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PROPOSED PLAN PRIVATE CHANGE – TRANSPORT ASSESSMENT MOONLIGHT HEIGHTS, AWAKINO ROAD, DARGAVILLE

1.0 INTRODUCTION

The following is a transport assessment for the proposed Private Plan Change on Awakino Road in Dargaville. The subject site is currently zoned Rural and is proposed to be changed to Residential to enable medium density living. Approximately 392,610 m² of land is seeking a plan change to facilitate the development of approximately 348 dwellings on the east side of Awakino Road, near its northern end. **Figure 1** displays the subject site location.

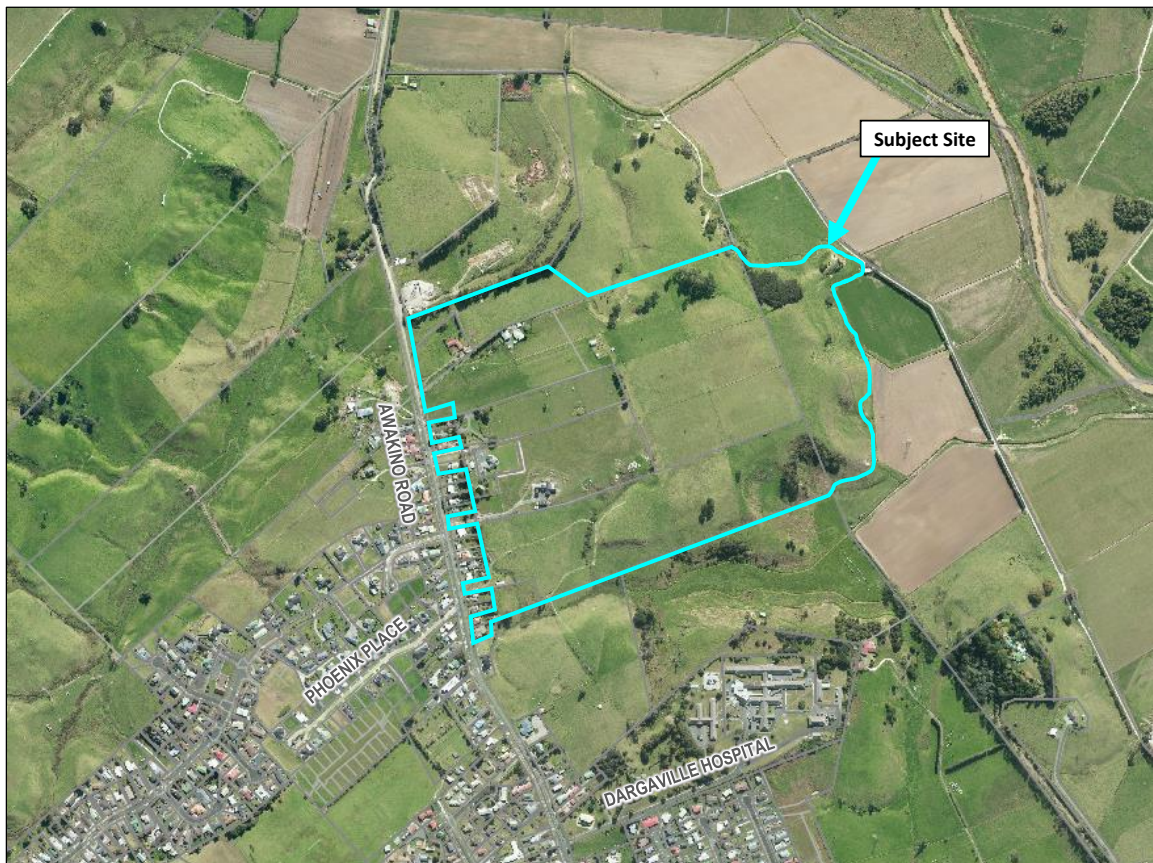


Figure 1: Site Location

Image Source: Kaipara District GIS

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2.0 EXISTING TRANSPORT ENVIRONMENT

2.1 Road Network

Awakino Road is a two-lane road which runs in a north-south directions from Victoria Street in the south and ends and terminates in the north, some 1.4 kilometres north of Paritai Place. South of the Dargaville Hospital access, Awakino Road is classified as a Secondary Collector Road and north of the Dargaville Hospital access, is an access road. Near the subject site, Awakino Road has a carriageway width of some 7.0 metres, providing one traffic lane in each direction and on-street parking on both sides. It has a speed limit of 50 km/h. A footpath is provided on the western side of the street, terminating 215 metres north of Paritai Place.

2.2 Traffic Volumes

Turning movement count data was collected in April 2022 for the intersections of:

- Awakino Road and State Highway 12;
- Awakino Road and Ranfurly Street; and
- Awakino Road and Dargaville Hospital.

Figure 2 displays the AM and PM peak hour traffic volumes along the studied corridor.

The total two-way peak hour traffic volumes on Awakino Road near the site range from approximately 238 vehicles in the AM peak hour to 191 vehicles during the PM peak hour, mid-way along Awakino Road near Ranfurly Street volumes range from approximately 321 vehicles in the AM peak hour to 304 vehicles during the PM peak hour. Near State Highway 12 volumes along Awakino Road range from approximately 282 vehicles in the AM peak hour to 288 vehicles during the PM peak hour.

Attachment 1 contains the detailed traffic counts for study area intersections.

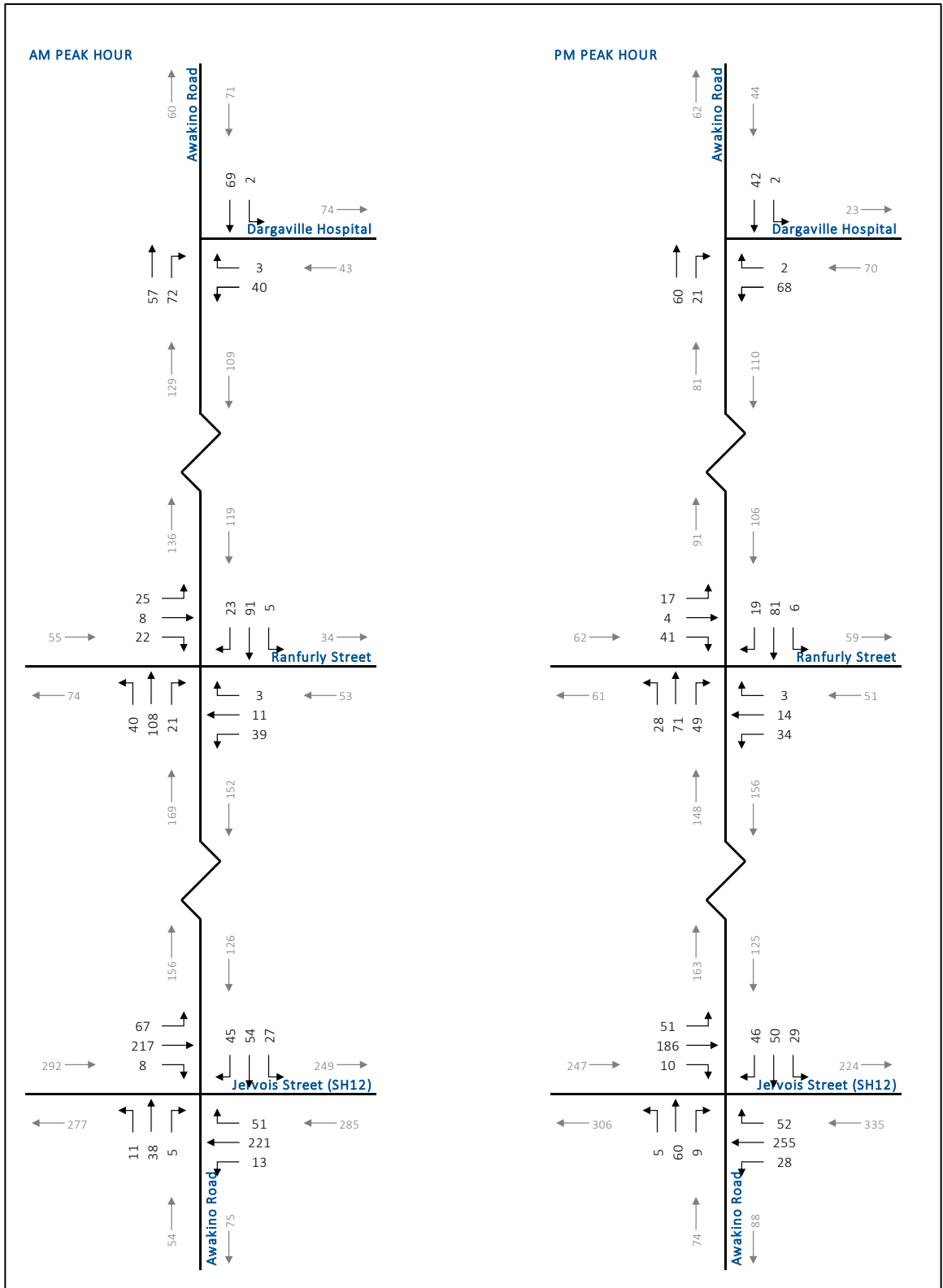


Figure 2: Awakino Road Existing Traffic Volumes
 Image source: Traffic Planning Consultants Ltd.

2.3 Crash History

A review of crash data along Awakino Road, for the five-year+ period (January 2017 to present¹) reported 17 crashes. **Table 1** summarised the reported crashes along the corridor.

Table 1: Awakino Road Crash History

Location	Reported Crashes			Key Factors
	Total	Injury	Non-Injury	
Awakino Rd and Dargaville Hospital Access	1	-	1	1 – driver hit rear end of vehicle in front
Awakino Rd and Ranfurly Street	1	-	1	1 – southbound driver turned into path of oncoming northbound vehicle
Awakino Rd and Tiraau Street	1	-	1	1 – driver under influence of alcohol and speeding, missed the intersection/end of road and hit house
Awakino Rd and Gordon Street	1	-	1	1 – driver turning from Gordon Street, failed to give-way to oncoming southbound traffic
Intersection: Awakino Rd and Jervois St (SH12)	13	4 minor	9	10 – driver failed to stop at stop sign 1 – driver misjudged other driver's action 1 – driver suspected to be under influence of alcohol and speed, hit rear end of vehicle in front (minor) 1 -driver lost control and hit fence
TOTAL	17	4 minor	3	

It is noted that 10 crashes occurred at the intersection of Awakino Road and Jervois Street (SH12), where drivers failed to stop at the stop sign, resulting in a collision with oncoming vehicles. A review of the available sightlines in this location indicated that visibility extends more than 150 metres in both directions (**Figure 3**). As such the crashes do not appear to be a result of the road environment, but rather human error and driver's making a mistake, which is expected to occur to a degree within any road environment. However, as no crashes resulted in serious injury or death, the crashes relatively minor in nature and do not represent a significant concern.

Elsewhere, there is no significant commonality within the studied crash history which would indicate an existing road safety issue along Awakino Road. While crashes have occurred, they resulted in either no injury, or minor injuries, which would be expected for collector roads within any developed area.

¹ 2022 data subject to reporting delays



Figure 3: Awakino Road Southbound Approach onto Jervois Street (SH12)
Image Source: Traffic Planning Consultants Ltd.

3.0 THE PROPOSAL

The proposal consists of rezoning approximately 392,610 m² of Rural zoning to Residential zoning. Based on the site area, it is estimated that approximately 348 lots will be created as a result of the plan change. The area to be rezoned is shown in **Figure 4**.

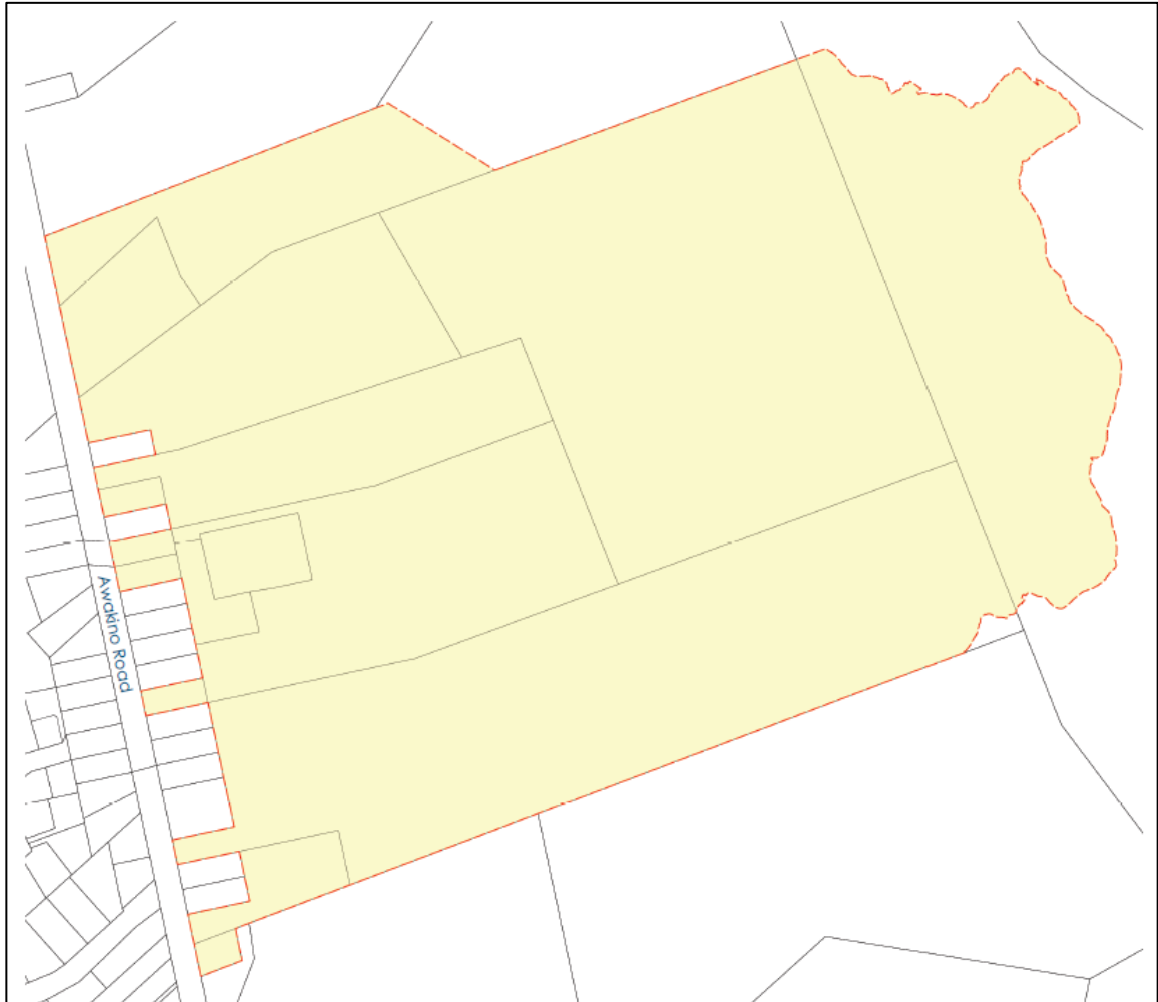


Figure 4: Proposed Plan Change Area

Image Source: Barker and Associates

3.1 Trip Generation

Residential trip generation data taken from the NZ Transport Agency publication “Trips and Parking Related to Land-Use”, provides trip generation estimates for outer suburban dwellings. The publication indicates an 85th percentile rate of 0.9 peak hour trips and 8.2 daily trips. The 85th percentile rates have been utilised due to no local public transportation infrastructure and higher reliance on personal vehicles for travel within this area. Further, utilising the higher rate, represents a more conservative approach within the following assessment, as it is not likely that each future dwelling in this area will have the 85th percentile trip generation rate in practice.

Overall, the site is estimated to generate 2,853 daily trips and 313 peak hour trips. As residential trips are typically tidal, with vehicle leaving in the AM and returning in the PM, an 80-20 and 20-80 inbound-outbound split has been estimated for the AM and PM peak hours, respectively.

3.2 Site Access to Public Road Network

The subject site is provided with multiple parcels of land onto Awakino Road which could be utilised to construct new public roads to service the resultant subdivision, post Plan Change. Along this section of Awakino Road, the road is relatively straight and flat allowing for good sightlines conducive to the creation of a new public road intersection. Preliminary massing for a future subdivision identified an access point along Awakino Road. Indicative sight distances from this location are shown in **Figure 5**. It is noted that further investigation of new road intersection locations will be carried out as part of any future subdivision applications, following a successful Plan Change.



Figure 5: Potential Road Connection Indicative Sightlines
Image Source: Traffic Planning Consultants Ltd.

4.0 TRAFFIC OPERATIONS

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.0, the movement is classed as LOS F and remedial measures are usually implemented, if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for right-turn movements at peak times, depending on delays.

The operations of intersections in the study area were evaluated with the existing turning movement volumes using Sidra.

The intersection analysis considered two separate measures of performance:

- The volume to capacity ratio for each intersection.
- The LOS for each turning movement (LOS is based on the average delay per vehicle).

4.1 Existing Operations

Using the above methodology, the existing intersection operations were assessed within Sidra and are summarized in **Table 2** indicating the existing levels of service (LOS), volume to capacity ratios (V/C) experienced within the study area, for the AM and PM peak hours. **Attachment 2** contains the detailed Sidra reports. Key findings from the analysis of the study area under existing conditions are as follows:

- All intersections are forecast to operate within acceptable levels, with no specific problem movements.

Table 2: Existing Intersection Operations

Intersection	Time	MOE	Approach / Movement												OVERALL
			South			East			North			West			
			LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	
Awakino Road and Dargaville Hospital	AM Peak	LOS		A	A	A		A	A	A					A
		Delay (s)		0	5	5		5	5	0					2
		V/C		0.08	0.08	0.03		0.03	0.04	0.04					
	PM Peak	LOS		A	A	A		A	A	A					A
		Delay (s)		0	5	5		6	5	0					2
		V/C		0.05	0.05	0.05		0.05	0.02	0.02					
Awakino Road and Ranfurly Street	AM Peak	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Delay (s)	5	0	5	8	9	9	5	0	5	8	9	9	3
		V/C	0.10	0.10	0.10	0.05	0.05	0.05	0.07	0.07	0.07	0.06	0.06	0.06	
	PM Peak	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Delay (s)	5	0	5	8	9	9	5	0	5	8	9	9	4
		V/C	0.09	0.09	0.09	0.05	0.05	0.05	0.06	0.06	0.06	0.08	0.08	0.08	
Awakino Road and Jervois Street (SH12)	AM Peak	LOS	A	C	C	A	A	A	B	C	C	A	A	A	A
		Delay (s)	9	16	17	5	0	6	10	17	20	5	0	5	5
		V/C	0.13	0.13	0.13	0.14	0.14	0.04	0.32	0.32	0.32	0.16	0.16	0.01	
	PM Peak	LOS	A	C	C	A	A	A	A	C	C	A	A	A	A
		Delay (s)	9	15	18	5	0	5	9	16	19	5	0	6	5
		V/C	0.19	0.19	0.19	0.16	0.16	0.04	0.31	0.31	0.31	0.13	0.13	0.01	
Queue (m)	5	5	5	0	0	1	10	10	10	0	0	0			

4.2 Development Trip Distribution and Assignment

Given that the surrounding area is largely developed with land-use similar to the proposed plan, the trip distribution was based on the likely origin/destination of trips generated by the development and the existing distribution on the surrounding streets, as determined by the collected intersection data. **Table 3** displays the breakdown of trip distribution used in this study.

Table 3: Estimated Trip Distribution

Origin/Destination	Percentage
Dargaville Hospital	2%
West via Ranfurly Street	20%
East via Ranfurly Street	3%
Other routes East & West between Ranfurly Street and Jervois Street (SH12)	20%
South via Awakino Road	20%
West via Jervois Street (SH12)	20%
East via Jervois Street (SH12)	15%

Figure 6 illustrates the site generated traffic volumes for the AM and PM peak hours.

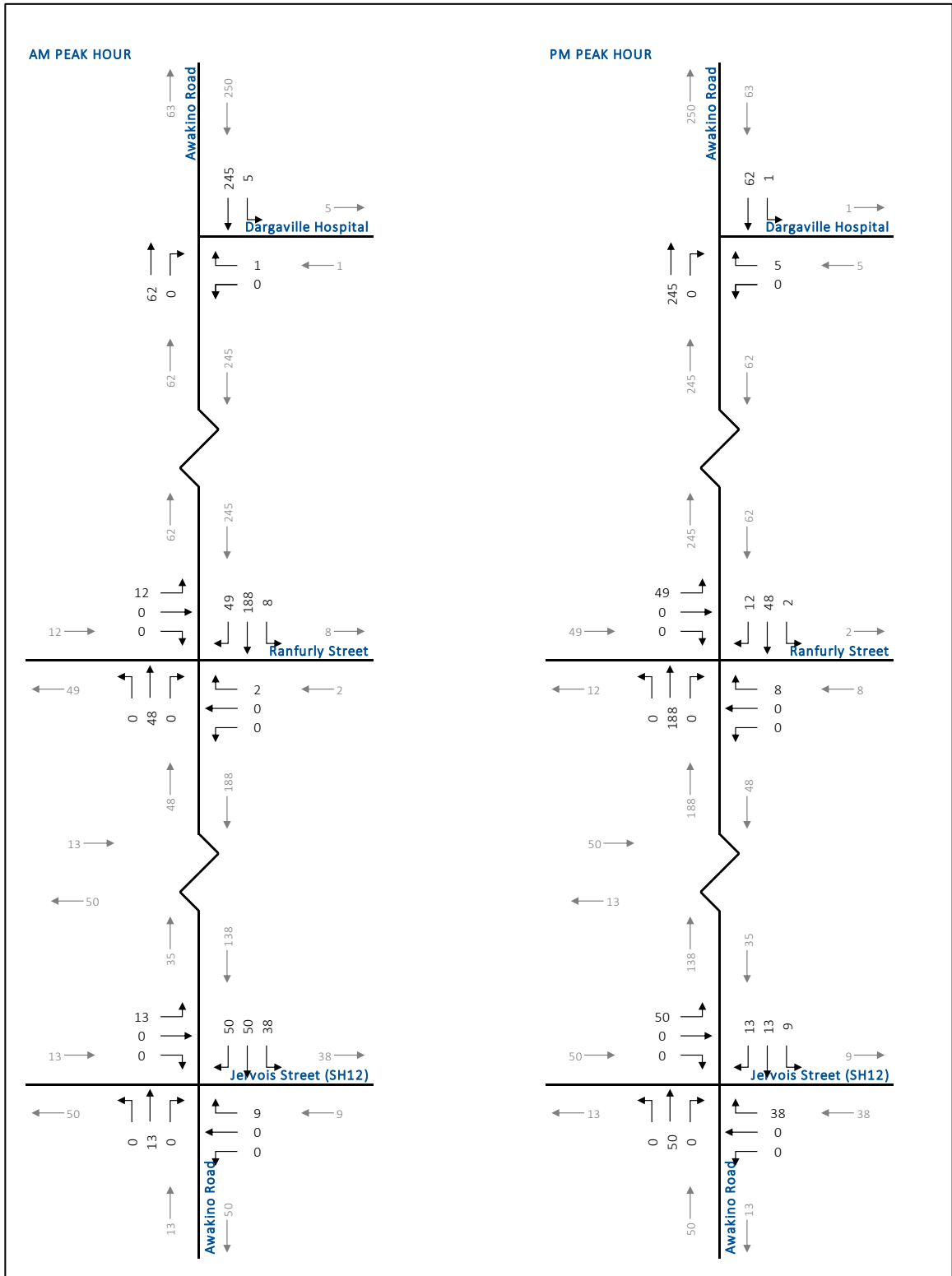


Figure 6: Estimated Site Generated Traffic Volumes
 Image source: Traffic Planning Consultants Ltd.

4.3 Future Background Traffic Operations

The assessment of future traffic conditions contained in this section includes estimates of future background and total traffic and analysis for the 2029 horizon (estimated opening day + 5 years). The future traffic volumes in the vicinity of the development will likely consist of increased non-site traffic volumes (background traffic), traffic generated by other developments, and the traffic forecast to be generated by the proposed development.

