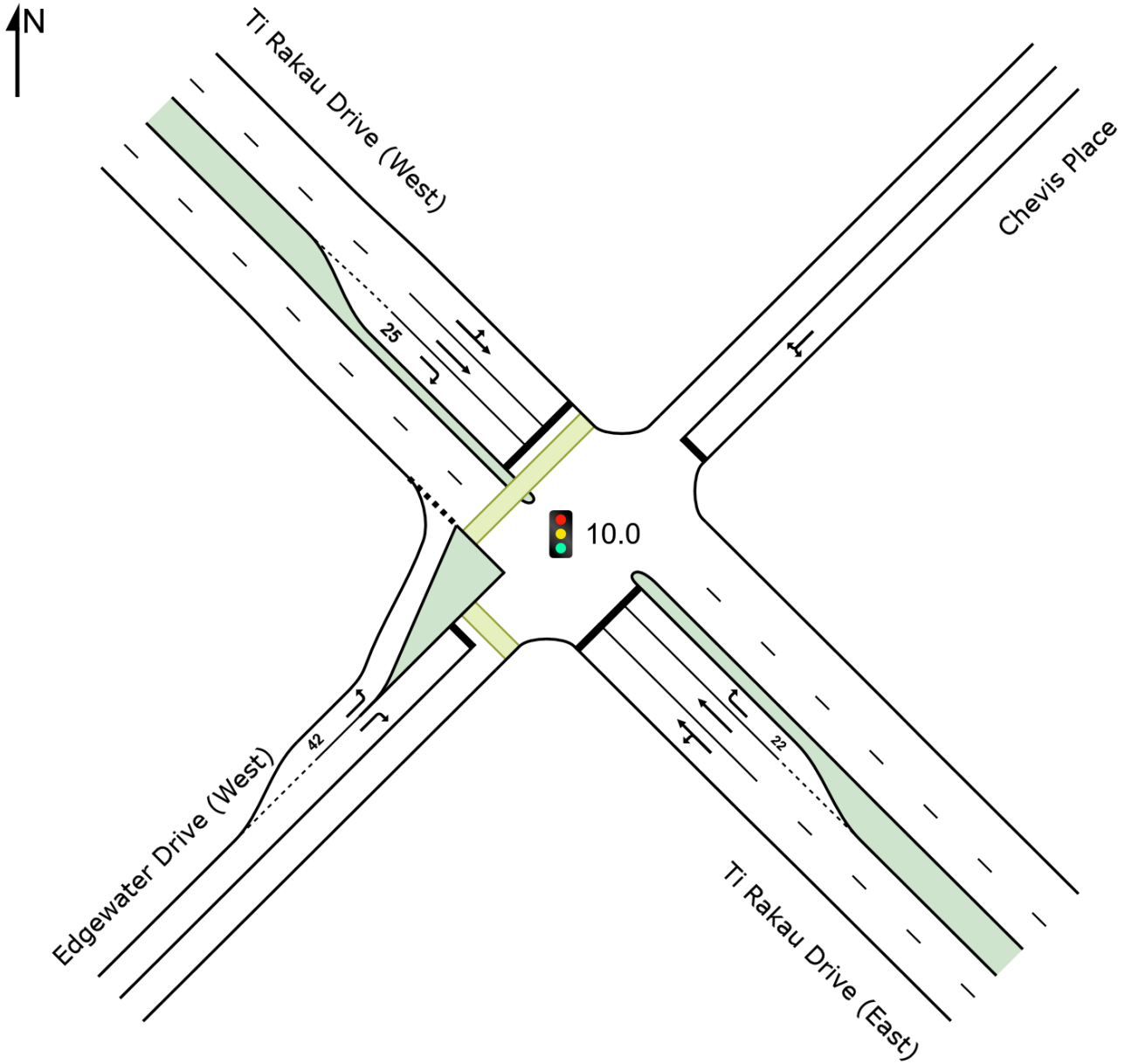


# SITE LAYOUT

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





From NE To Exit:	SE	NW				Cap. veh/h	Satn v/c	Util. %	SL %	Ov. %	Lane No.
Lane 1	10	18	28	3.6		102	0.276	100	NA	NA	
Approach	10	18	28	3.6			0.276				
NorthWest: Ti Rakau Drive (West)											
Mov. From NW To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
Lane 1	10	436	-	445	11.3	974	0.457	100	NA	NA	
Lane 2	-	381	-	381	11.6	834 <sup>1</sup>	0.457	100	NA	NA	
Lane 3	-	-	43	43	13.3	95	0.457	100	0.0		2
Approach	10	817	43	870	11.5		0.457				
SouthWest: Edgewater Drive (West)											
Mov. From SW To Exit:	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
Lane 1	118	-	118	8.5		619	0.191	100	0.0		2
Lane 2	-	34	34	8.8		244	0.140	100	NA	NA	
Approach	118	34	152	8.6			0.191				
Total %HV Deg.Satn (v/c)											
Intersection	2748	11.0		0.888							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

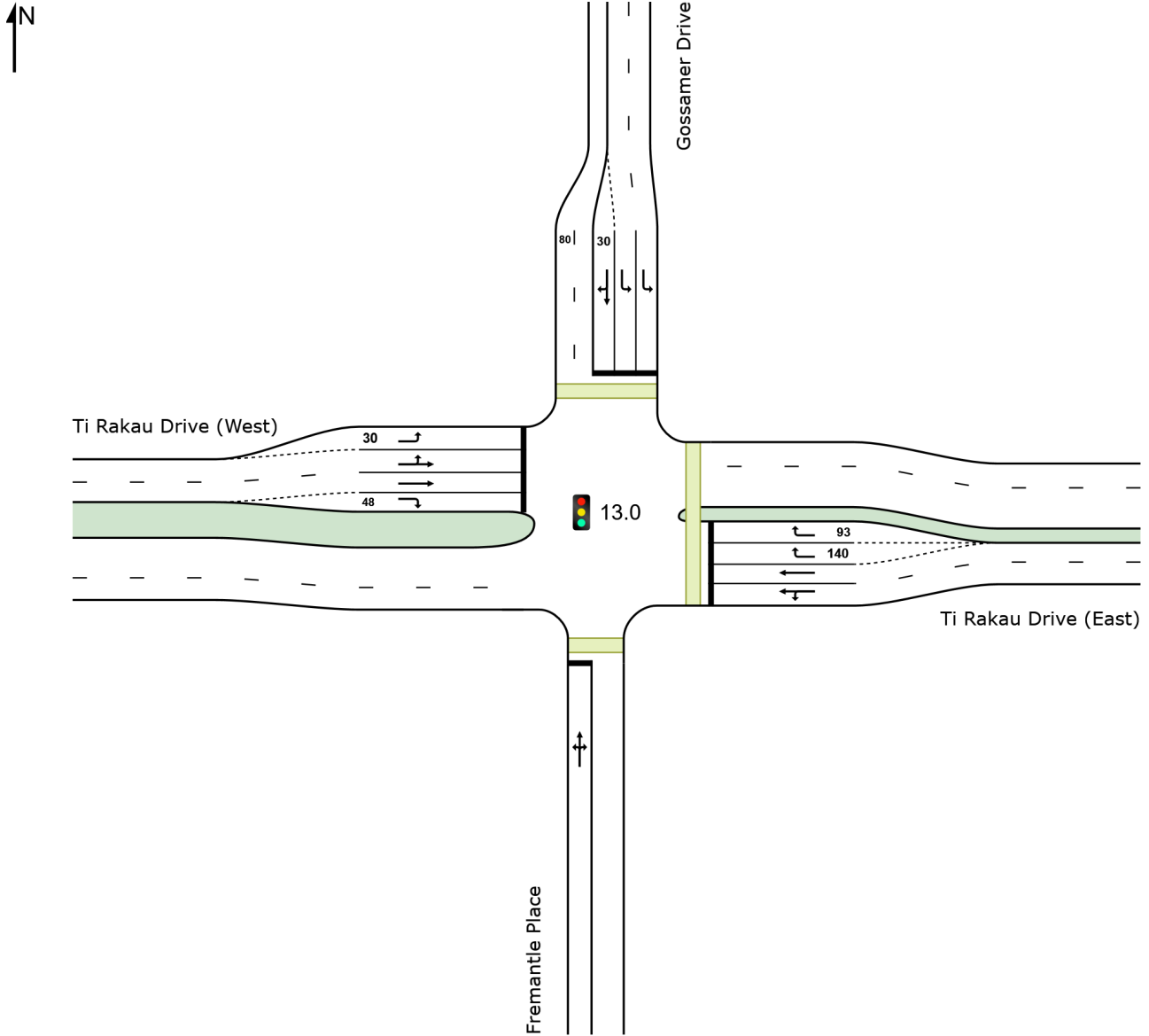
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
NorthEast Exit: Chevis Place											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
SouthWest Exit: Edgewater Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									

# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 132 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
South: Fremantle Place															
Lane 1	50	6.0	50	6.0	82	0.612	100	76.0	LOS E	3.4	25.3	Full	285	0.0	0.0
Approach	50	6.0	50	6.0		0.612		76.0	LOS E	3.4	25.3				
East: Ti Rakau Drive (East)															
Lane 1	784	10.7	784	10.7	752	1.043	100	97.8	LOS F	66.6	508.9	Full	636	0.0	0.0
Lane 2	730	10.8	730	10.8	700 <sup>1</sup>	0.731	100	120.9	LOS F	77.5	592.9	Full	636	0.0	0.0
Lane 3	128	7.8	128	7.8	328	0.389	47 <sup>6</sup>	31.2	LOS C	3.8	28.6	Short	140	0.0	NA
Lane 4	271	7.8	271	7.8	328	0.827	100	45.1	LOS D	11.6	86.8	Short	93	0.0	NA
Approach	1913	10.1	1913	10.1		1.043		94.7	LOS F	77.5	592.9				
North: Gossamer Drive															
Lane 1	521	8.9	521	8.9	794	0.656	100	23.1	LOS C	19.4	145.9	Full	1010	0.0	0.0
Lane 2	409	8.9	409	8.9	623 <sup>1</sup>	0.656	100	21.5	LOS C	13.9	104.4	Full	1010	0.0	0.0
Lane 3	291	5.8	291	5.8	230 <sup>1</sup>	1.267	100	315.6	LOS F	47.7	350.5	Short	30	0.0	NA
Approach	1221	8.2	1221	8.2		1.267		92.3	LOS F	47.7	350.5				
West: Ti Rakau Drive (West)															
Lane 1	55	9.1	52	9.1	907	0.057	8 <sup>5</sup>	14.1	LOS B	1.1	8.4	Short	30	0.0	NA
Lane 2	396	11.4	373	11.6	510 <sup>1</sup>	0.731	100	42.9	LOS D	21.0	161.5	Full	479	0.0	0.0
Lane 3	418	11.4	394	11.6	539 <sup>1</sup>	0.731	100	43.6	LOS D	22.5	173.5	Full	479	0.0	0.0
Lane 4	11	9.1	10	9.1	218	0.048	100	59.3	LOS E	0.6	4.4	Short	48	0.0	NA
Approach	880	11.3	829 <sup>N1</sup>	11.4		0.731		41.6	LOS D	22.5	173.5				
Intersection	4064	9.7	4013 <sup>N1</sup>	9.9		1.267		82.8	LOS F	77.5	592.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

<sup>6</sup> Lane under-utilisation due to downstream effects

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: Fremantle Place											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
Lane 1	23	10	17	50	6.0	82	0.612	100	NA	NA	
Approach	23	10	17	50	6.0		0.612				
East: Ti Rakau Drive (East)											

Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	18	766	-	784	10.7	752	1.043	100	NA	NA
Lane 2	-	730	-	730	10.8	700 <sup>1</sup>	1.043	100	NA	NA
Lane 3	-	-	128	128	7.8	328	0.389	47 <sup>6</sup>	0.0	2
Lane 4	-	-	271	271	7.8	328	0.827	100	0.0	3
Approach	18	1496	399	1913	10.1		1.043			
North: Gossamer Drive										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	521	-	-	521	8.9	794	0.656	100	NA	NA
Lane 2	409	-	-	409	8.9	623 <sup>1</sup>	0.656	100	NA	NA
Lane 3	-	11	280	291	5.8	230 <sup>1</sup>	1.267	100	100.0	2
Approach	930	11	280	1221	8.2		1.267			
West: Ti Rakau Drive (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	52	-	-	52	9.1	907	0.057	8 <sup>5</sup>	0.0	2
Lane 2	-	373	-	373	11.6	510 <sup>1</sup>	0.731	100	NA	NA
Lane 3	-	394	-	394	11.6	539 <sup>1</sup>	0.731	100	NA	NA
Lane 4	-	-	10	10	9.1	218	0.048	100	0.0	3
Approach	52	767	10	829	11.4		0.731			
Total %HV Deg. Satn (v/c)										
Intersection	4013	9.9		1.267						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Gossamer Drive Merge Type: <b>Zipper</b>												
Exit Short Lane	1	80	50.0	141	146	2.50	2.00	179	1631	0.110	0.0	0.1
Merge Lane	2	-	50.0	90	93	2.50	2.00	281	1694	0.166	0.0	0.0
West Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Friday, 3 February 2023 1:48:58 pm  
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 AM.sip9

# SITE LAYOUT

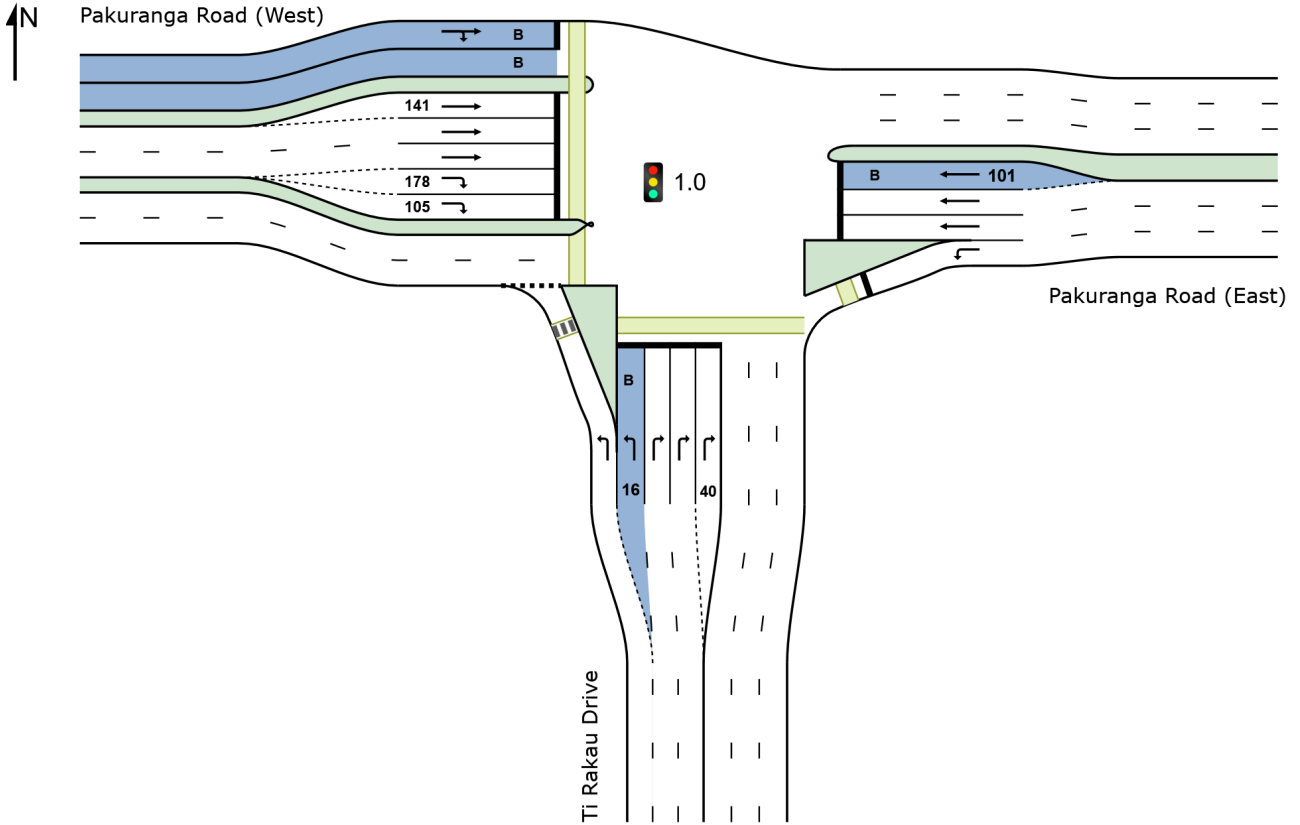
Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 9:51:14 am

Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 PM.sip9



# LANE SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 79 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m	m	%	%	
South: Ti Rakau Drive															
Lane 1	767	4.8	753	4.8	1142 <sup>1</sup>	0.659	100	9.3	LOS A	13.3	97.0	Full	174	0.0	0.0
Lane 2 (B)	13	100.0	13	100.0	129	0.101	100	44.1	LOS D	0.5	6.5	Short	16	0.0	NA
Lane 3	382	4.1	375	4.0	432	0.868	100	45.3	LOS D	16.7	120.6	Full	174	0.0	0.0
Lane 4	325	4.1	319	4.0	367 <sup>1</sup>	0.868	100	45.0	LOS D	13.9	100.4	Full	174	0.0	0.0
Lane 5	325	4.1	319	4.0	367 <sup>1</sup>	0.868	100	45.0	LOS D	13.9	100.4	Short	40	0.0	NA
Approach	1811	5.1	1778 <sup>N</sup> <sub>1</sub>	5.0		0.868		30.0	LOS C	16.7	120.6				
East: Pakuranga Road (East)															
Lane 1	787	4.7	749	4.7	973	0.770	100	22.1	LOS C	23.6	171.6	Full	113	0.0	43.2
Lane 2	406	10.2	386	10.3	414	0.932	100	51.9	LOS D	19.7	149.7	Full	113	0.0	30.6
Lane 3	406	10.2	386	10.3	414	0.932	100	51.9	LOS D	19.7	149.7	Full	113	0.0	30.6
Lane 4 (B)	11	100.0	11	100.0	91	0.121	100	41.6	LOS D	0.4	5.6	Short	101	0.0	NA
Approach	1609	8.1	1533 <sup>N</sup> <sub>1</sub>	8.2		0.932		37.3	LOS D	23.6	171.6				
West: Pakuranga Road (West)															
Lane 1 (B)	42	100.0	42	100.0	87	0.484	100	41.4	LOS D	1.7	21.6	Full	388	0.0	0.0
Lane 2	450	7.1	450	7.1	563	0.799	100	31.5	LOS C	17.7	131.2	Short	141	0.0	NA
Lane 3	450	7.1	450	7.1	563	0.799	100	31.5	LOS C	17.7	131.2	Full	388	0.0	0.0
Lane 4	450	7.1	450	7.1	563	0.799	100	31.5	LOS C	17.7	131.2	Full	388	0.0	0.0
Lane 5	228	8.8	228	8.8	264	0.861	100	50.1	LOS D	10.2	76.4	Short	178	0.0	NA
Lane 6	228	8.8	228	8.8	264	0.861	100	50.1	LOS D	10.2	76.4	Short	105	0.0	NA
Approach	1847	9.6	1847	9.6		0.861		36.4	LOS D	17.7	131.2				
Intersection	5267	7.6	5157 <sup>N</sup> <sub>1</sub>	7.8		0.932		34.4	LOS C	23.6	171.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	W	E								
Lane 1	753	-	753	4.8	1142 <sup>1</sup>	0.659	100	NA	NA	
Lane 2	13	-	13	100.0	129	0.101	100	0.0	1	
Lane 3	-	375	375	4.0	432	0.868	100	NA	NA	
Lane 4	-	319	319	4.0	367 <sup>1</sup>	0.868	100	NA	NA	

Lane 5	-	319	319	4.0	367 <sup>1</sup>	0.868	100	91.5	4
Approach	766	1012	1778	5.0		0.868			
East: Pakuranga Road (East)									
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W							
Lane 1	749	-	749	4.7	973	0.770	100	NA	NA
Lane 2	-	386	386	10.3	414	0.932	100	NA	NA
Lane 3	-	386	386	10.3	414	0.932	100	NA	NA
Lane 4	-	11	11	100.0	91	0.121	100	0.0	3
Approach	749	783	1533	8.2		0.932			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	21	21	42	100.0	87	0.484	100	NA	NA
Lane 2	450	-	450	7.1	563	0.799	100	0.0	3
Lane 3	450	-	450	7.1	563	0.799	100	NA	NA
Lane 4	450	-	450	7.1	563	0.799	100	NA	NA
Lane 5	-	228	228	8.8	264	0.861	100	0.0	4
Lane 6	-	228	228	8.8	264	0.861	100	0.0	5
Approach	1371	476	1847	9.6		0.861			
Total %HV Deg. Satn (v/c)									
Intersection	5157	7.8		0.932					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

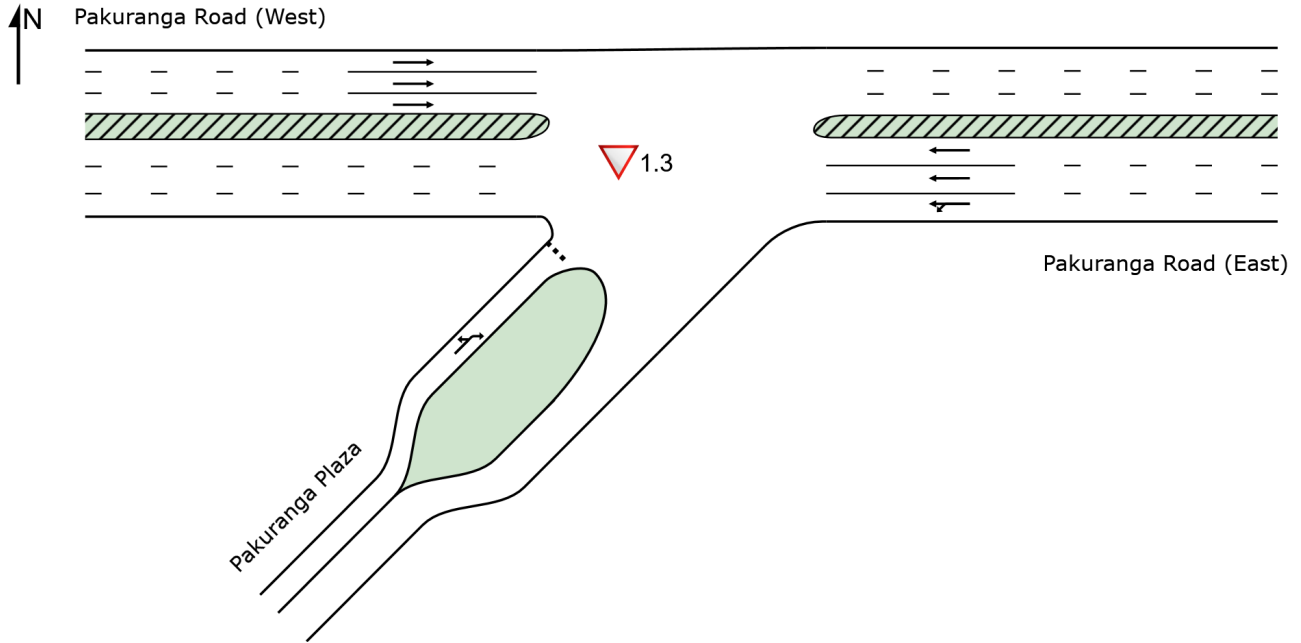
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
East Exit: Pakuranga Road (East) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
West Exit: Pakuranga Road (West) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										

# SITE LAYOUT

▽ Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM  
(Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Pakuranga Road (East)															
Lane 1	508	8.7	508	8.7	1846	0.275	100	1.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 2	515	7.3	515	7.3	1872	0.275	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 3	515	7.3	515	7.3	1872	0.275	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Approach	1539	7.7	1539	7.7		0.275		0.4	NA	0.0	0.0				
West: Pakuranga Road (West)															
Lane 1	797	6.6	792	6.6	1802	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 2	797	6.6	792	6.6	1802	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 3	792	6.6	787	6.6	1792	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Approach	2386	6.6	2371 <sup>N1</sup>	6.6		0.439		0.0	NA	0.0	0.0				
SouthWest: Pakuranga Plaza															
Lane 1	108	6.5	108	6.5	56	1.929	100	966.9	LOS F	38.6	284.9	Full	196	-8.5 <sup>N7</sup>	17.4
Approach	108	6.5	108	6.5		1.929		966.9	LOS F	38.6	284.9				
Intersection	4033	7.0	4018 <sup>N1</sup>	7.1		1.929		26.1	NA	38.6	284.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	L1	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	W								
Lane 1	94	414	508	8.7	1846	0.275	100	NA	NA	
Lane 2	-	515	515	7.3	1872	0.275	100	NA	NA	
Lane 3	-	515	515	7.3	1872	0.275	100	NA	NA	
Approach	94	1445	1539	7.7		0.275				
West: Pakuranga Road (West)										
Mov. From W To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
	E									
Lane 1	792	792	6.6	1802	0.439	100	NA	NA		
Lane 2	792	792	6.6	1802	0.439	100	NA	NA		

Lane 3	787	787	6.6		1792	0.439	100	NA	NA
Approach	2371	2371	6.6			0.439			
SouthWest: Pakuranga Plaza									
Mov. From SW To Exit:	L3 W	R1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	98	10	108	6.5	56	1.929	100	NA	NA
Approach	98	10	108	6.5		1.929			
Total %HV Deg. Satn (v/c)									
Intersection	4018	7.1		1.929					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

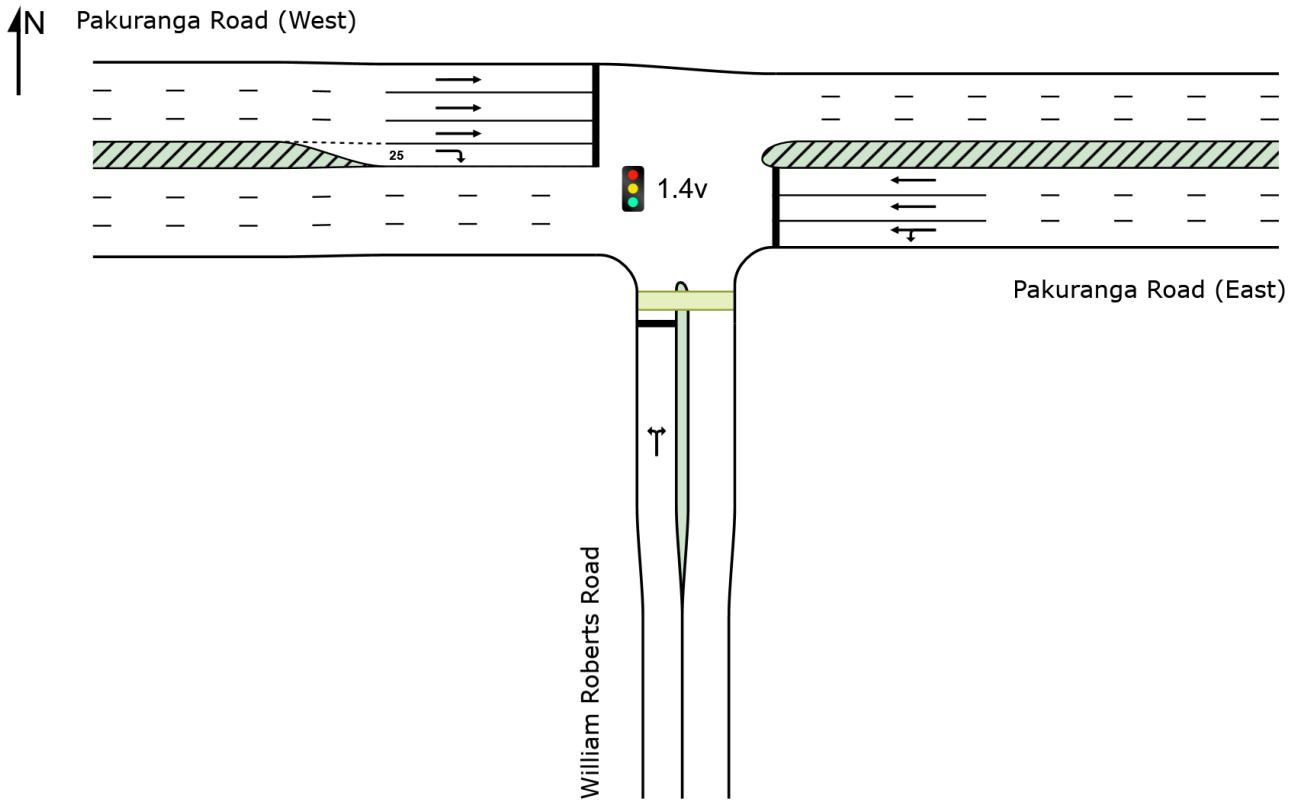
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
SouthWest Exit: Pakuranga Plaza											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

 **Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]**

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [ Veh Dist ] m		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: William Roberts Road															
Lane 1	236	7.2	236	7.2	256	0.921	100	92.0	LOS F	20.7	154.0	Full	244	-28.7 <sup>N7</sup>	0.0
Approach	236	7.2	236	7.2		0.921		92.0	LOS F	20.7	154.0				
East: Pakuranga Road (East)															
Lane 1	490	7.3	490	7.3	1114	0.440	100	12.3	LOS B	12.7	94.7	Full	184	0.0	0.0
Lane 2	488	7.6	488	7.6	1110	0.440	100	15.1	LOS B	15.7	117.2	Full	184	0.0	0.0
Lane 3	493	7.6	493	7.6	1122	0.440	100	15.0	LOS B	15.8	118.0	Full	184	0.0	0.0
Approach	1471	7.5	1471	7.5		0.440		14.2	LOS B	15.8	118.0				
West: Pakuranga Road (West)															
Lane 1	1212	6.5	1209	6.6	1345	0.899	100	17.8	LOS B	33.6 <sup>N4</sup>	248.1 <sup>N4</sup>	Full	152	0.0	50.0
Lane 2	688	6.5	687	6.6	764	0.899	100	35.8	LOS D	33.6 <sup>N4</sup>	248.1 <sup>N4</sup>	Full	152	-43.2 <sup>N3</sup>	50.0
Lane 3	561	6.5	560	6.6	623 <sup>1</sup>	0.899	100	40.5	LOS D	33.6 <sup>N4</sup>	248.1 <sup>N4</sup>	Full	152	-50.0 <sup>N3</sup>	50.0
Lane 4	54	13.0	54	13.0	119	0.451	100	80.8	LOS F	4.0	30.8	Short	25	0.0	NA
Approach	2515	6.7	2509 <sup>N1</sup>	6.7		0.899		29.1	LOS C	33.6	248.1				
Intersection	4222	7.0	4216 <sup>N1</sup>	7.0		0.921		27.4	LOS C	33.6	248.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Road										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	W	E								
Lane 1	141	95	236	7.2	256	0.921	100	NA	NA	
Approach	141	95	236	7.2		0.921				
East: Pakuranga Road (East)										
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	S	W								
Lane 1	73	417	490	7.3	1114	0.440	100	NA	NA	
Lane 2	-	488	488	7.6	1110	0.440	100	NA	NA	

Lane 3	-	493	493	7.6	1122	0.440	100	NA	NA
Approach	73	1398	1471	7.5		0.440			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	1209	-	1209	6.6	1345	0.899	100	NA	NA
Lane 2	687	-	687	6.6	764	0.899	100	NA	NA
Lane 3	560	-	560	6.6	623 <sup>1</sup>	0.899	100	NA	NA
Lane 4	-	54	54	13.0	119	0.451	100	24.0	3
Approach	2456	54	2509	6.7		0.899			
Total %HV Deg. Satn (v/c)									
Intersection	4216	7.0		0.921					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

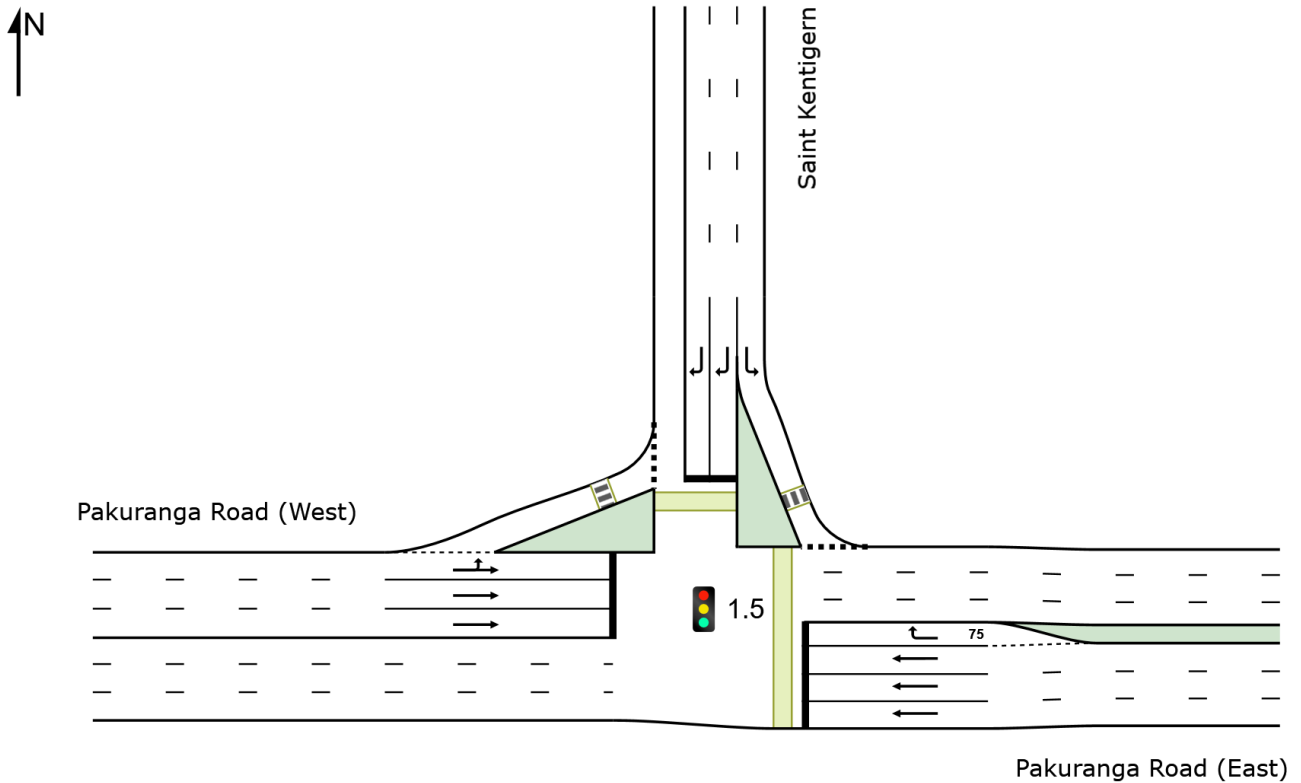


# SITE LAYOUT

**Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]**

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Pakuranga Road (East)															
Lane 1	458	7.6	458	7.6	1415	0.323	100	5.4	LOS A	9.8	73.3	Full	87	0.0	0.0
Lane 2	458	7.6	458	7.6	1415	0.323	100	5.4	LOS A	9.8	73.3	Full	87	0.0	0.0
Lane 3	460	7.6	460	7.6	1422	0.323	100	5.4	LOS A	9.9	73.6	Full	87	0.0	0.0
Lane 4	27	3.7	27	3.7	139	0.194	100	52.6	LOS D	1.5	10.8	Short	75	0.0	NA
Approach	1402	7.5	1402	7.5		0.323		6.3	LOS A	9.9	73.6				
North: Saint Kentigern															
Lane 1	57	3.5	57	3.5	544	0.105	100	15.0	LOS B	1.9	13.8	Full	96	0.0	0.0
Lane 2	47	7.5	47	7.5	254	0.184	100	60.9	LOS E	3.0	22.6	Full	96	0.0	0.0
Lane 3	46	7.5	46	7.5	250	0.184	100	61.0	LOS E	3.0	22.3	Full	96	0.0	0.0
Approach	150	6.0	150	6.0		0.184		43.5	LOS D	3.0	22.6				
West: Pakuranga Road (West)															
Lane 1	603	6.2	602	6.2	701	0.859	100	15.7	LOS B	21.8	160.7	Full	184	0.0	0.0
Lane 2	982	6.5	981	6.5	1142	0.859	100	10.5	LOS B	37.8	279.2	Full	184	0.0	43.2
Lane 3	982	6.5	981	6.5	1142	0.859	100	16.7	LOS B	40.6 <sup>N4</sup>	300.3 <sup>N4</sup>	Full	184	0.0	50.0
Approach	2568	6.4	2564 <sup>N1</sup>	6.4		0.859		14.1	LOS B	40.6	300.3				
Intersection	4120	6.8	4116 <sup>N1</sup>	6.8		0.859		12.4	LOS B	40.6	300.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From E To Exit:	W	N								
Lane 1	458	-	458	7.6	1415	0.323	100	NA	NA	NA
Lane 2	458	-	458	7.6	1415	0.323	100	NA	NA	NA
Lane 3	460	-	460	7.6	1422	0.323	100	NA	NA	NA
Lane 4	-	27	27	3.7	139	0.194	100	0.0	3	
Approach	1375	27	1402	7.5		0.323				
North: Saint Kentigern										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From N To Exit:	E	W								
Lane 1	57	-	57	3.5	544	0.105	100	NA	NA	NA

Lane 2	-	47	47	7.5	254	0.184	100	NA	NA
Lane 3	-	46	46	7.5	250	0.184	100	NA	NA
Approach	57	93	150	6.0		0.184			
West: Pakuranga Road (West)									
Mov. From W To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E							
Lane 1	54	548	602	6.2	701	0.859	100	NA	NA
Lane 2	-	981	981	6.5	1142	0.859	100	NA	NA
Lane 3	-	981	981	6.5	1142	0.859	100	NA	NA
Approach	54	2510	2564	6.4		0.859			
Total %HV Deg. Satn (v/c)									
Intersection	4116	6.8		0.859					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

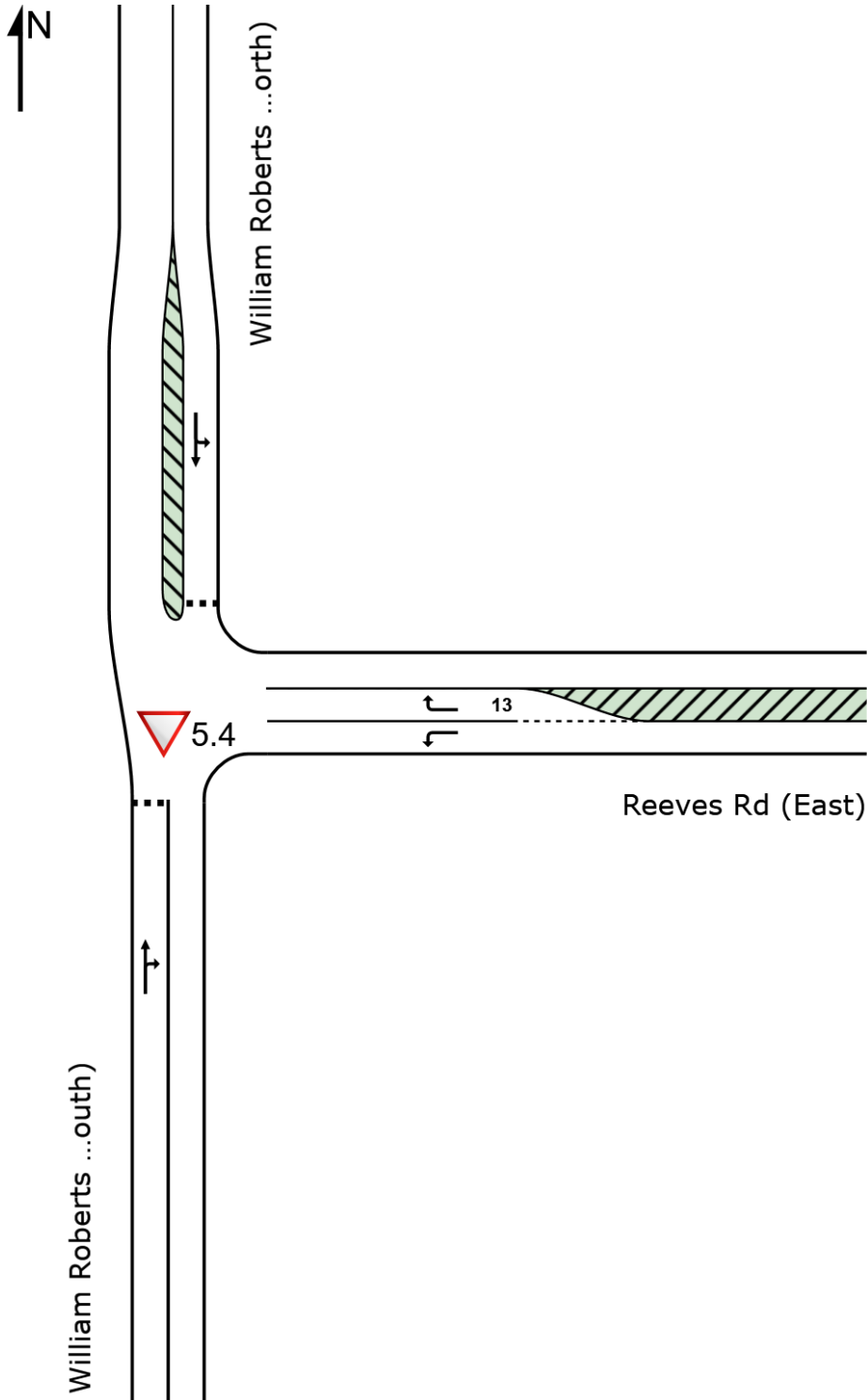
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
North Exit: Saint Kentigern												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

▽ Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 9:51:52 am  
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport  
Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 PM.sip9

# LANE SUMMARY

Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: William Roberts Rd (South)															
Lane 1	315	8.0	315	8.0	1139	0.276	100	2.2	LOS A	1.2	8.8	Full	243	0.0	0.0
Approach	315	8.0	315	8.0		0.276		2.2	LOS A	1.2	8.8				
East: Reeves Rd (East)															
Lane 1	57	8.8	57	8.8	1721	0.033	100	4.6	LOS A	0.0	0.0	Full	266	0.0	0.0
Lane 2	76	15.8	76	15.8	1643	0.046	100	4.7	LOS A	0.0	0.0	Short	13	0.0	NA
Approach	133	12.8	133	12.8		0.046		4.7	NA	0.0	0.0				
North: William Roberts Rd (North)															
Lane 1	80	5.0	80	5.0	1296	0.062	100	4.3	LOS A	0.2	1.5	Full	244	0.0	0.0
Approach	80	5.0	80	5.0		0.062		4.3	LOS A	0.2	1.5				
Intersection	528	8.7	528	8.8		0.276		3.2	NA	1.2	8.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
South: William Roberts Rd (South)										
Mov. From S To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	N	E								
Lane 1	161	154	315	8.0	1139	0.276	100	NA	NA	
Approach	161	154	315	8.0		0.276				
East: Reeves Rd (East)										
Mov. From E To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	S	N								
Lane 1	57	-	57	8.8	1721	0.033	100	NA	NA	
Lane 2	-	76	76	15.8	1643	0.046	100	0.0	1	
Approach	57	76	133	12.8		0.046				
North: William Roberts Rd (North)										
Mov. From N To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	E	S								
Lane 1	12	68	80	5.0	1296	0.062	100	NA	NA	
Approach	12	68	80	5.0		0.062				

	Total	%HV	Deg.Satn (v/c)
Intersection	528	8.8	0.276

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

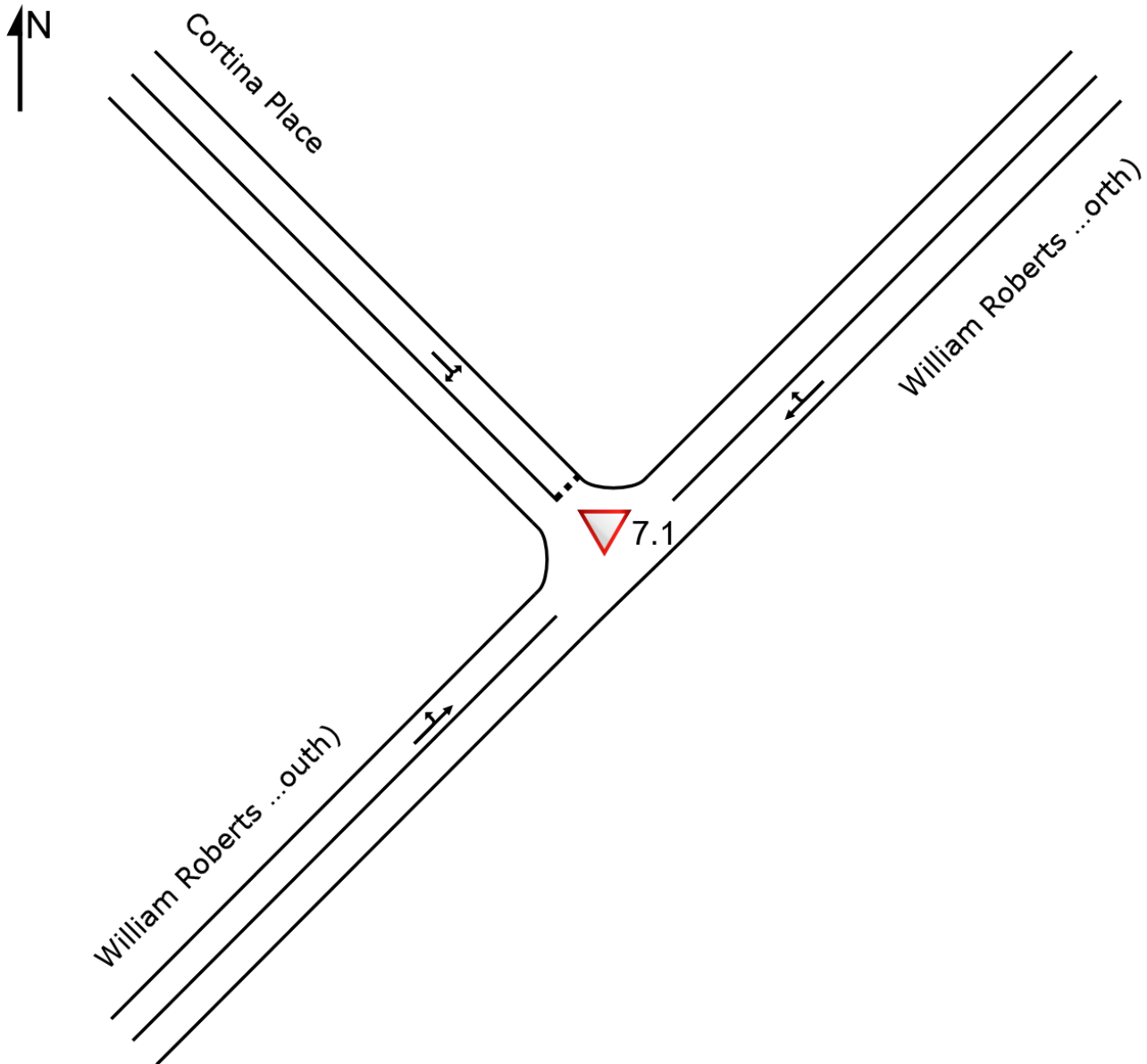
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: William Roberts Rd (South)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
East Exit: Reeves Rd (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
North Exit: William Roberts Rd (North)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

▼ Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Give-Way (Two-Way)

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





# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
NorthEast: William Roberts Road (North)															
Lane 1	116	5.2	116	5.2	1702	0.068	100	1.0	LOS A	0.2	1.4	Full	243	0.0	0.0
Approach	116	5.2	116	5.2		0.068		1.0	NA	0.2	1.4				
NorthWest: Cortina Place															
Lane 1	64	6.3	64	6.3	1111	0.058	100	3.2	LOS A	0.2	1.6	Full	177	0.0	0.0
Approach	64	6.3	64	6.3		0.058		3.2	LOS A	0.2	1.6				
SouthWest: William Roberts Road (South)															
Lane 1	276	8.4	276	8.3	1792	0.154	100	0.2	LOS A	0.0	0.0	Full	110	0.0	0.0
Approach	276	8.4	276	8.3		0.154		0.2	NA	0.0	0.0				
Intersection	456	7.3	456	7.3		0.154		0.8	NA	0.2	1.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov. From NE To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
	SW	NW								
Lane 1	91	25	116	5.2	1702	0.068	100	NA	NA	
Approach	91	25	116	5.2		0.068				
NorthWest: Cortina Place										
Mov. From NW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
	NE	SW								
Lane 1	45	19	64	6.3	1111	0.058	100	NA	NA	
Approach	45	19	64	6.3		0.058				
SouthWest: William Roberts Road (South)										
Mov. From SW To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
	NW	NE								
Lane 1	29	247	276	8.3	1792	0.154	100	NA	NA	
Approach	29	247	276	8.3		0.154				
Total %HV Deg. Satn (v/c)										

Intersection	456	7.3	0.154
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Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

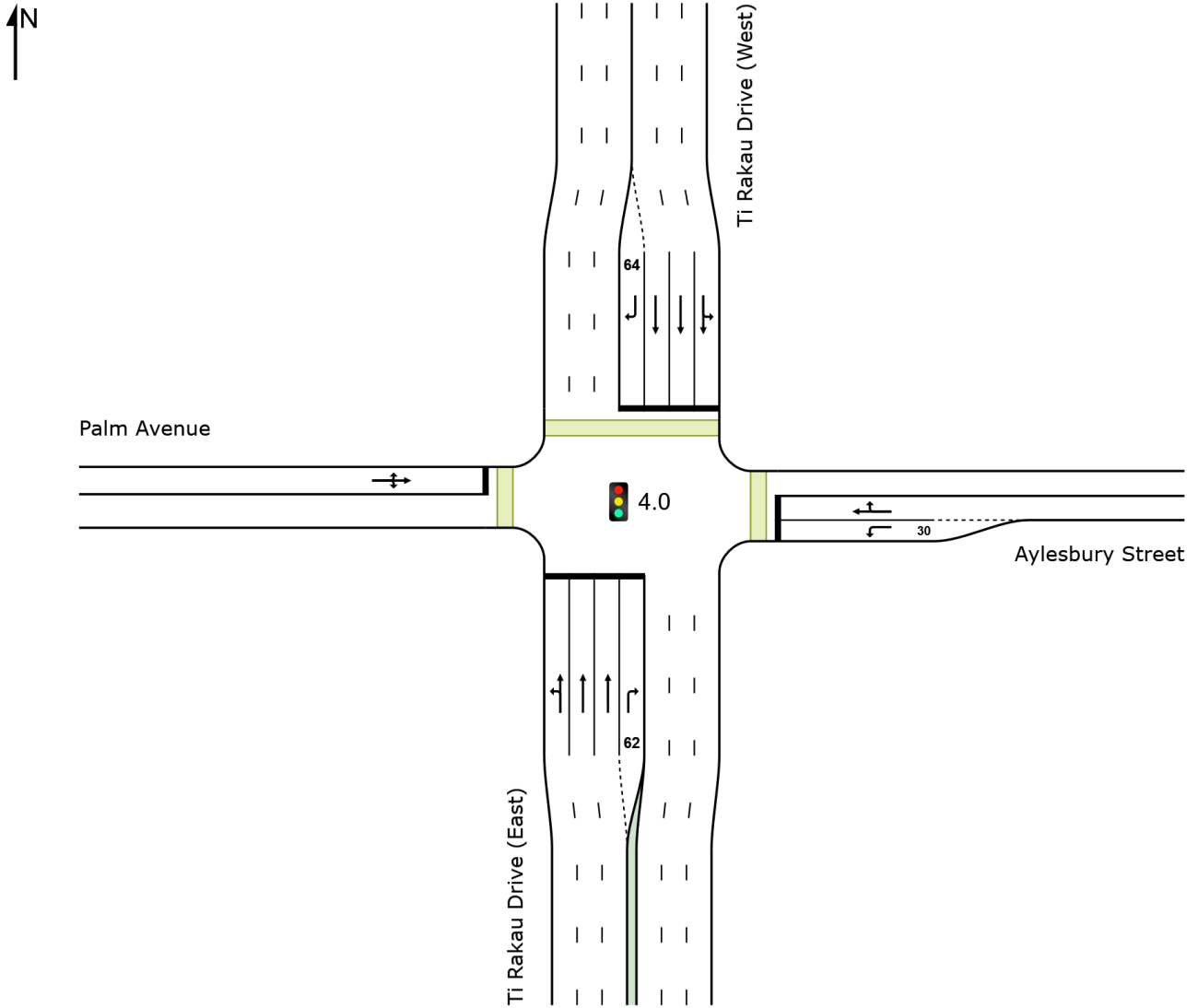
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
NorthWest Exit: Cortina Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
SouthWest Exit: William Roberts Road (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total HV ]	%	[ Total HV ]	%						[ Veh ]	[ Dist ]				
South: Ti Rakau Drive (East)															
Lane 1	596	4.9	584	4.9	1207	0.483	100	16.1	LOS B	19.5	142.0	Full	110	0.0	28.2
Lane 2	619	5.1	606	5.1	1254	0.483	100	14.0	LOS B	19.5	142.3	Full	110	0.0	28.5
Lane 3	611	5.1	598	5.1	1237 <sup>1</sup>	0.483	100	13.9	LOS B	19.1	139.4	Full	110	0.0	26.5
Lane 4	10	0.0	10	0.0	70	0.139	100	82.9	LOS F	0.7	5.1	Short	62	0.0	NA
Approach	1836	5.0	1798 <sup>N1</sup>	5.0		0.483		15.0	LOS B	19.5	142.3				
East: Aylesbury Street															
Lane 1	27	3.7	27	3.7	67	0.404	100	61.3	LOS E	1.8	13.3	Short	30	-50.0 <sup>N3</sup>	NA
Lane 2	20	0.0	20	0.0	72	0.278	100	81.3	LOS F	1.5	10.6	Full	40	0.0	0.0
Approach	47	2.1	47	2.1		0.404		69.8	LOS E	1.8	13.3				
North: Ti Rakau Drive (West)															
Lane 1	414	7.5	402	7.7	624	0.644	100	15.9	LOS B	15.5	115.9	Full	174	-49.4 <sup>N3</sup>	0.0
Lane 2	409	7.7	397	7.8	616	0.644	100	16.4	LOS B	15.6	116.3	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 3	402	7.7	390	7.8	606	0.644	100	16.2	LOS B	15.1	112.7	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 4	43	7.0	42	7.1	67	0.622	100	86.9	LOS F	3.3	24.3	Short	64	0.0	NA
Approach	1268	7.6	1231 <sup>N1</sup>	7.8		0.644		18.5	LOS B	15.6	116.3				
West: Palm Avenue															
Lane 1	95	4.2	95	4.2	112	0.852	100	89.2	LOS F	7.8	56.8	Full	87	-30.1 <sup>N3</sup>	0.0
Approach	95	4.2	95	4.2		0.852		89.2	LOS F	7.8	56.8				
Intersection	3246	6.0	3170 <sup>N1</sup>	6.1		0.852		19.4	LOS B	19.5	142.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive (East)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E							
Lane 1	63	521	-	584	4.9	1207	0.483	100	NA	NA
Lane 2	-	606	-	606	5.1	1254	0.483	100	NA	NA
Lane 3	-	598	-	598	5.1	1237 <sup>1</sup>	0.483	100	NA	NA
Lane 4	-	-	10	10	0.0	70	0.139	100	0.0	3

Approach	63	1725	10	1798	5.0		0.483				
East: Aylesbury Street											
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	27	-	-	27	3.7	67	0.404	100	0.0	2	
Lane 2	-	10	10	20	0.0	72	0.278	100	NA	NA	
Approach	27	10	10	47	2.1		0.404				
North: Ti Rakau Drive (West)											
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	10	392	-	402	7.7	624	0.644	100	NA	NA	
Lane 2	-	397	-	397	7.8	616	0.644	100	NA	NA	
Lane 3	-	390	-	390	7.8	606	0.644	100	NA	NA	
Lane 4	-	-	42	42	7.1	67	0.622	100	0.0	3	
Approach	10	1179	42	1231	7.8		0.644				
West: Palm Avenue											
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	44	10	41	95	4.2	112	0.852	100	NA	NA	
Approach	44	10	41	95	4.2		0.852				
Total %HV Deg. Satn (v/c)											
Intersection	3170	6.1		0.852							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
Full Length Lane	2										Merge Analysis not applied.	
Full Length Lane	3										Merge Analysis not applied.	
East Exit: Aylesbury Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
North Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
Full Length Lane	2										Merge Analysis not applied.	
Full Length Lane	3										Merge Analysis not applied.	
West Exit: Palm Avenue Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	

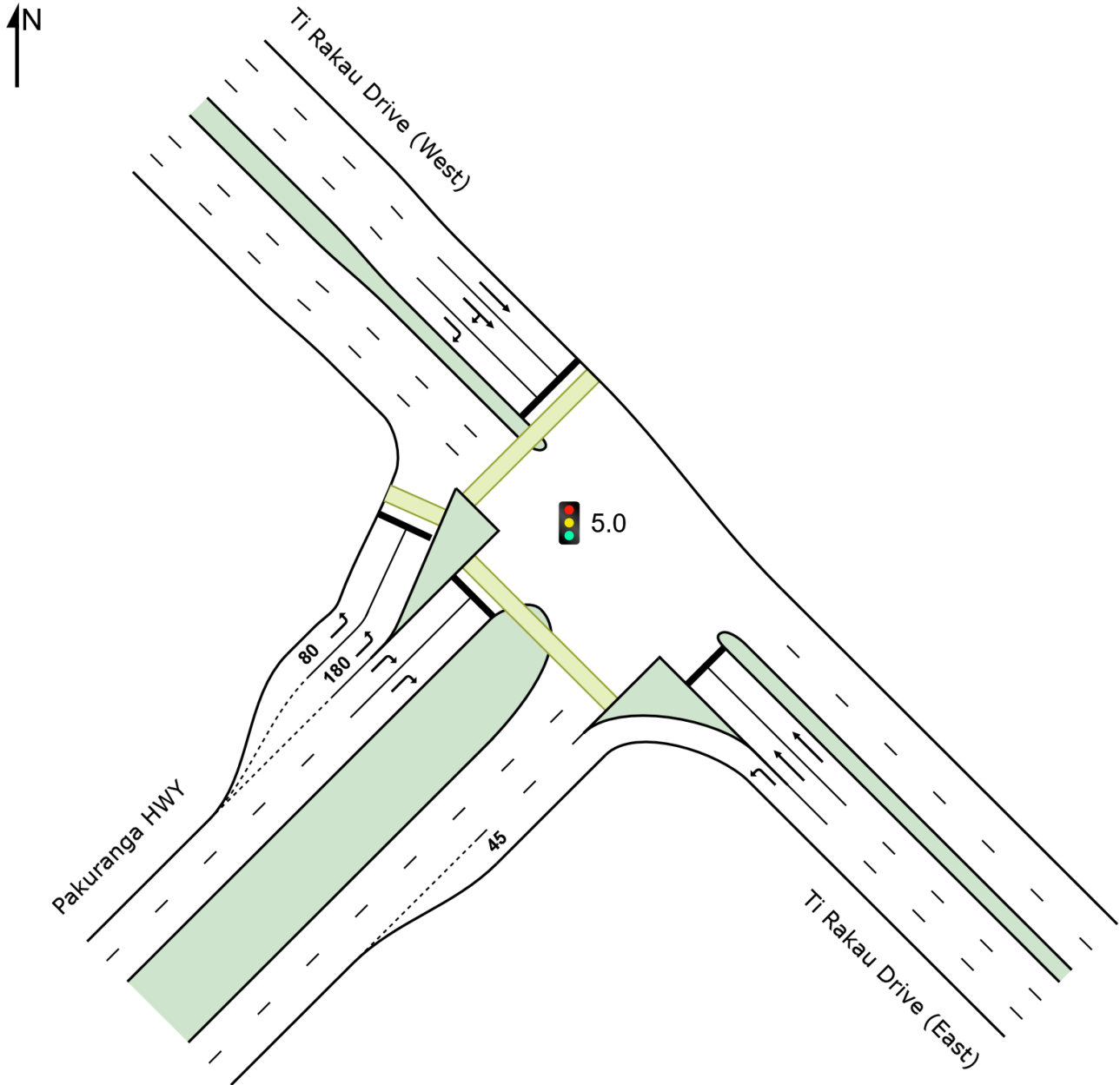
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 PM.sip9

# SITE LAYOUT

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m	m	%	%	
SouthEast: Ti Rakau Drive (East)															
Lane 1	840	7.7	795	7.5	1727	0.461	100	6.4	LOS A	0.0	0.0	Full	91	0.0	0.0
Lane 2	382	5.7	363	5.6	392	0.925	100	80.4	LOS F	20.2 <sup>N4</sup>	148.5 <sup>N4</sup>	Full	91	-28.2 <sup>N3</sup>	50.0
Lane 3	379	5.7	360	5.6	389	0.925	100	80.6	LOS F	20.2 <sup>N4</sup>	148.5 <sup>N4</sup>	Full	91	-28.5 <sup>N3</sup>	50.0
Approach	1601	6.7	1518 <sup>N1</sup>	6.6		0.925		41.7	LOS D	20.2	148.5				
NorthWest: Ti Rakau Drive (West)															
Lane 1	442	9.0	429	9.1	534	0.804	100	55.3	LOS E	23.8 <sup>N4</sup>	179.5 <sup>N4</sup>	Full	110	0.0	50.0
Lane 2	433	6.9	421	7.0	524	0.804	100	59.6	LOS E	24.2 <sup>N4</sup>	179.5 <sup>N4</sup>	Full	110	0.0	50.0
Lane 3	420	6.7	409	6.8	509	0.804	100	60.3	LOS E	24.2 <sup>N4</sup>	179.5 <sup>N4</sup>	Full	110	0.0	50.0
Approach	1295	7.6	1259 <sup>N1</sup>	7.7		0.804		58.3	LOS E	24.2	179.5				
SouthWest: Pakuranga HWY															
Lane 1	534	4.7	534	4.7	557 <sup>1</sup>	0.959	100	75.4	LOS E	41.0	298.9	Short	80	-28.2 <sup>N3</sup>	NA
Lane 2	534	4.7	534	4.7	556 <sup>1</sup>	0.959	100	75.5	LOS E	41.0	298.6	Short	180	-28.5 <sup>N3</sup>	NA
Lane 3	492	5.7	492	5.7	521	0.944	100	88.7	LOS F	43.6	320.3	Full	1650	0.0	0.0
Lane 4	497	5.7	497	5.7	526	0.944	100	88.5	LOS F	44.0	323.2	Full	1650	0.0	0.0
Approach	2057	5.2	2057	5.2		0.959		81.8	LOS F	44.0	323.2				
Intersection	4953	6.3	4834 <sup>N1</sup>	6.5		0.959		63.1	LOS E	44.0	323.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane No.	Ov. Lane
From SE To Exit:	SW	NW		%						
Lane 1	795	-	795	7.5	1727	0.461	100	NA	NA	NA
Lane 2	-	363	363	5.6	392	0.925	100	NA	NA	NA
Lane 3	-	360	360	5.6	389	0.925	100	NA	NA	NA
Approach	795	722	1518	6.6		0.925				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	Ov. Lane
From NW				%						



To Exit:	SE	SW			veh/h	v/c	%	%	No.
Lane 1	429	-	429	9.1	534	0.804	100	NA	NA
Lane 2	38	383	421	7.0	524	0.804	100	NA	NA
Lane 3	-	409	409	6.8	509	0.804	100	NA	NA
Approach	467	792	1259	7.7		0.804			
SouthWest: Pakuranga HWY									
Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From SW					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	NW	SE			veh/h	v/c	%	%	No.
Lane 1	534	-	534	4.7	557 <sup>1</sup>	0.959	100	100.0	2
Lane 2	534	-	534	4.7	556 <sup>1</sup>	0.959	100	51.6	4
Lane 3	-	492	492	5.7	521	0.944	100	NA	NA
Lane 4	-	497	497	5.7	526	0.944	100	NA	NA
Approach	1068	989	2057	5.2		0.959			
Total %HV Deg. Satn (v/c)									
Intersection	4834	6.5		0.959					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

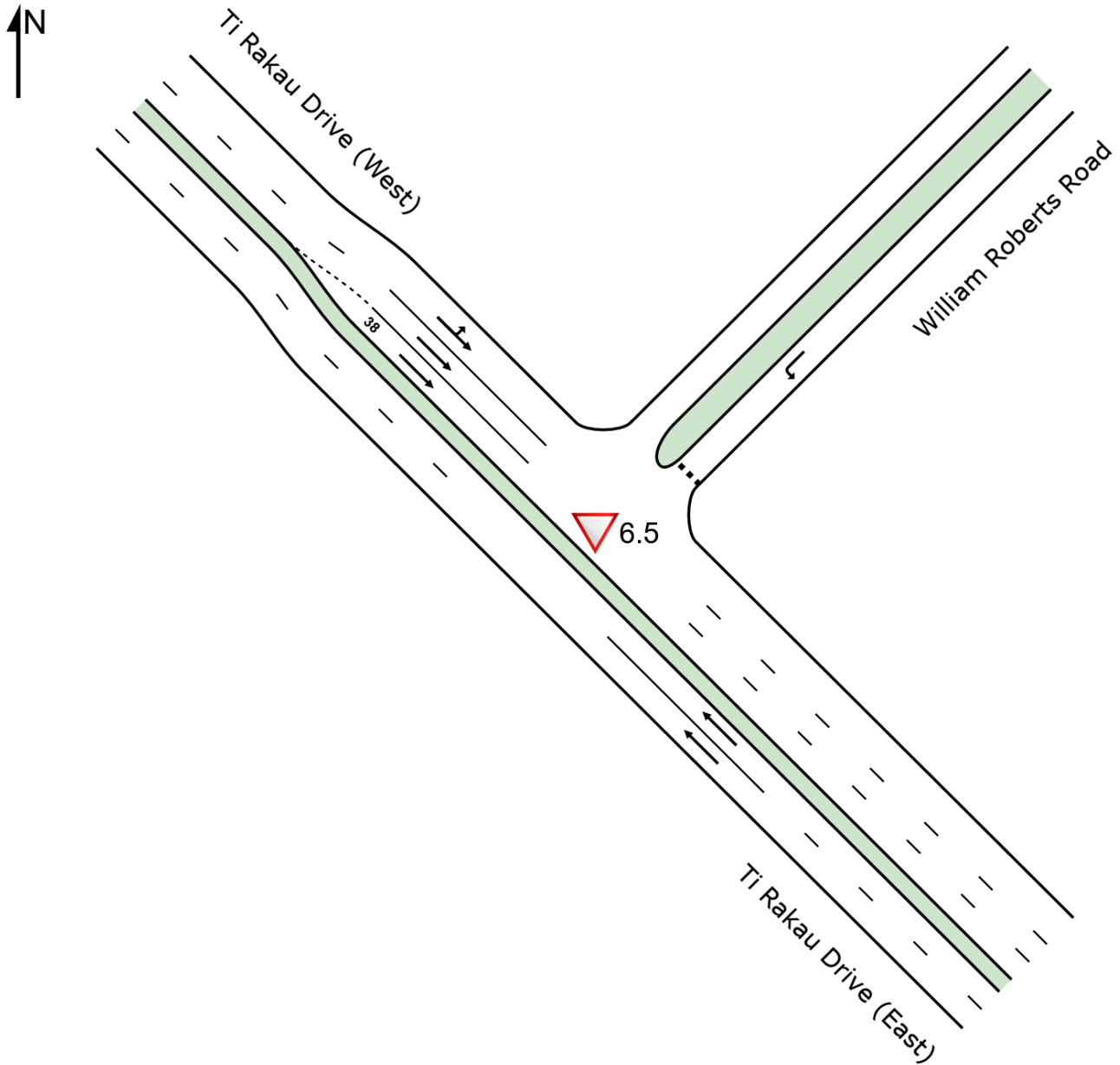
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
SouthWest Exit: Pakuranga HWY												
Merge Type: <b>Priority</b>												
Exit Short Lane	1	45	0.0	383	3.00	2.00	795	1395	0.570	0.6	2.0	
Merge Lane	2	-	100.0				383	1800	0.213	0.0	0.0	

# SITE LAYOUT

▽ Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
SouthEast: Ti Rakau Drive (East)															
Lane 1	835	6.4	789	6.2	1826	0.432	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Lane 2	826	6.4	781	6.2	1806	0.432	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	1661	6.4	1570 <sup>N1</sup>	6.2		0.432		0.0	NA	0.0	0.0				
NorthEast: William Roberts Road															
Lane 1	110	3.6	110	3.6	485	0.227	100	3.4	LOS A	0.4	3.0	Full	110	-50.0 <sup>N7</sup>	0.0
Approach	110	3.6	110	3.6		0.227		3.4	LOS A	0.4	3.0				
NorthWest: Ti Rakau Drive (West)															
Lane 1	566	7.3	565	7.3	1869	0.302	100	2.3	LOS A	0.0	0.0	Full	97	0.0	0.0
Lane 2	547	6.2	546	6.2	1806	0.302	100	0.0	LOS A	5.1 <sup>N5</sup>	37.6 <sup>N5</sup>	Full	97	0.0	0.0
Lane 3	349	6.2	348	6.2	1152	0.302	100	0.0	LOS A	0.0	0.0	Short	38	-36.2 <sup>N3</sup>	NA
Approach	1461	6.7	1460 <sup>N1</sup>	6.6		0.302		0.9	NA	5.1	37.6				
Intersection	3232	6.4	3139 <sup>N1</sup>	6.6		0.432		0.5	NA	5.1	37.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N3** Capacity Adjustment due to downstream lane blockage determined by the program.

