- The left turn movement from Pier Street into Harbour Street performs at a Level of Service F particularly during larger events. The queuing of this movement extends back to Harbour Street and adversely affects the performance of the roundabout;
- The allocation of 600 spaces in the Sydney Entertainment Centre (SEC) will prevent motorists associated with SICEEP from using it and therefore reduce traffic travelling from Darling Street to Pier Street and to Harbour Street (particularly during major events) and result in an improved performance of the intersection;
- The relocation of the SEC to the northern side of Pier St will result in an increase in pedestrian movements across the Pier St / Harbour St intersection particularly during major events in which the movements to and from the train station are anticipated to be tidal in nature;
- The Pier St / Harbour St intersection design is not anticipated to cater for the increased pedestrian movements associated with major events particularly given the distance required to cross the road as well as the small storage space provided by the islands in the intersection;
- An ameliorative treatment will be required in order to provide safety for pedestrians and improve the intersection's traffic efficiency;
- The determination of the most appropriate treatment is subject to further investigation in terms of financial feasibility and physical constraints. However, it is recommended that the possible reconfiguration of the intersection be considered as well as the possibility of providing a pedestrian overpass.
- The analysis contained within this report is indicative and based on possible outcomes from the range of assumptions adopted. The PPP Proponent should undertake a separate detailed assessment upon successful tender for the project, including detailed consultation with relevant authorities and key stakeholders.