The non-site traffic increase is the generalized traffic growth in Dargaville. The generalized traffic growth will follow the average increase in population within the area, which is estimated to be 1% per annum, based on population growth forecasts provided by Stats NZ. **Figure 7** displays the 2029 AM and PM peak hour background traffic volumes.

Based on the forecast 2029 background traffic volumes, LOS analyses have been conducted using Sidra to determine the AM and PM peak hour conditions for the intersections within the study area and are summarised in **Table 4. Attachment 3** contains the detailed Sidra reports. Key findings from the analysis of the study area under background 2029 conditions are as follows:

- All intersections are forecast to operate within acceptable levels, with no specific problem movements.

Table 4: Background 2029 Intersection Operations

Intersection	Time	MOE	Approach / Movement											OVERALL	
			South			East			North			West			
			LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH		RIGHT
Awakino Road and Dargaville Hospital	AM Peak	LOS		A	A	A		A	A	A					A
		Delay (s)		0	5	5		5	5	0					2
		V/C		0.08	0.08	0.03		0.03	0.04	0.04					
		Queue (m)		3	3	1		1	0	0					
	PM Peak	LOS		A	A	A		A	A	A					A
		Delay (s)		0	5	5		6	5	0					2
V/C			0.05	0.05	0.05		0.05	0.02	0.02						
	Queue (m)		1	1	1		1	0	0						
Awakino Road and Ranfurly Street	AM Peak	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Delay (s)	5	0	5	8	9	9	5	0	5	8	9	9	3
		V/C	0.10	0.10	0.10	0.05	0.05	0.05	0.07	0.07	0.07	0.06	0.06	0.06	
		Queue (m)	1	1	1	1	1	1	1	1	1	1	1	1	
	PM Peak	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Delay (s)	5	0	5	8	9	9	5	0	5	8	9	9	4
V/C		0.09	0.09	0.09	0.05	0.05	0.05	0.06	0.06	0.06	0.08	0.08	0.08		
	Queue (m)	2	2	2	1	1	1	1	1	1	2	2	2		
Awakino Road and Jervois Street (SH12)	AM Peak	LOS	A	C	C	A	A	A	B	C	C	A	A	A	A
		Delay (s)	9	16	17	5	0	6	10	17	20	5	0	5	5
		V/C	0.13	0.13	0.13	0.14	0.14	0.04	0.32	0.32	0.32	0.16	0.16	0.01	
		Queue (m)	4	4	4	0	0	1	11	11	11	0	0	0	
	PM Peak	LOS	A	C	C	A	A	A	A	C	C	A	A	A	A
		Delay (s)	9	15	18	5	0	5	9	16	19	5	0	6	5
V/C		0.19	0.19	0.19	0.16	0.16	0.04	0.31	0.31	0.31	0.13	0.13	0.01		
	Queue (m)	5	5	5	0	0	1	10	10	10	0	0	0		

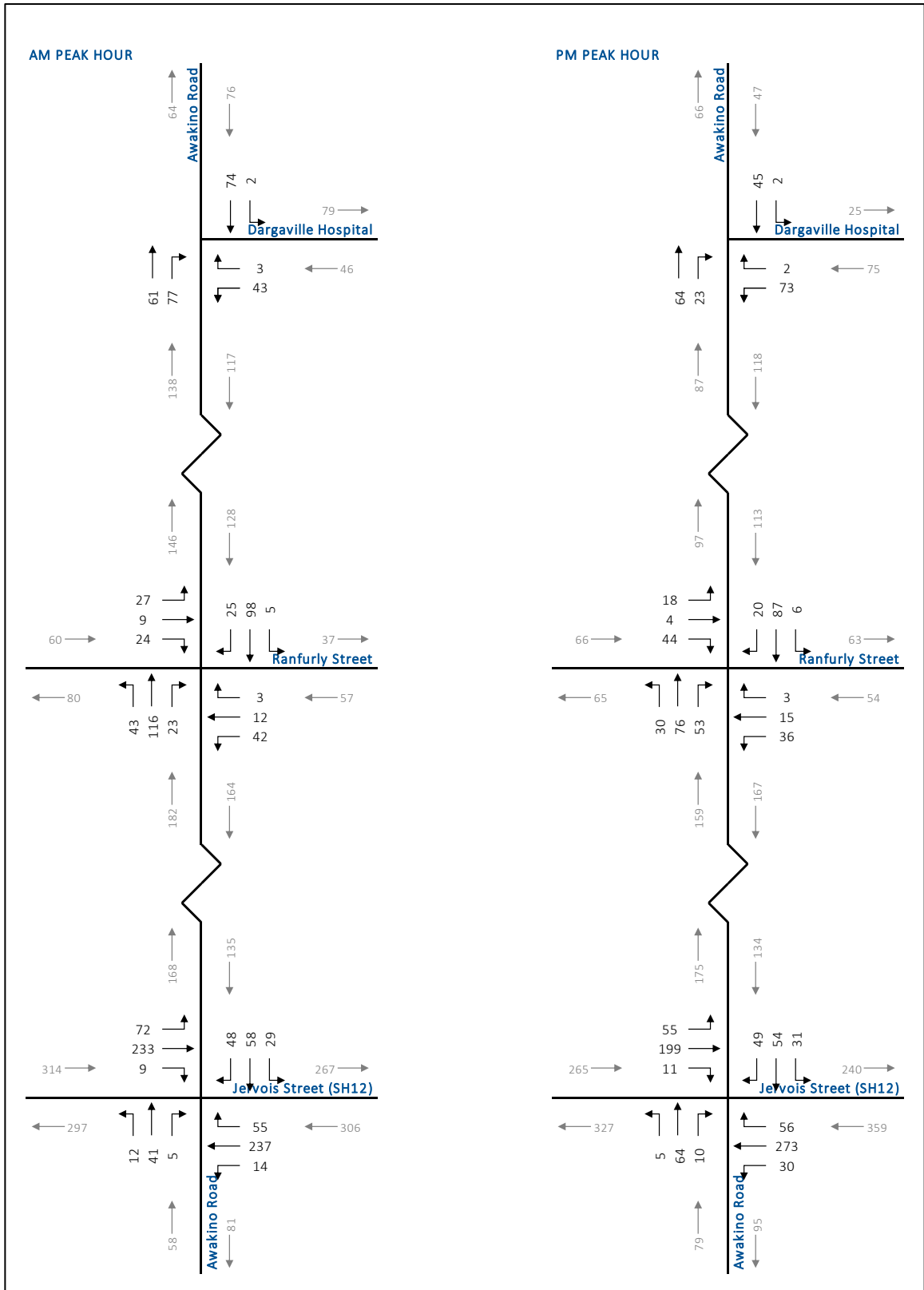


Figure 7: Estimated 2029 Background Traffic Volumes
 Image source: Traffic Planning Consultants Ltd.

4.4 Future Total Traffic Operations

Figure 8 displays the total trips expected in 2029, which is the addition of the development traffic (Figure 6) to the background traffic (Figure 7). Based on the forecast 2029 total traffic volumes, LOS analyses have been conducted using Sidra to determine the AM and PM peak hour conditions for the intersections within the study area and are summarised in Table 5. Attachment 4 contains the detailed Sidra reports. Key findings from the analysis of the study area under total 2029 conditions are as follows:

- At the intersection of Awakino Road and Jervois Street (SH12), the north approach’s right turn movement operates at LOS E with average delay of 36 seconds and a v/c ratio of 0.77.
- All other intersections are forecast to operate within acceptable levels, with no specific problem movements.

Table 5: Total 2029 Intersection Operations

Intersection	Time	MOE	Approach / Movement											OVERALL	
			South			East			North			West			
			LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH		RIGHT
Awakino Road and Dargaville Hospital	AM Peak	LOS		A	A	A		A	A	A					A
		Delay (s)		1	6	6		7	5	0					2
		V/C		0.13	0.13	0.04		0.04	0.18	0.18					
	Queue (m)		4	4	1		1	0	0						
	PM Peak	LOS		A	A	A		A	A	A					A
		Delay (s)		0	5	5		9	5	0					1
V/C			0.18	0.18	0.06		0.06	0.60	0.60						
Queue (m)		1	1	2		2	0	0							
Awakino Road and Ranfurly Street	AM Peak	LOS	A	A	A	A	B	B	A	A	A	A	B	B	A
		Delay (s)	5	0	6	9	12	12	5	0	5	8	12	13	3
		V/C	0.13	0.13	0.13	0.08	0.08	0.08	0.22	0.22	0.22	0.11	0.11	0.11	
	Queue (m)	2	2	2	2	2	2	6	6	6	3	3	3		
	PM Peak	LOS	A	A	A	A	B	B	A	A	A	A	B	B	A
		Delay (s)	5	0	5	8	11	12	6	0	6	9	11	12	4
V/C		0.20	0.20	0.20	0.08	0.08	0.08	0.10	0.10	0.10	0.16	0.16	0.16		
Queue (m)	3	3	3	2	2	2	2	2	2	4	4	4			
Awakino Road and Jervois Street (SH12)	AM Peak	LOS	A	C	C	A	A	A	C	D	E	A	A	A	B
		Delay (s)	9	18	22	5	0	6	21	31	36	5	0	5	11
		V/C	0.21	0.21	0.21	0.15	0.15	0.05	0.77	0.77	0.77	0.18	0.18	0.01	
	Queue (m)	6	6	6	0	0	2	52	52	52	0	0	0		
	PM Peak	LOS	B	C	C	A	A	A	B	C	D	A	A	A	A
		Delay (s)	12	22	25	5	0	6	13	23	29	5	0	6	8
V/C		0.42	0.42	0.42	0.17	0.17	0.08	0.53	0.53	0.53	0.17	0.17	0.01		
Queue (m)	15	15	15	0	0	2	21	21	21	0	0	0			

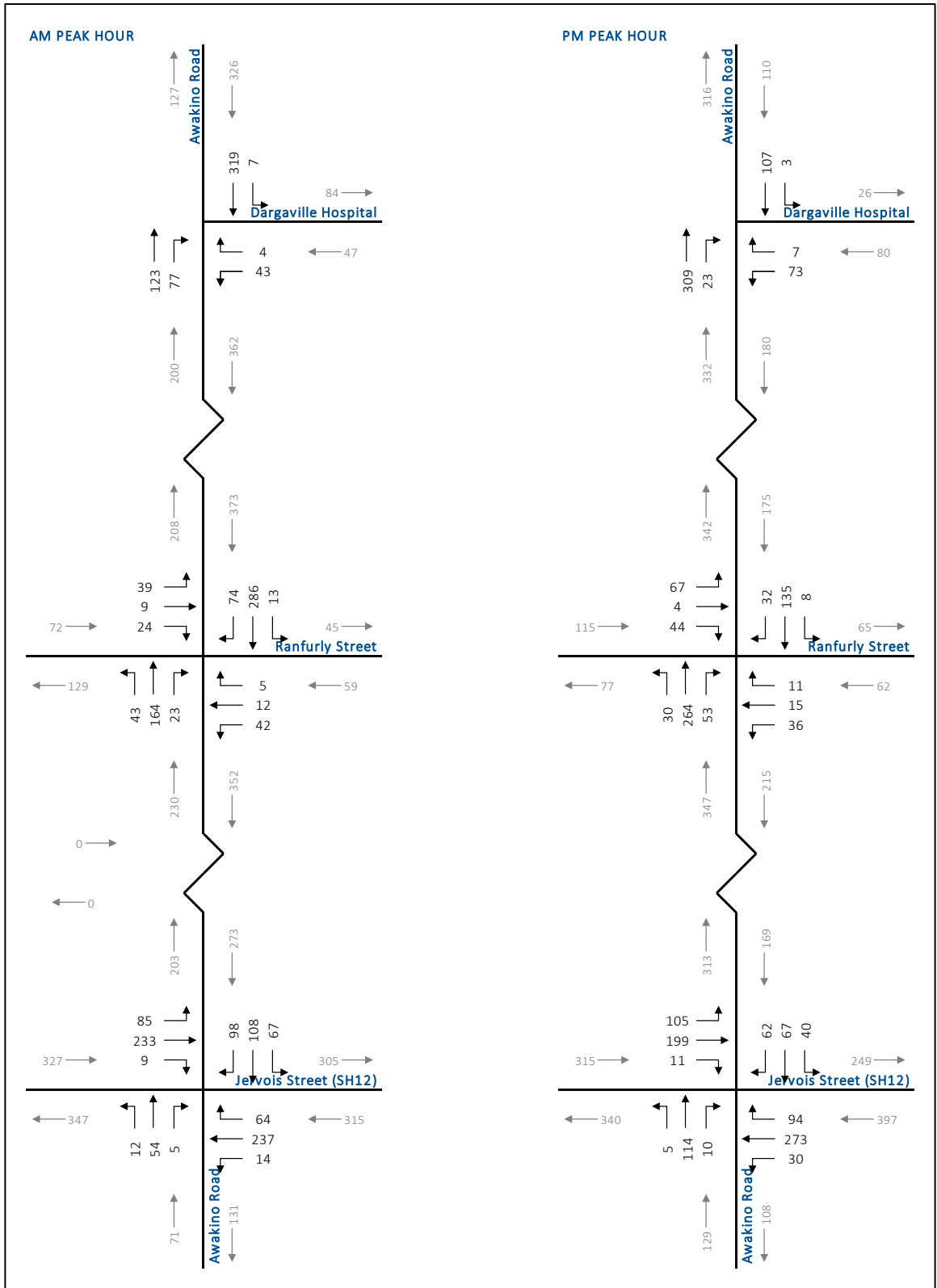


Figure 8: Estimated 2029 Total Traffic Volumes
 Image source: Traffic Planning Consultants Ltd.

4.5 Effects of Proposal on Study Area

Reviewing the intersection operation findings between the Background 2029 scenario and the Total 2029 scenario, it can be seen that the proposal has negligible impacts onto the operation of the intersections of Awakino Road and Dargaville Hospital and Awakino Road and Ranfurly Street.

At the intersection of Awakino Road and Jervois Street, average delays on the north approach increase by a noticeable margin, where the three other intersection approaches do not have significant delay increases. The changes to average delays and v/c ratios on the north approach are summarised below:

- AM Peak hour:
 - Left turn delays increase from 11 seconds to 21 seconds.
 - Through movement delays increase from 19 seconds to 31 seconds.
 - Right turn delays increase from 22 seconds to 36 seconds.
 - The approach v/c ratio increase from 0.37 to 0.77.
- PM Peak hour:
 - Left turn delays increase from 10 seconds to 13 seconds.
 - Through movement delays increase from 18 seconds to 23 seconds.
 - Right turn delays increase from 21 seconds to 29 seconds.
 - The approach v/c ratio increase from 0.36 to 0.53.

Due to the increase in average delay on the north approach, specifically during the AM peak hour, remedial measures were investigated in order to lessen the experienced effects of the proposal at this location and to improve the overall operations of the intersection. As the north approach is currently a single lane serving all three turn movements through the intersection, installing an auxiliary left-turn lane with a length of 20 metres was tested as a remedial measure. **Table 6** summarises the operations of the intersection with this improvement implemented and compares to the other scenarios for easy reference.

From implementation of the remedial measure, the average delay for left turns on the north approach reduces from 21 seconds to 9 seconds, as drivers will be able to by-pass any queue of drivers looking to turn right onto Jervois Street (SH12) or drive straight through the intersection. This in-turn removes vehicles within the single lane approach queue, thereby reducing delays for right-turning and straight travelling vehicles. With this remedial measure implemented, the LOS for all intersection turning movements is at LOS D (or better) and therefore within acceptable intersection operation parameters.

Table 6: Awakino Road and Jervois Street (SH12) Intersection Operations

Scenario	Intersection	Time	MOE	Approach / Movement												OVERALL
				South			East			North			West			
				LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	LEFT	THROUGH	RIGHT	
2029 Background	Awakino Road and Jervois Street (SH12)	AM Peak	LOS	A	C	C	A	A	A	B	C	C	A	A	A	A
			Delay (s)	9	17	19	5	0	6	11	19	22	5	0	5	5
			V/C	0.16	0.16	0.16	0.15	0.15	0.05	0.37	0.37	0.37	0.17	0.17	0.01	
			Queue (m)	4	4	4	0	0	1	13	13	13	0	0	0	
		PM Peak	LOS	A	C	C	A	A	A	B	C	C	A	A	A	A
			Delay (s)	9	16	19	5	0	5	10	18	21	5	0	6	6
			V/C	0.22	0.22	0.22	0.17	0.17	0.04	0.36	0.36	0.36	0.14	0.14	0.01	
			Queue (m)	6	6	6	0	0	1	12	12	12	0	0	0	
2029 Total	Awakino Road and Jervois Street (SH12)	AM Peak	LOS	A	C	C	A	A	A	C	D	E	A	A	A	
			Delay (s)	9	18	22	5	0	6	21	31	36	5	0	5	
			V/C	0.21	0.21	0.21	0.15	0.15	0.05	0.77	0.77	0.77	0.18	0.18	0.01	
			Queue (m)	6	6	6	0	0	2	52	52	52	0	0	0	
		PM Peak	LOS	B	C	C	A	A	A	B	C	D	A	A	A	A
			Delay (s)	12	22	25	5	0	6	13	23	29	5	0	6	
			V/C	0.42	0.42	0.42	0.17	0.17	0.08	0.53	0.53	0.53	0.17	0.17	0.01	
			Queue (m)	15	15	15	0	0	2	21	21	21	0	0	0	
2029 Total with Remedial Measure	Awakino Road and Jervois Street (SH12)	AM Peak	LOS	A	C	C	A	A	A	A	D	D	A	A	A	
			Delay (s)	9	18	22	5	0	6	9	27	32	5	0	5	
			V/C	0.21	0.21	0.21	0.15	0.15	0.05	0.08	0.69	0.69	0.18	0.18	0.18	
			Queue (m)	6	6	6	0	0	2	2	35	35	0	0	2	
		PM Peak	LOS	B	C	C	A	A	A	A	C	D	A	A	A	A
			Delay (s)	12	22	25	5	0	6	9	22	28	5	0	6	
			V/C	0.42	0.42	0.42	0.17	0.17	0.08	0.04	0.49	0.49	0.17	0.17	0.01	
			Queue (m)	15	15	15	0	0	2	1	17	17	0	0	0	

5.0 CONCLUSION

Based on the investigations carried out as part of this assessment the following is concluded:

- The proposed plan change for approximately 392,610 m² of rural land, enabling the creation of up to 348 dwellings will generate approximately 2,853 daily trips and 313 peak hour trips.
 - Trip generation has been calculated based on the 85th percentile trip generation rate for each of the 348 dwellings; thereby representing a conservative approach to effect determination.
- A review of the area crash history did not suggest any inherent road safety issues, which would likely result in serious injury or death.
- When these trips are assigned to the wider road network following existing trip distribution trends, there are significantly noticeable effects onto intersections along Awakino Road, north of Jervois Street (SH12).
- At the intersection of Awakino Road and Jervois Street (SH12), the north intersection approach was forecast to result in increased average delays for all turning movements, such that the proposal would likely result in noticeable effects onto the operation to the intersection.
- To mitigate the effects of the proposal, an auxiliary left-turn lane, with 20 metres of storage can be constructed through road widening on the north approach to improve the intersection's capacity and reduce delays to an acceptable level.

Prepared by,



Peter Kelly
Senior Transportation Engineer

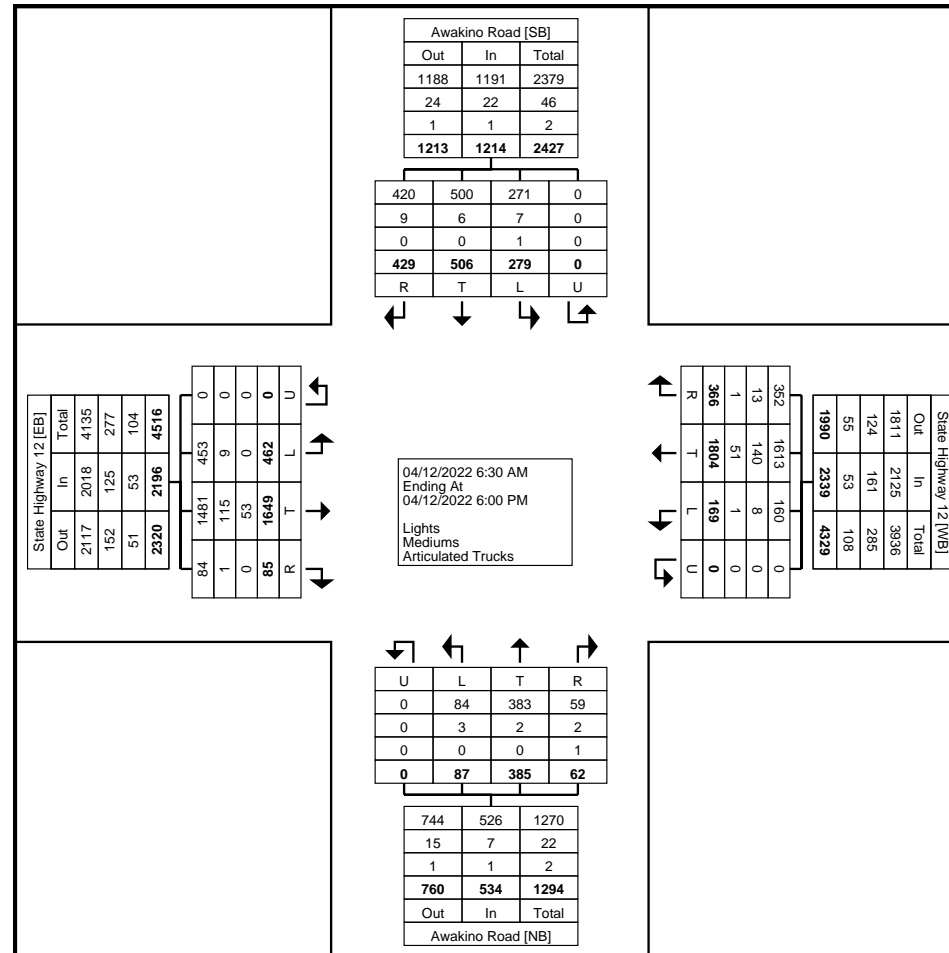
ATTACHMENT 1:

EXISTING INTERSECTION TURNING MOVEMENT COUNT DATA

Turning Movement Data

Start Time	Awakino Road Southbound					State Highway 12 Westbound					Awakino Road Northbound					State Highway 12 Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
6:30 AM	8	1	10	0	19	3	18	1	0	22	0	2	2	0	4	3	27	1	0	31	76
6:45 AM	14	3	11	0	28	0	44	8	0	52	0	2	1	0	3	2	63	0	0	65	148
Hourly Total	22	4	21	0	47	3	62	9	0	74	0	4	3	0	7	5	90	1	0	96	224
7:00 AM	9	8	12	0	29	3	33	2	0	38	0	7	0	0	7	4	35	0	0	39	113
7:15 AM	5	9	9	0	23	4	38	5	0	47	2	8	3	0	13	8	54	2	0	64	147
7:30 AM	12	9	4	0	25	3	38	13	0	54	2	5	0	0	7	6	55	2	0	63	149
7:45 AM	10	17	11	0	38	2	60	10	0	72	4	9	0	0	13	18	75	2	0	95	218
Hourly Total	36	43	36	0	115	12	169	30	0	211	8	29	3	0	40	36	219	6	0	261	627
8:00 AM	4	8	11	0	23	1	55	10	0	66	1	5	1	0	7	15	44	3	0	62	158
8:15 AM	9	8	12	0	29	5	58	15	0	78	6	10	2	0	18	19	46	3	0	68	193
8:30 AM	4	21	11	0	36	5	48	16	0	69	0	14	2	0	16	15	52	0	0	67	188
8:45 AM	6	15	14	0	35	4	41	11	0	56	5	13	2	0	20	16	45	3	0	64	175
Hourly Total	23	52	48	0	123	15	202	52	0	269	12	42	7	0	61	65	187	9	0	261	714
9:00 AM	4	21	16	0	41	6	44	12	0	62	3	8	2	0	13	14	32	3	0	49	165
9:15 AM	4	18	11	0	33	1	48	12	0	61	4	15	1	0	20	20	41	3	0	64	178
9:30 AM	7	19	13	0	39	4	50	6	0	60	5	8	0	0	13	13	51	2	0	66	178
9:45 AM	8	17	13	0	38	12	59	9	0	80	2	12	1	0	15	15	46	1	0	62	195
Hourly Total	23	75	53	0	151	23	201	39	0	263	14	43	4	0	61	62	170	9	0	241	716
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	8	19	14	0	41	2	56	5	0	63	3	10	4	0	17	17	38	4	0	59	180
11:15 AM	7	19	20	0	46	3	43	8	0	54	2	14	1	0	17	13	46	1	0	60	177
11:30 AM	7	15	7	0	29	3	38	9	0	50	3	8	0	0	11	19	35	1	0	55	145
11:45 AM	9	22	10	0	41	3	50	8	0	61	1	15	3	0	19	11	36	2	0	49	170
Hourly Total	31	75	51	0	157	11	187	30	0	228	9	47	8	0	64	60	155	8	0	223	672
12:00 PM	8	8	10	0	26	10	56	9	0	75	4	16	3	0	23	15	46	2	0	63	187
12:15 PM	13	20	12	0	45	4	50	10	0	64	0	12	2	0	14	19	46	1	0	66	189
12:30 PM	8	23	17	0	48	5	59	10	0	74	4	9	1	0	14	15	44	6	0	65	201
12:45 PM	8	20	17	0	45	3	41	7	0	51	5	18	0	0	23	19	56	2	0	77	196
Hourly Total	37	71	56	0	164	22	206	36	0	264	13	55	6	0	74	68	192	11	0	271	773
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:30 PM	3	15	14	0	32	4	55	8	0	67	3	10	2	0	15	16	43	1	0	60	174
2:45 PM	9	8	5	0	22	2	43	9	0	54	1	13	2	0	16	9	41	1	0	51	143
Hourly Total	12	23	19	0	54	6	98	17	0	121	4	23	4	0	31	25	84	2	0	111	317
3:00 PM	13	17	14	0	44	5	56	14	0	75	4	9	4	0	17	12	62	6	0	80	216
3:15 PM	13	24	15	0	52	5	38	16	0	59	4	11	2	0	17	6	50	3	0	59	187
3:30 PM	8	11	8	0	27	4	44	10	0	58	0	15	1	0	16	7	45	3	0	55	156
3:45 PM	8	15	10	0	33	7	53	19	0	79	2	12	2	0	16	12	47	6	0	65	193
Hourly Total	42	67	47	0	156	21	191	59	0	271	10	47	9	0	66	37	204	18	0	259	752

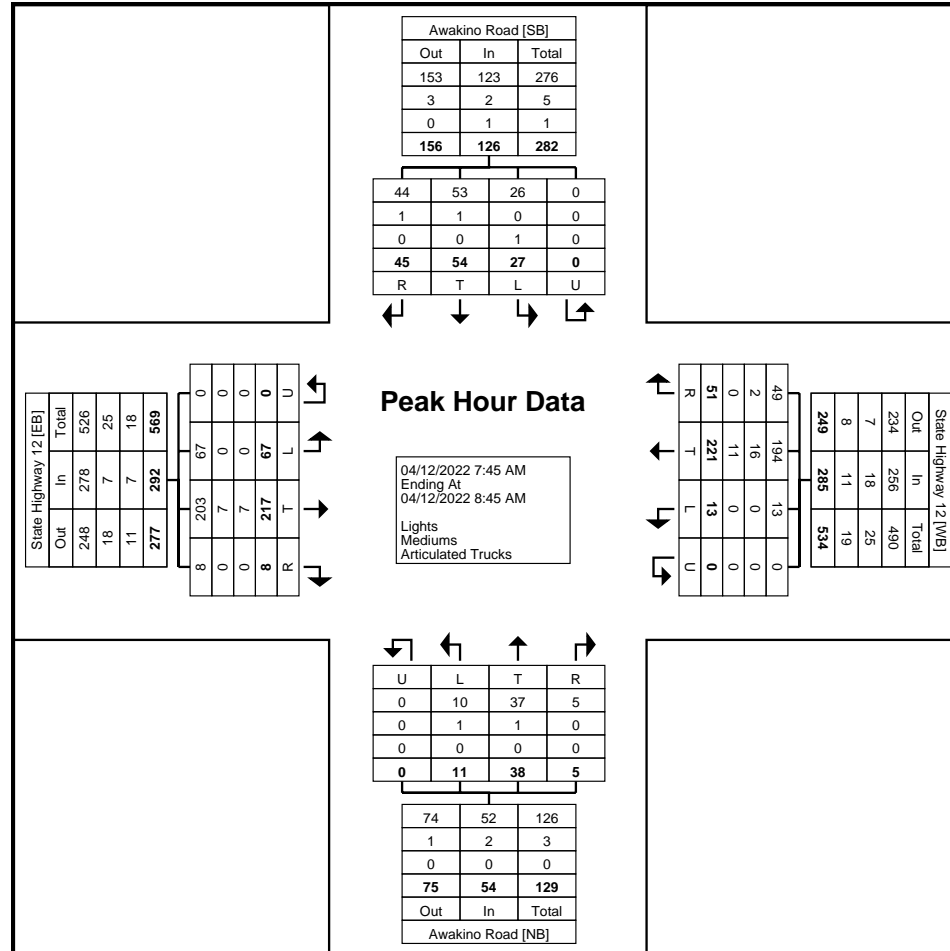
4:00 PM	9	16	14	0	39	9	64	16	0	89	5	10	2	0	17	13	62	1	0	76	221
4:15 PM	3	9	11	0	23	3	55	5	0	63	2	8	1	0	11	15	34	3	0	52	149
4:30 PM	8	12	14	0	34	11	61	11	0	83	3	7	6	0	16	13	39	4	0	56	189
4:45 PM	9	11	8	0	28	8	47	7	0	62	0	16	3	0	19	7	43	5	0	55	164
Hourly Total	29	48	47	0	124	31	227	39	0	297	10	41	12	0	63	48	178	13	0	239	723
5:00 PM	8	16	10	0	34	9	61	16	0	86	3	25	2	0	30	21	58	3	0	82	232
5:15 PM	4	13	13	0	30	5	66	18	0	89	1	8	1	0	10	10	38	2	0	50	179
5:30 PM	8	10	15	0	33	6	81	11	0	98	1	11	3	0	15	13	47	0	0	60	206
5:45 PM	4	9	13	0	26	5	53	10	0	68	2	10	0	0	12	12	27	3	0	42	148
Hourly Total	24	48	51	0	123	25	261	55	0	341	7	54	6	0	67	56	170	8	0	234	765
Grand Total	279	506	429	0	1214	169	1804	366	0	2339	87	385	62	0	534	462	1649	85	0	2196	6283
Approach %	23.0	41.7	35.3	0.0	-	7.2	77.1	15.6	0.0	-	16.3	72.1	11.6	0.0	-	21.0	75.1	3.9	0.0	-	-
Total %	4.4	8.1	6.8	0.0	19.3	2.7	28.7	5.8	0.0	37.2	1.4	6.1	1.0	0.0	8.5	7.4	26.2	1.4	0.0	35.0	-
Lights	271	500	420	0	1191	160	1613	352	0	2125	84	383	59	0	526	453	1481	84	0	2018	5860
% Lights	97.1	98.8	97.9	-	98.1	94.7	89.4	96.2	-	90.9	96.6	99.5	95.2	-	98.5	98.1	89.8	98.8	-	91.9	93.3
Mediums	7	6	9	0	22	8	140	13	0	161	3	2	2	0	7	9	115	1	0	125	315
% Mediums	2.5	1.2	2.1	-	1.8	4.7	7.8	3.6	-	6.9	3.4	0.5	3.2	-	1.3	1.9	7.0	1.2	-	5.7	5.0
Articulated Trucks	1	0	0	0	1	1	51	1	0	53	0	0	1	0	1	0	53	0	0	53	108
% Articulated Trucks	0.4	0.0	0.0	-	0.1	0.6	2.8	0.3	-	2.3	0.0	0.0	1.6	-	0.2	0.0	3.2	0.0	-	2.4	1.7



Turning Movement Data Plot

Turning Movement Peak Hour Data (7:45 AM)

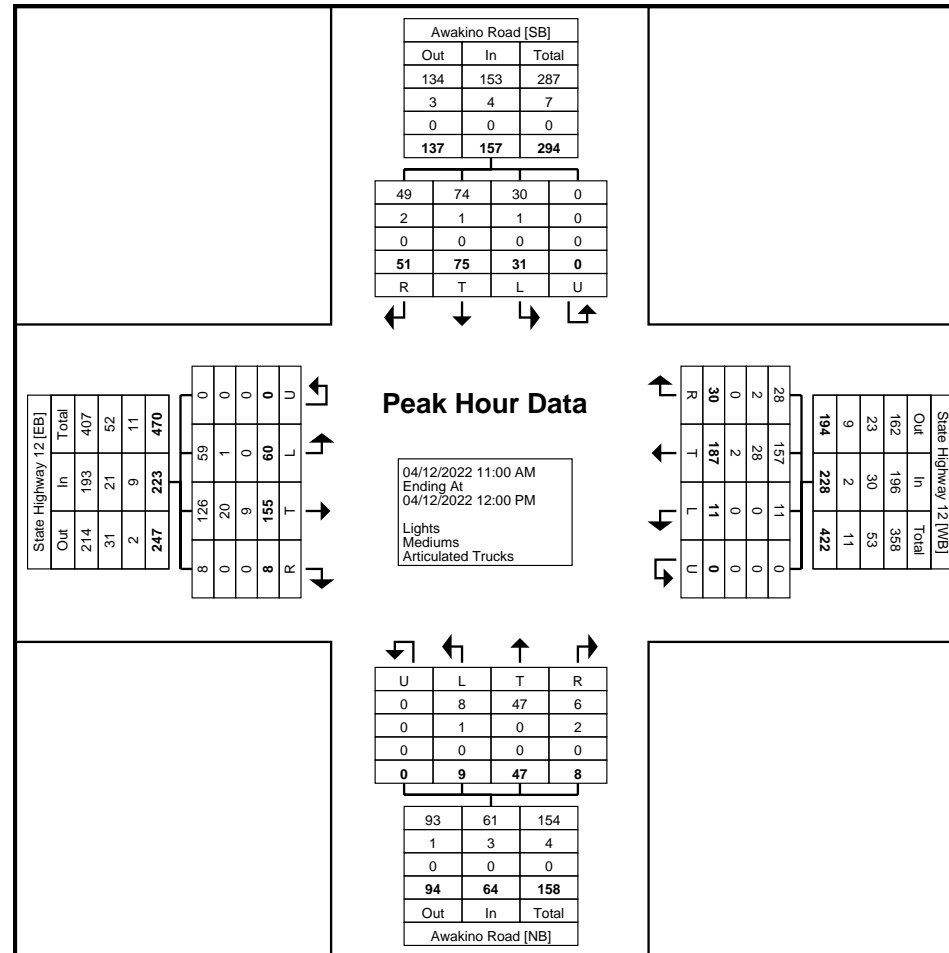
Start Time	Awakino Road Southbound					State Highway 12 Westbound					Awakino Road Northbound					State Highway 12 Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	10	17	11	0	38	2	60	10	0	72	4	9	0	0	13	18	75	2	0	95	218
8:00 AM	4	8	11	0	23	1	55	10	0	66	1	5	1	0	7	15	44	3	0	62	158
8:15 AM	9	8	12	0	29	5	58	15	0	78	6	10	2	0	18	19	46	3	0	68	193
8:30 AM	4	21	11	0	36	5	48	16	0	69	0	14	2	0	16	15	52	0	0	67	188
Total	27	54	45	0	126	13	221	51	0	285	11	38	5	0	54	67	217	8	0	292	757
Approach %	21.4	42.9	35.7	0.0	-	4.6	77.5	17.9	0.0	-	20.4	70.4	9.3	0.0	-	22.9	74.3	2.7	0.0	-	-
Total %	3.6	7.1	5.9	0.0	16.6	1.7	29.2	6.7	0.0	37.6	1.5	5.0	0.7	0.0	7.1	8.9	28.7	1.1	0.0	38.6	-
PHF	0.675	0.643	0.938	0.000	0.829	0.650	0.921	0.797	0.000	0.913	0.458	0.679	0.625	0.000	0.750	0.882	0.723	0.667	0.000	0.768	0.868
Lights	26	53	44	0	123	13	194	49	0	256	10	37	5	0	52	67	203	8	0	278	709
% Lights	96.3	98.1	97.8	-	97.6	100.0	87.8	96.1	-	89.8	90.9	97.4	100.0	-	96.3	100.0	93.5	100.0	-	95.2	93.7
Mediums	0	1	1	0	2	0	16	2	0	18	1	1	0	0	2	0	7	0	0	7	29
% Mediums	0.0	1.9	2.2	-	1.6	0.0	7.2	3.9	-	6.3	9.1	2.6	0.0	-	3.7	0.0	3.2	0.0	-	2.4	3.8
Articulated Trucks	1	0	0	0	1	0	11	0	0	11	0	0	0	0	0	0	7	0	0	7	19
% Articulated Trucks	3.7	0.0	0.0	-	0.8	0.0	5.0	0.0	-	3.9	0.0	0.0	0.0	-	0.0	0.0	3.2	0.0	-	2.4	2.5



Turning Movement Peak Hour Data Plot (7:45 AM)

Turning Movement Peak Hour Data (11:00 AM)

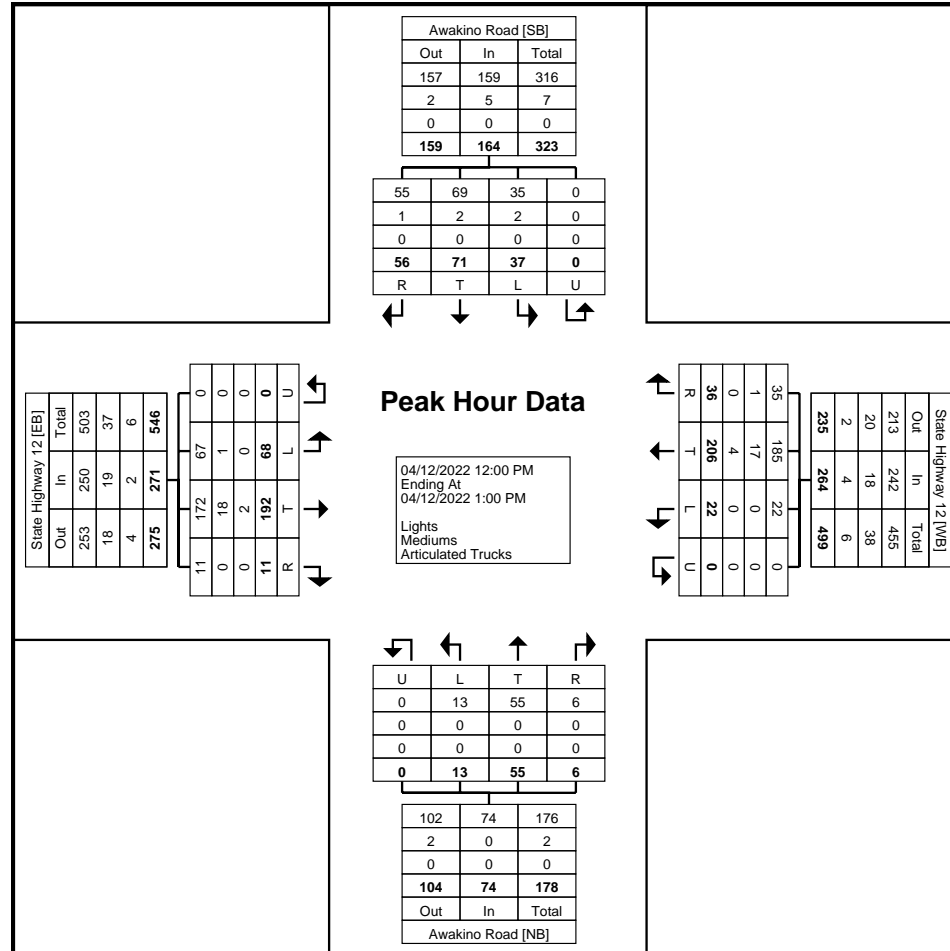
Start Time	Awakino Road Southbound					State Highway 12 Westbound					Awakino Road Northbound					State Highway 12 Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
11:00 AM	8	19	14	0	41	2	56	5	0	63	3	10	4	0	17	17	38	4	0	59	180
11:15 AM	7	19	20	0	46	3	43	8	0	54	2	14	1	0	17	13	46	1	0	60	177
11:30 AM	7	15	7	0	29	3	38	9	0	50	3	8	0	0	11	19	35	1	0	55	145
11:45 AM	9	22	10	0	41	3	50	8	0	61	1	15	3	0	19	11	36	2	0	49	170
Total	31	75	51	0	157	11	187	30	0	228	9	47	8	0	64	60	155	8	0	223	672
Approach %	19.7	47.8	32.5	0.0	-	4.8	82.0	13.2	0.0	-	14.1	73.4	12.5	0.0	-	26.9	69.5	3.6	0.0	-	-
Total %	4.6	11.2	7.6	0.0	23.4	1.6	27.8	4.5	0.0	33.9	1.3	7.0	1.2	0.0	9.5	8.9	23.1	1.2	0.0	33.2	-
PHF	0.861	0.852	0.638	0.000	0.853	0.917	0.835	0.833	0.000	0.905	0.750	0.783	0.500	0.000	0.842	0.789	0.842	0.500	0.000	0.929	0.933
Lights	30	74	49	0	153	11	157	28	0	196	8	47	6	0	61	59	126	8	0	193	603
% Lights	96.8	98.7	96.1	-	97.5	100.0	84.0	93.3	-	86.0	88.9	100.0	75.0	-	95.3	98.3	81.3	100.0	-	86.5	89.7
Mediums	1	1	2	0	4	0	28	2	0	30	1	0	2	0	3	1	20	0	0	21	58
% Mediums	3.2	1.3	3.9	-	2.5	0.0	15.0	6.7	-	13.2	11.1	0.0	25.0	-	4.7	1.7	12.9	0.0	-	9.4	8.6
Articulated Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	9	0	0	9	11
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	-	0.9	0.0	0.0	0.0	-	0.0	0.0	5.8	0.0	-	4.0	1.6



Turning Movement Peak Hour Data Plot (11:00 AM)

Turning Movement Peak Hour Data (12:00 PM)

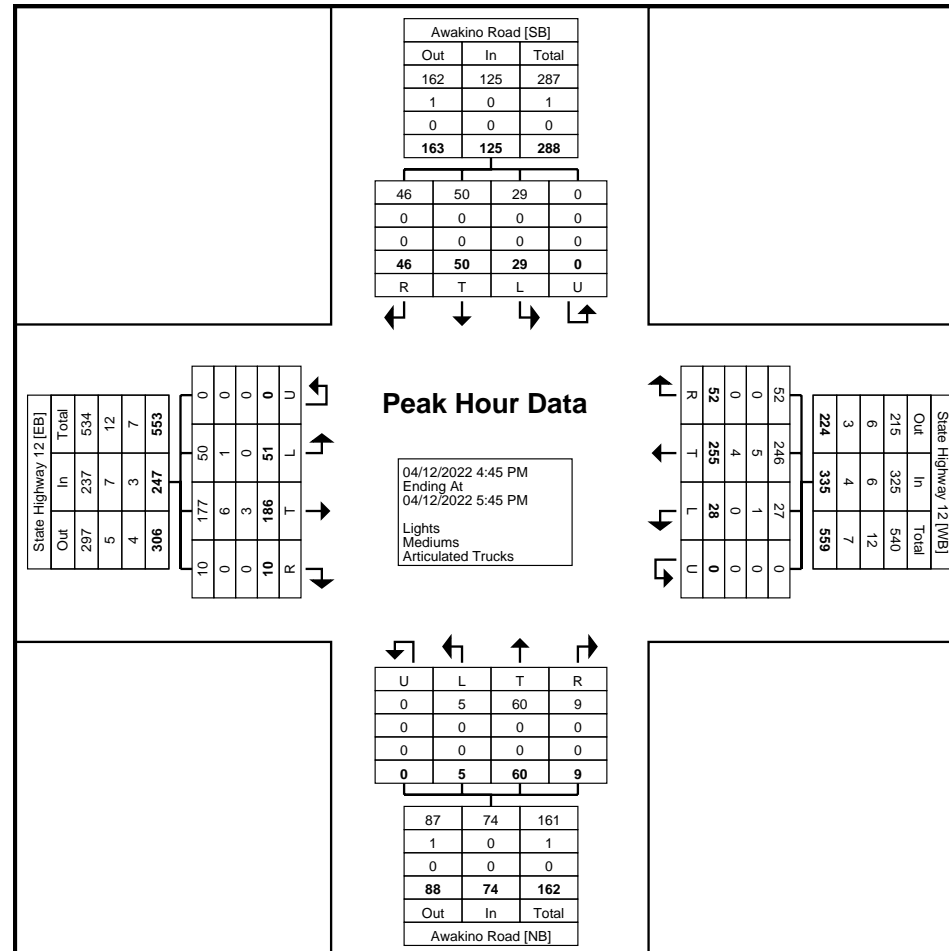
Start Time	Awakino Road Southbound					State Highway 12 Westbound					Awakino Road Northbound					State Highway 12 Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
12:00 PM	8	8	10	0	26	10	56	9	0	75	4	16	3	0	23	15	46	2	0	63	187
12:15 PM	13	20	12	0	45	4	50	10	0	64	0	12	2	0	14	19	46	1	0	66	189
12:30 PM	8	23	17	0	48	5	59	10	0	74	4	9	1	0	14	15	44	6	0	65	201
12:45 PM	8	20	17	0	45	3	41	7	0	51	5	18	0	0	23	19	56	2	0	77	196
Total	37	71	56	0	164	22	206	36	0	264	13	55	6	0	74	68	192	11	0	271	773
Approach %	22.6	43.3	34.1	0.0	-	8.3	78.0	13.6	0.0	-	17.6	74.3	8.1	0.0	-	25.1	70.8	4.1	0.0	-	-
Total %	4.8	9.2	7.2	0.0	21.2	2.8	26.6	4.7	0.0	34.2	1.7	7.1	0.8	0.0	9.6	8.8	24.8	1.4	0.0	35.1	-
PHF	0.712	0.772	0.824	0.000	0.854	0.550	0.873	0.900	0.000	0.880	0.650	0.764	0.500	0.000	0.804	0.895	0.857	0.458	0.000	0.880	0.961
Lights	35	69	55	0	159	22	185	35	0	242	13	55	6	0	74	67	172	11	0	250	725
% Lights	94.6	97.2	98.2	-	97.0	100.0	89.8	97.2	-	91.7	100.0	100.0	100.0	-	100.0	98.5	89.6	100.0	-	92.3	93.8
Mediums	2	2	1	0	5	0	17	1	0	18	0	0	0	0	0	1	18	0	0	19	42
% Mediums	5.4	2.8	1.8	-	3.0	0.0	8.3	2.8	-	6.8	0.0	0.0	0.0	-	0.0	1.5	9.4	0.0	-	7.0	5.4
Articulated Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	1.9	0.0	-	1.5	0.0	0.0	0.0	-	0.0	0.0	1.0	0.0	-	0.7	0.8



Turning Movement Peak Hour Data Plot (12:00 PM)