**N5** Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NW								
Lane 1	789	789	6.2	1826	0.432	100	NA	NA	
Lane 2	781	781	6.2	1806	0.432	100	NA	NA	
Approach	1570	1570	6.2		0.432				
NorthEast: William Roberts Road									
Mov. From NE To Exit:	L2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SE								
Lane 1	110	110	3.6	485	0.227	100	NA	NA	

Approach	110	110	3.6			0.227				
NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	L2 NE	T1 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
Lane 1	276	289	565	7.3	1869	0.302	100	NA	NA	
Lane 2	-	546	546	6.2	1806	0.302	100	NA	NA	
Lane 3	-	348	348	6.2	1152	0.302	100	0.0	2	
Approach	276	1184	1460	6.6		0.302				
Total %HV Deg. Satn (v/c)										
Intersection	3139	6.6		0.432						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
NorthEast Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# SITE LAYOUT

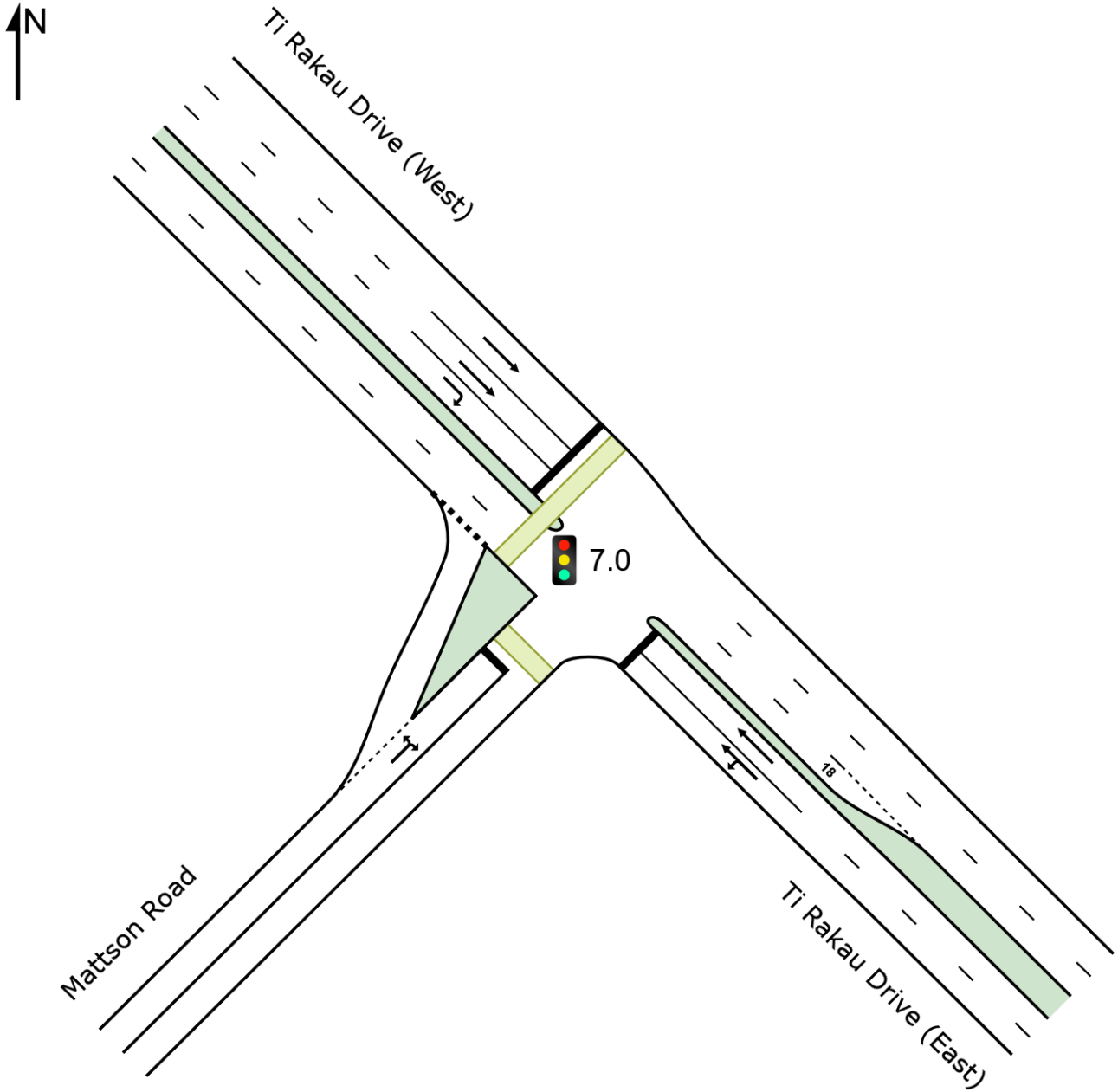
 Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





From SW To Exit:	NW	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	23	48	71	1.4	405	0.175	100	NA	NA
Approach	23	48	71	1.4		0.175			
Total %HV Deg. Satn (v/c)									
Intersection	2953	6.4		0.883					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

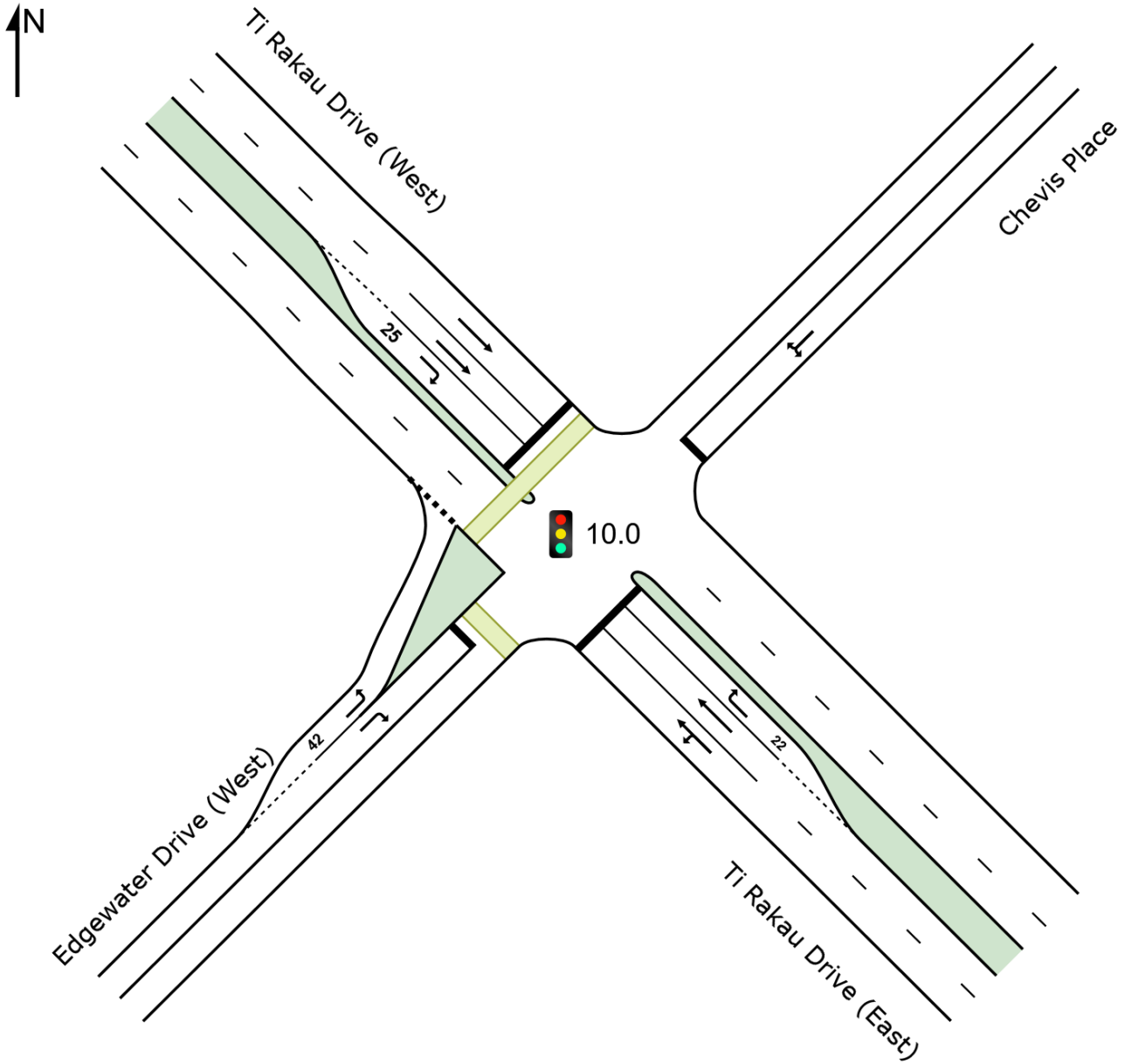
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Priority</b>												
Exit Short Lane	3	18	0.0	580	597	3.00	2.00	48	1184	0.041	1.1	1.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				580	1800	0.322	0.0	0.0
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
SouthWest Exit: Mattson Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										

# SITE LAYOUT

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





# LANE SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	868	6.5	853	6.5	962	0.886	100	34.3	LOS C	35.8 <sup>N4</sup>	264.4 <sup>N4</sup>	Full	162	0.0	50.0
Lane 2	853	6.4	838	6.4	946 <sup>1</sup>	0.886	100	34.1	LOS C	35.8 <sup>N4</sup>	264.4 <sup>N4</sup>	Full	162	0.0	50.0
Lane 3	11	9.1	11	9.0	96	0.113	100	58.4	LOS E	0.6	4.2	Short	22	0.0	NA
Approach	1732	6.5	1701 <sup>N1</sup>	6.4		0.886		34.4	LOS C	35.8	264.4				
NorthEast: Chevis Place															
Lane 1	20	0.0	20	0.0	106	0.188	100	58.6	LOS E	1.0	7.3	Full	138	0.0	0.0
Approach	20	0.0	20	0.0		0.188		58.6	LOS E	1.0	7.3				
NorthWest: Ti Rakau Drive (West)															
Lane 1	526	2.5	512	2.6	1012	0.506	100	17.8	LOS B	15.5 <sup>N4</sup>	111.0 <sup>N4</sup>	Full	68	0.0	50.0
Lane 2	432	2.5	420	2.6	830 <sup>1</sup>	0.506	100	17.0	LOS B	13.4	95.5	Full	68	0.0	36.0
Lane 3	73	5.5	71	5.6	102	0.700	100	62.6	LOS E	3.9	28.9	Short	25	0.0	NA
Approach	1031	2.7	1003 <sup>N1</sup>	2.8		0.700		20.7	LOS C	15.5	111.0				
SouthWest: Edgewater Drive (West)															
Lane 1	87	5.7	87	5.7	650	0.134	100	17.2	LOS B	2.2	16.1	Short	42	0.0	NA
Lane 2	35	8.6	35	8.6	249	0.141	100	47.9	LOS D	1.6	12.1	Full	789	0.0	0.0
Approach	122	6.6	122	6.6		0.141		26.0	LOS C	2.2	16.1				
Intersection	2905	5.1	2846 <sup>N1</sup>	5.2		0.886		29.4	LOS C	35.8	264.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov. From SE To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
	SW	NW	NE							
Lane 1	112	741	-	853	6.5	962	0.886	100	NA	NA
Lane 2	-	838	-	838	6.4	946 <sup>1</sup>	0.886	100	NA	NA
Lane 3	-	-	11	11	9.0	96	0.113	100	0.0	2
Approach	112	1579	11	1701	6.4		0.886			
NorthEast: Chevis Place										
Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	

From NE To Exit:	SE	NW			Cap. veh/h	Satn v/c	Util. %	SL %	Ov. %	Lane No.
Lane 1	10	10	20	0.0	106	0.188	100	NA	NA	
Approach	10	10	20	0.0		0.188				
NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
Lane 1	512	-	512	2.6	1012	0.506	100	NA	NA	
Lane 2	420	-	420	2.6	830 <sup>1</sup>	0.506	100	NA	NA	
Lane 3	-	71	71	5.6	102	0.700	100	18.3		2
Approach	931	71	1003	2.8		0.700				
SouthWest: Edgewater Drive (West)										
Mov. From SW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
Lane 1	87	-	87	5.7	650	0.134	100	0.0		2
Lane 2	-	35	35	8.6	249	0.141	100	NA	NA	
Approach	87	35	122	6.6		0.141				
Total %HV Deg.Satn (v/c)										
Intersection	2846	5.2		0.886						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

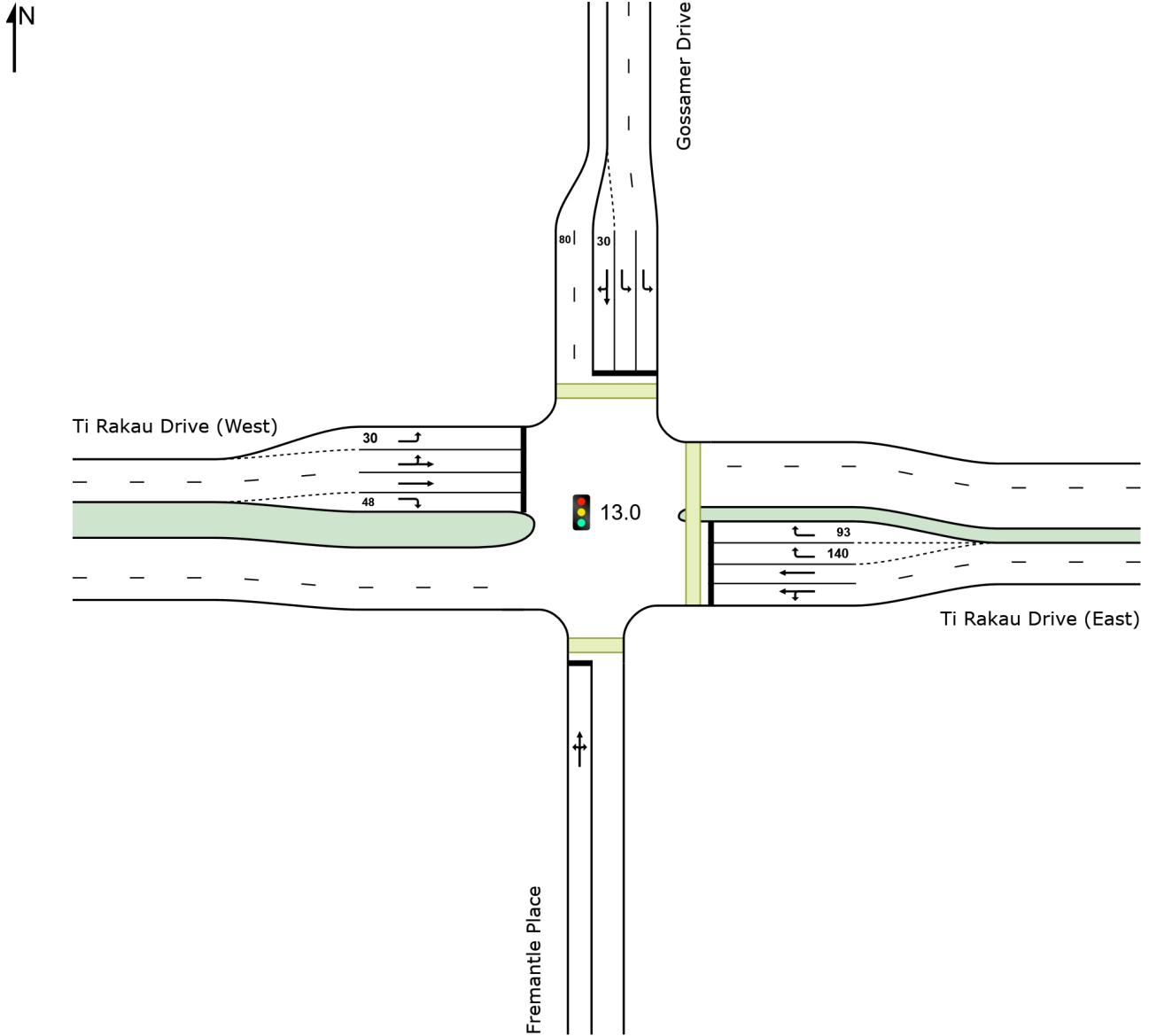
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
Full Length Lane	2		Merge Analysis not applied.								
NorthEast Exit: Chevis Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
NorthWest Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
Full Length Lane	2		Merge Analysis not applied.								
SouthWest Exit: Edgewater Drive (West) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								

# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%	veh/h	v/c	%	sec		Dist ]	m		m	%	%
South: Fremantle Place															
Lane 1	40	5.0	40	5.0	97	0.413	100	81.6	LOS F	3.0	21.8	Full	285	0.0	0.0
Approach	40	5.0	40	5.0		0.413		81.6	LOS F	3.0	21.8				
East: Ti Rakau Drive (East)															
Lane 1	906	6.5	906	6.5	901	1.005	100	77.9	LOS E	80.1	591.9	Full	636	0.0	0.0
Lane 2	775	6.6	775	6.6	771 <sup>1</sup>	1.005	100	98.9	LOS F	82.1	606.8	Full	636	0.0	0.8
Lane 3	258	8.6	258	8.6	505	0.511	47 <sup>6</sup>	29.7	LOS C	9.3	70.2	Short	140	0.0	NA
Lane 4	548	8.6	548	8.6	505	1.084	100	141.5	LOS F	50.3	378.1	Short	93	0.0	NA
Approach	2487	7.2	2487	7.2		1.084		93.5	LOS F	82.1	606.8				
North: Gossamer Drive															
Lane 1	259	17.8	259	17.8	757	0.342	100	22.2	LOS C	9.2	73.9	Full	1010	0.0	0.0
Lane 2	246	17.8	246	17.8	719 <sup>1</sup>	0.342	100	22.0	LOS C	8.6	69.5	Full	1010	0.0	0.0
Lane 3	61	4.9	61	4.9	238	0.256	100	67.3	LOS E	4.1	29.6	Short	30	0.0	NA
Approach	566	16.4	566	16.4		0.342		26.9	LOS C	9.2	73.9				
West: Ti Rakau Drive (West)															
Lane 1	170	0.6	163	0.5	822	0.198	28 <sup>5</sup>	19.3	LOS B	4.6	32.1	Short	30	0.0	NA
Lane 2	347	2.8	333	2.8	467 <sup>1</sup>	0.712	100	43.9	LOS D	19.7	140.9	Full	479	0.0	0.0
Lane 3	442	2.8	423	2.8	594 <sup>1</sup>	0.712	100	47.0	LOS D	26.7	191.6	Full	479	0.0	0.0
Lane 4	17	0.0	16	0.0	312	0.052	100	59.9	LOS E	1.0	6.9	Short	48	0.0	NA
Approach	976	2.4	934 <sup>N1</sup>	2.3		0.712		41.3	LOS D	26.7	191.6				
Intersection	4069	7.3	4027 <sup>N1</sup>	7.4		1.084		71.9	LOS E	82.1	606.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

<sup>6</sup> Lane under-utilisation due to downstream effects

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: Fremantle Place											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	W	N	E								
Lane 1	13	10	17	40	5.0	97	0.413	100	NA	NA	
Approach	13	10	17	40	5.0		0.413				
East: Ti Rakau Drive (East)											

Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	23	883	-	906	6.5	901	1.005	100	NA	NA
Lane 2	-	775	-	775	6.6	771 <sup>1</sup>	1.005	100	NA	NA
Lane 3	-	-	258	258	8.6	505	0.511	47 <sup>6</sup>	98.9	2
Lane 4	-	-	548	548	8.6	505	1.084	100	100.0	3
Approach	23	1658	806	2487	7.2		1.084			
North: Gossamer Drive										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	259	-	-	259	17.8	757	0.342	100	NA	NA
Lane 2	246	-	-	246	17.8	719 <sup>1</sup>	0.342	100	NA	NA
Lane 3	-	12	49	61	4.9	238	0.256	100	3.8	2
Approach	505	12	49	566	16.4		0.342			
West: Ti Rakau Drive (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	163	-	-	163	0.5	822	0.198	28 <sup>5</sup>	11.1	2
Lane 2	-	333	-	333	2.8	467 <sup>1</sup>	0.712	100	NA	NA
Lane 3	-	423	-	423	2.8	594 <sup>1</sup>	0.712	100	NA	NA
Lane 4	-	-	16	16	0.0	312	0.052	100	0.0	3
Approach	163	755	16	934	2.3		0.712			
Total %HV Deg. Satn (v/c)										
Intersection	4027	7.4		1.084						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Gossamer Drive Merge Type: <b>Zipper</b>												
Exit Short Lane	1	80	50.0	258	269	2.50	2.00	421	1474	0.285	0.0	0.2
Merge Lane	2	-	50.0	210	216	2.50	2.00	515	1543	0.334	0.0	0.1
West Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Friday, 3 February 2023 1:55:23 pm  
Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.3\CS 1.3 PM.sip9

## Appendix Q

### Construction Scenario 1.4 – Phasing Diagrams

# PHASING SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

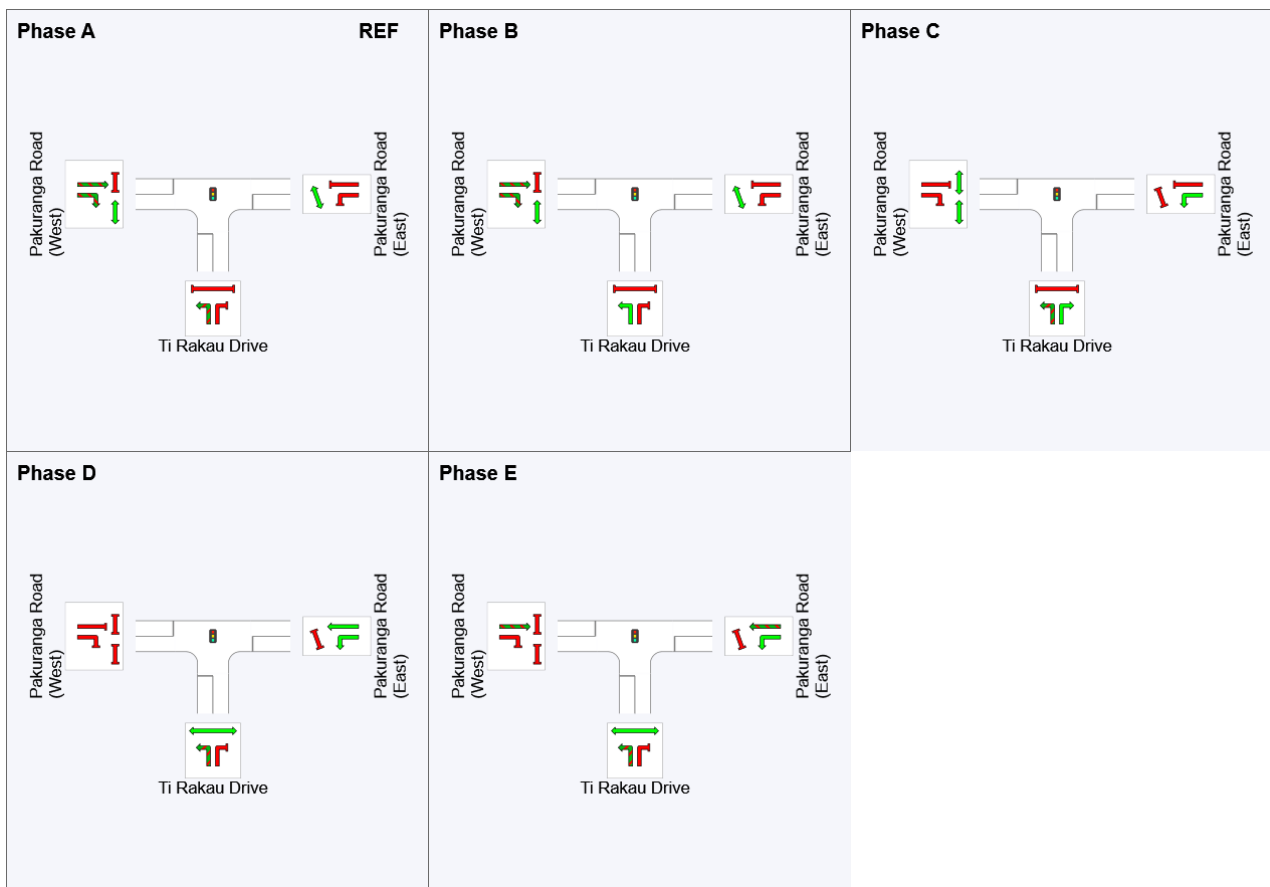
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	13	25	47	59
Green Time (sec)	7	6	16	6	19
Phase Time (sec)	13	12	22	12	25
Phase Split	15%	14%	26%	14%	30%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.









## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Tuesday, 7 February 2023 10:06:48 am  
 Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 AM - V1.sip9

# PHASING SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Convert Function Default

Reference Phase: Phase B

Input Phase Sequence: A, B, C

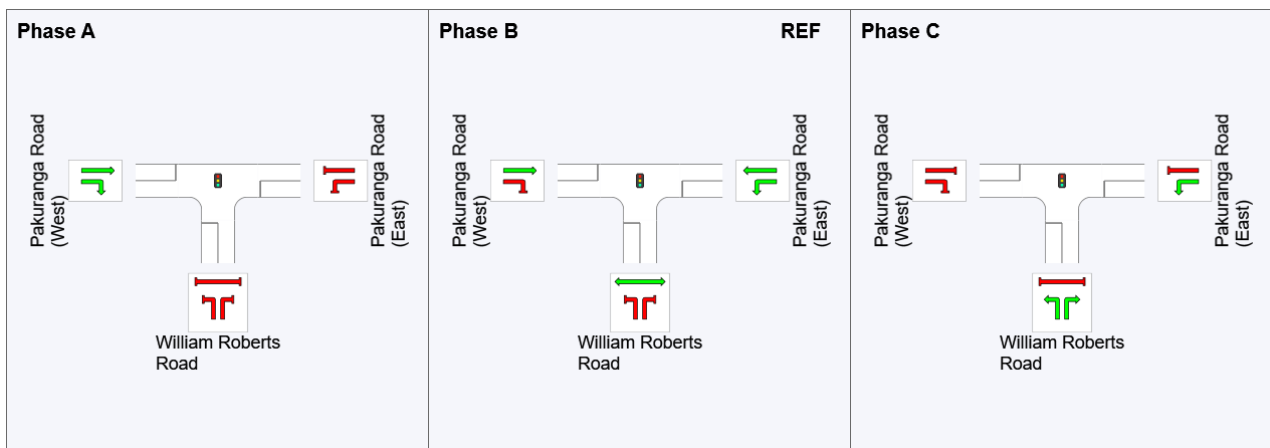
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	49	0	32
Green Time (sec)	6	26	11
Phase Time (sec)	12	32	17
Phase Split	20%	52%	28%

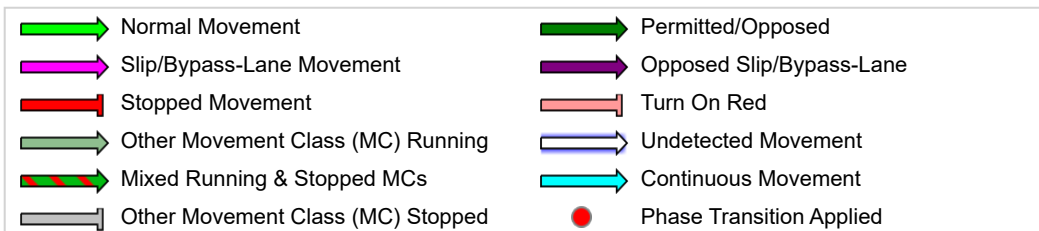
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 87 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

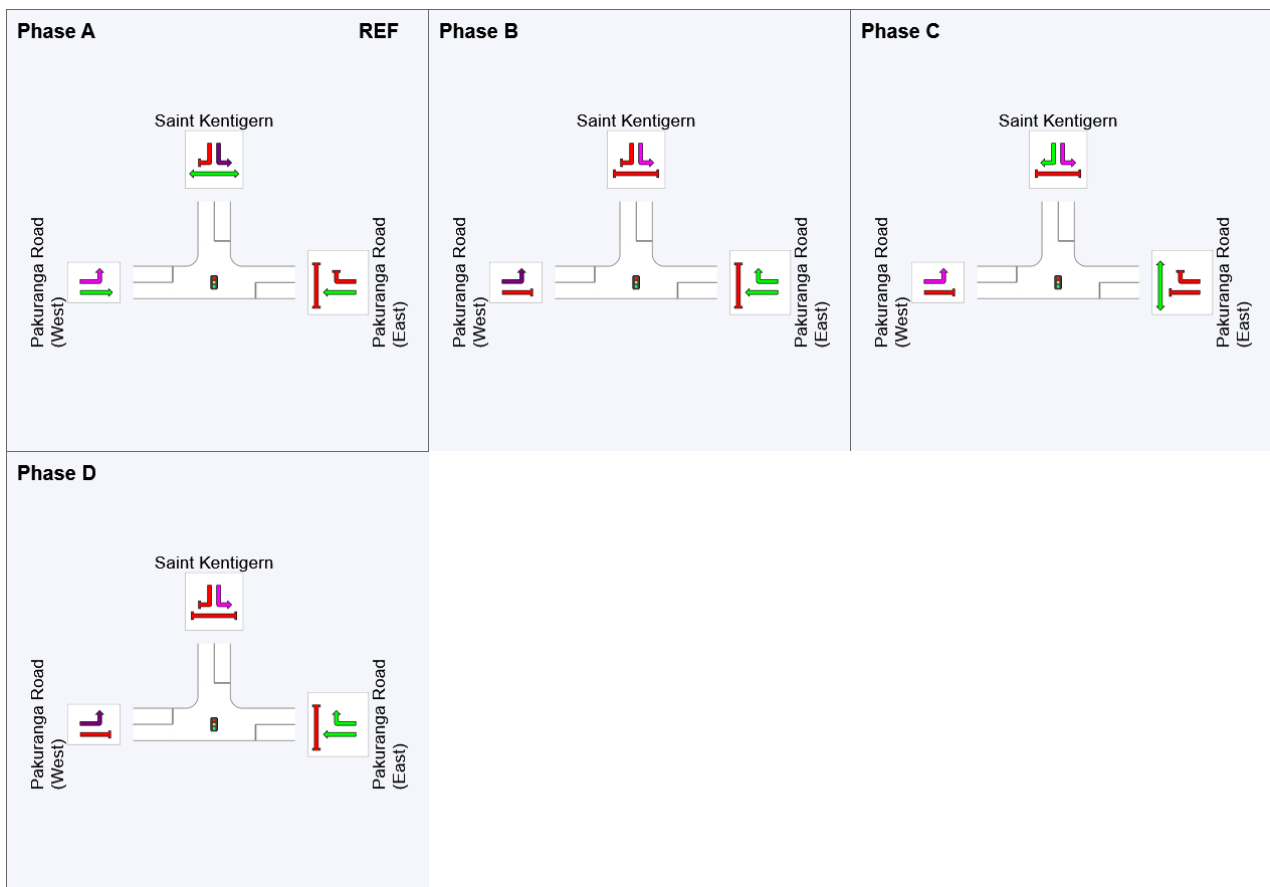
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	35	47	75
Green Time (sec)	29	6	22	6
Phase Time (sec)	35	12	28	12
Phase Split	40%	14%	32%	14%






See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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 Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 AM - V1.sip9

# PHASING SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 82 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Green Split Priority has been specified

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

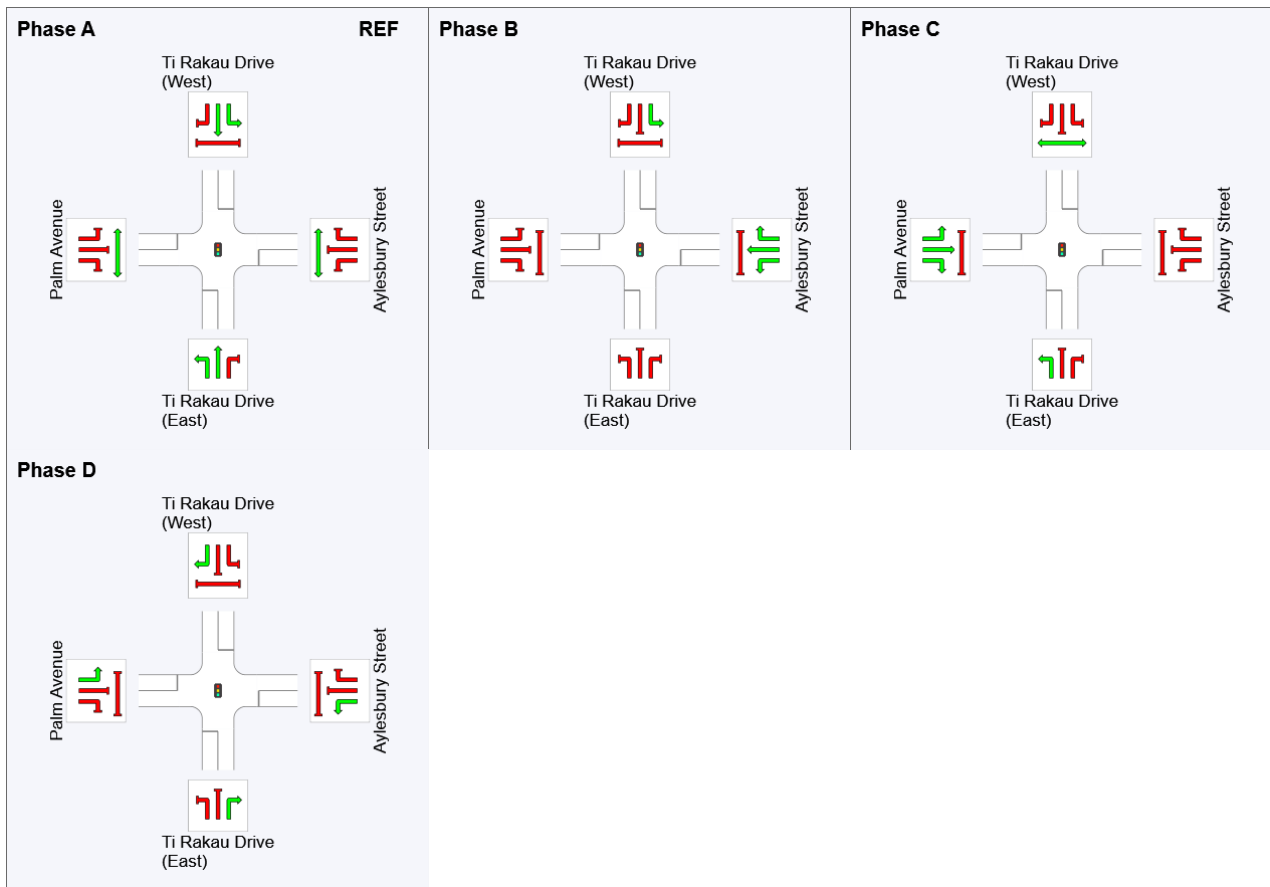
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	35	47	70
Green Time (sec)	29	6	17	6
Phase Time (sec)	35	12	23	12
Phase Split	43%	15%	28%	15%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 89 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

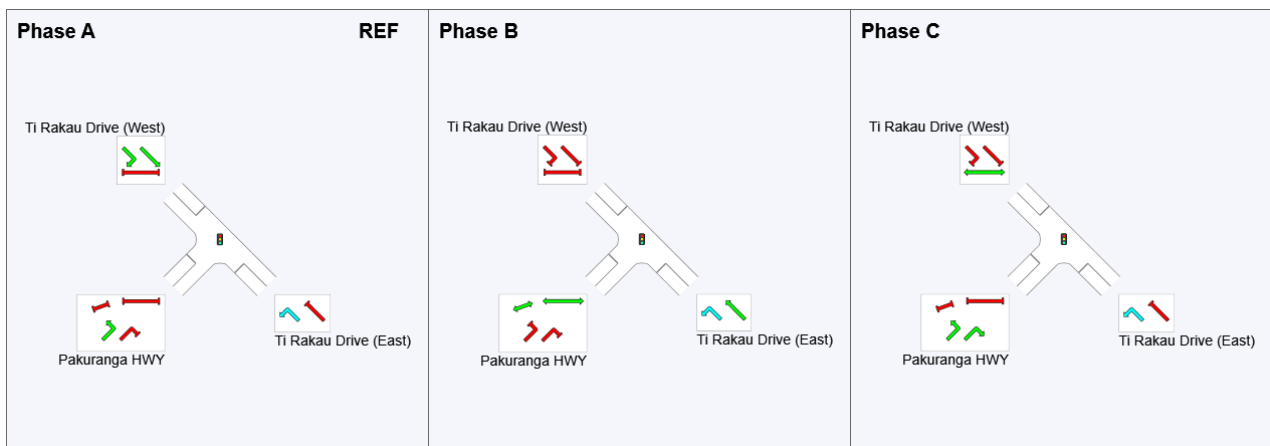
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	33	58
Green Time (sec)	27	19	25
Phase Time (sec)	33	25	31
Phase Split	37%	28%	35%

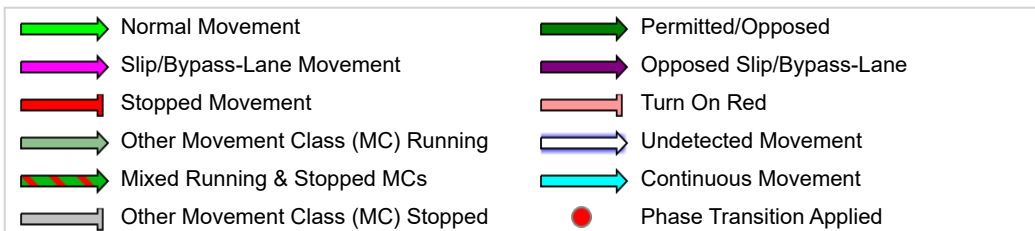
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 81 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

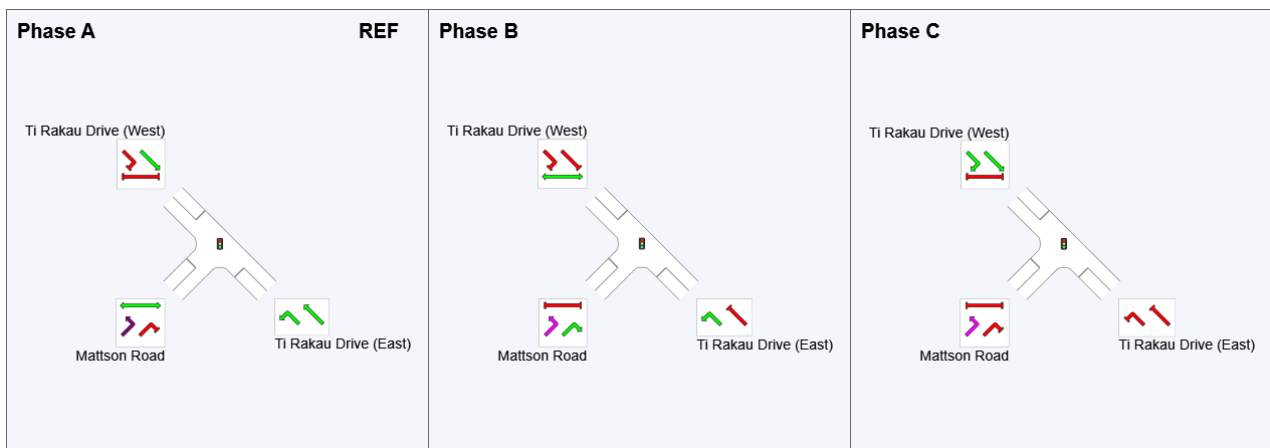
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	51	69
Green Time (sec)	45	12	6
Phase Time (sec)	51	18	12
Phase Split	63%	22%	15%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

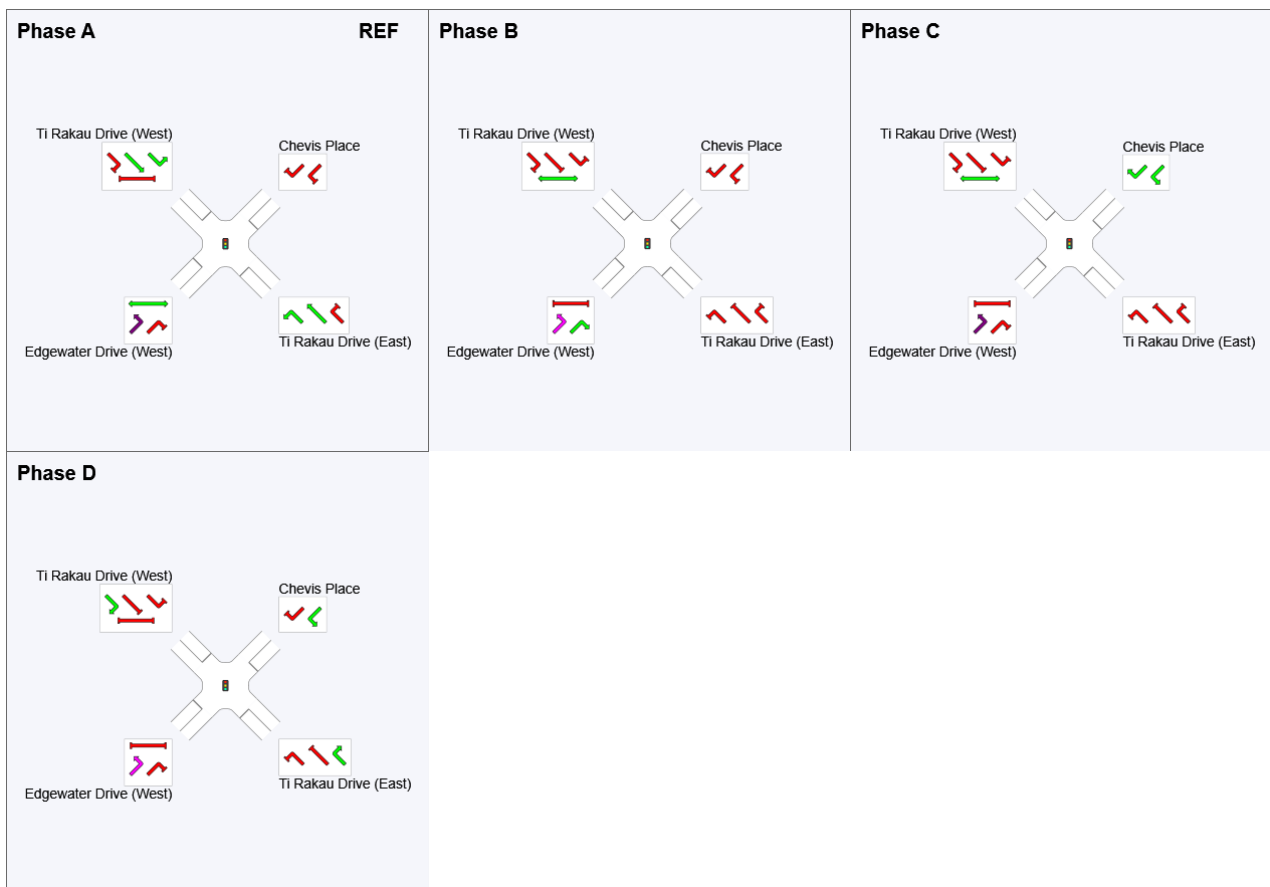
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	55	67	79
Green Time (sec)	49	6	6	6
Phase Time (sec)	55	12	12	12
Phase Split	60%	13%	13%	13%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 132 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

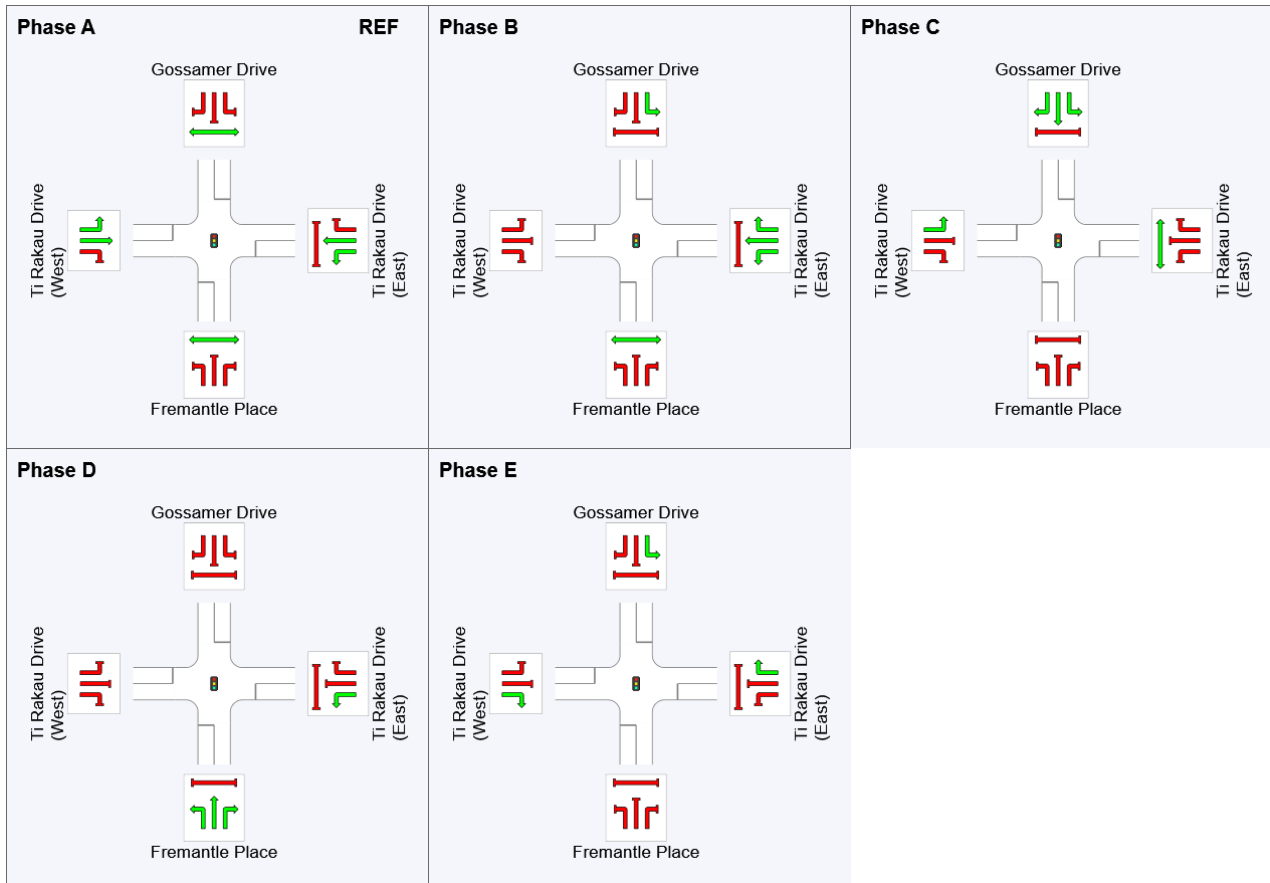
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	47	61	97	109
Green Time (sec)	41	8	30	6	17
Phase Time (sec)	47	14	36	12	23
Phase Split	36%	11%	27%	9%	17%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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# TIME - DISTANCE DIAGRAM

Time – Distance Diagram for the Selected Route

Movement Class: Light Vehicles

➔ Route: R101 [Route1]

■ Network: N101 [PM (Network Folder: General)]

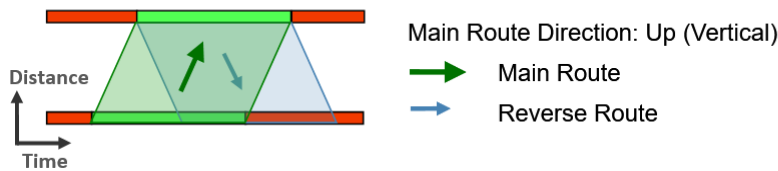
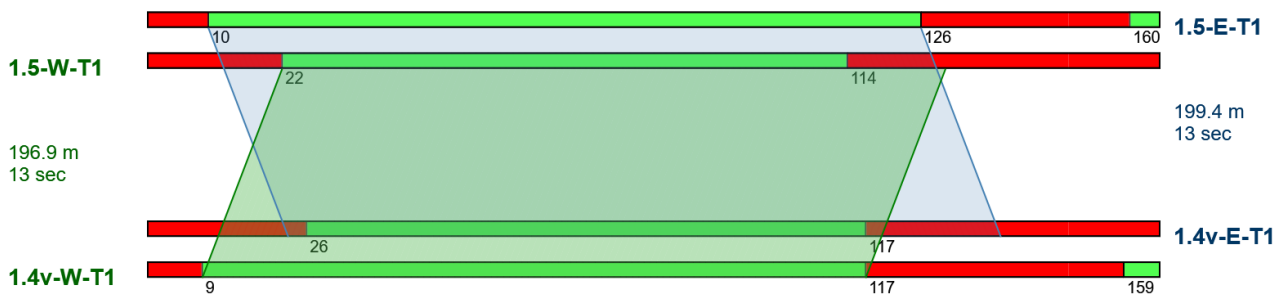
New Route

Network Category: (None)

Network Cycle Time = 150 seconds (Network User-Given Cycle Time)

Signal Offsets option used: User

## Interactive Offsets



# PHASING SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 80 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

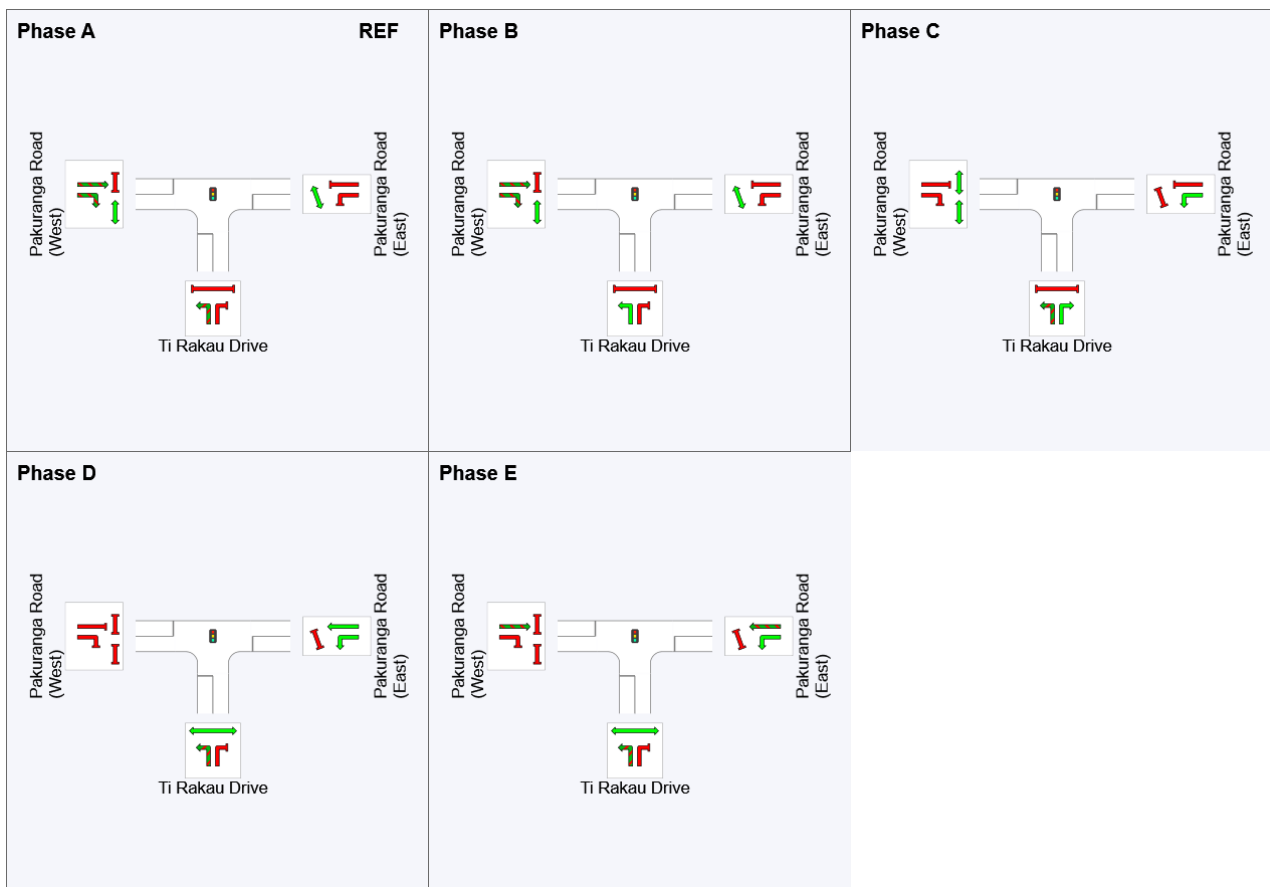
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	18	30	55	67
Green Time (sec)	12	6	19	6	7
Phase Time (sec)	18	12	25	12	13
Phase Split	23%	15%	31%	15%	16%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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# PHASING SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Convert Function Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

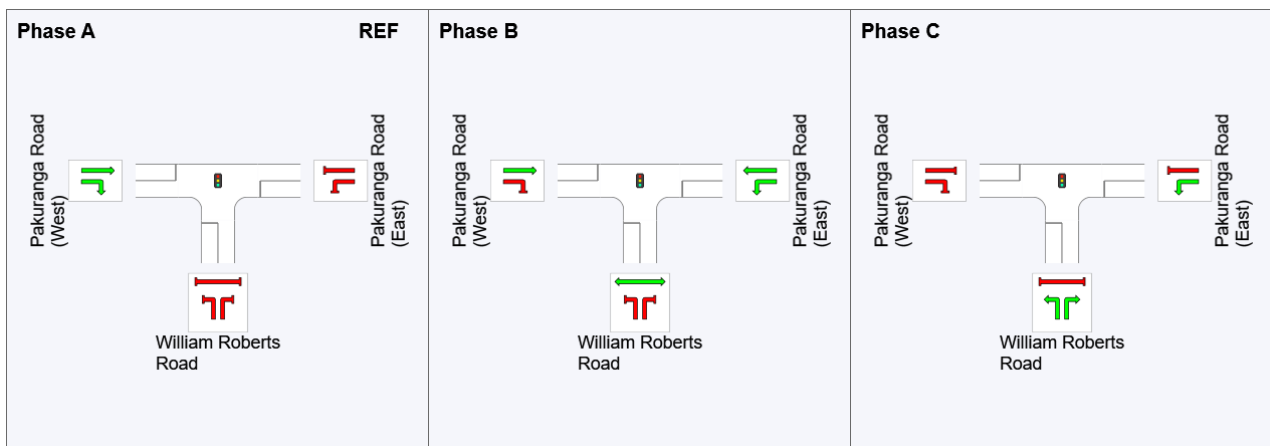
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	17	114
Green Time (sec)	11	91	30
Phase Time (sec)	17	97	36
Phase Split	11%	65%	24%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



# PHASING SUMMARY

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: Network: N101 [PM (Network General) Folder: General])

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Timings based on settings in the Network Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

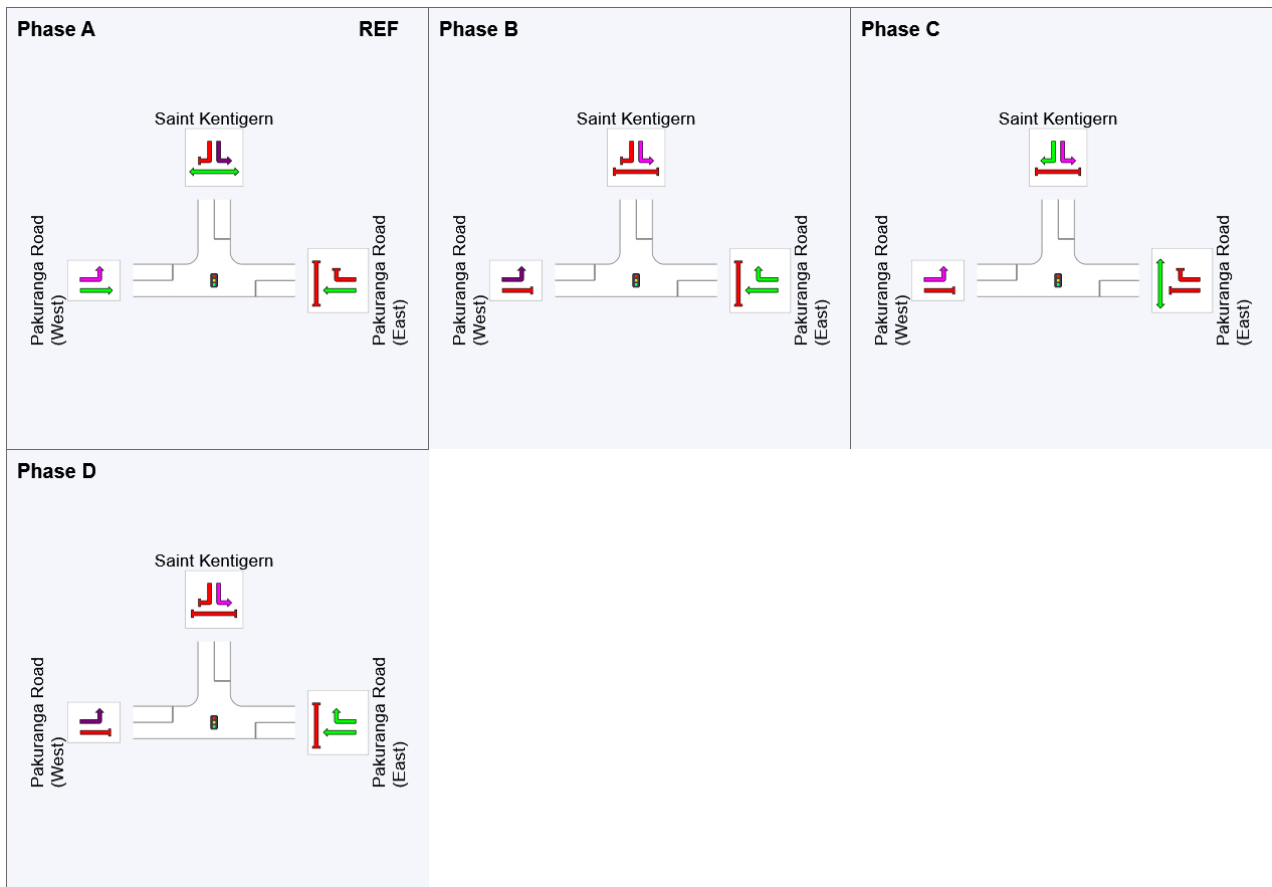
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	13	111	123	1
Green Time (sec)	92	6	22	6
Phase Time (sec)	98	12	28	12
Phase Split	65%	8%	19%	8%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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# PHASING SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

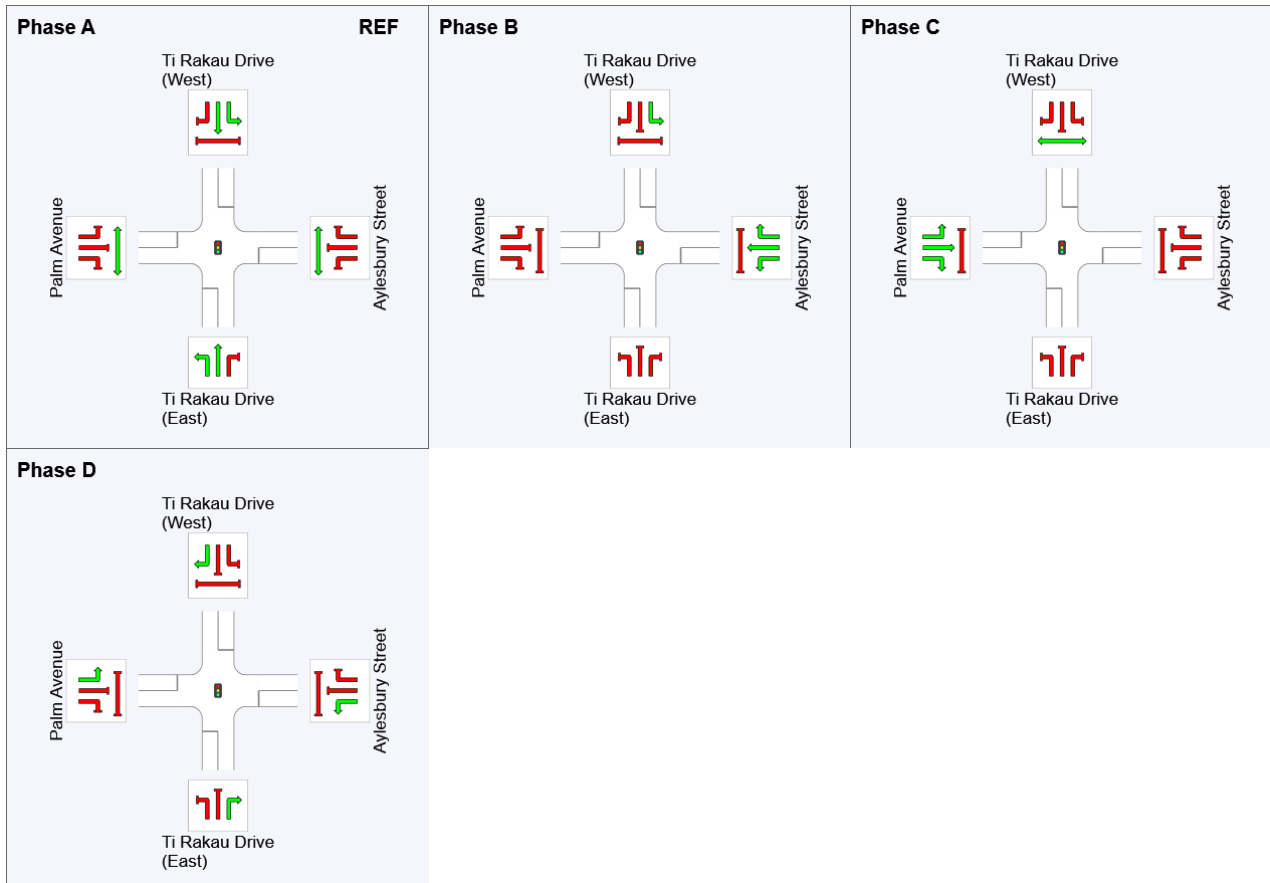
Output Phase Sequence: A, B, C, D

## Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	111	123	141
Green Time (sec)	105	6	12	6
Phase Time (sec)	111	12	15	12
Phase Split	74%	8%	10%	8%

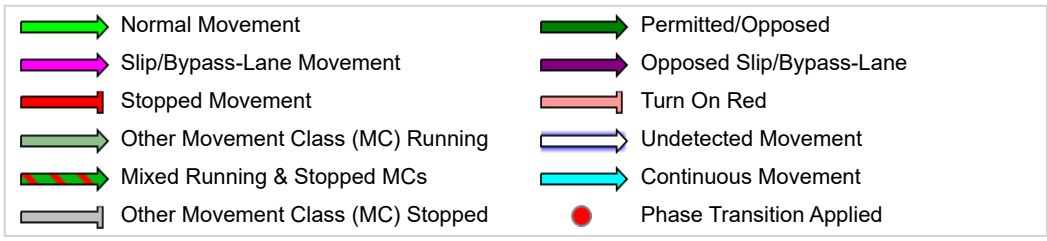
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

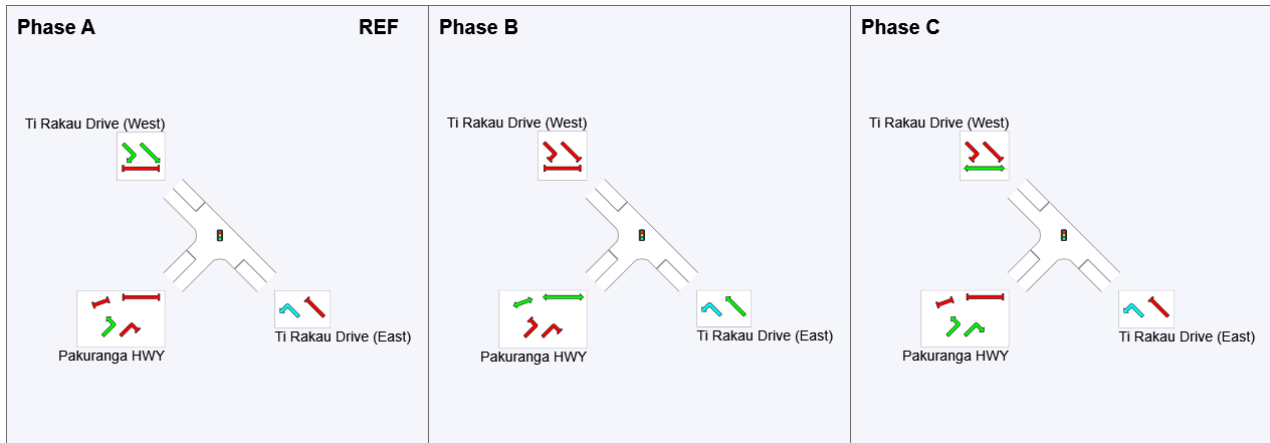
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	50	100
Green Time (sec)	44	44	44
Phase Time (sec)	50	50	50
Phase Split	33%	33%	33%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

# PHASING SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 68 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Downstream lane blockage effects included in determining phase times

Phase Sequence: Map Extract Default

Reference Phase: Phase A

Input Phase Sequence: A, B, C

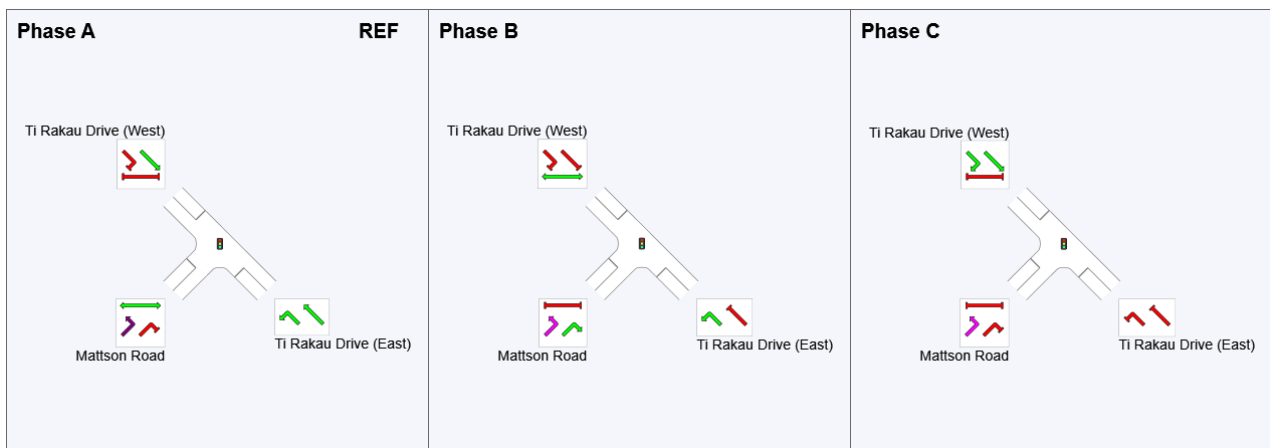
Output Phase Sequence: A, B, C

## Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	40	56
Green Time (sec)	34	10	6
Phase Time (sec)	40	16	12
Phase Split	59%	24%	18%

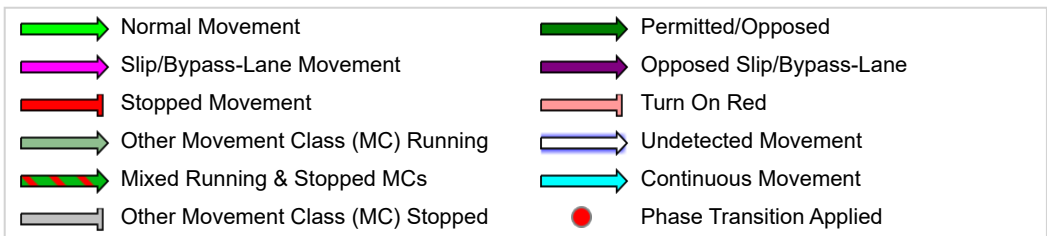
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



# PHASING SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site Practical Cycle Time)

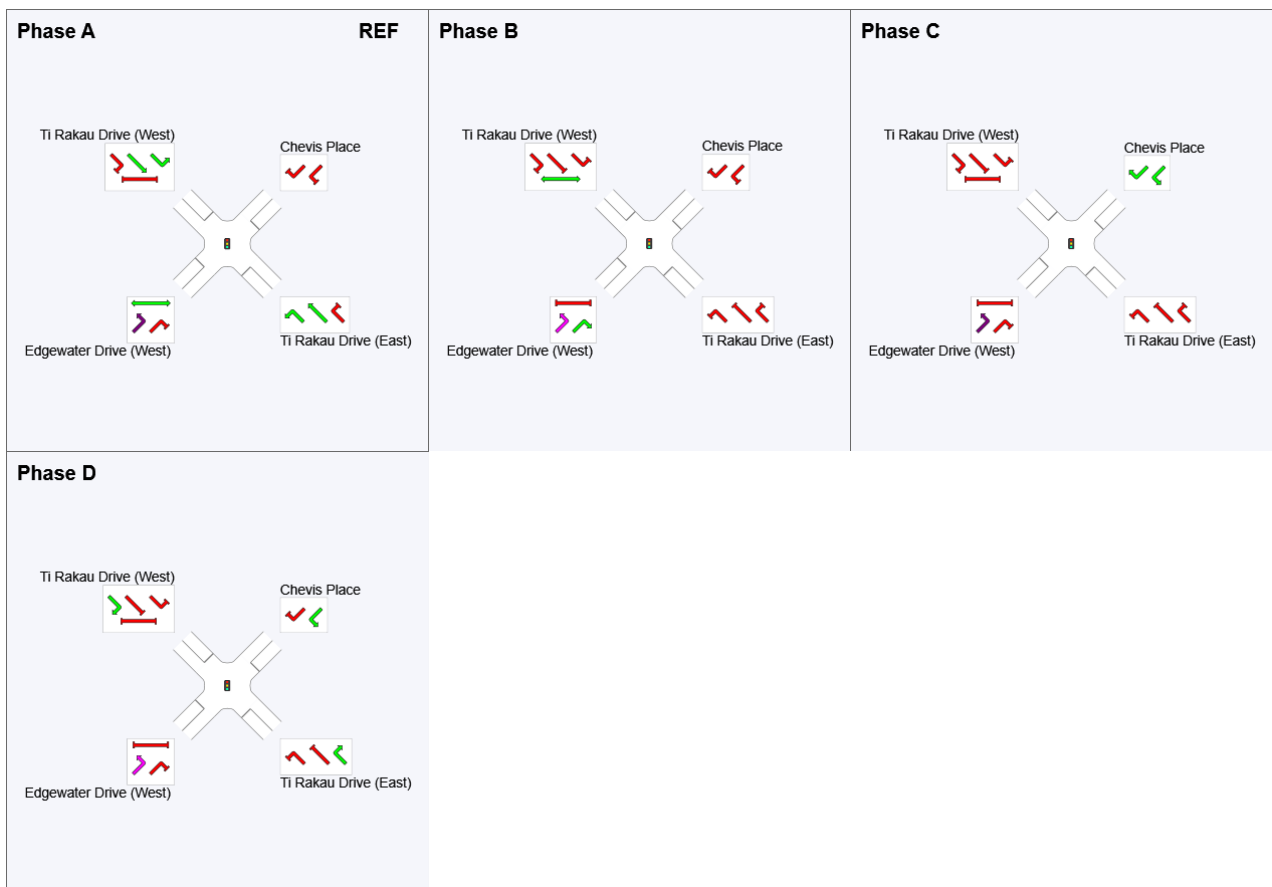
Timings based on settings in the Site Phasing & Timing dialog  
 Phase Times determined by the program  
 Downstream lane blockage effects included in determining phase times  
 Phase Sequence: Variable Phasing  
 Reference Phase: Phase A  
 Input Phase Sequence: A, B, C, D  
 Output Phase Sequence: A, B, C, D

## Phase Timing Summary













Phase	A	B	C	D
Phase Change Time (sec)	0	61	81	93
Green Time (sec)	55	14	6	6
Phase Time (sec)	61	20	12	12
Phase Split	58%	19%	11%	11%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase  
 VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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# PHASING SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D, E

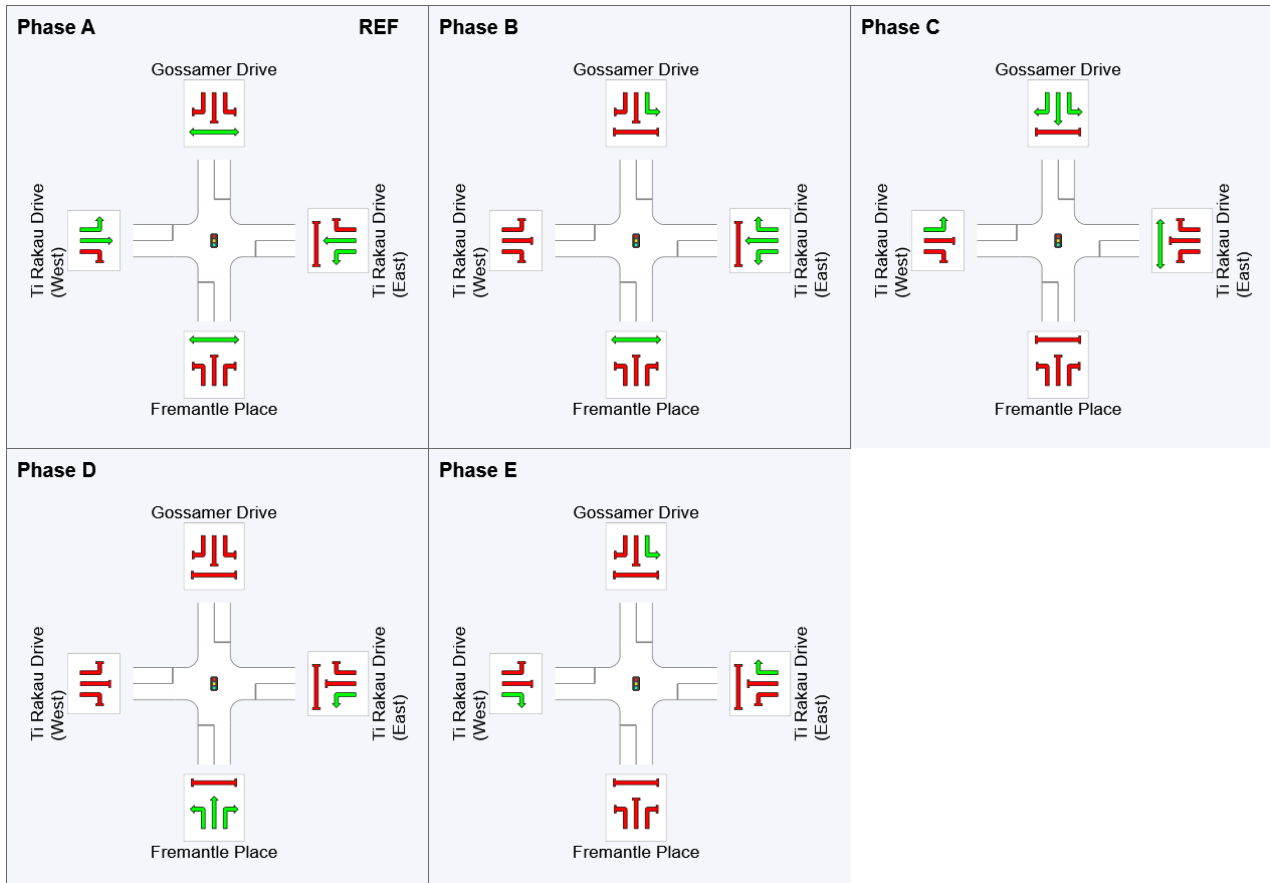
Output Phase Sequence: A, B, C, D, E

## Phase Timing Summary

Phase	A	B	C	D	E
Phase Change Time (sec)	0	55	79	105	118
Green Time (sec)	49	18	20	8	26
Phase Time (sec)	55	24	25	14	32
Phase Split	37%	16%	17%	9%	21%













See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Tuesday, 7 February 2023 3:26:49 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 PM - V1.sip9

# Appendix R

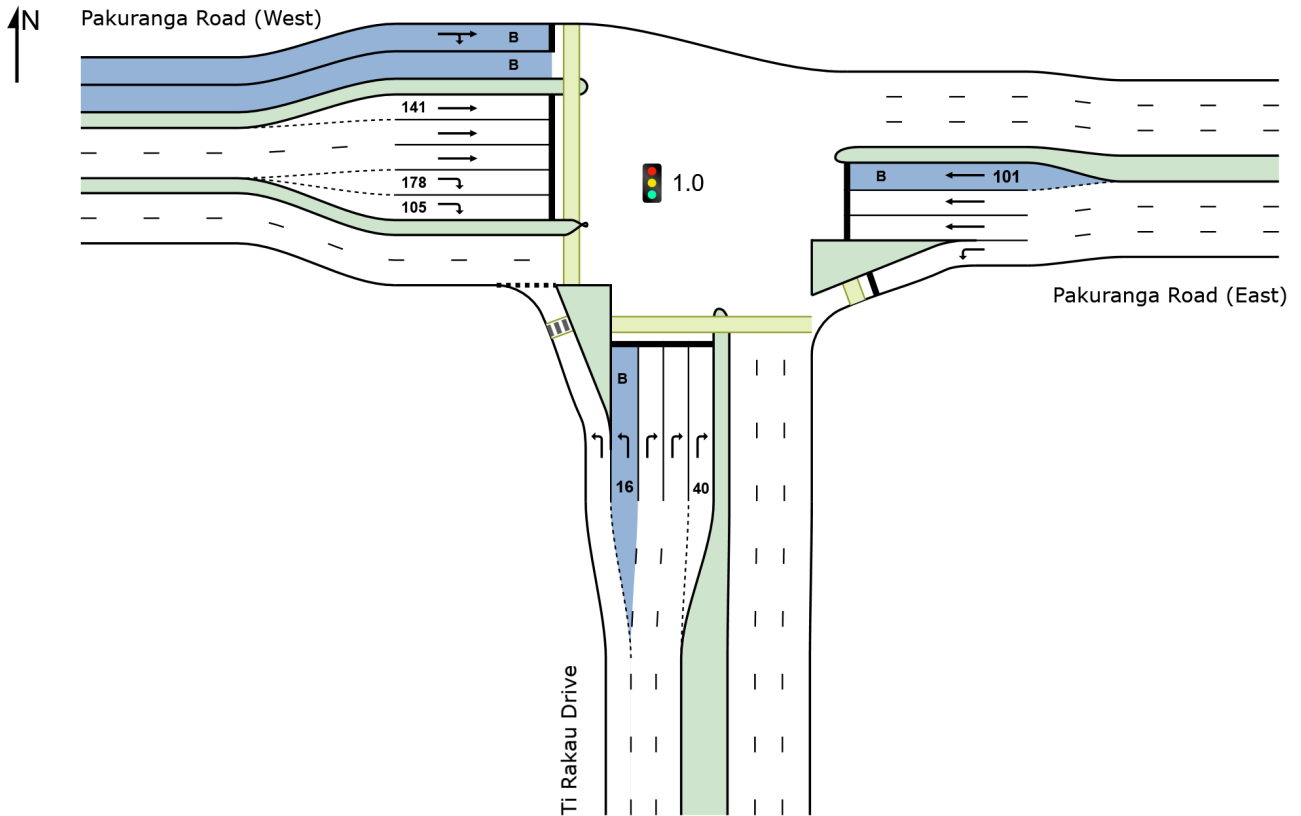
## Construction Scenario 1.4 – Lane Performance Summaries

# SITE LAYOUT

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist m ]				
South: Ti Rakau Drive															
Lane 1	579	8.6	567	8.5	896 <sup>1</sup>	0.633	100	13.7	LOS B	12.4	93.0	Full	174	0.0	0.0
Lane 2 (B)	17	100.0	17	100.0	121	0.141	100	47.3	LOS D	0.6	8.1	Short	16	0.0	NA
Lane 3	191	4.0	187	4.0	342	0.546	100	38.7	LOS D	6.4	46.3	Full	174	0.0	0.0
Lane 4	191	4.0	187	4.0	342	0.546	100	38.7	LOS D	6.4	46.3	Full	174	0.0	0.0
Lane 5	191	4.0	187	4.0	342	0.546	100	38.7	LOS D	6.4	46.3	Short	40	0.0	NA
Approach	1168	7.7	1144 <sup>N</sup> <sub>1</sub>	7.7		0.633		26.4	LOS C	12.4	93.0				
East: Pakuranga Road (East)															
Lane 1	832	4.8	812	4.8	1127	0.720	100	16.9	LOS B	20.1	146.3	Full	113	0.0	38.7
Lane 2	626	6.1	611	6.0	689	0.887	100	38.5	LOS D	22.4 <sup>N4</sup>	165.1 <sup>N4</sup>	Full	113	0.0	50.0
Lane 3	626	6.1	611	6.0	689	0.887	100	38.5	LOS D	22.4 <sup>N4</sup>	165.1 <sup>N4</sup>	Full	113	0.0	50.0
Lane 4 (B)	25	100.0	25	100.0	85	0.293	100	45.6	LOS D	1.0	12.5	Short	101	0.0	NA
Approach	2109	6.7	2059 <sup>N</sup> <sub>1</sub>	6.7		0.887		30.0	LOS C	22.4	165.1				
West: Pakuranga Road (West)															
Lane 1 (B)	24	100.0	24	100.0	81	0.297	100	44.1	LOS D	0.9	11.4	Full	388	0.0	0.0
Lane 2	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	8.8	66.8	Short	141	0.0	NA
Lane 3	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	8.8	66.8	Full	388	0.0	0.0
Lane 4	318	9.6	318	9.6	695	0.458	100	21.1	LOS C	8.8	66.8	Full	388	0.0	0.0
Lane 5	131	11.5	131	11.5	142	0.920	100	62.1	LOS E	6.0	45.9	Short	178	0.0	NA
Lane 6	131	11.5	131	11.5	142	0.920	100	62.1	LOS E	6.0	45.9	Short	105	0.0	NA
Approach	1241	11.8	1241	11.8		0.920		30.2	LOS C	8.8	66.8				
Intersection	4518	8.3	4444 <sup>N</sup> <sub>1</sub>	8.5		0.920		29.2	LOS C	22.4	165.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	W	E								
Lane 1	567	-	567	8.5	896 <sup>1</sup>	0.633	100	NA	NA	
Lane 2	17	-	17	100.0	121	0.141	100	0.0	1	
Lane 3	-	187	187	4.0	342	0.546	100	NA	NA	

Lane 4	-	187	187	4.0	342	0.546	100	NA	NA
Lane 5	-	187	187	4.0	342	0.546	100	28.4	4
Approach	584	560	1144	7.7		0.633			
East: Pakuranga Road (East)									
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W							
Lane 1	812	-	812	4.8	1127	0.720	100	NA	NA
Lane 2	-	611	611	6.0	689	0.887	100	NA	NA
Lane 3	-	611	611	6.0	689	0.887	100	NA	NA
Lane 4	-	25	25	100.0	85	0.293	100	0.0	3
Approach	812	1247	2059	6.7		0.887			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	9	15	24	100.0	81	0.297	100	NA	NA
Lane 2	318	-	318	9.6	695	0.458	100	0.0	3
Lane 3	318	-	318	9.6	695	0.458	100	NA	NA
Lane 4	318	-	318	9.6	695	0.458	100	NA	NA
Lane 5	-	131	131	11.5	142	0.920	100	0.0	4
Lane 6	-	131	131	11.5	142	0.920	100	0.0	5
Approach	964	277	1241	11.8		0.920			
Total %HV Deg. Satn (v/c)									
Intersection	4444	8.5		0.920					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

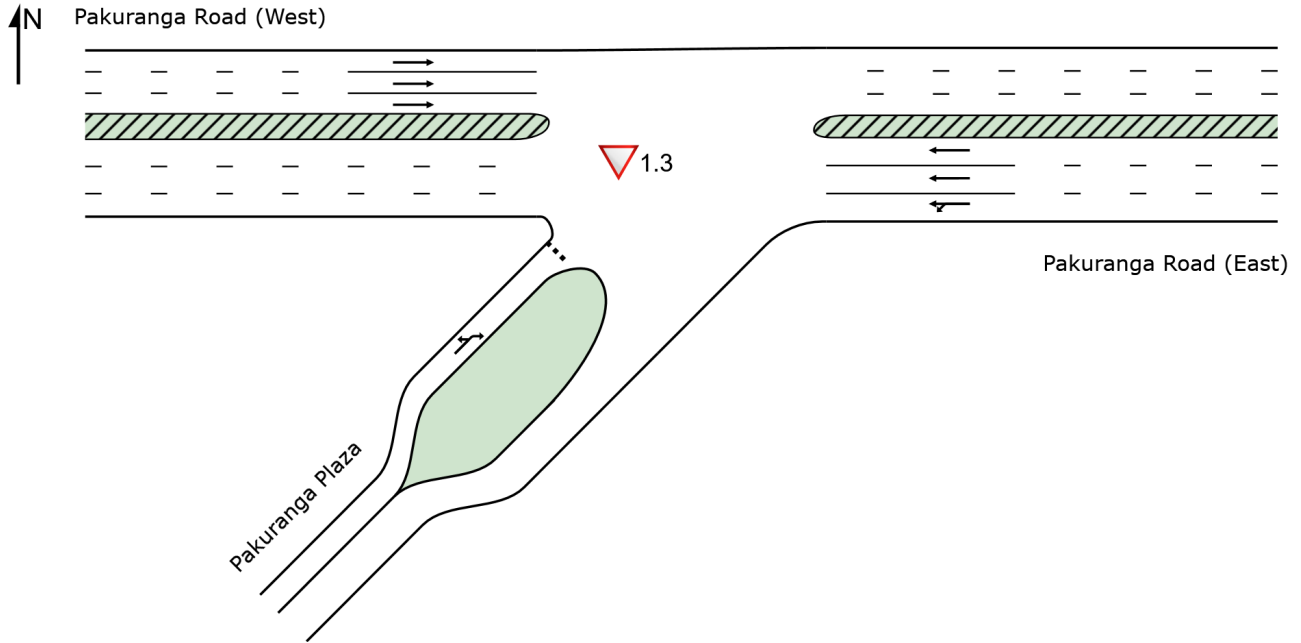
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Ti Rakau Drive											
Merge Type: <b>Not Applied</b>											
	Full Length Lane	1	Merge Analysis not applied.								
	Full Length Lane	2	Merge Analysis not applied.								
	Full Length Lane	3	Merge Analysis not applied.								
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
	Full Length Lane	1	Merge Analysis not applied.								
	Full Length Lane	2	Merge Analysis not applied.								
	Full Length Lane	3	Merge Analysis not applied.								
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
	Full Length Lane	1	Merge Analysis not applied.								
	Full Length Lane	2	Merge Analysis not applied.								
	Full Length Lane	3	Merge Analysis not applied.								