Mott MacDonald
Australia
FEDERICO RAMOS
TRAFFIC ENGINEER

Mott MacDonald
Australia
STEPHEN LUKE
TRANSPORT PLANNING MANAGER - AUSTRALIA

Appendices

Appendix A. Construction Traffic Management Plan

Appendix B. Traffic Volume Summary

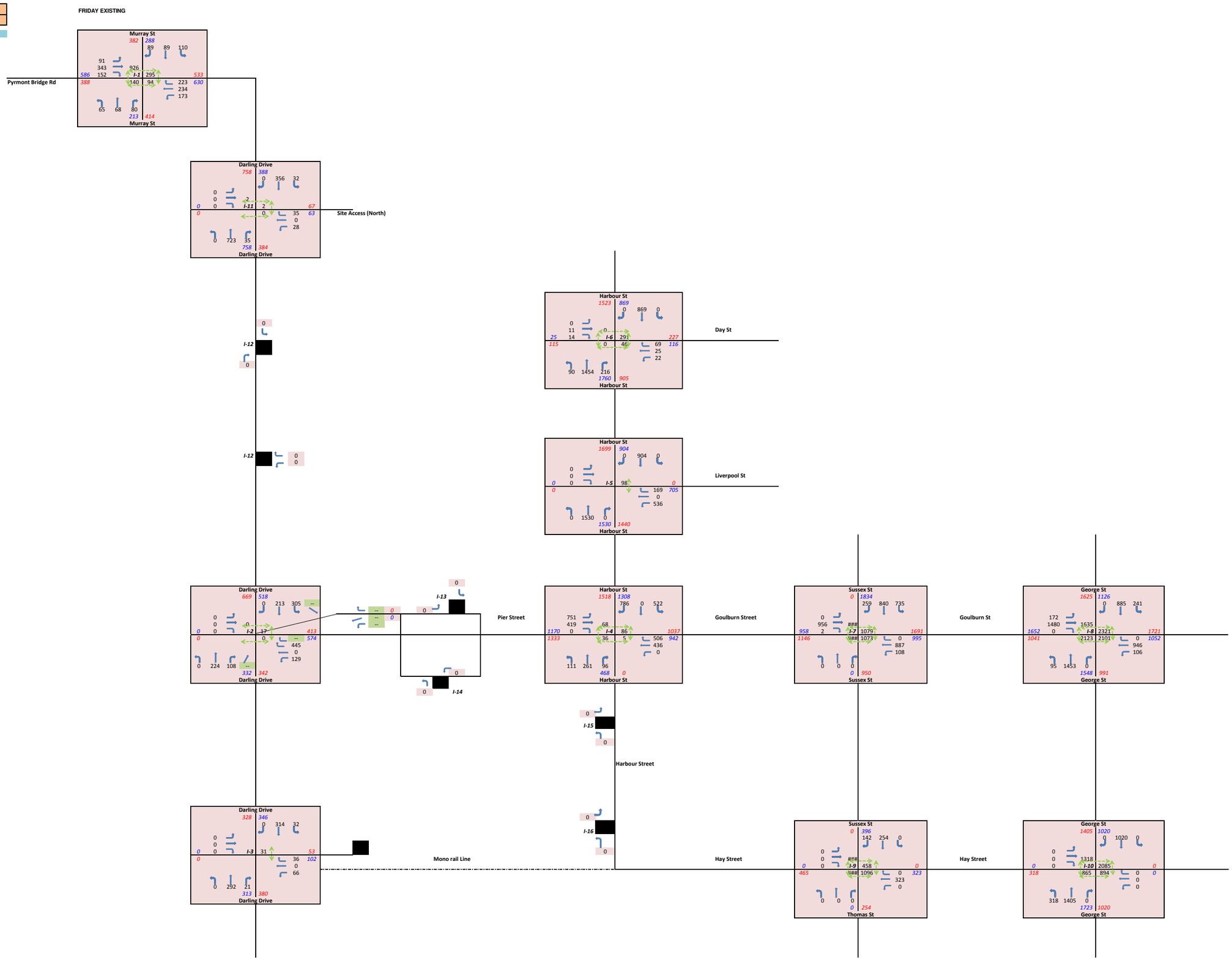
Appendix C. AIMSUN Modelling Results

APPENDIX B

Stick Diagrams – Traffic Volumes at Intersections

Friday_Final
Total
Ped_Friday

FRIDAY EXISTING

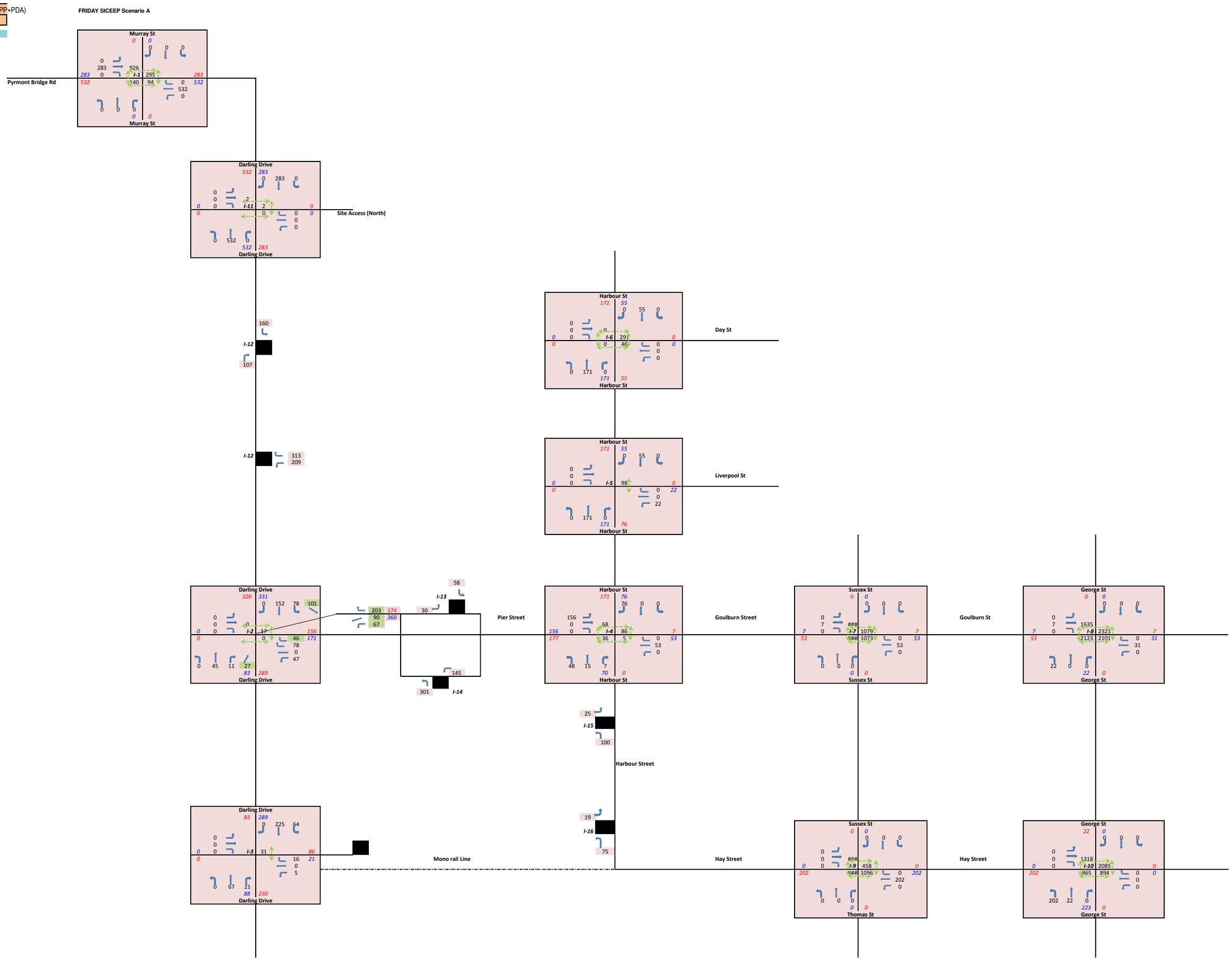


Total Dev (PPP+PDA)

