Appendix D SCATES Intersection Analyses

SCATES Modelling of Lane Cove Road Intersections

Extent of Model

Four intersections were modelled along the Lane Cove Road corridor:

- TCS 195 Epping Road
- TCS 1012 Waterloo Road
- TCS 1799 Talavera Road
- TCS 3161 M2 Ramps.

Data Collection

Geometry, gradients and lane lengths were taken from TCS plans, and aerial photos. Percentage phase splits and cycle lengths set using IDM data supplied by Transurban. Offset data obtained from SCATS for AM and PM peaks. Standard SCATES lane saturation flows used (adjusted upwards on the left turn to the M2 on ramp to reflect through alignment).

Volumes supplied by Transurban in spreadsheet HALCROWSCATES_TALAVERA_LCR.xlsx for existing and future scenarios:

- Base (existing)
- 2011 status quo
- 2011 with upgrading
- 2021 status quo
- 2021 with upgrading.

Proportion heavy vehicles taken from SIDRA files of the intersections supplied by Transurban. No data was supplied for future proportions of heavy vehicles, so the existing proportions were applied to the future scenarios. There are no changes to the road network itself for the future scenarios, only to the volumes.

SCATES Results

Results were extracted for two scenarios – the first being using the existing phase splits and offsets for all future scenarios, and the second allowing SCATES to optimise the phase splits and offsets, within the existing cycle length.

Table 1 – Lane Cove Road Base Results

Intersection	AM Peak			PM Peak		
	Avg Delay	LoS	X-value	Avg Delay	LoS	X-value
Existing Timing						
Lane Cove Rd	65	E	1.09	78	F	1.80
Waterloo Rd	107	F	1.01	56	D	1.45
Talavera Rd	25	B	1.02	90	F	1.44
M2 Ramps	8	A	0.80	7	A	0.81
SCATES Optimised						
Lane Cove Rd	42	C	0.77	32	C	0.86
Waterloo Rd	44	D	0.88	57	E	0.97
Talavera Rd	19	B	0.81	70	E	1.01
M2 Ramps	9	A	0.83	5	A	0.72

Table 2 – Lane Cove Road 2011 Results No Upgrading

Intersection	AM Peak			PM Peak		
	Avg Delay	LoS	X-value	Avg Delay	LoS	X-value
Existing Timing						
Lane Cove Rd	96	F	>1.0	77	F	>1.0
Waterloo Rd	126	F	>1.0	66	E	>1.0
Talavera Rd	58	E	>1.0	99	F	>1.0
M2 Ramps	12	A	0.82	6	A	0.79
SCATES Optimised						
Lane Cove Rd	60	E	0.79	32	C	0.89
Waterloo Rd	50	D	0.91	61	E	0.94
Talavera Rd	19	B	0.81	84	F	>1.0
M2 Ramps	11	A	0.86	5	A	0.73

Table 3 – Lane Cove Road 2011 Results With Upgrading

Intersection	AM Peak			PM Peak		
	Avg Delay	LoS	X-value	Avg Delay	LoS	X-value
Existing Timing						
Lane Cove Rd	48	D	0.78	28	C	0.88
Waterloo Rd	44	D	0.91	65	E	0.93
Talavera Rd	55	D	0.82	112	F	>1.0
M2 Ramps	12	A	0.89	6	A	0.75
SCATES Optimised						
Lane Cove Rd	49	D	0.78	31	C	0.88
Waterloo Rd	48	D	0.91	53	D	0.93
Talavera Rd	20	B	0.82	109	F	>1.0
M2 Ramps	12	A	0.89	6	A	0.75

Table 4 – Lane Cove Road 2021 Results No Upgrading

Intersection	AM Peak			PM Peak		
	Avg Delay	LoS	X-value	Avg Delay	LoS	X-value
Existing Timing						
Lane Cove Rd	320	F	>1.0	86	F	>1.0
Waterloo Rd	178	F	>1.0	110	F	>1.0
Talavera Rd	56	D	>1.0	218	F	>1.0
M2 Ramps	49	D	>1.0	9	A	0.91
SCATES Optimised						
Lane Cove Rd	145	F	0.96	44	D	0.99
Waterloo Rd	136	F	>1.0	113	F	>1.0
Talavera Rd	13	A	0.87	195	F	>1.0
M2 Ramps	29	C	>1.0	6	A	0.82

Table 5 – Lane Cove Road 2021 Results With Upgrading

Intersection	AM Peak			PM Peak		
	Avg Delay	LoS	X-value	Avg Delay	LoS	X-value
Existing Timing						
Lane Cove Rd	122	F	>1.0	63	E	>1.0
Waterloo Rd	177	F	>1.0	65	E	>1.0
Talavera Rd	42	C	>1.0	228	F	>1.0
M2 Ramps	123	F	>1.0	26	B	>1.0
SCATES Optimised						
Lane Cove Rd	71	F	0.82	37	C	0.94
Waterloo Rd	106	F	>1.0	57	E	0.97
Talavera Rd	13	A	0.88	211	F	>1.0
M2 Ramps	48	D	>1.0	9	A	0.83

Notes:

The detailed results indicate that in many instances, the degree of saturation >1.0 occurs on a minor movement with low volumes while the majority of movements have acceptable degrees of saturation.