# SITE LAYOUT

▽ Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

Network: N101 [AM  
(Network Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
East: Pakuranga Road (East)															
Lane 1	719	8.5	719	8.5	1844	0.390	100	1.4	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 2	737	5.6	737	5.6	1892	0.390	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 3	737	5.6	737	5.6	1892	0.390	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Approach	2193	6.5	2193	6.5		0.390		0.5	NA	0.0	0.0				
West: Pakuranga Road (West)															
Lane 1	509	8.1	506	8.1	1785	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 2	509	8.1	506	8.1	1785	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 3	506	8.1	503	8.1	1775	0.283	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Approach	1524	8.1	1514 <sup>N1</sup>	8.1		0.283		0.0	NA	0.0	0.0				
SouthWest: Pakuranga Plaza															
Lane 1	54	5.6	54	5.6	11	4.747	100	3565.0	LOS F	26.0	190.8	Full	196	-11.4 <sup>N7</sup>	14.0
Approach	54	5.6	54	5.6		4.747		3565.0	LOS F	26.0	190.8				
Intersection	3771	7.2	3761 <sup>N1</sup>	7.2		4.747		51.5	NA	26.0	190.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	L1	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	W								
Lane 1	180	539	719	8.5	1844	0.390	100	NA	NA	
Lane 2	-	737	737	5.6	1892	0.390	100	NA	NA	
Lane 3	-	737	737	5.6	1892	0.390	100	NA	NA	
Approach	180	2013	2193	6.5		0.390				
West: Pakuranga Road (West)										
Mov. From W To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
	E									
Lane 1	506	506	8.1	1785	0.283	100	NA	NA		
Lane 2	506	506	8.1	1785	0.283	100	NA	NA		



Lane 3	503	503	8.1		1775	0.283	100	NA	NA
Approach	1514	1514	8.1			0.283			
SouthWest: Pakuranga Plaza									
Mov. From SW To Exit:	L3 W	R1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	29	25	54	5.6	11	4.747	100	NA	NA
Approach	29	25	54	5.6		4.747			
Total %HV Deg. Satn (v/c)									
Intersection	3761	7.2		4.747					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

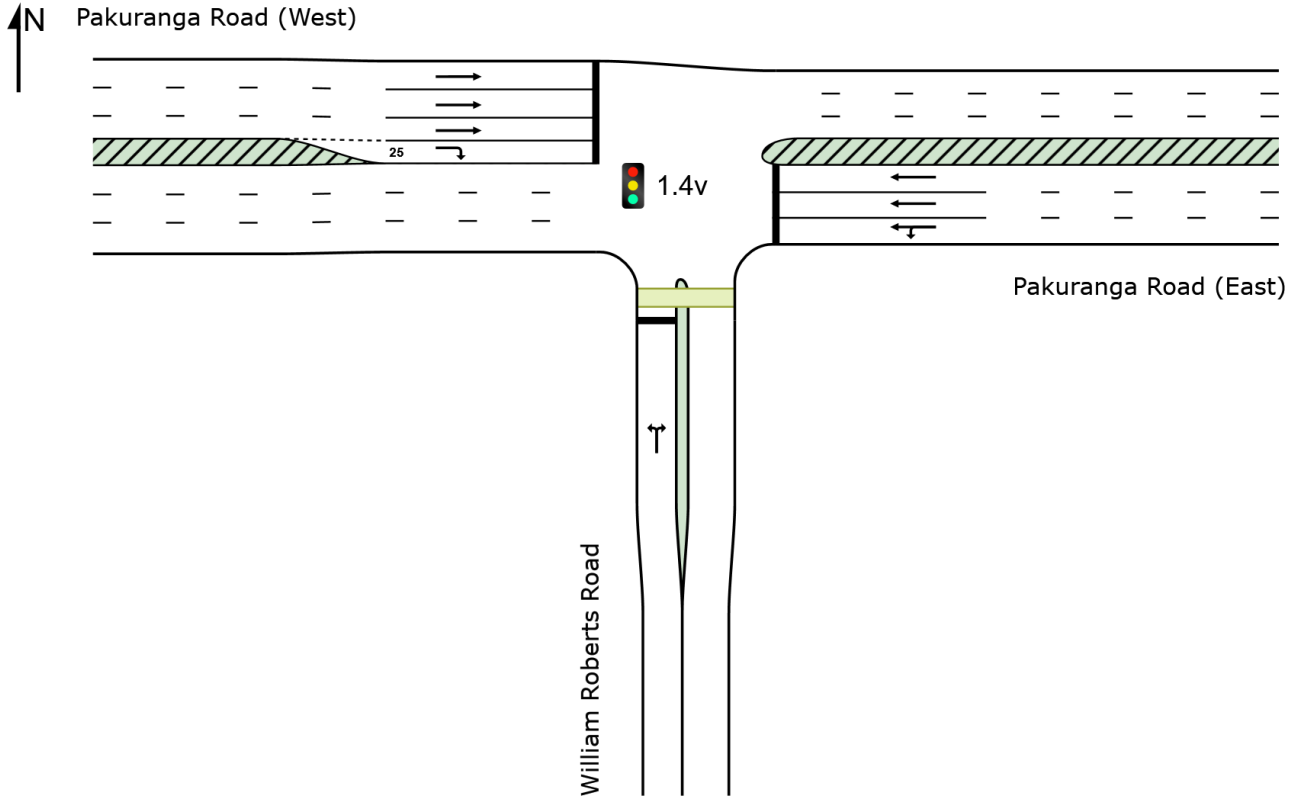
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
SouthWest Exit: Pakuranga Plaza											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

 Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 61 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec		Veh	m		m	%	%
South: William Roberts Road															
Lane 1	287	8.7	287	8.7	330	0.868	100	39.8	LOS D	9.1	68.7	Full	244	-0.4 <sup>N7</sup>	0.0
Approach	287	8.7	287	8.7		0.868		39.8	LOS D	9.1	68.7				
East: Pakuranga Road (East)															
Lane 1	699	6.0	699	6.0	790	0.885	100	29.7	LOS C	22.6	166.4	Full	184	0.0	5.9
Lane 2	688	6.2	688	6.2	778	0.885	100	28.9	LOS C	22.3	164.1	Full	184	0.0	4.6
Lane 3	696	6.2	696	6.2	786	0.885	100	28.8	LOS C	22.4	165.5	Full	184	0.0	5.4
Approach	2083	6.1	2083	6.1		0.885		29.1	LOS C	22.6	166.4				
West: Pakuranga Road (West)															
Lane 1	550	8.1	543	8.1	1142	0.475	100	6.7	LOS A	7.8	58.2	Full	152	0.0	0.0
Lane 2	532	8.1	525	8.1	1105	0.475	100	6.7	LOS A	7.5	56.4	Full	152	-3.2 <sup>N3</sup>	0.0
Lane 3	470	8.1	464	8.1	976 <sup>1</sup>	0.475	100	6.4	LOS A	6.4	48.1	Full	152	-3.2 <sup>N3</sup>	0.0
Lane 4	54	13.0	53	13.0	160	0.333	100	35.8	LOS D	1.4	11.2	Short	25	0.0	NA
Approach	1605	8.2	1585 <sup>N1</sup>	8.3		0.475		7.6	LOS A	7.8	58.2				
Intersection	3975	7.2	3955 <sup>N1</sup>	7.2		0.885		21.3	LOS C	22.6	166.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Road										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	W	E								
Lane 1	253	34	287	8.7	330	0.868	100	NA	NA	
Approach	253	34	287	8.7		0.868				
East: Pakuranga Road (East)										
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	S	W								
Lane 1	143	556	699	6.0	790	0.885	100	NA	NA	
Lane 2	-	688	688	6.2	778	0.885	100	NA	NA	

Lane 3	-	696	696	6.2	786	0.885	100	NA	NA
Approach	143	1940	2083	6.1		0.885			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	543	-	543	8.1	1142	0.475	100	NA	NA
Lane 2	525	-	525	8.1	1105	0.475	100	NA	NA
Lane 3	464	-	464	8.1	976 <sup>1</sup>	0.475	100	NA	NA
Lane 4	-	53	53	13.0	160	0.333	100	0.0	3
Approach	1532	53	1585	8.3		0.475			
Total %HV Deg. Satn (v/c)									
Intersection	3955	7.2		0.885					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

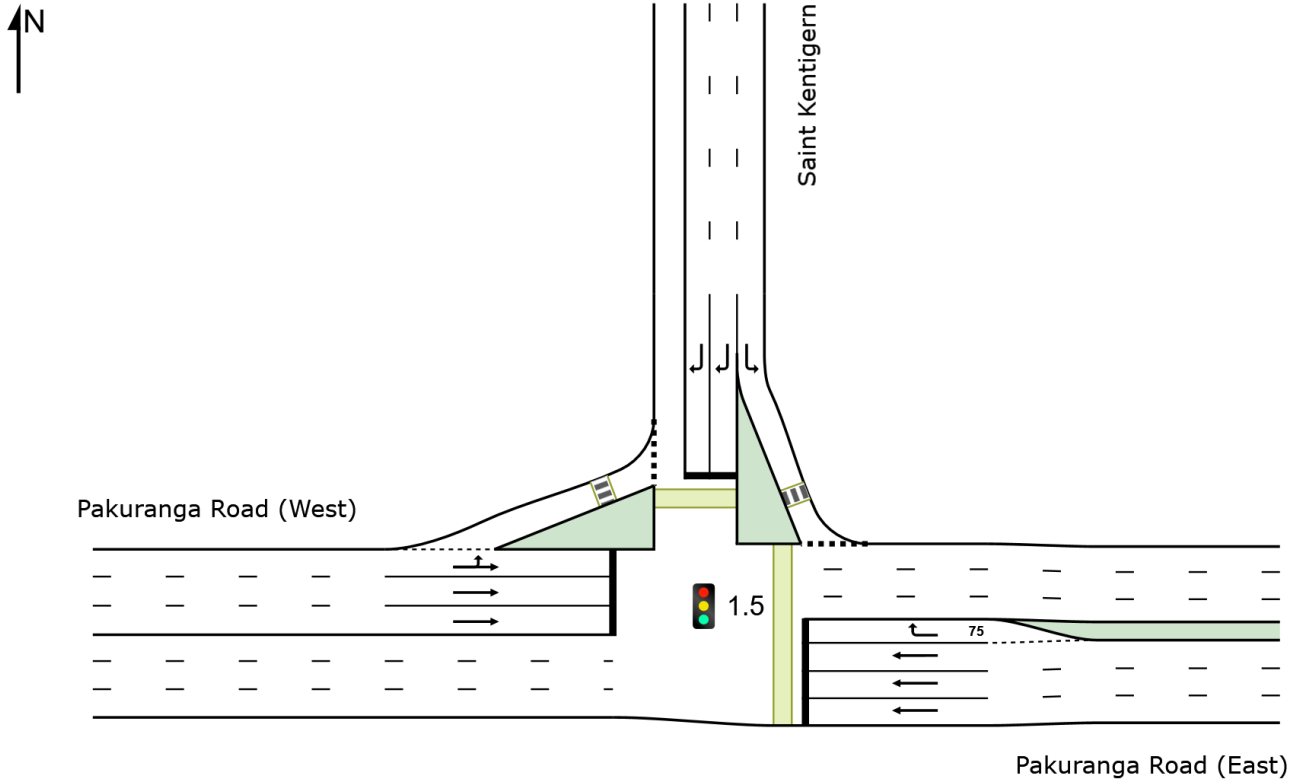
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

**Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]**

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





To Exit:	E	W			veh/h	v/c	%	%	No.
Lane 1	13	-	13	0.0	947	0.014	100	NA	NA
Lane 2	-	20	20	10.0	412	0.049	100	NA	NA
Lane 3	-	20	20	10.0	402	0.049	100	NA	NA
Approach	13	40	53	7.5		0.049			
West: Pakuranga Road (West)									
Mov.	L2	T1	Total	%HV		Deg.	Lane	Prob.	Ov.
From W					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	E			veh/h	v/c	%	%	No.
Lane 1	127	369	497	6.5	582	0.854	100	NA	NA
Lane 2	-	527	527	7.3	617	0.854	100	NA	NA
Lane 3	-	527	527	7.3	617	0.854	100	NA	NA
Approach	127	1424	1552	7.0		0.854			
Total %HV Deg.Satn (v/c)									
Intersection	3729	6.6		0.854					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

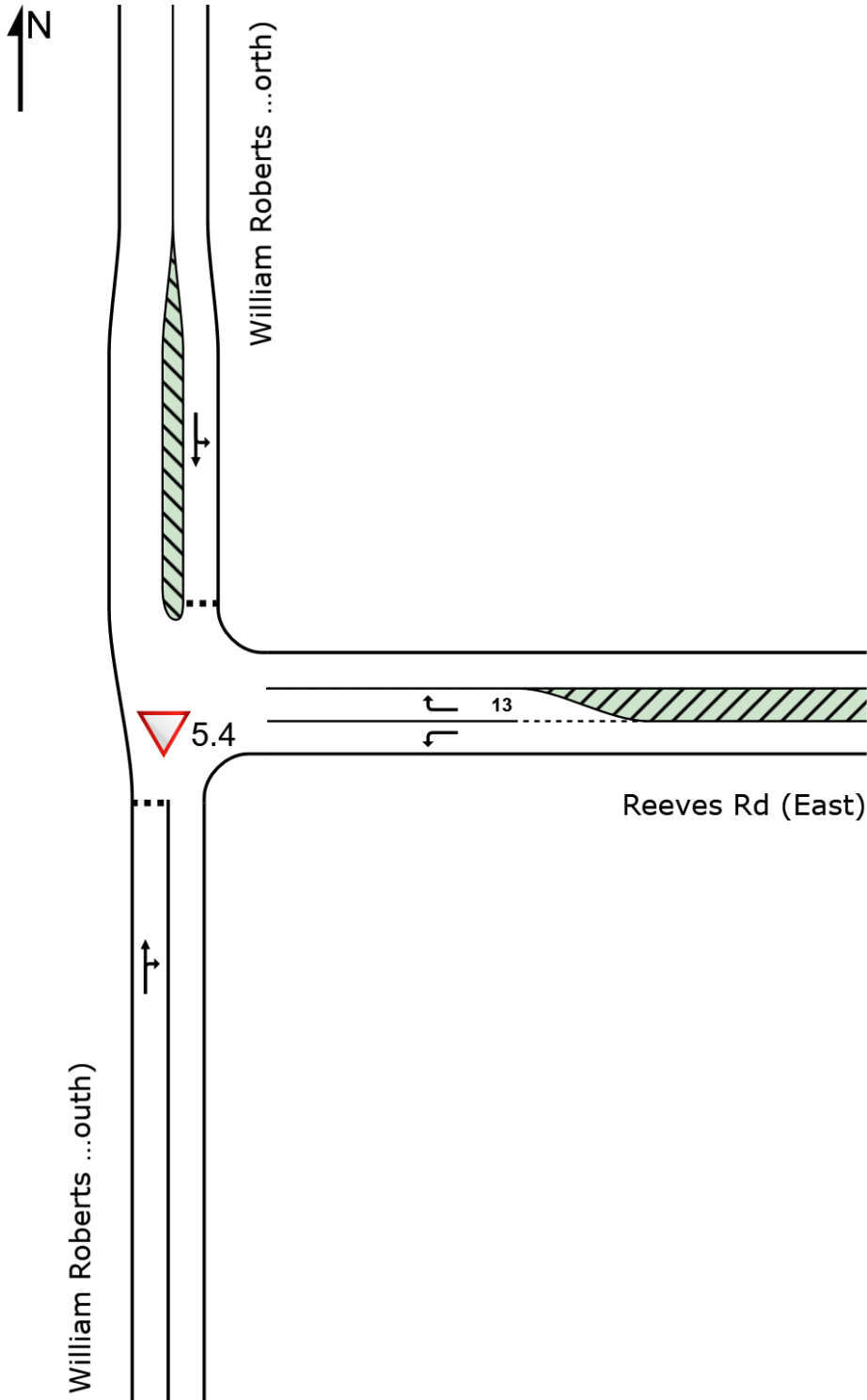
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
North Exit: Saint Kentigern												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

▽ Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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





Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 9:56:58 am  
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport  
Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 AM - V1.sip9

# LANE SUMMARY

Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: William Roberts Rd (South)															
Lane 1	220	8.2	220	8.2	831	0.265	100	4.2	LOS A	0.8	5.7	Full	243	0.0	0.0
Approach	220	8.2	220	8.2		0.265		4.2	LOS A	0.8	5.7				
East: Reeves Rd (East)															
Lane 1	215	9.3	215	9.3	1714	0.125	100	4.7	LOS A	0.0	0.0	Full	266	0.0	0.0
Lane 2	222	9.0	222	9.0	1718	0.129	100	4.7	LOS A	0.0	0.0	Short	13	0.0	NA
Approach	437	9.2	437	9.2		0.129		4.7	NA	0.0	0.0				
North: William Roberts Rd (North)															
Lane 1	141	5.0	141	5.0	1112	0.126	100	5.7	LOS A	0.3	2.5	Full	244	0.0	0.0
Approach	141	5.0	141	5.0		0.126		5.7	LOS A	0.3	2.5				
Intersection	798	8.2	797 <sup>N1</sup>	8.2		0.265		4.7	NA	0.8	5.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
South: William Roberts Rd (South)										
Mov. From S To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	67	153	220	8.2	831	0.265	100	NA	NA	
Approach	67	153	220	8.2		0.265				
East: Reeves Rd (East)										
Mov. From E To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	215	-	215	9.3	1714	0.125	100	NA	NA	
Lane 2	-	222	222	9.0	1718	0.129	100	0.0	1	
Approach	215	222	437	9.2		0.129				
North: William Roberts Rd (North)										
Mov. From N To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	42	99	141	5.0	1112	0.126	100	NA	NA	
Approach	42	99	141	5.0		0.126				

	Total	%HV	Deg.Satn (v/c)
Intersection	797	8.2	0.265

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

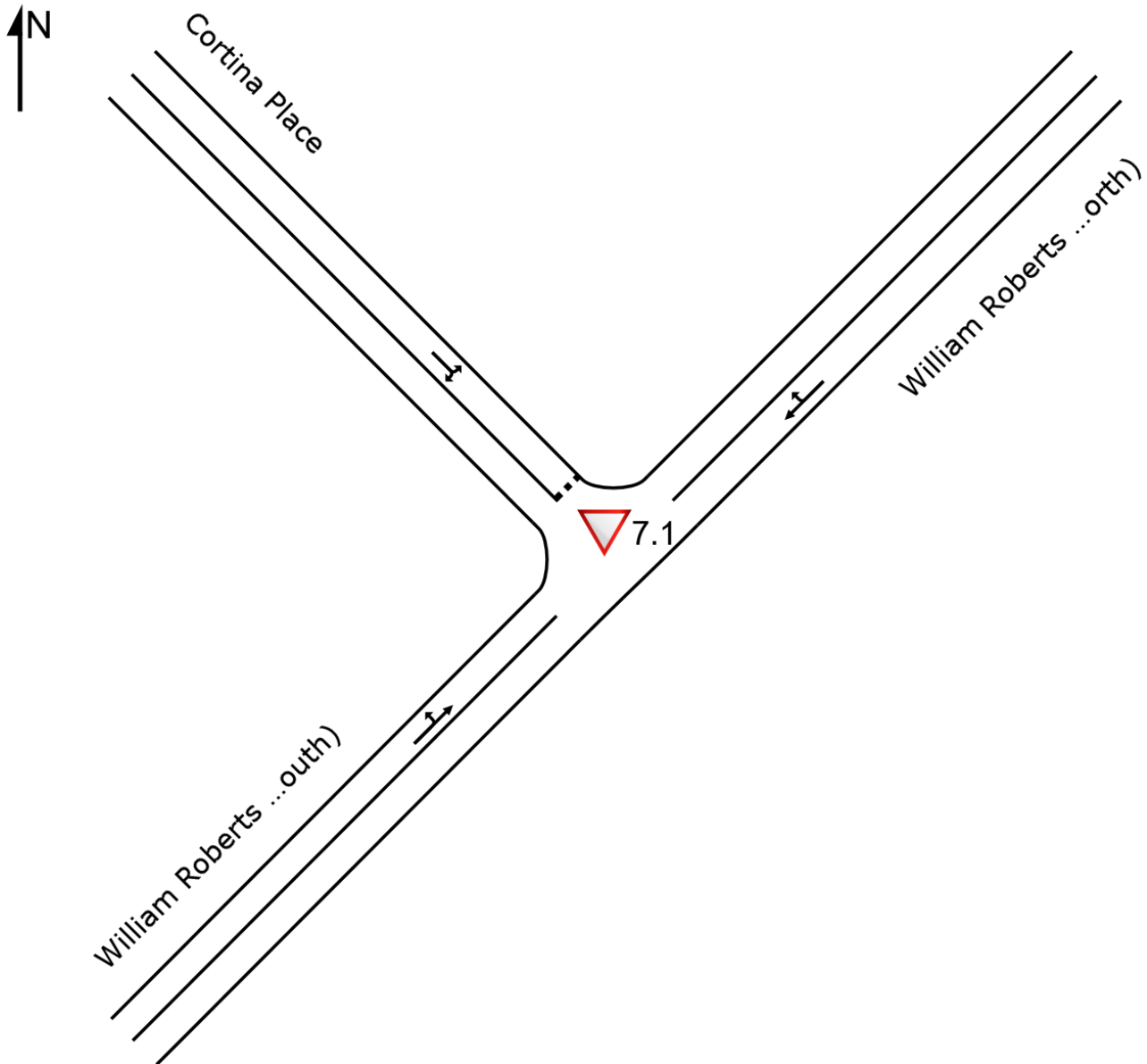
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: William Roberts Rd (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
East Exit: Reeves Rd (East) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
North Exit: William Roberts Rd (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								

# SITE LAYOUT

▼ Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
NorthEast: William Roberts Road (North)															
Lane 1	293	7.8	293	7.9	1772	0.165	100	0.5	LOS A	0.2	1.6	Full	243	0.0	0.0
Approach	293	7.8	293	7.9		0.165		0.5	NA	0.2	1.6				
NorthWest: Cortina Place															
Lane 1	31	6.5	31	6.5	1051	0.029	100	3.3	LOS A	0.1	0.6	Full	177	0.0	0.0
Approach	31	6.5	31	6.5		0.029		3.3	LOS A	0.1	0.6				
SouthWest: William Roberts Road (South)															
Lane 1	204	8.8	204	8.8	1785	0.114	100	0.2	LOS A	0.0	0.0	Full	110	0.0	0.0
Approach	204	8.8	204	8.8		0.114		0.2	NA	0.0	0.0				
Intersection	528	8.2	527 <sup>N1</sup>	8.2		0.165		0.6	NA	0.2	1.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From NE					Cap. veh/h	v/c	%	%	No.	
To Exit:	SW	NW								
Lane 1	256	37	293	7.9	1772	0.165	100	NA	NA	
Approach	256	37	293	7.9		0.165				
NorthWest: Cortina Place										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From NW					Cap. veh/h	v/c	%	%	No.	
To Exit:	NE	SW								
Lane 1	20	11	31	6.5	1051	0.029	100	NA	NA	
Approach	20	11	31	6.5		0.029				
SouthWest: William Roberts Road (South)										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From SW					Cap. veh/h	v/c	%	%	No.	
To Exit:	NW	NE								
Lane 1	24	180	204	8.8	1785	0.114	100	NA	NA	
Approach	24	180	204	8.8		0.114				
Total %HV Deg. Satn (v/c)										

Intersection	527	8.2	0.165
--------------	-----	-----	-------

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
NorthWest Exit: Cortina Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
SouthWest Exit: William Roberts Road (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								

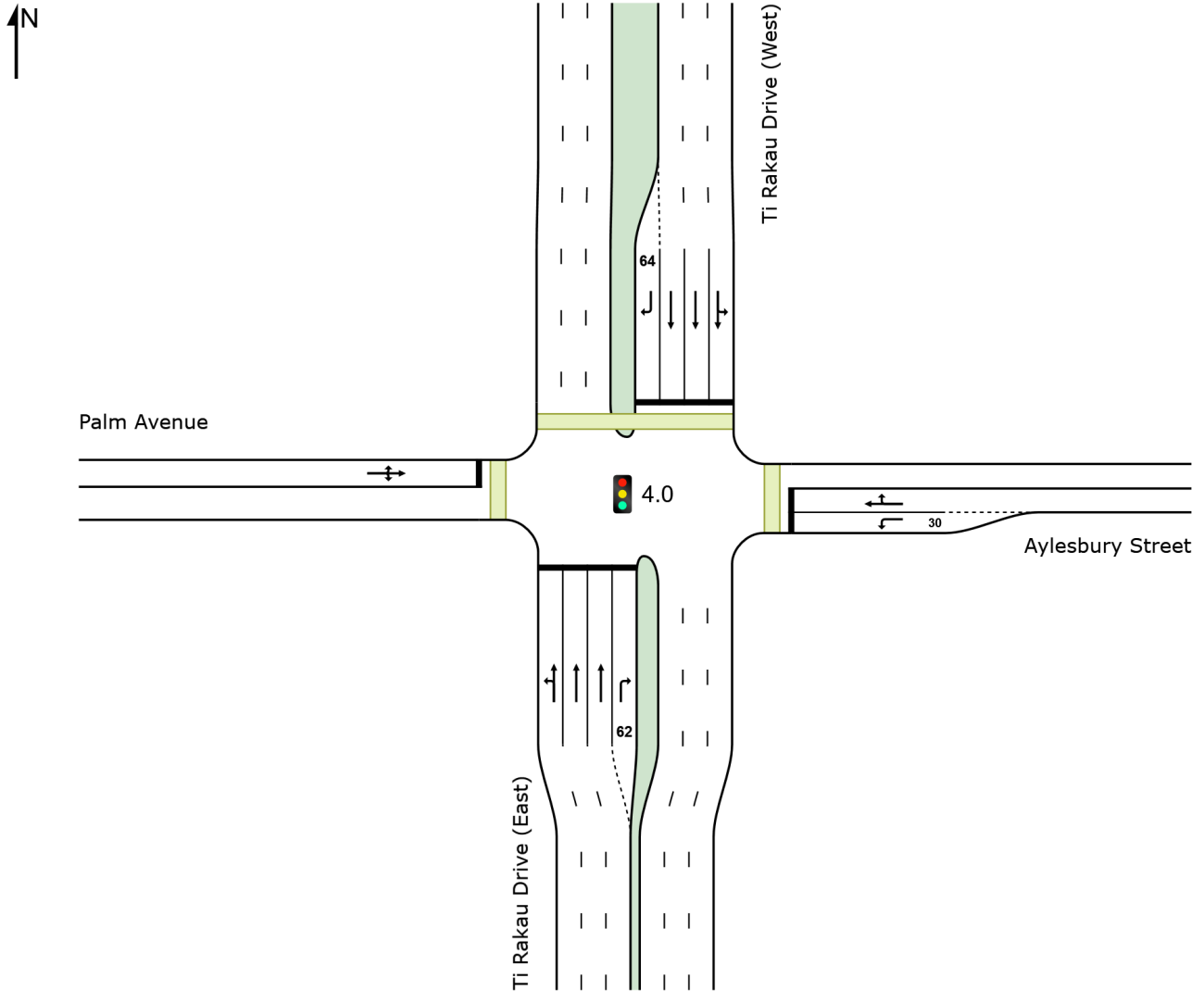
# SITE LAYOUT

 Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



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Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 9:57:13 am  
Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 AM - V1.sip9

# LANE SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 82 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
South: Ti Rakau Drive (East)															
Lane 1	370	7.5	354	7.4	604	0.586	100	28.6	LOS C	10.4	77.1	Full	110	0.0	0.0
Lane 2	382	7.9	365	7.8	623	0.586	100	26.8	LOS C	10.7	80.2	Full	110	0.0	0.0
Lane 3	382	7.9	365	7.8	623	0.586	100	26.8	LOS C	10.7	80.2	Full	110	0.0	0.0
Lane 4	23	4.3	22	4.3	125	0.176	100	44.9	LOS D	0.8	5.8	Short	62	0.0	NA
Approach	1157	7.7	1106 <sup>N1</sup>	7.6		0.586		27.7	LOS C	10.7	80.2				
East: Aylesbury Street															
Lane 1	10	0.0	10	0.0	251	0.040	100	18.5	LOS B	0.2	1.3	Short	30	0.0	NA
Lane 2	20	0.0	20	0.0	131	0.152	100	41.9	LOS D	0.7	5.0	Full	40	0.0	0.0
Approach	30	0.0	30	0.0		0.152		34.1	LOS C	0.7	5.0				
North: Ti Rakau Drive (West)															
Lane 1	543	7.8	533	7.9	623	0.856	100	37.8	LOS D	20.9	156.4	Full	174	0.0	5.3
Lane 2	271	7.8	267	7.9	311	0.856	100	44.8	LOS D	11.6	86.4	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 3	271	7.8	267	7.9	311	0.856	100	44.8	LOS D	11.6	86.4	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 4	21	0.0	21	0.0	129	0.160	100	44.6	LOS D	0.7	5.2	Short	64	0.0	NA
Approach	1107	7.7	1087 <sup>N1</sup>	7.7		0.856		41.4	LOS D	20.9	156.4				
West: Palm Avenue															
Lane 1	135	4.4	135	4.4	273	0.494	100	34.7	LOS C	4.4	32.0	Full	87	-31.5 <sup>N3</sup>	0.0
Approach	135	4.4	135	4.4		0.494		34.7	LOS C	4.4	32.0				
Intersection	2429	7.4	2358 <sup>N1</sup>	7.6		0.856		34.5	LOS C	20.9	156.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)													
South: Ti Rakau Drive (East)													
Mov. From S To Exit:	L2		T1		R2		Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E										
Lane 1	33	322	-	354	7.4	604	0.586	100	NA	NA			
Lane 2	-	365	-	365	7.8	623	0.586	100	NA	NA			
Lane 3	-	365	-	365	7.8	623	0.586	100	NA	NA			
Lane 4	-	-	22	22	4.3	125	0.176	100	0.0	3			
Approach	33	1052	22	1106	7.6		0.586						



East: Aylesbury Street										
Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	-	-	10	0.0	251	0.040	100	0.0	2
Lane 2	-	10	10	20	0.0	131	0.152	100	NA	NA
Approach	10	10	10	30	0.0		0.152			
North: Ti Rakau Drive (West)										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	522	-	533	7.9	623	0.856	100	NA	NA
Lane 2	-	267	-	267	7.9	311	0.856	100	NA	NA
Lane 3	-	267	-	267	7.9	311	0.856	100	NA	NA
Lane 4	-	-	21	21	0.0	129	0.160	100	0.0	3
Approach	11	1056	21	1087	7.7		0.856			
West: Palm Avenue										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	63	10	62	135	4.4	273	0.494	100	NA	NA
Approach	63	10	62	135	4.4		0.494			
Total %HV Deg.Satn (v/c)										
Intersection	2358	7.6		0.856						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

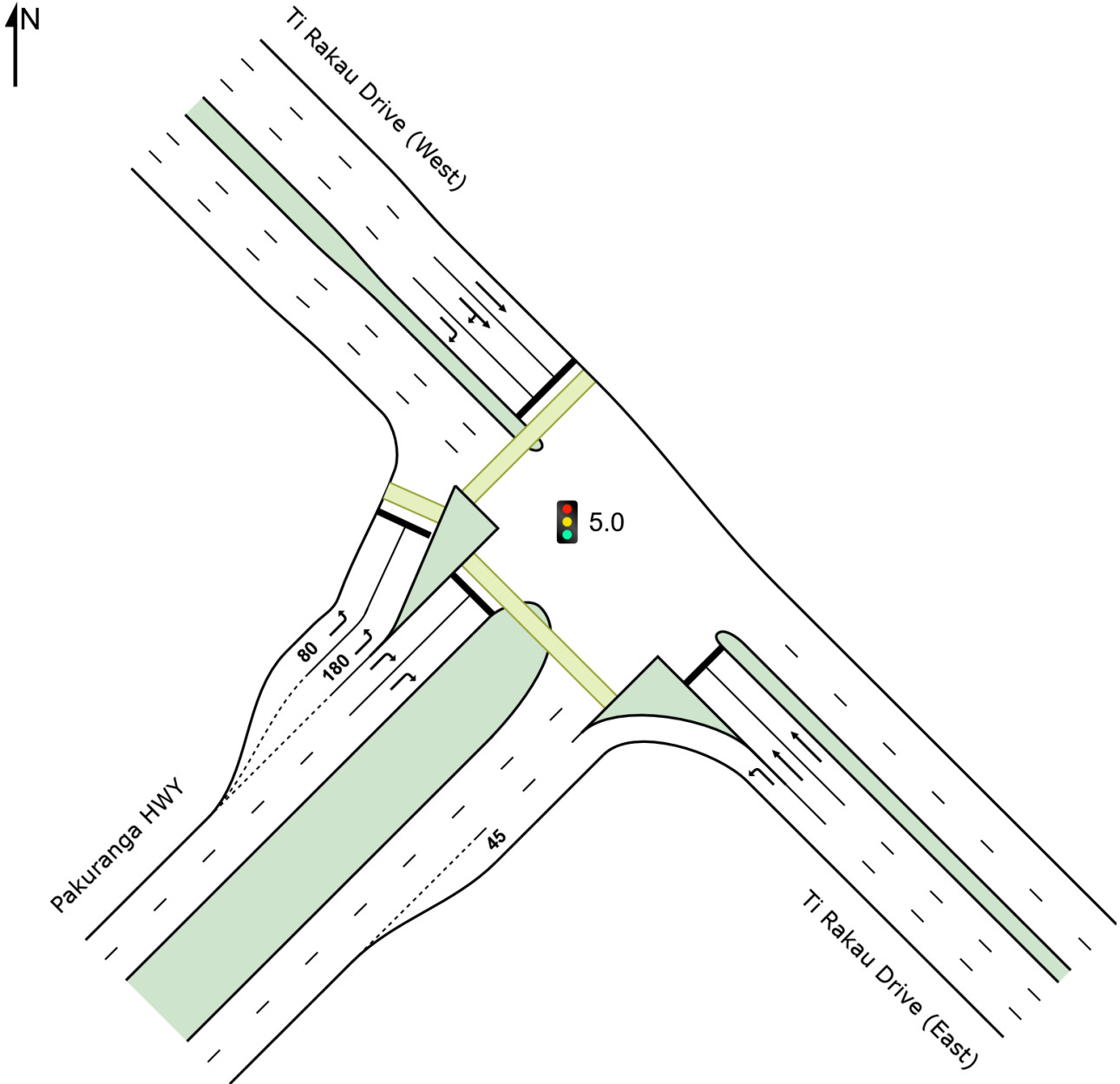
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
East Exit: Aylesbury Street Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
North Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
Full Length Lane	2										Merge Analysis not applied.
Full Length Lane	3										Merge Analysis not applied.
West Exit: Palm Avenue Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





Lane 1	152	-	152	24.2	506	0.300	33 <sup>5</sup>	NA	NA
Lane 2	-	490	490	5.2	546	0.898	100	NA	NA
Lane 3	-	478	478	5.2	532	0.898	100	NA	NA
Approach	152	968	1120	7.8		0.898			
SouthWest: Pakuranga HWY									
Mov. From SW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	324	-	324	4.9	1146	0.283	100	0.0	2
Lane 2	324	-	324	4.9	1146	0.283	100	0.0	4
Lane 3	-	429	429	9.3	487	0.882	100	NA	NA
Lane 4	-	434	434	9.3	492	0.882	100	NA	NA
Approach	648	863	1511	7.4		0.882			
Total %HV Deg. Satn (v/c)									
Intersection	4506	9.1		0.898					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

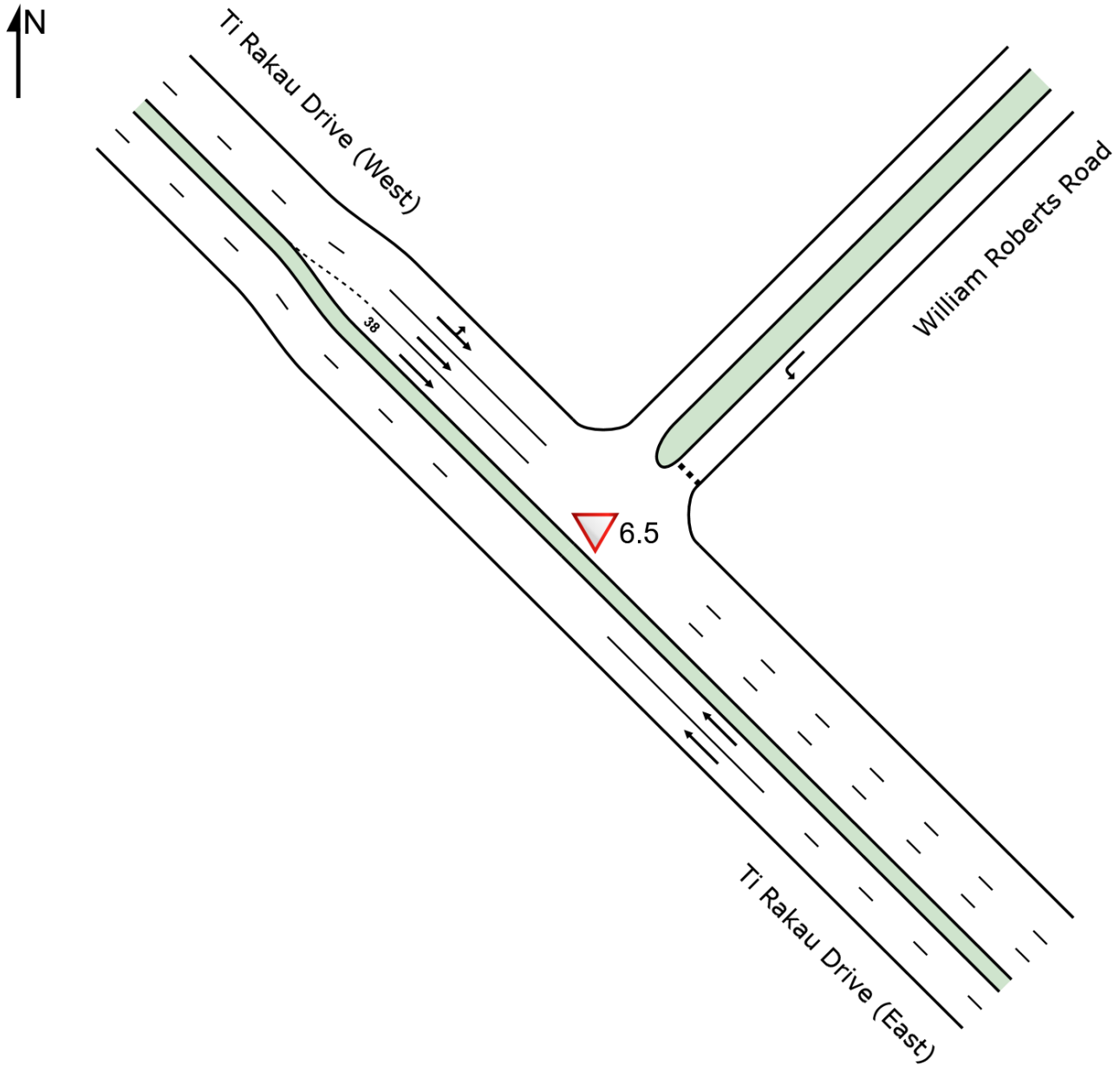
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
Full Length Lane	3		Merge Analysis not applied.									
SouthWest Exit: Pakuranga HWY												
Merge Type: <b>Priority</b>												
Exit Short Lane	1	45	0.0	490	503	3.00	2.00	1412	1283	1.100	0.8	98.7
Merge Lane	2	-	100.0	Merge Lane is not Opposed			490	1800	0.272	0.0	0.0	

# SITE LAYOUT

▽ Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	990	10.2	882	10.2	1781	0.495	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Lane 2	979	10.2	872	10.2	1762	0.495	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	1969	10.2	1754 <sup>N1</sup>	10.2		0.495		0.0	NA	0.0	0.0				
NorthEast: William Roberts Road															
Lane 1	263	8.0	263	8.0	553	0.475	100	2.9	LOS A	2.7 <sup>N5</sup>	19.8 <sup>N5</sup>	Full	110	-50.0 <sup>N3</sup>	0.0
Approach	263	8.0	263	8.0		0.475		2.9	LOS A	2.7	19.8				
NorthWest: Ti Rakau Drive (West)															
Lane 1	348	10.2	348	10.2	1827	0.190	100	2.7	LOS A	1.5 <sup>N5</sup>	11.1 <sup>N5</sup>	Full	97	0.0	0.0
Lane 2	332	12.1	332	12.1	1742	0.190	100	0.0	LOS A	3.7 <sup>N5</sup>	28.3 <sup>N5</sup>	Full	97	0.0	0.0
Lane 3	332	12.1	332	12.1	1742	0.190	100	0.0	LOS A	0.0	0.0	Short	38	0.0	NA
Approach	1013	11.5	1011 <sup>N1</sup>	11.5		0.190		0.9	NA	3.7	28.3				
Intersection	3245	10.4	3028 <sup>N1</sup>	11.1		0.495		0.6	NA	3.7	28.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N5</sup> Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NW			Cap. veh/h					
Lane 1	882	882	10.2	1781	0.495	100	NA	NA	
Lane 2	872	872	10.2	1762	0.495	100	NA	NA	
Approach	1754	1754	10.2		0.495				
NorthEast: William Roberts Road									
Mov. From NE To Exit:	L2	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SE			Cap. veh/h					
Lane 1	263	263	8.0	553	0.475	100	NA	NA	
Approach	263	263	8.0		0.475				
NorthWest: Ti Rakau Drive (West)									

Mov. From NW To Exit:	L2 NE	T1 SE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	204	144	348	10.2	1827	0.190	100	NA	NA
Lane 2	-	332	332	12.1	1742	0.190	100	NA	NA
Lane 3	-	332	332	12.1	1742	0.190	100	0.0	2
Approach	204	807	1011	11.5		0.190			
Total %HV Deg.Satn (v/c)									
Intersection	3028	11.1		0.495					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec		
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
Full Length Lane	2										Merge Analysis not applied.	
Full Length Lane	3										Merge Analysis not applied.	
NorthEast Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
Full Length Lane	2										Merge Analysis not applied.	

# SITE LAYOUT

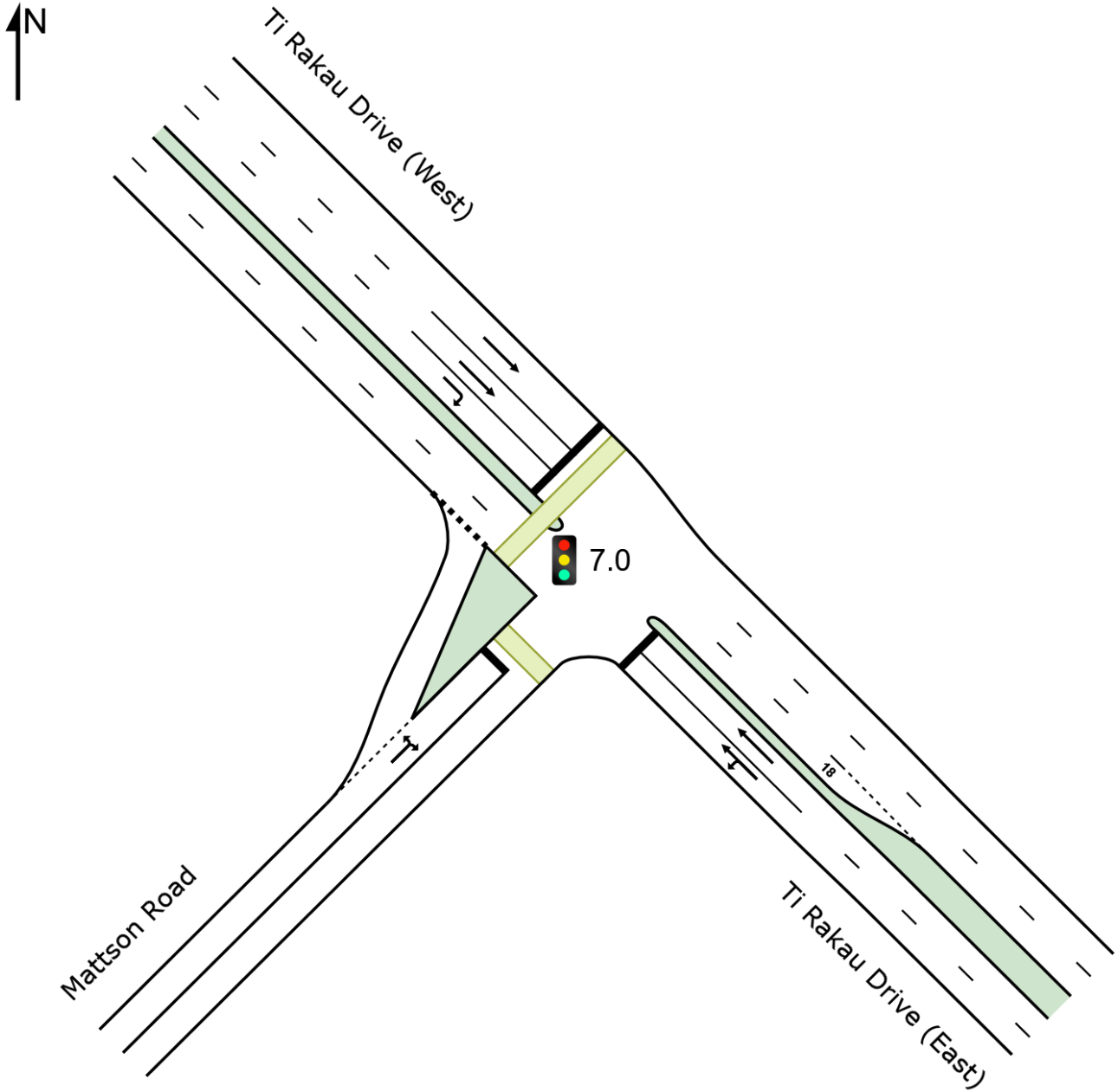
 Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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







From SW To Exit:	NW	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	72	64	136	4.4	509	0.267	100	NA	NA
Approach	72	64	136	4.4		0.267			
	Total	%HV	Deg.	Satn (v/c)					
Intersection	2929	11.1		0.884					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Priority</b>												
Exit Short Lane	3	18	0.0	493	521	3.00	2.00	64	1265	0.051	0.9	1.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				493	1800	0.274	0.0	0.0
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
SouthWest Exit: Mattson Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										

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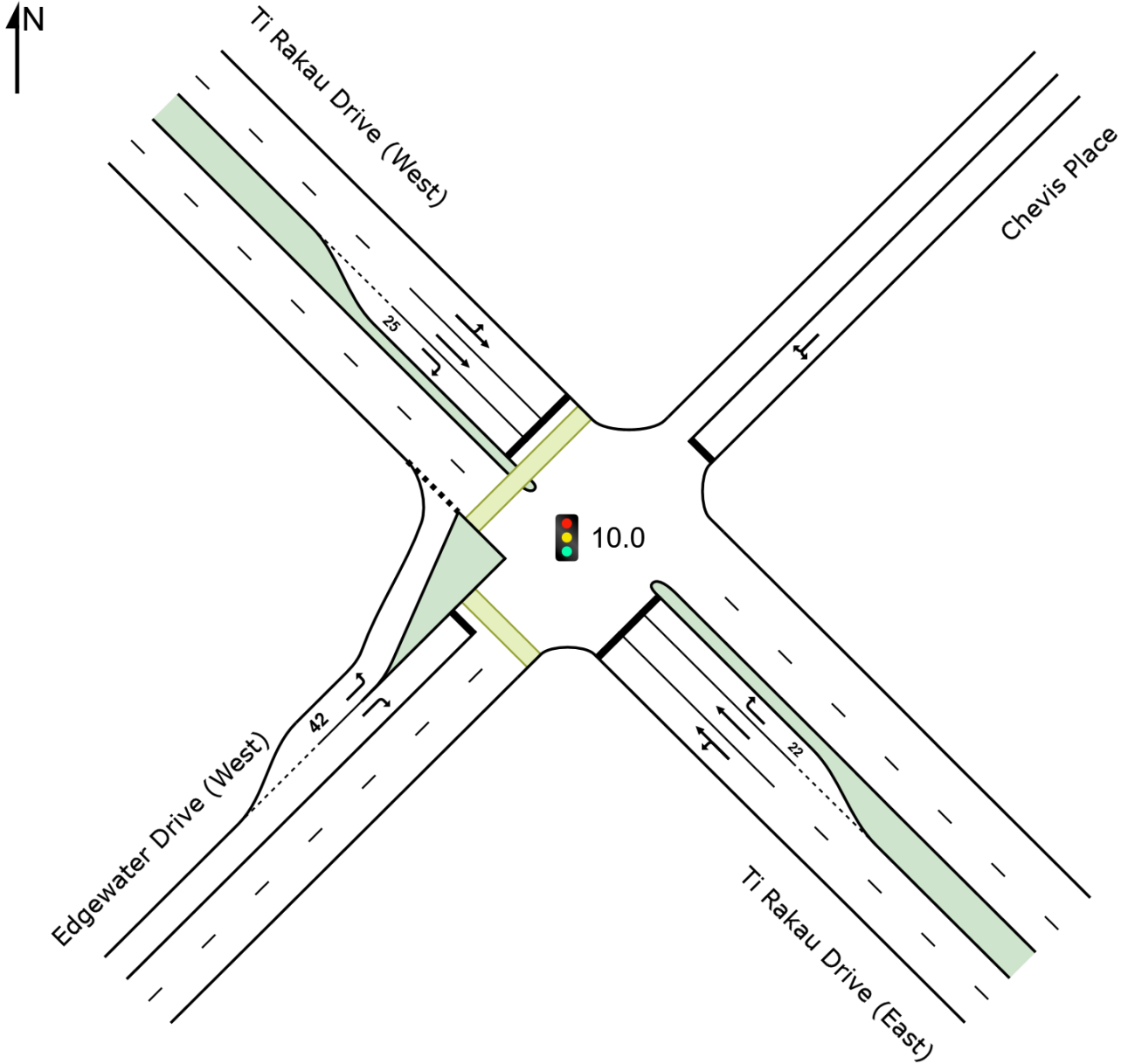
Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Tuesday, 7 February 2023 10:06:48 am  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 AM - V1.sip9

# SITE LAYOUT

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 91 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	949	9.5	881	9.6	991	0.890	100	32.0	LOS C	36.6 <sup>N4</sup>	277.6 <sup>N4</sup>	Full	190	0.0	50.0
Lane 2	928	10.4	861	10.6	968 <sup>1</sup>	0.890	100	31.3	LOS C	36.4 <sup>N4</sup>	277.6 <sup>N4</sup>	Full	190	0.0	50.0
Lane 3	10	0.0	9	0.0	117	0.079	100	49.9	LOS D	0.4	2.6	Short	22	0.0	NA
Approach	1887	9.9	1752 <sup>N1</sup>	10.0		0.890		31.8	LOS C	36.6	277.6				
NorthEast: Chevis Place															
Lane 1	28	3.6	28	3.6	141	0.198	100	48.6	LOS D	1.1	7.9	Full	138	0.0	0.0
Approach	28	3.6	28	3.6		0.198		48.6	LOS D	1.1	7.9				
NorthWest: Ti Rakau Drive (West)															
Lane 1	478	11.3	460	11.3	1003	0.459	100	13.9	LOS B	11.1	85.5	Full	68	0.0	36.0
Lane 2	382	11.5	368	11.6	801 <sup>1</sup>	0.459	100	13.1	LOS B	8.5	65.3	Full	68	0.0	11.3
Lane 3	77	13.7	74	13.7	108	0.684	100	54.7	LOS D	3.2	25.0	Short	25	0.0	NA
Approach	937	11.6	902 <sup>N1</sup>	11.6		0.684		16.9	LOS B	11.1	85.5				
SouthWest: Edgewater Drive (West)															
Lane 1	132	8.0	132	8.0	549	0.240	100	18.6	LOS B	2.9	21.4	Short	42	0.0	NA
Lane 2	59	8.9	59	8.9	115	0.512	100	53.7	LOS D	2.5	18.5	Full	789	0.0	0.0
Approach	191	8.3	191	8.3		0.512		29.5	LOS C	2.9	21.4				
Intersection	3043	10.2	2872 <sup>N1</sup>	10.8		0.890		27.1	LOS C	36.6	277.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)											
SouthEast: Ti Rakau Drive (East)											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From SE						veh/h	Satn	Util.	SL	OV.	Lane
To Exit:	SW	NW	NE				v/c	%	%		No.
Lane 1	134	748	-	881	9.6	991	0.890	100	NA	NA	
Lane 2	-	861	-	861	10.6	968 <sup>1</sup>	0.890	100	NA	NA	
Lane 3	-	-	9	9	0.0	117	0.079	100	0.0	2	
Approach	134	1609	9	1752	10.0		0.890				
NorthEast: Chevis Place											
Mov.	L2	R2	Total	%HV	Deg.	Lane	Prob.	Ov.			
					v/c	Util.	SL	OV.			

From NE To Exit:	SE	NW				Cap. veh/h	Satn v/c	Util. %	SL %	Ov. %	Lane No.
Lane 1	10	18	28	3.6		141	0.198	100	NA	NA	
Approach	10	18	28	3.6			0.198				
NorthWest: Ti Rakau Drive (West)											
Mov. From NW To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
Lane 1	10	451	-	460	11.3	1003	0.459	100	NA	NA	
Lane 2	-	368	-	368	11.6	801 <sup>1</sup>	0.459	100	NA	NA	
Lane 3	-	-	74	74	13.7	108	0.684	100	15.1		2
Approach	10	818	74	902	11.6		0.684				
SouthWest: Edgewater Drive (West)											
Mov. From SW To Exit:	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
Lane 1	132	-	132	8.0		549	0.240	100	0.0		2
Lane 2	-	59	59	8.9		115	0.512	100	NA	NA	
Approach	132	59	191	8.3			0.512				
Total %HV Deg.Satn (v/c)											
Intersection	2872	10.8		0.890							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

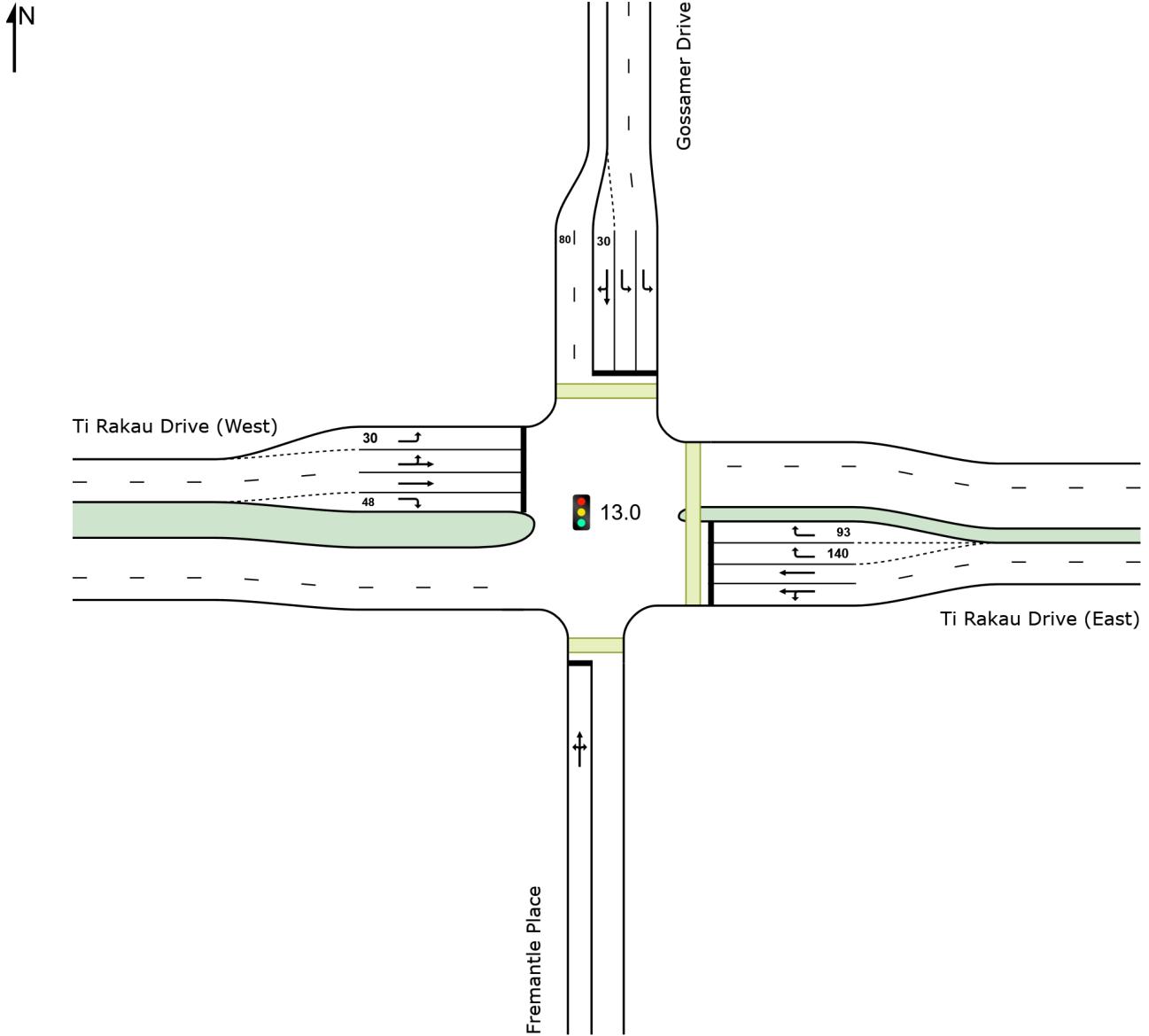
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
Full Length Lane	2		Merge Analysis not applied.								
NorthEast Exit: Chevis Place											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
NorthWest Exit: Ti Rakau Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
Full Length Lane	2		Merge Analysis not applied.								
SouthWest Exit: Edgewater Drive (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1		Merge Analysis not applied.								
Full Length Lane	2		Merge Analysis not applied.								

# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [AM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 132 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
South: Fremantle Place															
Lane 1	51	7.8	51	7.8	81	0.631	100	76.2	LOS E	3.1	23.5	Full	285	0.0	0.0
Approach	51	7.8	51	7.8		0.631		76.2	LOS E	3.1	23.5				
East: Ti Rakau Drive (East)															
Lane 1	784	10.7	784	10.7	752	1.043	100	97.8	LOS F	59.6	455.7	Full	636	0.0	0.0
Lane 2	730	10.8	730	10.8	700 <sup>1</sup>	1.043	100	120.9	LOS F	69.4	530.9	Full	636	0.0	0.0
Lane 3	128	7.8	128	7.8	328	0.389	47 <sup>6</sup>	31.2	LOS C	3.4	25.6	Short	140	0.0	NA
Lane 4	271	7.8	271	7.8	328	0.827	100	45.1	LOS D	10.4	77.7	Short	93	0.0	NA
Approach	1913	10.1	1913	10.1		1.043		94.7	LOS F	69.4	530.9				
North: Gossamer Drive															
Lane 1	521	8.9	521	8.9	794	0.656	100	23.1	LOS C	17.3	130.7	Full	1010	0.0	0.0
Lane 2	409	8.9	409	8.9	623 <sup>1</sup>	0.656	100	21.5	LOS C	12.4	93.5	Full	1010	0.0	0.0
Lane 3	291	5.8	291	5.8	230 <sup>1</sup>	1.267	100	315.6	LOS F	42.7	313.8	Short	30	0.0	NA
Approach	1221	8.2	1221	8.2		1.267		92.3	LOS F	42.7	313.8				
West: Ti Rakau Drive (West)															
Lane 1	55	9.1	53	9.1	907	0.058	8 <sup>5</sup>	14.1	LOS B	1.0	7.6	Short	30	0.0	NA
Lane 2	396	11.4	380	11.5	510 <sup>1</sup>	0.746	100	43.6	LOS D	19.4	149.3	Full	479	0.0	0.0
Lane 3	418	11.4	402	11.5	539 <sup>1</sup>	0.746	100	44.3	LOS D	20.9	160.6	Full	479	0.0	0.0
Lane 4	11	9.1	11	9.1	218	0.049	100	59.4	LOS E	0.5	4.1	Short	48	0.0	NA
Approach	880	11.3	845 <sup>N1</sup>	11.3		0.746		42.3	LOS D	20.9	160.6				
Intersection	4065	9.8	4030 <sup>N1</sup>	9.9		1.267		82.7	LOS F	69.4	530.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

<sup>6</sup> Lane under-utilisation due to downstream effects

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: Fremantle Place											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
Lane 1	23	11	17	51	7.8	81	0.631	100	NA	NA	
Approach	23	11	17	51	7.8		0.631				
East: Ti Rakau Drive (East)											

Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	18	766	-	784	10.7	752	1.043	100	NA	NA
Lane 2	-	730	-	730	10.8	700 <sup>1</sup>	1.043	100	NA	NA
Lane 3	-	-	128	128	7.8	328	0.389	47 <sup>6</sup>	0.0	2
Lane 4	-	-	271	271	7.8	328	0.827	100	0.0	3
Approach	18	1496	399	1913	10.1		1.043			
North: Gossamer Drive										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	521	-	-	521	8.9	794	0.656	100	NA	NA
Lane 2	409	-	-	409	8.9	623 <sup>1</sup>	0.656	100	NA	NA
Lane 3	-	11	280	291	5.8	230 <sup>1</sup>	1.267	100	100.0	2
Approach	930	11	280	1221	8.2		1.267			
West: Ti Rakau Drive (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	53	-	-	53	9.1	907	0.058	8 <sup>5</sup>	0.0	2
Lane 2	-	380	-	380	11.5	510 <sup>1</sup>	0.746	100	NA	NA
Lane 3	-	402	-	402	11.5	539 <sup>1</sup>	0.746	100	NA	NA
Lane 4	-	-	11	11	9.1	218	0.049	100	0.0	3
Approach	53	782	11	845	11.3		0.746			
Total %HV Deg. Satn (v/c)										
Intersection	4030	9.9		1.267						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Gossamer Drive Merge Type: <b>Zipper</b>												
Exit Short Lane	1	80	50.0	141	147	2.50	2.00	181	1630	0.111	0.0	0.1
Merge Lane	2	-	50.0	90	94	2.50	2.00	282	1693	0.167	0.0	0.0
West Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										



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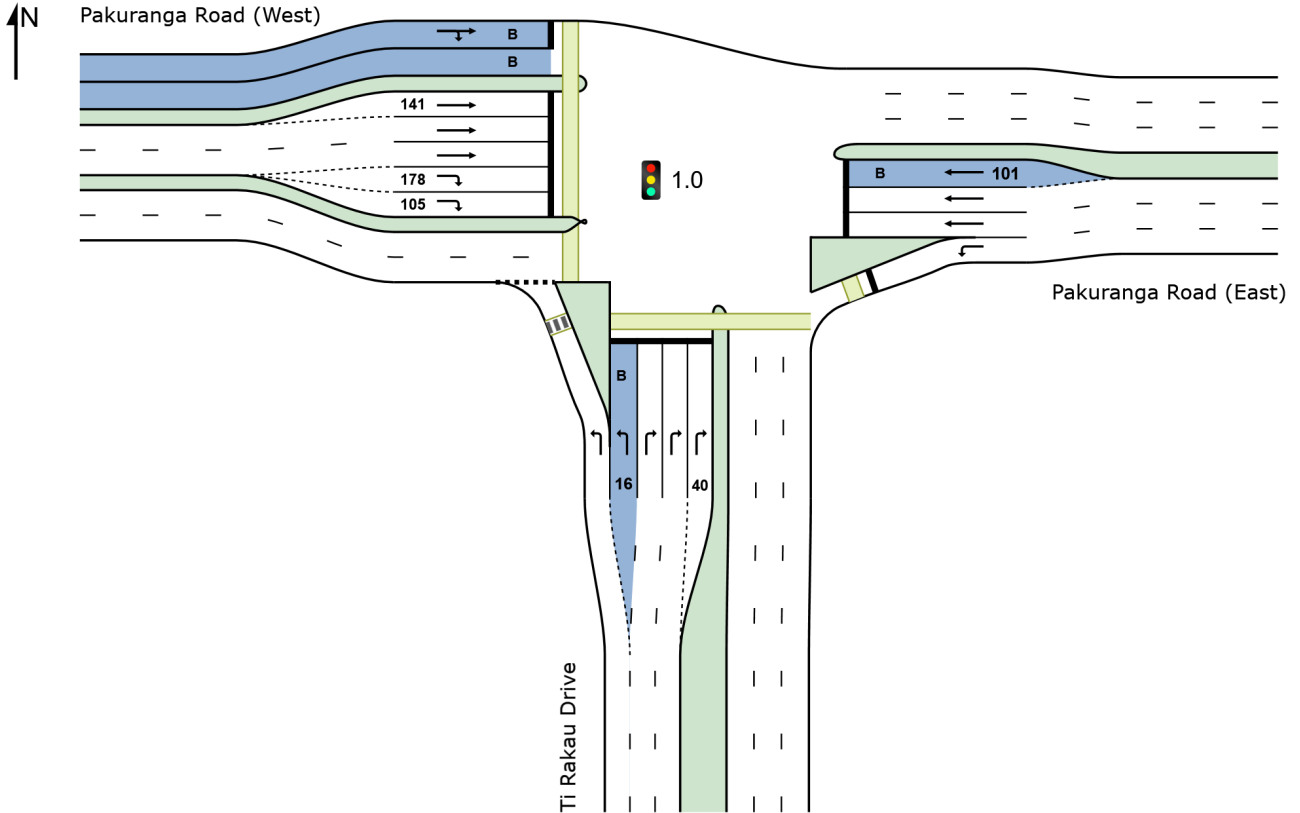
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# SITE LAYOUT

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 1.0 [1.0 Pakuranga Rd / Ti Rakau Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 80 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m	m	%	%	
South: Ti Rakau Drive															
Lane 1	767	4.8	754	4.8	1132 <sup>1</sup>	0.666	100	9.4	LOS A	12.2	89.2	Full	174	0.0	0.0
Lane 2 (B)	13	100.0	13	100.0	127	0.102	100	44.7	LOS D	0.5	5.9	Short	16	0.0	NA
Lane 3	385	4.1	378	4.0	427	0.887	100	48.2	LOS D	15.7	114.0	Full	174	0.0	0.0
Lane 4	323	4.1	318	4.0	358 <sup>1</sup>	0.887	100	48.1	LOS D	12.9	93.7	Full	174	0.0	0.0
Lane 5	323	4.1	318	4.0	358 <sup>1</sup>	0.887	100	48.1	LOS D	12.9	93.7	Short	40	0.0	NA
Approach	1811	5.1	1780 <sup>N</sup>	5.0		0.887		31.7	LOS C	15.7	114.0				
East: Pakuranga Road (East)															
Lane 1	787	4.7	766	4.7	983	0.779	100	22.4	LOS C	22.1	160.6	Full	113	0.0	47.4
Lane 2	406	10.2	395	10.2	432	0.913	100	47.9	LOS D	17.3	132.1	Full	113	0.0	29.3
Lane 3	406	10.2	395	10.2	432	0.913	100	47.9	LOS D	17.3	132.1	Full	113	0.0	29.3
Lane 4 (B)	11	100.0	11	100.0	90	0.123	100	42.2	LOS D	0.4	5.1	Short	101	0.0	NA
Approach	1609	8.1	1566 <sup>N</sup>	8.1		0.913		35.4	LOS D	22.1	160.6				
West: Pakuranga Road (West)															
Lane 1 (B)	42	100.0	42	100.0	86	0.490	100	42.0	LOS D	1.5	19.7	Full	388	0.0	0.0
Lane 2	450	7.1	450	7.1	579	0.777	100	30.1	LOS C	15.5	115.0	Short	141	0.0	NA
Lane 3	450	7.1	450	7.1	579	0.777	100	30.1	LOS C	15.5	115.0	Full	388	0.0	0.0
Lane 4	450	7.1	450	7.1	579	0.777	100	30.1	LOS C	15.5	115.0	Full	388	0.0	0.0
Lane 5	228	8.8	228	8.8	261	0.872	100	51.7	LOS D	9.3	70.2	Short	178	0.0	NA
Lane 6	228	8.8	228	8.8	261	0.872	100	51.7	LOS D	9.3	70.2	Short	105	0.0	NA
Approach	1847	9.6	1847	9.6		0.872		35.7	LOS D	15.5	115.0				
Intersection	5267	7.6	5193 <sup>N</sup>	7.7		0.913		34.2	LOS C	22.1	160.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive										
Mov. From S To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	W	E								
Lane 1	754	-	754	4.8	1132 <sup>1</sup>	0.666	100	NA	NA	
Lane 2	13	-	13	100.0	127	0.102	100	0.0	1	
Lane 3	-	378	378	4.0	427	0.887	100	NA	NA	
Lane 4	-	318	318	4.0	358 <sup>1</sup>	0.887	100	NA	NA	

Lane 5	-	318	318	4.0	358 <sup>1</sup>	0.887	100	95.7	4
Approach	767	1013	1780	5.0		0.887			
East: Pakuranga Road (East)									
Mov. From E To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	S	W							
Lane 1	766	-	766	4.7	983	0.779	100	NA	NA
Lane 2	-	395	395	10.2	432	0.913	100	NA	NA
Lane 3	-	395	395	10.2	432	0.913	100	NA	NA
Lane 4	-	11	11	100.0	90	0.123	100	0.0	3
Approach	766	800	1566	8.1		0.913			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	21	21	42	100.0	86	0.490	100	NA	NA
Lane 2	450	-	450	7.1	579	0.777	100	0.0	3
Lane 3	450	-	450	7.1	579	0.777	100	NA	NA
Lane 4	450	-	450	7.1	579	0.777	100	NA	NA
Lane 5	-	228	228	8.8	261	0.872	100	0.0	4
Lane 6	-	228	228	8.8	261	0.872	100	0.0	5
Approach	1371	476	1847	9.6		0.872			
Total %HV Deg. Satn (v/c)									
Intersection	5193	7.7		0.913					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

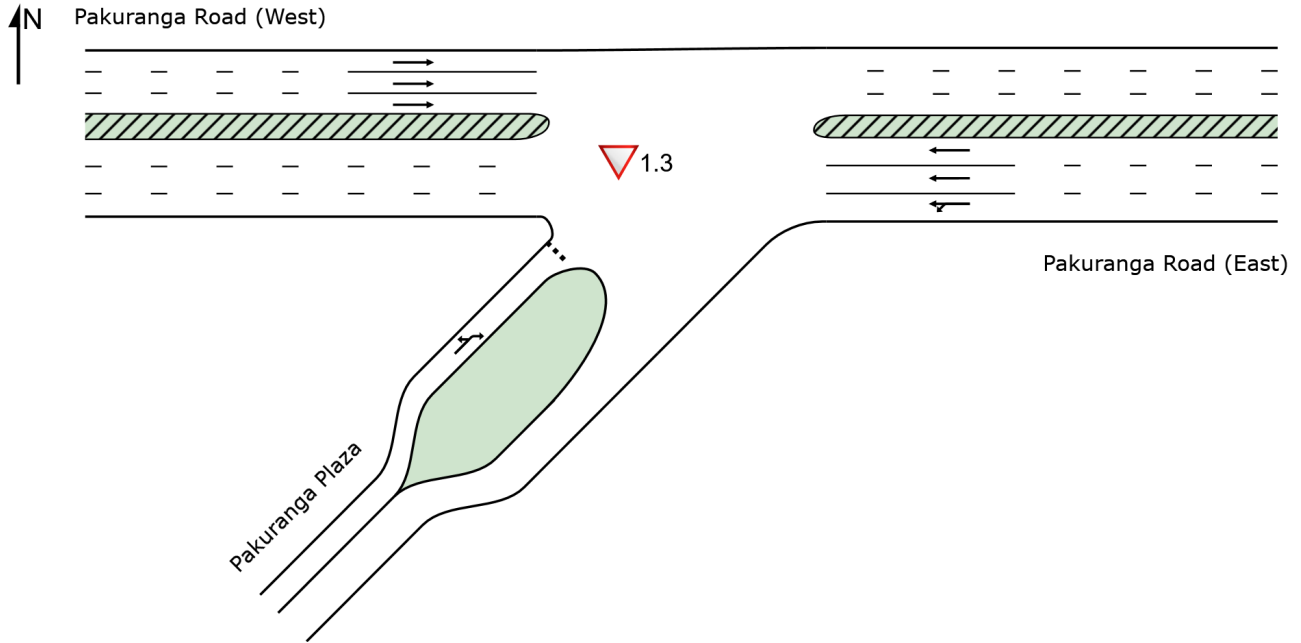
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
East Exit: Pakuranga Road (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										
West Exit: Pakuranga Road (West)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1										
Full Length Lane	2										
Full Length Lane	3										

# SITE LAYOUT

▽ Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



## LANE SUMMARY

Site: 1.3 [1.3 Mall/ Pakuranga Rd - PD (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%	veh/h	v/c	%	sec		Dist ]	m	%	%		
East: Pakuranga Road (East)															
Lane 1	508	8.7	508	8.7	1846	0.275	100	1.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 2	515	7.3	515	7.3	1872	0.275	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Lane 3	515	7.3	515	7.3	1872	0.275	100	0.0	LOS A	0.0	0.0	Full	152	0.0	0.0
Approach	1539	7.7	1539	7.7		0.275		0.4	NA	0.0	0.0				
West: Pakuranga Road (West)															
Lane 1	797	6.6	792	6.6	1802	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 2	797	6.6	792	6.6	1802	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Lane 3	792	6.6	787	6.6	1792	0.439	100	0.0	LOS A	0.0	0.0	Full	108	0.0	0.0
Approach	2386	6.6	2371 <sup>N1</sup>	6.6		0.439		0.0	NA	0.0	0.0				
SouthWest: Pakuranga Plaza															
Lane 1	99	7.1	99	7.1	88	1.128	100	318.2	LOS F	12.1	89.8	Full	196	-1.0 <sup>N7</sup>	0.0
Approach	99	7.1	99	7.1		1.128		318.2	LOS F	12.1	89.8				
Intersection	4024	7.1	4009 <sup>N1</sup>	7.1		1.128		8.0	NA	12.1	89.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

**N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

**N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	L1	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	W								
Lane 1	94	414	508	8.7	1846	0.275	100	NA	NA	
Lane 2	-	515	515	7.3	1872	0.275	100	NA	NA	
Lane 3	-	515	515	7.3	1872	0.275	100	NA	NA	
Approach	94	1445	1539	7.7		0.275				
West: Pakuranga Road (West)										
Mov. From W To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
	E									
Lane 1	792	792	6.6	1802	0.439	100	NA	NA		
Lane 2	792	792	6.6	1802	0.439	100	NA	NA		

Lane 3	787	787	6.6		1792	0.439	100	NA	NA
Approach	2371	2371	6.6			0.439			
SouthWest: Pakuranga Plaza									
Mov. From SW To Exit:	L3 W	R1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
Lane 1	98	1	99	7.1	88	1.128	100	NA	NA
Approach	98	1	99	7.1		1.128			
Total %HV Deg. Satn (v/c)									
Intersection	4009	7.1		1.128					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

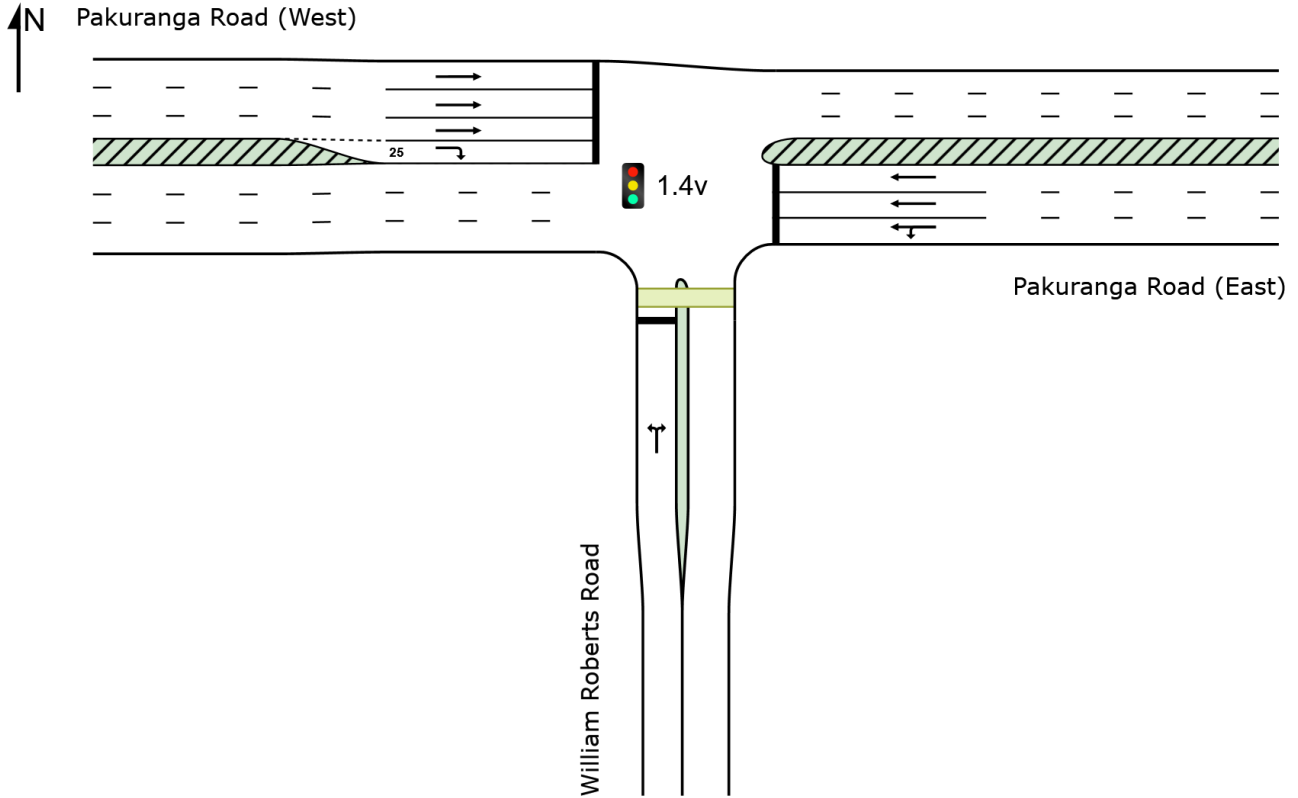
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
SouthWest Exit: Pakuranga Plaza												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

# SITE LAYOUT

 **Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]**

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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