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Awakino Road Southbound					State Highway 12 Westbound					Awakino Road Northbound					State Highway 12 Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:45 PM	9	11	8	0	28	8	47	7	0	62	0	16	3	0	19	7	43	5	0	55	164
5:00 PM	8	16	10	0	34	9	61	16	0	86	3	25	2	0	30	21	58	3	0	82	232
5:15 PM	4	13	13	0	30	5	66	18	0	89	1	8	1	0	10	10	38	2	0	50	179
5:30 PM	8	10	15	0	33	6	81	11	0	98	1	11	3	0	15	13	47	0	0	60	206
Total	29	50	46	0	125	28	255	52	0	335	5	60	9	0	74	51	186	10	0	247	781
Approach %	23.2	40.0	36.8	0.0	-	8.4	76.1	15.5	0.0	-	6.8	81.1	12.2	0.0	-	20.6	75.3	4.0	0.0	-	-
Total %	3.7	6.4	5.9	0.0	16.0	3.6	32.7	6.7	0.0	42.9	0.6	7.7	1.2	0.0	9.5	6.5	23.8	1.3	0.0	31.6	-
PHF	0.806	0.781	0.767	0.000	0.919	0.778	0.787	0.722	0.000	0.855	0.417	0.600	0.750	0.000	0.617	0.607	0.802	0.500	0.000	0.753	0.842
Lights	29	50	46	0	125	27	246	52	0	325	5	60	9	0	74	50	177	10	0	237	761
% Lights	100.0	100.0	100.0	-	100.0	96.4	96.5	100.0	-	97.0	100.0	100.0	100.0	-	100.0	98.0	95.2	100.0	-	96.0	97.4
Mediums	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	1	6	0	0	7	13
% Mediums	0.0	0.0	0.0	-	0.0	3.6	2.0	0.0	-	1.8	0.0	0.0	0.0	-	0.0	2.0	3.2	0.0	-	2.8	1.7
Articulated Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	1.6	0.0	-	1.2	0.0	0.0	0.0	-	0.0	0.0	1.6	0.0	-	1.2	0.9



Turning Movement Peak Hour Data Plot (4:45 PM)

Awakino Road and Dargaville Hospital

		Vehicles						Trucks / Buses						Pedestrians			
Time:		Westbound		Northbound		Southbound		Westbound		Northbound		Southbound					
Start	End	Left	Right	Thru	Right	Left	Thru	Left	Right	Thru	Right	Left	Thru	East	West	North	South
6:30	6:45	0	0	3	2	0	9							1			2
6:45	7:00	0	0	3	9	1	10			1							
7:00	7:15	1	0	2	3	0	12										
7:15	7:30	3	0	5	16	0	11							1	3		
7:30	7:45	2	0	12	12	4	16			1					2		
7:45	8:00	2	0	8	24	0	17								1		2
8:00	8:15	5	0	5	24	3	13						2		1		1
8:15	8:30	7	0	16	22	0	7						1	1	2		1
8:30	8:45	9	1	13	21	0	21							1			
8:45	9:00	5	1	16	17	0	18								1		1
9:00	9:15	13	1	12	18	0	16				1						4
9:15	9:30	12	0	15	15	2	13	1		1			1				1

Totals	
15min	1 hr
14	
24	
18	
35	91
47	124
51	151
52	185
53	203
65	221
57	227
61	236
60	243
	243

		Vehicles						Trucks / Buses						Pedestrians			
Time:		Westbound		Northbound		Southbound		Westbound		Northbound		Southbound					
Start	End	Left	Right	Thru	Right	Left	Thru	Left	Right	Thru	Right	Left	Thru	East	West	North	South
11:00	11:15	16	2	24	12	2	18			1							4
11:15	11:30	9	1	13	20	1	20						1				3
11:30	11:45	12	0	21	14	0	17			3			1		2		
11:45	12:00	23	0	13	7	1	14			1			2	1			1
12:00	12:15	14	1	18	10	2	12			1					1		1
12:15	12:30	26	2	17	16	2	7			1			1				1
12:30	12:45	12	2	14	5	0	10						1		1		
12:45	13:00	20	0	24	23	1	25			2			1				

Totals	
15min	1 hr
75	
65	
68	
61	269
58	252
72	259
44	235
96	270
	270

		Vehicles						Trucks / Buses						Pedestrians			
Time:		Westbound		Northbound		Southbound		Westbound		Northbound		Southbound					
Start	End	Left	Right	Thru	Right	Left	Thru	Left	Right	Thru	Right	Left	Thru	East	West	North	South
15:00	15:15	12	0	24	7	0	20								1		
15:15	15:30	12	1	15	8	0	14			1					3		1
15:30	15:45	10	0	5	4	0	13							1	1		2
15:45	16:00	10	0	15	6	0	13				1		1				
16:00	16:15	19	0	16	6	0	16	1		1					2		
16:15	16:30	11	0	18	2	1	6							1	2		
16:30	16:45	25	0	11	7	0	8		1								1
16:45	17:00	12	1	14	6	1	12										
17:00	17:15	15	0	23	1	0	8								2		
17:15	17:30	10	0	18	1	0	9							1			
17:30	17:45	11	0	17	2	0	12								1		
17:45	18:00	2	0	15	0	0	10	1						3			

Totals	
15min	1 hr
63	
51	
32	
46	192
59	188
38	175
52	195
46	195
47	183
38	183
42	173
28	155

ATTACHMENT 2:
EXISTING TRAFFIC INTERSECTION OPERATIONS

MOVEMENT SUMMARY

Site: 101 [Awakino+Hospital_EX_AM (Site Folder: Awakino +Hospital)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
2	T1	57	2.0	60	2.0	0.077	0.2	LOS A	0.3	2.5	0.16	0.30	0.16	47.9
3	R2	72	1.0	76	1.0	0.077	4.8	LOS A	0.3	2.5	0.16	0.30	0.16	47.0
Approach		129	1.4	136	1.4	0.077	2.8	NA	0.3	2.5	0.16	0.30	0.16	47.4
East: Dargaville Hospital														
4	L2	40	3.0	42	3.0	0.031	4.8	LOS A	0.1	0.9	0.16	0.50	0.16	46.2
6	R2	3	0.0	3	0.0	0.031	5.3	LOS A	0.1	0.9	0.16	0.50	0.16	45.8
Approach		43	2.8	45	2.8	0.031	4.8	LOS A	0.1	0.9	0.16	0.50	0.16	46.2
North: Awakino Road														
7	L2	2	0.0	2	0.0	0.039	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
8	T1	69	1.0	73	1.0	0.039	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.9
Approach		71	1.0	75	1.0	0.039	0.1	NA	0.0	0.0	0.00	0.02	0.00	49.9
All Vehicles		243	1.5	256	1.5	0.077	2.4	NA	0.3	2.5	0.11	0.25	0.11	47.9

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101 [Awakino+Hospital_EX_PM (Site Folder: Awakino +Hospital)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
2	T1	60	2.0	63	2.0	0.046	0.0	LOS A	0.1	0.9	0.07	0.14	0.07	49.0
3	R2	21	0.0	22	0.0	0.046	4.7	LOS A	0.1	0.9	0.07	0.14	0.07	48.1
Approach		81	1.5	85	1.5	0.046	1.3	NA	0.1	0.9	0.07	0.14	0.07	48.8
East: Dargaville Hospital														
4	L2	68	1.0	72	1.0	0.048	4.7	LOS A	0.2	1.4	0.12	0.50	0.12	46.3
6	R2	2	50.0	2	50.0	0.048	5.7	LOS A	0.2	1.4	0.12	0.50	0.12	45.1
Approach		70	2.4	74	2.4	0.048	4.7	LOS A	0.2	1.4	0.12	0.50	0.12	46.3
North: Awakino Road														
7	L2	2	0.0	2	0.0	0.024	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
8	T1	42	0.0	44	0.0	0.024	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		44	0.0	46	0.0	0.024	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
All Vehicles		195	1.5	205	1.5	0.048	2.3	NA	0.2	1.4	0.07	0.24	0.07	48.1

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Ranfurlly_EX_AM (Site Folder: Awakino +Hospital - Copy)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	40	3.0	42	3.0	0.095	4.7	LOS A	0.2	1.3	0.08	0.19	0.08	48.2
2	T1	108	0.0	114	0.0	0.095	0.1	LOS A	0.2	1.3	0.08	0.19	0.08	48.7
3	R2	21	0.0	22	0.0	0.095	4.9	LOS A	0.2	1.3	0.08	0.19	0.08	47.8
Approach		169	0.7	178	0.7	0.095	1.8	NA	0.2	1.3	0.08	0.19	0.08	48.5
East: Ranfurlly Street														
4	L2	39	0.0	41	0.0	0.049	7.8	LOS A	0.2	1.3	0.21	0.91	0.21	44.9
5	T1	11	0.0	12	0.0	0.049	8.7	LOS A	0.2	1.3	0.21	0.91	0.21	44.7
6	R2	3	0.0	3	0.0	0.049	8.8	LOS A	0.2	1.3	0.21	0.91	0.21	44.5
Approach		53	0.0	56	0.0	0.049	8.0	LOS A	0.2	1.3	0.21	0.91	0.21	44.8
North: Awakino Road														
7	L2	5	0.0	5	0.0	0.068	5.0	LOS A	0.2	1.2	0.12	0.13	0.12	48.5
8	T1	91	0.0	96	0.0	0.068	0.1	LOS A	0.2	1.2	0.12	0.13	0.12	48.9
9	R2	23	0.0	24	0.0	0.068	5.0	LOS A	0.2	1.2	0.12	0.13	0.12	48.0
Approach		119	0.0	125	0.0	0.068	1.3	NA	0.2	1.2	0.12	0.13	0.12	48.7
West: Ranfurlly Street														
10	L2	25	0.0	26	0.0	0.063	7.9	LOS A	0.2	1.6	0.27	0.90	0.27	44.7
11	T1	8	0.0	8	0.0	0.063	8.6	LOS A	0.2	1.6	0.27	0.90	0.27	44.5
12	R2	22	0.0	23	0.0	0.063	9.1	LOS A	0.2	1.6	0.27	0.90	0.27	44.3
Approach		55	0.0	58	0.0	0.063	8.5	LOS A	0.2	1.6	0.27	0.90	0.27	44.5
All Vehicles		396	0.3	417	0.3	0.095	3.4	NA	0.2	1.6	0.13	0.37	0.13	47.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Ranfurly_EX_PM (Site Folder: Awakino +Hospital - Copy)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Awakino Road														
1	L2	28	0.0	29	0.0	0.086	4.8	LOS A	0.3	2.3	0.15	0.27	0.15	47.6
2	T1	71	1.0	75	1.0	0.086	0.2	LOS A	0.3	2.3	0.15	0.27	0.15	48.0
3	R2	49	0.0	52	0.0	0.086	4.8	LOS A	0.3	2.3	0.15	0.27	0.15	47.1
Approach		148	0.5	156	0.5	0.086	2.6	NA	0.3	2.3	0.15	0.27	0.15	47.7
East: Ranfurly Street														
4	L2	34	0.0	36	0.0	0.047	7.7	LOS A	0.2	1.3	0.20	0.92	0.20	44.9
5	T1	14	0.0	15	0.0	0.047	8.5	LOS A	0.2	1.3	0.20	0.92	0.20	44.7
6	R2	3	0.0	3	0.0	0.047	8.5	LOS A	0.2	1.3	0.20	0.92	0.20	44.5
Approach		51	0.0	54	0.0	0.047	8.0	LOS A	0.2	1.3	0.20	0.92	0.20	44.8
North: Awakino Road														
7	L2	6	0.0	6	0.0	0.060	4.8	LOS A	0.1	1.0	0.09	0.13	0.09	48.6
8	T1	81	0.0	85	0.0	0.060	0.1	LOS A	0.1	1.0	0.09	0.13	0.09	49.0
9	R2	19	0.0	20	0.0	0.060	4.9	LOS A	0.1	1.0	0.09	0.13	0.09	48.1
Approach		106	0.0	112	0.0	0.060	1.2	NA	0.1	1.0	0.09	0.13	0.09	48.8
West: Ranfurly Street														
10	L2	17	0.0	18	0.0	0.077	7.7	LOS A	0.3	1.9	0.26	0.91	0.26	44.7
11	T1	4	0.0	4	0.0	0.077	8.5	LOS A	0.3	1.9	0.26	0.91	0.26	44.4
12	R2	41	0.0	43	0.0	0.077	8.8	LOS A	0.3	1.9	0.26	0.91	0.26	44.3
Approach		62	0.0	65	0.0	0.077	8.5	LOS A	0.3	1.9	0.26	0.91	0.26	44.4
All Vehicles		367	0.2	386	0.2	0.086	3.9	NA	0.3	2.3	0.16	0.43	0.16	47.0

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_EX_AM (Site Folder: Awakino +Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
1	L2	11	9.0	12	9.0	0.134	9.2	LOS A	0.5	3.7	0.59	0.97	0.59	42.0
2	T1	38	3.0	40	3.0	0.134	15.5	LOS C	0.5	3.7	0.59	0.97	0.59	41.9
3	R2	5	0.0	5	0.0	0.134	17.1	LOS C	0.5	3.7	0.59	0.97	0.59	41.9
Approach		54	3.9	57	3.9	0.134	14.4	LOS B	0.5	3.7	0.59	0.97	0.59	42.0
East: Jervois Street (SH12)														
4	L2	13	0.0	14	0.0	0.137	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
5	T1	221	12.0	233	12.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
6	R2	51	4.0	54	4.0	0.041	5.6	LOS A	0.2	1.3	0.39	0.58	0.39	45.3
Approach		285	10.0	300	10.0	0.137	1.3	NA	0.2	1.3	0.07	0.13	0.07	48.9
North: Awakino Road														
7	L2	27	4.0	28	4.0	0.322	10.0	LOS B	1.5	10.6	0.63	1.02	0.76	41.1
8	T1	54	2.0	57	2.0	0.322	16.6	LOS C	1.5	10.6	0.63	1.02	0.76	41.1
9	R2	45	2.0	47	2.0	0.322	19.6	LOS C	1.5	10.6	0.63	1.02	0.76	41.0
Approach		126	2.4	133	2.4	0.322	16.3	LOS C	1.5	10.6	0.63	1.02	0.76	41.1
West: Jervois Street (SH12)														
10	L2	67	0.0	71	0.0	0.160	4.6	LOS A	0.0	0.0	0.00	0.13	0.00	48.7
11	T1	217	6.0	228	6.0	0.160	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	49.2
12	R2	8	0.0	8	0.0	0.006	5.3	LOS A	0.0	0.2	0.34	0.53	0.34	45.5
Approach		292	4.5	307	4.5	0.160	1.2	NA	0.0	0.2	0.01	0.14	0.01	49.0
All Vehicles		757	6.2	797	6.2	0.322	4.7	NA	1.5	10.6	0.18	0.34	0.20	46.9

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_EX_PM (Site Folder: Awakino +Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	5	0.0	5	0.0	0.192	9.0	LOS A	0.7	5.2	0.64	0.99	0.64	41.8
2	T1	60	0.0	63	0.0	0.192	15.0	LOS C	0.7	5.2	0.64	0.99	0.64	41.7
3	R2	9	0.0	9	0.0	0.192	17.5	LOS C	0.7	5.2	0.64	0.99	0.64	41.6
Approach		74	0.0	78	0.0	0.192	14.9	LOS B	0.7	5.2	0.64	0.99	0.64	41.7
East: Jervois Street (SH12)														
4	L2	28	4.0	29	4.0	0.158	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
5	T1	255	4.0	268	4.0	0.158	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
6	R2	52	0.0	55	0.0	0.038	5.4	LOS A	0.2	1.2	0.35	0.56	0.35	45.5
Approach		335	3.4	353	3.4	0.158	1.3	NA	0.2	1.2	0.05	0.13	0.05	48.9
North: Awakino Road														
7	L2	29	0.0	31	0.0	0.311	9.4	LOS A	1.4	9.9	0.60	1.00	0.72	41.4
8	T1	50	0.0	53	0.0	0.311	16.3	LOS C	1.4	9.9	0.60	1.00	0.72	41.3
9	R2	46	0.0	48	0.0	0.311	19.1	LOS C	1.4	9.9	0.60	1.00	0.72	41.2
Approach		125	0.0	132	0.0	0.311	15.8	LOS C	1.4	9.9	0.60	1.00	0.72	41.3
West: Jervois Street (SH12)														
10	L2	51	2.0	54	2.0	0.133	4.6	LOS A	0.0	0.0	0.00	0.12	0.00	48.8
11	T1	186	5.0	196	5.0	0.133	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	49.3
12	R2	10	0.0	11	0.0	0.008	5.5	LOS A	0.0	0.2	0.37	0.54	0.37	45.4
Approach		247	4.2	260	4.2	0.133	1.2	NA	0.0	0.2	0.02	0.13	0.02	49.0
All Vehicles		781	2.8	822	2.8	0.311	4.9	NA	1.4	9.9	0.18	0.35	0.20	46.8

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

ATTACHMENT 3:

2029 BACKGROUND TRAFFIC INTERSECTION OPERATIONS

MOVEMENT SUMMARY

Site: 101 [Awakino+Hospital_BG_AM (Site Folder: Awakino +Hospital)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
2	T1	61	2.0	64	2.0	0.083	0.2	LOS A	0.4	2.7	0.17	0.30	0.17	47.9
3	R2	77	1.0	81	1.0	0.083	4.8	LOS A	0.4	2.7	0.17	0.30	0.17	47.0
Approach		138	1.4	145	1.4	0.083	2.8	NA	0.4	2.7	0.17	0.30	0.17	47.4
East: Dargaville Hospital														
4	L2	43	3.0	45	3.0	0.033	4.8	LOS A	0.1	0.9	0.16	0.50	0.16	46.2
6	R2	3	0.0	3	0.0	0.033	5.4	LOS A	0.1	0.9	0.16	0.50	0.16	45.8
Approach		46	2.8	48	2.8	0.033	4.8	LOS A	0.1	0.9	0.16	0.50	0.16	46.2
North: Awakino Road														
7	L2	2	0.0	2	0.0	0.041	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
8	T1	74	1.0	78	1.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		76	1.0	80	1.0	0.041	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
All Vehicles		260	1.5	274	1.5	0.083	2.4	NA	0.4	2.7	0.12	0.25	0.12	47.9

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101 [Awakino+Hospital_BG_PM (Site Folder: Awakino +Hospital)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
2	T1	64	2.0	67	2.0	0.049	0.1	LOS A	0.1	1.0	0.07	0.15	0.07	49.0
3	R2	23	0.0	24	0.0	0.049	4.7	LOS A	0.1	1.0	0.07	0.15	0.07	48.0
Approach		87	1.5	92	1.5	0.049	1.3	NA	0.1	1.0	0.07	0.15	0.07	48.7
East: Dargaville Hospital														
4	L2	73	1.0	77	1.0	0.051	4.7	LOS A	0.2	1.5	0.12	0.50	0.12	46.3
6	R2	2	50.0	2	50.0	0.051	5.8	LOS A	0.2	1.5	0.12	0.50	0.12	45.1
Approach		75	2.3	79	2.3	0.051	4.7	LOS A	0.2	1.5	0.12	0.50	0.12	46.3
North: Awakino Road														
7	L2	2	0.0	2	0.0	0.025	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
8	T1	45	0.0	47	0.0	0.025	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.9
Approach		47	0.0	49	0.0	0.025	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
All Vehicles		209	1.4	220	1.4	0.051	2.3	NA	0.2	1.5	0.07	0.25	0.07	48.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 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.

MOVEMENT SUMMARY

Site: 101v [Awakino+Ranfurlly_BG_AM (Site Folder: Awakino +Hospital - Copy)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	43	3.0	45	3.0	0.103	4.7	LOS A	0.2	1.4	0.08	0.19	0.08	48.2
2	T1	116	0.0	122	0.0	0.103	0.1	LOS A	0.2	1.4	0.08	0.19	0.08	48.7
3	R2	23	0.0	24	0.0	0.103	4.9	LOS A	0.2	1.4	0.08	0.19	0.08	47.8
Approach		182	0.7	192	0.7	0.103	1.8	NA	0.2	1.4	0.08	0.19	0.08	48.4
East: Ranfurlly Street														
4	L2	42	0.0	44	0.0	0.053	7.8	LOS A	0.2	1.4	0.22	0.91	0.22	44.9
5	T1	12	0.0	13	0.0	0.053	8.9	LOS A	0.2	1.4	0.22	0.91	0.22	44.6
6	R2	3	0.0	3	0.0	0.053	8.9	LOS A	0.2	1.4	0.22	0.91	0.22	44.5
Approach		57	0.0	60	0.0	0.053	8.1	LOS A	0.2	1.4	0.22	0.91	0.22	44.8
North: Awakino Road														
7	L2	5	0.0	5	0.0	0.073	5.0	LOS A	0.2	1.3	0.13	0.13	0.13	48.5
8	T1	98	0.0	103	0.0	0.073	0.2	LOS A	0.2	1.3	0.13	0.13	0.13	48.9
9	R2	25	0.0	26	0.0	0.073	5.1	LOS A	0.2	1.3	0.13	0.13	0.13	48.0
Approach		128	0.0	135	0.0	0.073	1.3	NA	0.2	1.3	0.13	0.13	0.13	48.7
West: Ranfurlly Street														
10	L2	27	0.0	28	0.0	0.070	7.9	LOS A	0.3	1.8	0.29	0.91	0.29	44.7
11	T1	9	0.0	9	0.0	0.070	8.8	LOS A	0.3	1.8	0.29	0.91	0.29	44.4
12	R2	24	0.0	25	0.0	0.070	9.3	LOS A	0.3	1.8	0.29	0.91	0.29	44.3
Approach		60	0.0	63	0.0	0.070	8.6	LOS A	0.3	1.8	0.29	0.91	0.29	44.5
All Vehicles		427	0.3	449	0.3	0.103	3.4	NA	0.3	1.8	0.14	0.37	0.14	47.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Ranfurlly_BG_PM (Site Folder: Awakino +Hospital - Copy)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Awakino Road														
1	L2	30	0.0	32	0.0	0.093	4.8	LOS A	0.4	2.6	0.16	0.27	0.16	47.6
2	T1	76	1.0	80	1.0	0.093	0.2	LOS A	0.4	2.6	0.16	0.27	0.16	48.0
3	R2	53	0.0	56	0.0	0.093	4.9	LOS A	0.4	2.6	0.16	0.27	0.16	47.1
Approach		159	0.5	167	0.5	0.093	2.6	NA	0.4	2.6	0.16	0.27	0.16	47.6
East: Ranfurlly Street														
4	L2	36	0.0	38	0.0	0.051	7.8	LOS A	0.2	1.3	0.21	0.92	0.21	44.9
5	T1	15	0.0	16	0.0	0.051	8.6	LOS A	0.2	1.3	0.21	0.92	0.21	44.6
6	R2	3	0.0	3	0.0	0.051	8.6	LOS A	0.2	1.3	0.21	0.92	0.21	44.5
Approach		54	0.0	57	0.0	0.051	8.1	LOS A	0.2	1.3	0.21	0.92	0.21	44.8
North: Awakino Road														
7	L2	6	0.0	6	0.0	0.064	4.8	LOS A	0.1	1.0	0.09	0.12	0.09	48.6
8	T1	87	0.0	92	0.0	0.064	0.1	LOS A	0.1	1.0	0.09	0.12	0.09	49.0
9	R2	20	0.0	21	0.0	0.064	4.9	LOS A	0.1	1.0	0.09	0.12	0.09	48.1
Approach		113	0.0	119	0.0	0.064	1.2	NA	0.1	1.0	0.09	0.12	0.09	48.8
West: Ranfurlly Street														
10	L2	18	0.0	19	0.0	0.083	7.7	LOS A	0.3	2.1	0.27	0.91	0.27	44.6
11	T1	4	0.0	4	0.0	0.083	8.6	LOS A	0.3	2.1	0.27	0.91	0.27	44.4
12	R2	44	0.0	46	0.0	0.083	9.0	LOS A	0.3	2.1	0.27	0.91	0.27	44.2
Approach		66	0.0	69	0.0	0.083	8.6	LOS A	0.3	2.1	0.27	0.91	0.27	44.3
All Vehicles		392	0.2	413	0.2	0.093	4.0	NA	0.4	2.6	0.17	0.42	0.17	47.0