SCATES Modelling of Talavera Road Intersections

Extent of Model

Four intersections were modelled along the Talavera Road corridor:

- TCS 3170 Khartoum Road
- TCS 3299 Alma Road/Macquarie Centre access
- TCS 3162 Herring Road/M2 ramp
- TCS3167 Christie Road.

Data Collection

Geometry, gradients and lane lengths were taken from TCS plans, and aerial photos. Percentage phase splits and cycle lengths set using IDM data supplied by Transurban. SCATES optimised offset has been adopted. Standard SCATES lane saturation flows used.

Volumes supplied by Transurban in spreadsheet HALCROWSCATES_TALEVERA_LCR.xlsx for existing and future scenarios:

- Base (existing)
- 2011 status quo
- 2011 with upgrading
- 2021 status quo
- 2021 with upgrading.

Proportion heavy vehicles have been estimated from SIDRA files of the intersections supplied by Transurban. No data was supplied for future proportions of heavy vehicles, so the existing proportions were applied to the future scenarios.

Under the 2011/2021 with upgrade options, Herring Road/M2 ramp and Christie Road intersection layouts have been modified according to the concept designs provided by Transurban. All other intersections were analysed using the existing intersection layout.

SCATES Results

Results were extracted for two scenarios – the first being using the existing phase splits and offsets for all future scenarios, and the second allowing SCATES to optimise the phase splits and offsets, within the existing cycle length.

The results for Alma Road/Macquarie Centre access were not reported as phase split and cycle length information was not provided to calibrate the model.

Table 1 – Talavera Road Base Results

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay (S)	DOS	LOS	Average Delay (S)	DOS
Existing Timing						
I3 - Christie Rd - Talavera Rd	C	42	0.98	A	8	0.55
I4 - Herring Rd - Talavera Rd	B	26	0.68	B	18	0.83
I6 - Khartoum Rd - Talavera Rd	B	28	>1.0	B	26	0.96
SCATES Optimised						
I3 - Christie Rd - Talavera Rd	B	27	0.95	A	6	0.53
I4 - Herring Rd - Talavera Rd	D	45	0.62	A	12	0.66
I6 - Khartoum Rd - Talavera Rd	D	48	0.58	A	10	0.76

Table 2 – Talavera Road 2011 Results No Upgrading

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay (S)	DOS	LOS	Average Delay (S)	DOS
Existing Timing						
I3 - Christie Rd - Talavera Rd	F	98	>1.0	A	8	0.59
I4 - Herring Rd - Talavera Rd	C	31	0.72	B	17	0.94
I6 - Khartoum Rd - Talavera Rd	B	26	>1.0	C	38	>1.0
SCATES Optimised						
I3 - Christie Rd - Talavera Rd	F	90	>1.0	A	6	0.57
I4 - Herring Rd - Talavera Rd	C	35	0.67	B	16	0.72
I6 - Khartoum Rd - Talavera Rd	C	41	0.62	A	14	0.82

Table 3 – Talavera Road 2011 Results With Upgrading

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay (S)	DOS	LOS	Average Delay (S)	DOS
SCATES Optimised						
I3 - Christie Rd - Talavera Rd	C	40	0.91	A	5	0.56
I4 - Herring Rd - Talavera Rd	E	57	0.92	B	22	0.77
I6 - Khartoum Rd - Talavera Rd	C	37	0.65	B	16	0.83

Table 4 – Talavera Road 2021 Results No Upgrading

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay (S)	DOS	LOS	Average Delay (S)	DOS
Existing Timing						
I3 - Christie Rd - Talavera Rd	F	544	>1.0	A	9	0.77
I4 - Herring Rd - Talavera Rd	B	22	0.89	B	22	>1.0
I6 - Khartoum Rd - Talavera Rd	B	22	>1.0	F	110	>1.0
SCATES Optimised						
I3 - Christie Rd - Talavera Rd	F	495	>1.0	A	12	0.75
I4 - Herring Rd - Talavera Rd	C	34	0.80	C	34	0.79
I6 - Khartoum Rd - Talavera Rd	C	37	0.72	E	57	0.95

Table 5 – Talavera Road 2021 Results With Upgrading

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Average Delay (S)	DOS	LOS	Average Delay (S)	DOS
SCATES Optimised						
I3 - Christie Rd - Talavera Rd	F	190	>1.0	A	9	0.58
I4 - Herring Rd - Talavera Rd	F	92	>1.0	C	40	0.84
I6 - Khartoum Rd - Talavera Rd	C	33	0.75	F	136	>1.0

NOTE: For 2011/2021 with upgrade scenarios, the phasing was modified at all intersections to reflect the change in intersection layouts and traffic volumes.