# LANE SUMMARY

Site: 1.4v [1.4 William Roberts/ Pakuranga Rd - PD - Conversion (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ]		ARRIVAL FLOWS [ Total HV ]		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE [ Veh Dist ]		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: William Roberts Road															
Lane 1	236	7.2	235	7.2	265	0.888	100	84.0	LOS F	17.6	130.7	Full	244	-28.7 <sup>N7</sup>	0.0
Approach	236	7.2	235 <sup>N1</sup>	7.2		0.888		84.0	LOS F	17.6	130.7				
East: Pakuranga Road (East)															
Lane 1	490	7.3	490	7.3	1102	0.444	100	12.9	LOS B	11.7	87.3	Full	184	0.0	0.0
Lane 2	488	7.6	488	7.6	1098	0.444	100	15.7	LOS B	14.4	107.1	Full	184	0.0	0.0
Lane 3	493	7.6	493	7.6	1110	0.444	100	15.6	LOS B	14.5	107.9	Full	184	0.0	0.0
Approach	1471	7.5	1471	7.5		0.444		14.7	LOS B	14.5	107.9				
West: Pakuranga Road (West)															
Lane 1	1187	6.5	1186	6.5	1333	0.890	100	17.2	LOS B	30.0 <sup>N4</sup>	222.1 <sup>N4</sup>	Full	152	0.0	50.0
Lane 2	725	6.5	725	6.5	814	0.890	100	31.6	LOS C	30.0 <sup>N4</sup>	222.1 <sup>N4</sup>	Full	152	-38.9 <sup>N3</sup>	50.0
Lane 3	549	6.5	549	6.5	616 <sup>1</sup>	0.890	100	38.1	LOS D	30.0 <sup>N4</sup>	222.1 <sup>N4</sup>	Full	152	-50.0 <sup>N3</sup>	50.0
Lane 4	54	13.0	54	13.0	119	0.452	100	80.8	LOS F	3.6	27.6	Short	25	0.0	NA
Approach	2515	6.7	2514 <sup>N1</sup>	6.7		0.890		27.3	LOS C	30.0	222.1				
Intersection	4222	7.0	4220 <sup>N1</sup>	7.0		0.890		26.1	LOS C	30.0	222.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

<sup>N7</sup> The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Road										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	E			veh/h	v/c	%	%		
Lane 1	141	95	235	7.2	265	0.888	100	NA	NA	
Approach	141	95	235	7.2		0.888				
East: Pakuranga Road (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W			veh/h	v/c	%	%		
Lane 1	73	417	490	7.3	1102	0.444	100	NA	NA	
Lane 2	-	488	488	7.6	1098	0.444	100	NA	NA	

Lane 3	-	493	493	7.6	1110	0.444	100	NA	NA
Approach	73	1398	1471	7.5		0.444			
West: Pakuranga Road (West)									
Mov. From W To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	1186	-	1186	6.5	1333	0.890	100	NA	NA
Lane 2	725	-	725	6.5	814	0.890	100	NA	NA
Lane 3	549	-	549	6.5	616 <sup>1</sup>	0.890	100	NA	NA
Lane 4	-	54	54	13.0	119	0.452	100	24.1	3
Approach	2460	54	2514	6.7		0.890			
Total %HV Deg. Satn (v/c)									
Intersection	4220	7.0		0.890					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

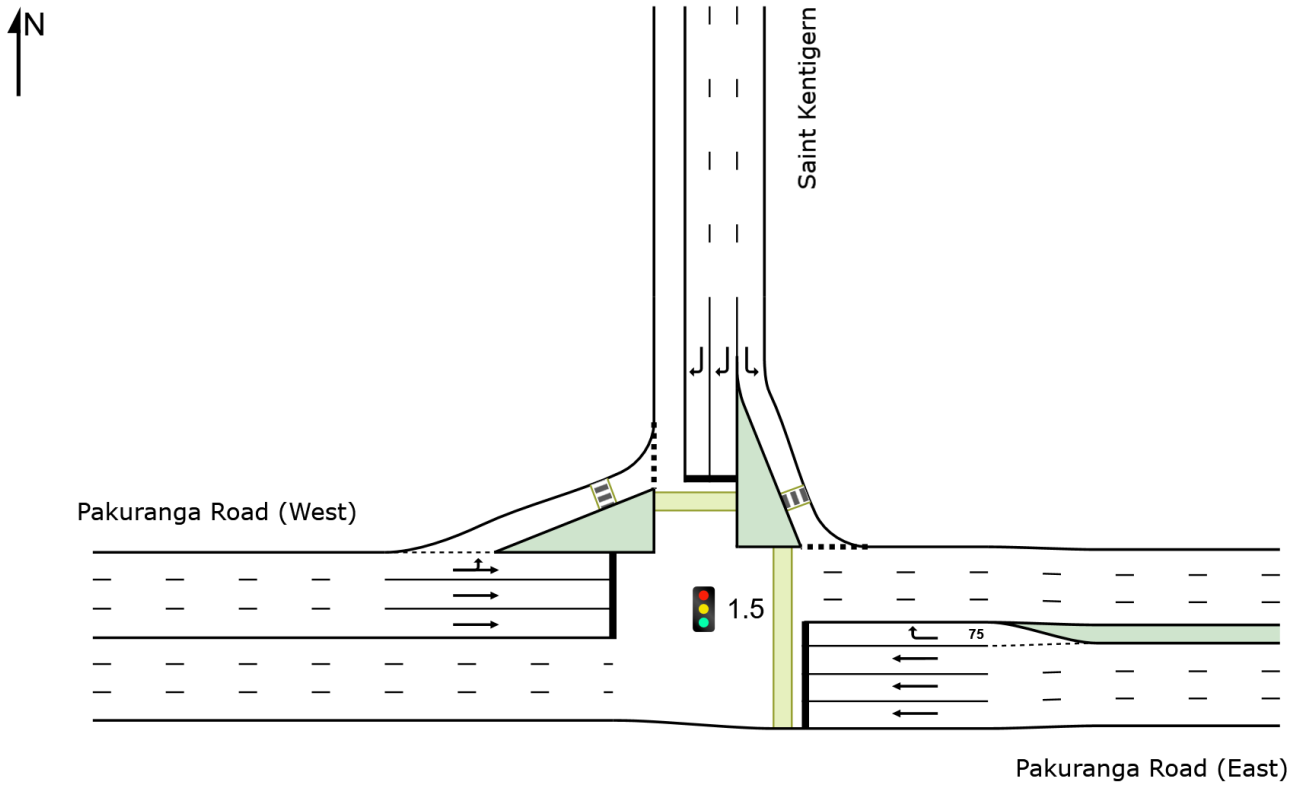
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

**Site: 1.5 [1.5 Saint Kentigern/ Pakuranga Rd - PD (Site Folder:  Network: N101 [PM (Network General) Folder: General])]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Network User-Given Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]				
East: Pakuranga Road (East)															
Lane 1	458	7.6	458	7.6	1415	0.323	100	5.4	LOS A	8.8	65.6	Full	87	0.0	0.0
Lane 2	458	7.6	458	7.6	1415	0.323	100	5.4	LOS A	8.8	65.6	Full	87	0.0	0.0
Lane 3	460	7.6	460	7.6	1422	0.323	100	5.4	LOS A	8.8	65.9	Full	87	0.0	0.0
Lane 4	27	3.7	27	3.7	139	0.194	100	52.6	LOS D	1.3	9.7	Short	75	0.0	NA
Approach	1402	7.5	1402	7.5		0.323		6.3	LOS A	8.8	65.9				
North: Saint Kentigern															
Lane 1	57	3.5	57	3.5	544	0.105	100	14.6	LOS B	1.7	12.1	Full	96	0.0	0.0
Lane 2	47	7.5	47	7.5	254	0.184	100	60.9	LOS E	2.7	20.2	Full	96	0.0	0.0
Lane 3	46	7.5	46	7.5	250	0.184	100	61.0	LOS E	2.7	19.9	Full	96	0.0	0.0
Approach	150	6.0	150	6.0		0.184		43.3	LOS D	2.7	20.2				
West: Pakuranga Road (West)															
Lane 1	603	6.2	603	6.2	701	0.860	100	14.9	LOS B	18.1	133.5	Full	184	0.0	0.0
Lane 2	982	6.5	982	6.5	1142	0.860	100	9.5	LOS A	32.3	238.8	Full	184	0.0	38.9
Lane 3	982	6.5	982	6.5	1142	0.860	100	15.8	LOS B	36.4 <sup>N4</sup>	268.9 <sup>N4</sup>	Full	184	0.0	50.0
Approach	2568	6.4	2568	6.4		0.860		13.2	LOS B	36.4	268.9				
Intersection	4120	6.8	4120	6.8		0.860		11.9	LOS B	36.4	268.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
East: Pakuranga Road (East)										
Mov. From E To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	W	N								
Lane 1	458	-	458	7.6	1415	0.323	100	NA	NA	
Lane 2	458	-	458	7.6	1415	0.323	100	NA	NA	
Lane 3	460	-	460	7.6	1422	0.323	100	NA	NA	
Lane 4	-	27	27	3.7	139	0.194	100	0.0	3	
Approach	1375	27	1402	7.5		0.323				
North: Saint Kentigern										
Mov. From N To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	E	W								
Lane 1	57	-	57	3.5	544	0.105	100	NA	NA	
Lane 2	-	47	47	7.5	254	0.184	100	NA	NA	

Lane 3	-	46	46	7.5	250	0.184	100	NA	NA
Approach	57	93	150	6.0		0.184			
West: Pakuranga Road (West)									
Mov. From W To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E							
Lane 1	54	549	603	6.2	701	0.860	100	NA	NA
Lane 2	-	982	982	6.5	1142	0.860	100	NA	NA
Lane 3	-	982	982	6.5	1142	0.860	100	NA	NA
Approach	54	2514	2568	6.4		0.860			
Total %HV Deg. Satn (v/c)									
Intersection	4120	6.8		0.860					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

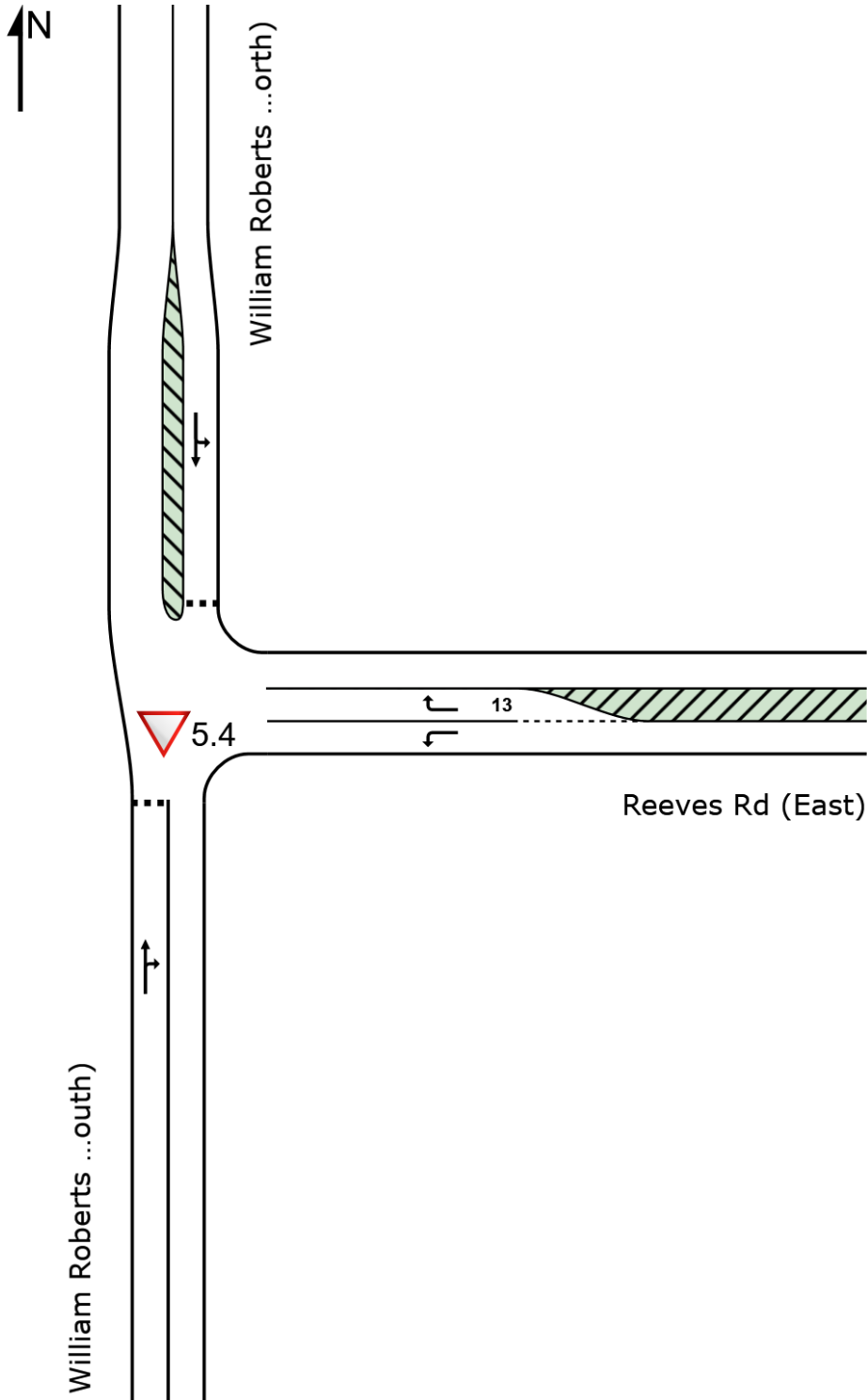
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
East Exit: Pakuranga Road (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
North Exit: Saint Kentigern												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
West Exit: Pakuranga Road (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											

# SITE LAYOUT

▽ Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Created: Wednesday, 15 February 2023 10:01:25 am  
Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport  
Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 PM - V1.sip9

# LANE SUMMARY

Site: 5.4 [5.4 Reeves Rd / William Roberts Rd - Import (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE [ Veh Dist ] m		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: William Roberts Rd (South)															
Lane 1	315	8.0	314	8.0	1139	0.276	100	2.2	LOS A	0.9	6.4	Full	243	0.0	0.0
Approach	315	8.0	314 <sup>N1</sup>	8.0		0.276		2.2	LOS A	0.9	6.4				
East: Reeves Rd (East)															
Lane 1	57	8.8	57	8.8	1721	0.033	100	4.6	LOS A	0.0	0.0	Full	266	0.0	0.0
Lane 2	76	15.8	76	15.8	1643	0.046	100	4.7	LOS A	0.0	0.0	Short	13	0.0	NA
Approach	133	12.8	133	12.8		0.046		4.7	NA	0.0	0.0				
North: William Roberts Rd (North)															
Lane 1	80	5.0	80	5.0	1296	0.062	100	4.3	LOS A	0.1	1.1	Full	244	0.0	0.0
Approach	80	5.0	80	5.0		0.062		4.3	LOS A	0.1	1.1				
Intersection	528	8.7	527 <sup>N1</sup>	8.8		0.276		3.2	NA	0.9	6.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
South: William Roberts Rd (South)										
Mov. From S To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	N	E								
Lane 1	160	154	314	8.0	1139	0.276	100	NA	NA	
Approach	160	154	314	8.0		0.276				
East: Reeves Rd (East)										
Mov. From E To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	S	N								
Lane 1	57	-	57	8.8	1721	0.033	100	NA	NA	
Lane 2	-	76	76	15.8	1643	0.046	100	0.0	1	
Approach	57	76	133	12.8		0.046				
North: William Roberts Rd (North)										
Mov. From N To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	E	S								
Lane 1	12	68	80	5.0	1296	0.062	100	NA	NA	



Approach	12	68	80	5.0	0.062
	Total	%HV	Deg. Satn	(v/c)	
Intersection	527	8.8		0.276	

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

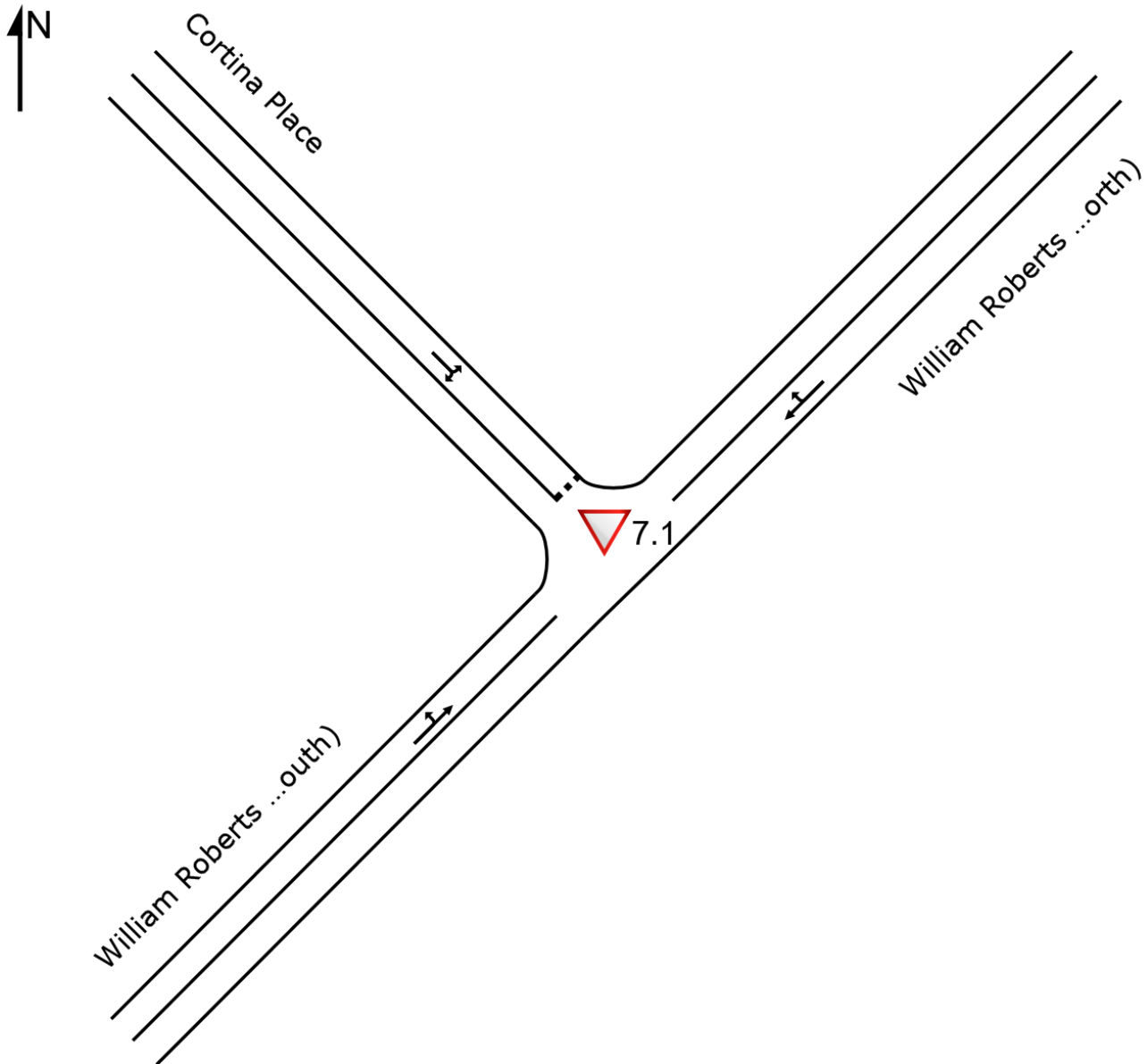
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: William Roberts Rd (South)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: Reeves Rd (East)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: William Roberts Rd (North)											
Merge Type: <b>Not Applied</b>											
Full Length Lane	1	Merge Analysis not applied.									

# SITE LAYOUT

▽ Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 7.1 [7.1 William Roberts Rd / Cortina PI - Import (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Scheme Design  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS [ Total HV ] veh/h %		ARRIVAL FLOWS [ Total HV ] veh/h %		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE [ Veh Dist ] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %	
NorthEast: William Roberts Road (North)															
Lane 1	116	5.2	116	5.2	1703	0.068	100	1.0	LOS A	0.1	1.0	Full	243	0.0	0.0
Approach	116	5.2	116	5.2		0.068		1.0	NA	0.1	1.0				
NorthWest: Cortina Place															
Lane 1	64	6.3	64	6.3	1112	0.058	100	3.2	LOS A	0.2	1.1	Full	177	0.0	0.0
Approach	64	6.3	64	6.3		0.058		3.2	LOS A	0.2	1.1				
SouthWest: William Roberts Road (South)															
Lane 1	276	8.4	275	8.4	1791	0.153	100	0.2	LOS A	0.0	0.0	Full	110	0.0	0.0
Approach	276	8.4	275 <sup>N1</sup>	8.4		0.153		0.2	NA	0.0	0.0				
Intersection	456	7.3	455 <sup>N1</sup>	7.3		0.153		0.8	NA	0.2	1.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab). Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)										
NorthEast: William Roberts Road (North)										
Mov. From NE To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	SW	NW								
Lane 1	91	25	116	5.2	1703	0.068	100	NA	NA	
Approach	91	25	116	5.2		0.068				
NorthWest: Cortina Place										
Mov. From NW To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NE	SW								
Lane 1	45	19	64	6.3	1112	0.058	100	NA	NA	
Approach	45	19	64	6.3		0.058				
SouthWest: William Roberts Road (South)										
Mov. From SW To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	NW	NE								
Lane 1	29	246	275	8.4	1791	0.153	100	NA	NA	
Approach	29	246	275	8.4		0.153				
Total %HV Deg. Satn (v/c)										

Intersection	455	7.3	0.153
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Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

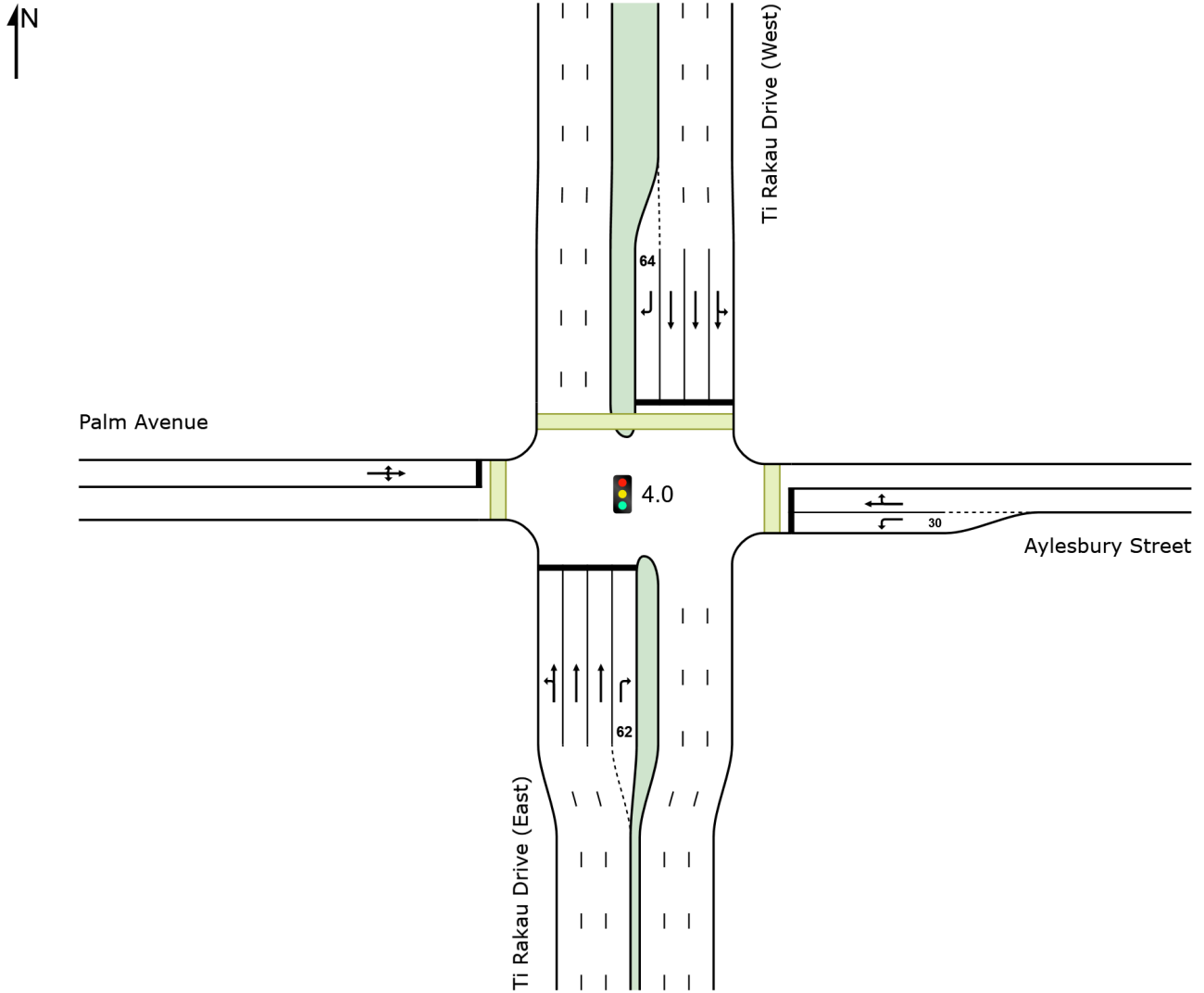
Merge Analysis											
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
NorthEast Exit: William Roberts Road (North) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
NorthWest Exit: Cortina Place Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.
SouthWest Exit: William Roberts Road (South) Merge Type: <b>Not Applied</b>											
Full Length Lane	1										Merge Analysis not applied.

# SITE LAYOUT

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)]

Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



# LANE SUMMARY

Site: 4.0 [4.0 Palm Ave / Aylesbury St - Import (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total HV ]	%	[ Total HV ]	%						[ Veh ]	[ Dist ]				
South: Ti Rakau Drive (East)															
Lane 1	595	4.9	584	4.8	1204	0.485	100	15.4	LOS B	17.7	129.1	Full	110	0.0	29.6
Lane 2	620	5.1	608	5.1	1254	0.485	100	14.0	LOS B	17.5	127.9	Full	110	0.0	28.8
Lane 3	611	5.1	599	5.1	1237 <sup>1</sup>	0.485	100	13.9	LOS B	17.1	125.2	Full	110	0.0	26.8
Lane 4	10	0.0	10	0.0	70	0.139	100	82.9	LOS F	0.7	4.6	Short	62	0.0	NA
Approach	1836	5.0	1800 <sup>N1</sup>	5.0		0.485		14.8	LOS B	17.7	129.1				
East: Aylesbury Street															
Lane 1	27	3.7	27	3.7	67	0.404	100	61.3	LOS E	1.6	11.9	Short	30	-50.0 <sup>N3</sup>	NA
Lane 2	20	0.0	20	0.0	72	0.278	100	81.3	LOS F	1.4	9.5	Full	40	0.0	0.0
Approach	47	2.1	47	2.1		0.404		69.8	LOS E	1.6	11.9				
North: Ti Rakau Drive (West)															
Lane 1	415	7.6	408	7.6	624	0.654	100	16.1	LOS B	14.3	106.7	Full	174	-49.4 <sup>N3</sup>	0.0
Lane 2	410	7.7	403	7.8	616	0.654	100	16.5	LOS B	14.3	107.1	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 3	400	7.7	393	7.8	601 <sup>1</sup>	0.654	100	16.3	LOS B	13.7	102.3	Full	174	-50.0 <sup>N3</sup>	0.0
Lane 4	43	7.0	42	7.0	67	0.630	100	86.9	LOS F	3.0	22.1	Short	64	0.0	NA
Approach	1268	7.6	1247 <sup>N1</sup>	7.7		0.654		18.7	LOS B	14.3	107.1				
West: Palm Avenue															
Lane 1	95	4.2	95	4.2	112	0.852	100	89.2	LOS F	7.0	50.8	Full	87	-30.1 <sup>N3</sup>	0.0
Approach	95	4.2	95	4.2		0.852		89.2	LOS F	7.0	50.8				
Intersection	3246	6.0	3189 <sup>N1</sup>	6.1		0.852		19.3	LOS B	17.7	129.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)										
South: Ti Rakau Drive (East)										
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E							
Lane 1	63	521	-	584	4.8	1204	0.485	100	NA	NA
Lane 2	-	608	-	608	5.1	1254	0.485	100	NA	NA
Lane 3	-	599	-	599	5.1	1237 <sup>1</sup>	0.485	100	NA	NA
Lane 4	-	-	10	10	0.0	70	0.139	100	0.0	3

Approach	63	1728	10	1800	5.0		0.485				
East: Aylesbury Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From E						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	S	W	N			veh/h	v/c	%	%	%	No.
Lane 1	27	-	-	27	3.7	67	0.404	100	0.0	2	
Lane 2	-	10	10	20	0.0	72	0.278	100	NA	NA	
Approach	27	10	10	47	2.1		0.404				
North: Ti Rakau Drive (West)											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	E	S	W			veh/h	v/c	%	%	%	No.
Lane 1	10	398	-	408	7.6	624	0.654	100	NA	NA	
Lane 2	-	403	-	403	7.8	616	0.654	100	NA	NA	
Lane 3	-	393	-	393	7.8	601 <sup>1</sup>	0.654	100	NA	NA	
Lane 4	-	-	42	42	7.0	67	0.630	100	0.0	3	
Approach	10	1195	42	1247	7.7		0.654				
West: Palm Avenue											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W						Cap.	Satn	Util.	SL	Ov.	Lane
To Exit:	N	E	S			veh/h	v/c	%	%	%	No.
Lane 1	44	10	41	95	4.2	112	0.852	100	NA	NA	
Approach	44	10	41	95	4.2		0.852				
Total %HV Deg. Satn (v/c)											
Intersection	3189	6.1		0.852							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
East Exit: Aylesbury Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
West Exit: Palm Avenue Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

Project: C:\Users\jacques.vandenneever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 PM - V1.sip9

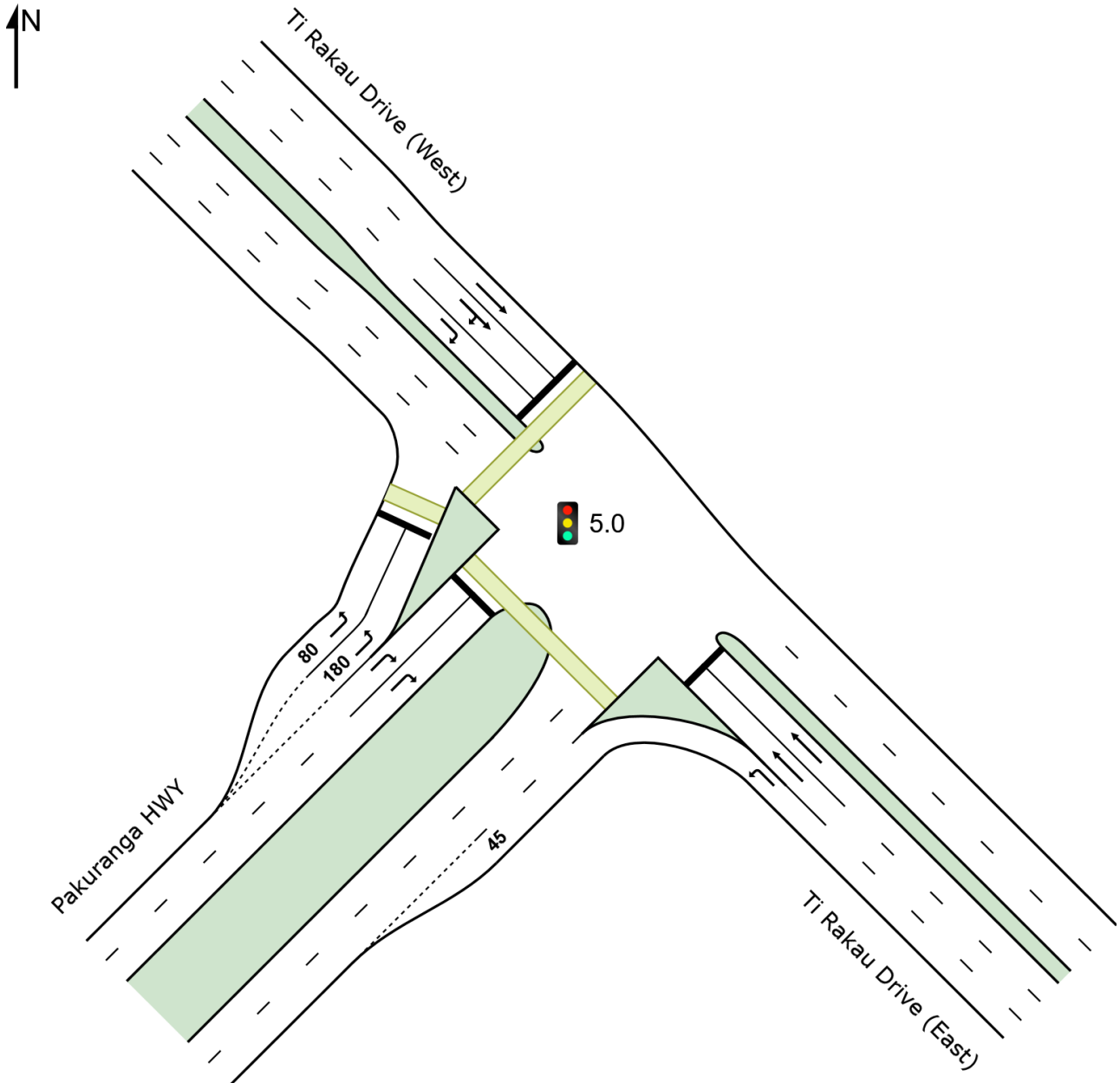


# SITE LAYOUT

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 5.0 [5.0 Pakuranga HWY/ Reeves Rd (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]				
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			m	m	%	%	
SouthEast: Ti Rakau Drive (East)															
Lane 1	840	7.7	798	7.4	1727	0.462	100	6.5	LOS A	0.0	0.0	Full	91	0.0	0.0
Lane 2	379	5.7	361	5.6	385	0.939	100	85.8	LOS F	18.1 <sup>N4</sup>	133.0 <sup>N4</sup>	Full	91	-29.6 <sup>N3</sup>	50.0
Lane 3	382	5.7	364	5.6	387	0.939	100	85.6	LOS F	18.1 <sup>N4</sup>	133.0 <sup>N4</sup>	Full	91	-28.8 <sup>N3</sup>	50.0
Approach	1601	6.7	1523 <sup>N1</sup>	6.5		0.939		44.2	LOS D	18.1	133.0				
NorthWest: Ti Rakau Drive (West)															
Lane 1	442	9.0	435	9.0	535	0.813	100	56.1	LOS E	21.3 <sup>N4</sup>	160.7 <sup>N4</sup>	Full	110	0.0	50.0
Lane 2	433	6.9	426	7.0	524	0.813	100	60.4	LOS E	21.7 <sup>N4</sup>	160.7 <sup>N4</sup>	Full	110	0.0	50.0
Lane 3	420	6.7	414	6.8	509	0.813	100	61.1	LOS E	21.7 <sup>N4</sup>	160.7 <sup>N4</sup>	Full	110	0.0	50.0
Approach	1295	7.6	1275 <sup>N1</sup>	7.6		0.813		59.2	LOS E	21.7	160.7				
SouthWest: Pakuranga HWY															
Lane 1	532	4.7	532	4.7	541 <sup>1</sup>	0.985	100	90.6	LOS F	40.1	292.3	Short	80	-29.6 <sup>N3</sup>	NA
Lane 2	536	4.7	536	4.7	544 <sup>1</sup>	0.985	100	90.4	LOS F	40.3	293.2	Short	180	-28.8 <sup>N3</sup>	NA
Lane 3	492	5.7	492	5.7	521	0.944	100	88.7	LOS F	39.1	286.8	Full	1650	0.0	0.0
Lane 4	497	5.7	497	5.7	526	0.944	100	88.5	LOS F	39.4	289.4	Full	1650	0.0	0.0
Approach	2057	5.2	2057	5.2		0.985		89.6	LOS F	40.3	293.2				
Intersection	4953	6.3	4855 <sup>N1</sup>	6.4		0.985		67.4	LOS E	40.3	293.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N3</sup> Capacity Adjustment due to downstream lane blockage determined by the program.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane No.	Ov. Lane
From SE To Exit:	SW	NW		veh/h						
Lane 1	798	-	798	7.4	1727	0.462	100	NA	NA	NA
Lane 2	-	361	361	5.6	385	0.939	100	NA	NA	NA
Lane 3	-	364	364	5.6	387	0.939	100	NA	NA	NA
Approach	798	725	1523	6.5		0.939				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	Ov. Lane
From NW				veh/h						

To Exit:	SE	SW			veh/h	v/c	%	%	No.
Lane 1	435	-	435	9.0	535	0.813	100	NA	NA
Lane 2	38	388	426	7.0	524	0.813	100	NA	NA
Lane 3	-	414	414	6.8	509	0.813	100	NA	NA
Approach	473	802	1275	7.6		0.813			
SouthWest: Pakuranga HWY									
Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From SW					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	NW	SE			veh/h	v/c	%	%	No.
Lane 1	532	-	532	4.7	541 <sup>1</sup>	0.985	100	100.0	2
Lane 2	536	-	536	4.7	544 <sup>1</sup>	0.985	100	60.3	4
Lane 3	-	492	492	5.7	521	0.944	100	NA	NA
Lane 4	-	497	497	5.7	526	0.944	100	NA	NA
Approach	1068	989	2057	5.2		0.985			
Total %HV Deg. Satn (v/c)									
Intersection	4855	6.4		0.985					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

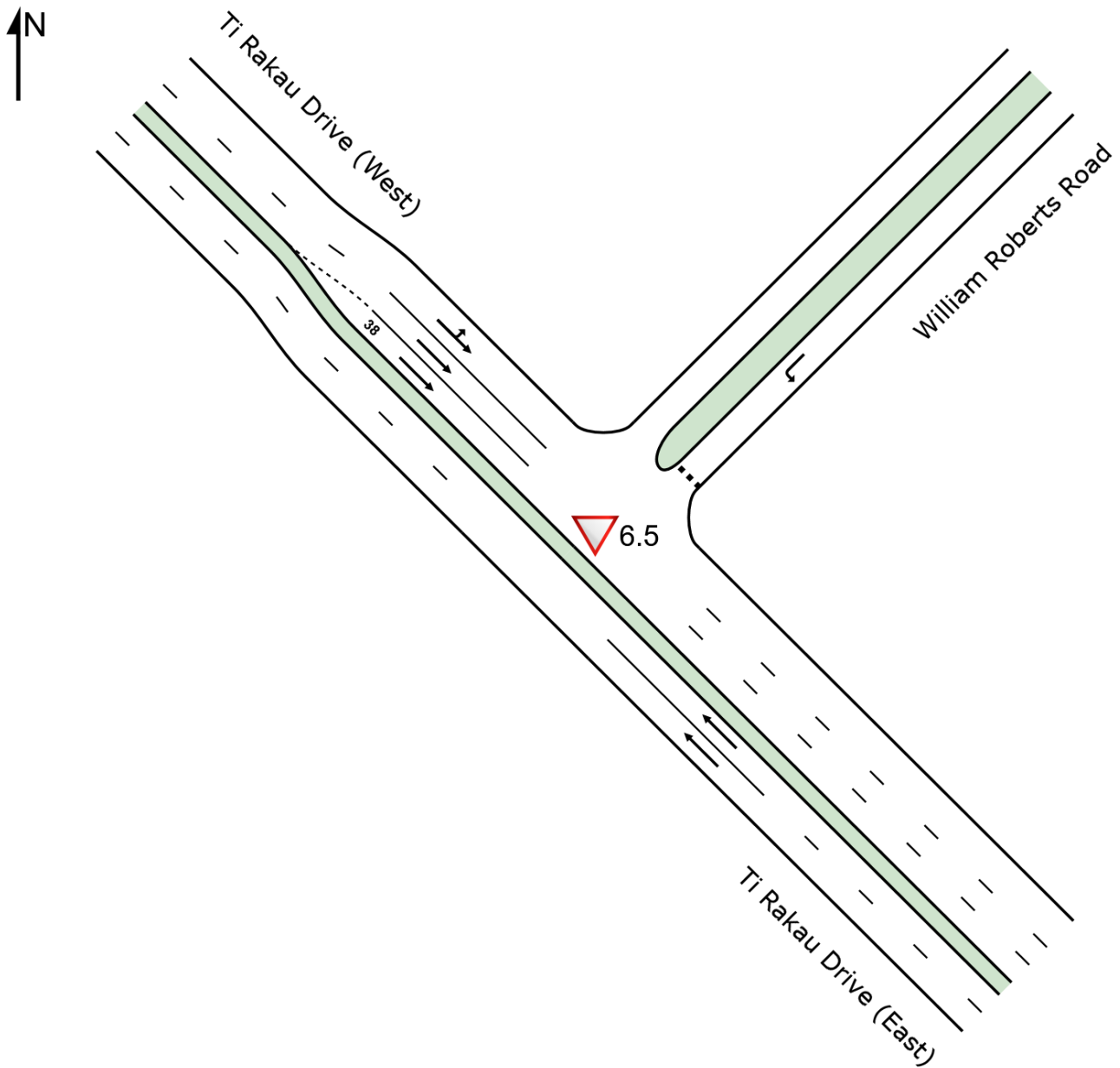
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
Full Length Lane	3											
SouthWest Exit: Pakuranga HWY												
Merge Type: <b>Priority</b>												
Exit Short Lane	1	45	0.0	388	401	3.00	2.00	798	1390	0.574	0.6	2.0
Merge Lane	2	-	100.0					388	1800	0.216	0.0	0.0

# SITE LAYOUT

▽ Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)]

New Site  
Site Category: (None)  
Give-Way (Two-Way)

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



# LANE SUMMARY

Site: 6.5 [6.5 William Roberts Rd / Ti Rakau Dr - Import (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %	[ Total veh/h	[ HV %						[ Veh	[ Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	835	6.4	792	6.2	1826	0.434	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Lane 2	826	6.4	784	6.2	1807	0.434	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	1661	6.4	1576 <sup>N1</sup>	6.2		0.434		0.0	NA	0.0	0.0				
NorthEast: William Roberts Road															
Lane 1	110	3.6	110	3.6	486	0.226	100	3.4	LOS A	0.3	2.2	Full	110	-50.0 <sup>N7</sup>	0.0
Approach	110	3.6	110	3.6		0.226		3.4	LOS A	0.3	2.2				
NorthWest: Ti Rakau Drive (West)															
Lane 1	565	7.3	562	7.3	1869	0.301	100	2.3	LOS A	0.0	0.0	Full	97	0.0	0.0
Lane 2	546	6.2	543	6.3	1806	0.301	100	0.0	LOS A	4.5 <sup>N5</sup>	33.4 <sup>N5</sup>	Full	97	0.0	0.0
Lane 3	350	6.2	348	6.3	1158	0.301	100	0.0	LOS A	0.0	0.0	Short	38	-35.9 <sup>N3</sup>	NA
Approach	1461	6.7	1454 <sup>N1</sup>	6.7		0.301		0.9	NA	4.5	33.4				
Intersection	3232	6.4	3140 <sup>N1</sup>	6.6		0.434		0.5	NA	4.5	33.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Lane LOS values are based on average delay per lane.  
 Minor Road Approach LOS values are based on average delay for all lanes.  
 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 lanes.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

- N1** Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
- N3** Capacity Adjustment due to downstream lane blockage determined by the program.
- N5** Continuous Lane results determined by Back of Queue values of downstream lanes (proportional to lane movement flows).
- N7** The capacity reduction has been determined from the queue blockage probability of a Site further downstream due to intermediate continuous lanes.

Approach Lane Flows (veh/h)									
SouthEast: Ti Rakau Drive (East)									
Mov. From SE To Exit:	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	792	792	6.2	1826	0.434	100	NA	NA	
Lane 2	784	784	6.2	1807	0.434	100	NA	NA	
Approach	1576	1576	6.2		0.434				
NorthEast: William Roberts Road									
Mov. From NE To Exit:	L2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	110	110	3.6	486	0.226	100	NA	NA	

Approach	110	110	3.6			0.226				
NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	L2	T1	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
	NE	SE								
Lane 1	275	288	562	7.3		1869	0.301	100	NA	NA
Lane 2	-	543	543	6.3		1806	0.301	100	NA	NA
Lane 3	-	348	348	6.3		1158	0.301	100	0.0	2
Approach	275	1179	1454	6.7			0.301			
Total %HV Deg. Satn (v/c)										
Intersection	3140	6.6		0.434						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
Full Length Lane	3											Merge Analysis not applied.
NorthEast Exit: William Roberts Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# SITE LAYOUT

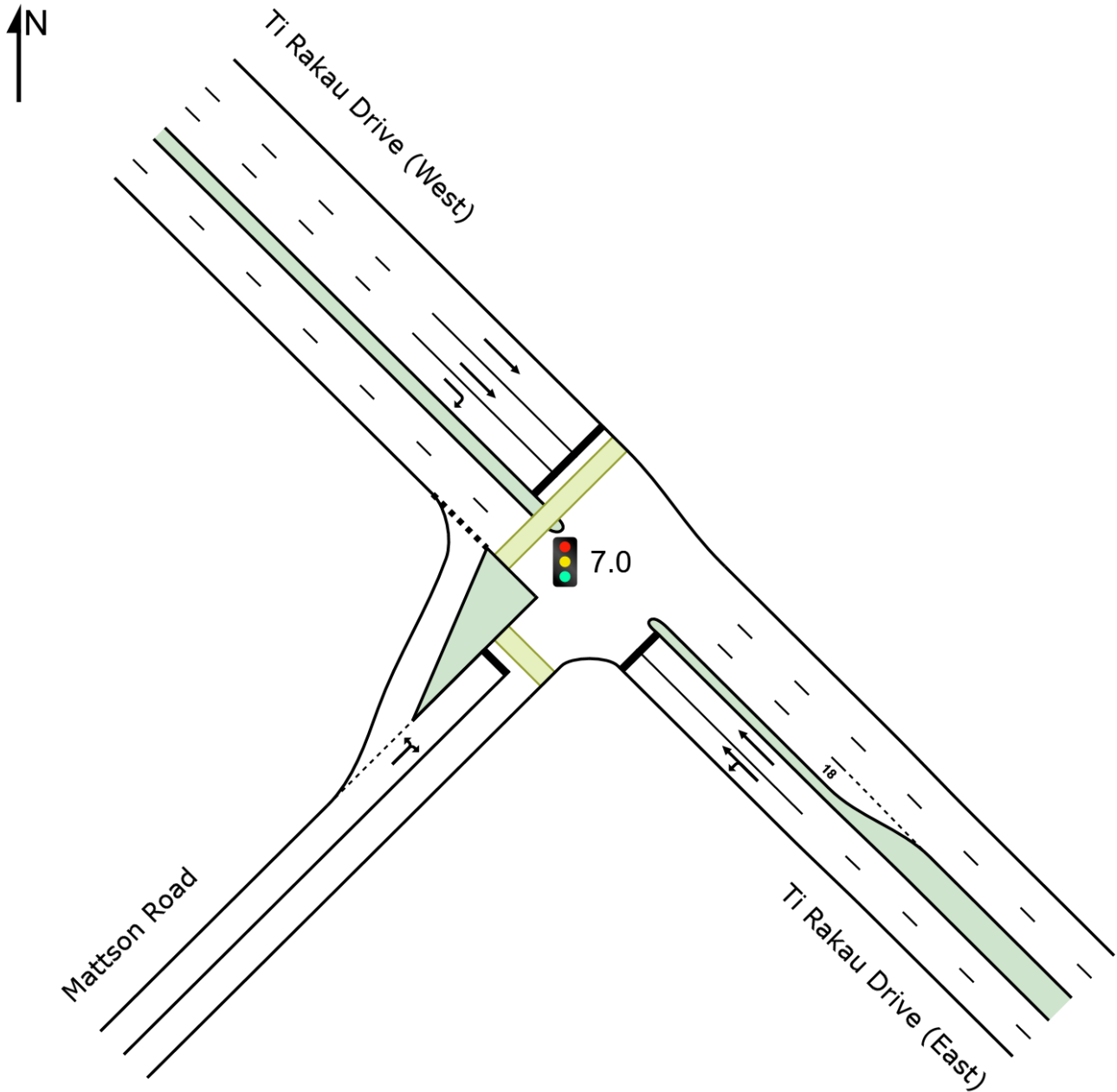
 Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 7.0 [7.0 Mattson Rd/ Ti Rakau Dr (Site Folder: General)] Network: N101 [PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 68 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
SouthEast: Ti Rakau Drive (East)															
Lane 1	837	6.6	794	6.4	895	0.887	100	28.4	LOS C	27.7	204.7	Full	187	0.0	23.3
Lane 2	845	6.5	801	6.3	903	0.887	100	28.3	LOS C	27.9	205.7	Full	187	0.0	23.7
Approach	1682	6.5	1594 <sup>N</sup>	6.3		0.887		28.4	LOS C	27.9	205.7				
NorthWest: Ti Rakau Drive (West)															
Lane 1	618	6.0	615	6.0	1316	0.467	100	5.6	LOS A	3.6 <sup>N4</sup>	26.3 <sup>N4</sup>	Full	18	0.0	50.0
Lane 2	580	6.0	578	6.0	1236	0.467	100	5.6	LOS A	3.6 <sup>N4</sup>	26.3 <sup>N4</sup>	Full	18	0.0	50.0
Lane 3	97	6.2	97	6.2	154	0.628	100	38.1	LOS D	3.1	22.6	Full	18	0.0	35.9
Approach	1295	6.0	1289 <sup>N</sup>	6.0		0.628		8.0	LOS A	3.6	26.3				
SouthWest: Mattson Road															
Lane 1	71	1.4	71	1.4	405	0.175	100	24.5	LOS C	1.7	12.3	Full	282	0.0	0.0
Approach	71	1.4	71	1.4		0.175		24.5	LOS C	1.7	12.3				
Intersection	3048	6.2	2954 <sup>N</sup>	6.4		0.887		19.4	LOS B	27.9	205.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From SE To Exit:	SW	NW			veh/h	v/c	%	%		
Lane 1	42	752	794	6.4	895	0.887	100	NA	NA	
Lane 2	-	801	801	6.3	903	0.887	100	NA	NA	
Approach	42	1552	1594	6.3		0.887				
NorthWest: Ti Rakau Drive (West)										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane No.
From NW To Exit:	SE	SW			veh/h	v/c	%	%		
Lane 1	615	-	615	6.0	1316	0.467	100	NA	NA	
Lane 2	578	-	578	6.0	1236	0.467	100	NA	NA	
Lane 3	-	97	97	6.2	154	0.628	100	NA	NA	
Approach	1193	97	1289	6.0		0.628				
SouthWest: Mattson Road										
Mov.	L2	R2	Total	%HV	Deg.	Lane Util.	Prob.	Ov.		



From SW To Exit:	NW	SE			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	23	48	71	1.4	405	0.175	100	NA	NA
Approach	23	48	71	1.4		0.175			
	Total	%HV	Deg.	Satn (v/c)					
Intersection	2954	6.4		0.887					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Priority</b>												
Exit Short Lane	3	18	0.0	578	595	3.00	2.00	48	1186	0.040	1.1	1.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				578	1800	0.321	0.0	0.0
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
SouthWest Exit: Mattson Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										

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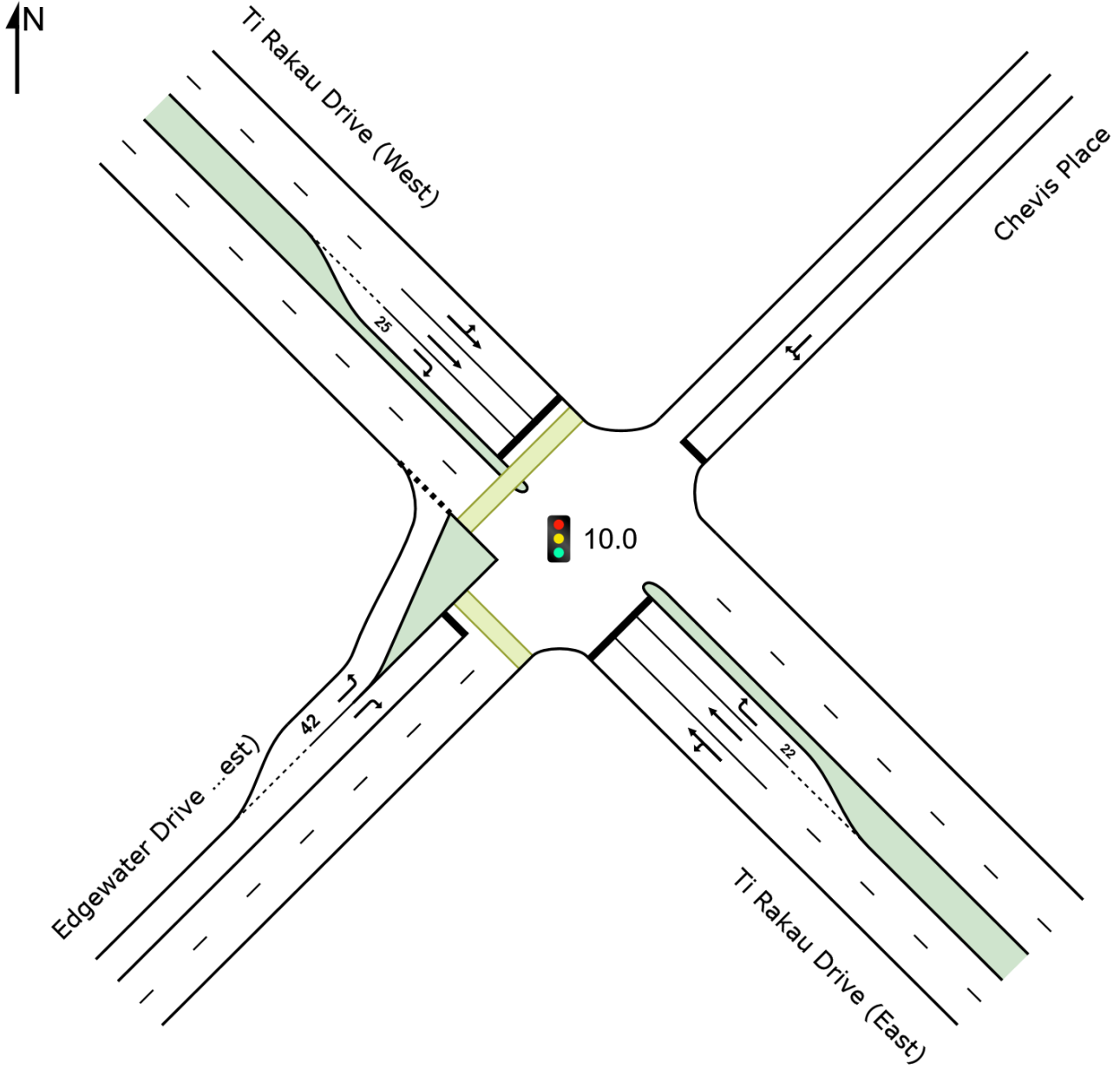
Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Tuesday, 7 February 2023 3:26:49 pm  
 Project: C:\Users\jacques.vandenheever\Eastern Busway Alliance\PAA - 05 DESIGN MGMNT\12 Transport\3-3. Integrated Transport Assessment\ITA 2 - EB2,3R\Version 9 (Addendum)\AIMSUN and SIDRA\CS 1.4\CS 1.4 PM - V1.sip9

# SITE LAYOUT

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: General)]

New Site  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 10.0 [10.0 Edgewater Dr (West) / Chevis Pl (Site Folder: Network: N101 [PM (Network General) Folder: General])]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site Practical Cycle Time)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %	[ Total veh/h	HV %						[ Veh	Dist ] m				
SouthEast: Ti Rakau Drive (East)															
Lane 1	888	6.5	876	6.4	981	0.893	100	35.7	LOS D	37.6 <sup>N4</sup>	277.6 <sup>N4</sup>	Full	190	0.0	50.0
Lane 2	872	6.4	860	6.4	964 <sup>1</sup>	0.893	100	34.8	LOS C	37.6 <sup>N4</sup>	277.6 <sup>N4</sup>	Full	190	0.0	50.0
Lane 3	11	9.1	11	9.0	96	0.113	100	58.4	LOS E	0.5	3.8	Short	22	0.0	NA
Approach	1772	6.5	1747 <sup>N</sup> <sub>1</sub>	6.4		0.893		35.4	LOS D	37.6	277.6				
NorthEast: Chevis Place															
Lane 1	20	0.0	20	0.0	140	0.143	100	55.6	LOS E	0.9	6.3	Full	138	0.0	0.0
Approach	20	0.0	20	0.0		0.143		55.6	LOS E	0.9	6.3				
NorthWest: Ti Rakau Drive (West)															
Lane 1	540	2.5	524	2.5	1030	0.509	100	17.4	LOS B	13.9 <sup>N4</sup>	99.4 <sup>N4</sup>	Full	68	0.0	50.0
Lane 2	428	2.5	415	2.6	815 <sup>1</sup>	0.509	100	16.3	LOS B	11.5	82.6	Full	68	0.0	32.8
Lane 3	89	7.1	87	7.3	98	0.889	100	70.0	LOS E	4.7	34.7	Short	25	0.0	NA
Approach	1057	2.9	1026 <sup>N</sup> <sub>1</sub>	3.0		0.889		21.4	LOS C	13.9	99.4				
SouthWest: Edgewater Drive (West)															
Lane 1	102	5.2	102	5.2	627	0.163	100	19.1	LOS B	2.4	17.5	Short	42	0.0	NA
Lane 2	55	9.6	55	9.6	232	0.236	100	50.8	LOS D	2.3	17.5	Full	500	0.0	0.0
Approach	157	6.7	157	6.7		0.236		30.2	LOS C	2.4	17.5				
Intersection	3006	5.2	2951 <sup>N</sup> <sub>1</sub>	5.3		0.893		30.4	LOS C	37.6	277.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

<sup>N4</sup> Average back of queue has been restricted to the available queue storage space.

Approach Lane Flows (veh/h)										
SouthEast: Ti Rakau Drive (East)										
Mov. From SE To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.
	SW	NW	NE							
Lane 1	152	725	-	876	6.4	981	0.893	100	NA	NA
Lane 2	-	860	-	860	6.4	964 <sup>1</sup>	0.893	100	NA	NA
Lane 3	-	-	11	11	9.0	96	0.113	100	0.0	2
Approach	152	1585	11	1747	6.4		0.893			
NorthEast: Chevis Place										
Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	

From NE To Exit:	SE	NW				Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	10	10	20	0.0		140	0.143	100	NA	NA
Approach	10	10	20	0.0			0.143			
NorthWest: Ti Rakau Drive (West)										
Mov. From NW To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	515	-	524	2.5	1030	0.509	100	NA	NA
Lane 2	-	415	-	415	2.6	815 <sup>1</sup>	0.509	100	NA	NA
Lane 3	-	-	87	87	7.3	98	0.889	100	45.3	2
Approach	10	930	87	1026	3.0		0.889			
SouthWest: Edgewater Drive (West)										
Mov. From SW To Exit:	L2	R2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	102	-	102	5.2		627	0.163	100	0.0	2
Lane 2	-	55	55	9.6		232	0.236	100	NA	NA
Approach	102	55	157	6.7			0.236			
Total %HV Deg.Satn (v/c)										
Intersection	2951	5.3		0.893						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

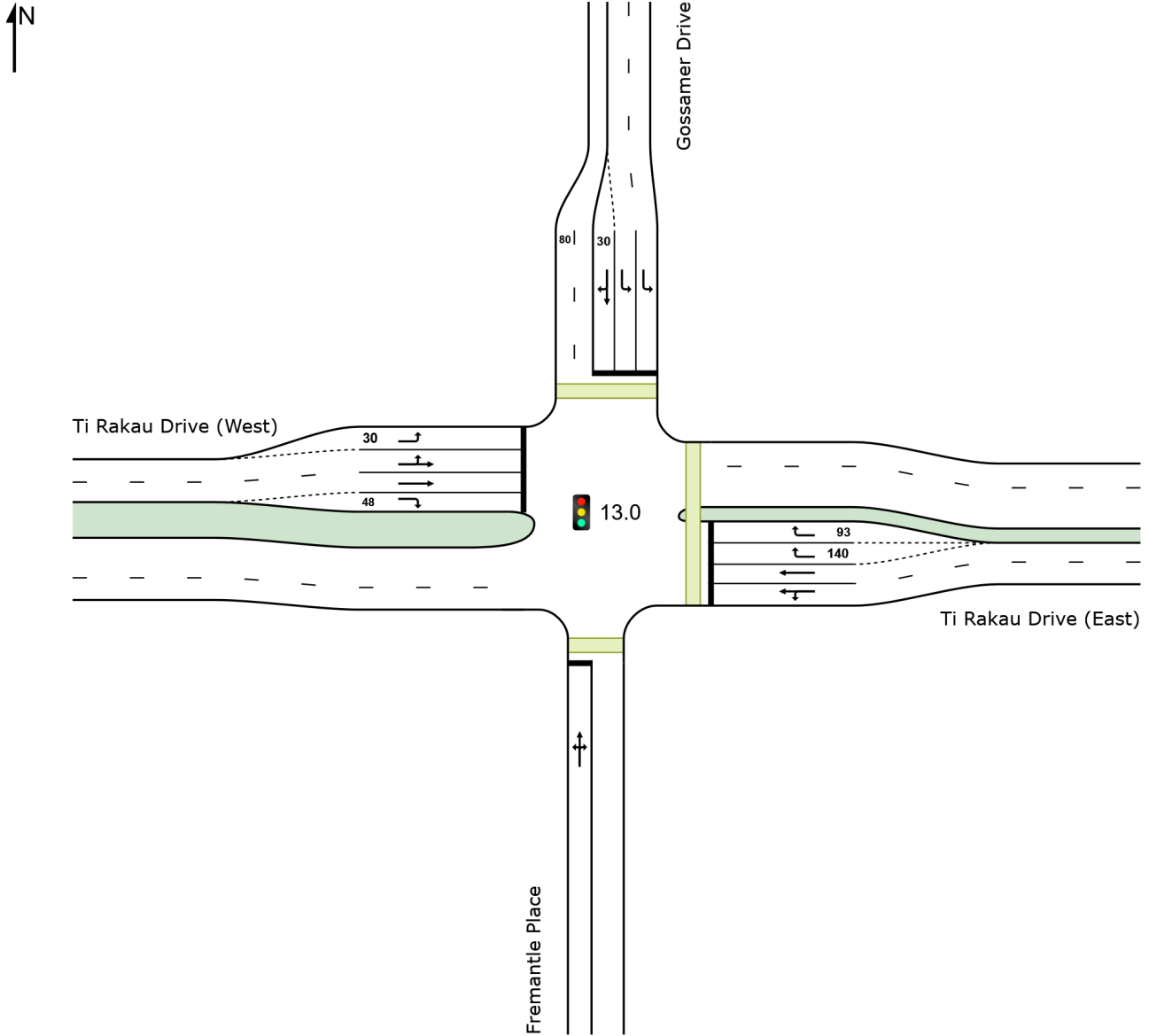
Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
SouthEast Exit: Ti Rakau Drive (East)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
NorthEast Exit: Chevis Place												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
NorthWest Exit: Ti Rakau Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									
SouthWest Exit: Edgewater Drive (West)												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
Full Length Lane	2		Merge Analysis not applied.									

# SITE LAYOUT

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Scheme Design  
Site Category: (None)  
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# LANE SUMMARY

Site: 13.0 [13.0 Gossamer Dr / Ti Rakau Dr (Site Folder: General)]

Network: N101 [PM (Network Folder: General)]

Scheme Design

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site User-Given Phase Times)

Lane Use and Performance															
	DEMAND FLOWS		ARRIVAL FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	85% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]	[ Total	HV ]	veh/h	v/c	%	sec		[ Veh	Dist ]		m	%	%
	veh/h	%	veh/h	%	veh/h	v/c	%	sec		Dist ]	m		m	%	%
South: Fremantle Place															
Lane 1	40	5.0	40	5.0	97	0.413	100	81.6	LOS F	2.7	19.6	Full	285	0.0	0.0
Approach	40	5.0	40	5.0		0.413		81.6	LOS F	2.7	19.6				
East: Ti Rakau Drive (East)															
Lane 1	906	6.5	906	6.5	901	1.005	100	77.9	LOS E	71.7	530.0	Full	636	0.0	0.0
Lane 2	775	6.6	775	6.6	771 <sup>1</sup>	1.005	100	98.9	LOS F	73.5	543.3	Full	636	0.0	0.8
Lane 3	258	8.6	258	8.6	505	0.511	47 <sup>6</sup>	29.7	LOS C	8.4	62.8	Short	140	0.0	NA
Lane 4	548	8.6	548	8.6	505	1.084	100	141.5	LOS F	45.1	338.5	Short	93	0.0	NA
Approach	2487	7.2	2487	7.2		1.084		93.5	LOS F	73.5	543.3				
North: Gossamer Drive															
Lane 1	259	17.8	259	17.8	757	0.342	100	22.2	LOS C	8.2	66.2	Full	1010	0.0	0.0
Lane 2	246	17.8	246	17.8	719 <sup>1</sup>	0.342	100	22.0	LOS C	7.7	62.2	Full	1010	0.0	0.0
Lane 3	61	4.9	61	4.9	238	0.256	100	67.3	LOS E	3.6	26.5	Short	30	0.0	NA
Approach	566	16.4	566	16.4		0.342		26.9	LOS C	8.2	66.2				
West: Ti Rakau Drive (West)															
Lane 1	170	0.6	165	0.6	822	0.200	28 <sup>5</sup>	19.3	LOS B	4.1	29.1	Short	30	0.0	NA
Lane 2	348	3.3	337	3.4	464 <sup>1</sup>	0.726	100	44.2	LOS D	17.9	129.2	Full	479	0.0	0.0
Lane 3	445	3.3	432	3.4	595 <sup>1</sup>	0.726	100	47.3	LOS D	24.7	177.6	Full	479	0.0	0.0
Lane 4	13	0.0	13	0.0	312	0.040	100	59.7	LOS E	0.7	4.8	Short	48	0.0	NA
Approach	976	2.8	946 <sup>N1</sup>	2.9		0.726		41.5	LOS D	24.7	177.6				
Intersection	4069	7.4	4039 <sup>N1</sup>	7.5		1.084		71.8	LOS E	73.5	543.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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

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

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

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

<sup>6</sup> Lane under-utilisation due to downstream effects

<sup>N1</sup> Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Approach Lane Flows (veh/h)											
South: Fremantle Place											
Mov. From S To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
Lane 1	13	10	17	40	5.0	97	0.413	100	NA	NA	
Approach	13	10	17	40	5.0		0.413				
East: Ti Rakau Drive (East)											

Mov. From E To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	23	883	-	906	6.5	901	1.005	100	NA	NA
Lane 2	-	775	-	775	6.6	771 <sup>1</sup>	1.005	100	NA	NA
Lane 3	-	-	258	258	8.6	505	0.511	47 <sup>6</sup>	98.9	2
Lane 4	-	-	548	548	8.6	505	1.084	100	100.0	3
Approach	23	1658	806	2487	7.2		1.084			
North: Gossamer Drive										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	259	-	-	259	17.8	757	0.342	100	NA	NA
Lane 2	246	-	-	246	17.8	719 <sup>1</sup>	0.342	100	NA	NA
Lane 3	-	12	49	61	4.9	238	0.256	100	3.8	2
Approach	505	12	49	566	16.4		0.342			
West: Ti Rakau Drive (West)										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	165	-	-	165	0.6	822	0.200	28 <sup>5</sup>	12.4	2
Lane 2	-	337	-	337	3.4	464 <sup>1</sup>	0.726	100	NA	NA
Lane 3	-	432	-	432	3.4	595 <sup>1</sup>	0.726	100	NA	NA
Lane 4	-	-	13	13	0.0	312	0.040	100	0.0	3
Approach	165	769	13	946	2.9		0.726			
Total %HV Deg. Satn (v/c)										
Intersection	4039	7.5		1.084						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
- 5 Lane under-utilisation found by the program
- 6 Lane under-utilisation due to downstream effects

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Fremantle Place Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ti Rakau Drive (East) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Gossamer Drive Merge Type: <b>Zipper</b>												
Exit Short Lane	1	80	50.0	258	269	2.50	2.00	423	1474	0.287	0.0	0.2
Merge Lane	2	-	50.0	211	217	2.50	2.00	515	1542	0.334	0.0	0.1
West Exit: Ti Rakau Drive (West) Merge Type: <b>Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

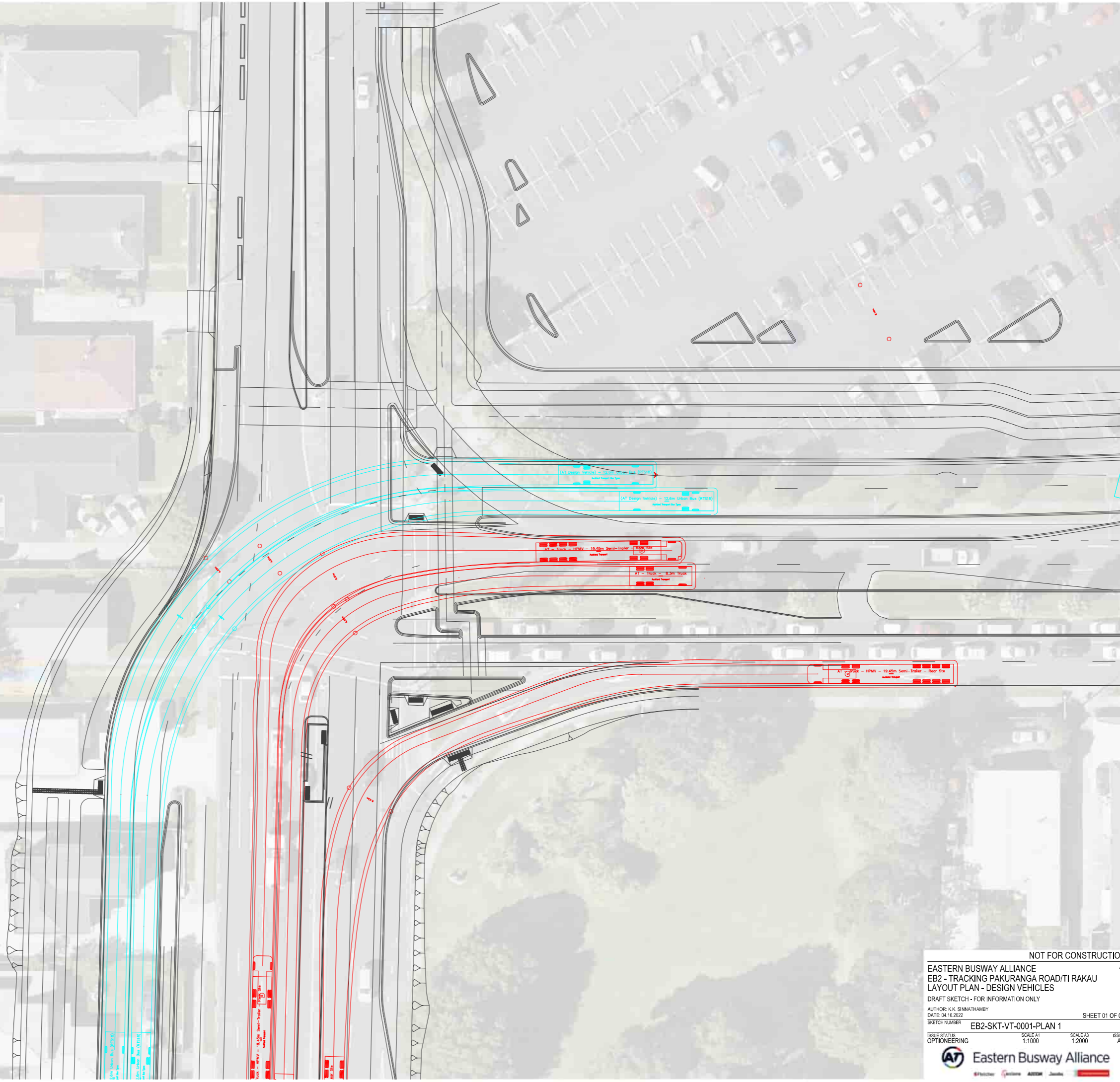
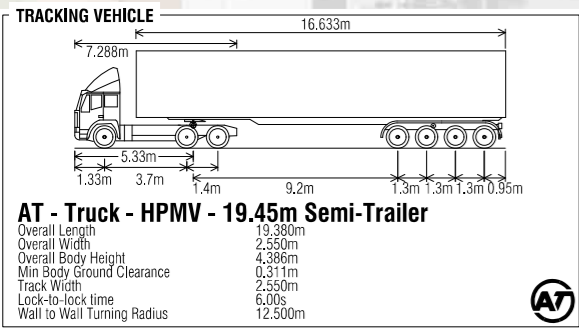
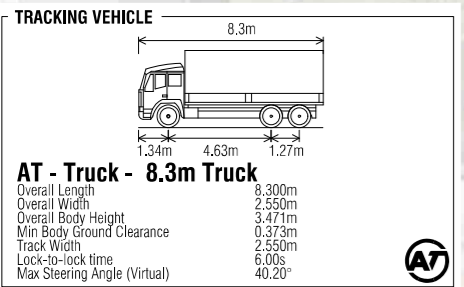
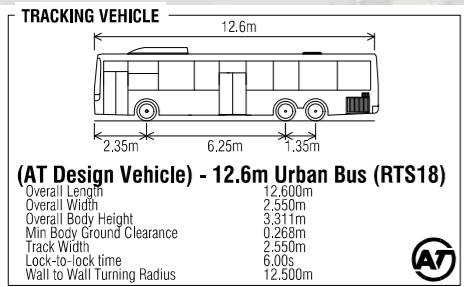
**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

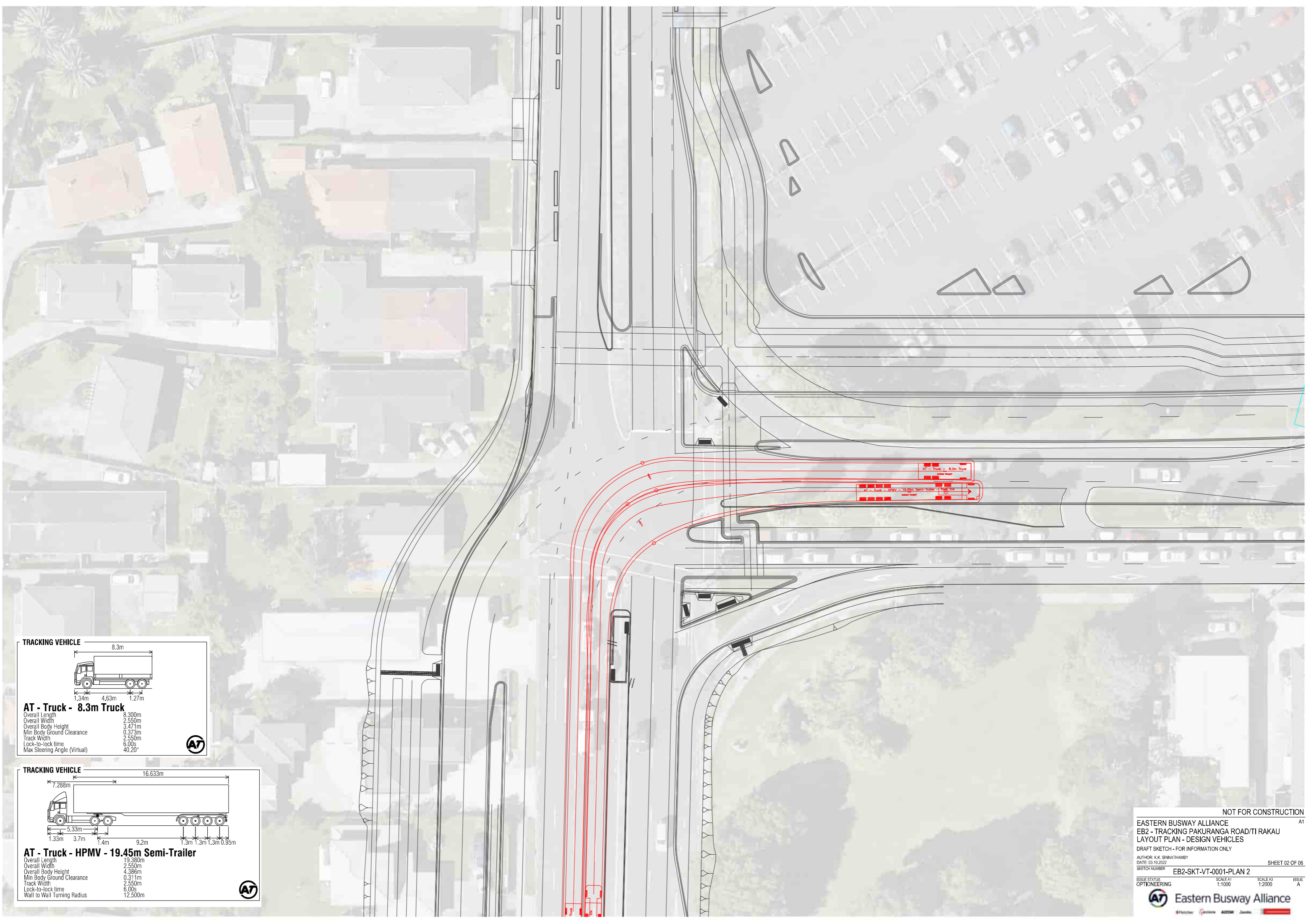
Organisation: AECOM AUSTRALIA PTY LTD | Licence: NETWORK / Enterprise | Processed: Tuesday, 7 February 2023 3:26:49 pm

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# Attachment 2 – Tracking Curves