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_BG_AM (Site Folder: Awakino +Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	12	9.0	13	9.0	0.156	9.3	LOS A	0.6	4.2	0.61	0.97	0.61	41.6
2	T1	41	3.0	43	3.0	0.156	16.7	LOS C	0.6	4.2	0.61	0.97	0.61	41.5
3	R2	5	0.0	5	0.0	0.156	18.5	LOS C	0.6	4.2	0.61	0.97	0.61	41.5
Approach		58	4.0	61	4.0	0.156	15.3	LOS C	0.6	4.2	0.61	0.97	0.61	41.5
East: Jervois Street (SH12)														
4	L2	14	0.0	15	0.0	0.147	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
5	T1	237	12.0	249	12.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
6	R2	55	4.0	58	4.0	0.045	5.7	LOS A	0.2	1.4	0.40	0.59	0.40	45.3
Approach		306	10.0	322	10.0	0.147	1.3	NA	0.2	1.4	0.07	0.13	0.07	48.9
North: Awakino Road														
7	L2	29	4.0	31	4.0	0.373	10.9	LOS B	1.8	12.9	0.66	1.05	0.87	40.3
8	T1	58	2.0	61	2.0	0.373	18.5	LOS C	1.8	12.9	0.66	1.05	0.87	40.3
9	R2	48	2.0	51	2.0	0.373	22.0	LOS C	1.8	12.9	0.66	1.05	0.87	40.2
Approach		135	2.4	142	2.4	0.373	18.1	LOS C	1.8	12.9	0.66	1.05	0.87	40.3
West: Jervois Street (SH12)														
10	L2	72	0.0	76	0.0	0.172	4.6	LOS A	0.0	0.0	0.00	0.13	0.00	48.7
11	T1	233	6.0	245	6.0	0.172	0.1	LOS A	0.0	0.0	0.00	0.13	0.00	49.2
12	R2	9	0.0	9	0.0	0.007	5.4	LOS A	0.0	0.2	0.36	0.53	0.36	45.4
Approach		314	4.5	331	4.5	0.172	1.2	NA	0.0	0.2	0.01	0.14	0.01	48.9
All Vehicles		813	6.2	856	6.2	0.373	5.1	NA	1.8	12.9	0.18	0.35	0.22	46.6

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_BG_PM (Site Folder: Awakino +Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	5	0.0	5	0.0	0.222	9.3	LOS A	0.9	6.2	0.68	1.00	0.70	41.2
2	T1	64	0.0	67	0.0	0.222	16.3	LOS C	0.9	6.2	0.68	1.00	0.70	41.1
3	R2	10	0.0	11	0.0	0.222	19.2	LOS C	0.9	6.2	0.68	1.00	0.70	41.1
Approach		79	0.0	83	0.0	0.222	16.2	LOS C	0.9	6.2	0.68	1.00	0.70	41.1
East: Jervois Street (SH12)														
4	L2	30	4.0	32	4.0	0.170	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
5	T1	273	4.0	287	4.0	0.170	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
6	R2	56	0.0	59	0.0	0.042	5.4	LOS A	0.2	1.3	0.36	0.56	0.36	45.4
Approach		359	3.4	378	3.4	0.170	1.3	NA	0.2	1.3	0.06	0.13	0.06	48.9
North: Awakino Road														
7	L2	31	0.0	33	0.0	0.360	10.2	LOS B	1.7	12.1	0.63	1.03	0.82	40.6
8	T1	54	0.0	57	0.0	0.360	18.1	LOS C	1.7	12.1	0.63	1.03	0.82	40.5
9	R2	49	0.0	52	0.0	0.360	21.3	LOS C	1.7	12.1	0.63	1.03	0.82	40.5
Approach		134	0.0	141	0.0	0.360	17.5	LOS C	1.7	12.1	0.63	1.03	0.82	40.5
West: Jervois Street (SH12)														
10	L2	55	2.0	58	2.0	0.143	4.6	LOS A	0.0	0.0	0.00	0.12	0.00	48.8
11	T1	199	5.0	209	5.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	49.3
12	R2	11	0.0	12	0.0	0.009	5.6	LOS A	0.0	0.3	0.39	0.55	0.39	45.4
Approach		265	4.2	279	4.2	0.143	1.2	NA	0.0	0.3	0.02	0.14	0.02	49.0
All Vehicles		837	2.8	881	2.8	0.360	5.3	NA	1.7	12.1	0.19	0.36	0.23	46.5

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

ATTACHMENT 4:

2029 TOTAL TRAFFIC INTERSECTION OPERATIONS

MOVEMENT SUMMARY

Site: 101 [Awakino+Hospital_TOT_AM (Site Folder: Awakino+Hospital)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
2	T1	123	2.0	129	2.0	0.131	0.8	LOS A	0.6	4.1	0.34	0.24	0.34	48.0
3	R2	77	1.0	81	1.0	0.131	5.9	LOS A	0.6	4.1	0.34	0.24	0.34	47.0
Approach		200	1.6	211	1.6	0.131	2.8	NA	0.6	4.1	0.34	0.24	0.34	47.6
East: Dargaville Hospital														
4	L2	43	3.0	45	3.0	0.044	5.8	LOS A	0.2	1.2	0.39	0.58	0.39	45.7
6	R2	4	0.0	4	0.0	0.044	7.0	LOS A	0.2	1.2	0.39	0.58	0.39	45.3
Approach		47	2.7	49	2.7	0.044	5.9	LOS A	0.2	1.2	0.39	0.58	0.39	45.6
North: Awakino Road														
7	L2	7	0.0	7	0.0	0.177	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
8	T1	319	1.0	336	1.0	0.177	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		326	1.0	343	1.0	0.177	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
All Vehicles		573	1.3	603	1.3	0.177	1.5	NA	0.6	4.1	0.15	0.14	0.15	48.7

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101 [Awakino+Hospital_TOT_PM (Site Folder: Awakino+Hospital)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
2	T1	309	2.0	325	2.0	0.184	0.0	LOS A	0.2	1.3	0.04	0.04	0.04	49.7
3	R2	23	0.0	24	0.0	0.184	5.0	LOS A	0.2	1.3	0.04	0.04	0.04	48.7
Approach		332	1.9	349	1.9	0.184	0.4	NA	0.2	1.3	0.04	0.04	0.04	49.6
East: Dargaville Hospital														
4	L2	73	1.0	77	1.0	0.064	4.9	LOS A	0.3	1.8	0.21	0.51	0.21	46.1
6	R2	7	50.0	7	50.0	0.064	8.5	LOS A	0.3	1.8	0.21	0.51	0.21	44.9
Approach		80	5.3	84	5.3	0.064	5.2	LOS A	0.3	1.8	0.21	0.51	0.21	46.0
North: Awakino Road														
7	L2	3	0.0	3	0.0	0.059	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
8	T1	107	0.0	113	0.0	0.059	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		110	0.0	116	0.0	0.059	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
All Vehicles		522	2.0	549	2.0	0.184	1.1	NA	0.3	1.8	0.06	0.11	0.06	49.1

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Ranfurlly_TOT_AM (Site Folder: Awakino+Hospital - Copy)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	43	3.0	45	3.0	0.132	5.1	LOS A	0.3	1.8	0.13	0.15	0.13	48.3
2	T1	164	0.0	173	0.0	0.132	0.2	LOS A	0.3	1.8	0.13	0.15	0.13	48.8
3	R2	23	0.0	24	0.0	0.132	5.8	LOS A	0.3	1.8	0.13	0.15	0.13	47.8
Approach		230	0.6	242	0.6	0.132	1.7	NA	0.3	1.8	0.13	0.15	0.13	48.6
East: Ranfurlly Street														
4	L2	42	0.0	44	0.0	0.075	8.7	LOS A	0.3	1.9	0.43	0.91	0.43	44.3
5	T1	12	0.0	13	0.0	0.075	11.5	LOS B	0.3	1.9	0.43	0.91	0.43	44.1
6	R2	5	0.0	5	0.0	0.075	12.4	LOS B	0.3	1.9	0.43	0.91	0.43	43.9
Approach		59	0.0	62	0.0	0.075	9.6	LOS A	0.3	1.9	0.43	0.91	0.43	44.2
North: Awakino Road														
7	L2	13	0.0	14	0.0	0.216	5.4	LOS A	0.6	4.5	0.17	0.13	0.17	48.3
8	T1	286	0.0	301	0.0	0.216	0.3	LOS A	0.6	4.5	0.17	0.13	0.17	48.8
9	R2	74	0.0	78	0.0	0.216	5.4	LOS A	0.6	4.5	0.17	0.13	0.17	47.9
Approach		373	0.0	393	0.0	0.216	1.5	NA	0.6	4.5	0.17	0.13	0.17	48.6
West: Ranfurlly Street														
10	L2	39	0.0	41	0.0	0.106	8.1	LOS A	0.4	2.7	0.37	0.92	0.37	43.9
11	T1	9	0.0	9	0.0	0.106	11.5	LOS B	0.4	2.7	0.37	0.92	0.37	43.7
12	R2	24	0.0	25	0.0	0.106	12.8	LOS B	0.4	2.7	0.37	0.92	0.37	43.6
Approach		72	0.0	76	0.0	0.106	10.1	LOS B	0.4	2.7	0.37	0.92	0.37	43.8
All Vehicles		734	0.2	773	0.2	0.216	3.0	NA	0.6	4.5	0.20	0.28	0.20	47.7

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Awakino.sip9

MOVEMENT SUMMARY

Site: 101v [Awakino+Ranfurlly_TOT_PM (Site Folder: Awakino+Hospital - Copy)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	30	0.0	32	0.0	0.197	5.0	LOS A	0.5	3.4	0.12	0.13	0.12	48.5
2	T1	264	1.0	278	1.0	0.197	0.1	LOS A	0.5	3.4	0.12	0.13	0.12	48.9
3	R2	53	0.0	56	0.0	0.197	5.1	LOS A	0.5	3.4	0.12	0.13	0.12	48.0
Approach		347	0.8	365	0.8	0.197	1.3	NA	0.5	3.4	0.12	0.13	0.12	48.8
East: Ranfurlly Street														
4	L2	36	0.0	38	0.0	0.078	8.0	LOS A	0.3	2.0	0.31	0.92	0.31	44.3
5	T1	15	0.0	16	0.0	0.078	10.7	LOS B	0.3	2.0	0.31	0.92	0.31	44.1
6	R2	11	0.0	12	0.0	0.078	11.8	LOS B	0.3	2.0	0.31	0.92	0.31	43.9
Approach		62	0.0	65	0.0	0.078	9.3	LOS A	0.3	2.0	0.31	0.92	0.31	44.2
North: Awakino Road														
7	L2	8	0.0	8	0.0	0.103	5.6	LOS A	0.3	2.0	0.19	0.13	0.19	48.3
8	T1	135	0.0	142	0.0	0.103	0.3	LOS A	0.3	2.0	0.19	0.13	0.19	48.8
9	R2	32	0.0	34	0.0	0.103	5.7	LOS A	0.3	2.0	0.19	0.13	0.19	47.9
Approach		175	0.0	184	0.0	0.103	1.6	NA	0.3	2.0	0.19	0.13	0.19	48.6
West: Ranfurlly Street														
10	L2	67	0.0	71	0.0	0.164	8.7	LOS A	0.6	4.3	0.45	0.93	0.45	44.0
11	T1	4	0.0	4	0.0	0.164	10.9	LOS B	0.6	4.3	0.45	0.93	0.45	43.8
12	R2	44	0.0	46	0.0	0.164	12.0	LOS B	0.6	4.3	0.45	0.93	0.45	43.7
Approach		115	0.0	121	0.0	0.164	10.1	LOS B	0.6	4.3	0.45	0.93	0.45	43.9
All Vehicles		699	0.4	736	0.4	0.197	3.5	NA	0.6	4.3	0.21	0.33	0.21	47.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_TOT_AM (Site Folder: Awakino +Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	12	9.0	13	9.0	0.205	9.4	LOS A	0.8	5.6	0.65	0.98	0.66	41.1
2	T1	54	3.0	57	3.0	0.205	17.5	LOS C	0.8	5.6	0.65	0.98	0.66	41.0
3	R2	5	0.0	5	0.0	0.205	21.8	LOS C	0.8	5.6	0.65	0.98	0.66	41.0
Approach		71	3.8	75	3.8	0.205	16.4	LOS C	0.8	5.6	0.65	0.98	0.66	41.0
East: Jervois Street (SH12)														
4	L2	14	0.0	15	0.0	0.147	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
5	T1	237	12.0	249	12.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
6	R2	64	4.0	67	4.0	0.053	5.8	LOS A	0.2	1.7	0.42	0.60	0.42	45.3
Approach		315	9.8	332	9.8	0.147	1.4	NA	0.2	1.7	0.08	0.15	0.08	48.7
North: Awakino Road														
7	L2	67	4.0	71	4.0	0.772	21.2	LOS C	7.3	51.9	0.80	1.44	2.05	35.5
8	T1	108	2.0	114	2.0	0.772	31.2	LOS D	7.3	51.9	0.80	1.44	2.05	35.5
9	R2	98	2.0	103	2.0	0.772	36.3	LOS E	7.3	51.9	0.80	1.44	2.05	35.4
Approach		273	2.5	287	2.5	0.772	30.6	LOS D	7.3	51.9	0.80	1.44	2.05	35.5
West: Jervois Street (SH12)														
10	L2	85	0.0	89	0.0	0.179	4.6	LOS A	0.0	0.0	0.00	0.15	0.00	48.6
11	T1	233	6.0	245	6.0	0.179	0.1	LOS A	0.0	0.0	0.00	0.15	0.00	49.1
12	R2	9	0.0	9	0.0	0.007	5.4	LOS A	0.0	0.2	0.36	0.53	0.36	45.4
Approach		327	4.3	344	4.3	0.179	1.4	NA	0.0	0.2	0.01	0.16	0.01	48.8
All Vehicles		986	5.5	1038	5.5	0.772	10.6	NA	7.3	51.9	0.30	0.57	0.65	43.7

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_TOT_PM (Site Folder: Awakino +Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
1	L2	5	0.0	5	0.0	0.423	12.1	LOS B	2.1	14.6	0.78	1.10	1.09	38.8
2	T1	114	0.0	120	0.0	0.423	22.0	LOS C	2.1	14.6	0.78	1.10	1.09	38.8
3	R2	10	0.0	11	0.0	0.423	24.9	LOS C	2.1	14.6	0.78	1.10	1.09	38.7
Approach		129	0.0	136	0.0	0.423	21.8	LOS C	2.1	14.6	0.78	1.10	1.09	38.8
East: Jervois Street (SH12)														
4	L2	30	4.0	32	4.0	0.170	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
5	T1	273	4.0	287	4.0	0.170	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
6	R2	94	0.0	99	0.0	0.075	5.7	LOS A	0.3	2.3	0.41	0.60	0.41	45.3
Approach		397	3.1	418	3.1	0.170	1.7	NA	0.3	2.3	0.10	0.18	0.10	48.5
North: Awakino Road														
7	L2	40	0.0	42	0.0	0.529	13.3	LOS B	3.0	21.1	0.71	1.13	1.17	38.2
8	T1	67	0.0	71	0.0	0.529	23.4	LOS C	3.0	21.1	0.71	1.13	1.17	38.1
9	R2	62	0.0	65	0.0	0.529	29.4	LOS D	3.0	21.1	0.71	1.13	1.17	38.1
Approach		169	0.0	178	0.0	0.529	23.2	LOS C	3.0	21.1	0.71	1.13	1.17	38.1
West: Jervois Street (SH12)														
10	L2	105	2.0	111	2.0	0.171	4.6	LOS A	0.0	0.0	0.00	0.19	0.00	48.4
11	T1	199	5.0	209	5.0	0.171	0.1	LOS A	0.0	0.0	0.00	0.19	0.00	48.9
12	R2	11	0.0	12	0.0	0.009	5.6	LOS A	0.0	0.3	0.39	0.55	0.39	45.4
Approach		315	3.8	332	3.8	0.171	1.8	NA	0.0	0.3	0.01	0.20	0.01	48.6
All Vehicles		1010	2.4	1063	2.4	0.529	7.9	NA	3.0	21.1	0.26	0.46	0.38	45.0

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_TOT_AM_REM (Site Folder: Awakino+Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Awakino Road														
1	L2	12	9.0	13	9.0	0.206	9.4	LOS A	0.8	5.6	0.65	0.98	0.66	41.1
2	T1	54	3.0	57	3.0	0.206	17.5	LOS C	0.8	5.6	0.65	0.98	0.66	41.0
3	R2	5	0.0	5	0.0	0.206	22.1	LOS C	0.8	5.6	0.65	0.98	0.66	41.0
Approach		71	3.8	75	3.8	0.206	16.5	LOS C	0.8	5.6	0.65	0.98	0.66	41.0
East: Jervois Street (SH12)														
4	L2	14	0.0	15	0.0	0.147	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
5	T1	237	12.0	249	12.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
6	R2	64	4.0	67	4.0	0.053	5.8	LOS A	0.2	1.7	0.42	0.59	0.42	45.4
Approach		315	9.8	332	9.8	0.147	1.4	NA	0.2	1.7	0.08	0.14	0.08	48.8
North: Awakino Road														
7	L2	67	4.0	71	4.0	0.079	9.0	LOS A	0.3	2.1	0.36	0.89	0.36	44.6
8	T1	108	2.0	114	2.0	0.692	27.3	LOS D	4.9	34.7	0.87	1.31	1.77	35.9
9	R2	98	2.0	103	2.0	0.692	32.0	LOS D	4.9	34.7	0.87	1.31	1.77	35.9
Approach		273	2.5	287	2.5	0.692	24.5	LOS C	4.9	34.7	0.74	1.21	1.43	37.7
West: Jervois Street (SH12)														
10	L2	85	0.0	89	0.0	0.179	4.6	LOS A	0.0	0.0	0.00	0.15	0.00	48.6
11	T1	233	6.0	245	6.0	0.179	0.1	LOS A	0.0	0.0	0.00	0.15	0.00	49.1
12	R2	9	0.0	9	0.0	0.007	5.4	LOS A	0.0	0.2	0.36	0.53	0.36	45.4
Approach		327	4.3	344	4.3	0.179	1.4	NA	0.0	0.2	0.01	0.16	0.01	48.8
All Vehicles		986	5.5	1038	5.5	0.692	8.9	NA	4.9	34.7	0.28	0.50	0.47	44.6

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

MOVEMENT SUMMARY

Site: 101v [Awakino+Jervois_TOT_PM_REM (Site Folder: Awakino+Jervois)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Awakino Road														
1	L2	5	0.0	5	0.0	0.423	12.1	LOS B	2.1	14.6	0.78	1.10	1.09	38.8
2	T1	114	0.0	120	0.0	0.423	22.0	LOS C	2.1	14.6	0.78	1.10	1.09	38.8
3	R2	10	0.0	11	0.0	0.423	24.9	LOS C	2.1	14.6	0.78	1.10	1.09	38.7
Approach		129	0.0	136	0.0	0.423	21.8	LOS C	2.1	14.6	0.78	1.10	1.09	38.8
East: Jervois Street (SH12)														
4	L2	30	4.0	32	4.0	0.170	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
5	T1	273	4.0	287	4.0	0.170	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
6	R2	94	0.0	99	0.0	0.075	5.7	LOS A	0.3	2.3	0.41	0.59	0.41	45.5
Approach		397	3.1	418	3.1	0.170	1.7	NA	0.3	2.3	0.10	0.18	0.10	48.5
North: Awakino Road														
7	L2	40	0.0	42	0.0	0.044	8.5	LOS A	0.2	1.1	0.32	0.88	0.32	44.8
8	T1	67	0.0	71	0.0	0.485	22.4	LOS C	2.4	17.0	0.82	1.13	1.22	37.4
9	R2	62	0.0	65	0.0	0.485	28.2	LOS D	2.4	17.0	0.82	1.13	1.22	37.4
Approach		169	0.0	178	0.0	0.485	21.3	LOS C	2.4	17.0	0.70	1.07	1.00	38.9
West: Jervois Street (SH12)														
10	L2	105	2.0	111	2.0	0.171	4.6	LOS A	0.0	0.0	0.00	0.19	0.00	48.4
11	T1	199	5.0	209	5.0	0.171	0.1	LOS A	0.0	0.0	0.00	0.19	0.00	48.9
12	R2	11	0.0	12	0.0	0.009	5.6	LOS A	0.0	0.3	0.39	0.55	0.39	45.4
Approach		315	3.8	332	3.8	0.171	1.8	NA	0.0	0.3	0.01	0.20	0.01	48.6
All Vehicles		1010	2.4	1063	2.4	0.485	7.6	NA	2.4	17.0	0.26	0.45	0.35	45.2

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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.

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Project: D:\Traffic Planning Dropbox\A TPC Projects\2022 Projects\220035 - Awakino Road Plan Change, Dargaville\TPC Documents

Awakino.sip9

14 November 2022

Alisa Neal
Associate
Barker and Associates

RESPONSE TO ADDITIONAL INFORMATION REQUEST – MOONLIGHT HEIGHTS, AWAKINO ROAD, DARGAVILLE

The following is a response to the additional information requests received from Kaipara District Council (via Northland Transport Alliance) and Waka Kotahi in response to the provided Transport Assessment. This letter follows a request-comment format, where requests/suggested change comments from Council are shown in *italic blue font* and those from WK are shown in *italic green font* followed by our response. It is intended that this response be read in conjunction with the Transport Assessment dated June 2022.

Request 1:

The Traffic Impact Assessment (TIA) provided with the request does not address effects of active transport connectivity requirements with the existing network, with the schools, playground, shops, civic centre/precinct – please provide mitigation measures in the ITA.

Response 1:

This was an oversight within the reporting, as footpath provisions to connect to the wider road network was discussed within the project team, prior to Plan Change Lodgement.

A footpath is provided on the western side of Awakino Road, terminating 215 metres north of Paritai Place. As part of any resultant subdivision and road construction within the Plan Change area the existing footpath will be extended to the north connecting to the northern most boundary of the subject site. See **Figure 1** below.

To supplement this footpath extension, and subject to detailed design a pedestrian crossing facility will be included as part of the main intersection design of Awakino Road and the Awakino Precinct area.

Lastly, as the Dargaville Spatial Plan looks to utilise Awakino Road as a main North-South pedestrian/cyclist route, there is opportunity to provide a shared pathway along the site frontage (eastern side of Awakino Road), which currently is without any public footpath between Cranley Street and its northern end. Providing the shared path along this side of the Awakino Road, in conjunction with long term planning by KDC, will allow for a great number of residents to have direct access to an active mode connection. It is noted that the applicant would only provide a shared path for the extent of their development area frontage which would be completed as part of subdivision enabling works.

With respect to walking/cycling catchment area, it is considered that Dargaville High School and Dargaville Hospital are within reasonable walking distances, which will be encouraged through the supporting active transport connections as a result of subsequent subdivisions. As for connection to playgrounds, as part of a future subdivision, green space and public park area will be included, allowing for good active mode connection. For shopping areas, given the distance being ~2.5 kilometres, it is unlikely that many trips will be made by active modes, as the distance will be discouraging for many, taking approximately 30 minutes one-way. However, with the improvements made to the existing public footpath network, safe connections will be available giving individuals the option of mode choice.