**TRACKING VEHICLE**

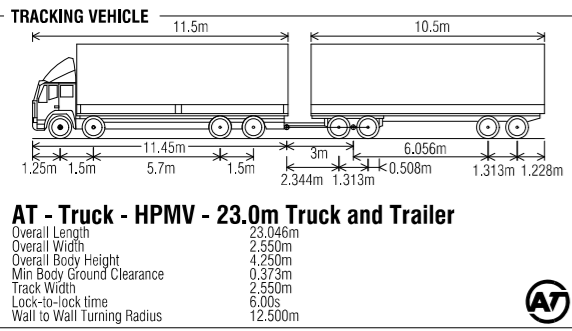
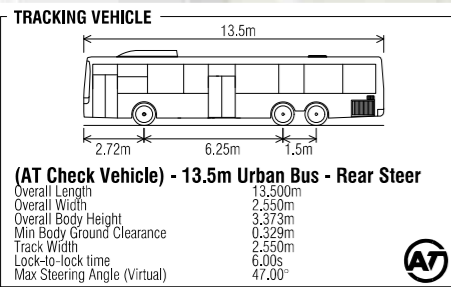
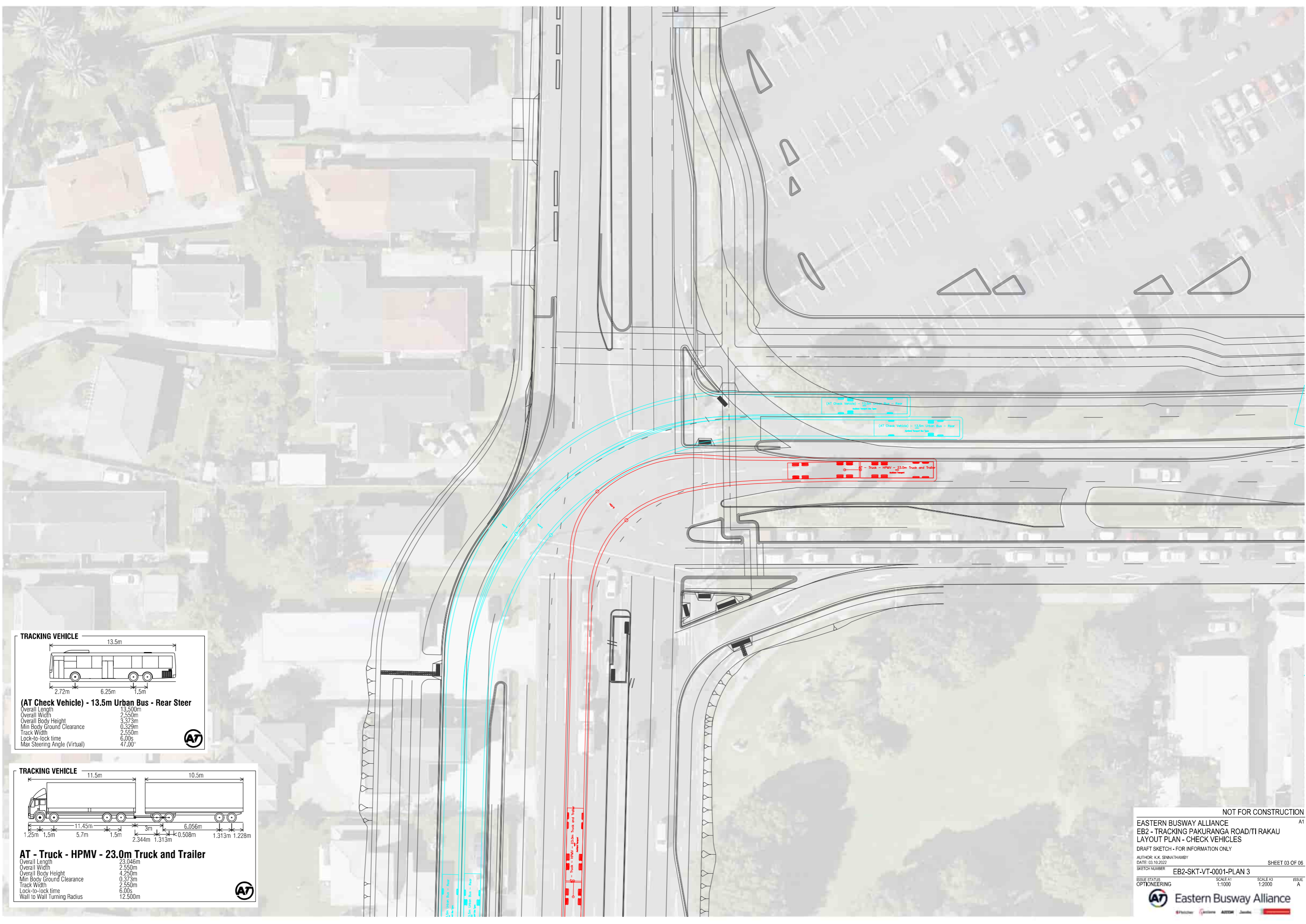
**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - HPMV - 19.45m Semi-Trailer**

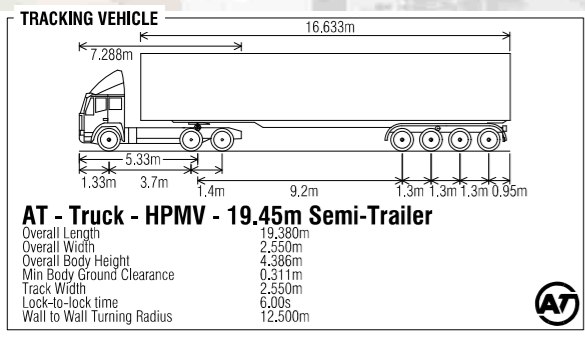
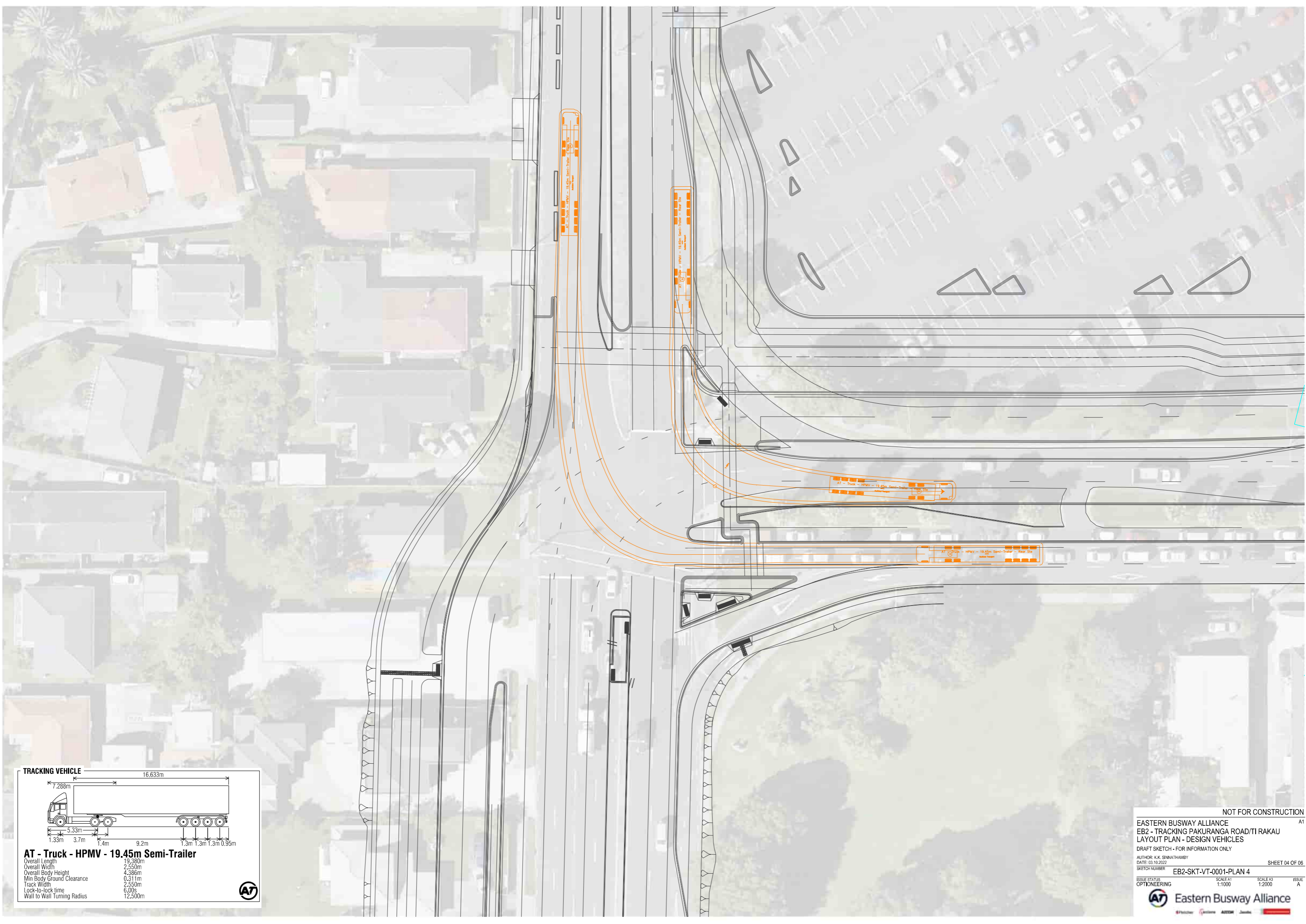
Overall Length	19.380m
Overall Width	2.550m
Overall Body Height	4.386m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m

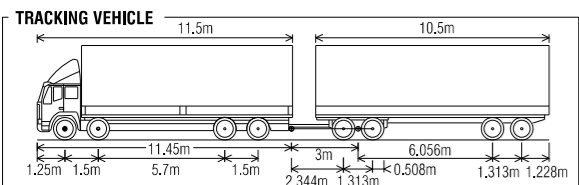
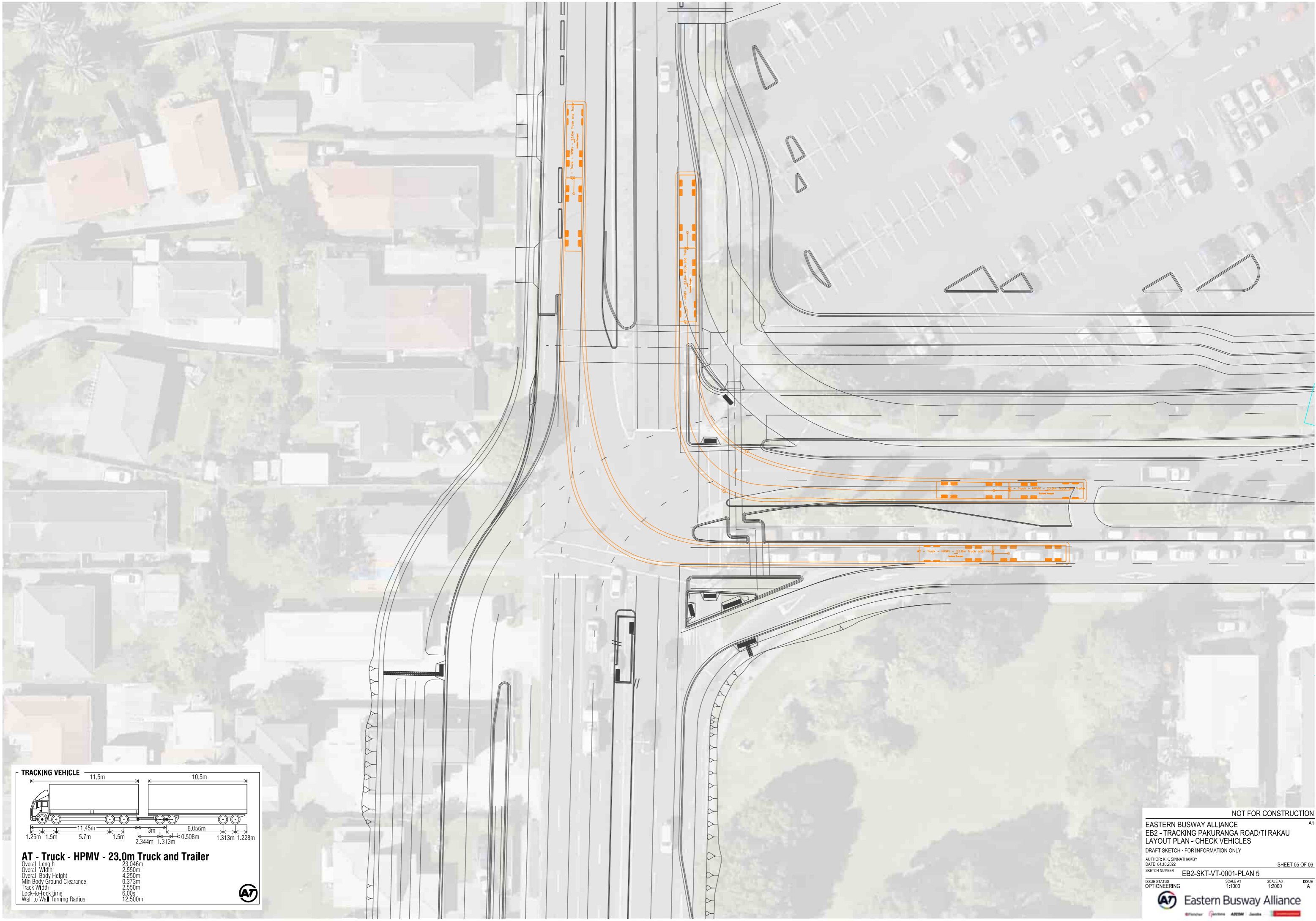


(AT Check Vehicle) - 13.5m Urban Bus - Rear Steer

(AT Check Vehicle) - 13.5m Urban Bus - Rear Steer

Truck - HPMV - 23.0m Truck and Trailer





**AT - Truck - HPMV - 23.0m Truck and Trailer**

Overall Length	23.046m
Overall Width	2.550m
Overall Body Height	4.250m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m



NOT FOR CONSTRUCTION A1

EASTERN BUSWAY ALLIANCE  
 EB2 - TRACKING PAKURANGA ROAD/TI RAKAU  
 LAYOUT PLAN - CHECK VEHICLES

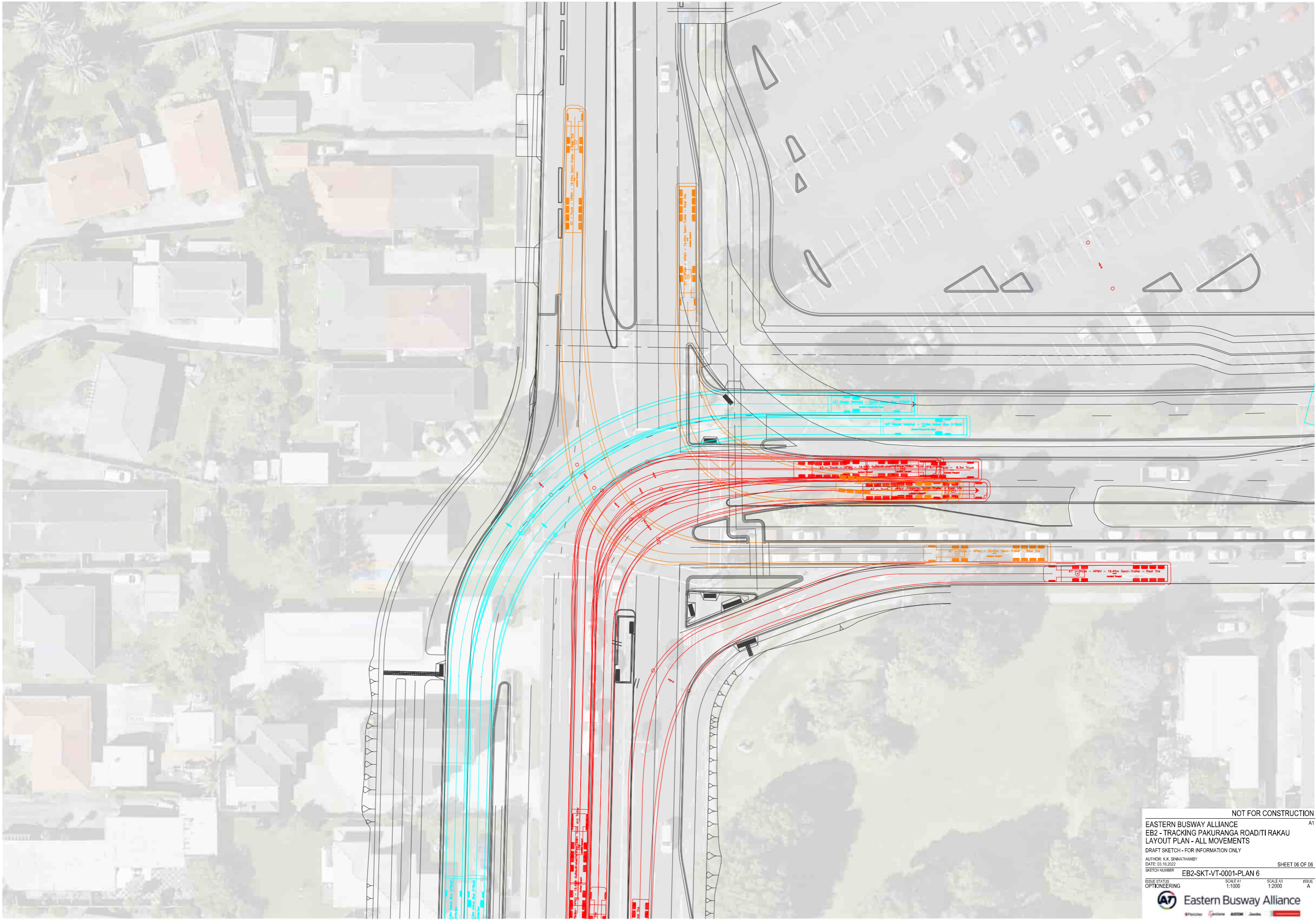
DRAFT SKETCH - FOR INFORMATION ONLY  
 AUTHOR: K.K. SINNATHAMBY  
 DATE: 04.10.2022 SHEET 05 OF 06

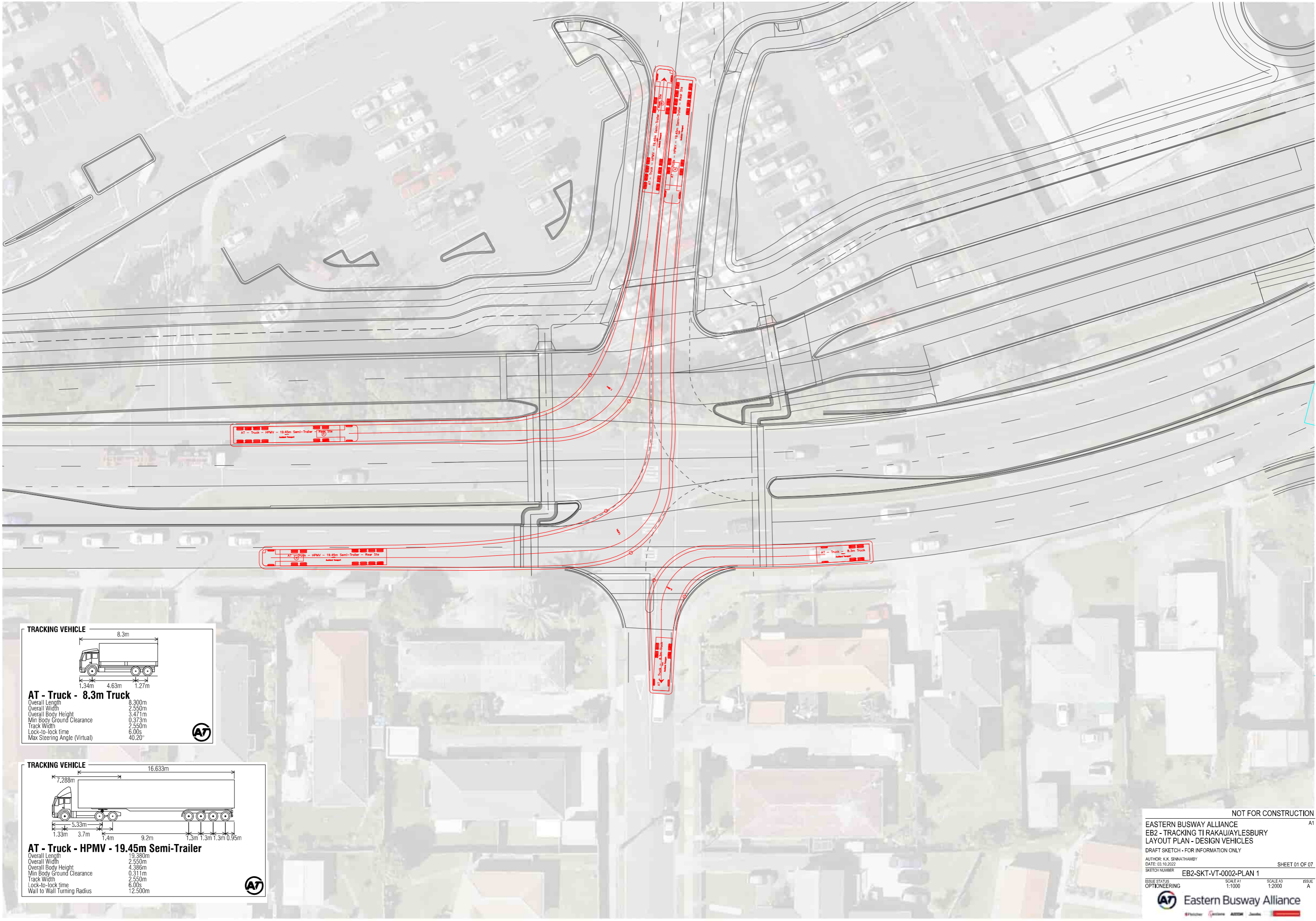
SKETCH NUMBER: EB2-SKT-VT-0001-PLAN 5

ISSUE STATUS: OPTIONERING SCALE A1: 1:1000 SCALE A3: 1:2000 ISSUE: A



Partner | Member | AECOM | Jacobs





**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

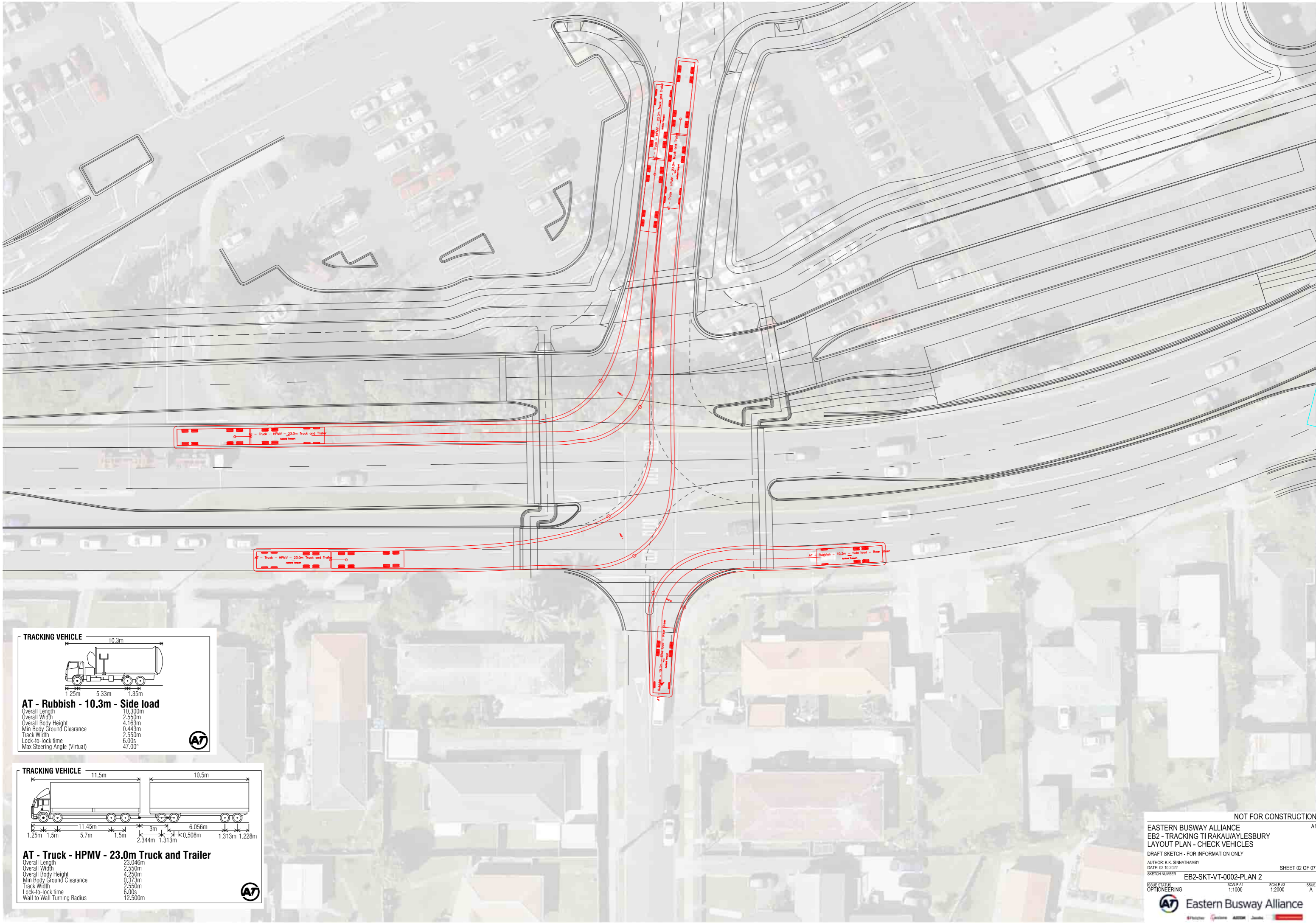
Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - HPMV - 19.45m Semi-Trailer**

Overall Length	19.380m
Overall Width	2.550m
Overall Body Height	4.386m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m





**TRACKING VEHICLE**

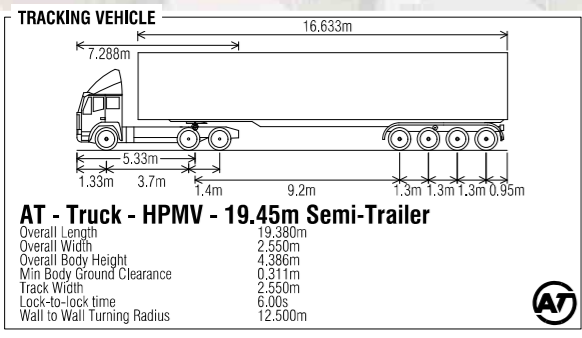
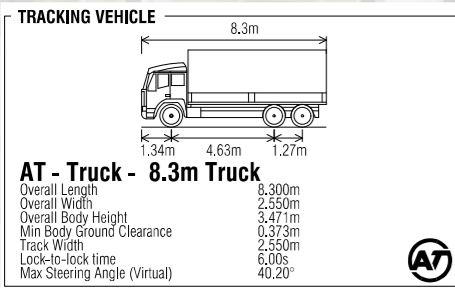
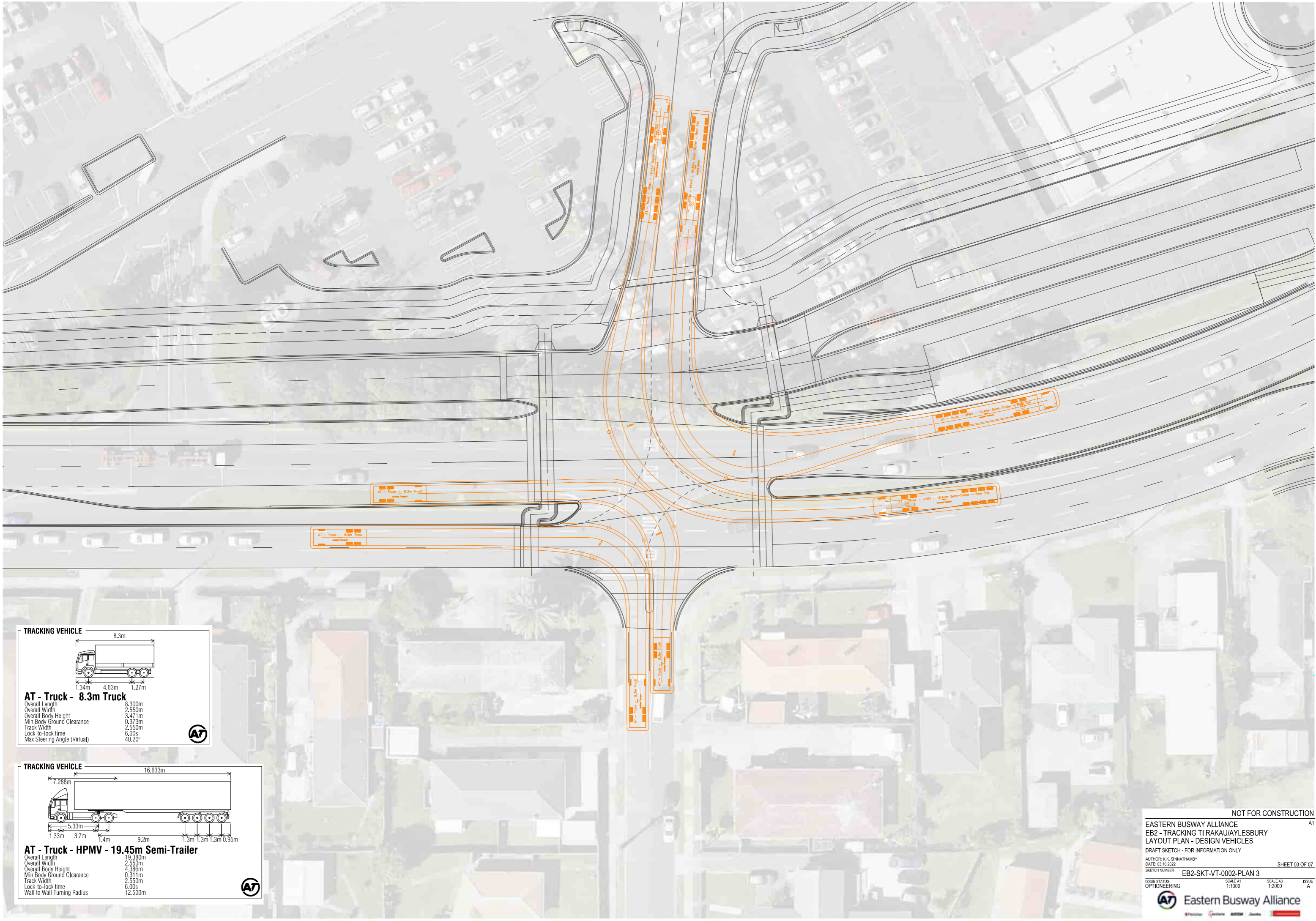
**AT - Rubbish - 10.3m - Side load**

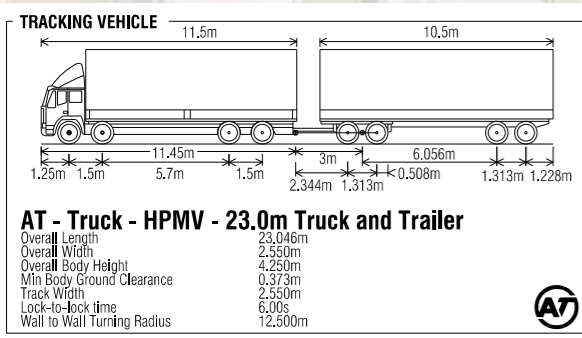
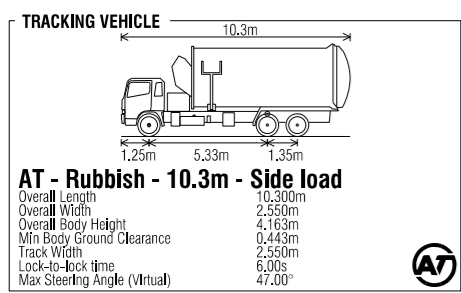
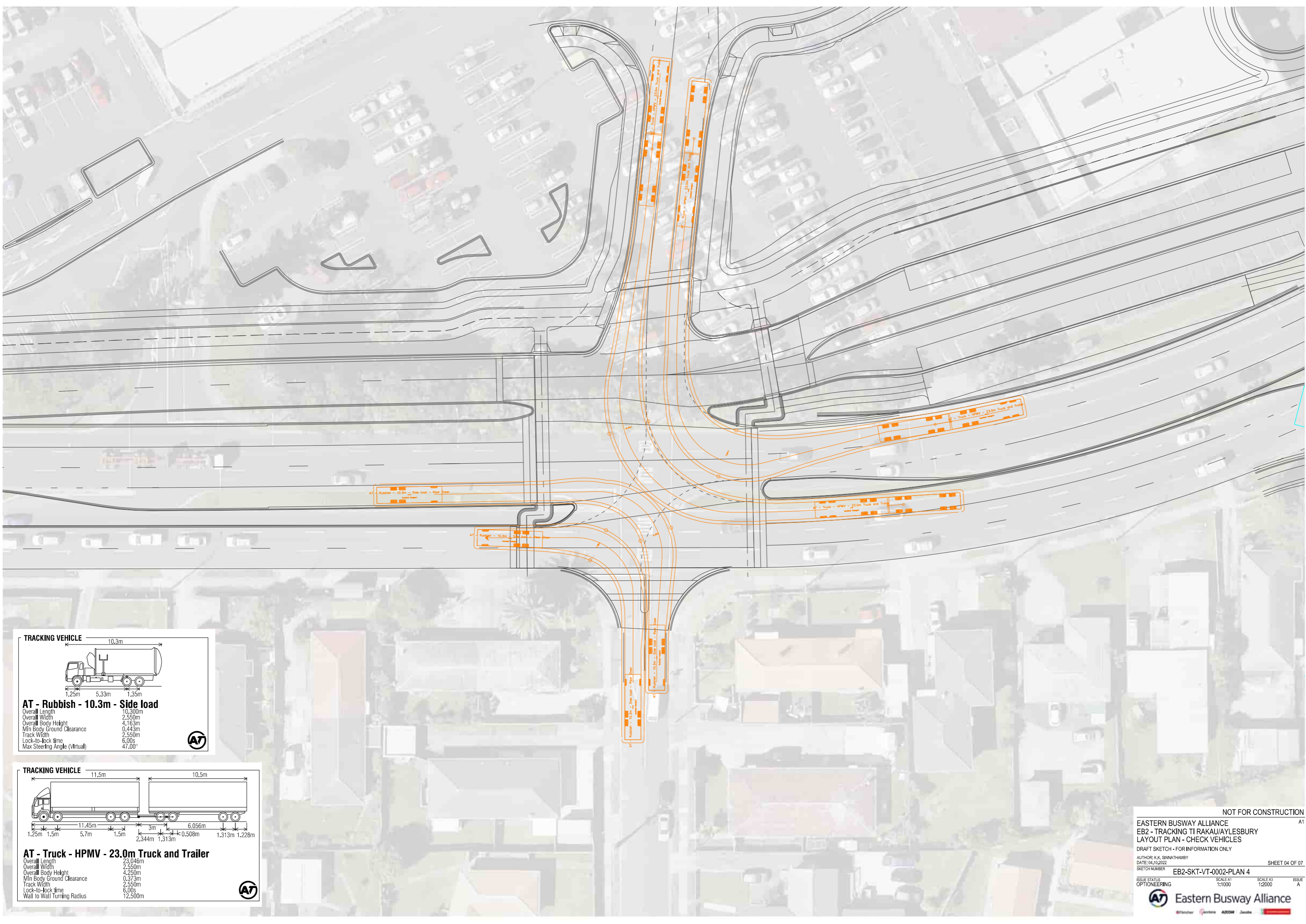
Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.163m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

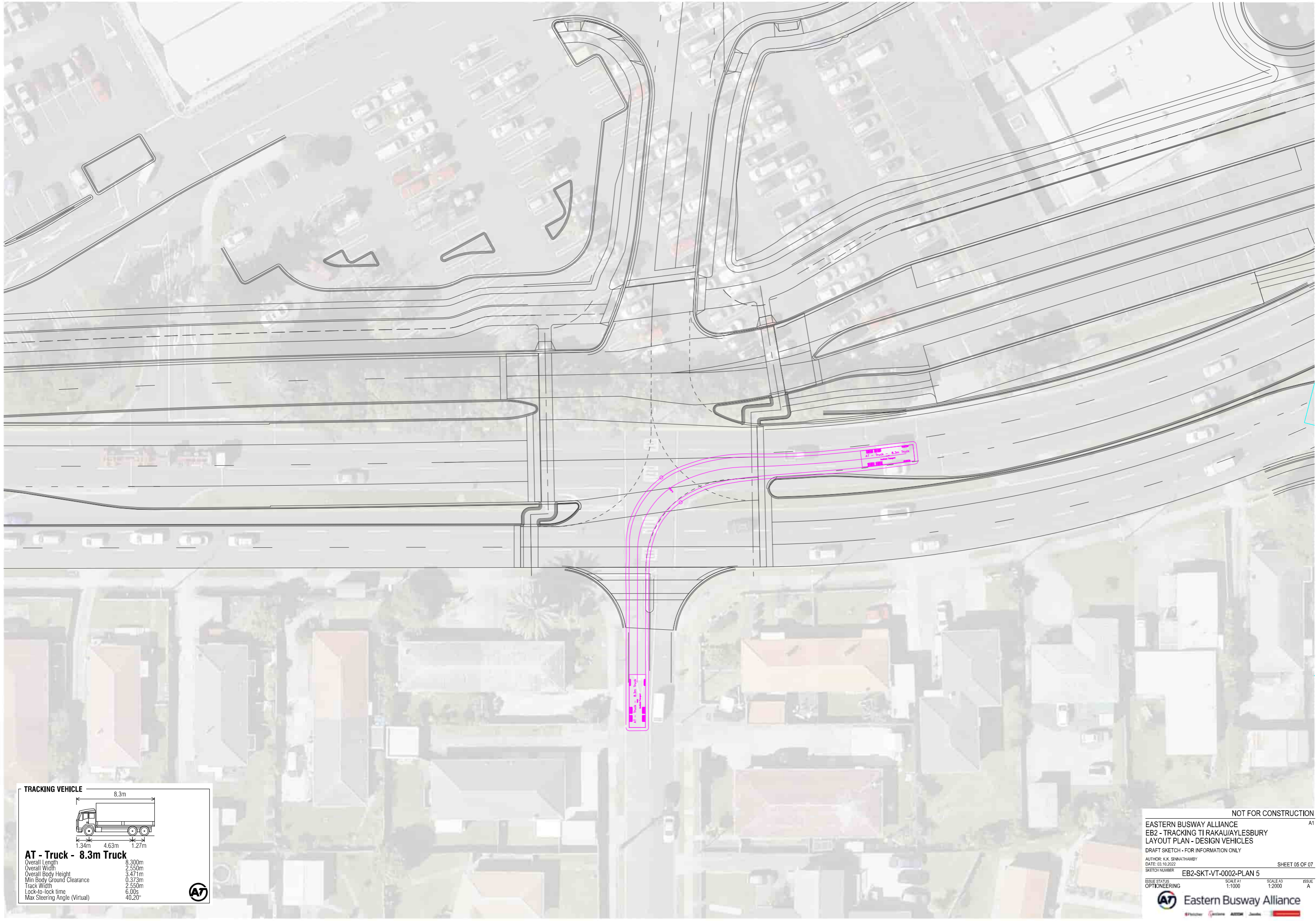
**TRACKING VEHICLE**

**AT - Truck - HPMV - 23.0m Truck and Trailer**

Overall Length	23.046m
Overall Width	2.550m
Overall Body Height	4.250m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m







**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

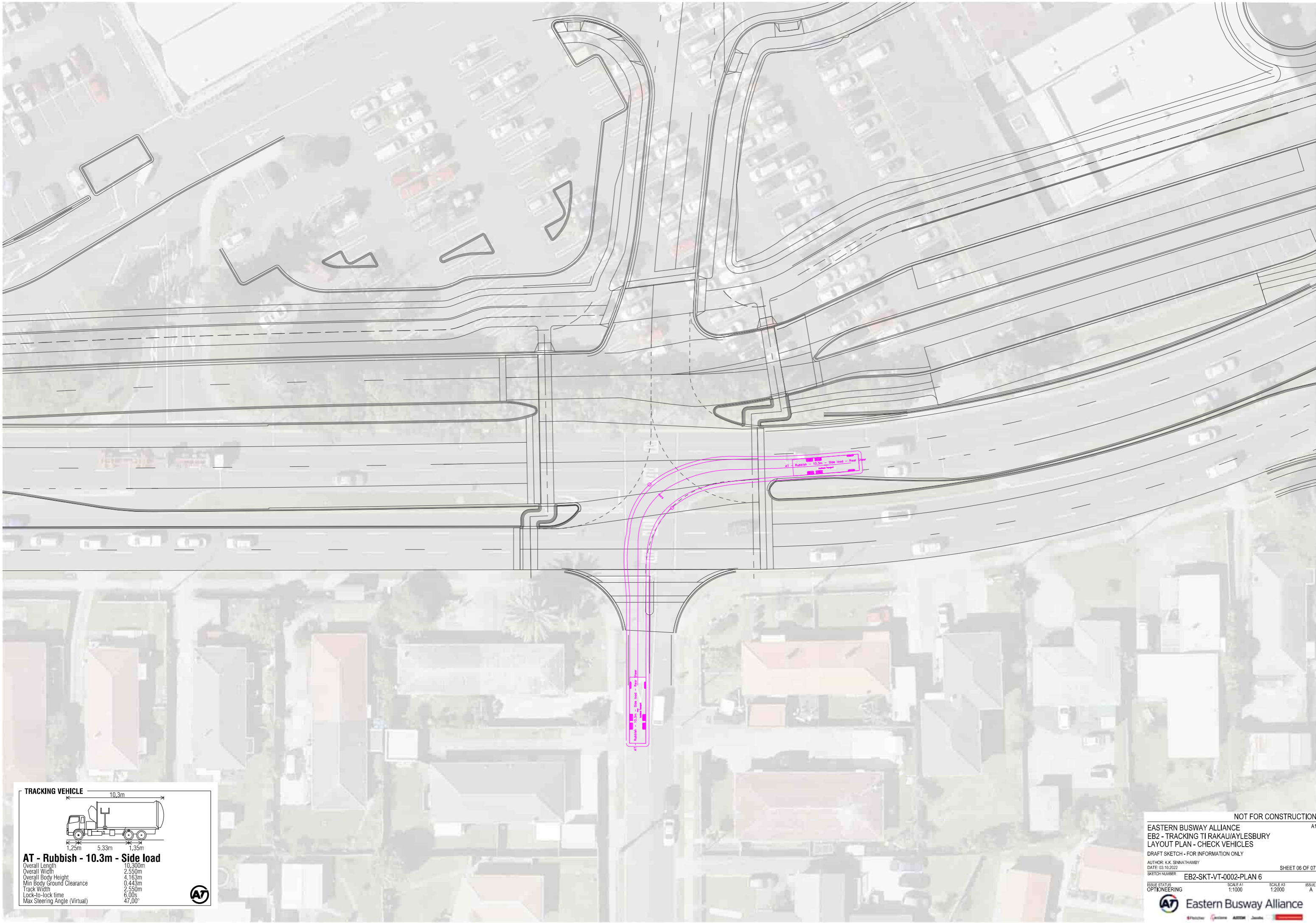
**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING TI RAKAU/AYLESBURY**  
**LAYOUT PLAN - DESIGN VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0002-PLAN 5

SHEET 05 OF 07

ISSUE STATUS: OPTONEERING

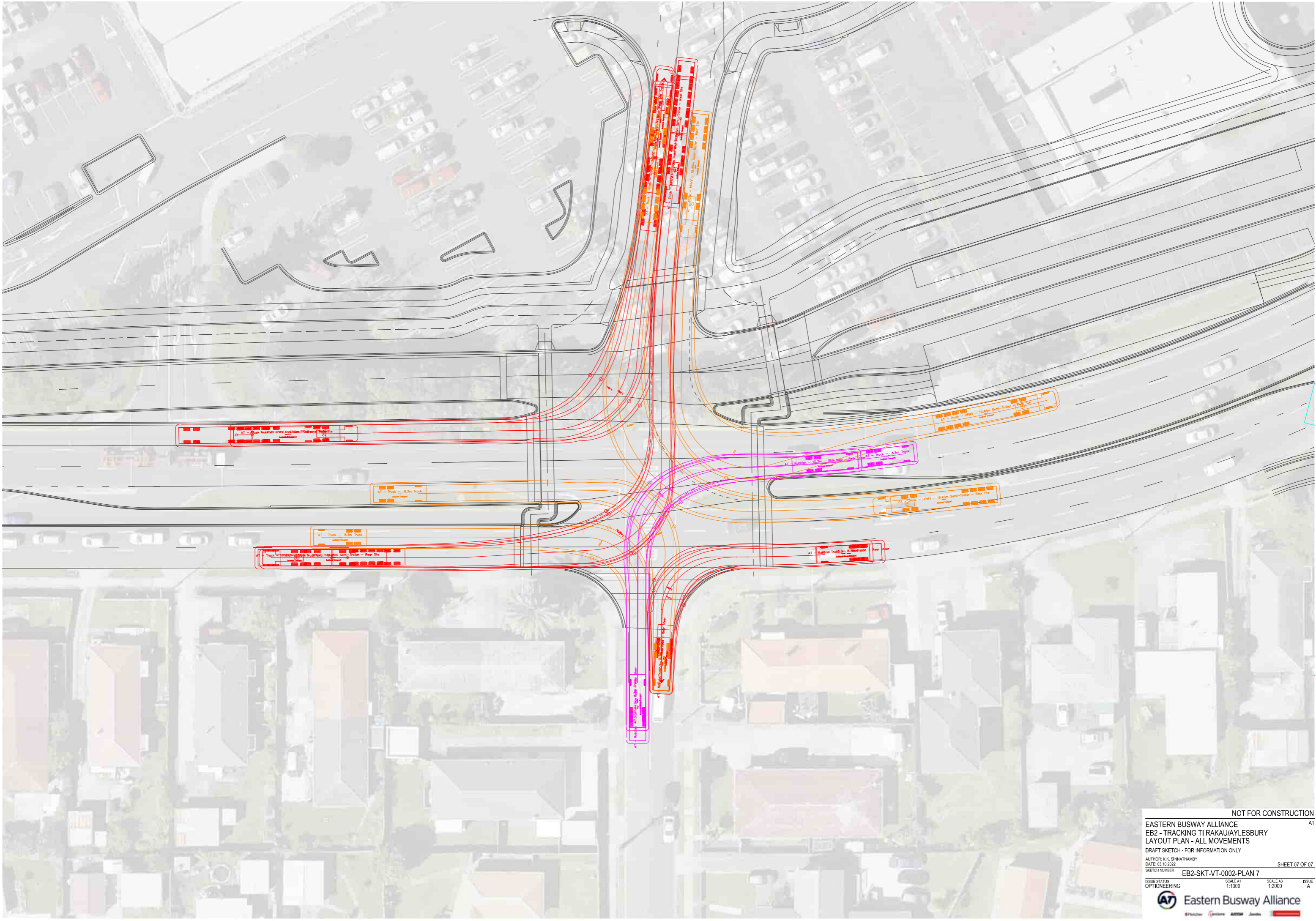
SCALE A1 1:1000	SCALE A3 1:2000	ISSUE A
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**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.163m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.06s
Max Steering Angle (Virtual)	47.00°



**TRACKING VEHICLE**

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Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - 95th - Car**

Overall Length	5.060m
Overall Width	1.923m
Overall Body Height	1.784m
Min Body Ground Clearance	0.231m
Max Track Width	1.888m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.450m

**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**

NOT FOR CONSTRUCTION A1

EASTERN BUSWAY ALLIANCE  
EB2 - TRACKING CORTINA/AYLESBURY  
LAYOUT PLAN - DESIGN VEHICLES  
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
DATE: 03.10.2022  
SHEET 01 OF 05

SKETCH NUMBER: EB2-SKT-VT-0003-PLAN 1

ISSUE STATUS: OPTONEERING SCALE A1: 1:1000 SCALE A3: 1:2000 ISSUE A

**TRACKING VEHICLE**

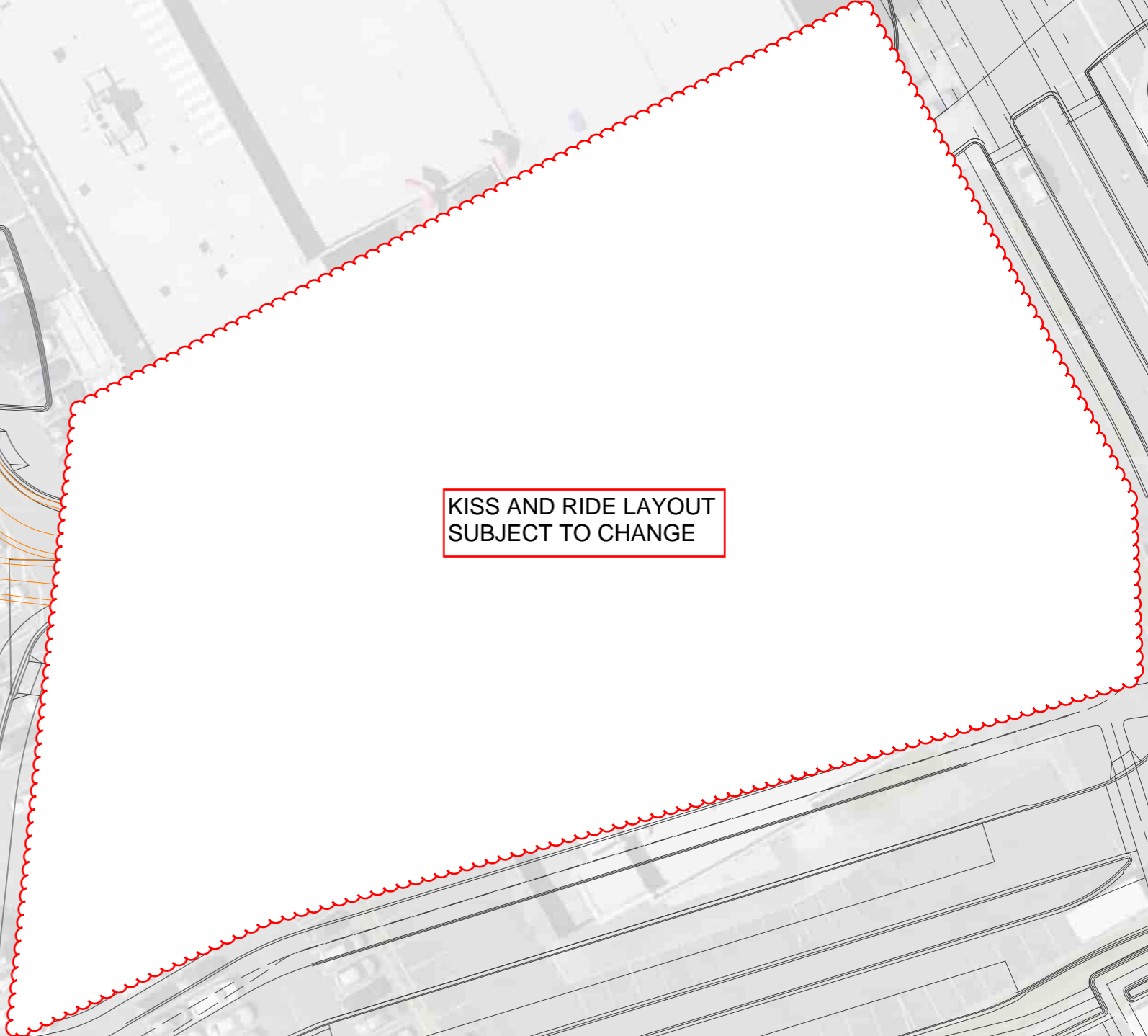
**AT - Truck - 8.3m Truck**

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Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

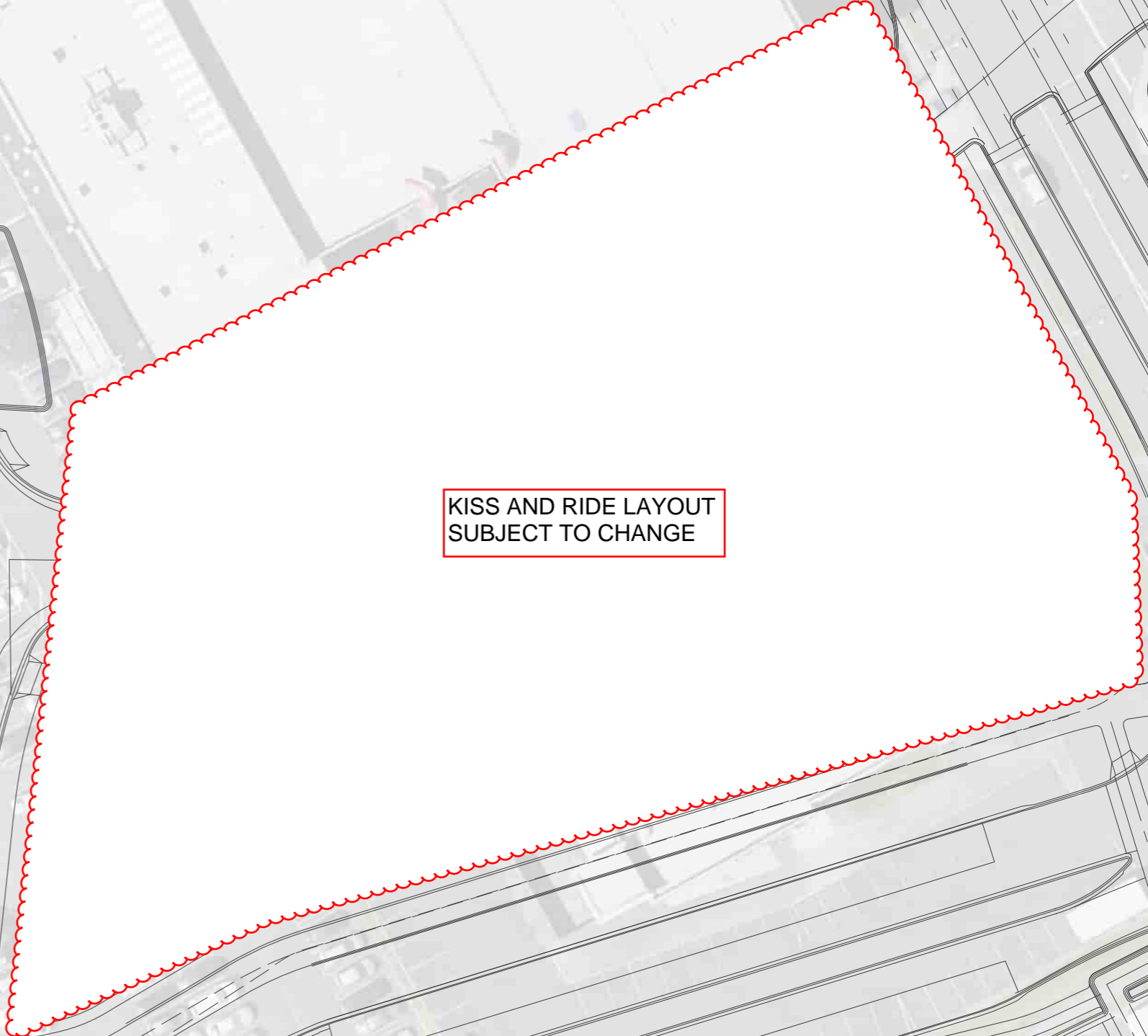
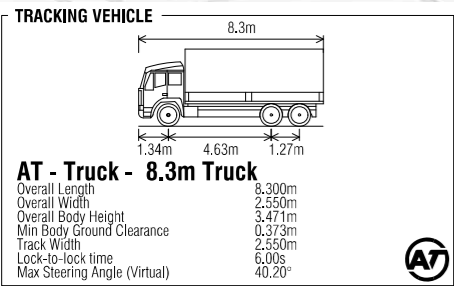
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Max Track Width	1.888m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.450m

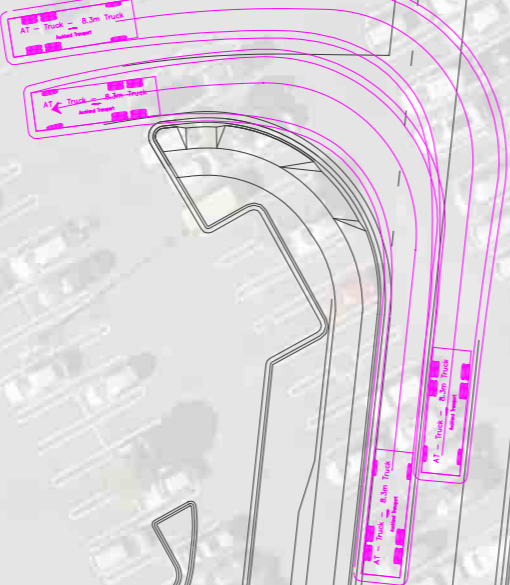


**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**





**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**

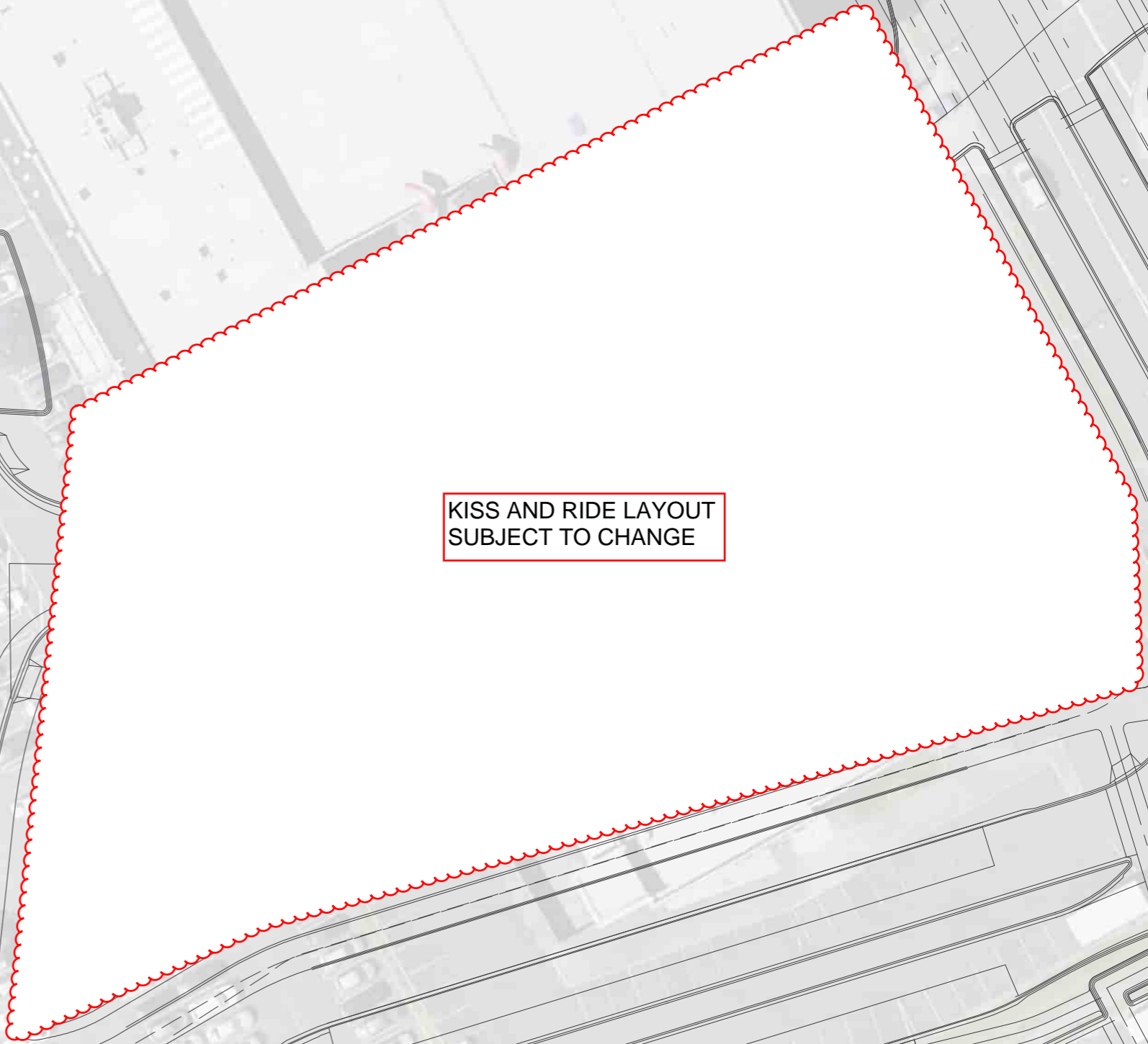


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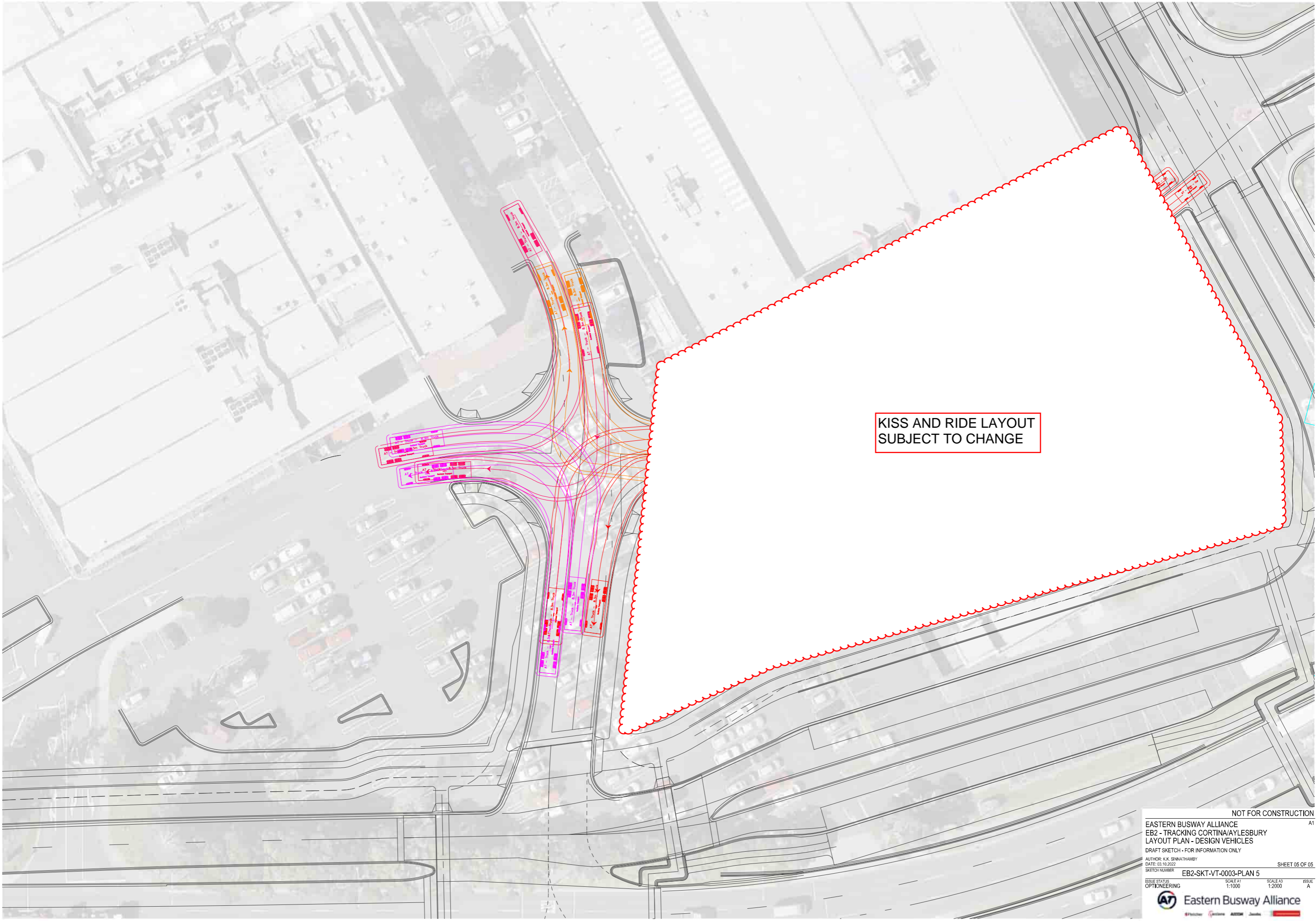
**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

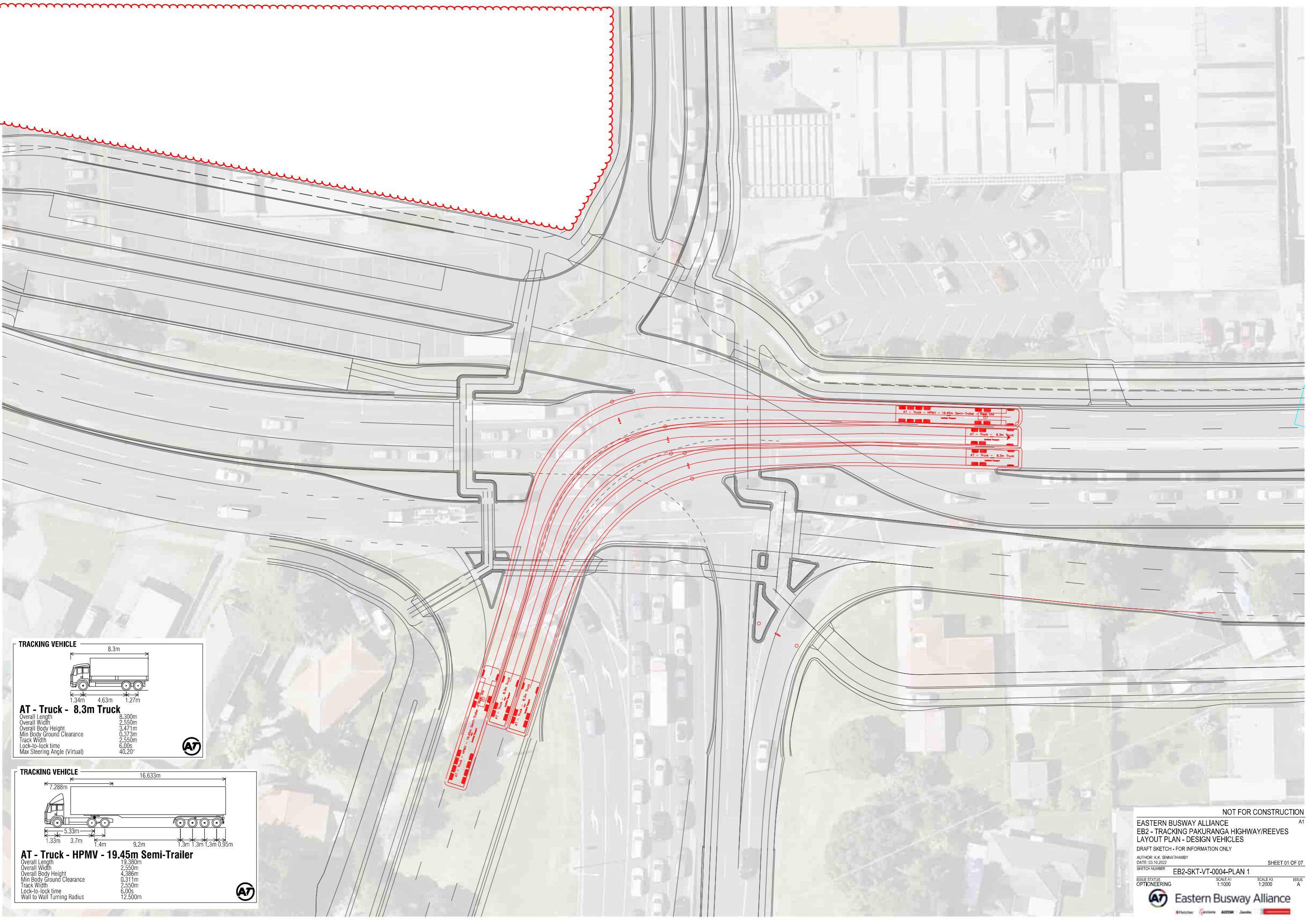
Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°



**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**



KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE



**TRACKING VEHICLE**

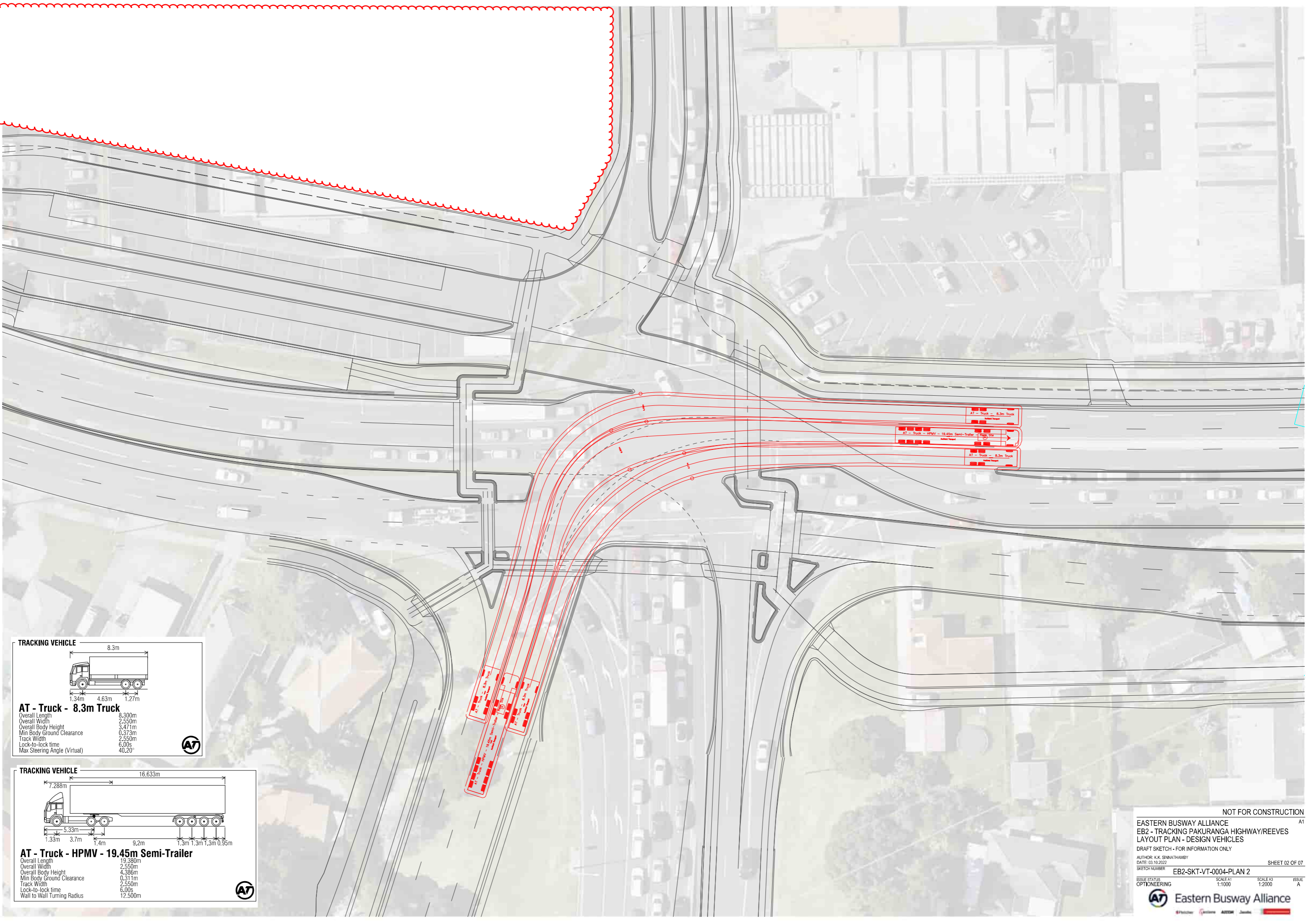
**AT - Truck - 8.3m Truck**

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Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - HPMV - 19.45m Semi-Trailer**

Overall Length	19.380m
Overall Width	2.550m
Overall Body Height	4.386m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m



**TRACKING VEHICLE**

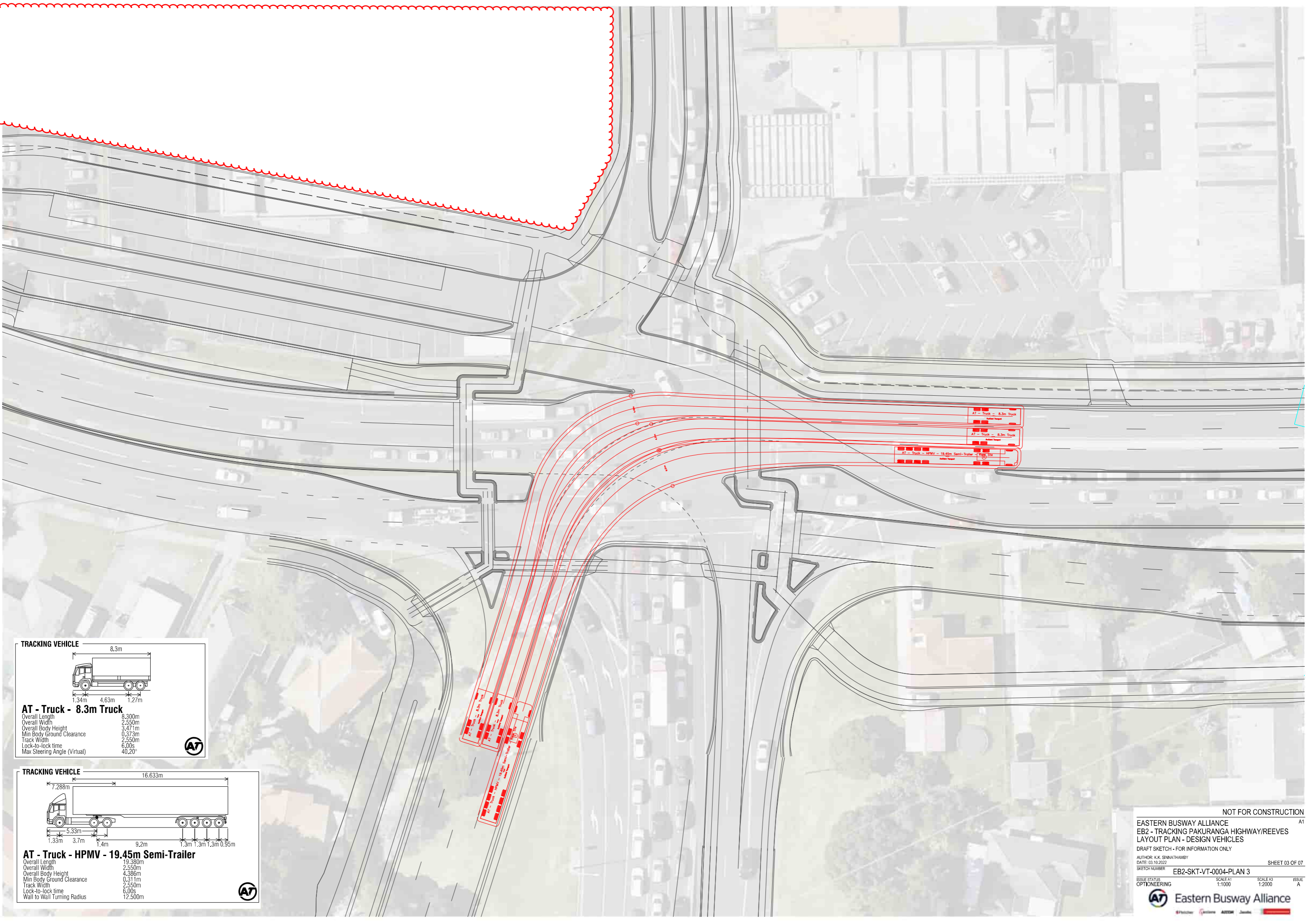
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**TRACKING VEHICLE**

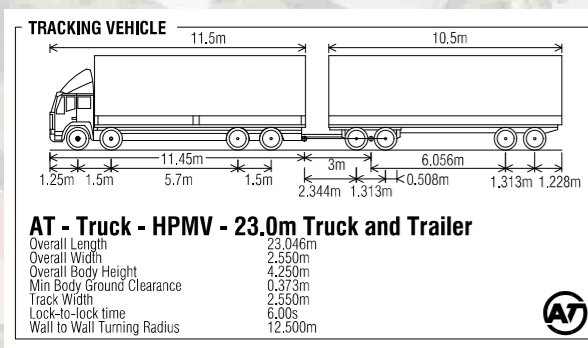
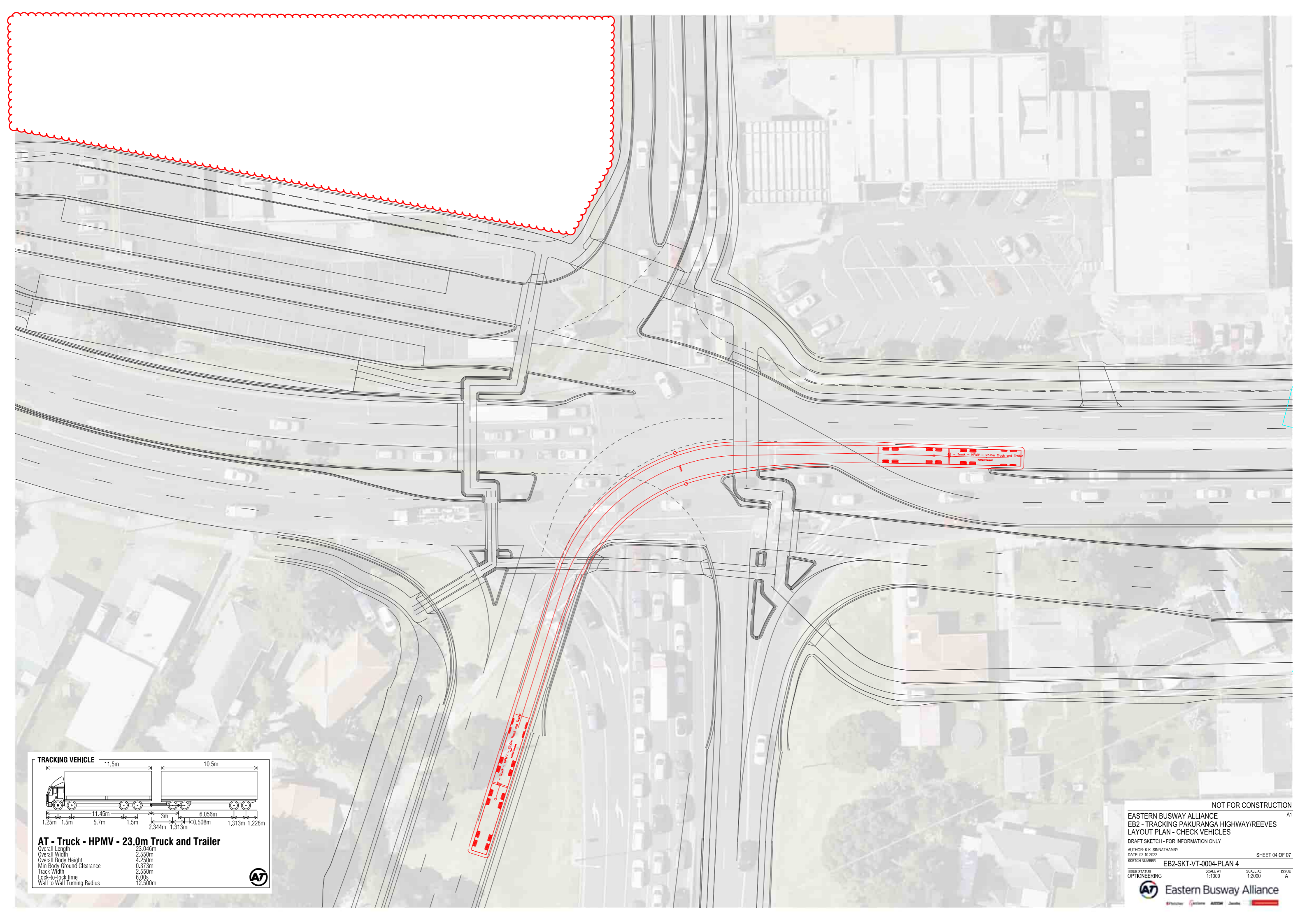
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NOT FOR CONSTRUCTION A1

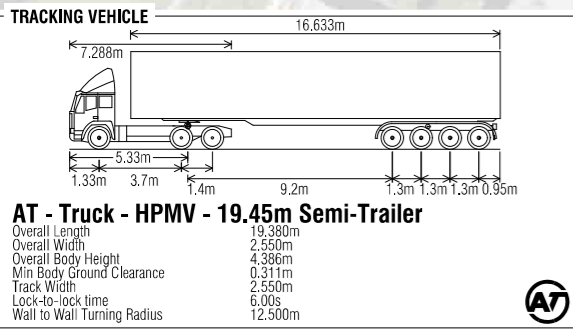
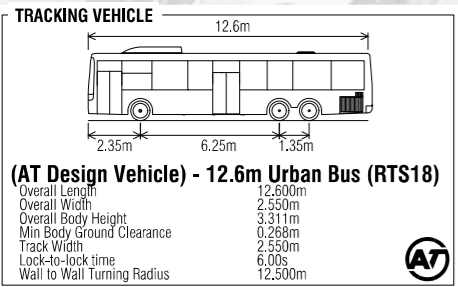
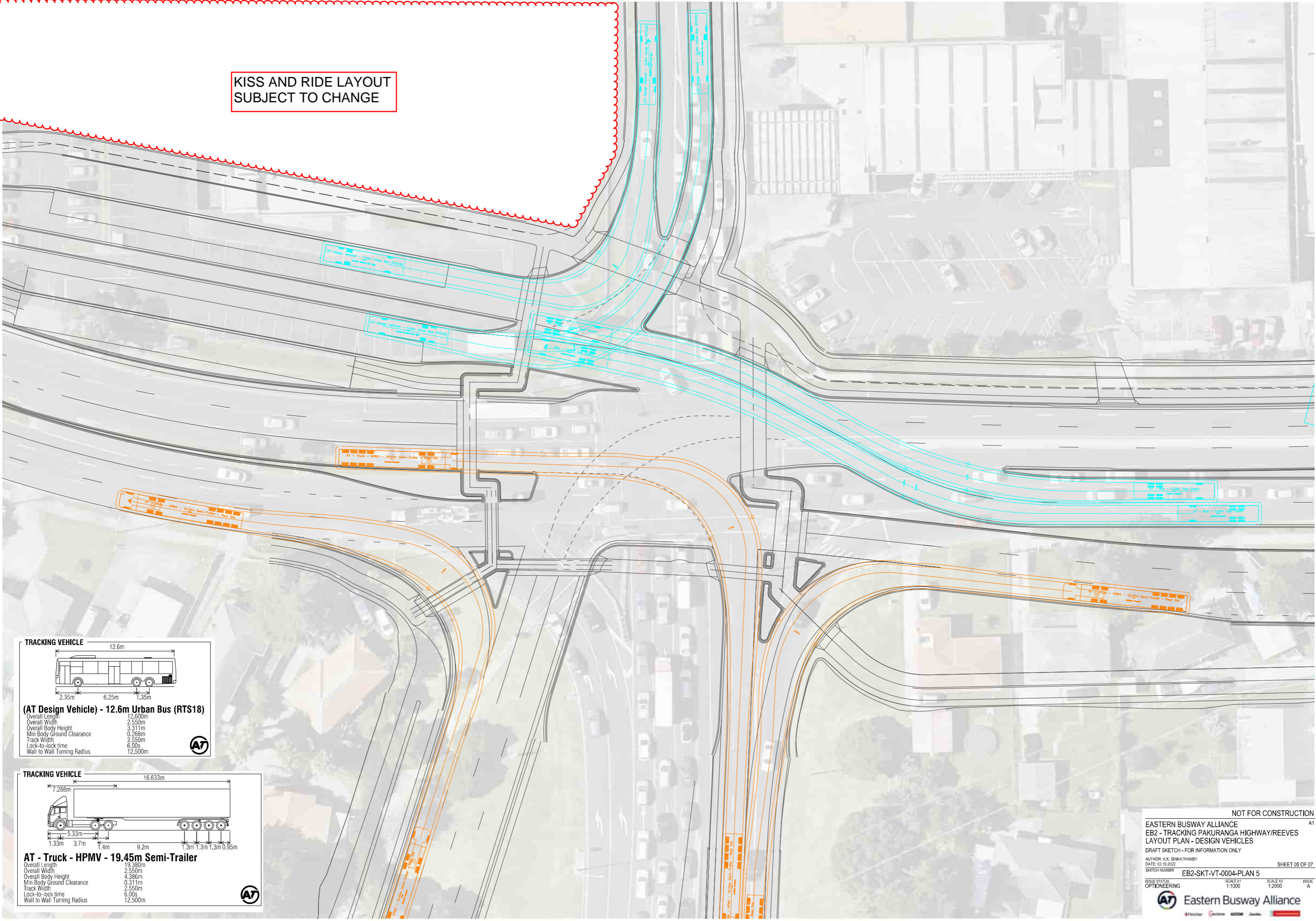
**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAKURANGA HIGHWAY/REEVES**  
**LAYOUT PLAN - CHECK VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0004-PLAN 4

ISSUE STATUS: OPTONEERING  
 SCALE A1: 1:1000  
 SCALE A3: 1:2000  
 SCALE A: A

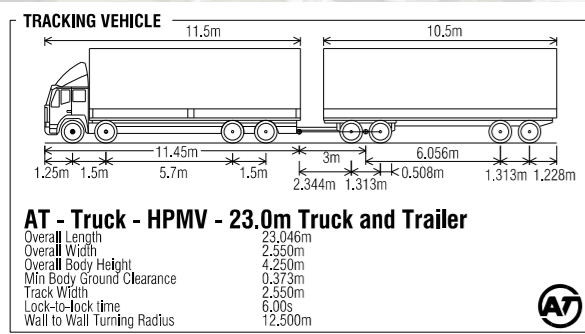
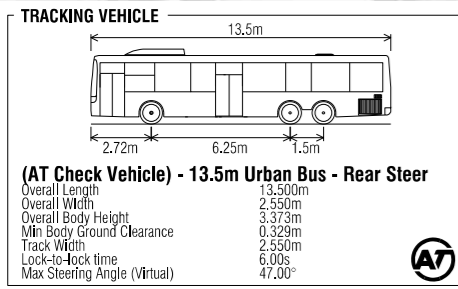
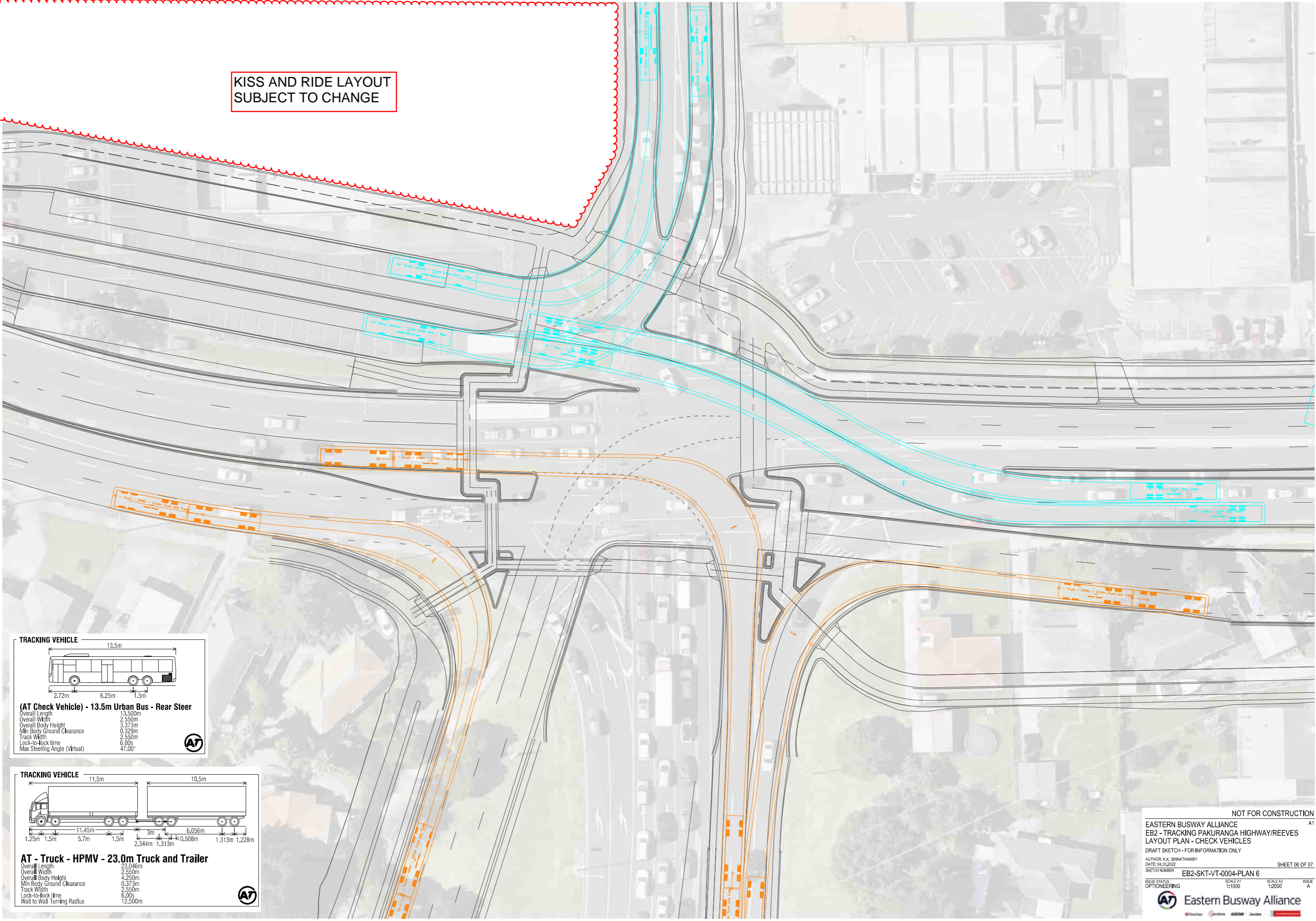
SHEET 04 OF 07

**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**

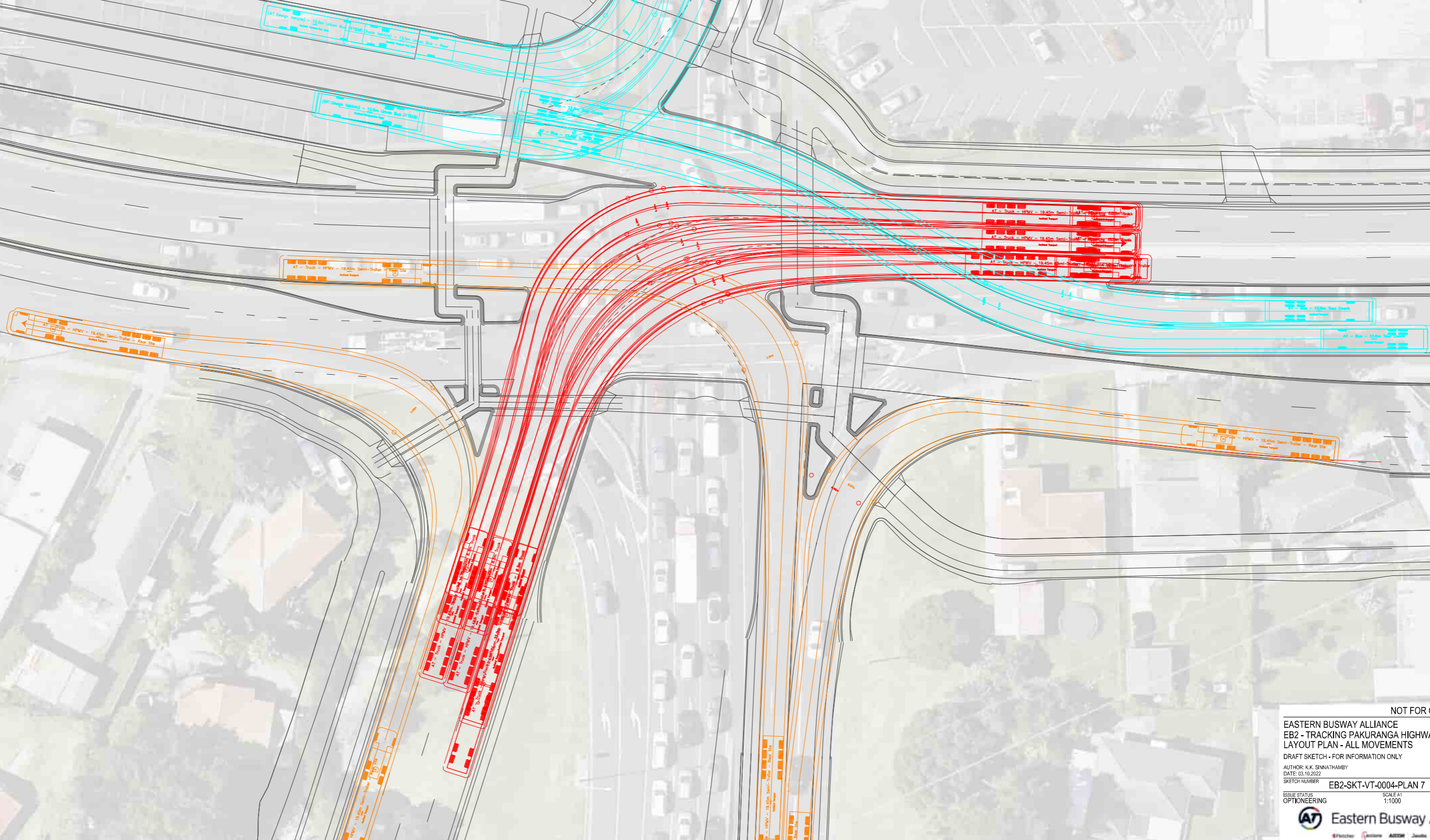




**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**



KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE

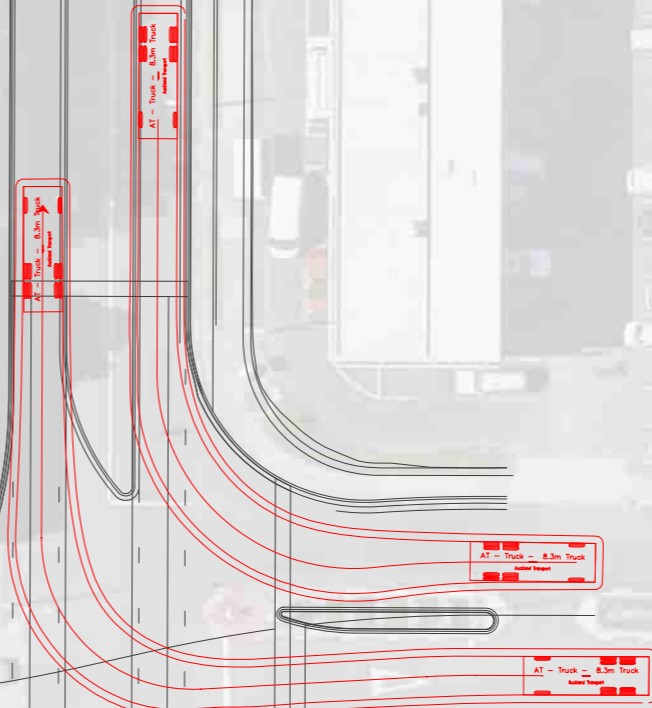


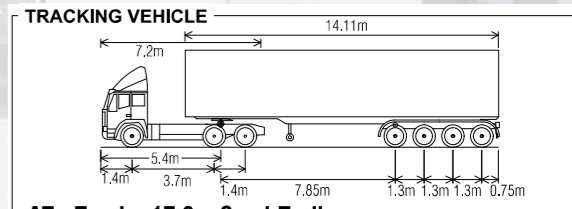
**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE**





**AT - Truck - 17.9m Semi-Trailer**

Overall Length	17.90m
Overall Width	2.550m
Overall Body Height	4.371m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m



Adjust median island to suit tracking

KISS AND RIDE LAYOUT SUBJECT TO CHANGE

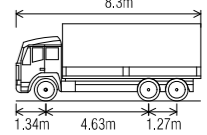
NOT FOR CONSTRUCTION A1

EASTERN BUSWAY ALLIANCE  
 EB2 - TRACKING CORTINA/REEVES  
 LAYOUT PLAN - CHECK VEHICLES

DRAFT SKETCH - FOR INFORMATION ONLY  
 AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0005-PLAN 2  
 ISSUE STATUS: SCALE A1 1:1000 SCALE A3 1:2000 SCALE A  
 OPTONEERING



TRACKING VEHICLE



AT - Truck - 8.3m Truck

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°



KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE

NOT FOR CONSTRUCTION

EASTERN BUSWAY ALLIANCE  
EB2 - TRACKING CORTINA/REEVES  
LAYOUT PLAN - DESIGN VEHICLES

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY

DATE: 03.10.2022

SKETCH NUMBER: EB2-SKT-VT-0005-PLAN 3

SHEET 03 OF 05

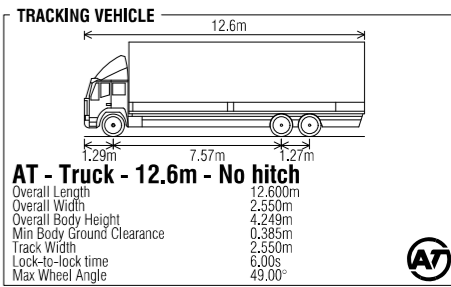
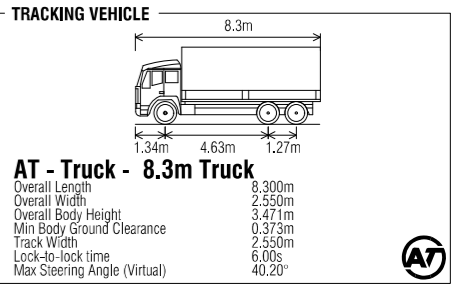
ISSUE STATUS: OPTONEERING

SCALE A1: 1:1000

SCALE A3: 1:2000

ISSUE: A





KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE

NOT FOR CONSTRUCTION

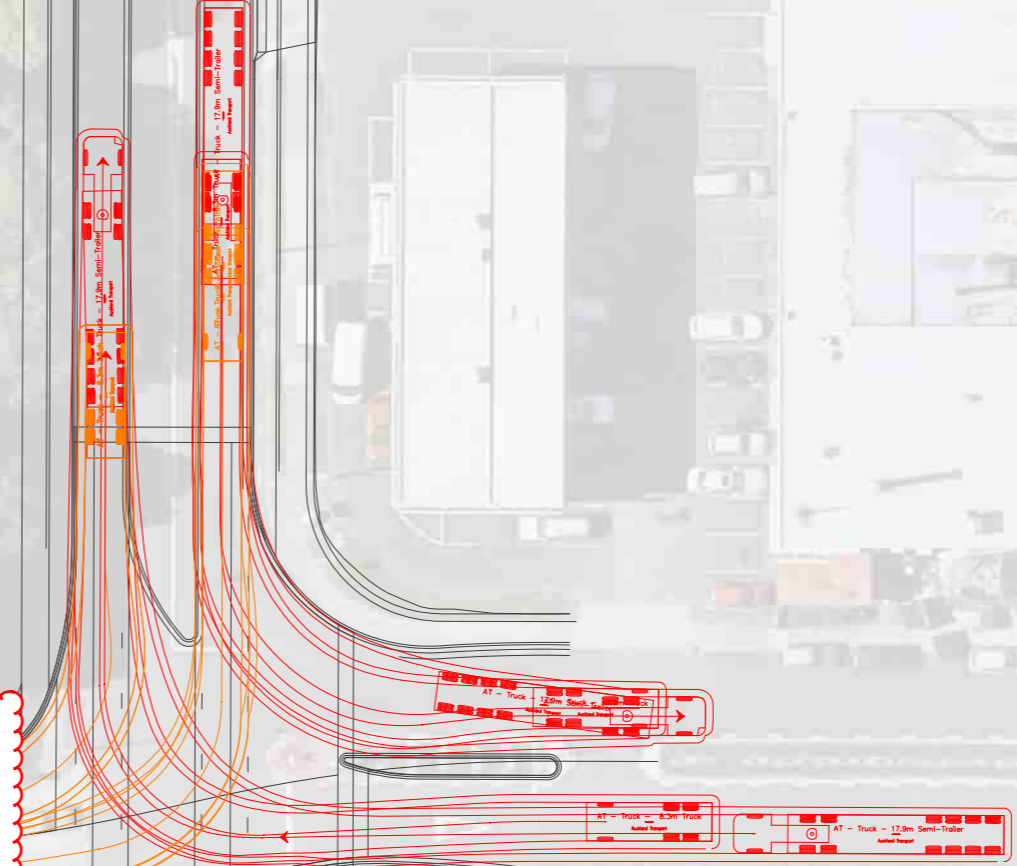
EASTERN BUSWAY ALLIANCE  
EB2 - TRACKING CORTINA/REEVES  
LAYOUT PLAN - CHECK VEHICLES  
DRAFT SKETCH - FOR INFORMATION ONLY

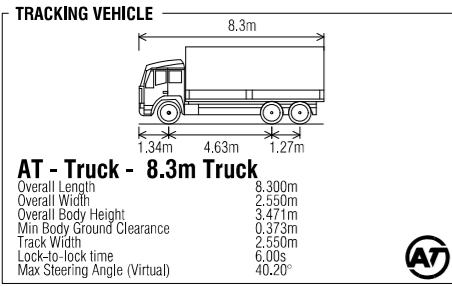
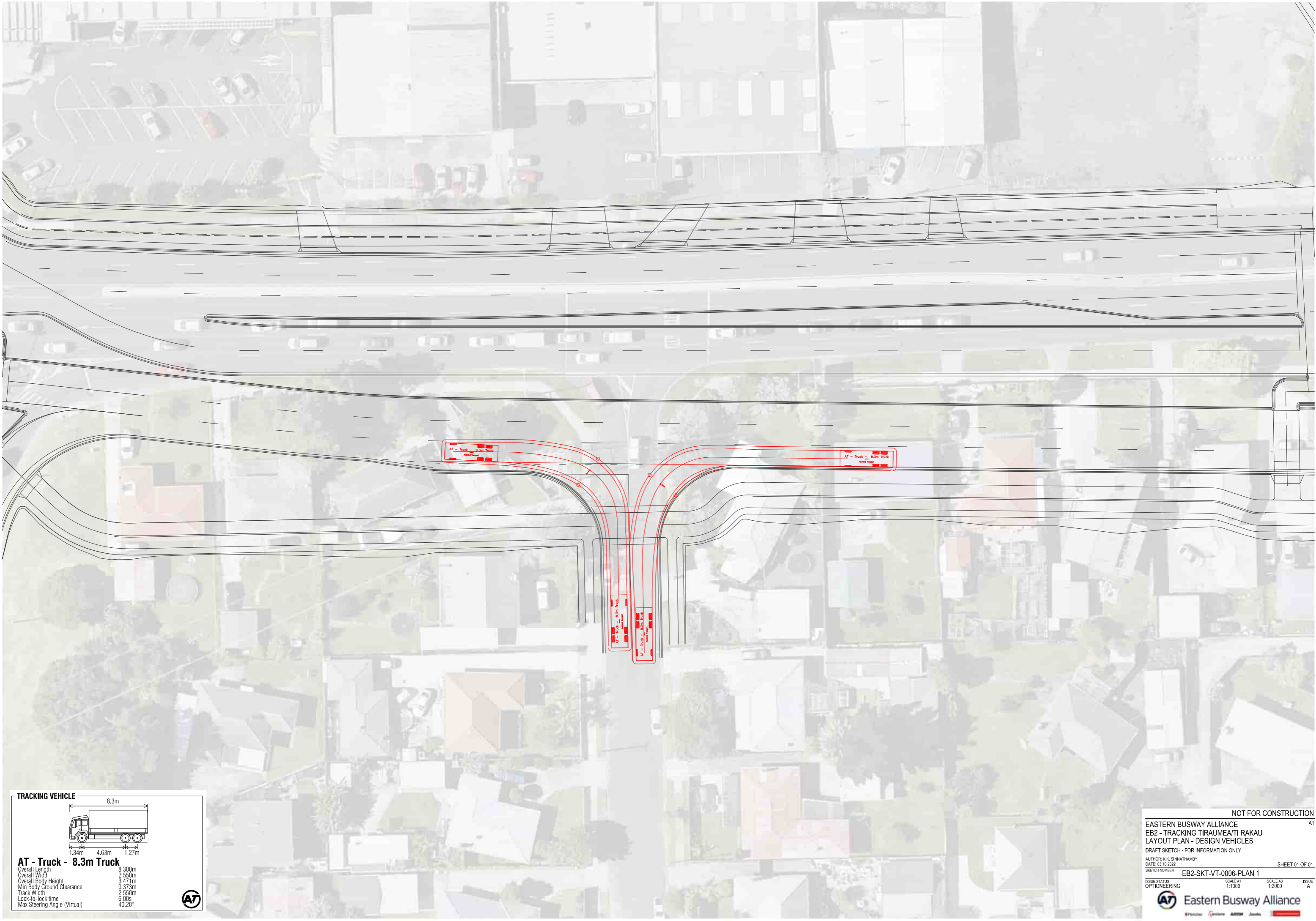
AUTHOR: K.K. SINNATHAMBY  
DATE: 03.10.2022  
SKETCH NUMBER: EB2-SKT-VT-0005-PLAN 4

SCALE A1: 1:1000  
SCALE A3: 1:2000  
ISSUE STATUS: OPTONEERING  
SHEET 04 OF 05  
ISSUE: A



KISS AND RIDE LAYOUT  
SUBJECT TO CHANGE





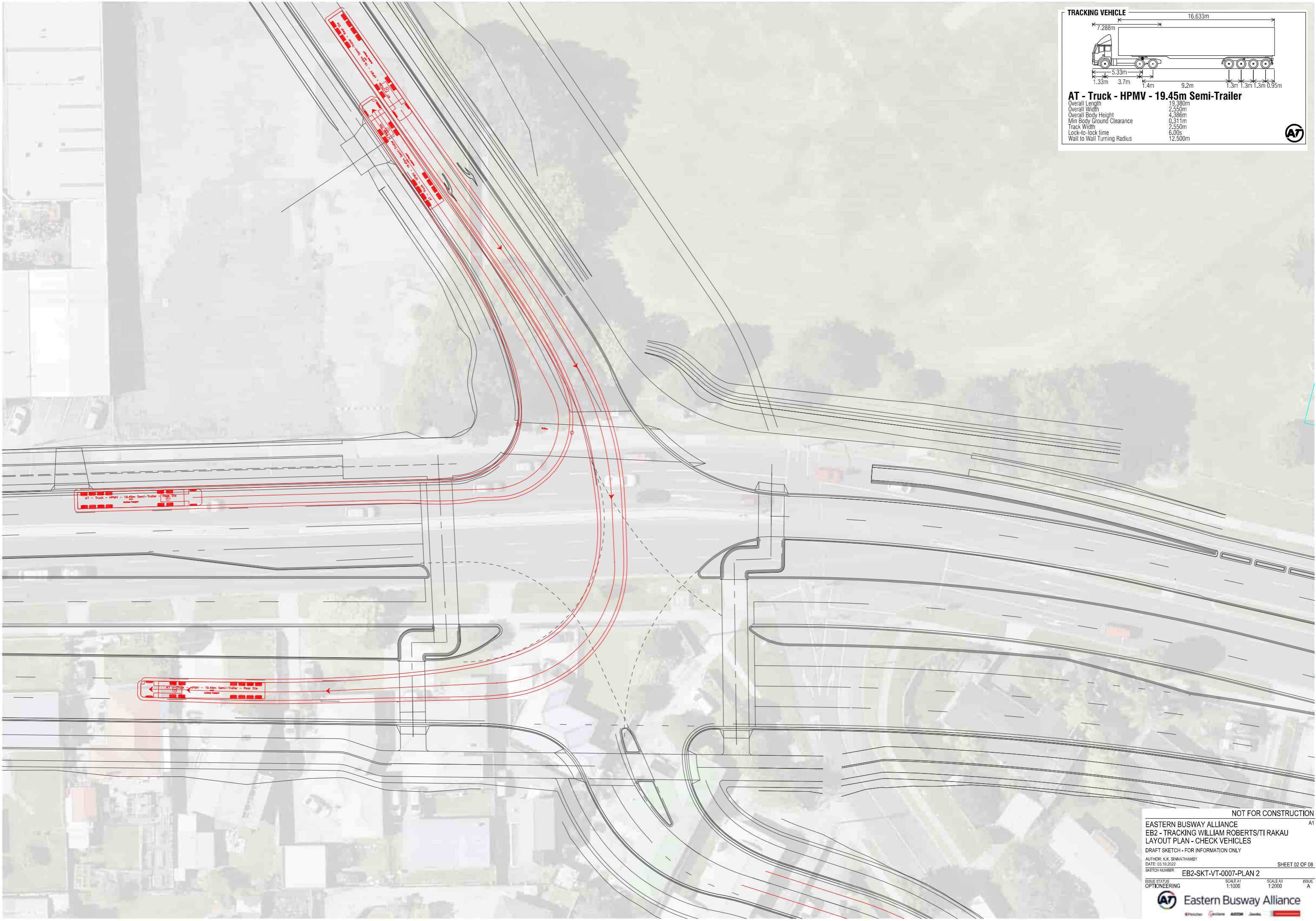


**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°





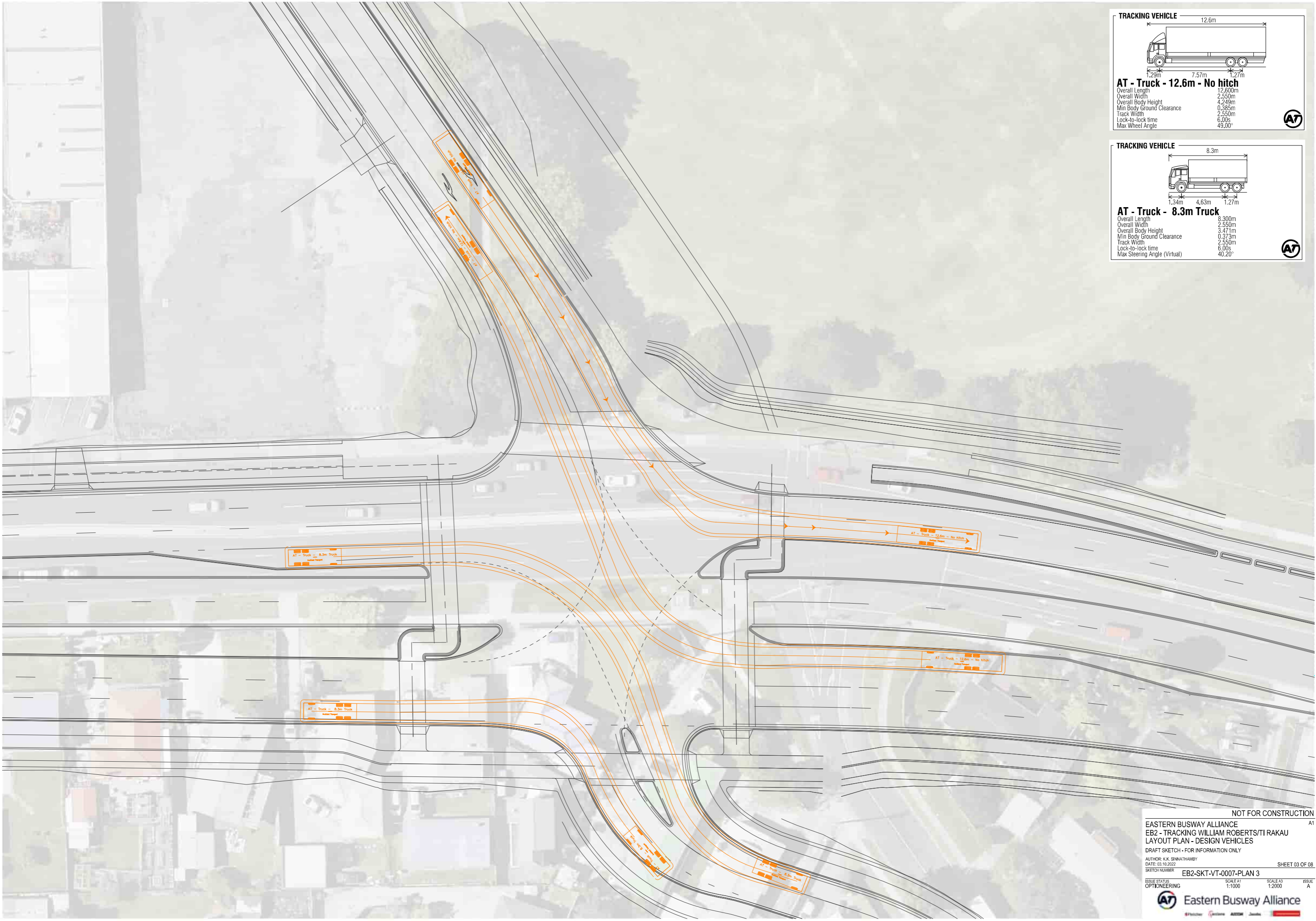
**TRACKING VEHICLE**

**AT - Truck - HPMV - 19.45m Semi-Trailer**

Overall Length	19.380m
Overall Width	2.550m
Overall Body Height	4.386m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m

AT - Truck - HPMV - 19.45m Semi-Trailer - Side View

AT - Truck - HPMV - 19.45m Semi-Trailer - Rear View



**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION

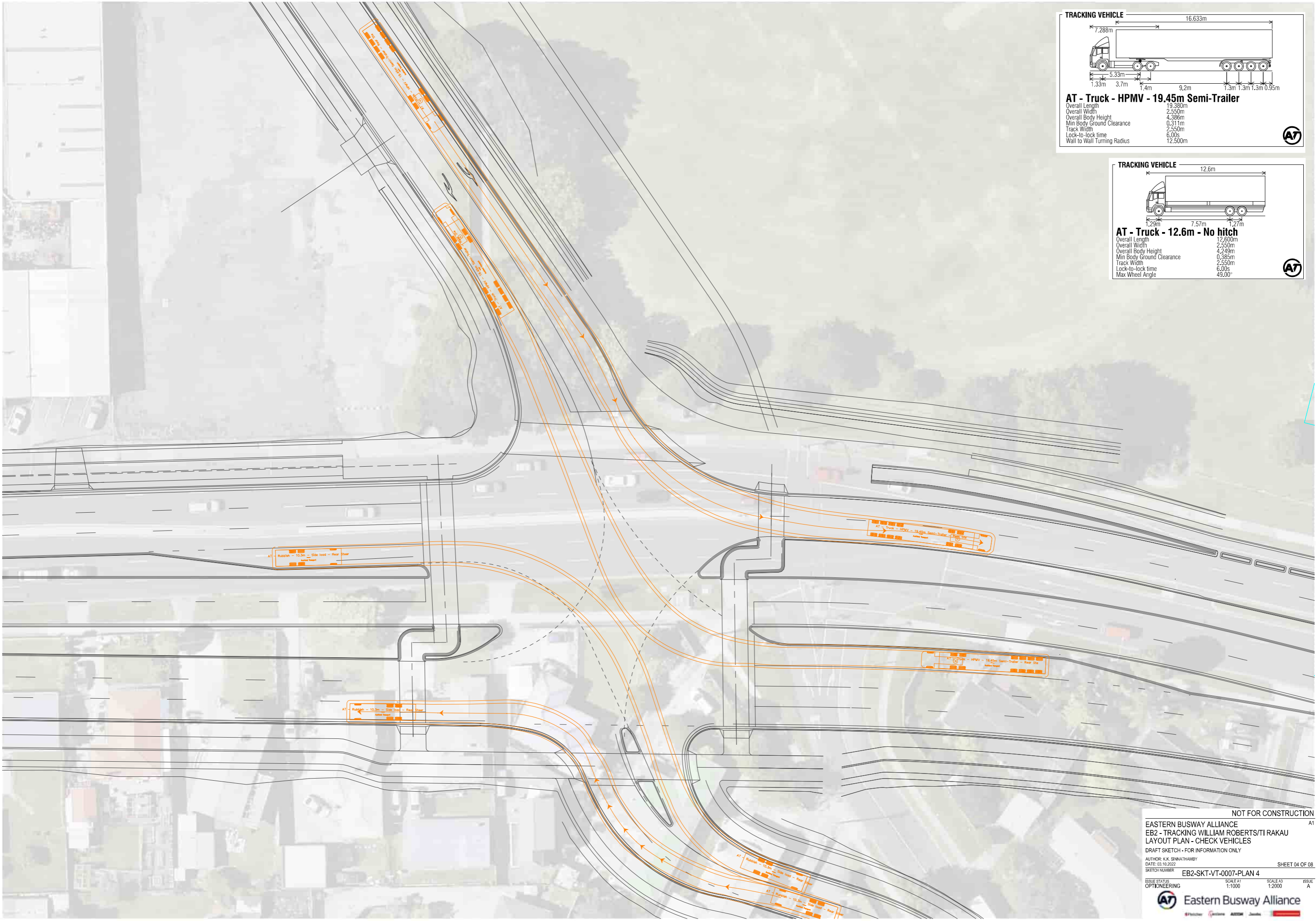
EASTERN BUSWAY ALLIANCE  
 EB2 - TRACKING WILLIAM ROBERTS/TI RAKAU  
 LAYOUT PLAN - DESIGN VEHICLES  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0007-PLAN 3

ISSUE STATUS: OPTONEERING

SCALE A1: 1:1000  
 SCALE A3: 1:2000  
 SCALE A: 1:2000

SHEET 03 OF 08



**TRACKING VEHICLE**

**AT - Truck - HPMV - 19.45m Semi-Trailer**

Overall Length	19.380m
Overall Width	2.550m
Overall Body Height	4.386m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m

**AT**

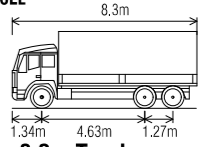
**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°


**AT**

**TRACKING VEHICLE**



**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°




NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING WILLIAM ROBERTS/TI RAKAU**  
**LAYOUT PLAN - DESIGN VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: **EB2-SKT-VT-0007-PLAN 5** SHEET 05 OF 08

ISSUE STATUS: **OPTONEERING** SCALE A1: 1:1000    SCALE A3: 1:2000    ISSUE: A



**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.163m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°



NOT FOR CONSTRUCTION

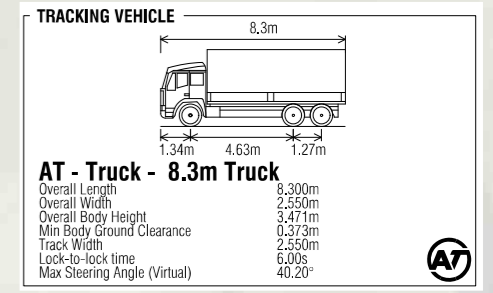
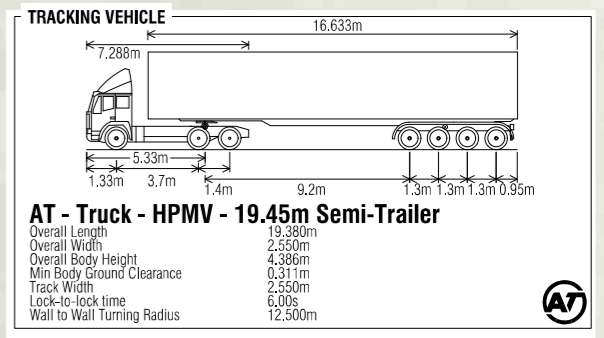
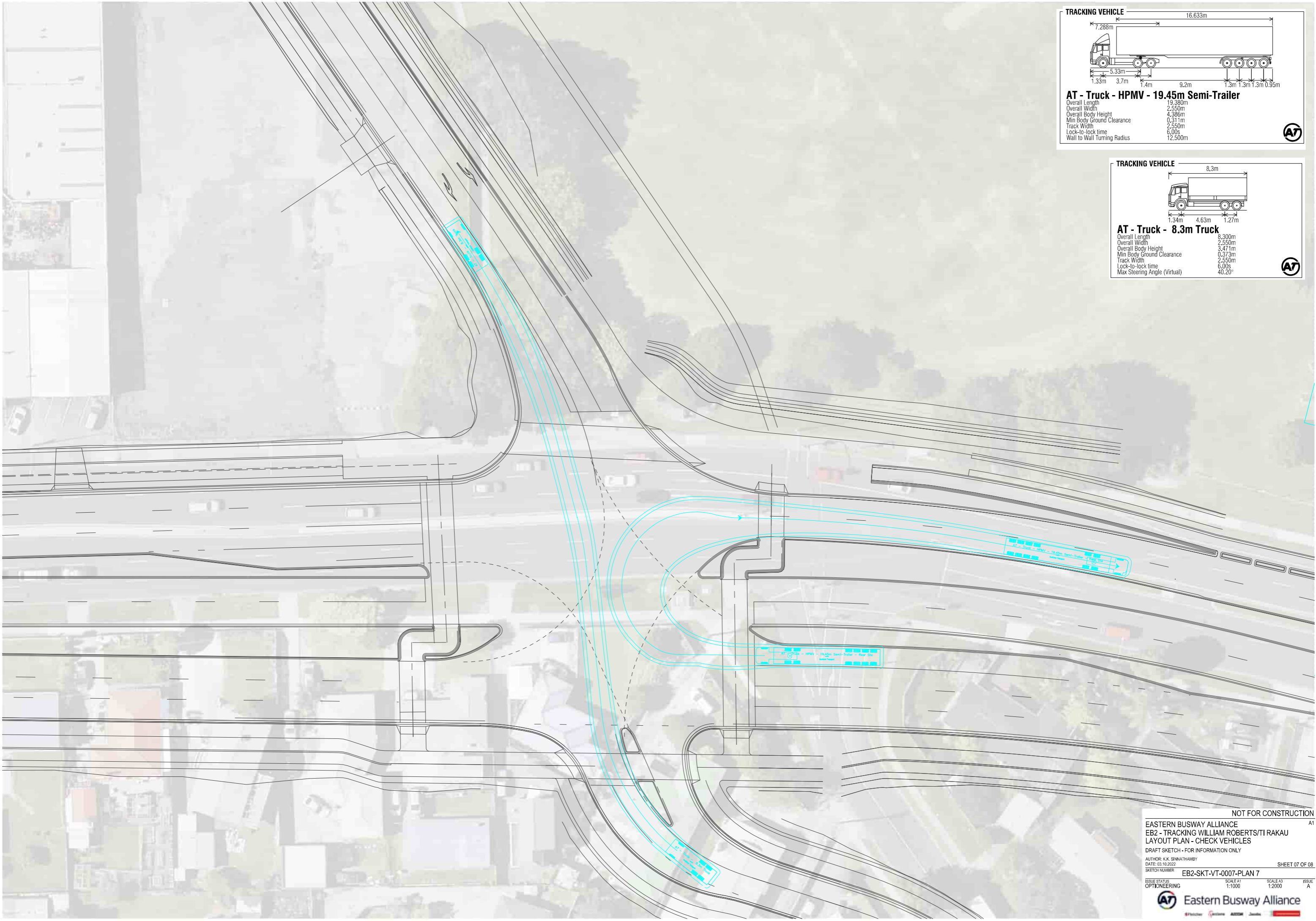
EASTERN BUSWAY ALLIANCE  
 EB2 - TRACKING WILLIAM ROBERTS/TI RAKAU  
 LAYOUT PLAN - CHECK VEHICLES  
 DRAFT SKETCH - FOR INFORMATION ONLY

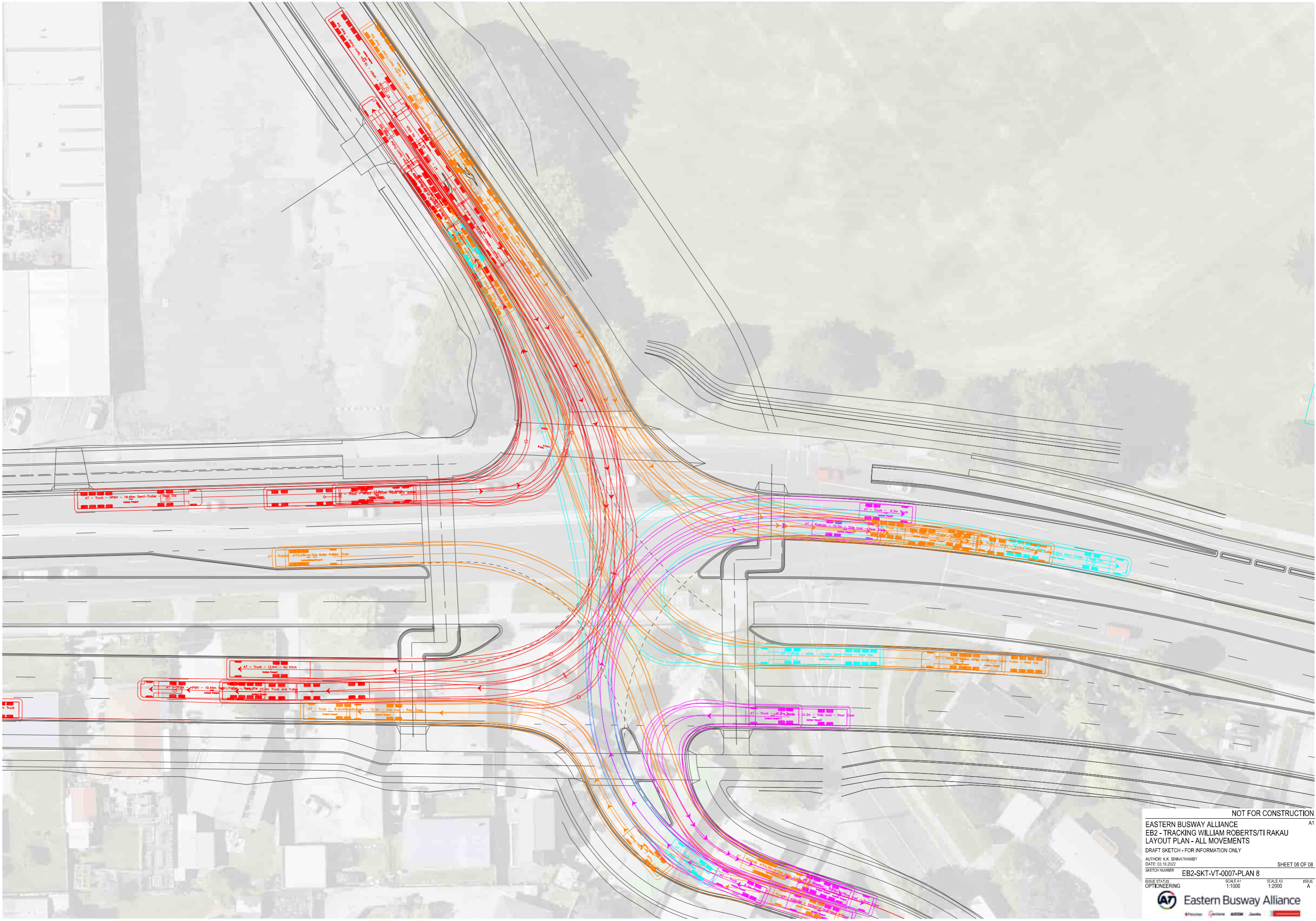
AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0007-PLAN 6

ISSUE STATUS: OPTONEERING  
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 SCALE A3: 1:2000  
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SHEET 06 OF 08

Eastern Busway Alliance





NOT FOR CONSTRUCTION

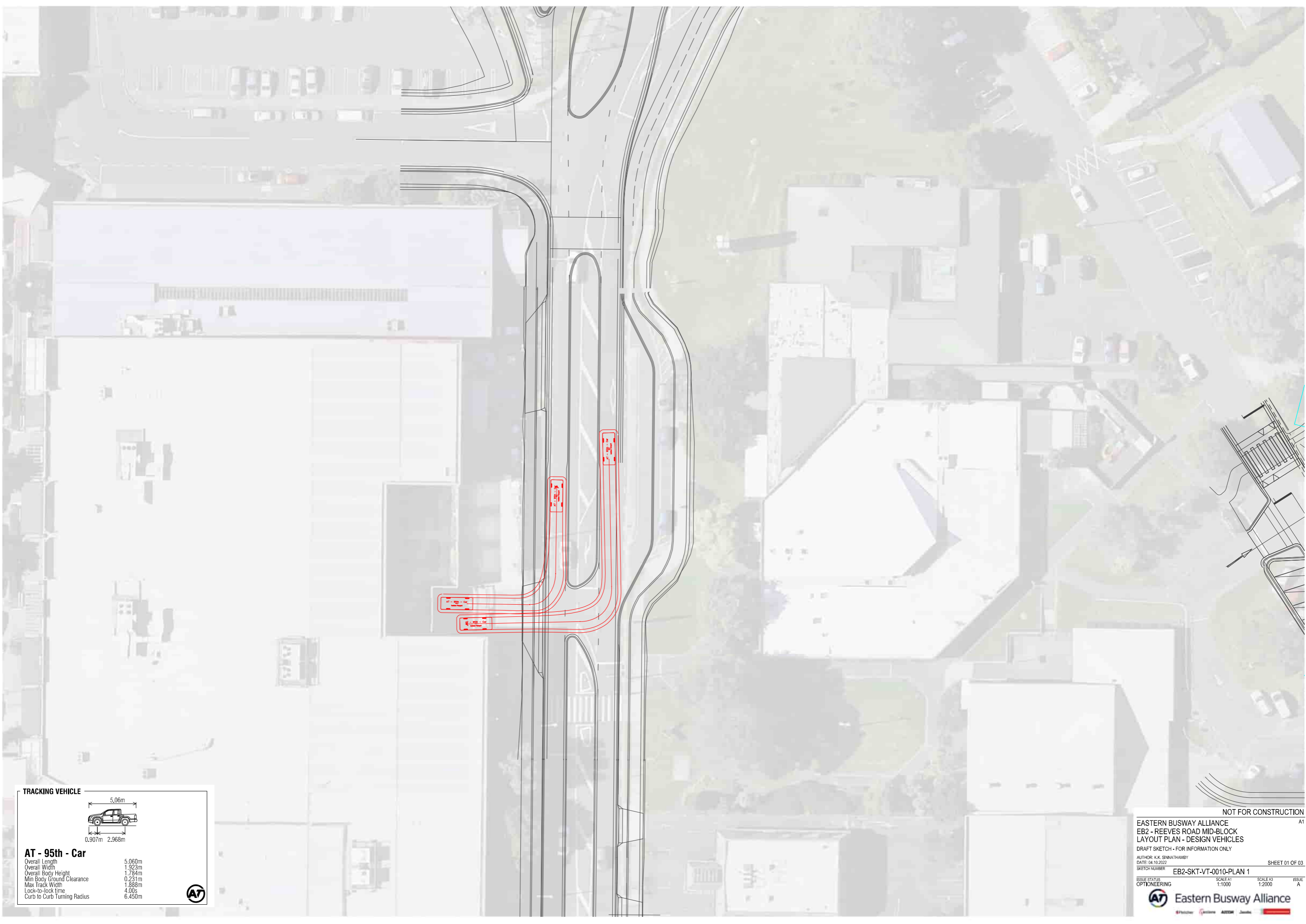
EASTERN BUSWAY ALLIANCE  
 EB2 - TRACKING WILLIAM ROBERTS/TI RAKAU  
 LAYOUT PLAN - ALL MOVEMENTS

DRAFT SKETCH - FOR INFORMATION ONLY  
 AUTHOR: K.K. SINNATHAMBY  
 DATE: 03.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0007-PLAN 8

ISSUE STATUS: OPTONEERING  
 SCALE A1: 1:1000  
 SCALE A3: 1:2000  
 SHEET 08 OF 08  
 ISSUE A







**TRACKING VEHICLE**

**AT - 95th - Car**

Overall Length	5.060m
Overall Width	1.923m
Overall Body Height	1.784m
Min Body Ground Clearance	0.231m
Max Track Width	1.888m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.450m

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB2 - REEVES ROAD MID-BLOCK**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

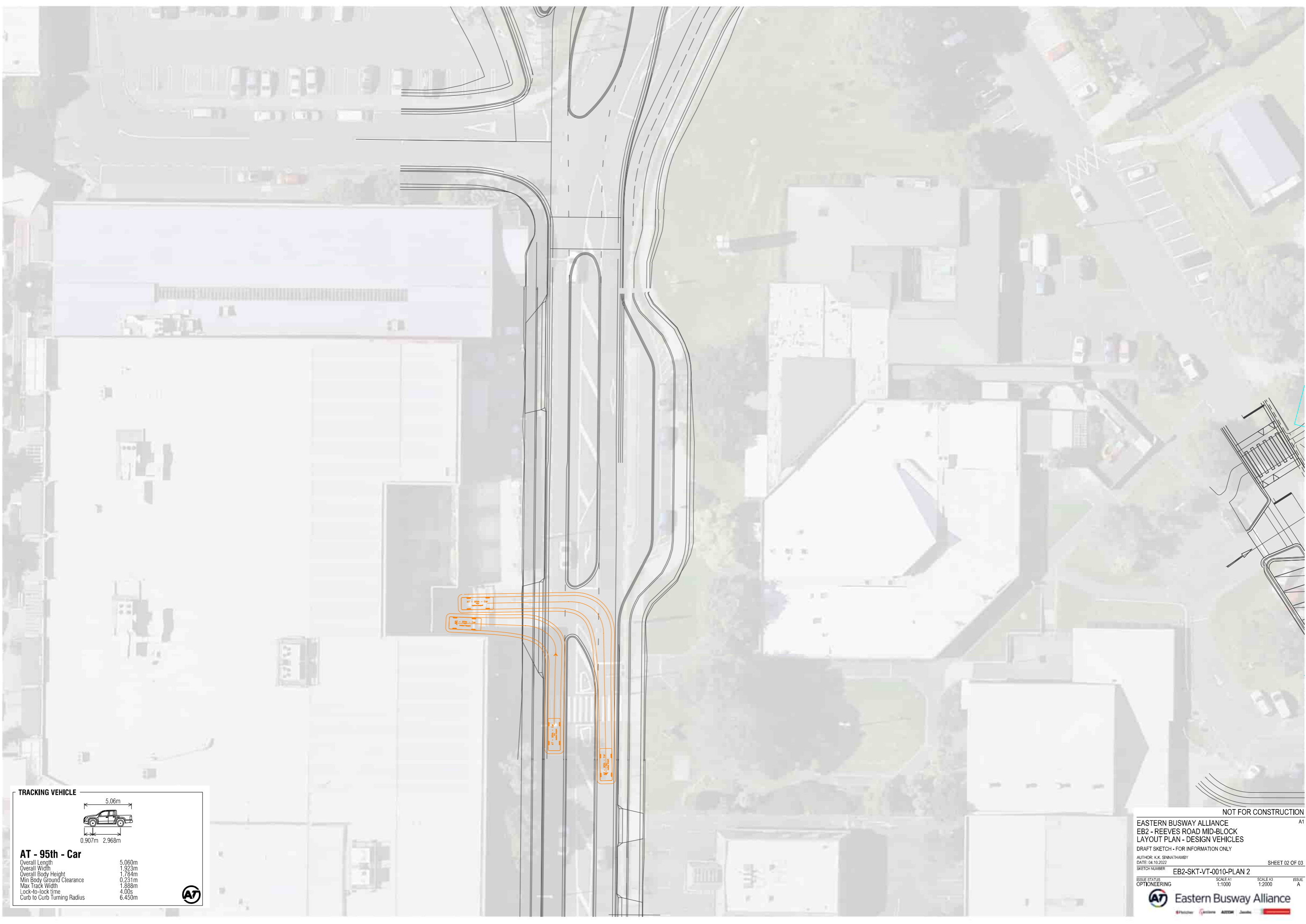
AUTHOR: K.K. SINNATHAMBY  
 DATE: 04.10.2022  
 SHEET 01 OF 03

SKETCH NUMBER: **EB2-SKT-VT-0010-PLAN 1**

ISSUE STATUS: OPTONEERING

SCALE A1	SCALE A3	SCALE A4
1:1000	1:2000	1:2000
		ISSUE A

Eastern Busway Alliance



**TRACKING VEHICLE**

**AT - 95th - Car**

Overall Length	5.060m
Overall Width	1.923m
Overall Body Height	1.784m
Min Body Ground Clearance	0.231m
Max Track Width	1.888m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.450m

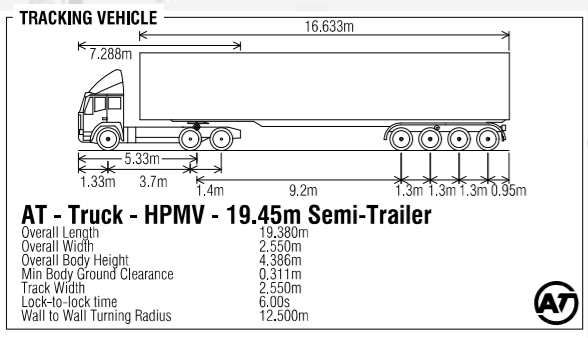
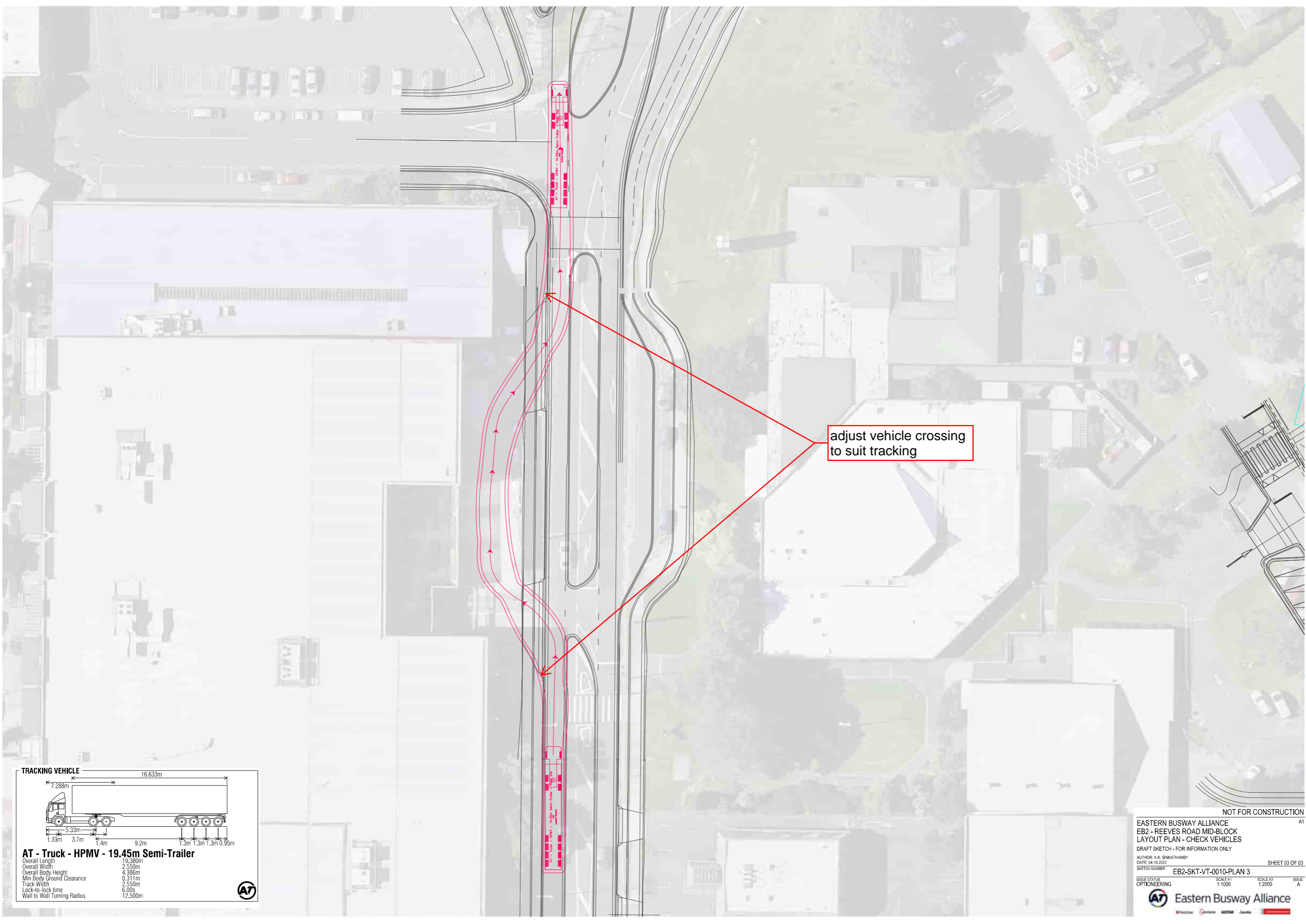
NOT FOR CONSTRUCTION A1

EASTERN BUSWAY ALLIANCE  
EB2 - REEVES ROAD MID-BLOCK  
LAYOUT PLAN - DESIGN VEHICLES  
DRAFT SKETCH - FOR INFORMATION ONLY

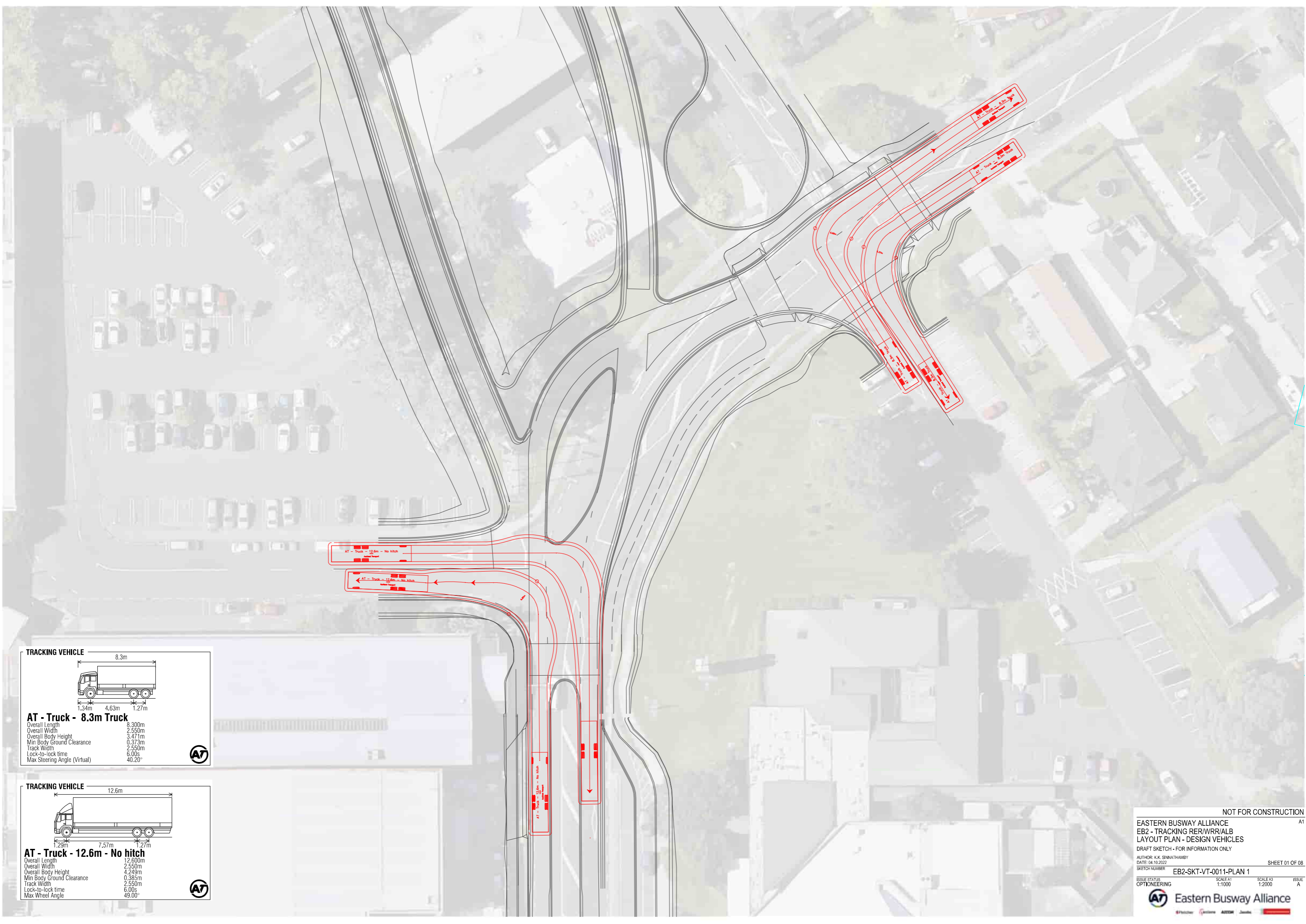
AUTHOR: K.K. SINNATHAMBY  
DATE: 04.10.2022  
SKETCH NUMBER: EB2-SKT-VT-0010-PLAN 2  
ISSUE STATUS: OPTIONEERING

SCALE A1	SCALE A3	ISSUE
1:1000	1:2000	A

Eastern Busway Alliance



adjust vehicle crossing  
to suit tracking



**TRACKING VEHICLE**

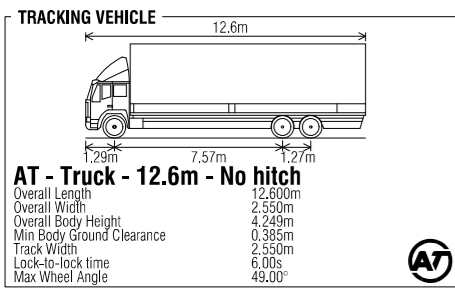
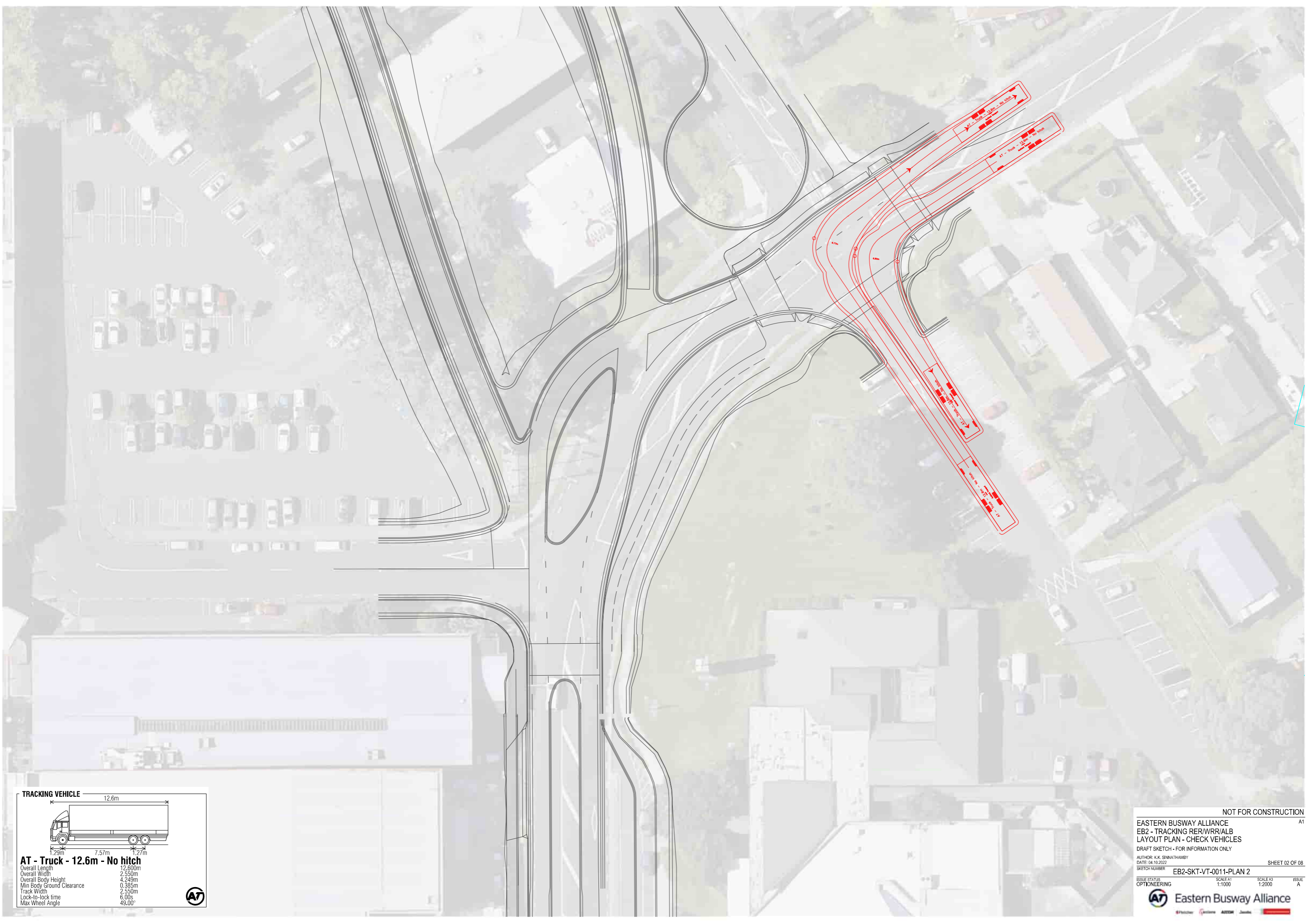
**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

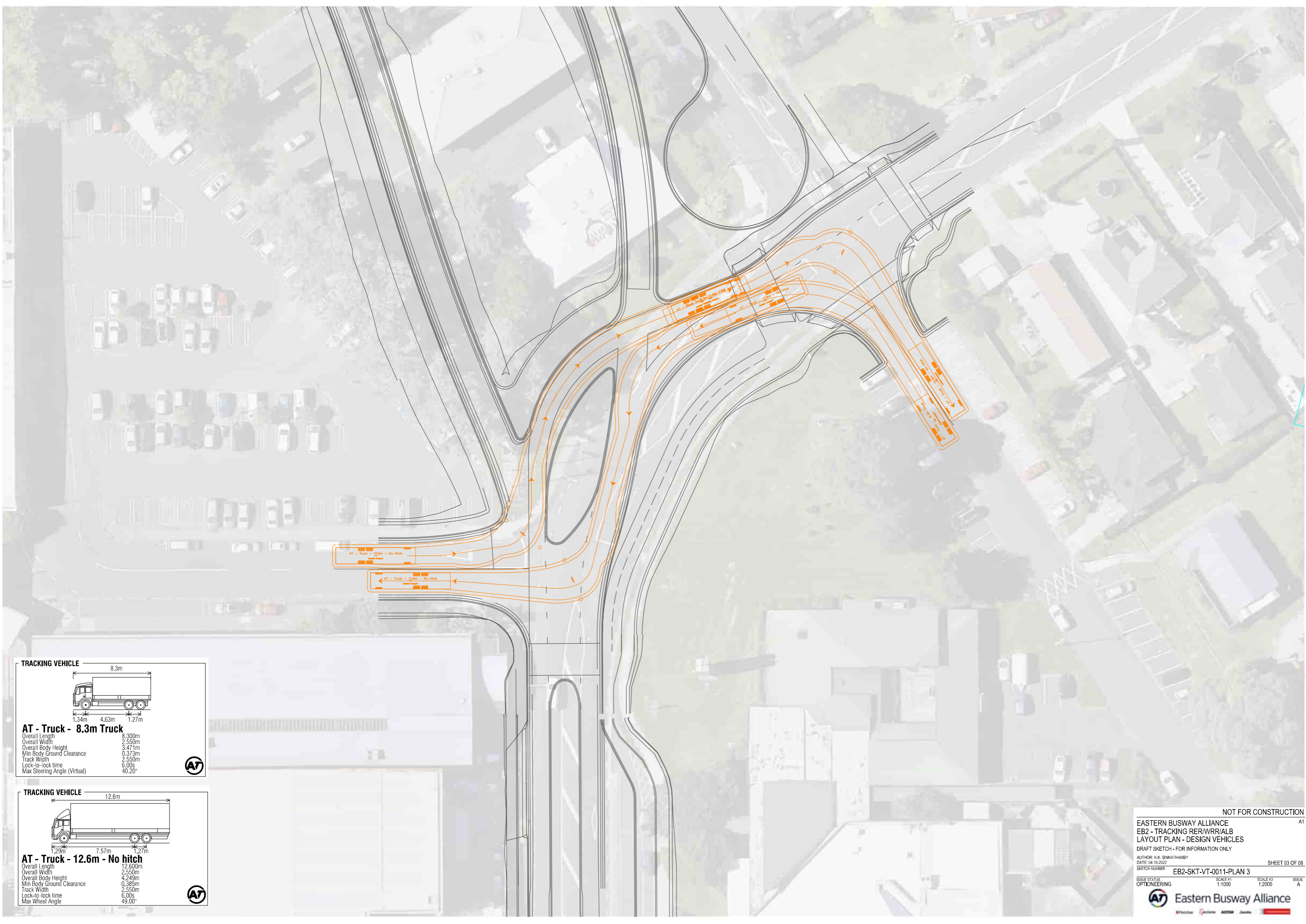


NOT FOR CONSTRUCTION A1

EASTERN BUSWAY ALLIANCE  
EB2 - TRACKING RER/WRR/ALB  
LAYOUT PLAN - CHECK VEHICLES  
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
DATE: 04.10.2022  
SKETCH NUMBER: EB2-SKT-VT-0011-PLAN 2  
SHEET 02 OF 08

ISSUE STATUS: OPTONEERING  
SCALE A1: 1:1000  
SCALE A3: 1:2000  
ISSUE: A



**TRACKING VEHICLE**

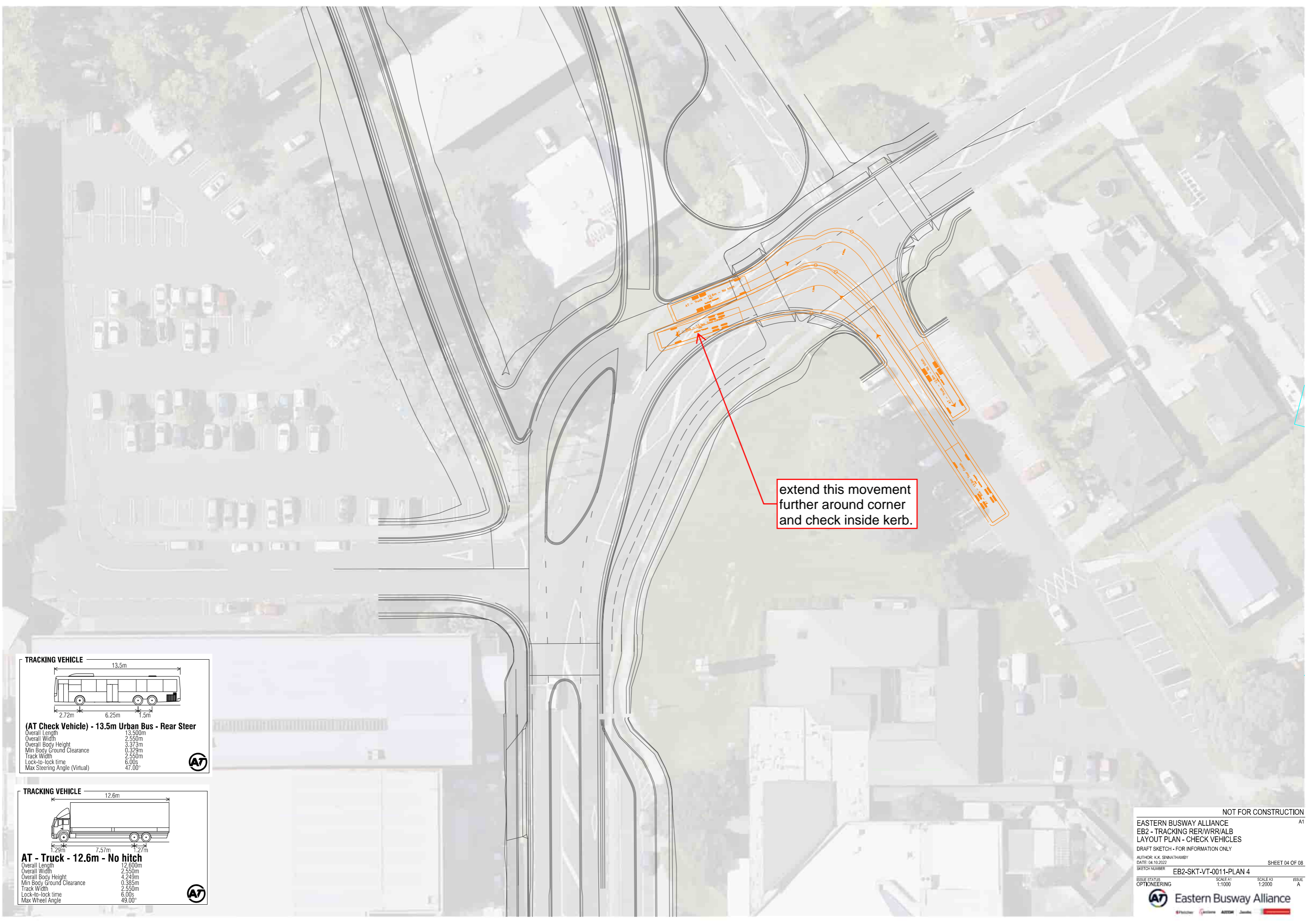
**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

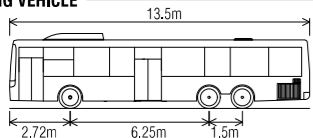
**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.365m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°



extend this movement further around corner and check inside kerb.