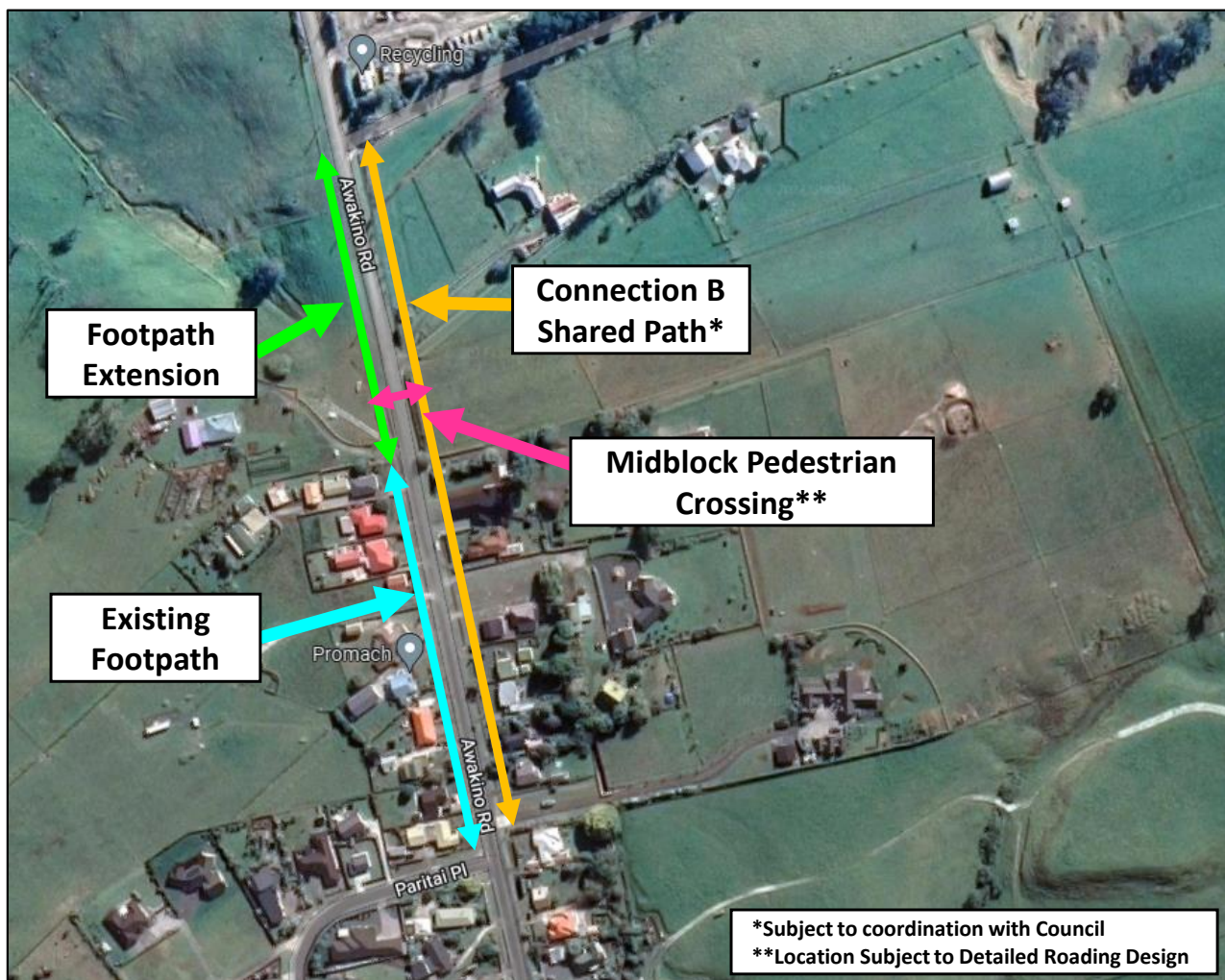


Figure 1: Awakino Precinct Existing Footpath Network Extension

Request 2:

Provision for cyclists – will this be on-road or off-road?

Response 2:

It is anticipated that cyclists will have the option to choose between an off-road 3 metre shared path, or cycle within the carriageway.

This matter will be investigated in greater detail at a future subdivision and road design stage, as it is considered to be a more detailed design matter.

Request 3:

Even though recent crashes that occurred in Awakino road are minor injury crashes, the cause is mainly due to turning movements, which will increase due to this plan change and this is due to the gridline alignment of Dargaville. Mitigations are to be provided to address the additional risk due to this plan change – please address in ITA.

Response 3:

Request 7 builds upon Request 3 and has been responded to in Response 7.

Request 4:

Please ensure the ITA provides recommendations for locations of pedestrian/cyclists crossing facilities, which should comply with “NZ Pedestrian Planning Design Guide 2022 and associated Pedestrian Crossing Selection Tool”.

Response 4:

At least one pedestrian/cyclist crossing facility will be provided across Awakino Road near the site’s frontage. However, as the exact location of the road network is unknown and subject to change following further engineering investigation, provided recommended locations would be of low value at this point in time.

Notwithstanding, the location of the pedestrian/cyclist facility can be investigated further at the subdivision design stage.

Request 5:

ITA to include how safe system compliant pedestrian and cycle routes will be provided to local schools (Primary & Secondary), parks and key destinations.

Response 5:

The site is located 1.2 kilometres from Dargaville High School and 2.0 kilometres from Selwyn Park Primary School. As identified previously, the existing public footpath network will be extended and supplemented by a robust pedestrian/cyclist network within the Plan Change Area, along with a mid-block pedestrian/cyclist facility (subject to further design at a later stage). Similarly, green space will be provided within the future area, allowing for close, well-connected access to parks.

Request 6:

Will the existing pavement design along Awakino Road be able to accommodate the additional traffic? – Please address in the ITA.

Response 6:

There is no reason to anticipate that Awakino Road pavement design would structurally fail as a result of the additional vehicle loading from the proposal. As the majority of traffic from the Awakino Precinct would be personal vehicle, the loading profile is fairly small, compared to that of larger trucks. If there are any as-built construction details of the road which Council could provide for Awakino Road, further investigation could be carried out. Additionally, it is noted that with the old landfill location north of the subject site and existing Transfer Station, heavy vehicles currently utilise the road regularly and this can be reasoned to have been a factor in the existing road/pavement design.

As part of the resultant intersection designs to serve the subject areas, there is opportunity to reform parts of Awakino Road near the subject site, as needed. However, a full reconstruction is not considered necessary at this stage in time. However, during construction phases with significant increases to heavy vehicle traffic, there is potential for increased wearing on the road. This can be addressed through a pre and post road survey, which will identify any existing deficiencies and any created deficiencies as a result of the construction process.

Request 7:

Proposed auxiliary left turn lane at SH 12 and Awakino Road intersection is not in compliance with Safe System, National Cycle Strategy, and the National Standards – Applicant to address this and propose a mitigation that is safe system compliant.

Response 7:

The auxiliary left turn lane for the southbound approach was proposed to help reduce average delays experienced at this approach. By reducing delays, it is considered that drivers will have more patience when looking to turn and therefore be less likely to attempt to take an unsuitable gap within the traffic stream, which can lead to a crash. It is not clear how this proposal is not in compliance with the standards mentioned and more specifics in relation to this would be appreciated.

When examining the specifics of the reported minor injury crashes; the following is noted:

- September 2020: Driver suspected to be under the influence of alcohol, travelling at excessive speed hit a vehicle's rear end, which hit multiple other vehicles.
- July 2021: Driver failed to stop at stop sign, hitting vehicle along Jervois Street (SH12)
- September 2019: Drivers on opposite sides of Awakino Road, both went to travel through intersection at same time with northbound through vehicle being hit by southbound right-turning vehicle, which failed to give-way.
- February 2017: Truck driver failed to stop at stop sign, hitting vehicle along Jervois Street (SH12).

As part of the Safe System Approach, the goal is to eliminate deaths and serious injuries on roads within New Zealand. As there has been four minor injuries at this intersection in the past 5+ years, (five serious injuries in the past 42 years, 1980-2022), it is considered that this intersection operates at a level that is generally consistent with the objectives of the SSA.

In terms of road improvements to reduce the potential of side-on collisions at this intersection as part of a SSA, a speed hump could be installed on the north intersection approach approximately 10 metres from the stop line position. As such drivers would be required to slow in advance of the intersection, thereby reducing the potential for travelling through the intersection without stopping. However it is noted that this improvement would not address driver's making mistakes and pulling into the path of oncoming vehicles. The only realistic ways to address this would be to reduce speed limits along SH12, install a raised speed table through the intersection, or construct a roundabout.

With respect to improvements outside of the road carriageway at this intersection, the pedestrian crossing along the north approach of the intersection of Awakino Road and SH12 can have its alignment improved, such that pedestrians are able to walk in a straight line across the carriageway, as illustrated in **Figure 2**.



Figure 2: Awakino Road Pedestrian Crossing

At this stage of the development process, it is considered that greater assessment and improvement investigation can be successfully be carried out following a successful Plan Change Application. To ensure this, a provision can be included within the Awakino Precinct Plan that would call for the intersection of Awakino Road and SH12 to undergo a full SSA Assessment for the development of more than 10 lots at a subdivision stage.

Request 8:

The Transport Assessment Report (dated 2 June 2022) states: At the intersection of Awakino Road and Jervois Street (SH12), the north intersection approach was forecast to result in increased average delays for all turning movements, such that the proposal would likely result in noticeable effects onto the operation to the intersection. To mitigate the effects of the proposal, an auxiliary left-turn lane, with 20 metres of storage can be constructed through road widening on the north approach to improve the intersection's capacity and reduce delays to an acceptable level. It is considered that the proposed provisions will trigger appropriate upgrading of the intersection of Awakino Road and Jervois Street (SH12) as necessary.

a. Can the precinct provision that would trigger this upgrade be clearly stipulated;

b. Can the applicant consult with Waka Kotahi in regard to any proposal resulting in works on State Highway 12 as per Chapter 11 Transport Network, Rule 11.10.2(1)(b) Road Construction and works in or on a road not undertaken by the Council or NZ Transport Agency (where Rule 11.10.1 does not apply).

c. In terms of the safe and efficient operation of the SH12/Awakino Road intersection, there is no discussion around a safer system treatment that would improve both the safety and efficiency of the intersection in the future for vehicles and active transportation modes.

d. The Transport Assessment notes that the major contributing factor for crashes at this intersection is human error and this is expected to occur to a degree within any road environment. It is highly likely that the increase in traffic using this intersection (particularly right turn movements) generated by this development will increase the safety risk. The addition of a left turn lane is targeting the efficiency of the intersection but it in no way addresses the safety performance and therefore can not be considered a safer system treatment.

e. Can evidence and a general arrangement plan be provided to Waka Kotahi that this is an appropriate intersection form and will provide the safest outcome for vehicle drivers, cyclists and pedestrians. The concern being that the intersection will involve three active lanes and visibility will be reduced.

f. In consideration of all the points above, can the applicant review the Transport Assessment and provide more detail in terms of road safety and the provision of walking and cycling facilities that would then enable Waka Kotahi to re-assess the proposal.

Response 8:

Following comments from Council and WK as part of this Plan Change Application, it has been identified that implementing an auxiliary left turn lane on the north intersection approach of Awakino Road and SH12 was not a preferred outcome following preliminary investigation. As such a precinct provision to implement this is not considered necessary at this stage, rather a Precinct Provision to trigger a Safe System Approach Assessment of the existing public footpath network along Awakino Road between the subject lands and Kauri Court, and the intersection of Awakino Road and SH12. Having this a precinct provision will aid in the outcomes as the context of any proposed subdivision, its roading, number of dwellings, and other supporting active transport infrastructure can be considered as a whole.

Any works on the SH will involve consultation and approval with WK. This would be a standard condition of any subsequent consent decision.

Request 9:

The applicant has stated that the plan change will be consistent with the planned urban built form anticipated for Dargaville giving effect to the Dargaville Spatial Plan. Could the following matters please be clarified:

- a. How will this policy: PREC1-P1 Awakino Precinct Subdivision [c. Have a well-connected transportation network, including walking and cycling corridors] be achieved without wider transportation connections to the town centre or adjoining land parcels.*
- b. Will the applicant develop a portion of the walking and cycling connection along Awakino Road as shown in the Dargaville Spatial Plan, Primary Cycle/walking connection B.*
- c. There is no mention of the KDC Walking & Cycling Strategy 2017 in Section 7.4 Council Strategic Plans and Policies of the AEE. The strategy recognises that the compact size of Dargaville provides an ideal opportunity to encourage residents to walk and cycle for local trips. Could detail please be provided on how this will be addressed.*

Response 9:

As part of any subsequent subdivision and development, the public footpath along Awakino Road will be extended along the west side of the road to meet the subject lands and integrate with the new public footpath/cycle network within the Awakino Precinct. Following a successful plan change, Precinct Provisions can allow for both the extension of the existing footpath and a shared path to be constructed along Awakino Road (potentially on its eastern side) in aligning with the cycle/walking connection B. However, this provision will require further design investigation and coordination with Council following a successful plan change. There are no immediate concerns that implementing these changes and upgrading existing infrastructure cannot be achieved following the Plan Change.

With these new active infrastructure facilities constructed and connecting into the existing public footpath, provisions will be in place to allow resident to walk and cycle for local trips, should they so choose.

Request 10:

The Draft Precinct Plan shows the internal transport loop road connection and green street connection.

- a. Waka Kotahi considers there would be benefit in creating further connections to the north and south of the site or implementing a mechanism for broader connectivity to future subdivisions in the future.*
- b. Waka Kotahi considers there would be benefit in enforcing a mechanism (ie. easement) for future proofing of public access to the rear extent of the plan change area to provide future access for Primary Cycle/walking connection C as shown in the Dargaville Spatial Plan.*

Response 10:

Based on the contours of the surrounding area, no provisions for future road connects to the north and south have been made as from an engineering standpoint, they would be cost-prohibitive to build and would likely result in roads with steep gradients not appropriate for a public road.

As part of the future subdivision, provisions will be made for public walkways and can be included to connect to the future shared path along the river and stream network. This allowance would be mutually beneficial and is recommended to be provided for within the Precinct Plan provisions.

Request 11:

The applicant has not proposed any changes to the KDC District Plan which will reduce the need for parking.

a. National Policy Statement on Urban Development 2020, Subpart 8 – Car Parking 3.38 Requires that: If the district plan of a tier 1, 2, or 3 territorial authority contains objectives, policies, rules, or assessment criteria that have the effect of requiring a minimum number of car parks to be provided for a particular development, land use, or activity, the territorial authority must change its district plan to remove that effect, other than in respect of accessible car parks.

b. Does the applicant intend for each residential dwelling to meet the minimum requirements as per Appendix 25C Parking, Loading and Manoeuvring Standards of 2 car parking spaces required per unit. This would amount to approx. 736 car parks within the plan change area. Can this be clarified as parking is not discussed in the AEE or Transport Assessment Report.

Response 11:

Parking for the Awakino Precinct has been provided in line with the Kaipara District Plan requirements. Given the limited availability of public transport within Dargaville and the walk distances which would be required to reach the town centre/trip attractors, it is forecast that personal vehicle will form a large portion of trips to/from the site. It is noted that Dargaville the population of Dargaville, does not subject it to the removal of parking minimums and as such, parking is to still be provided in accordance with the Operative District Plan.

There is currently no parking number proposed for the development area, as first the Plan Change must be approved, followed by a Subdivision Consent. It is then anticipated that each dwelling construction will be subject to its own Resource Consent Application, where the prospective residents would be able to determine their own parking/access provisions in accordance with the Precinct Plan.

From a baseline perspective it can be expected that at least two parking spaces will be available per each developed lot, or some 696 on-site parking spaces (~348 lots). Additionally, the Precinct Plan requires indented parking to be provided, but the extent and number of on-street spaces will be subject to greater engineering design at a higher detailed stage.

Request 12:

How will the plan change ensure consistency with the strategic priorities of the NPS 2021, those of relevance being: Safety: Developing a transport system where no one is killed or seriously injured; Better Travel Options: Providing people with better transport options to access social and economic opportunities; and Climate Change: Developing a low carbon transport system that supports emissions reductions, while improving safety and inclusive access.

Response 12:

The development will look to provide supporting active mode transportation in the form of public shared paths. As outlined within the Precinct Plan provisions, roads serving more than six dwellings will be required to provide a 3-metre-wide shared path, on at least one side of the road. With the other side having a 1.8-metre-wide public footpath.

A provision will be included within the Precinct Plan to carryout a SSA Assessment for the existing pedestrian network along Awakino Road between the subject area and Kauri Court, along with the existing intersection of Awakino Road and SH12.

Request 13:

In May 2022, the Government launched Te hau mārohi ki anamata, Aotearoa New Zealand's first emissions reduction plan. The ERP contains wide ranging actions and outcomes for multiple sectors and transport has a significant role to play, with the ERP calling for a 41% reduction in emissions for the transport sector by 2035 (from 2019 levels).

a. If the applicant does not provide the relevant transport infrastructure to encourage modal shift, how will this plan change reduce reliance on private vehicles and support people to walk, cycle and use public transport and in turn reduce vehicle emissions.

Response 13:

The development will look to provide supporting active mode transportation in the form of public shared paths. As outlined within the Precinct Plan provisions, roads serving more than six dwellings will be required to provide a 3-metre-wide shared path, on at least one side of the road. With the other side having a 1.8-metre-wide public footpath.

As the development plan matures following the result of this Plan Change, the expectation is that greater engineering design will be carried out ensuring a safe and robust active transport network within the Awakino Precinct, which then connects to existing public roads.

Conclusion:

Following the review of Council's and Waka Kotahi's comments, it has been realised that the previous Precinct Plan Provisions contained a gap within them, that failed to address the required pedestrian and cyclist improvements needed to facilitate the development within the Plan Change area. As such the Provisions have been updated to reflect this to ensure that as part of any subsequent development, the necessary upgrades to the active transport network and assessment on the Awakino Road and State Highway 12 is carried out. The provision is:

8.a.iii) Any Integrated Transport Assessment shall be commensurate to the scale and effect of the proposed development, and identify of any necessary mitigation measures that will be required to address any impacts on the transport network, including:

- Potential mitigation measures needed both within the proposed development and on the immediately adjacent transport network including any improvements, upgrades, alterations or extensions to the transport network (including at level crossings).
- Any mitigation required to achieve convenient and safe operation of access points for all users and safe and efficient pedestrian and cycle connections and crossings.
- Any recommendations and necessary mitigation to establish active transport connectivity and compliance with NZ Pedestrian Planning Design Guide 2022, including the consideration of the following:
 - Extensions of existing footpaths on Awakino Road where necessary.
 - The need to establish a shared path connecting the development to any existing shared path facilities.
 - Provision for pedestrian crossing facilities near new public road connections to Awakino Precinct.
- A summary of the Integrated Transport Assessment including key findings and implications that the development will have for transport including any proposed mitigation measures.
- Any development which requires new public road infrastructure to be constructed and vested to Council shall undergo a Safe System Approach Assessment.

- Any development which generates more than 70 vehicle movements within a peak hour (not daily) at the intersection of Awakino Road and State Highway 12, shall carry out a Safe System Approach Assessment of the intersection.

We trust that the preceding provides sufficient additional information as related to your requests. However, should you have any queries or require further clarification, please contact the undersigned.

Yours faithfully

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Part B Land Use: Chapter 13 Residential: Precinct 1 – Awakino Precinct

Insert new Precinct Section into Chapter 13 – between 13.9 and 13.10

PREC1 AWAKINO PRECINCT

Description of Awakino Precinct

The Awakino Precinct enables medium density residential development for a range of allotment sizes where ecological enhancement, open space and connectivity corridors are achieved. The Awakino Precinct integrates with the Residential Zone to provide for a variety of residential intensities that promote housing and living choices whilst recognising the natural features and characteristics of the area. The Residential Zone provides for traditional suburban densities and housing forms which is currently characterised by one to two storey detached residential units on larger properties setback from boundaries with landscape gardens.

Objectives	
PREC1-O1	Awakino Precinct Density
Residential living opportunities and housing choice is enabled in the Awakino Precinct whilst ecological, reverse sensitivity, and character and amenity effects are managed.	

Policies	
PREC1-P1	Awakino Precinct Subdivision
Awakino Precinct provides for a range of site sizes and densities, and subdivision layout where: <ol style="list-style-type: none">1. <u>A mixture of allotment sizes is provided that have the ability to accommodate different housing typologies.</u>2. <u>There is sufficient infrastructure to accommodate the development.</u>3. <u>The development is sympathetic to the surrounding environment and adverse effects on adjoining sites are managed, including reverse sensitivity effects.</u>4. <u>Good design of subdivision is achieved by the following:</u><ol style="list-style-type: none">a. <u>Urban blocks that respond to topography, solar orientation, prevailing winds and are flexible to deliver a range of typologies.</u>b. <u>Lots are generally shaped, sized and orientated to achieve positive sunlight access, onsite amenity, privacy and outlook, with particular regard to east – west orientation.</u>c. <u>Have a well-connected transportation network, including walking and cycling corridors.</u>d. <u>Public roads, and open space networks are well connected, legible and safe.</u>e. <u>The creation of rear lots is minimised, except where there is no practicable alternative.</u>f. <u>Integration with adjacent sites to enable future development opportunities.</u>	
PREC1-P2	Awakino Precinct Residential Amenity
To manage adverse effects on residential amenity and character by requiring residential activities to have regard to the way the development: <ol style="list-style-type: none">1. <u>Provides street activation through:</u><ol style="list-style-type: none">i. <u>Orientation of building mass towards the street;</u>ii. <u>Visual and physical connection between principle pedestrian access and the street;</u>iii. <u>Visual connection from windows overlooking the street to create passive surveillance.</u>	

Part B Land Use: Chapter 13 Residential: Precinct 1 – Awakino Precinct

	<ul style="list-style-type: none"> iv. <u>Provides landscaping and fencing treatments at the interface with the Rural Zone, natural wetland network and other open space.</u> v. <u>Relates to neighbouring properties by employing setbacks, sensitive building orientation and design, and landscaping to mitigate dominance and privacy impacts.</u> vi. <u>Provides safe and active interface to open space networks and road corridors onto which it fronts.</u> vii. <u>Design to recognise the amenity and character of the street and other buildings in the vicinity, having regard to building bulk, scale and mass.</u>
<u>PREC1-P3</u>	<u>Awakino Precinct Connectivity</u>
<p><u>Require land use and subdivision to achieve a connected, legible and safe open space, pedestrian and transport network in the Awakino Precinct by:</u></p> <ol style="list-style-type: none"> 1. <u>Forming a well-connected street network, that avoids no exit roads and cul-de-sacs, except where there is no practical alternative.</u> 2. <u>Establishing connections along and between the existing wetland features and open spaces.</u> 3. <u>Establishing a visually distinct, high amenity road (the Green Road) providing connection within the precinct that accommodates separated cycle infrastructure with restricted vehicle access along one side and connects parks, open space and the freshwater network and terrestrial habitats.</u> 4. <u>Maximising walking and cycling networks along streets, waterways and open space.</u> 	
<u>PREC1-P4</u>	<u>Awakino Precinct Ecological Values</u>
<p><u>Protect and restore the values of all natural wetland features, intermittent and permanent streams, and indigenous vegetation within the Awakino Precinct when undertaking land use and subdivision, with particular regard to:</u></p> <ol style="list-style-type: none"> 1. <u>Maintaining the interconnected network between the natural features.</u> 2. <u>Method of enhancement and permanent protection of the natural features; and</u> 3. <u>Appropriate setback of residential activities.</u> 	
<u>PREC1-P5</u>	<u>Awakino Precinct Open Space</u>
<p><u>Require subdivision within the Awakino Precinct to provide for the recreation and amenity needs of residents by:</u></p> <ol style="list-style-type: none"> 1. <u>Providing open spaces which are prominent and accessible and are of a quality and size in proportion to the future density of the neighbourhood.</u> 2. <u>Providing for pedestrian and/or cycle linkages.</u> 3. <u>Incorporate natural features, mature trees and ecological areas into the design of subdivisions through open spaces where they can contribute to recreation networks and/or maintain ecological values.</u> 	