**TRACKING VEHICLE**

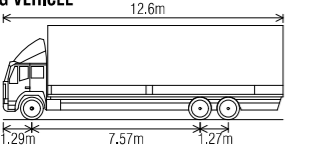


**(AT Check Vehicle) - 13.5m Urban Bus - Rear Steer**

Overall Length	13.500m
Overall Width	2.550m
Overall Body Height	3.373m
Min Body Ground Clearance	0.329m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°



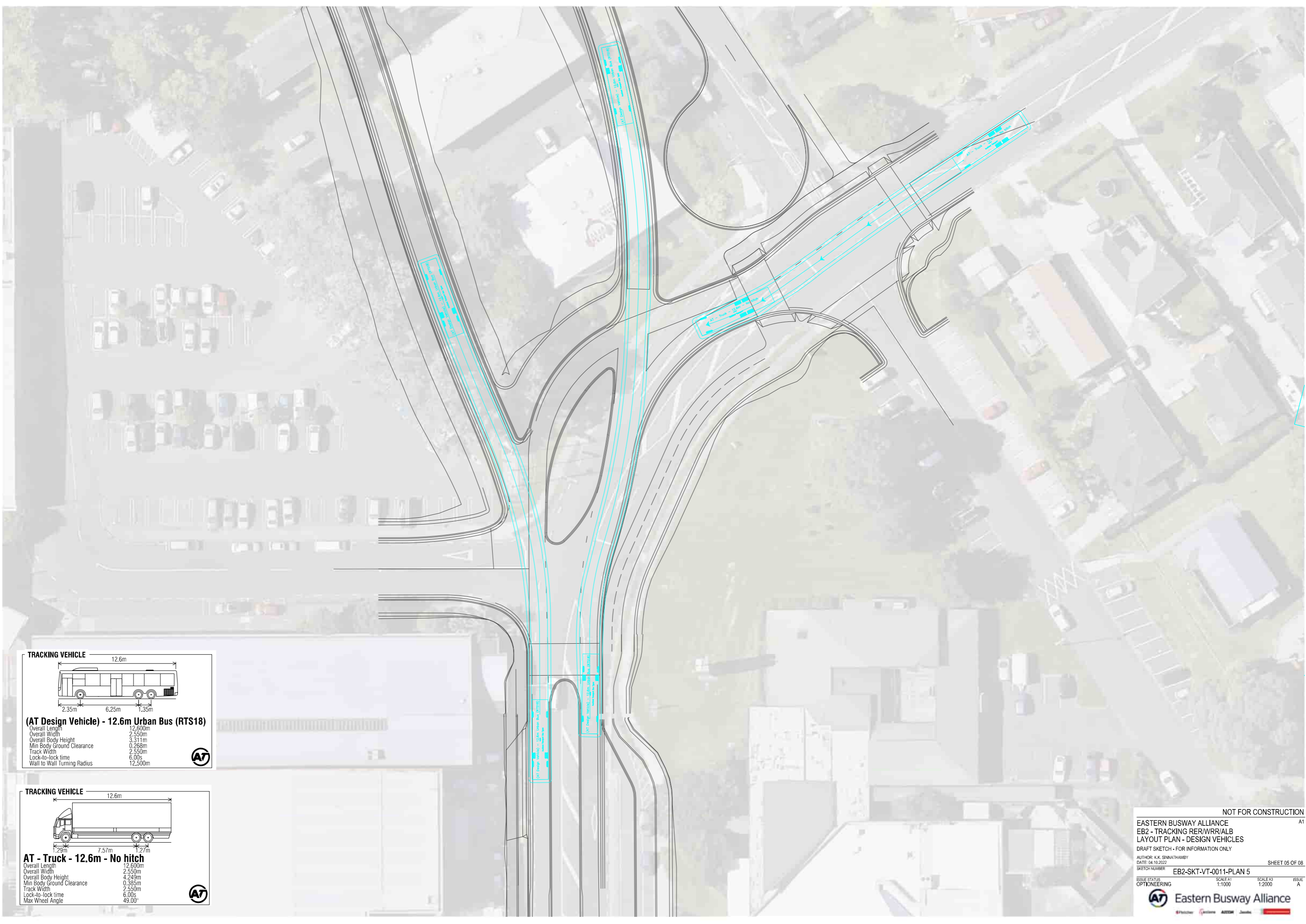
**TRACKING VEHICLE**



**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.365m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°





**TRACKING VEHICLE**

**(AT Design Vehicle) - 12.6m Urban Bus (RTS18)**

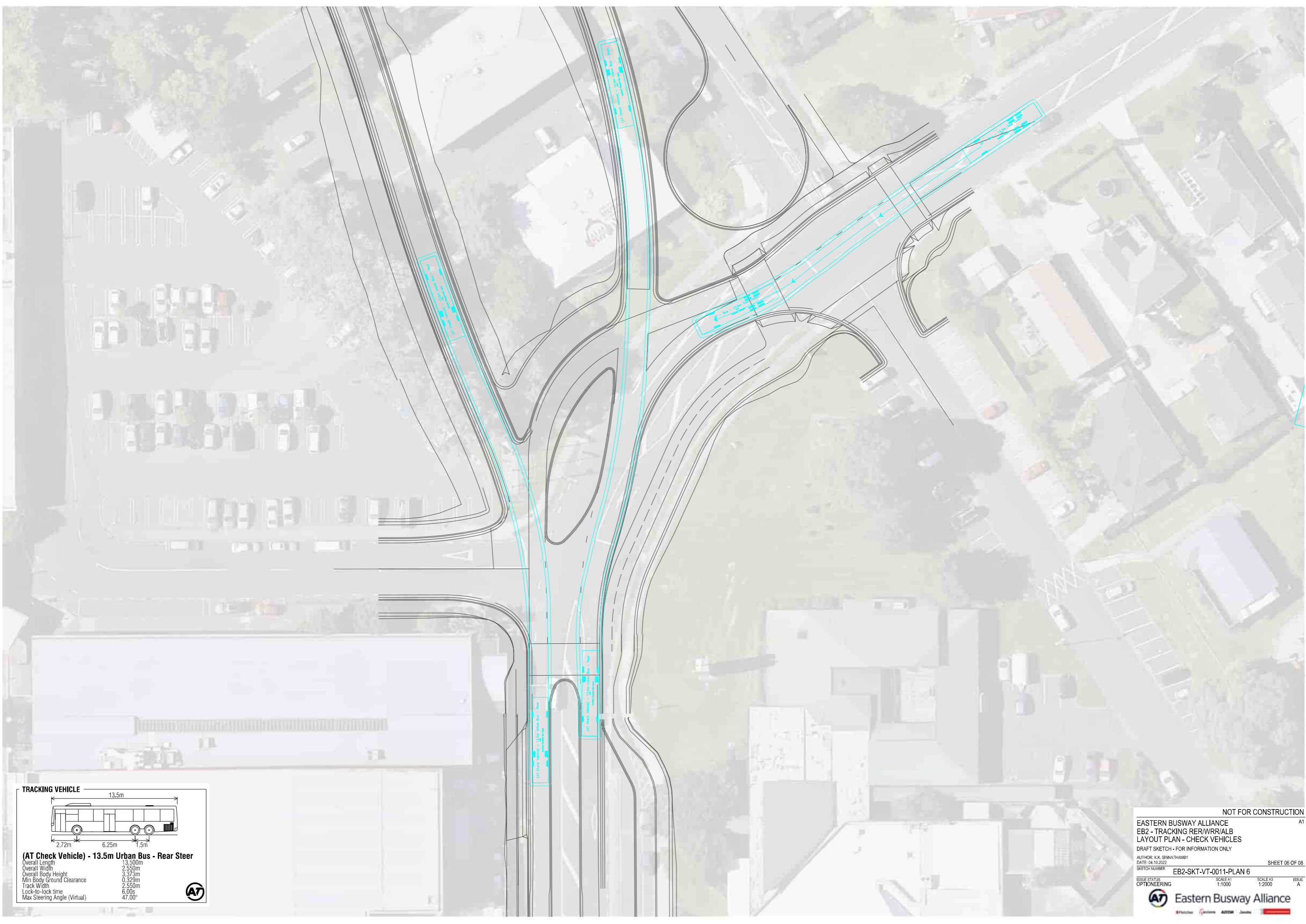
Overall Length	12.500m
Overall Width	2.550m
Overall Body Height	3.311m
Min Body Ground Clearance	0.268m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m

**TRACKING VEHICLE**

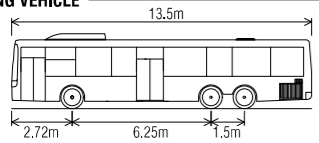
**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°





**TRACKING VEHICLE**



**(AT Check Vehicle) - 13.5m Urban Bus - Rear Steer**

Overall Length	13.500m
Overall Width	2.550m
Overall Body Height	3.373m
Min Body Ground Clearance	0.329m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°



NOT FOR CONSTRUCTION A1

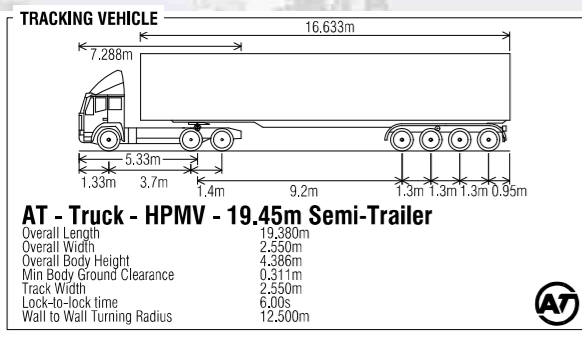
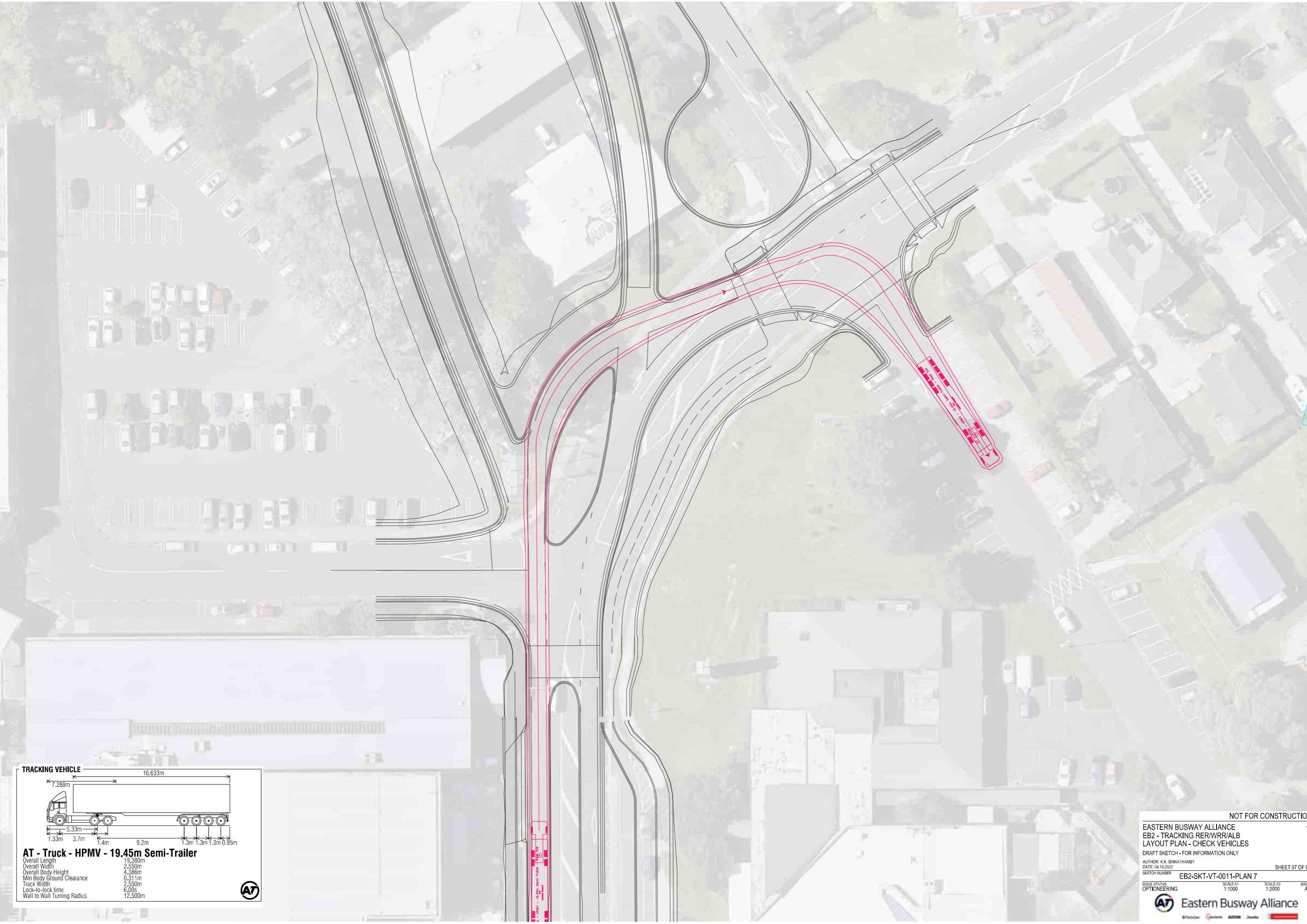
EASTERN BUSWAY ALLIANCE  
EB2 - TRACKING RER/WRR/ALB  
LAYOUT PLAN - CHECK VEHICLES  
DRAFT SKETCH - FOR INFORMATION ONLY

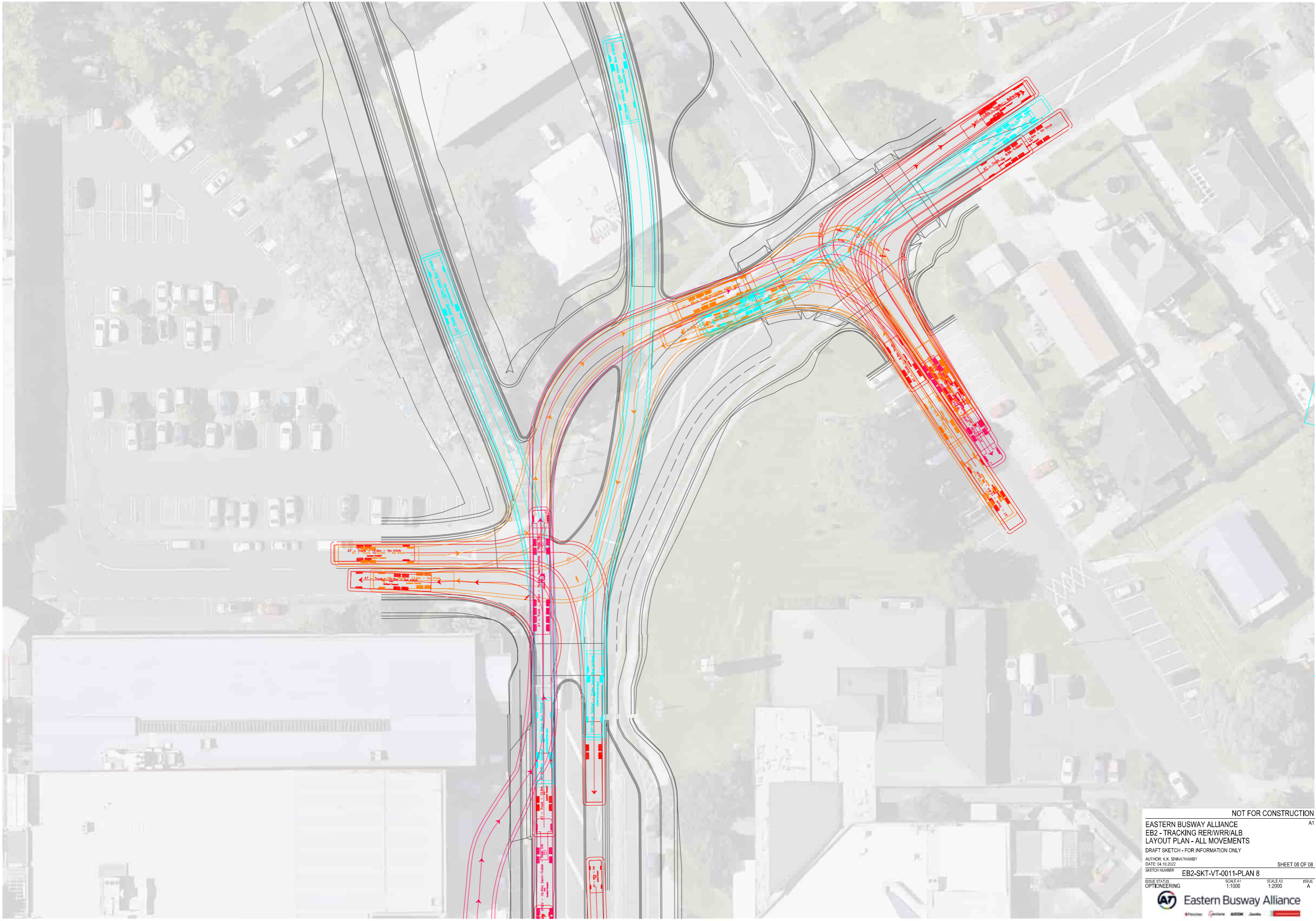
AUTHOR: K.K. SINNATHAMBY  
DATE: 04.10.2022  
SHEET 06 OF 08

SKETCH NUMBER: EB2-SKT-VT-0011-PLAN 6

ISSUE STATUS: SCALE A1 1:1000 SCALE A3 1:2000 ISSUE A







NOT FOR CONSTRUCTION

EASTERN BUSWAY ALLIANCE  
 EB2 - TRACKING RER/WRR/ALB  
 LAYOUT PLAN - ALL MOVEMENTS

DRAFT SKETCH - FOR INFORMATION ONLY

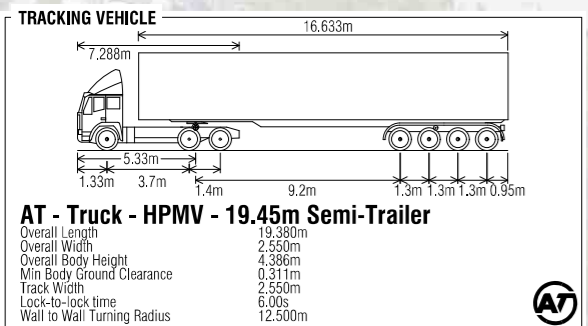
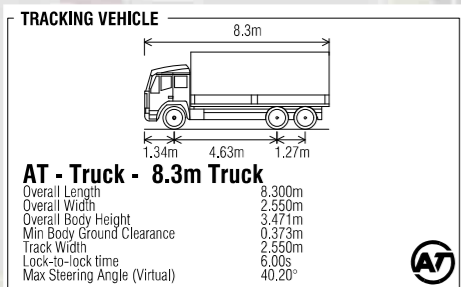
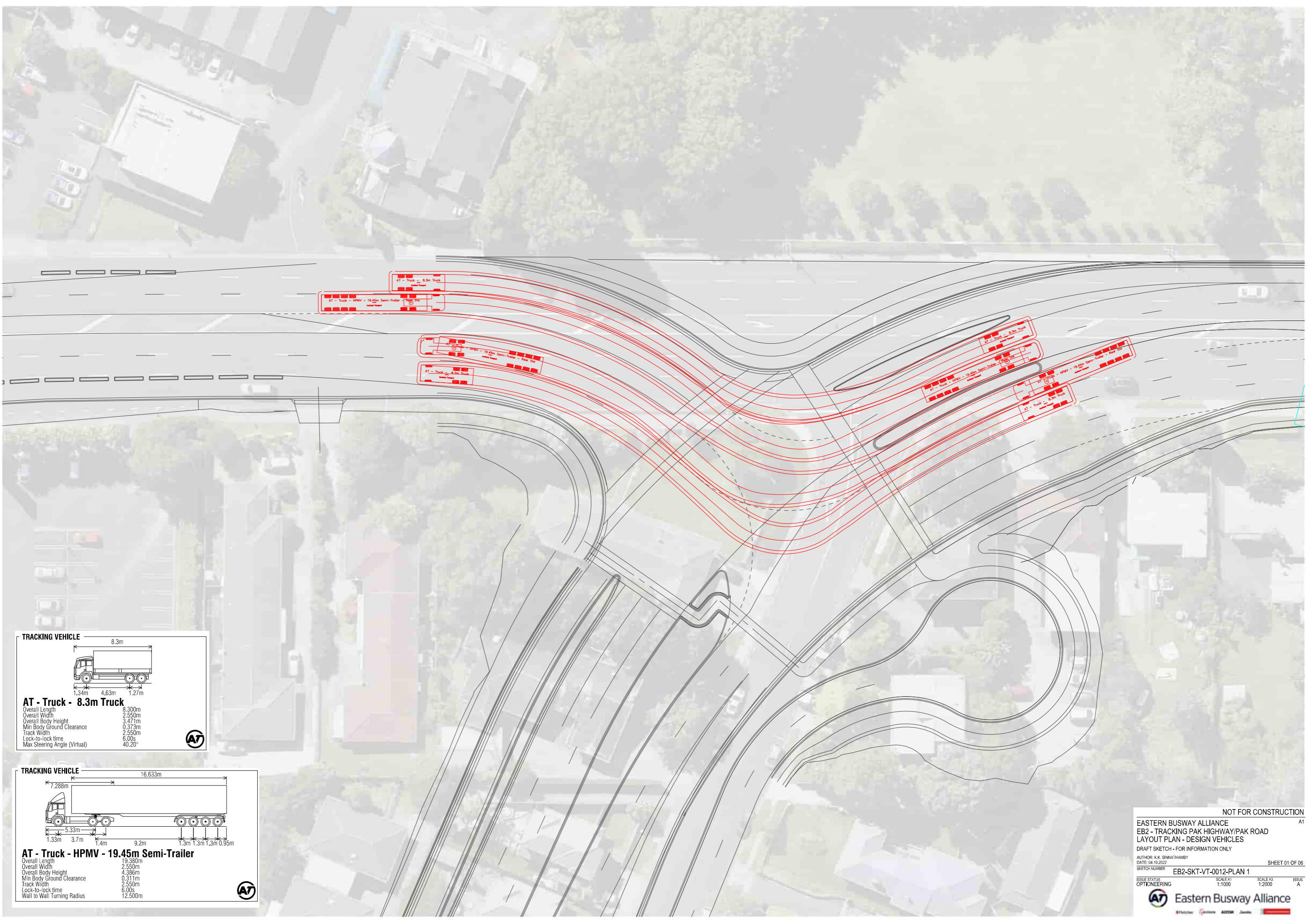
AUTHOR: K.K. SINNATHAMBY  
 DATE: 04.10.2022  
 SHEET NUMBER: EB2-SKT-VT-0011-PLAN 8

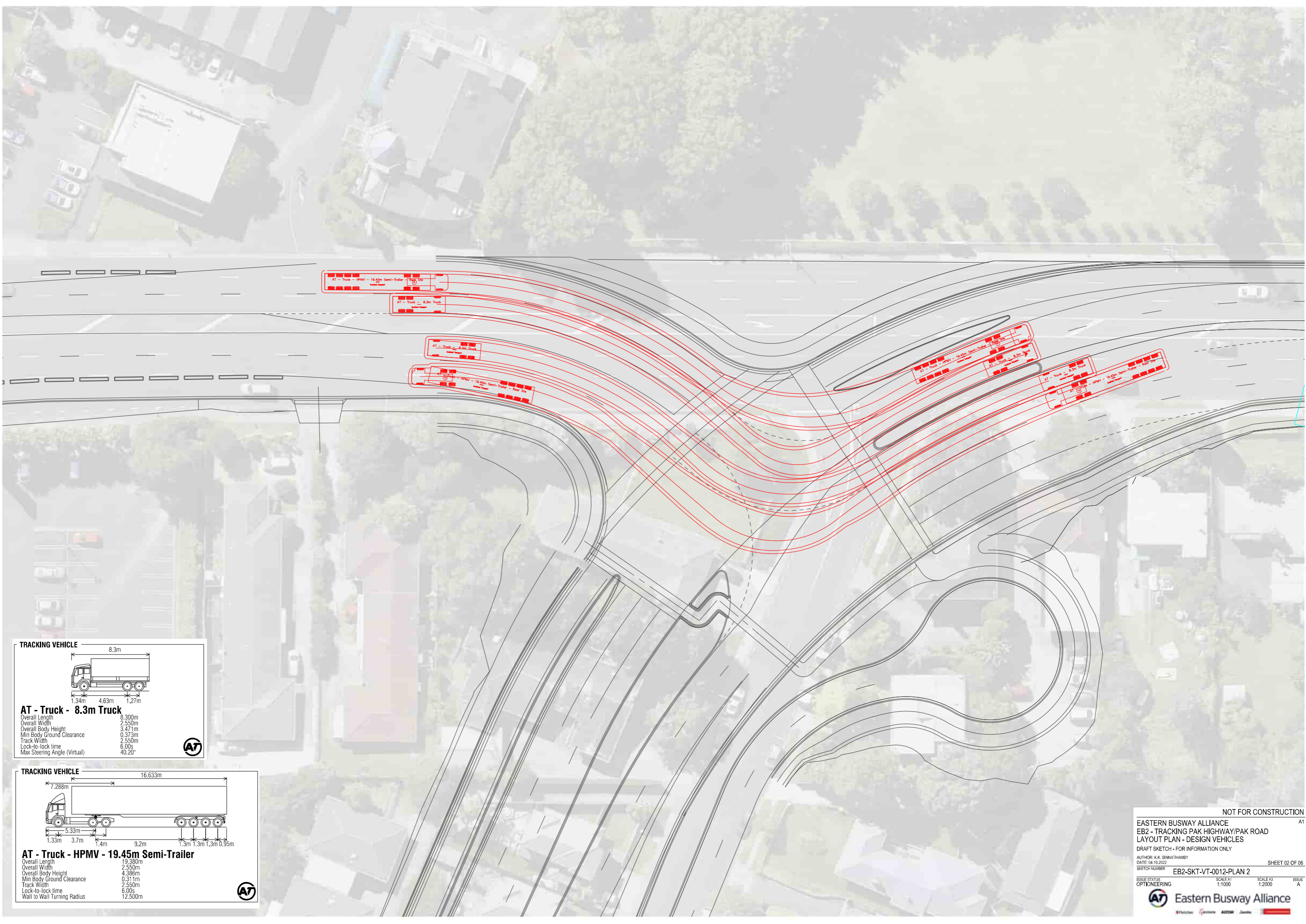
ISSUE STATUS: OPTONEERING  
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 SCALE A: A



A1

SHEET 08 OF 08





**TRACKING VEHICLE**

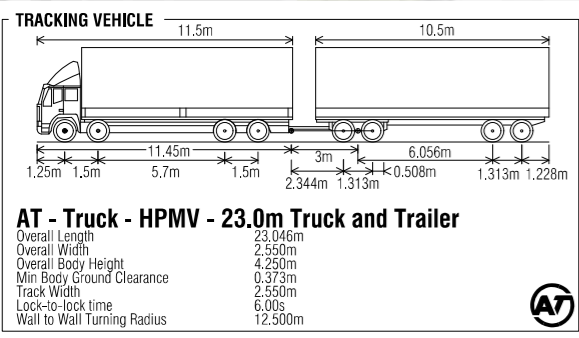
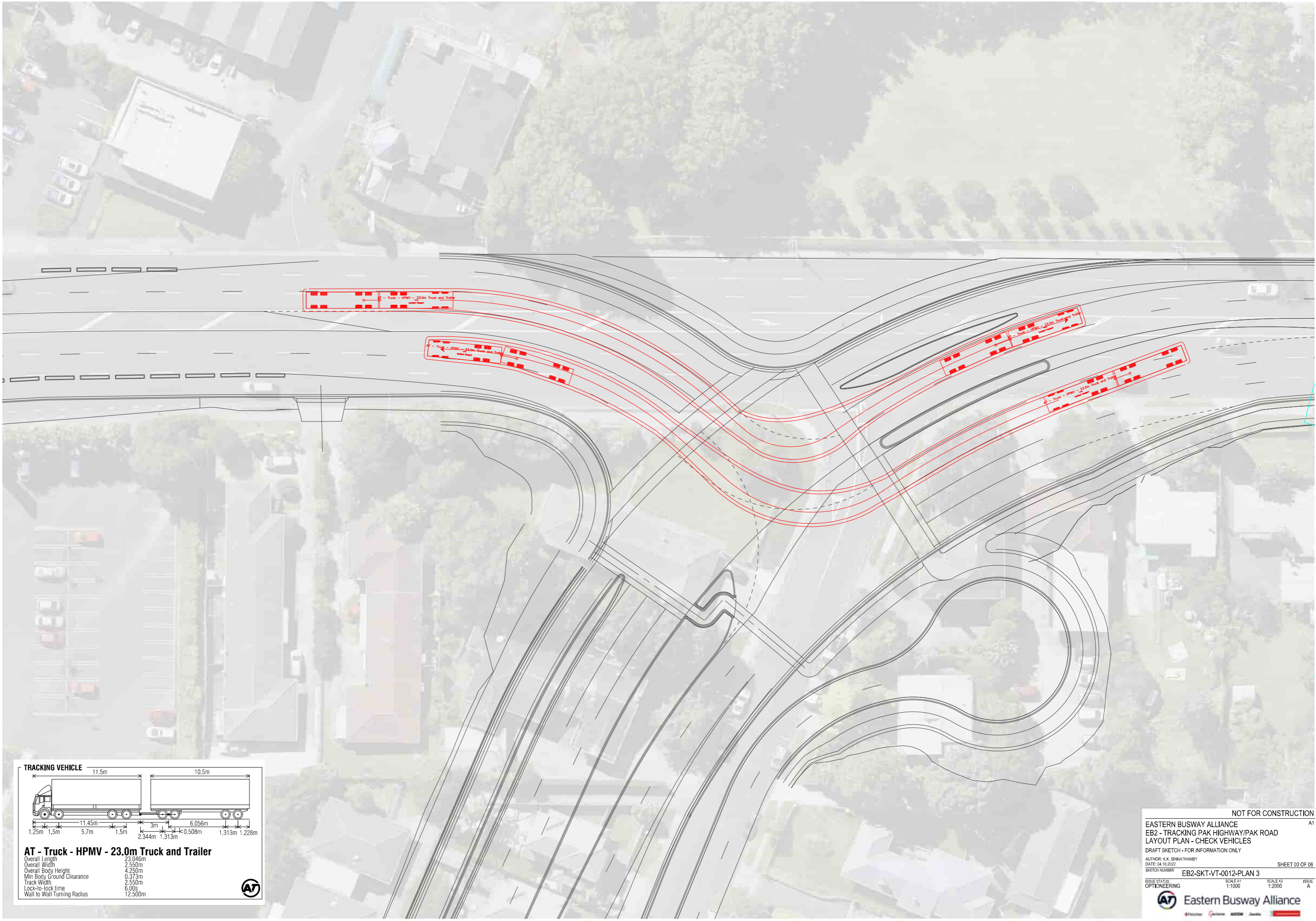
**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - HPMV - 19.45m Semi-Trailer**

Overall Length	19.380m
Overall Width	2.550m
Overall Body Height	4.386m
Min Body Ground Clearance	0.311m
Track Width	2.550m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	12.500m



NOT FOR CONSTRUCTION <sup>A1</sup>

**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAK HIGHWAY/PAK ROAD**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

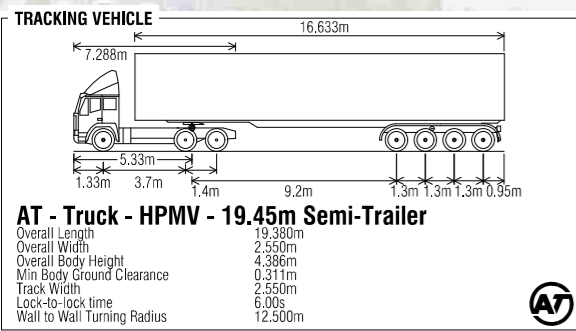
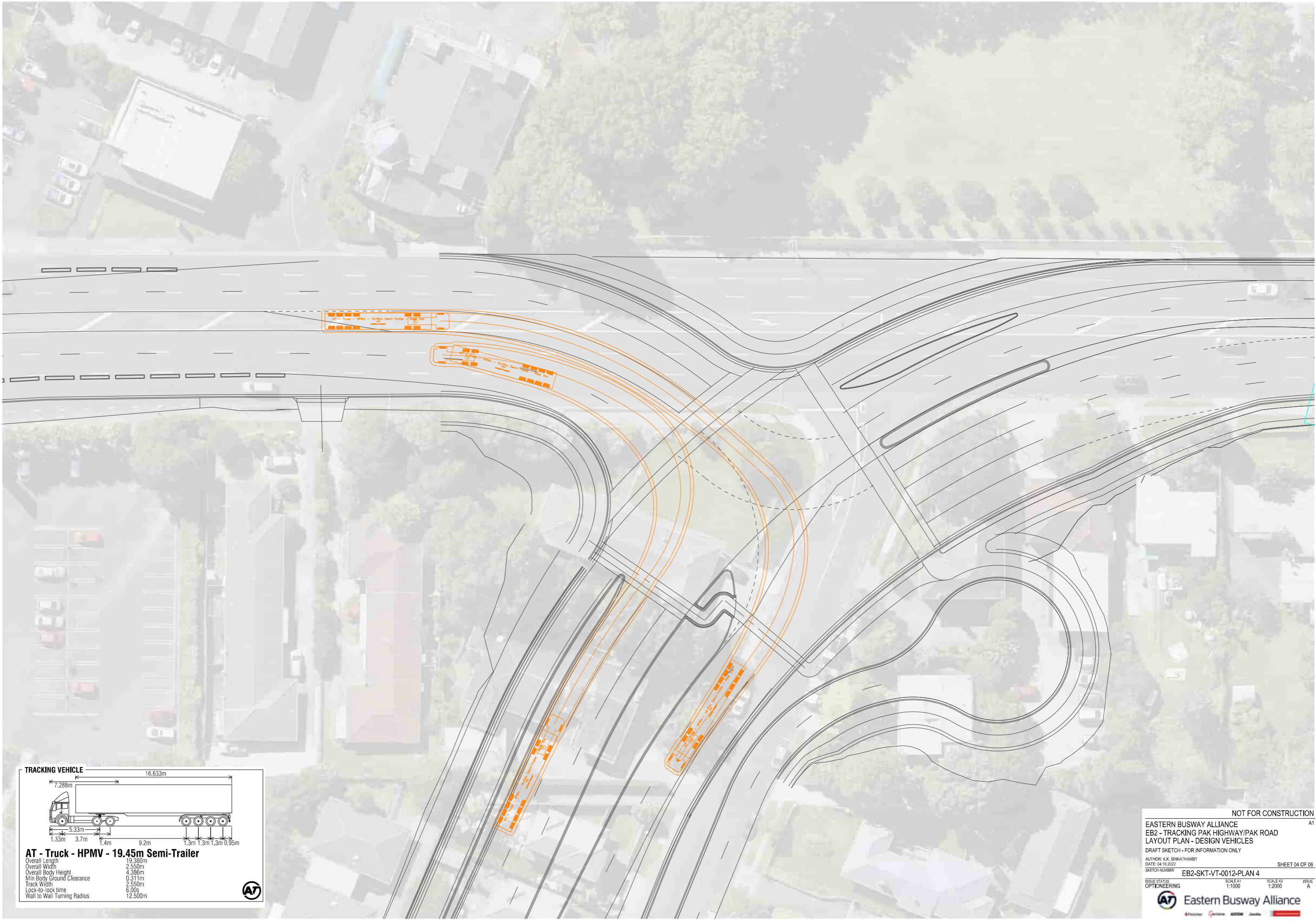
AUTHOR: K.K. SINNATHAMBY  
 DATE: 04.10.2022  
 SHEET 03 OF 06

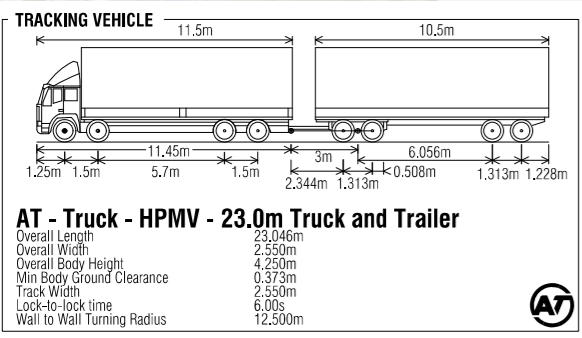
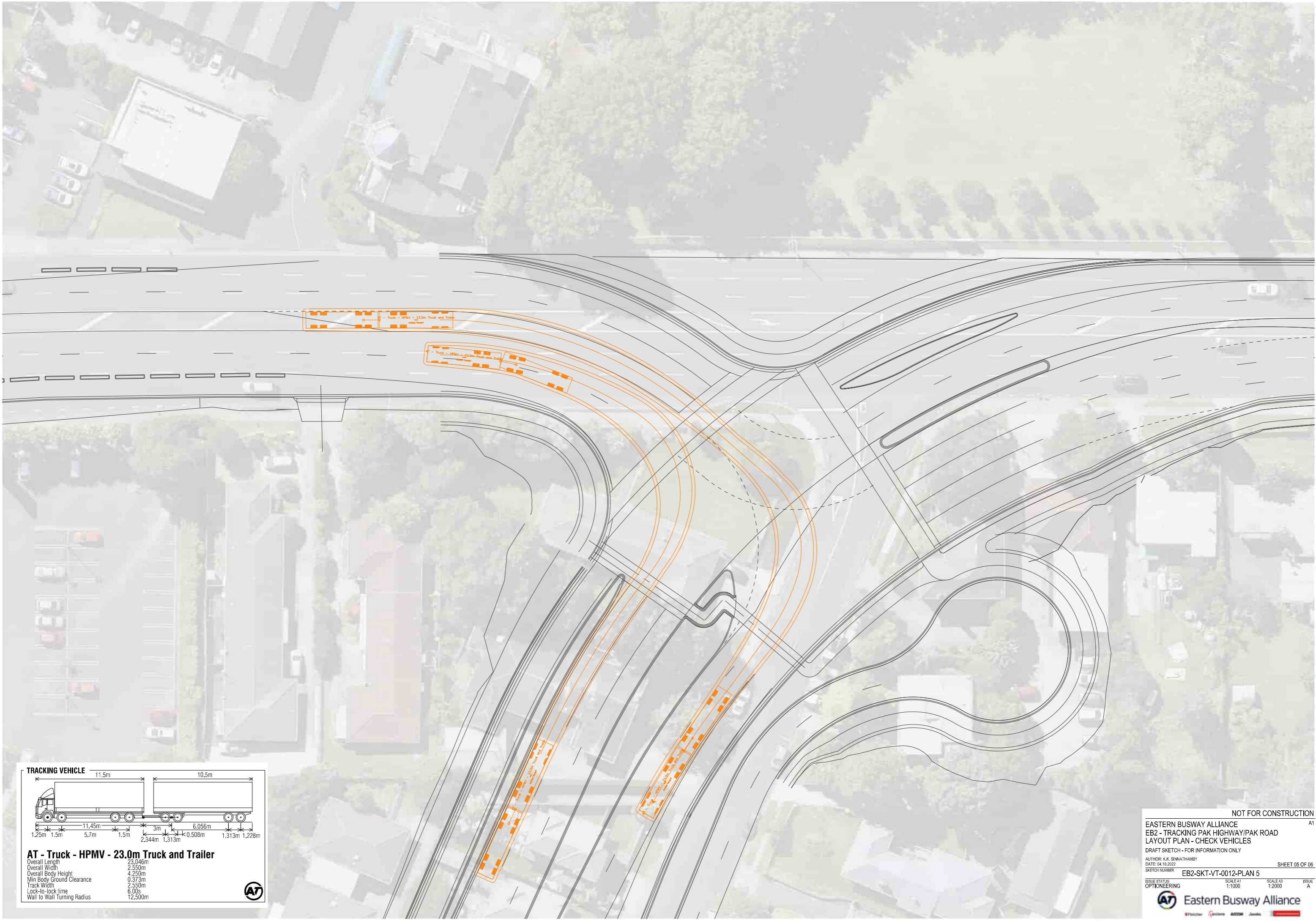
SKETCH NUMBER: **EB2-SKT-VT-0012-PLAN 3**

ISSUE STATUS: OPTONEERING

SCALE A1: 1:1000    SCALE A3: 1:2000    ISSUE: A

Eastern Busway Alliance





NOT FOR CONSTRUCTION <sup>A1</sup>

**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAK HIGHWAY/PAK ROAD**  
**LAYOUT PLAN - CHECK VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

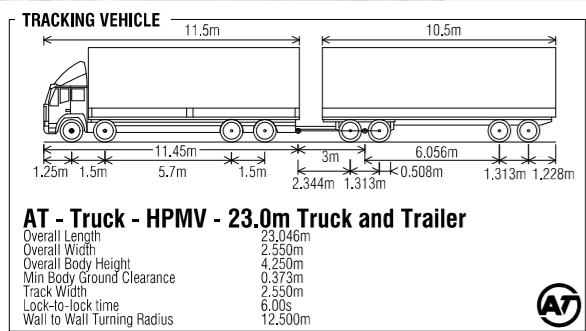
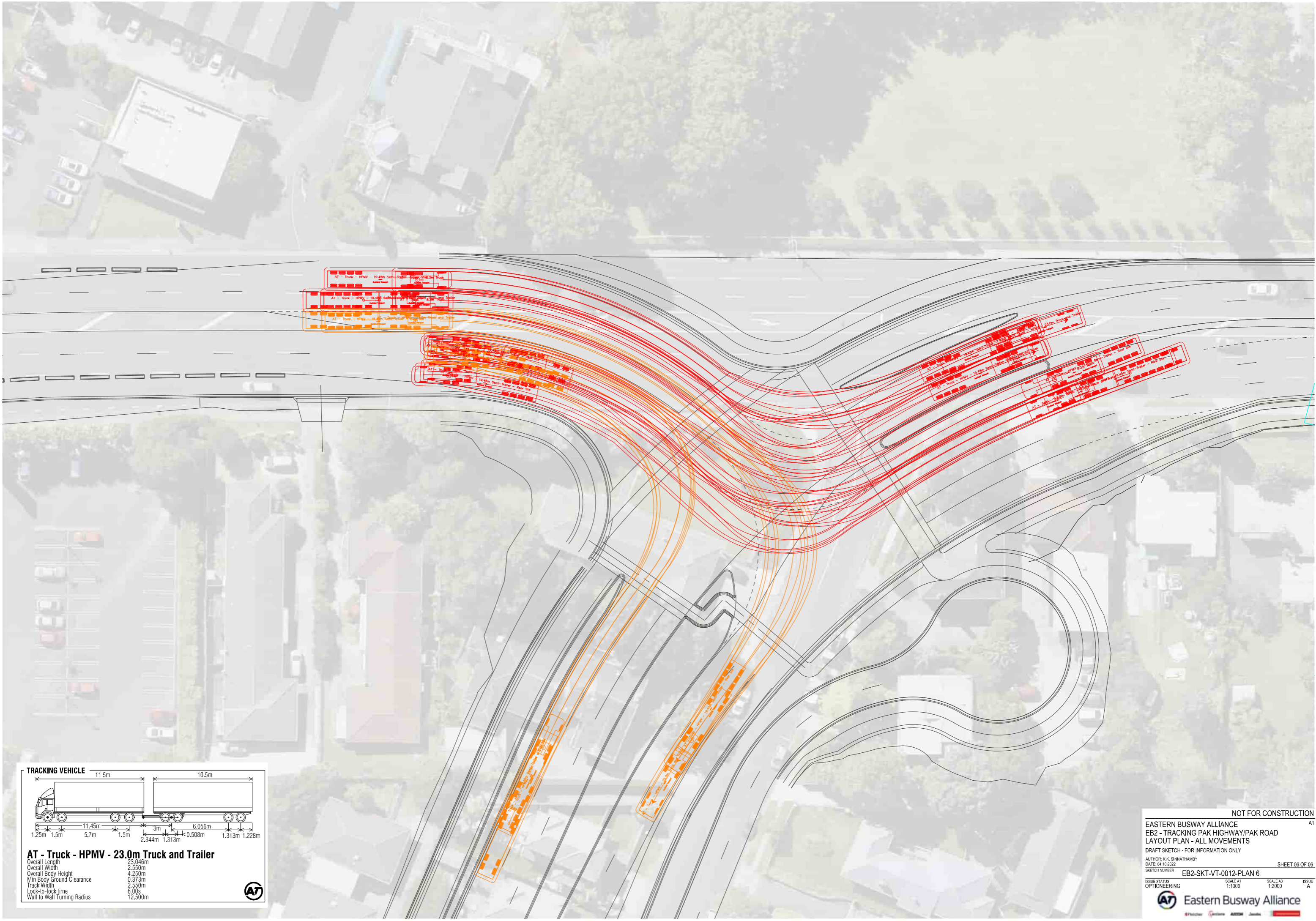
AUTHOR: K.K. SINNATHAMBY  
 DATE: 04.10.2022  
 SKETCH NUMBER: EB2-SKT-VT-0012-PLAN 5

ISSUE STATUS: OPTONEERING

SCALE A1	SCALE A3	ISSUE
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**Eastern Busway Alliance**





NOT FOR CONSTRUCTION <sup>A1</sup>

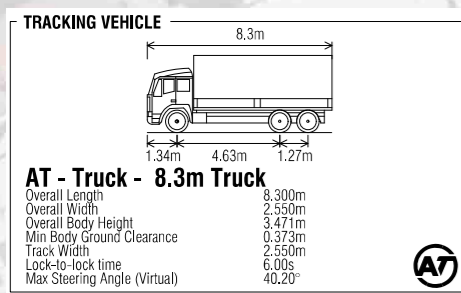
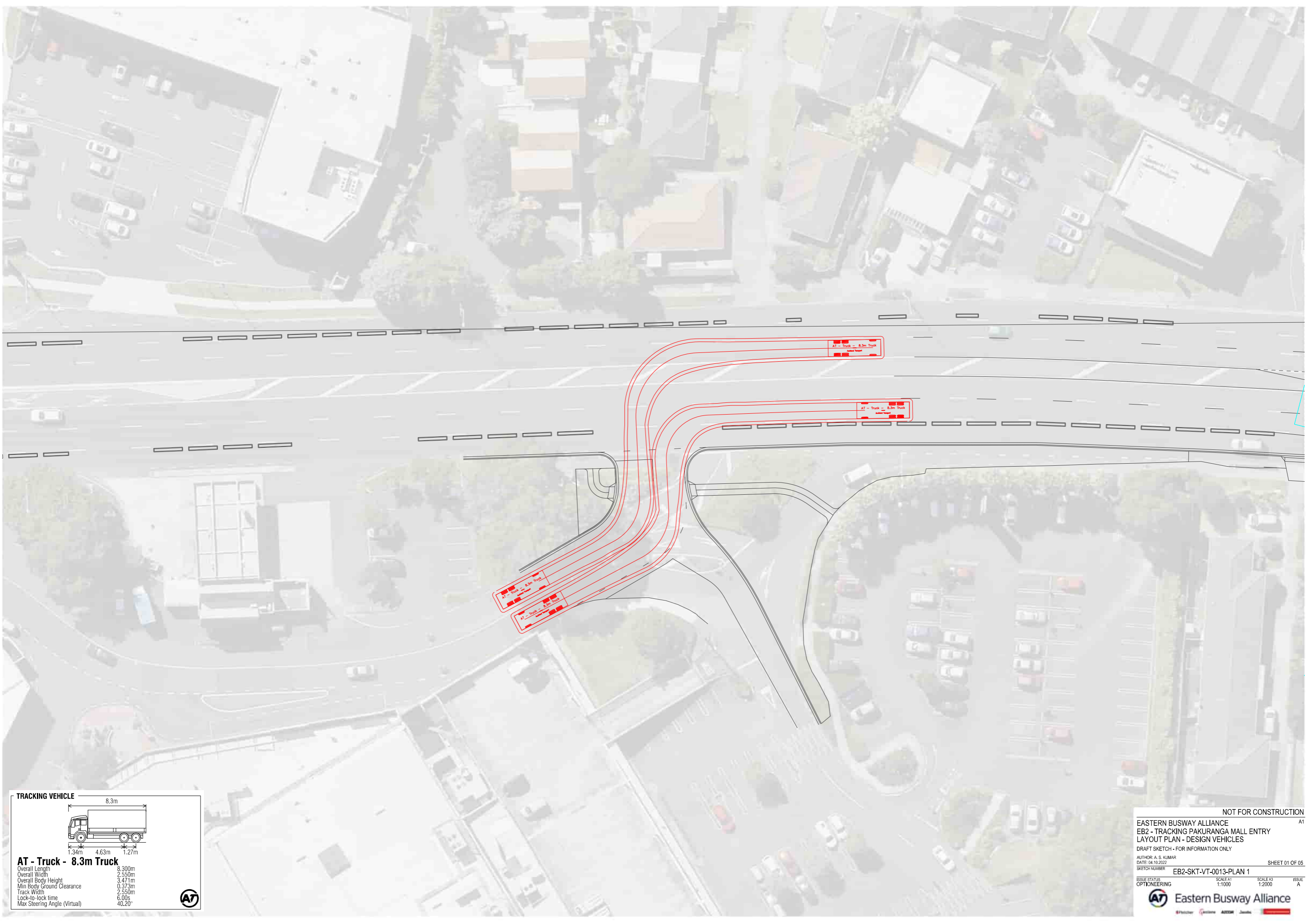
**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAK HIGHWAY/PAK ROAD**  
**LAYOUT PLAN - ALL MOVEMENTS**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: K.K. SINNATHAMBY  
 DATE: 04.10.2022  
 SKETCH NUMBER: **EB2-SKT-VT-0012-PLAN 6** SHEET 06 OF 06

ISSUE STATUS: **OPTIONEERING** SCALE A1: 1:1000    SCALE A3: 1:2000    ISSUE: A

**Eastern Busway Alliance**



NOT FOR CONSTRUCTION <sup>A1</sup>

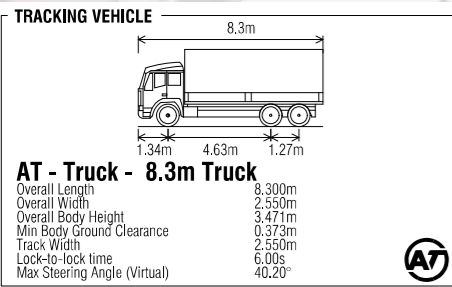
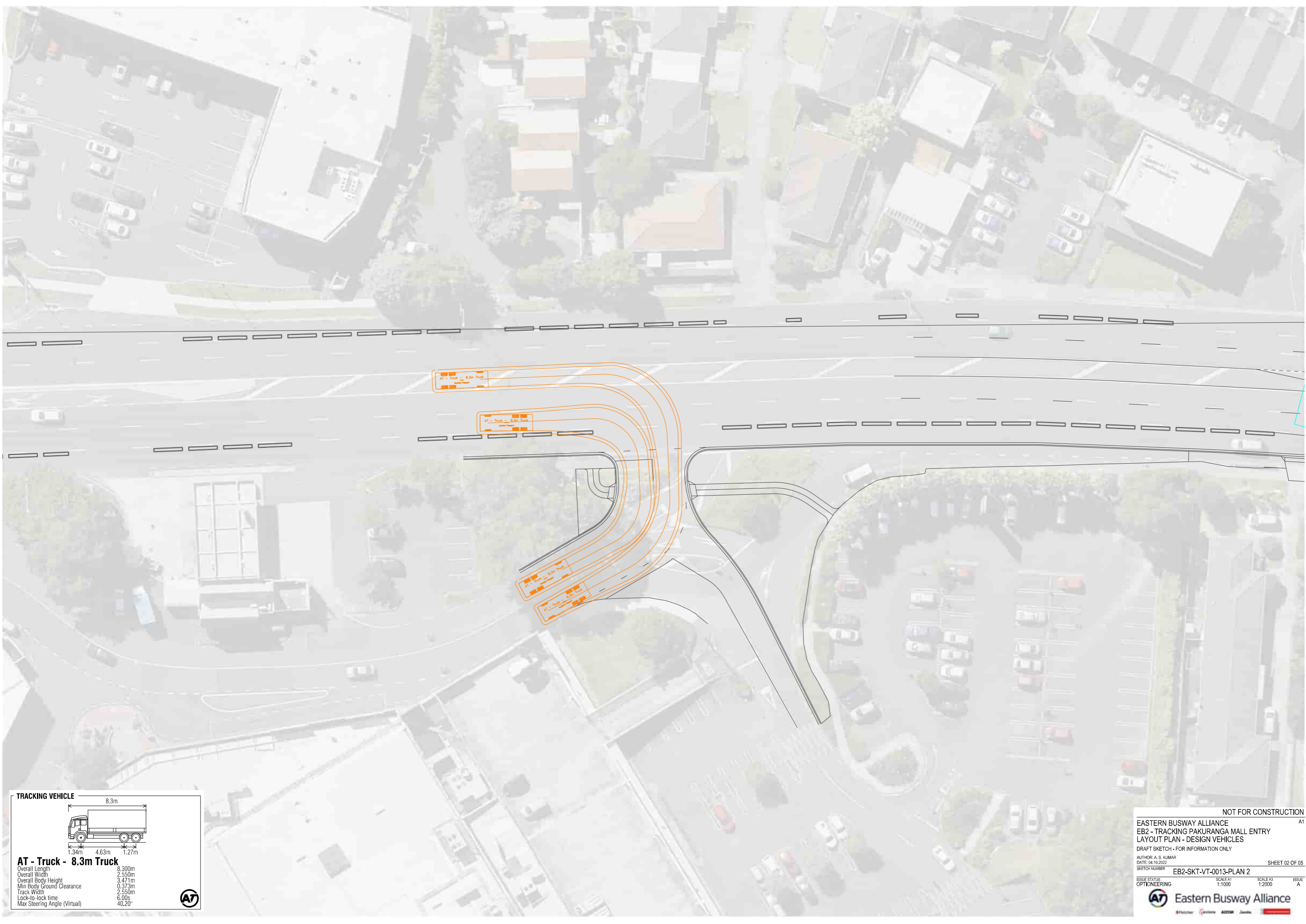
**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAKURANGA MALL ENTRY**  
**LAYOUT PLAN - DESIGN VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: A. S. KUMAR  
 DATE: 04.10.2022  
 SHEET 01 OF 05

SKETCH NUMBER: **EB2-SKT-VT-0013-PLAN 1**

ISSUE STATUS: **OPTONEERING** SCALE A1: 1:1000 SCALE A3: 1:2000 ISSUE A

**Eastern Busway Alliance**



NOT FOR CONSTRUCTION <sup>A1</sup>

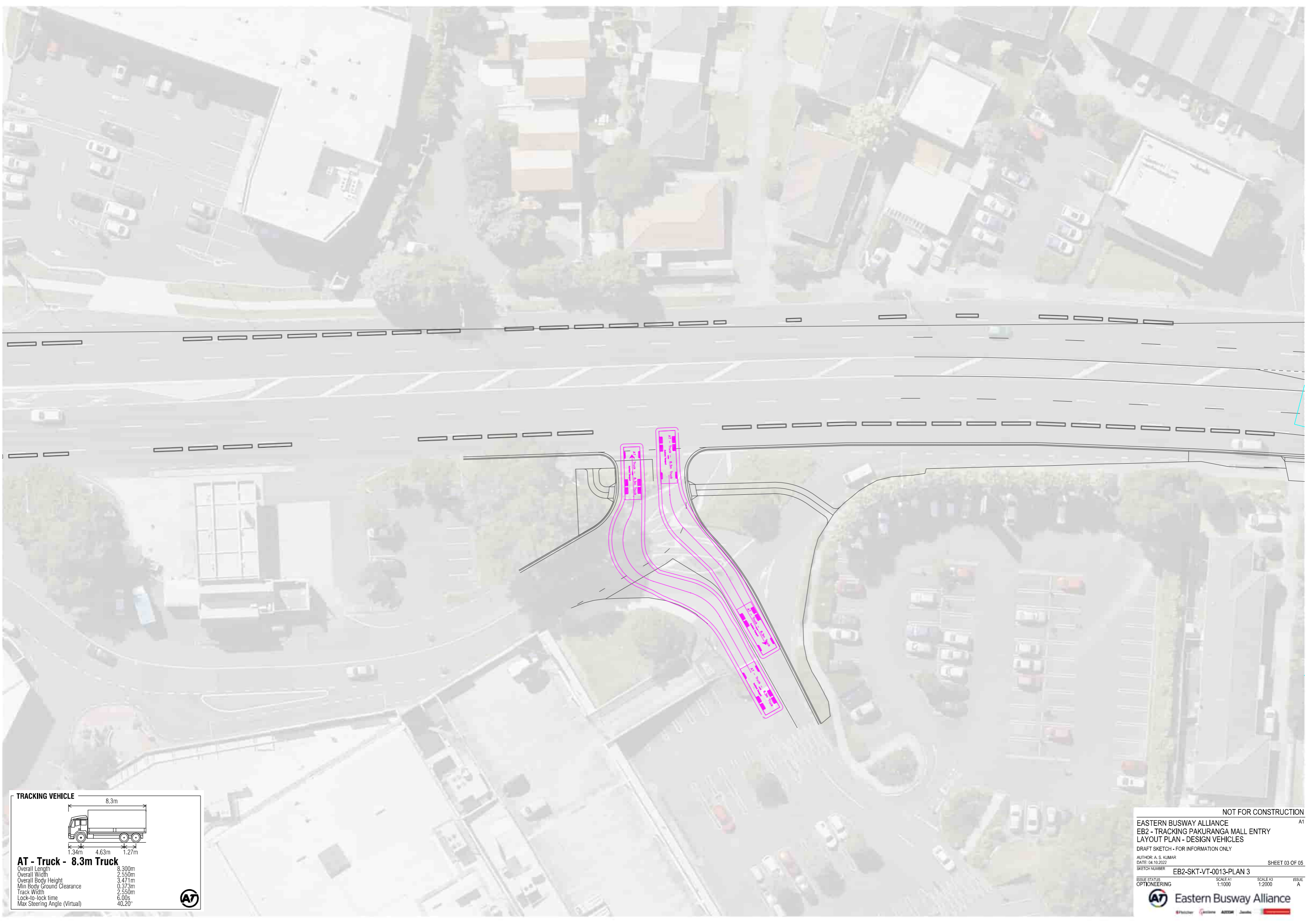
**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAKURANGA MALL ENTRY**  
**LAYOUT PLAN - DESIGN VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: A. S. KUMAR  
 DATE: 04.10.2022  
 SHEET 02 OF 05

SKETCH NUMBER: **EB2-SKT-VT-0013-PLAN 2**

ISSUE STATUS: **OPTONEERING** SCALE A1: 1:1000 SCALE A3: 1:2000 ISSUE: A

**Eastern Busway Alliance**



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
EB2 - TRACKING PAKURANGA MALL ENTRY  
LAYOUT PLAN - DESIGN VEHICLES  
DRAFT SKETCH - FOR INFORMATION ONLY

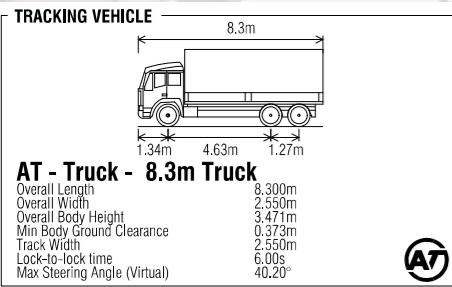
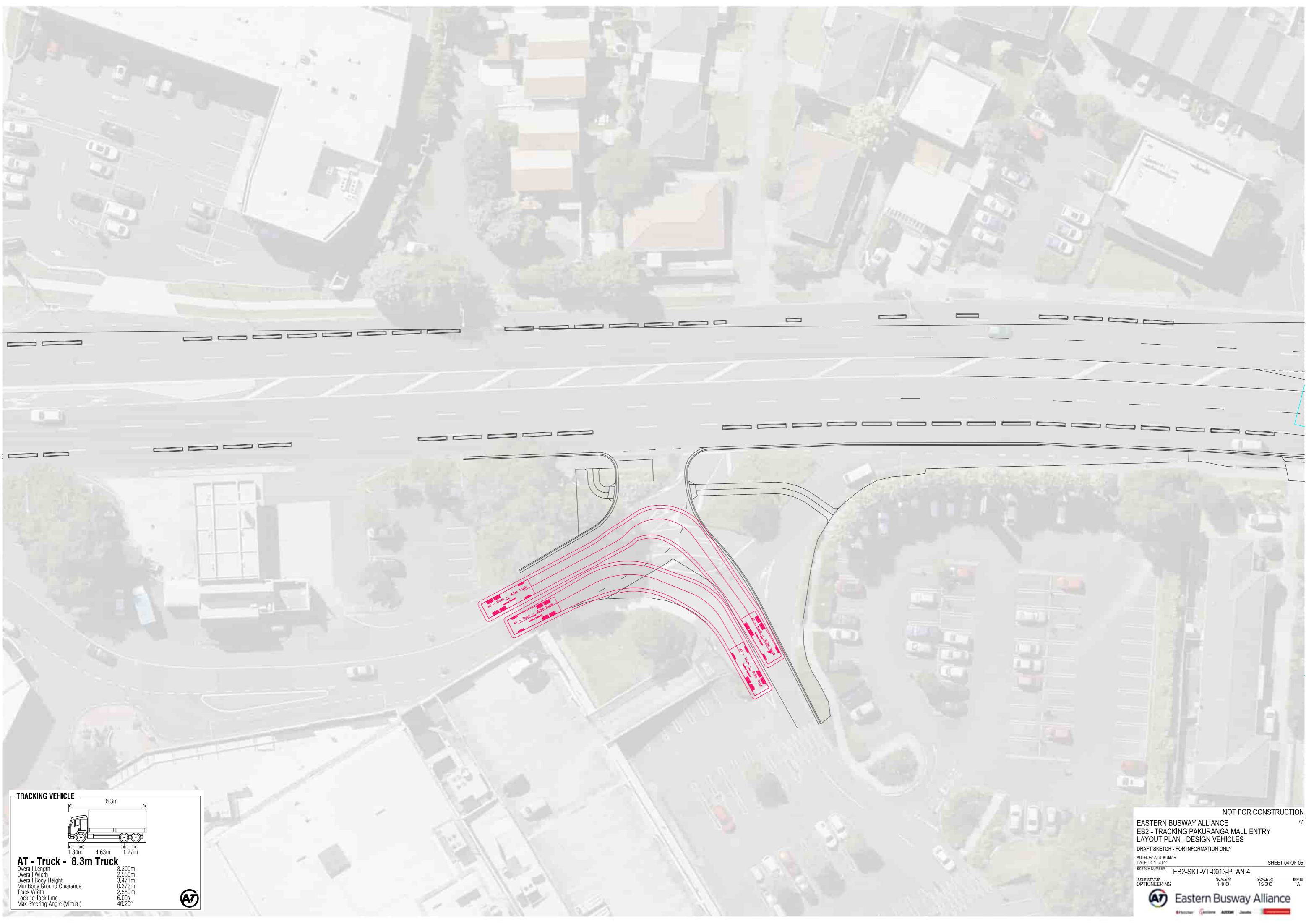
AUTHOR: A. S. KUMAR  
DATE: 04.10.2022  
SKETCH NUMBER: EB2-SKT-VT-0013-PLAN 3

ISSUE STATUS: OPTONEERING

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1:1000	1:2000	1:4000

SHEET 03 OF 05

**Eastern Busway Alliance**



NOT FOR CONSTRUCTION A1

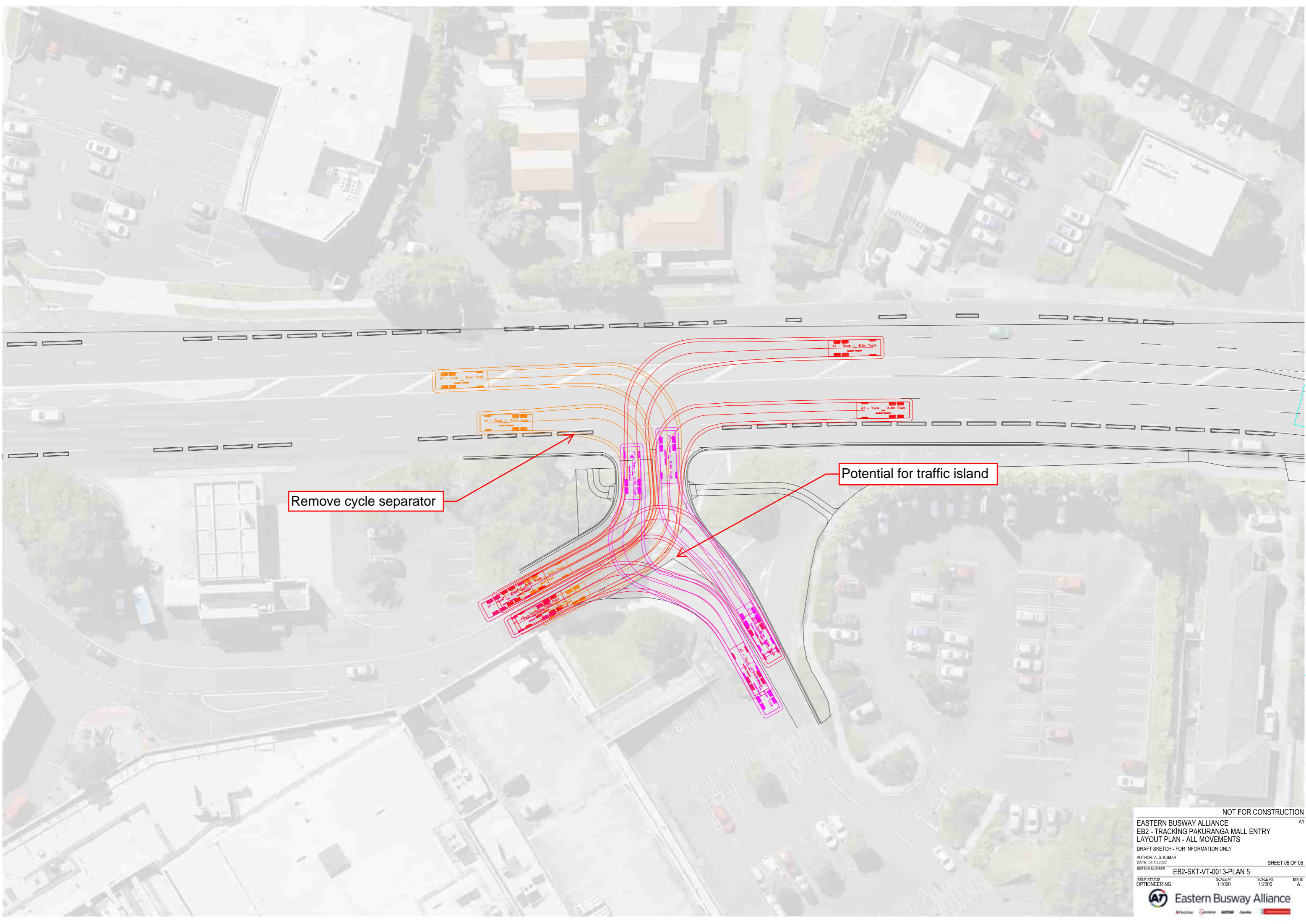
**EASTERN BUSWAY ALLIANCE**  
**EB2 - TRACKING PAKURANGA MALL ENTRY**  
**LAYOUT PLAN - DESIGN VEHICLES**  
 DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: A. S. KUMAR  
 DATE: 04.10.2022  
 SHEET 04 OF 05

SKETCH NUMBER: **EB2-SKT-VT-0013-PLAN 4**

ISSUE STATUS: OPTONEERING  
 SCALE A1: 1:1000  
 SCALE A3: 1:2000  
 ISSUE: A

Eastern Busway Alliance



Remove cycle separator

Potential for traffic island

AT - Truck - 8.3m Truck

AT - Truck - 8.3m Truck

AT - Truck - 8.3m Truck

AT - Truck - 8.3m Truck

AT - Truck - 8.3m Truck

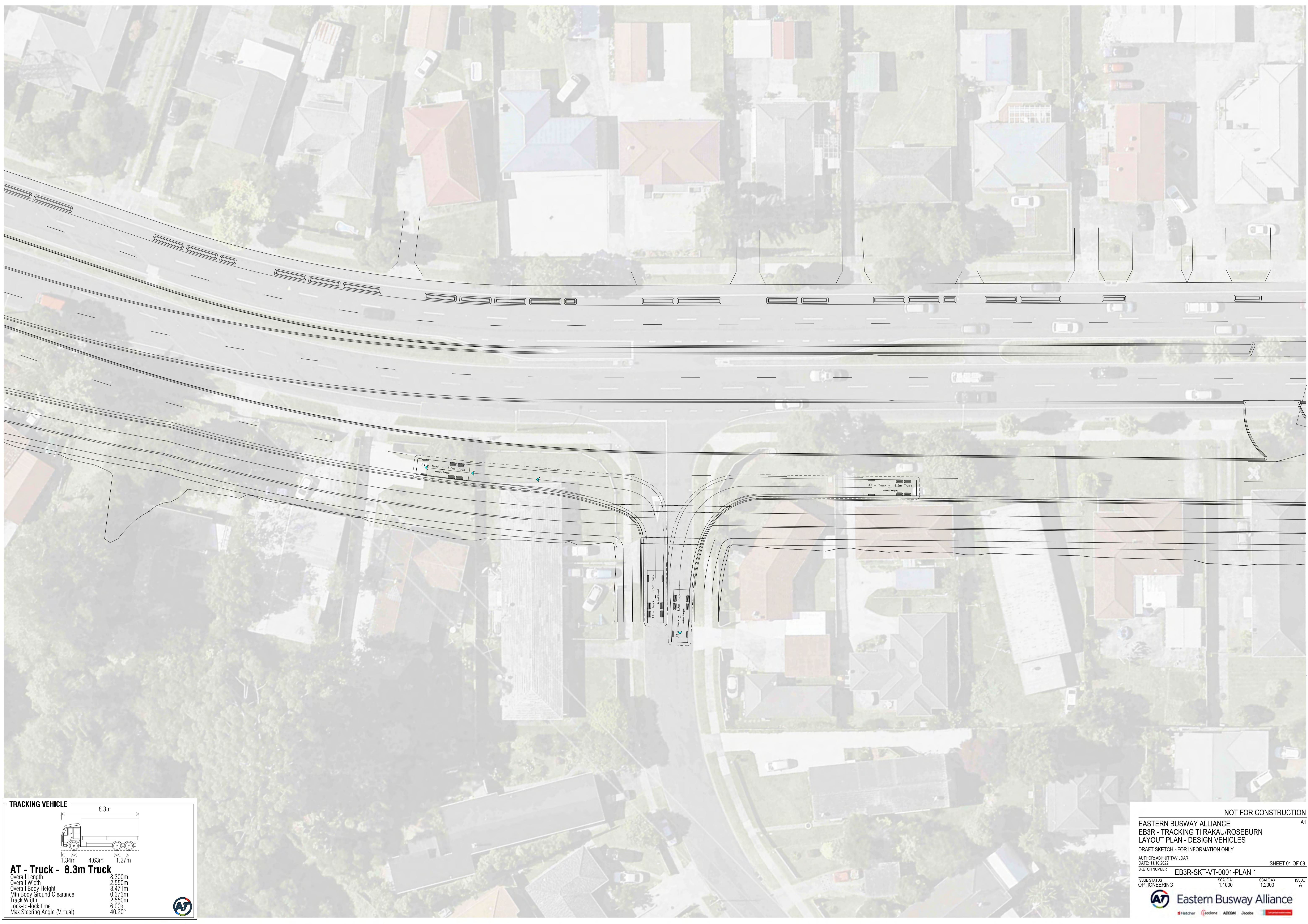
AT - Truck - 8.3m Truck

AT - Truck - 8.3m Truck

## Appendix 3. Visibility Assessments

The following visibility assessments are provided:

- SSD – Graphs for each lane of each carriageway for Ti Rakau Drive and Pakuranga Highway
- SISD – Plans showing critical visibility triangle(s) for each intersection
- ASD – Summary of ASD provided on minor approach to priority and signal controlled intersections where there a horizontal/vertical curves or speed tables on the approaches



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/ROSEBURN**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

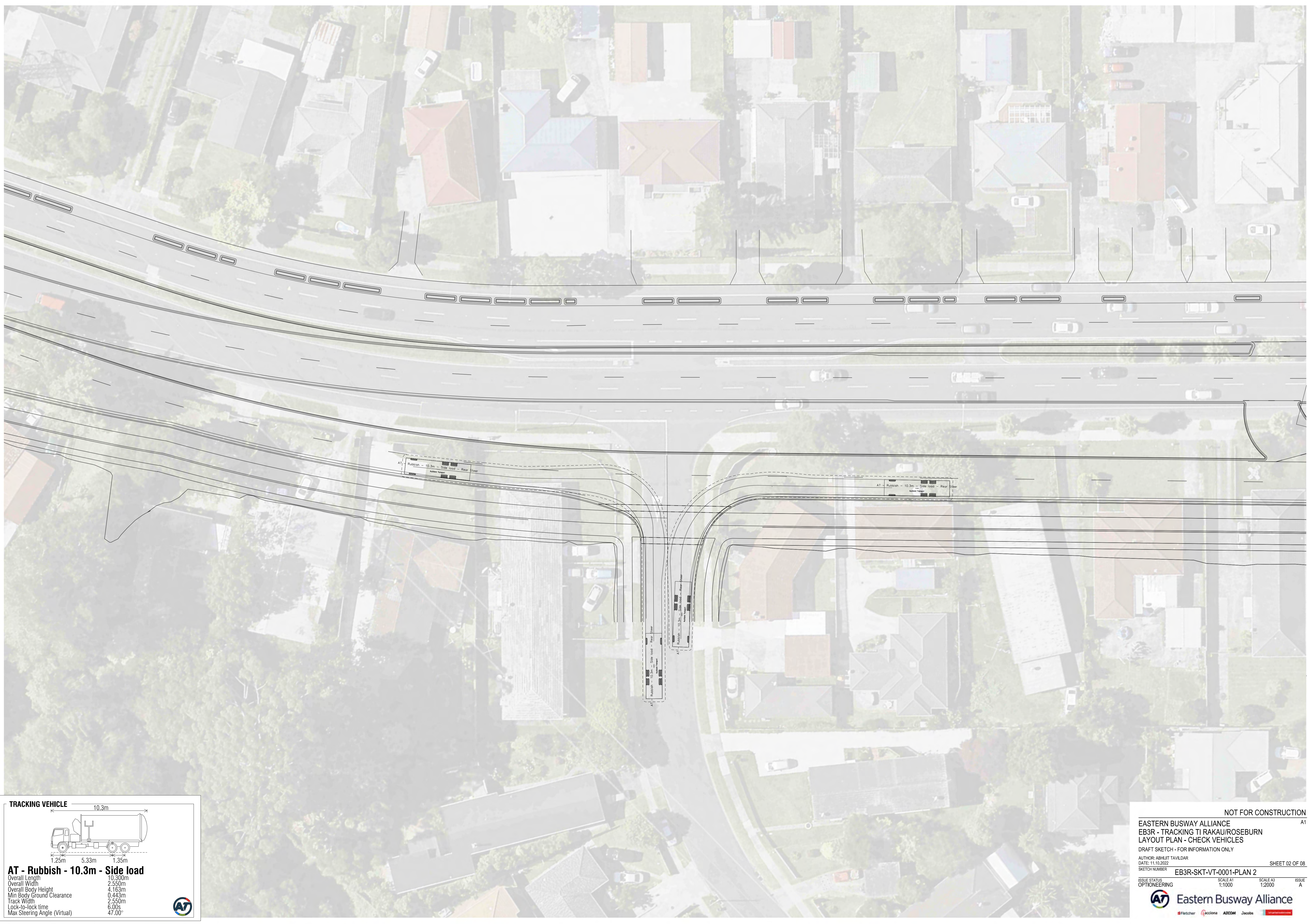
AUTHOR: ABHIJIT TAVILDAR SHEET 01 OF 08  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0001-PLAN 1

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTIONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

Fetchr Acciona ABCOM Jacobs





**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.183m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

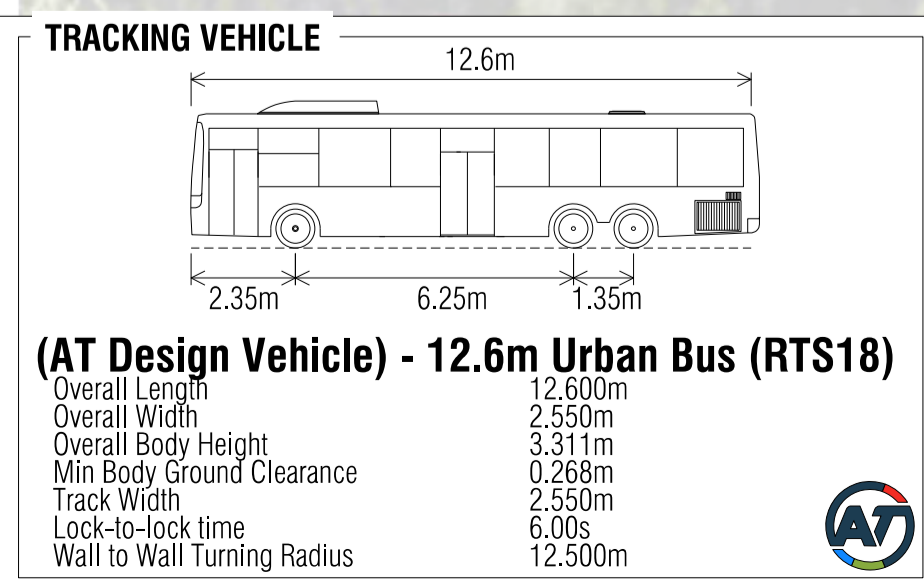
**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/ROSEBURN**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 02 OF 08  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0001-PLAN 2

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTIONEERING	1:1000	1:2000	A

Eastern Busway Alliance



NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING T1 RAKAU/EDGEWATER WEST**  
**LAYOUT PLAN - DESIGN VEHICLES**

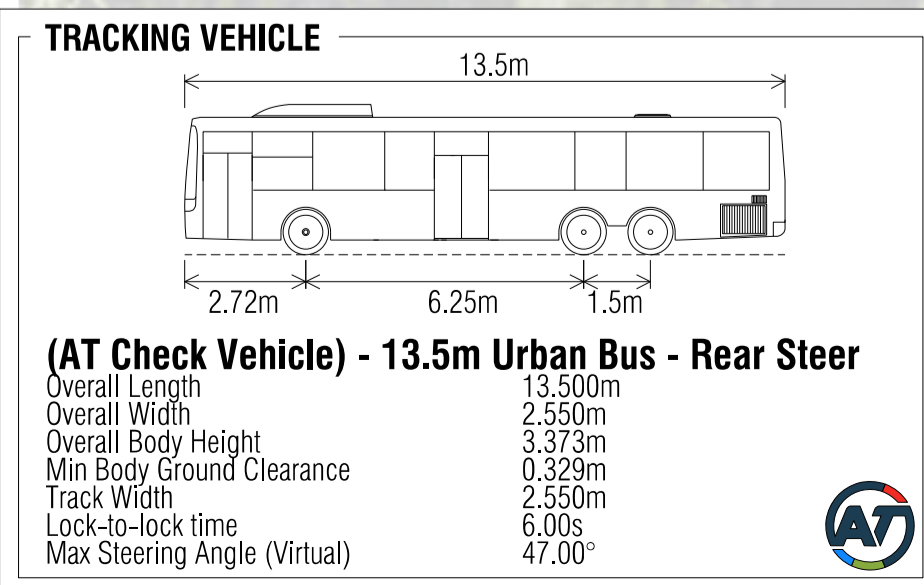
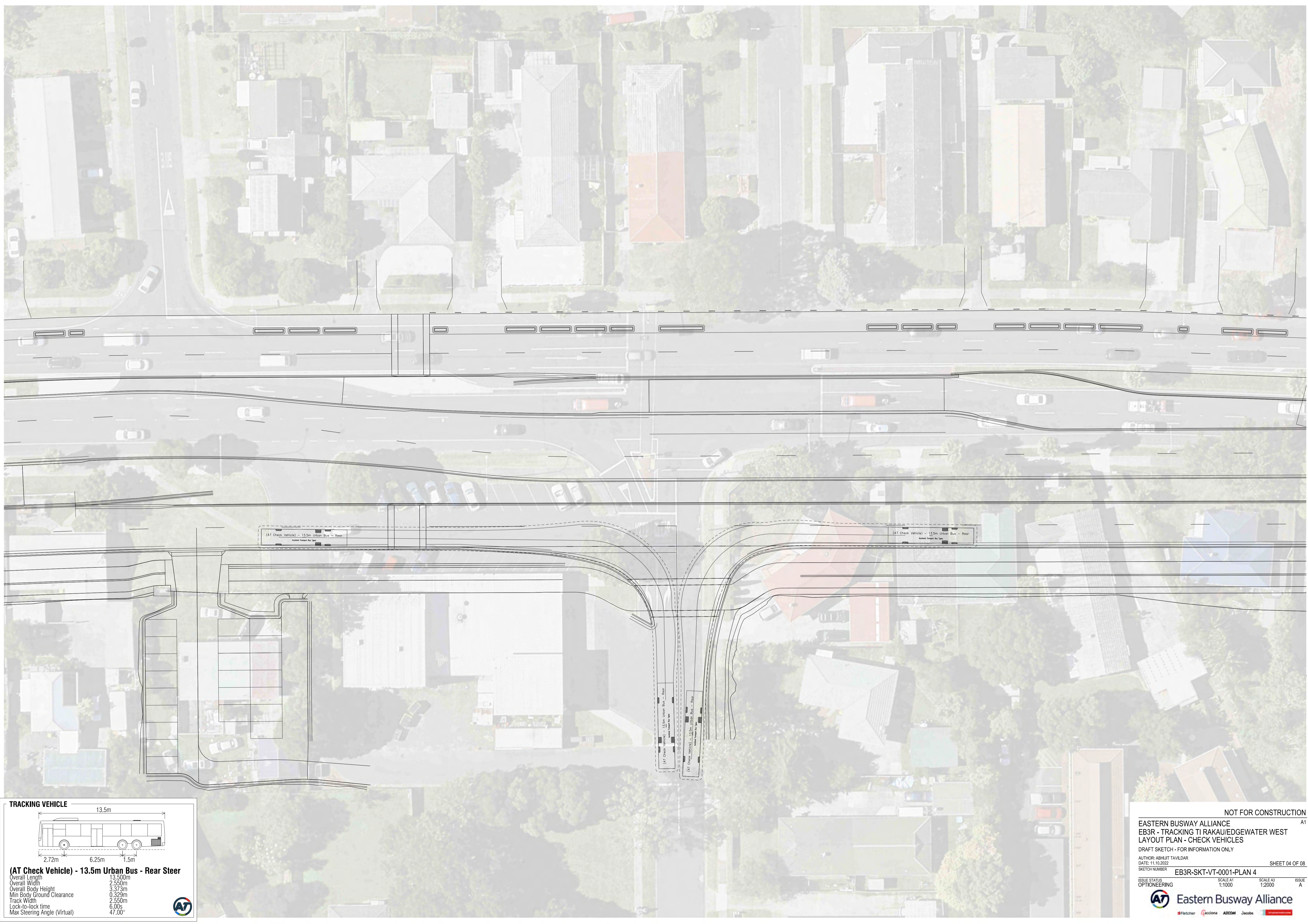
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 03 OF 08  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0001-PLAN 3

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

Fletcher | Hecobona | ABCOM | Jacobs



NOT FOR CONSTRUCTION <sup>A1</sup>

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER WEST**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 11.10.2022  
 SHEET 04 OF 08

SKETCH NUMBER: **EB3R-SKT-VT-0001-PLAN 4**

ISSUE STATUS	SCALE A1	SCALE A3
OPTIONEERING	1:1000	1:2000
		ISSUE A

**Eastern Busway Alliance**

Fletcher | Acciona | ABCOM | Jacobs



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION <sup>A1</sup>

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/WHEATLEY AVENUE**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

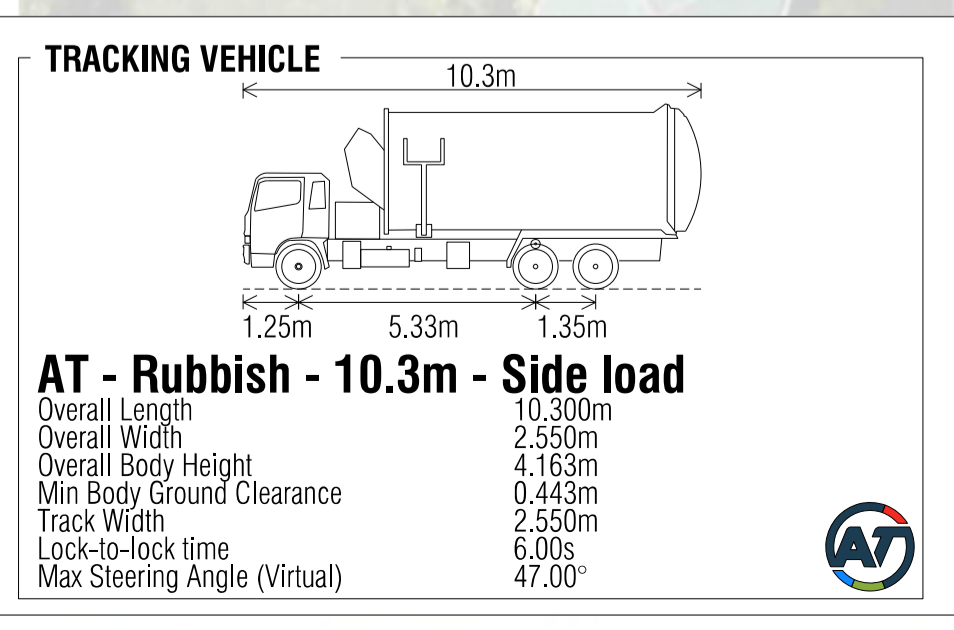
AUTHOR: ABHIJIT TAVILDAR  
 DATE: 11.10.2022  
 SHEET 05 OF 08

SKETCH NUMBER: **EB3R-SKT-VT-0001-PLAN 5**

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

Fletcher | Hecobas | ABCOM | Jacobs



NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/WHEATLEY AVENUE**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0001-PLAN 6

ISSUE STATUS: OPTIONEERING

SCALE A1	SCALE A3	SCALE A
1:1000	1:2000	

SHEET 06 OF 08

Eastern Busway Alliance



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER EAST**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 07 OF 08  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0001-PLAN 7

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

Fletcher | Hecobac | ABCOM | Jacobs



**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.183m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER EAST**  
**LAYOUT PLAN - CHECK VEHICLES**

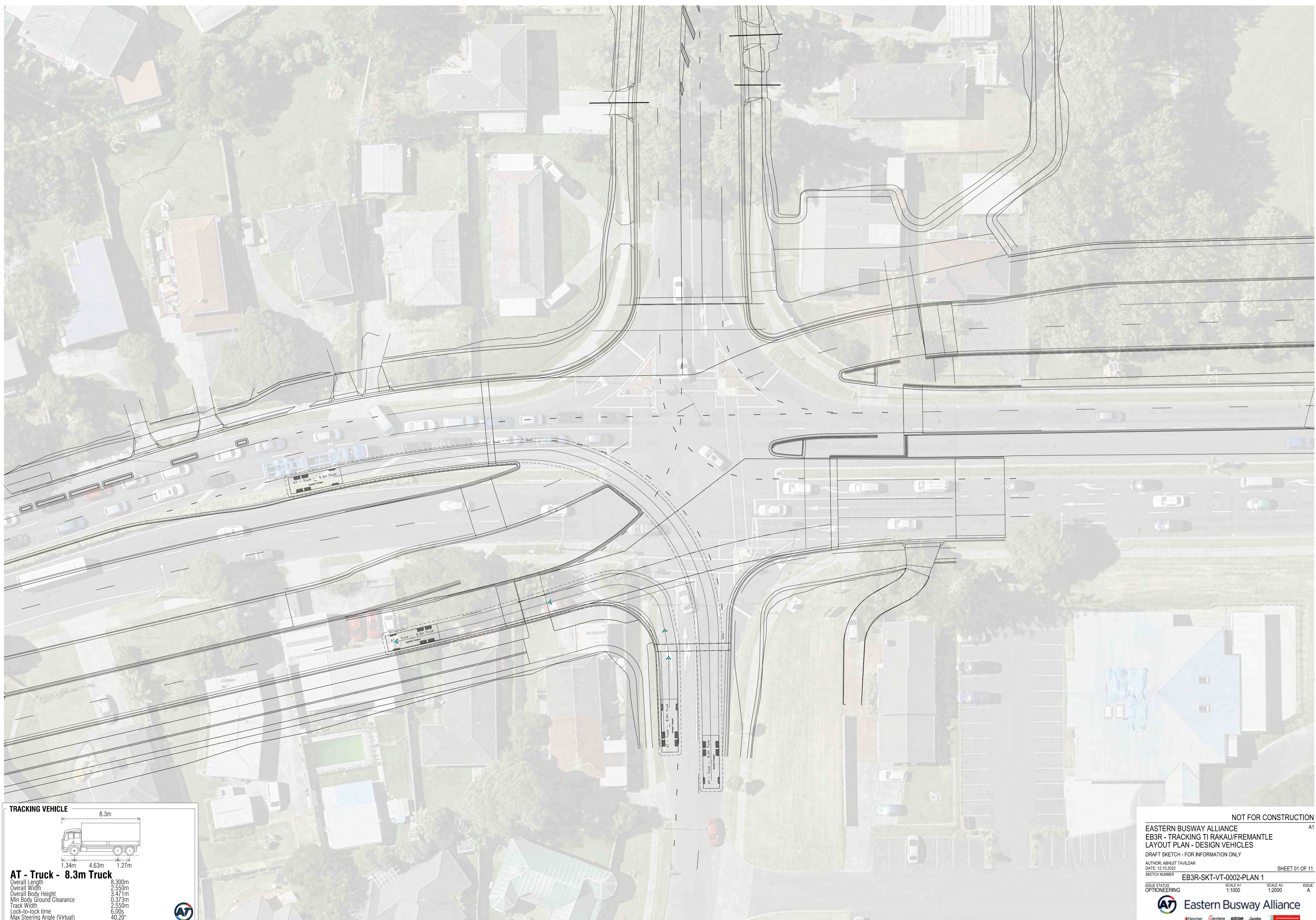
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AUTHOR: ABHIJIT TAVILDAR SHEET 08 OF 08  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0001-PLAN 8

ISSUE STATUS	SCALE A1	SCALE A3	SCALE A
OPTIONEERING	1:1000	1:2000	1:2000

**Eastern Busway Alliance**

Fletcher | Hecob | ABCOM | Jacobs



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/FREMANTLE**  
**LAYOUT PLAN - DESIGN VEHICLES**

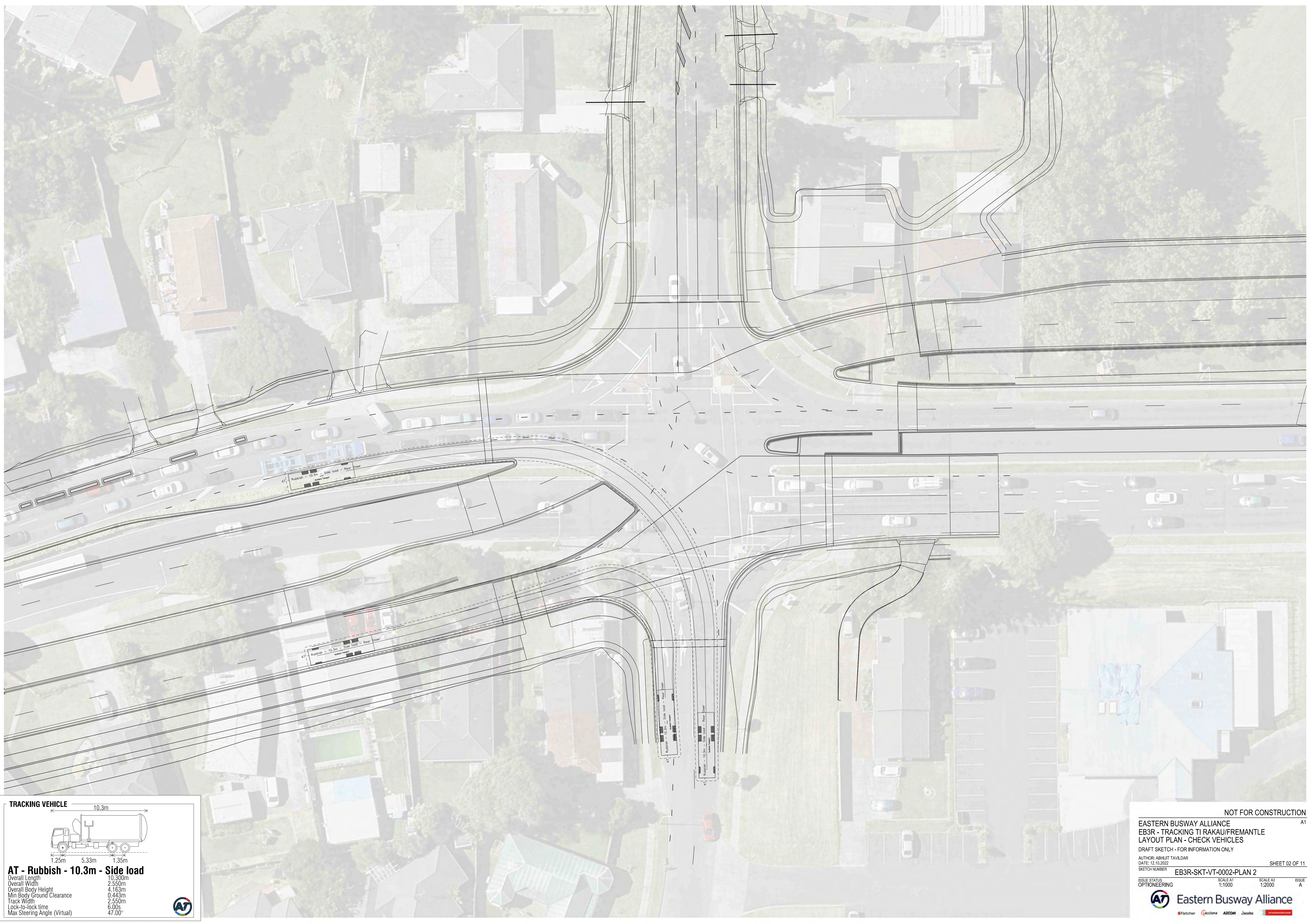
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 01 OF 11  
 DATE: 12.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 1

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

Eastern Busway Alliance





**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.183m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/FREMANTLE**  
**LAYOUT PLAN - CHECK VEHICLES**

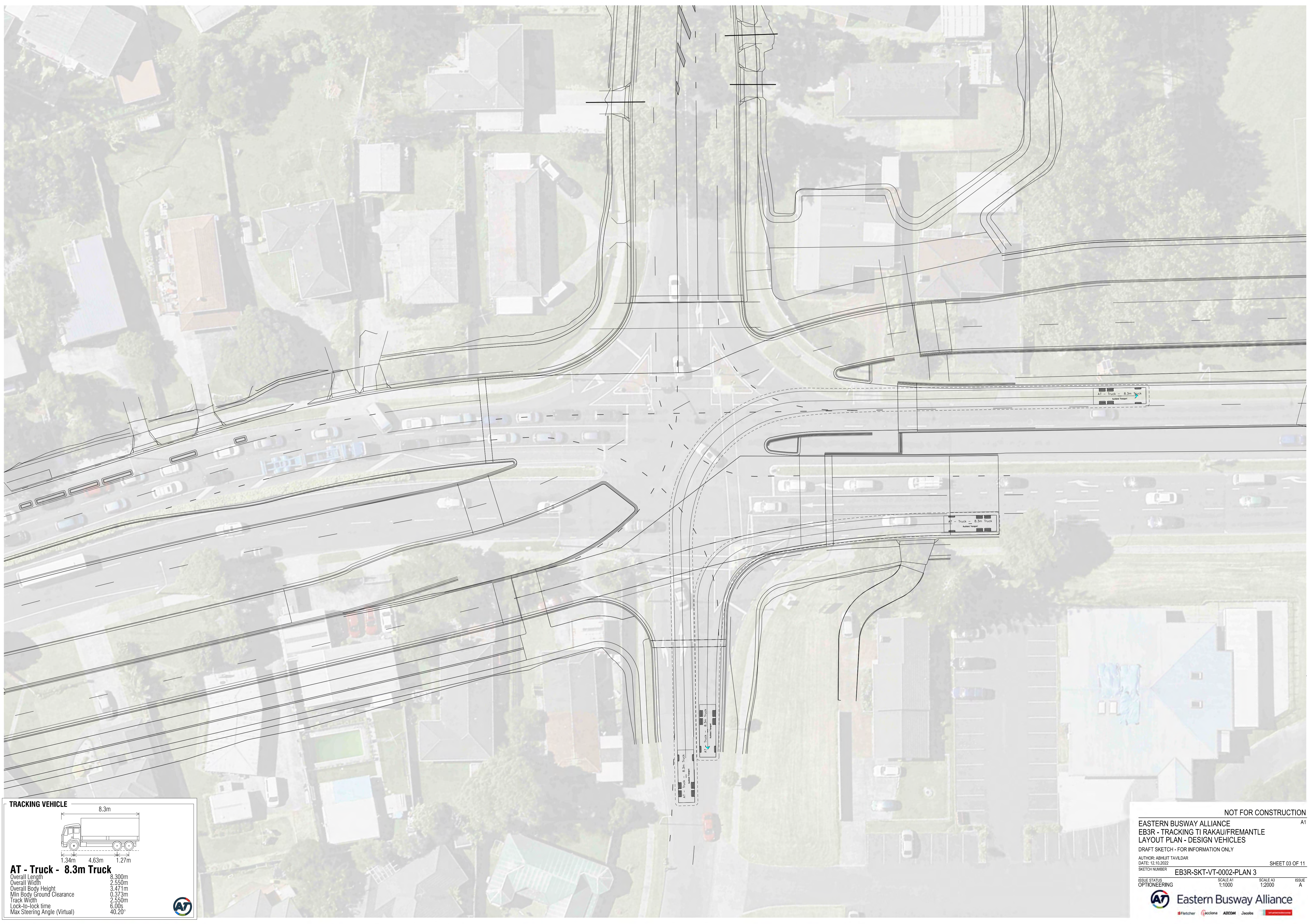
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 02 OF 11  
 DATE: 12.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 2

ISSUE STATUS	SCALE A1	SCALE A3
OPTONEERING	1:1000	1:2000
		ISSUE A

**Eastern Busway Alliance**

Partcher Acciona ABCOM Jacobs



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/FREMANTLE**  
**LAYOUT PLAN - DESIGN VEHICLES**

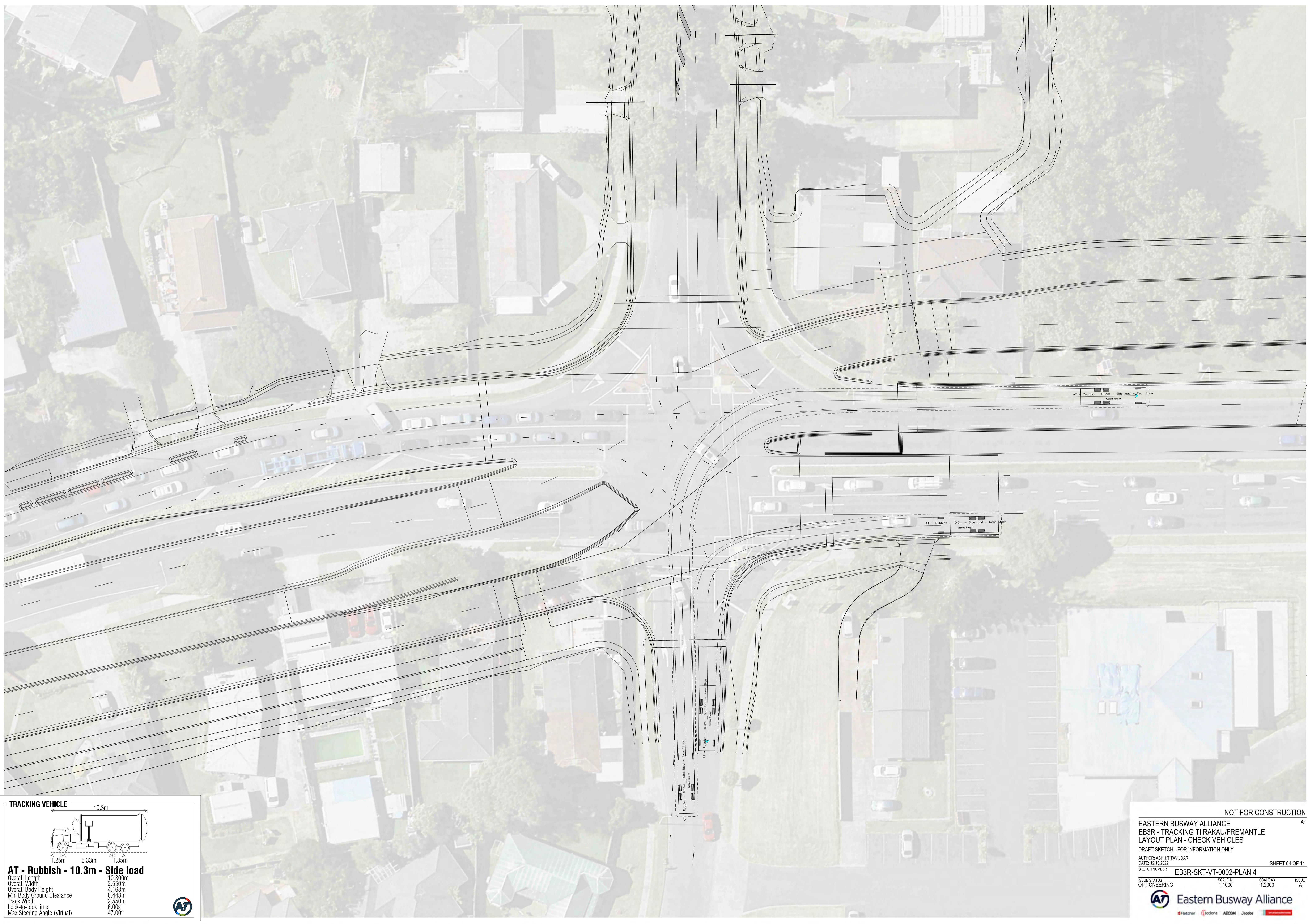
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 03 OF 11  
 DATE: 12.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 3

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

Fletcher | Hecobona | ABCOM | Jacobs



**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.183m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/FREMANTLE**  
**LAYOUT PLAN - CHECK VEHICLES**

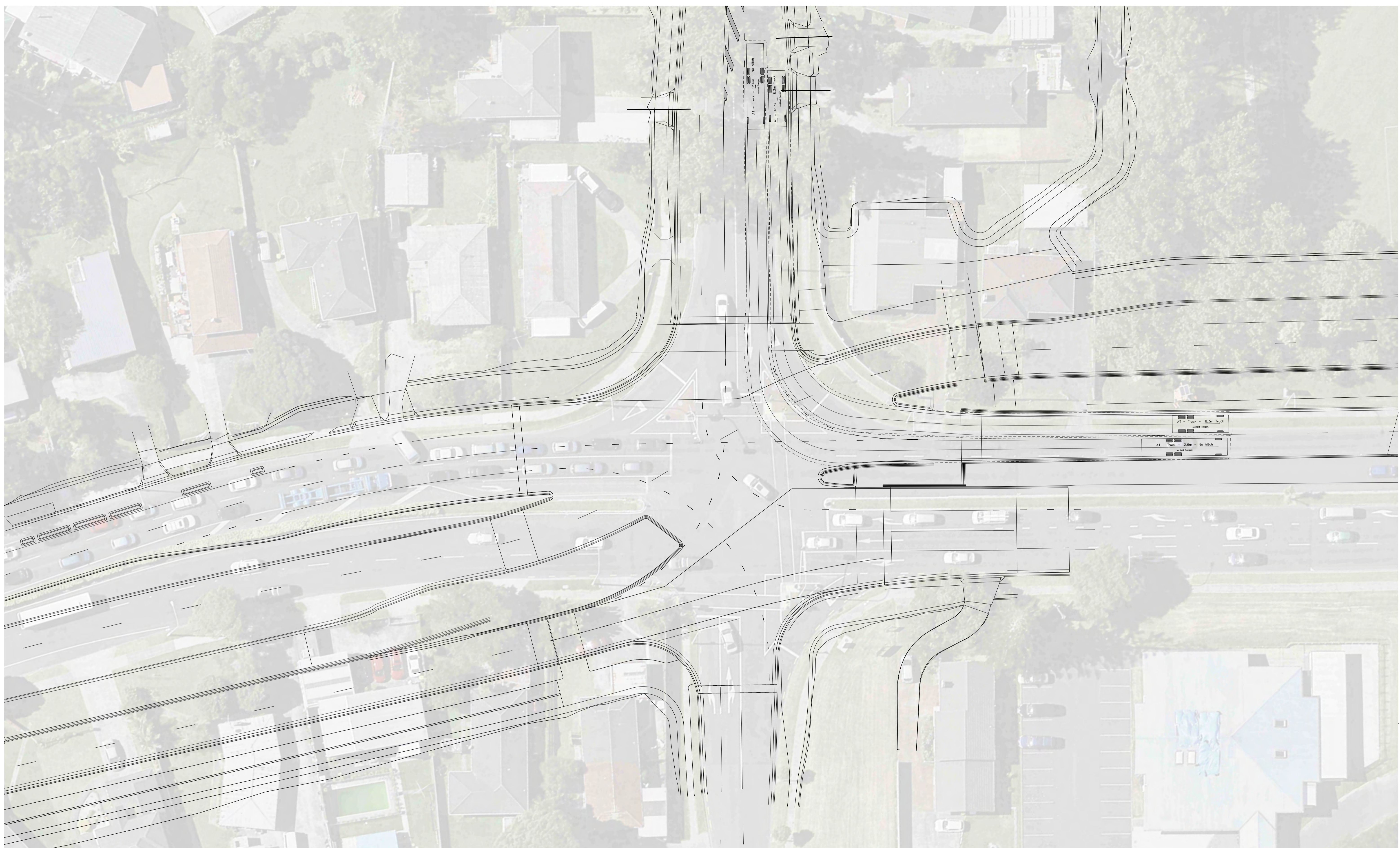
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 04 OF 11  
 DATE: 12.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 4

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

Eastern Busway Alliance

Partcher Acciona ABCOM Jacobs



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/GOSSAMER**  
**LAYOUT PLAN - DESIGN VEHICLES**

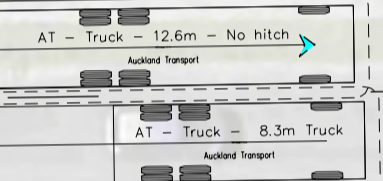
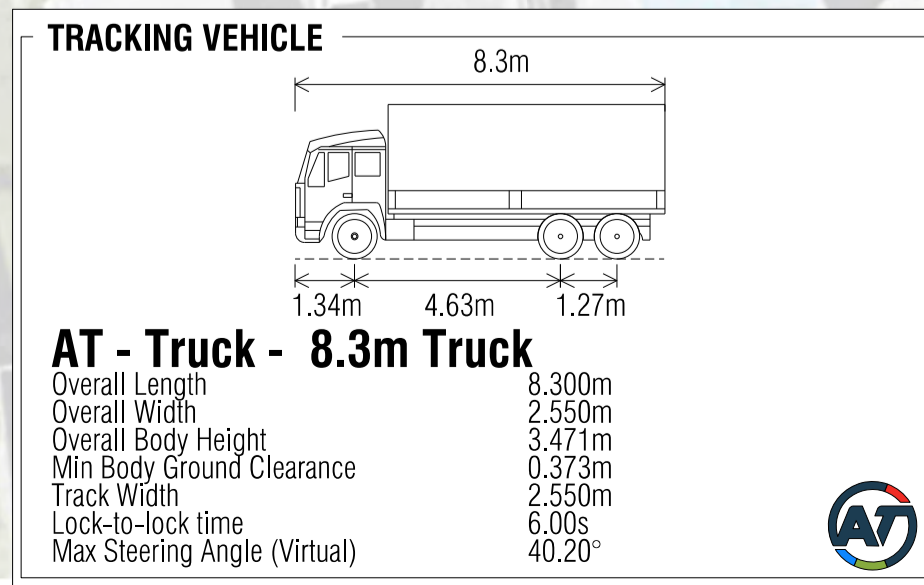
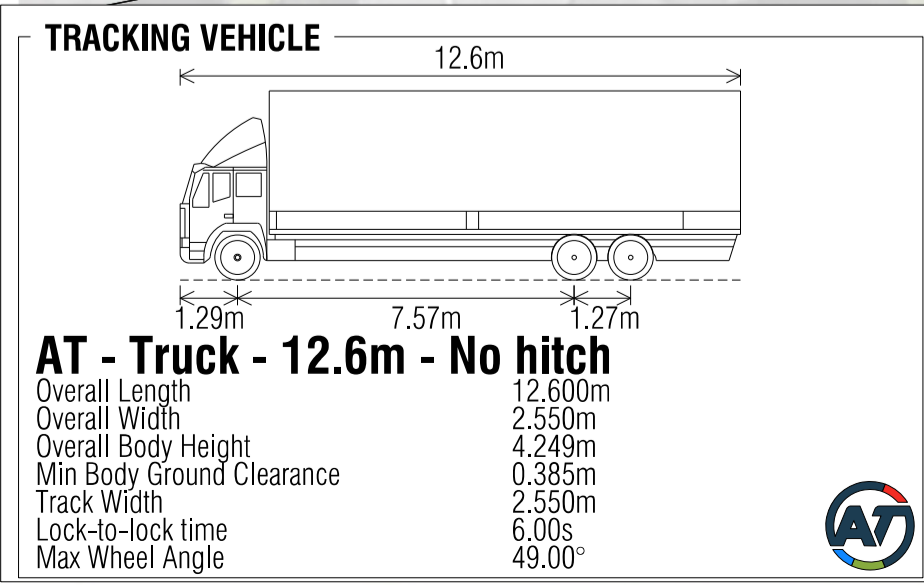
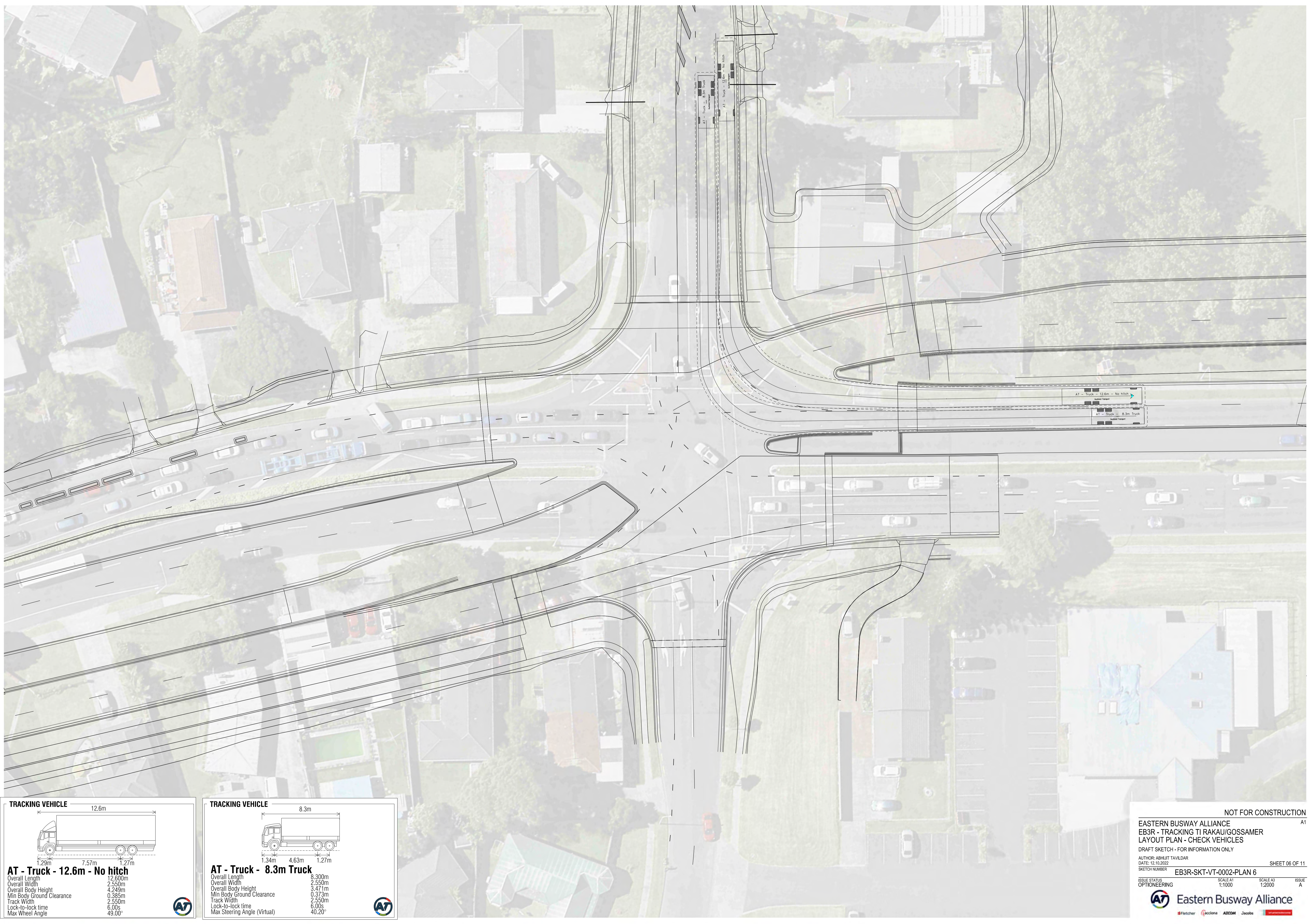
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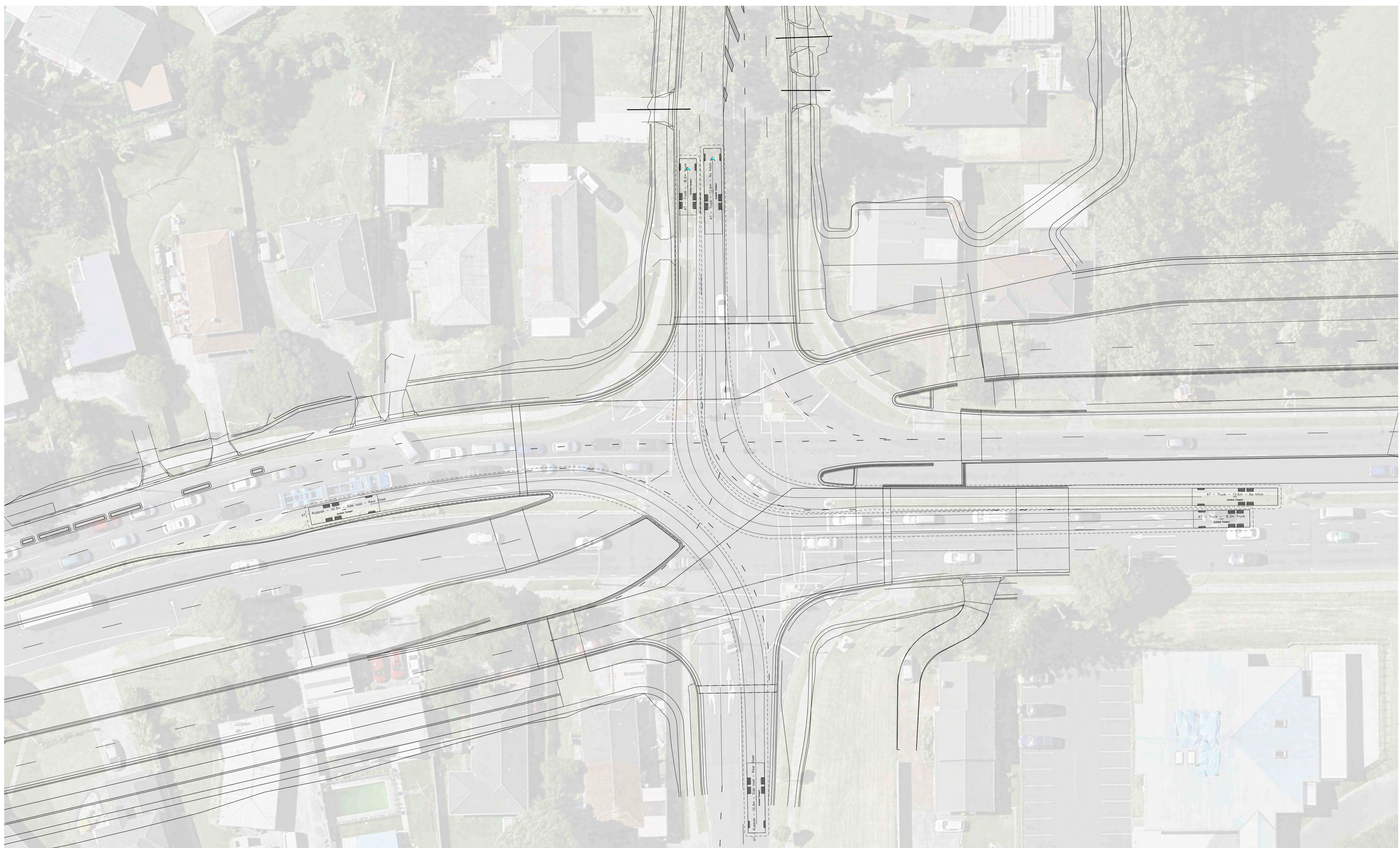
AUTHOR: ABHIJIT TAVILDAR SHEET 05 OF 11  
 DATE: 12.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 5

ISSUE STATUS: OPTONEERING SCALE A1: 1:1000    SCALE A3: 1:2000    ISSUE: A

**Eastern Busway Alliance**

Fletcher    Geccon    ABCOM    Jacobs





**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.183m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION

**EASTERN BUSWAY ALLIANCE** <sup>A1</sup>  
**EB3R - TRACKING TI RAKAU/GOSSAMER/FREMANTLE**  
**LAYOUT PLAN - DESIGN VEHICLES**

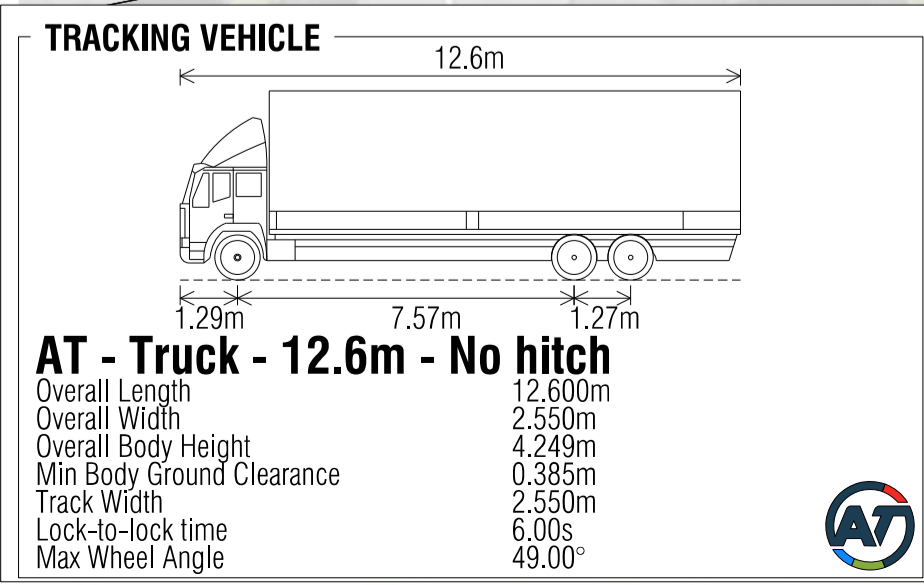
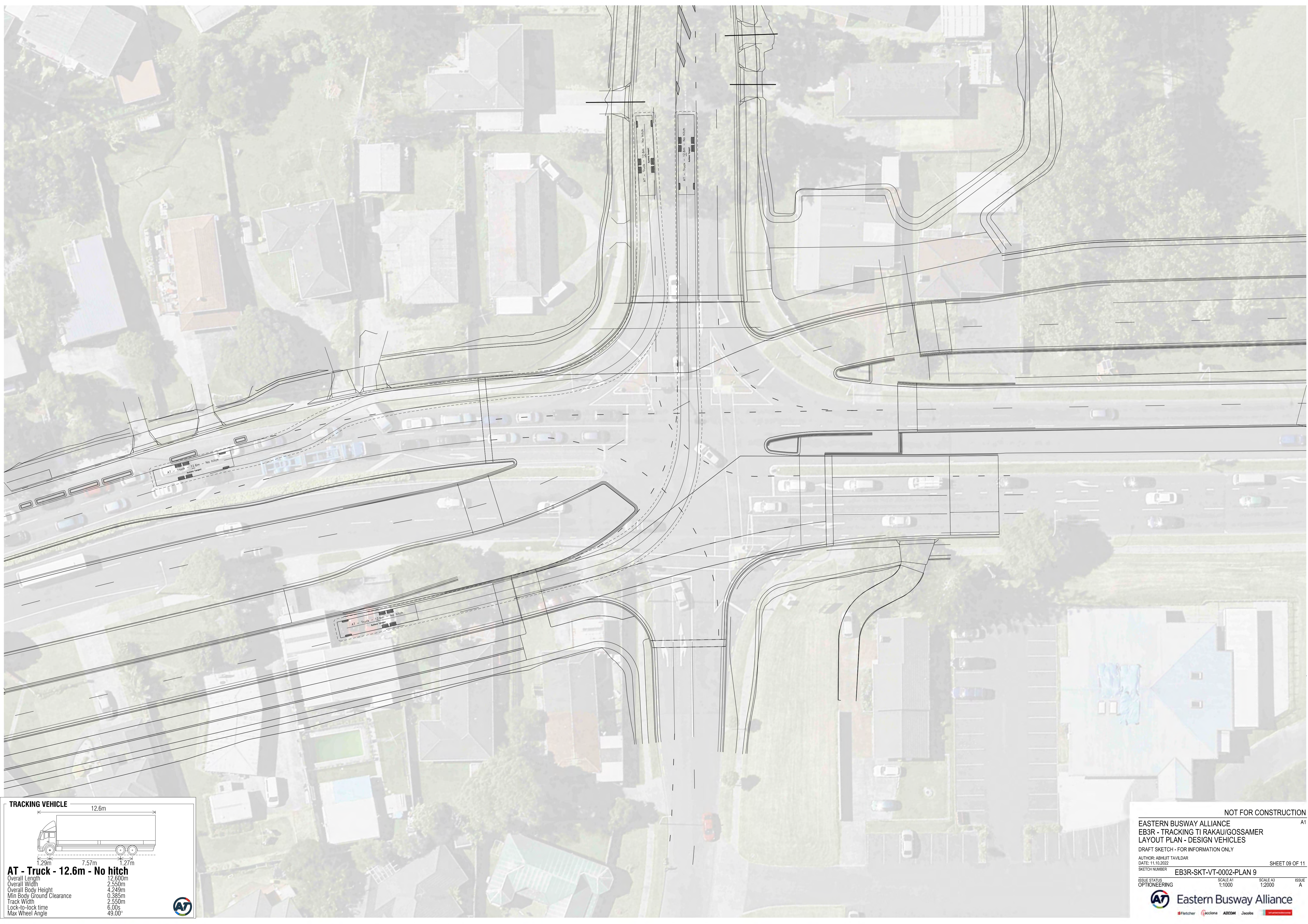
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 13.10.2022  
 SHEET NUMBER: EB3R-SKT-VT-0002-PLAN 8 SHEET 08 OF 11

ISSUE STATUS: OPTONEERING SCALE A1: 1:1000    SCALE A3: 1:2000    ISSUE: A

**Eastern Busway Alliance**

Partech    Acciona    ABCOM    Jacobs



NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/GOSSAMER**  
**LAYOUT PLAN - DESIGN VEHICLES**

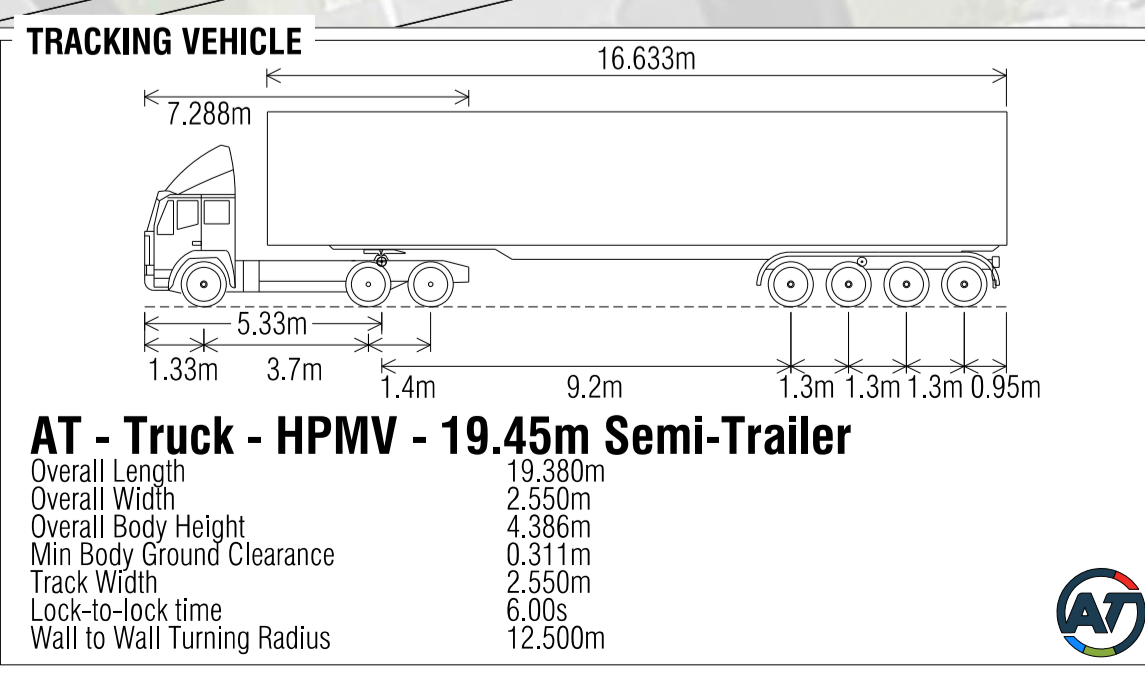
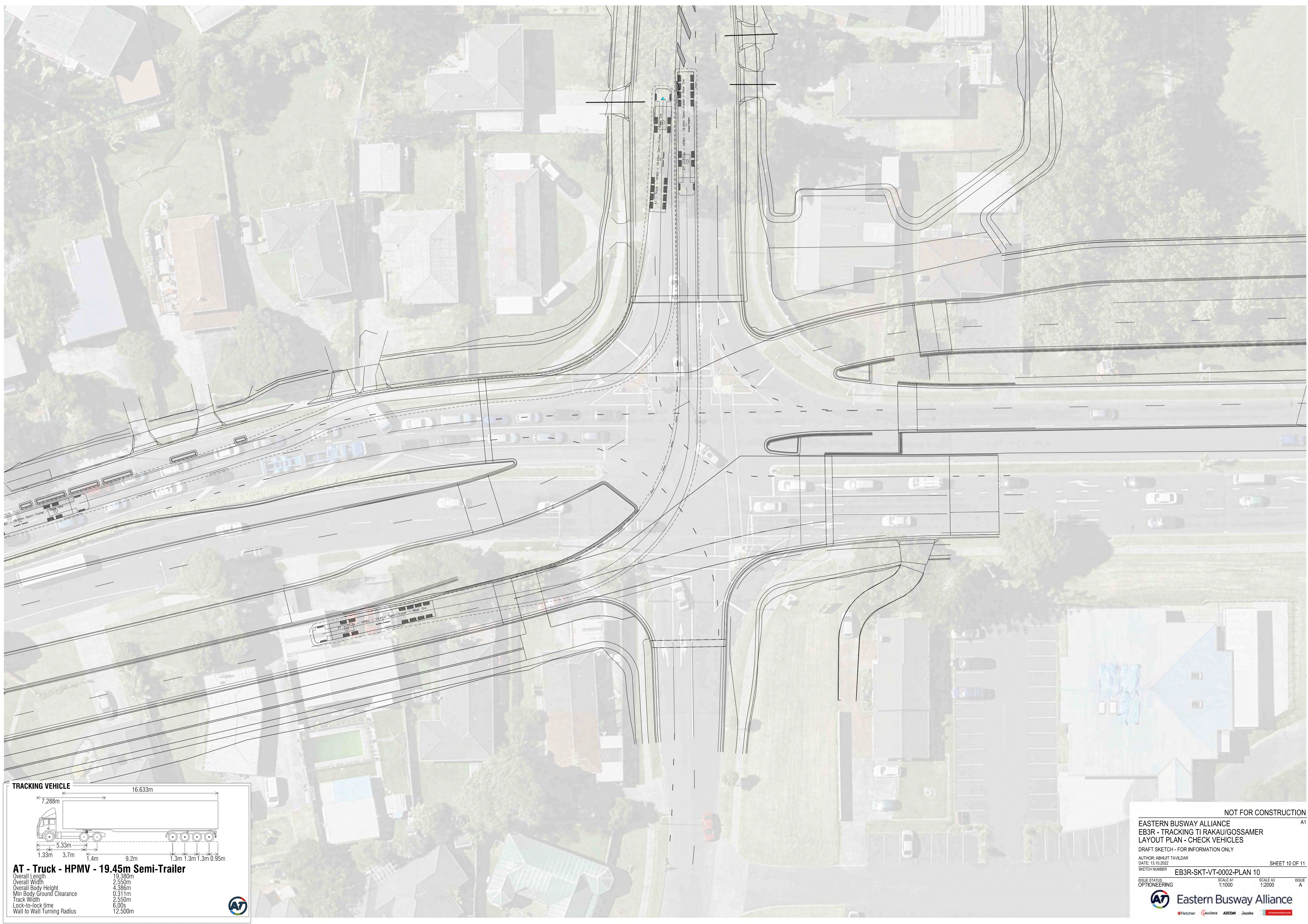
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 09 OF 11  
 DATE: 11.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 9

ISSUE STATUS	SCALE A1	SCALE A3
OPTONEERING	1:1000	1:2000
		ISSUE A

**Eastern Busway Alliance**

Partcher Acciona ABCOM Jacobs



NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/GOSSAMER**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 13.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 10

SHEET 10 OF 11

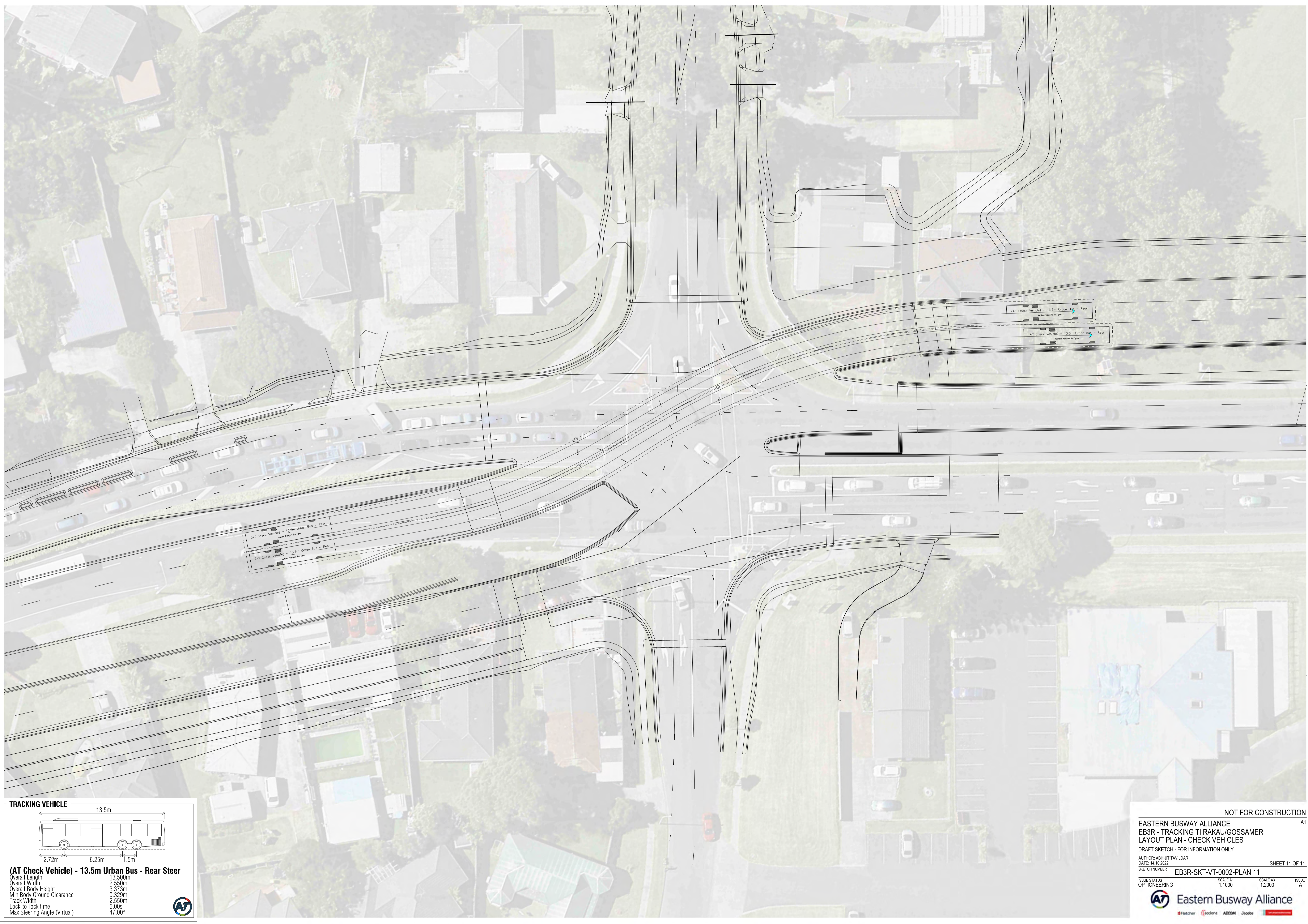
ISSUE STATUS: OPTONEERING

SCALE A1 1:1000	SCALE A3 1:2000	ISSUE A
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**Eastern Busway Alliance**

Fletcher | Hecobona | ABCOM | Jacobs





**TRACKING VEHICLE**

**(AT Check Vehicle) - 13.5m Urban Bus - Rear Steer**

Overall Length	13.500m
Overall Width	2.550m
Overall Body Height	3.373m
Min Body Ground Clearance	0.329m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

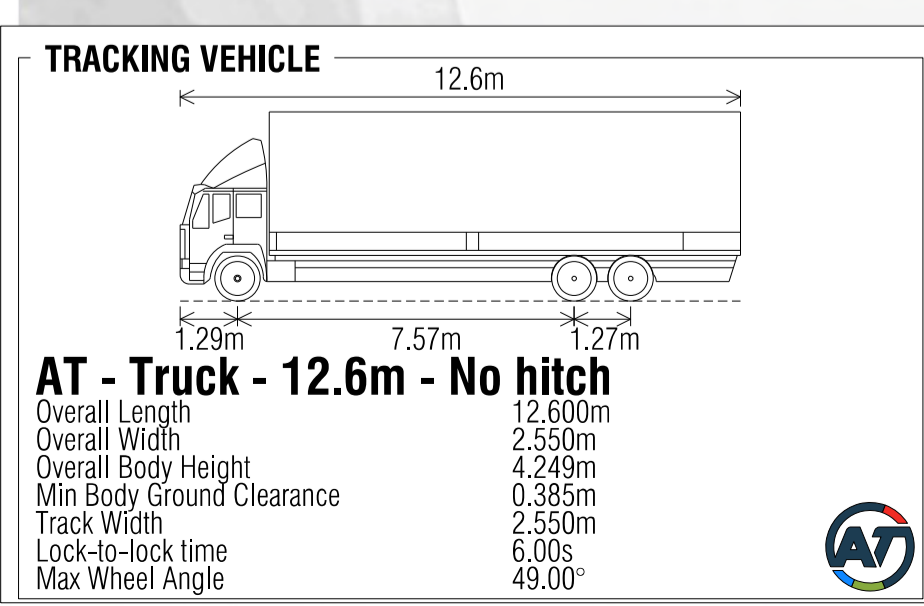
**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/GOSSAMER**  
**LAYOUT PLAN - CHECK VEHICLES**

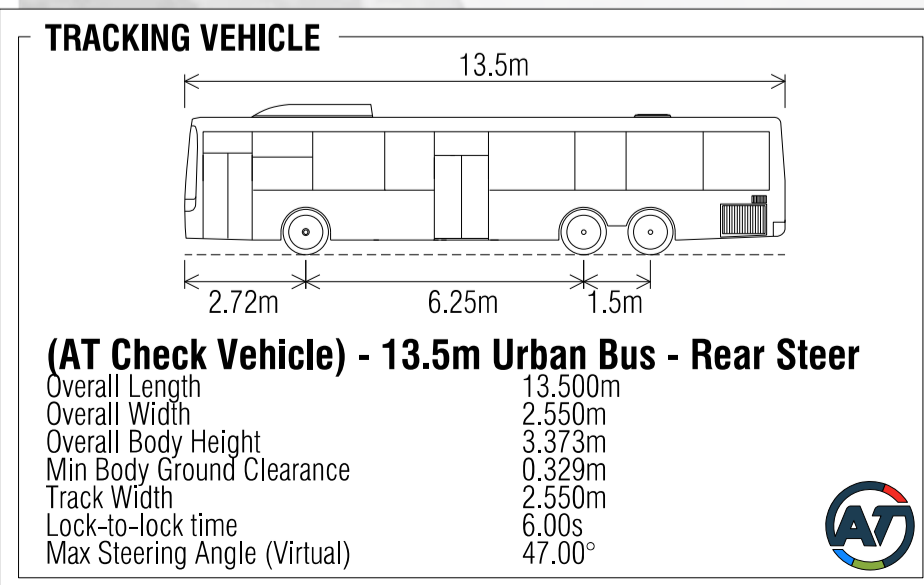
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 11 OF 11  
 DATE: 14.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0002-PLAN 11

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

Eastern Busway Alliance







**NOT REQUIRED**

**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TURN BAYS**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 13.10.2022  
 SKETCH NUMBER: EB3R-SKT-VT-0003-PLAN 3

ISSUE STATUS: OPTIONEERING

SCALE A1	SCALE A3	ISSUE
1:1000	1:2000	A

Eastern Busway Alliance



NOT REQUIRED

**TRACKING VEHICLE**

**(AT Check Vehicle) - 13.5m Urban Bus - Rear Steer**

Overall Length	13.500m
Overall Width	2.550m
Overall Body Height	3.373m
Min Body Ground Clearance	0.329m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

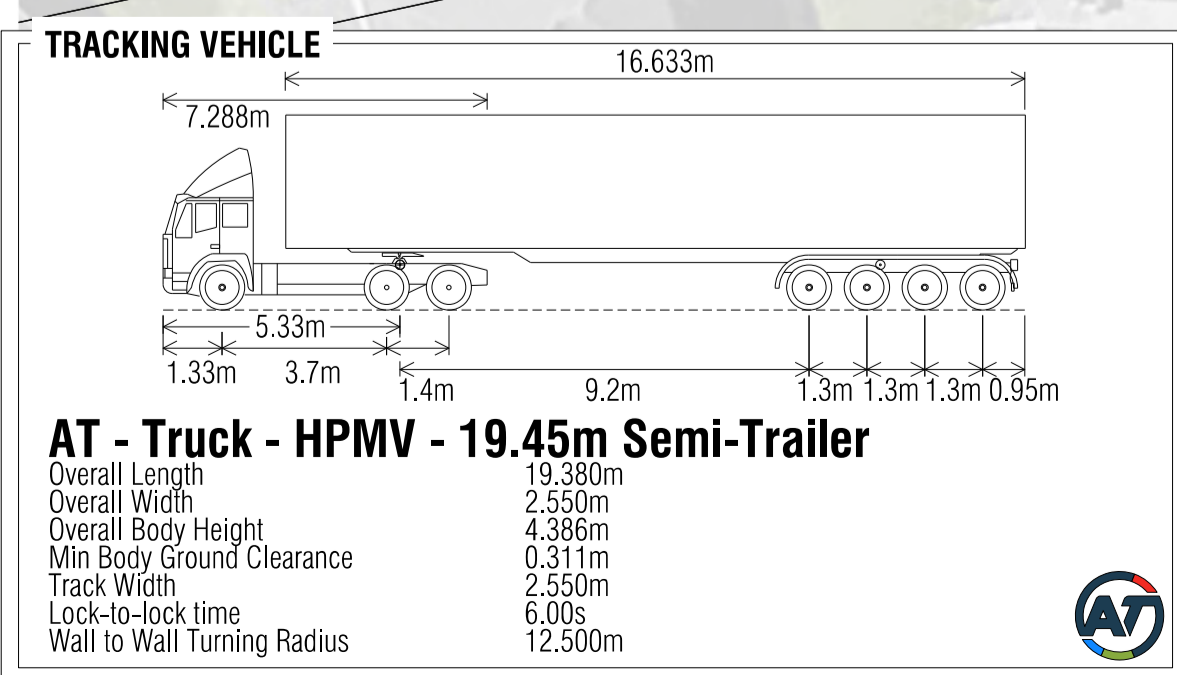
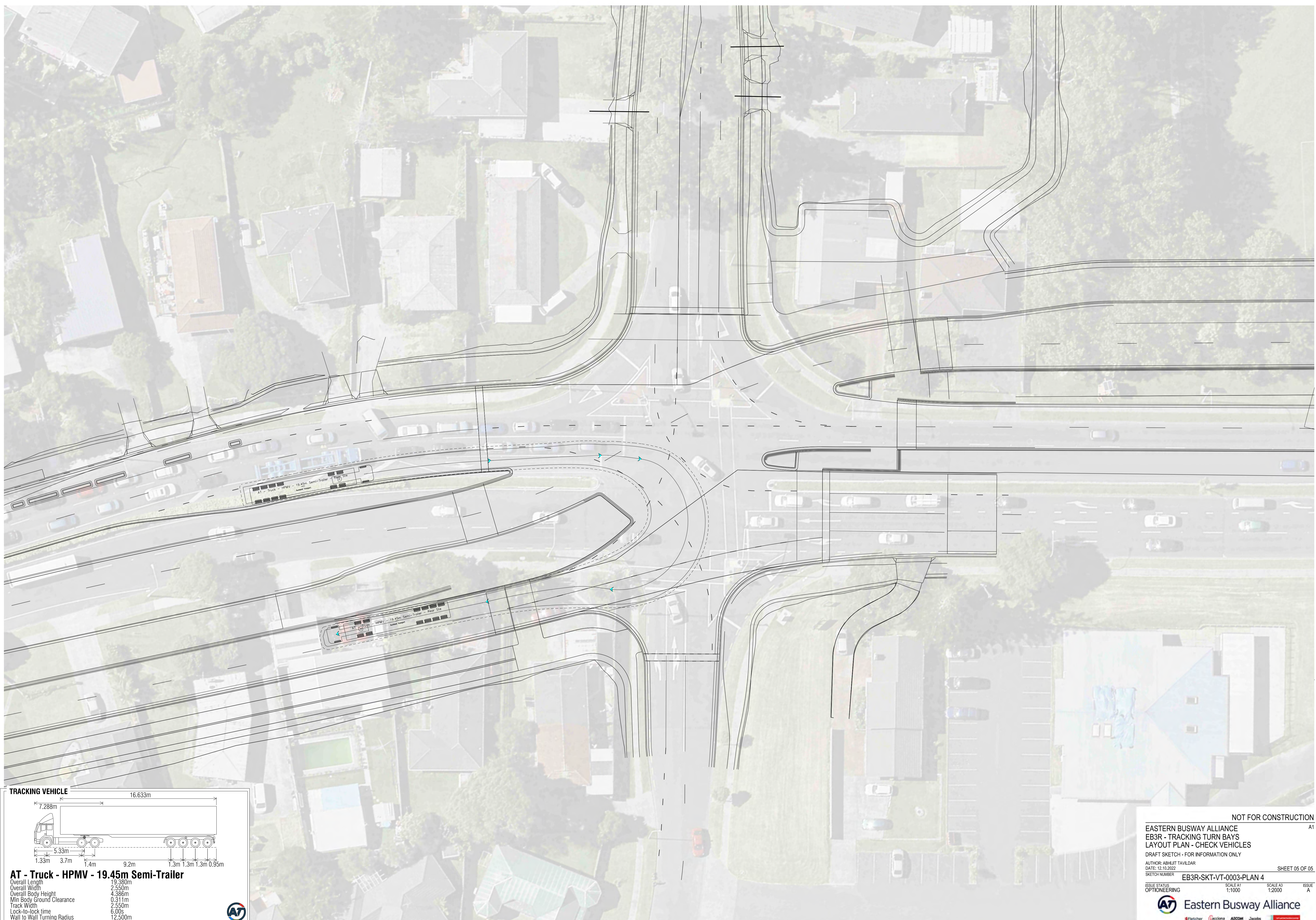
**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TURN BAYS**  
**LAYOUT PLAN - CHECK VEHICLES**

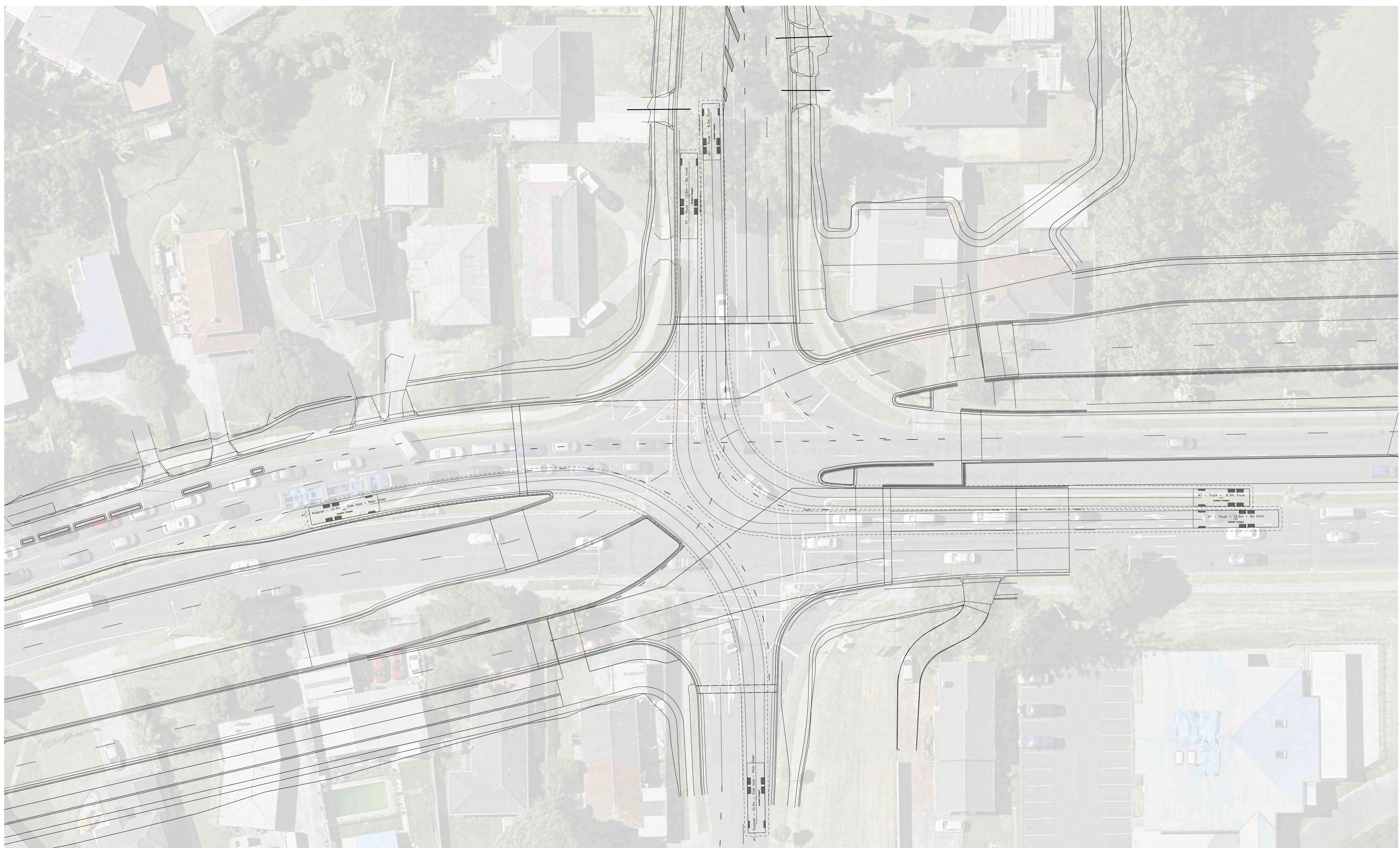
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
DATE: 12.10.2022  
SKETCH NUMBER: EB3R-SKT-VT-0003-PLAN 4  
ISSUE STATUS: OPTIONEERING

SCALE A1: 1:1000  
SCALE A3: 1:2000  
ISSUE: A

**Eastern Busway Alliance**





**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

**TRACKING VEHICLE**

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.163m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION <sup>A1</sup>

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER EAST**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 18.01.2023  
 SKETCH NUMBER: EB3R-SKT-VT-0004-PLAN 1

SHEET 01 OF 06

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

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**TRACKING VEHICLE**

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.183m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER EAST**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 18.01.2023  
 SKETCH NUMBER: EB3R-SKT-VT-0004-PLAN 2

ISSUE STATUS: OPTONEERING

SCALE A1	SCALE A3	SCALE A
1:1000	1:2000	1:2000

SHEET 02 OF 06

**Eastern Busway Alliance**

#Fletcher | @Gardner | AECOM | Jacobs



**TRACKING VEHICLE**

**AT - Truck - 8.3m Truck**

Overall Length	8.300m
Overall Width	2.550m
Overall Body Height	3.471m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	40.20°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER EAST**  
**LAYOUT PLAN - DESIGN VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR  
 DATE: 18.01.2023  
 SKETCH NUMBER: EB3R-SKT-VT-0004-PLAN 3

ISSUE STATUS: OPTIONEERING

SCALE A1	SCALE A3	SCALE A4
1:1000	1:2000	1:2000
		A

SHEET 03 OF 06

**Eastern Busway Alliance**

#Fletcher | #Gardiner | #BDO | #Jacobs



**TRACKING VEHICLE** 12.6m

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

**TRACKING VEHICLE** 10.3m

**AT - Rubbish - 10.3m - Side load**

Overall Length	10.300m
Overall Width	2.550m
Overall Body Height	4.163m
Min Body Ground Clearance	0.443m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	47.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TI RAKAU/EDGEWATER EAST**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 04 OF 06  
 DATE: 18.01.2023  
 SKETCH NUMBER: **EB3R-SKT-VT-0004-PLAN 4**

ISSUE STATUS: **OPTIONEERING** SCALE A1: 1:1000 SCALE A3: 1:2000 ISSUE: A

**Eastern Busway Alliance**  
 #Fletcher | #Gardiner | #BDO | #Jacobs



**TRACKING VEHICLE**

12.6m  
1.29m 7.57m 1.27m

**AT - Truck - 12.6m - No hitch**

Overall Length	12.600m
Overall Width	2.550m
Overall Body Height	4.249m
Min Body Ground Clearance	0.385m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Wheel Angle	49.00°

NOT FOR CONSTRUCTION A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TURN BAYS**  
**LAYOUT PLAN - DESIGN VEHICLES**

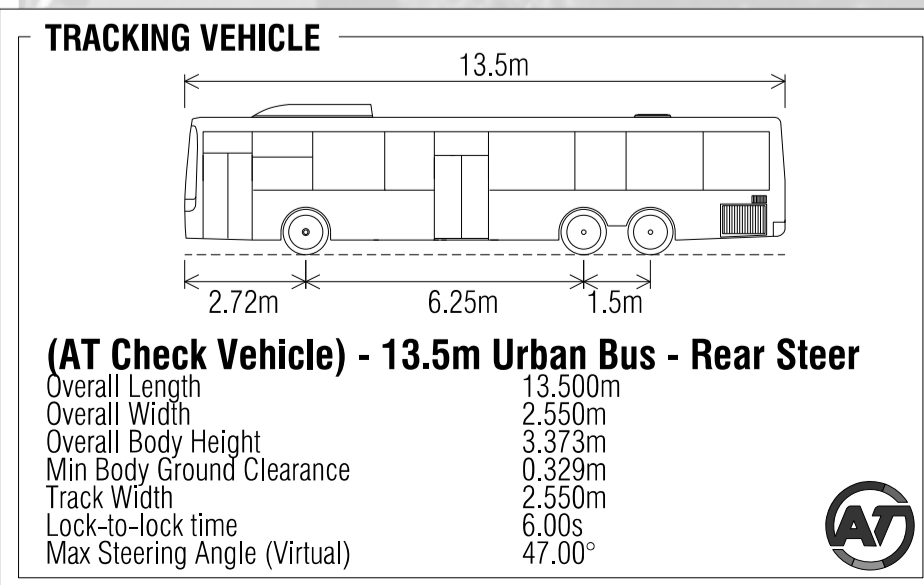
DRAFT SKETCH - FOR INFORMATION ONLY

AUTHOR: ABHIJIT TAVILDAR SHEET 05 OF 06  
DATE: 18.01.2023  
SKETCH NUMBER: **EB3R-SKT-VT-0004-PLAN 5**

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

#Fletcher | @acciona | AECOM | Jacobs



NOT FOR CONSTRUCTION  
A1

**EASTERN BUSWAY ALLIANCE**  
**EB3R - TRACKING TURN BAYS**  
**LAYOUT PLAN - CHECK VEHICLES**

DRAFT SKETCH - FOR INFORMATION ONLY

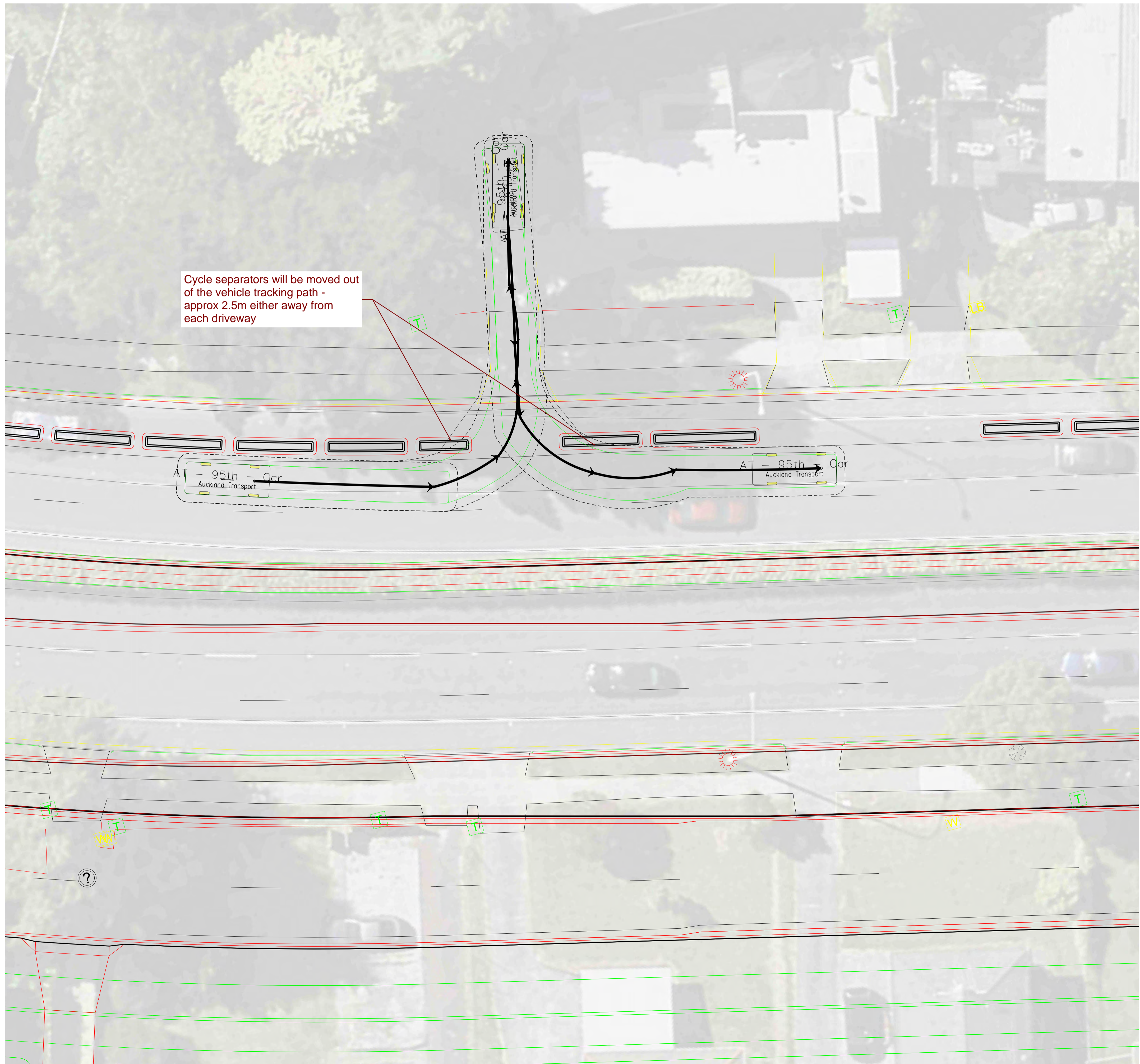
AUTHOR: ABHIJIT TAVILDAR  
 DATE: 18.01.2023  
 SKETCH NUMBER: EB3R-SKT-VT-0004-PLAN 6

SHEET 06 OF 06

ISSUE STATUS	SCALE A1	SCALE A3	ISSUE
OPTIONEERING	1:1000	1:2000	A

**Eastern Busway Alliance**

#Fletcher | @acciona | AECOM | Jacobs



Cycle separators will be moved out of the vehicle tracking path - approx 2.5m either away from each driveway

AT - 95th - Car  
Auckland Transport

AT - 95th - Car  
Auckland Transport

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