Part B Land Use: Chapter 13 Residential: Precinct 1 – Awakino Precinct

Amendments to Chapter 13 – 13.10 Performance Standards Residential Land Use

Amended Rules				
Rule	Parameter	Residential Permitted Activity Performance Standard	Activity Status if the Activity does not meet the Performance Standard	Assessment Criteria
13.10.3a	Dwellings	<p>(1) Construction of a dwelling is a Permitted Activity if:</p> <p>a) After completion, it will be the only dwelling on the site: or</p> <p>b) It will be an additional dwelling on the site, and the minimum net site area associated with each additional dwelling is:</p> <ul style="list-style-type: none"> – 600m² for a serviced site not in an Overlay Area; or – 1,000m² for a serviced site in an Overlay Area; or – 3,000m² for an un-serviced site. <p>c) There is a separation distance of at least 3m from any other detached dwelling; and</p> <p>d) There is a separation distance of at least 6m where there is a private open space area located between two residential dwellings.</p> <p>Note 1: The demolition and/or removal of a dwelling is a Permitted Activity except where the provisions of Chapter 17: Historic Heritage apply.</p> <p>Note 2: Each dwelling is also required to be assessed against the relevant performance Standards contained in the Plan, including within Sections 13.10 and 13.13.</p> <p>Note 3: For dwellings within an Outstanding Natural Landscape, Rule 13.10.3c shall also apply.</p> <p>Note 4: There is an exemption for Rule 13.10.3 that applies to part of Lot 2 DP 73030 Cynthia Place (Baylys Beach). See Rule 13.10.29(4).</p> <p>(2) <u>Any dwelling located within a site, within the Awakino Precinct that has a road boundary shall provide:</u></p> <p>a) <u>The primary pedestrian access oriented toward a road, and</u></p> <p>b) <u>At least one habitable room with at least one clear-glazed window, at least 1m² in size which is oriented toward the road.</u></p>	Restricted Discretionary / Discretionary Activity	<p><u>Where an activity is not permitted by this Rule and is located in the Awakino Precinct, the construction of a dwelling is a Restricted Discretionary Activity if:</u></p> <p>a. <u>It will be located in the Awakino Precinct; and</u></p> <p>b. <u>It will be an additional dwelling on the site, and the minimum net site area associated with each additional dwelling is:</u></p> <ul style="list-style-type: none"> i. <u>450m² for a serviced site; or</u> ii. <u>2,500m² for an un-serviced site.</u> <p>c. <u>There is a separation distance of at least 3m from any other detached dwelling; and</u></p> <p>d. <u>There is a separation distance of at least 6m where there is a private open space area located between two residential dwellings.</u></p> <p><u>Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</u></p> <ul style="list-style-type: none"> i) <u>The privacy, outlook and amenity of adjacent and adjoining sites;</u> ii) <u>Sufficient sunlight access to the outdoor living space;</u> iii) <u>Building mass, orientation and passive surveillance of the road/street.</u> iv) <u>Bulk and scale effects;</u> v) <u>Effects on any natural features with respect to natural wetlands, water courses, and indigenous vegetation;</u> vi) <u>The extent to which the activity is consistent with the purpose, character and amenity values of the Awakino Precinct; and</u> vii) <u>The ability to accommodate incidental activities anticipated within the Awakino Precinct such as parking (if it is to be provided), manoeuvring, waste collection and landscaping.</u> <p>Where an activity is not permitted by this Rule, Council will have regard to the following matters when considering an application for Resource Consent:</p> <ul style="list-style-type: none"> i) Building location, including alternatives considered; ii) Size and shape of the site; iii) Extent of visual intrusion of the building from beyond the site, particularly from the road and public places including the Coastal Marine Area, and the effects on skylines and ridgelines; iv) The extent to which proposed landscaping is consistent with the character of the area, provides screening from adjoining public places and dwellings and is in accordance with any Council adopted Design Guidelines; v) Effects on the locality, particularly residential character and amenity values; vi) If located within an Overlay, the extent to which the values identified in the Objectives and Policies for Overlays (Chapter 4) are present on the site, and the extent to which the proposal is compatible with those values; vii) Effects on landscape and heritage; viii) The extent to which the proposal will affect the values of any Outstanding Natural Landscape identified in Map Series 2; ix) Effects on safety and efficiency of vehicles and pedestrians using the site and affected roads and

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				<p><i>private ways;</i></p> <p>x) The extent to which the activity will affect any heritage values identified in Appendix 17.1 and 17.2 of the Plan.</p> <p>Note 1: A description of the landscapes and features is provided in Appendix 18A. The values associated with Outstanding Natural Landscapes are described in the Kaipara District Landscape Technical Report (2010).</p>
<p>13.10.7</p>	<p>Setbacks</p>	<p>(1) Residential Zone</p> <p>Any building is a Permitted Activity if it is located outside the following setback distances (yards):</p> <p>a) Front yard - 5m;</p> <p>b) Side yards – one of 1.5m and one of 3m (Residential Zone), two of 3m in Overlay Areas;</p> <p>c) Rear yards - 3m except on rear sites where one yard of 1.5m may be provided;</p> <p>d) Coast - 30m from the Coastal Marine Area; and</p> <p>e) Lake / River - 30m from the banks of: any dune lake; any other lake whose bed has an area of 8ha or more; any river including a perennial stream whose bed has an average width of 3m or more;</p> <p>f) Any building is setback 30m from a railway line where there is an intersection of road and rail (level crossing controlled by giveaway signage) within 300m; and</p> <p>g) Any building is set back 300m from the intersection of the State Highway and any local road (measured from the centreline of the local road).</p> <p>Provided that an accessory building may be erected in any side or rear yard where:</p> <p>h) Vehicle access is retained to the rear of the site; and</p> <p>i) It is located at least 3m from any habitable room on an adjoining site; and</p> <p>j) It does not exceed 10m in length or 25% of the length of the side or rear yard, whichever is less.</p> <p>In addition to the above Performance Standards</p> <p>(2) Mangawhai Harbour and Kai iwi Lakes Overlays</p> <p>Any building is a Permitted Activity if it is located outside the following setback distances (yards):</p> <p>a) River – 6m from the banks of any river with an average bed width of between 1 to 3m.</p> <p>Note: For clarification, if the average bed width is less than 1m this rule does not apply and if the average is greater than 3m the Rule 13.10.7(1)(e) above applies.</p> <p>(3) Awakino Precinct</p> <p><u>Any building is a Permitted Activity if it is located outside the following setback distances (yards):</u></p> <p>a) <u>Front yard - 3m;</u></p> <p>b) <u>Side yards – 1.5m;</u></p> <p>c) <u>Rear yards - 1.5m;</u></p> <p>d) <u>Wetlands and Rivers– 10m setback from any natural wetland; and river including a perennial stream;</u></p> <p>e) <u>Rural Zone – 3m.</u></p> <p><u>Provided that an accessory building may be erected in any side or rear yard where:</u></p> <p>f) <u>Vehicle access is retained to the rear of the site; and</u></p> <p>g) <u>It is located at least 3m from any habitable room on an adjoining site; and</u></p> <p>h) <u>It does not exceed 10m in length or 25% of the length of the side or rear yard, whichever is less.</u></p> <p>Note 1: The Regional Water and Soil Plan for Northland also requires setbacks from waterways and the coast for excavation activities. Applicants should contact the Northland Regional Council to confirm whether or not Resource Consent is required.</p>	<p>Restricted Discretionary Activity</p>	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <p>i) The outlook and privacy of adjacent and adjoining neighbours;</p> <p>ii) Extent of visual intrusion and dominance of any buildings from beyond the site, particularly from the road and public places including the Coastal Marine Area, and the effect on skylines and ridgelines;</p> <p>iii) If in the Mangawhai Structure Plan Area, whether the proposed landscaping is in accordance with the design principles of the Mangawhai Structure Plan (pages 46 - 49) for Policy Area Three;</p> <p>iv) Effects on the locality, particularly residential and natural character and amenity values;</p> <p>v) If located within an Overlay, the extent to which the values identified in the Objectives and Policies for Overlays (Chapter 4) are present on the site, and the extent to which the proposal is compatible with those values;</p> <p>vi) The extent to which the proposal will affect the values of any Outstanding Natural Landscape identified in Map Series 2 and if applicable the extent to which the subdivision, use or development meets the additional assessment criteria contained in Appendix 18B;</p> <p>vii) Effects on ecological values and in particular any sites of ecological significance as defined by the criteria listed in Appendix 25G;</p> <p>viii) Effects on public access;</p> <p>ix) Effects on natural hazards, including the design and construction of hazard protection works on land adjacent to the Coastal Marine Area, rivers and lakes;</p> <p>x) Protection of the conservation, ecological, recreation, access and hazard mitigation values of esplanade reserves or strips;</p> <p>xi) Where buildings are located in close proximity to State Highways or Rail (level crossings) whether and the extent to which consultation has been undertaken with NZ Transport Agency and New Zealand Railways Corporation respectively and written approval obtained; and</p> <p>xii) The functional requirements of the building and activity.</p> <p>Note 1: A description of the landscape features is provided in Appendix 18A. The values associated with the Outstanding Natural Landscapes are described in the Kaipara District Landscape Technical Report (2010).</p>

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		<p>Note 2: The 300m radius referred to in relation to State Highways shall be measured from the position where the centreline of the road joins the State Highway.</p> <p>Note 3: Any changes in land use on sites that have access onto Limited Access Road's require approval from the NZ Transport Agency under the Government Roothing Powers Act 1989.</p>		
13.10.7a	Fence and Landscaping	<p>(1) Awakino Precinct</p> <p>a) <u>Any fence is a permitted activity where:</u></p> <p>i. <u>The fence is adjacent to any road boundary and has a maximum height of 1.2m;</u> <u>or</u></p> <p>ii. <u>The fence is adjacent to any neighbourhood park or wetland enhancement area and has a maximum height of 1.5m and is 50% visually permeable.</u></p> <p>b) <u>Any building or dwelling is a permitted activity where:</u></p> <p>i. <u>The site is adjacent to the green street identified on the Awkaino Precinct Plan and 60% of the site frontage shall be vegetated to a minimum depth of .5m and a maximum height of 1.2m.</u></p>	Restricted Discretionary Activity	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <p>i. <u>The extent to which the fencing and landscaping visually connects the private front yards to the wider green street.</u></p> <p>ii. <u>The extent to which privacy is provided for residential units, while enabling opportunities for passive surveillance of public places.</u></p> <p>iii. <u>The extent to which shading and visual dominance effects to immediate neighbours and the street are minimised.</u></p> <p>iv. <u>Health and safety effects.</u></p>
13.10.11	Private Open Space	<p>(1) Residential Zone</p> <p>A dwelling is a Permitted Activity if the private open space meets the following:</p> <p>a) Is equivalent to 50% of the gross floor area of the dwelling;</p> <p>b) Is of a usable shape of no less than 3m dimension, capable of accommodating one circle of no less than 5m in diameter;</p> <p>c) Is located on the east, north or west side of the dwelling;</p> <p>d) Has direct access from the main living area of the dwelling;</p> <p>e) Is unobstructed by vehicle access or parking areas; and</p> <p>f) Is adequately screened from adjoining dwellings and adjacent sites, except in the case of reserves.</p> <p>(2) Awakino Precinct</p> <p>A dwelling is a Permitted Activity if the private open space meets the following:</p> <p>a) <u>Is at least 20m² or equivalent to 25% of the gross floor area of the dwelling;</u></p> <p>b) <u>Has a minimum dimension of 4m;</u></p> <p>c) <u>Is located on the east, north or west side of the dwelling;</u></p> <p>d) <u>Has direct access from the main living area of the dwelling; and</u></p> <p>e) <u>Is unobstructed by vehicle access or parking areas.</u></p>	Restricted Discretionary Activity	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <p>i) The on-site privacy and amenity of the occupants;</p> <p>ii) The open space nature of the surrounding neighbourhood; and</p> <p>iii) The extent to which the proposal will affect the values of any Outstanding Natural Landscape identified in Map Series 2 and if applicable the extent to which the subdivision, use or development meets the additional assessment criteria contained in Appendix 18B.</p> <p>Note 1: A description of the landscape features is provided in Appendix 18A. The values associated with the Outstanding Natural Landscapes are described in the Kaipara District Landscape Technical Report (2010).</p>
13.10.12	Permeable Surfaces	<p>(1) Residential Zone</p> <p>Any activity is a Permitted Activity if:</p> <p>a) The area of any site covered by buildings and other impermeable surfaces is less than 40% of the net site area.</p> <p>(2) Awakino Precinct</p> <p>Any activity is a Permitted Activity if:</p> <p>a) <u>The area of any site covered by buildings and other impermeable surfaces is less than 60% of the net site area; and</u></p> <p>b) <u>All stormwater management for the site shall comply with any stormwater management plan approved under rule 13.13b and performance standard 13.14.5 Stormwater Disposal.</u></p> <p>Note 1: For the purposes of this Rule, any area regularly used by vehicles whether metalled, sealed or concreted shall be considered an impermeable surface.</p>	Restricted Discretionary Activity	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <p>i) Control of stormwater run-off;</p> <p>ii) The effects of increased stormwater flows downstream;</p> <p>iii) Methods of attenuating stormwater flows to pre-development rates,</p> <p>iv) Whether and the extent to which the activity meets the relevant Performance Standards or the Kaipara District Council Engineering Standards 2011;</p> <p>v) Effects on water quality; and</p> <p>vi) The extent to which low impact design principles are utilised.</p> <p>vi) <u>Within the Awakino Precinct, whether the proposal utilises low impact and/or water sensitive stormwater management devices and designs, outfalls that mitigate concentrated flows and detail of any obligations for lot owners to construct and maintain such devices.</u></p> <p>vi) <u>Within the Awakino Precinct, the extent to which stormwater quality treatment has been provided to protect the environment from contaminants generated from the activity including whether the proposal includes appropriate stormwater quality monitoring associated with the design and construction stages</u></p>

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				<p><u>as well as the consent holder's maintenance obligations.</u></p> <p>(3) Awakino Precinct Information Requirement: <u>Any application shall be supported by a detailed stormwater assessment report prepared by a suitably qualified engineer to confirm that the proposal will achieve the following:</u></p> <ul style="list-style-type: none"> i) <u>Treatment of the Water Quality Volume (WQV) or Water Quality Flow (WQF) from all contaminant generating impermeable surfaces by a water quality device for the relevant contaminants.</u> ii) <u>Retention (volume reduction) of a minimum of 5mm runoff depth for all impermeable surfaces.</u> iii) <u>Detention (temporary storage) with a drain down period of 24 hours for the difference between the pre-development (grassed state) and post-development runoff volumes from the 1/3 of the 2 Year ARI, 24-hour rainfall event minus any retention volume provided for all impermeable surfaces.</u> iv) <u>Conveyance and discharge of primary and secondary flow in accordance with the Kaipara District Council Engineering Standards 2011.</u> <p>Note 1: <u>Within the Awakino Precinct, 1/3 of the 2 Year ARI rainfall event runoff volume is to be used as the Water Quality Volume (WQV) when designing a treatment device, and 10mm/hour is to be used as the Water Quality Flow (WQF).</u></p> <p>Note 2: <u>Within the Awakino Precinct, good management practice for stormwater management is equivalent to those set out in the guideline document, Stormwater Management Devices in the Auckland Region (GD01).</u></p>
13.10.13	Building Coverage	<p>(1) Residential Zone Any activity is a Permitted Activity if:</p> <ul style="list-style-type: none"> a) Building coverage on a site is less than 35% of the net site area. <p>(2) Awakino Precinct <u>Any activity is a Permitted Activity if:</u></p> <ul style="list-style-type: none"> a) <u>Building coverage on a site is less than 45% of the net site area.</u> <p>Note 1: For clarity, for sites within an Outstanding Natural Landscape, Rule 13.10.3c shall also apply</p>	Restricted Discretionary Activity	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <ul style="list-style-type: none"> i) The scale and bulk of the building in relation to the site; ii) The existing built character of the surrounding neighbourhood; iii) Effect on the open space nature of the surrounding neighbourhood; iv) The availability of useable on-site outdoor living space; and v) The extent to which the proposal will affect the values of any Outstanding Natural Landscape identified in Map Series 2 and if applicable the extent to which the subdivision, use or development meets the additional assessment criteria contained in Appendix 18B. <p>Note 1: A description of the landscape features is provided in Appendix 18A. The values associated with the Outstanding Natural Landscapes are described in the Kaipara District Landscape Technical Report (2010).</p>

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<p>13.10.25</p>	<p>Vehicle Access and Driveways</p>	<p>a) Residential Zone Any activity is permitted if:</p> <p>b) The owner or occupier of each site shall provide and maintain at all times adequate access for emergency vehicles and vehicles generally associated with activities on site;</p> <p>c) For new vehicle crossings on to State Highways, all NZ Transport Agency engineering requirements have been satisfied; or for vehicle crossings on to roads controlled by the Kaipara District Council, all Council engineering requirements have been satisfied (e.g. Kaipara District Council Engineering Standards 2011);</p> <p>d) Where a loading ramp is required it shall not be located within 25m of the edge of a traffic lane; and</p> <p>e) Each site shall be provided with and maintain a driveway to the following Standard:</p> <ul style="list-style-type: none"> i) Formed with an all-weather surface; ii) For driveways of greater than 100m, a passing bay shall be provided no further apart than 1 per 100m; iii) For an accessway or driveway servicing up to 6 dwellings the minimum width of 3.0m and for between 7 and 30 dwellings a minimum width of 5.5m and for more than 30 dwellings a width of 6m; iv) The maximum gradient shall be 1:5 for sealed and 1:8 for gravel driveway; v) Shall include internal manoeuvring area sufficient that vehicles using the driveway do not need to reverse onto a road or shared driveway (in accordance with 90th percentile vehicle manoeuvring figures in Appendix 25C: Parking, Loading and Manoeuvring Standard); vi) Access and manoeuvring areas shall comply with the New Zealand Building Code acceptable solutions C/AS1 Part 8.1 (Fire Service Vehicular Access 2010); vii) Where a private driveway is gated, the gates shall be located at least 13m from the edge of the public road carriageway (with an 80 or 100km/h speed limit) where the gate opens into the site or 13m plus the gate width where it opens towards the road; unless onto a State Highway (where gate setbacks may be higher and are required to be complied with); viii) All gated accesses shall be provided with turning provisions, such that a 90th percentile car may enter the driveway and turn around, without passing the gates or affecting through traffic on the public road; ix) Stormwater drainage for at least a 10% AEP rainfall event sufficient that surface ponding does not occur and discharge from the driveway does not result in adverse effects to adjoining properties or roads; and <p>f) The site is not within an Outstanding Natural Landscape, as identified in Map Series 2, unless the work is necessary for the maintenance of existing accesses or firebreaks.</p> <p>g) Awakino Precinct <u>Any activity is permitted if:</u></p> <p>h) If it meets the standards in 13.10.25.1 (a) and (c):</p> <ul style="list-style-type: none"> i) <u>New vehicle crossings on to roads controlled by the Kaipara District Council shall be designed, constructed and located in accordance with the Kaipara District Council Engineering Standards 2011, except as it relates to 5.2.10.d and 5.2.10.e, the following shall be met:</u> <ul style="list-style-type: none"> i) <u>No vehicle crossing shall be situated within 10m of any road intersection (as measured from the meeting point of the main kerb alignments).</u> ii) <u>The minimum spacing between vehicle crossings on the same side of any road shall be 2m.</u> iii) <u>No more than one vehicle crossing is provided to each lot, except where a vehicle crossing is a double width crossing and serves more than one site, in which case the vehicle crossing width shall be a maximum of 7m.</u> <p>j) Each site shall be provided with and maintain a driveway to the following Standard:</p>	<p>Restricted Discretionary Activity</p>	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <ul style="list-style-type: none"> i) Whether and the extent to which the vehicle access and driveway meets the Performance Standards in Rule 13.10.25 or the Kaipara District Council Engineering Standards 2011; ii) The provision of safe, practical access for all persons and vehicles likely to need access to the site, including pedestrian, cycle, disabled, vehicular; iii) The expected vehicle operating speeds and methods of controlling vehicle speeds; iv) The ease of access to and from, and within the site; v) Adequacy of sight distances at the vehicle crossing and along the access; vi) Possible measures or restrictions on vehicle movements in and out of the access; vii) Possible adverse effects on Council infrastructure or adjoining properties; viii) The provision made to mitigate the effects of stormwater runoff, and any impact of roading and access on waterways, ecosystems, drainage patterns or the amenities on adjoining properties; ix) Any traffic safety or congestion problems in the area; x) Any foreseeable future changes in traffic patterns in the area; xi) If a new access is being provided or modification of an existing access onto a State Highway, or on sites that have access over a railway line, whether the consent of the NZ Transport Agency or New Zealand Railways Corporation is obtained; xii) Whether and the extent to which the design of vehicle accesses and driveways meets the requirements of the NZ Building Code acceptable solutions C/AS1 Part 8.1 (Fire Service Vehicular Access); and xiii) The extent to which the proposal will affect the values of any Outstanding Natural Landscape identified in Map Series 2 and if applicable the extent to which the subdivision, use or development meets the additional assessment criteria contained in Appendix 18B. <p>Note 1: A description of the landscape features is provided in Appendix 18A. The values associated with the Outstanding Natural Landscapes are described in the Kaipara District Landscape Technical Report (2010).</p>
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		<ul style="list-style-type: none">i) <u>Formed with a sealed all-weather surface.</u>ii) <u>For an accessway or driveway servicing up to 6 dwellings the minimum width of 3.0m and for between 7 and 30 dwellings a minimum width of 5.5m and for more than 30 dwellings a width of 6m.</u>iii) <u>Shall include internal manoeuvring area sufficient that vehicles using the driveway do not need to reverse onto a road or shared where the access is located within 10m of an intersection road boundary.</u>iv) <u>Shall serve no more than four parking spaces, should vehicles be required to reverse from a site.</u> <p>Note 1: Any changes in land use on sites that have access over a railway line require approval from the New Zealand railways Corporation under the New Zealand Railways Corporation Act 1981.</p> <p>Note 2: Where land adjoins a limited access road under the Government Roding Powers Act 1989 access to and from that road is subject to restrictions and controlled by the NZ Transport Agency.</p> <p>Note 3: Council will confirm engineering approval for Council controlled roads, as per clause <u>13.10.25.1</u> (b) above, of the vehicle access and driveways by compliance with the Kaipara District Council Engineering Standards 2011 or by review from an independent appropriately qualified engineer.</p>		
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<p>13.10.27</p>	<p>Parking</p>	<p>Any activity is permitted if:</p> <ul style="list-style-type: none"> a) The owner or occupier of each site provides and maintains at all times spaces for the off street parking of cars and other vehicles generally associated with activities on the site; b) The number of parking spaces to be provided shall meet the minimum requirements outlined in Appendix 25C: Parking, Loading and Manoeuvring Standards; and c) Each parking space shall be formed and maintained so that the maximum gradient on any area used for parking and manoeuvring shall be 6%; and d) Parking spaces may be situated within a building provided the Council is satisfied that the spaces can be clearly defined and made available for parking at all times. The area of any parking spaces and associated access within a building shall be excluded from the gross floor area of that building for the purposes of assessing the total number of spaces required; and e) Any parking spaces required under the provisions of the District Plan are to be sited at least 15m from the banks of any river or stream, whose bed has an average width of 3m or more, any lake with an area greater than 8ha or the Coastal Marine Area or any mapped waterway or wetland in the Valued Natural Environments of Mangawhai, except where appropriate provision is made for the collection treatment and disposal of stormwater from the areas to a Council stormwater system or other approved outlet; and f) Each parking space shall have adequate physical access to a road, street or service lane and the buildings or uses to which it is intended to serve. It shall be provided with such access drives and aisles as are necessary for safe and convenient movement of vehicles to and from the street or service lane for the manoeuvring of vehicles within the site in accordance with the Figures in Appendix 25C: Parking, Loading and Manoeuvring; and g) Control of Access - Any parking area associated with a Commercial or Industrial Activity which adjoins a street shall be provided with a fence, kerb, nib or similar non-mountable barrier not less than 0.15m high along those parts of the site's frontage not used for access purposes. The barrier shall be designed to prevent vehicles entering or leaving the parking area other than by the access drives or aisles provided; and h) Control of Reversing - All parking areas shall be designed so that all vehicles can enter and leave the site in a forward gear and do not have to reverse onto or off the adjacent road or street, <u>except as provided in the Awakino Precinct by 13.10.25.2</u>; and i) Screening of Parking Areas - Any parking associated with a Commercial or Industrial activity shall be screened from residential sites by appropriate landscaping, fencing or other suitable screening of at least 1.8m in height. Any landscaping is to be provided and maintained in such a manner as to create and preserve a good standard of visual amenity; and j) Control of Stormwater - Each parking area shall be provided with a stormwater drainage system that is designed for at least a 10% AEP rainfall event sufficient that surface ponding does not occur and discharge does not result in adverse effects to adjoining properties or roads. 	<p>Restricted Discretionary Activity</p>	<p>Where an activity is not permitted by this Rule, Council has restricted its discretion over the following matters when considering and determining an application for Resource Consent:</p> <ul style="list-style-type: none"> i) The nature of street or service lane access available to the proposed parking and/or loading facilities; ii) The provision which can be made for parking and/or loading facilities for the proposed land use on an adjacent site; iii) The adequacy of public parking and/or loading facilities in the immediate vicinity of the site; iv) The nature of any special landscaping or pedestrian design features to be developed on the site; v) The hours of operation of the proposed use and number of employees on shift work if a Commercial activity is proposed in a Residential Zone; vi) The size and number of vehicles expected to use the site; vii) Whether and the extent to which the proposed parking area is designed, constructed and adequately drained in accordance with the Performance Standards in Rule 13.10.28 or the the Kaipara District Council Engineering Standards 2011; and viii) The extent to which the proposal will affect the values of any Outstanding Natural Landscape identified in Map Series 2 and if applicable the extent to which the subdivision, use or development meets the additional assessment criteria contained in Appendix 18B. <p>In granting any application the Council may require as a Condition of Consent either that:</p> <ul style="list-style-type: none"> i) The parking and/or loading spaces required be provided on other available sites in the immediate neighbourhood; or ii) A cash contribution is paid to the Council for the purchase of land and/or the construction of suitable parking and/or loading facilities. <p>Note 1: Any cash contribution required by the Council shall not exceed the value of a sufficient part of the site or building to accommodate the vehicles for which provision is required, and the associated cost of their construction.</p> <p>Note 2: A description of the landscape features is provided in Appendix 18A. The values associated with the Outstanding Natural Landscapes are described in the Kaipara District Landscape Technical Report (2010).</p>
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Amendments to Chapter 13 – 13.13 Performance Standards for All Residential Subdivision

Rule	Parameter	Terms for Subdivision	Matters for Discretion
13.13A	Awakino Precinct Subdivision	<p><u>General Rules:</u></p> <ol style="list-style-type: none"> 1. <u>Any subdivision within the Awakino Precinct:</u> 2. <u>Is not subject to Residential Zone rules 13.11.1 – 3, 13.12.1, 13.13.1 and 2.</u> 3. <u>Is subject to rules 13.13A.</u> 4. <u>Complies with the relevant Performance Standards in Section 13.10 and 13.14 of this Chapter.</u> 5. <u>Any subdivision within the Awakino Precinct is a Restricted Discretionary Activity where it complies with rules 8 – 13.</u> 6. <u>Any subdivision within the Awakino Precinct is a Discretionary Activity where it does not comply with rules 5 – 13.</u> 7. <u>Any subdivision within the Awakino Precinct shall comply with information requirements in rule 14.</u> <p><u>Subdivision Design Rules:</u></p> <ol style="list-style-type: none"> 8. <u>Every allotment has:</u> <ol style="list-style-type: none"> a) <u>A minimum net site area of 450m² and an average net site area of 600m² where a connection to public reticulated wastewater infrastructure is available, or a private wastewater system is proposed to be established to serve all proposed allotments; or</u> b) <u>A minimum net site area of 2,500m² and an average net site area 3,000m² where a connection to reticulated wastewater infrastructure is not available.</u> c) <u>Every urban block has:</u> <ol style="list-style-type: none"> i) <u>A maximum length of 250m.</u> ii) <u>A maximum perimeter (bounded by roads) of 750m.</u> <p><u>Open Space Rules:</u></p> <ol style="list-style-type: none"> 9. <u>Any subdivision within the Awakino Precinct, where the site contains an indicative neighbourhood park shown on the Awakino Precinct Map 1 shall:</u> <ol style="list-style-type: none"> a) <u>Provide, legally establish and manage on an on-going basis as part of the subdivision, a neighbourhood park that shall:</u> <ol style="list-style-type: none"> i. <u>Be no less than 300m² in net site area for the provision of a children's play area.</u> ii. <u>Be located in general accordance with the indicative neighbourhood park shown on the Awakino Precinct Map 1.</u> iii. <u>Include flat open spaces suitable for a range of informal recreational.</u> b) <u>Except where a neighbourhood park has been legally established within the Awakino Precinct.</u> <p><u>Road Layout Rules:</u></p> <ol style="list-style-type: none"> 10. <u>Any subdivision within the Awakino Precinct shall construct and establish a loop road, (to vest as public road) located in general accordance with the indicative loop road shown on the Awakino Precinct Map 1; or</u> 11. <u>Where the full extent of the indicative loop road shown on the Awakino Precinct Map 1 is not provided, any subdivision within the Awakino Precinct shall:</u> <ol style="list-style-type: none"> a) <u>Construct and establish any part of the indicative loop road within the site boundary in general accordance with the indicative loop road shown on the Awakino Precinct Map 1; and</u> 	<p><u>Council will restrict its discretionary over the following matters when considering and determining an application for Resource Consent:</u></p> <ol style="list-style-type: none"> (1) <u>The extent to which the proposal is consistent with the Awakino Precinct policies.</u> (2) <u>The extent to which the proposal is generally in accordance with the Awakino Precinct Map 1.</u> (3) <u>Measures to ensure the protection, restoration or enhancement of any natural features, including (but not limited to) the creation, extension or upgrading of services and systems, planting or replanting, the protection of natural wetlands and streams or any other works or services necessary to ensure the avoidance, remediation or mitigation of adverse environmental effects.</u> (4) <u>The design, size, shape, gradient and location of any allotment, urban block or public road.</u> (5) <u>Where any subdivision involves an identified natural wetland or stream, whether the details of ecological protection and enhancement have been provided, including 10m riparian planting to streams and wetlands, weed and pest management controls and indigenous revegetation (where appropriate), are provided and any required mechanisms for ownership and maintenance of the area. For the avoidance of doubt these areas may form parts of private lots and be held in private ownership.</u> (6) <u>Whether the proposal utilises low impact and/or water sensitive stormwater management devices and designs, outfalls that mitigate concentrated flows and detail of any obligations for lot owners to construct and maintain such devices.</u> (7) <u>The extent to which stormwater quality treatment has been provided to protect the environment from contaminants generated from the activity including whether the proposal includes appropriate stormwater quality monitoring associated with the design and construction stages as well as the consent holder's maintenance obligations.</u> (8) <u>The extent to which adequate access is provided to each lot.</u> (9) <u>The extent to which the proposal provides connections to transport networks including walking and cycling and roading function and design, including parking.</u> (10) <u>The location of vehicle crossings, private access ways and proposed allotment boundaries so as to avoid no exit roads and cul-de-sacs.</u> (11) <u>The nature of proposed street frontage in terms of securing effective, safe access onto a legal road.</u> (12) <u>Where staged subdivision is proposed, whether all necessary infrastructure, roading, utilities, public spaces and connections to service the proposed development will be established.</u> (13) <u>Where common lots are proposed, the extent to which appropriate mechanisms are provided to ensure that all infrastructure management and maintenance requirements are sustainable.</u> (14) <u>Where there are any communally owned or managed services, infrastructure or other such assets or joint responsibilities arising from any proposal; that the nature of arrangements which are proposed ensure the on-going implementation of such arrangements whether through body corporate or similar mechanisms.</u> (15) <u>Location of existing buildings, access and manoeuvring, and private open space.</u> (16) <u>The location of proposed allotment boundaries and building areas so as to avoid potential conflicts between incompatible land use activities, including reverse sensitivity effects.</u> (17) <u>The provision, location, design, capacity, connection, upgrading, staging and integration of infrastructure, and how any adverse effects on existing infrastructure are managed.</u> (18) <u>The protection of land within the proposed allotments to allow access and linkages to adjacent allotments for future infrastructure.</u> (19) <u>Avoidance or mitigation of natural or man-made hazards.</u> (20) <u>The extent to which the subdivision avoids adverse effects on significant flora and fauna habitats, including methods of weed and pest management.</u> (21) <u>The safe and efficient movement of people and vehicles including traffic manoeuvring, pedestrians and cyclists, and the potential effects on the accessibility and safety of transport networks.</u> (22) <u>Whether the subdivision creates lots adjoining public open space (including recreation reserves and riparian/green corridors) that are designed to encourage passive surveillance of reserve areas having regard to finished contours, retaining, fencing and landscaping.</u> (23) <u>Whether parks will be accessible to pedestrians and cyclists and located to integrate with riparian margins and the Green Road where possible.</u>

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		<p>b) <u>Provide a minimum of two public road intersections with Awakino Road where those intersections are connected internally within the Awakino Precinct via a public road.</u></p> <p>12. <u>Any subdivision within the Awakino Precinct shall construct and establish a green street (to vest as public road) located in general accordance with the indicative green street shown on the Awakino Precinct Map 1, where:</u></p> <p>a) <u>A minimum of 8 locally eco-sourced indigenous trees, of a minimum planter bag size of 160L shall be planted on each side (16 in total) of the green street within the road reserve; and</u></p> <p>b) <u>A cycleway and footpath shall be established to connect to any neighbourhood park.</u></p> <p><u>Ecological Enhancement Rules:</u></p> <p>13. <u>Any subdivision within the Awakino Precinct where the site contains an indicative ecological feature shown on the Awakino Precinct Map 1 shall:</u></p> <p>a) <u>Legally protect in perpetuity and manage on an on-going basis the ecological feature in accordance with an Ecological Enhancement and Management Plan.</u></p> <p><u>Information Requirement:</u></p> <p>14. <u>When Rules 7, 8 and 10 apply the following information requirements shall be met:</u></p> <p>a) <u>Transport:</u></p> <p>i) <u>The road layout is supported by an Integrated Transport Assessment and an Urban Design Assessment.</u></p> <p>ii) <u>The green street layout indigenous planting shall be supported by a street tree planting plan.</u></p> <p>iii) <u>Any Integrated Transport Assessment shall be commensurate to the scale and effect of the proposed development, and identify of any necessary mitigation measures that will be required to address any impacts on the transport network, including:</u></p> <ul style="list-style-type: none"> • <u>Potential mitigation measures needed both within the proposed development and on the immediately adjacent transport network including any improvements, upgrades, alterations or extensions to the transport network (including at level crossings).</u> • <u>Any mitigation required to achieve convenient and safe operation of access points for all users and safe and efficient pedestrian and cycle connections and crossings.</u> • <u>Any recommendations and necessary mitigation to establish active transport connectivity and compliance with NZ Pedestrian Planning Design Guide 2022, including the consideration of the following:</u> <ul style="list-style-type: none"> ○ <u>Extensions of existing footpaths on Awakino Road where necessary.</u> ○ <u>The need to establish a shared path connecting the development to any existing shared path facilities.</u> ○ <u>Provision for pedestrian crossing facilities near new public road connections to Awakino Precinct.</u> • <u>A summary of the Integrated Transport Assessment including key findings and implications that the development will have for transport including any proposed mitigation measures.</u> • <u>Any development which requires new public road infrastructure to be constructed and vested to Council shall undergo a Safe System Approach Assessment.</u> • <u>Any development which generates more than 70 vehicle movements within a peak hour (not daily) at the intersection of Awakino Road and State Highway 12, shall carry out a Safe System Approach Assessment of the intersection.</u> <p>b) <u>Open Space:</u></p>	<p>(24) <u>The extent to which a green street is created, providing a connection between open space, parks in a manner that provides ecological benefit, encourages cycle and pedestrian movement between areas of open spaces.</u></p>
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		<p>i) <u>The neighbourhood park shall be supported by a plan confirming the park suitably located, sized and provides for a range of recreational opportunities.</u></p> <p>c) <u>Ecological Enhancement:</u></p> <p>i) <u>An Ecological and Wetland Assessment and Ecological Management Plan shall be prepared to ensure that existing natural features and ecological values on site are appropriately enhanced as a part of site development.</u></p> <p>15. <u>Earthworks – Details of any excavation and fill associated with the subdivision, including erosion and sediment control measures in accordance with best practice.</u></p> <p><u>Note 1: Within the Awakino Precinct, good management practice for erosion and sediment control measures is equivalent to those set out in the guideline document, 2016/05 Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region. Incorporating amendment 2, 2020.</u></p>	
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Amendments to Chapter 13 – 13.14 Performance Standards for All Residential Subdivision

Rule	Parameter	Residential Permitted Activity Performance Standard	Activity Status if the Activity does not meet the Performance Standard	Assessment Criteria
13.14.2	Road, Private Way and Property Access	<p>The design and layout of the subdivision provides for, and takes into account:</p> <p>(1) Property Access</p> <ul style="list-style-type: none"> a) Every allotment within the subdivision is capable of having vehicular access to a road; b) Property access is formed where it is shared by two or more allotments; c) Vehicle access and driveways comply with Rule 13.10.25; d) No more than seven allotments are served by a private shared access; e) Driveways onto the road or private ways are located in a manner that will allow for the safe entry and exit from the site based on expected vehicle operating speeds and methods for controlling vehicle speeds; f) Driveways onto the road or private ways are located to provide adequate sight distances for the safe functioning of the vehicle crossing and access; g) The property access is of a suitable width to contain required services.; and h) For new vehicle crossings on to State Highways, all NZ Transport Agency engineering requirements have been satisfied. <p>Note 1: Any changes in land use, development or subdivision on sites that have access over a railway line require approval from the New Zealand Railways Corporation under the New Zealand Railways Corporation Act 1981.</p> <p>(2) Road, Private Way, Cycle Way and Property Access Formation</p> <ul style="list-style-type: none"> a) Road vesting in accordance with the following requirements, <u>excluding sites within the Awakino Precinct</u>: <ul style="list-style-type: none"> – Driveways serving eight or more allotments shall be by public road vested with Council; – Design and construction shall be to the satisfaction of Council's Asset Manager (in accordance with the Standards in Kaipara District Council Engineering Standards 2011); and – A cul-de-sac shall be provided at the end of any no-exit public road. b) Use and construction of unformed legal roads is to the satisfaction of Council's Asset Manager (in accordance with the Standards in Kaipara District Council Engineering Standards 2011), <u>excluding sites within the Awakino Precinct</u>. <p>(3) Awakino Precinct Road, Private way, Cycle Way and Property Access Formation</p> <ul style="list-style-type: none"> a) <u>Road vesting in accordance with the following requirements:</u> <ul style="list-style-type: none"> i) <u>Driveways serving either 8 or more allotments shall be by public road vested with Council;</u> ii) <u>Roads and Private Ways shall be designed and constructed in accordance with the Kaipara District Council Engineering Standards 2011, except as they relate to the following:</u> <ul style="list-style-type: none"> – <u>The legal and construction widths as detailed in Table 5.1 of the Kaipara District Council Engineering Standards 2011 do not apply. Legal and construction widths shall meet Table 13.1.</u> – <u>On-street car parking detailed in 5.2.10.d of the Kaipara District Council Engineering Standards 2011. On-street parking shall be provided at a rate of 1 per 4 dwellings.</u> 	Discretionary Activity	<p>Council will have regard to the following matters when considering an application for Resource Consent under this Rule</p> <ul style="list-style-type: none"> i) Whether and the extent to which the road or private way follows the alignment of indicative roads; ii) Whether and the extent to which there is a need for forming or upgrading roads in the vicinity, due to increased traffic from the subdivision; iii) Whether and the extent to which there is a the need for traffic control measures on the roads due to increased traffic from the subdivision; iv) Whether and the extent to which there is a the need for footpaths; v) Whether and the extent to which there is a need for stormwater management associated with the provision of the new road or private way; vi) Whether an adequate alternative access is able to be provided for the anticipated use; vii) Whether the access can contain required services; viii) The expected vehicle operating speeds and methods for controlling vehicle speeds; ix) Adequacy of sight distances available at the vehicle crossing and along the access; x) Possible measures or restrictions on vehicle movements in and out of the access; xi) Possible adverse effects on Council infrastructure on adjoining properties; xii) Any foreseeable future changes in traffic patterns in the area (including future congestion); xiii) The provision made to mitigate the effects of stormwater runoff and any impact on roading and access on waterways, ecosystems, drainage patterns or the amenities of adjoining properties; xiv) Whether and the extent to which the road, private way or property access complies with the Kaipara District Council Engineering Standards 2011 or has been confirmed as appropriate by Council's Engineer.; and xv) Where a new access is being provided or an existing access onto a State Highway modified, or on sites that have access over a railway line, whether the consent of the NZ Transport Agency and/or New Zealand Railways Corporation is obtained; xvi) <u>Within the Awakino Precinct, the safe and efficient movement of people and vehicles including traffic manoeuvring, pedestrians and cyclists, and the potential effects on the accessibility and safety of transport networks.</u> xvii) <u>Within the Awakino Precinct, whether the subdivision creates lots adjoining public open space (including recreation reserves and riparian/green corridors) that are designed to encourage passive surveillance of reserve areas having regard to finished contours, retaining, fencing and landscaping.</u> xviii) <u>Within the Awakino Precinct, whether parks will be accessible to pedestrians and cyclists and located to integrate with riparian margins and the Green Road where possible.</u> xix) <u>Within the Awakino Precinct, the extent to which a green street is created, providing a connection between open space, parks in a manner that provides ecological benefit, encourages cycle and pedestrian movement between areas of open spaces.</u> <p>Note 1: General assessment of the Kaipara District Council Engineering Standards 2011 is undertaken as part of the assessment of the Subdivision Resource Consent application and conditions relating to compliance with any of these Standards may be applied to the consent as part of the engineering approval.</p>

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<p>13.14.5</p>	<p>Stormwater Disposal</p>	<p>(1) Where available all allotments are provided, within their net site area, with:</p> <p>a) A connection to a Council-maintained stormwater system, <u>excluding sites within the Awakino Precinct</u>; or</p> <p>(2) Where no Council system is available:</p> <p>a) All allotments are provided with the means for the transport and disposal of collected stormwater from the roof of all potential or existing buildings and from all impervious surfaces, in such a way as to avoid any adverse effects of stormwater runoff on the receiving environment in accordance with the Kaipara District Council Engineering Standards 2011, <u>excluding sites within the Awakino Precinct</u>.</p> <p>(3) Awakino Precinct Stormwater Management</p> <p>a) <u>All allotments are provided with the means for the transport and disposal of collected stormwater from the roof of all potential or existing buildings and from all impervious surface, in such a way as to mitigate any adverse effects of stormwater runoff on the receiving environment by providing:</u></p> <p>i) <u>Treatment of the Water Quality Volume (WQV) or Water Quality Flow (WQF) from all contaminant generating impermeable surfaces by a water quality device for the relevant contaminants.</u></p> <p>ii) <u>Retention (volume reduction) of a minimum of 5mm runoff depth for all impermeable surfaces.</u></p> <p>iii) <u>Detention (temporary storage) with a drain down period of 24 hours for the difference between the pre-development (grassed state) and post-development runoff volumes from the 1/3 of the 2 Year ARI, 24-hour rainfall event with climate change minus any retention volume provided for all impermeable surfaces.</u></p> <p>iv) <u>Conveyance and discharge of primary and secondary flow in accordance with the Kaipara District Council Engineering Standards 2011.</u></p> <p>Note 1: Stormwater discharges may require Resource Consent under the Regional Water and Soil Plan for Northland. Applicants should contact the Northland Regional Council to determine whether or not a Resource Consent is required.</p> <p>Note 2: Where parallel Resource Consent for stormwater discharge is required from the Northland Regional Council, Kaipara District Council will seek to undertake joint processing of both applications, via delegated authority from the Northland Regional Council.</p> <p>Note 3: The discharge of stormwater into the rail corridor is an offence under the Railways Act 2005 unless the written consent of the New Zealand Railways Corporation has been provided.</p> <p><u>Note 1: Within the Awakino Precinct, 1/3 of the 2 Year ARI 24hr rainfall depth with climate change is to be used to determine the Water Quality Volume (WQV) when designing a treatment device.</u></p> <p><u>Note 5: Good management practice for stormwater management is equivalent to those set out in the guideline document, Stormwater Management Devices in the Auckland Region (GD01).</u></p>	<p>Discretionary Activity</p>	<p>Council will have regard to the following matters when considering an application for Resource Consent under this Rule:</p> <p>i) Whether there is sufficient control of water-borne contaminants, litter and sediment; ii) Whether there is sufficient land available for disposal of stormwater;</p> <p>ii) Whether and the extent to which the capacity of the downstream stormwater system is able to cater for increased runoff from the proposed allotments;</p> <p>iii) Whether and the extent to which measures are necessary in order to give effect to any drainage or</p> <p>iv) Catchment Integrated Development that has been prepared for the area;</p> <p>v) Whether and the extent to which measures proposed for avoiding or mitigating the effects of stormwater runoff, including low impact design principles are effective;</p> <p>vi) Whether and the extent to which the stormwater infrastructure within the subdivision, is able to link with existing disposal systems outside the subdivision;</p> <p>vii) Whether and the extent to which the development meets the relevant performance standards or the Kaipara District Council Engineering Standards 2011 or the <u>Awakino Precinct Stormwater Management Plan</u>;</p> <p>viii) Whether there is a need for land to be set aside and vested in the Council as a site for any public utility required to be provided;</p> <p>ix) <u>Within the Awakino Precinct:</u></p> <ul style="list-style-type: none"> - <u>The extent to which run-off from a developed catchment is discharged back into its natural catchment.</u> - <u>The applicability of retention to be provided within a 72-hour period.</u> - <u>The extent to which inert building materials are to be utilised (e.g., inert roof material).</u> <p>(4) Awakino Precinct Information Requirement:</p> <p><u>Any application shall be supported by a detailed stormwater assessment report and stormwater management plan prepared by a suitably qualified engineer to confirm that the proposal will achieve the following:</u></p> <p>i) <u>Treatment of the Water Quality Volume (WQV) or Water Quality Flow (WQF) from all contaminant generating impermeable surfaces by a water quality device for the relevant contaminants.</u></p> <p>ii) <u>Retention (volume reduction) of a minimum of 5mm runoff depth for all impermeable surfaces.</u></p> <p>iii) <u>Detention (temporary storage) with a drain down period of 24 hours for the difference between the pre-development (grassed state) and post-development runoff volumes from the 1/3 of the 2 Year ARI, 24-hour rainfall event minus any retention volume provided for all impermeable surfaces.</u></p> <p>iv) <u>Conveyance and discharge of primary and secondary flow in accordance with the Kaipara District Council Engineering Standards 2011.</u></p>
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Table 13.1 Awakino Precinct Road, Private Way, Cycle Way and Property Access Legal and Construction Widths

URBAN									
Household Equivalents	Minimum Legal Width	Minimum Carriageway Width	Minimum Cycleway/Footpath Width	Surface	Minimum Design Speed	Minimum Radius (m)	Minimum SSD(m)	Minimum Cres K (m/%)	Maximum Grade
1	<u>4.2m</u>	<u>3.0m</u>	-	<u>Seal</u>	-	<u>15m</u>	<u>20m</u>	<u>0.5</u>	<u>20.0%</u>
2 to 3	<u>6.0m</u>	<u>3.0m</u>	-		<u>20km/h</u>	<u>15m</u>	<u>30m*</u>	<u>0.5</u>	<u>16.7%</u>
4 to 6	<u>12.0m</u>	<u>5.5m</u>	-		<u>30km/h</u>	<u>20m</u>	<u>50m*</u>	<u>1.0</u>	<u>12.5%</u>

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7 to 30	<u>18.0m</u>	<u>6.0m + indented parking bays</u>	<u>3m</u>		<u>40km/h</u>	<u>30m</u>	<u>40m</u>	<u>1.5</u>	<u>12.5%</u>
31-50	<u>20.0m</u>	<u>6.0m + indented parking bays</u>	<u>3m</u>		<u>40km/h</u>	<u>30m</u>	<u>40m</u>	<u>1.5</u>	<u>12.5%</u>
>50	<u>20.0m</u>	<u>6.5m + indented parking bays</u>	<u>3m</u>		<u>40km/h</u>	<u>30m</u>	<u>40m</u>	<u>1.5</u>	<u>10.0%</u>

Table 13.1 Notes:

- (1). The legal width shall be sufficient for the carriageway (including widening on curves), cul-de-sacs, footpaths and cycleways (where appropriate), parking (where appropriate), public utilities, drainage facilities, grassed Berms, Swale Drains, amenity planting, sight benching and street furniture. Roads to vest shall have sufficient legal width for planned future development. Refer to Kaipara District Council Engineering Standards 2011, clause 5.2.4.
- (2). Carriageway width is exclusive of Berms, kerb concrete and parking. Carriageway widths should be increased by up to 1.0m where there is a high proportion of heavy traffic. Additional widening is required on curves in accordance with Kaipara District Council Engineering Standards 2011 clause 5.2.5. Passing bays are required on single lane carriageways in accordance with Kaipara District Council Engineering Standards 2011 clause 5.2.5.
- (3). Carriageway surface shall be sealed in accordance with Kaipara District Council Engineering Standards 2011 clause 5.2.6.
- (4). Design speeds are based on rolling terrain typical in Kaipara District. Higher design speeds should be considered in flatter terrain.
- (5). Safe stopping sight distances marked * have been increased to provide for two vehicles approaching each other on a single lane carriageway to stop before colliding. If a two lane carriageway is proposed for access ways serving 1 to 6 lots, sight distances may be reduced accordingly. K value is the length of vertical curve (m) divided by the algebraic difference in gradients (%).
- (6) Where there is potential for further development under the District Plan, the horizontal and vertical geometry and legal width shall provide for the Ultimate Development.