Total

Ped_Friday

FRIDAY SICEEP Scenario A

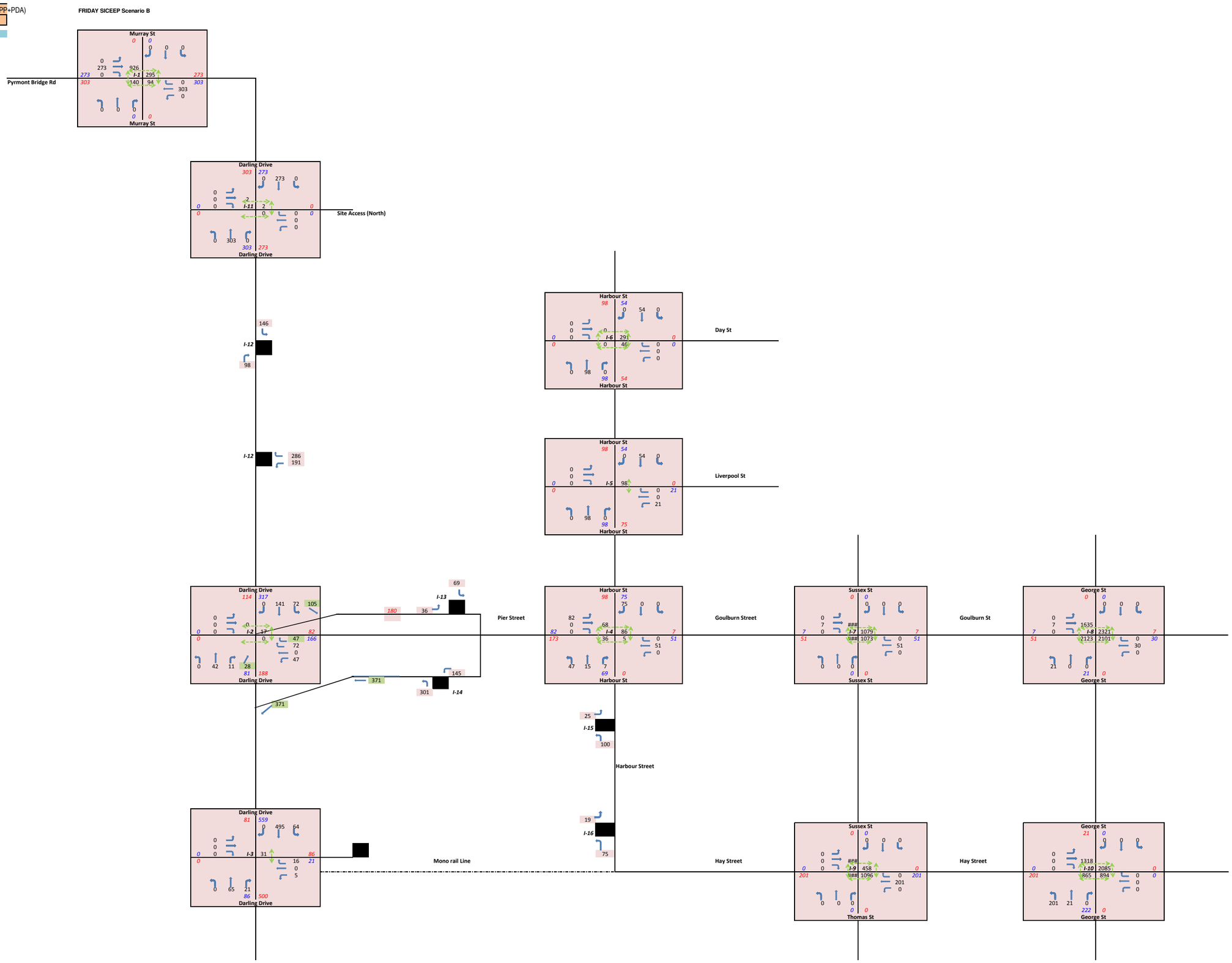


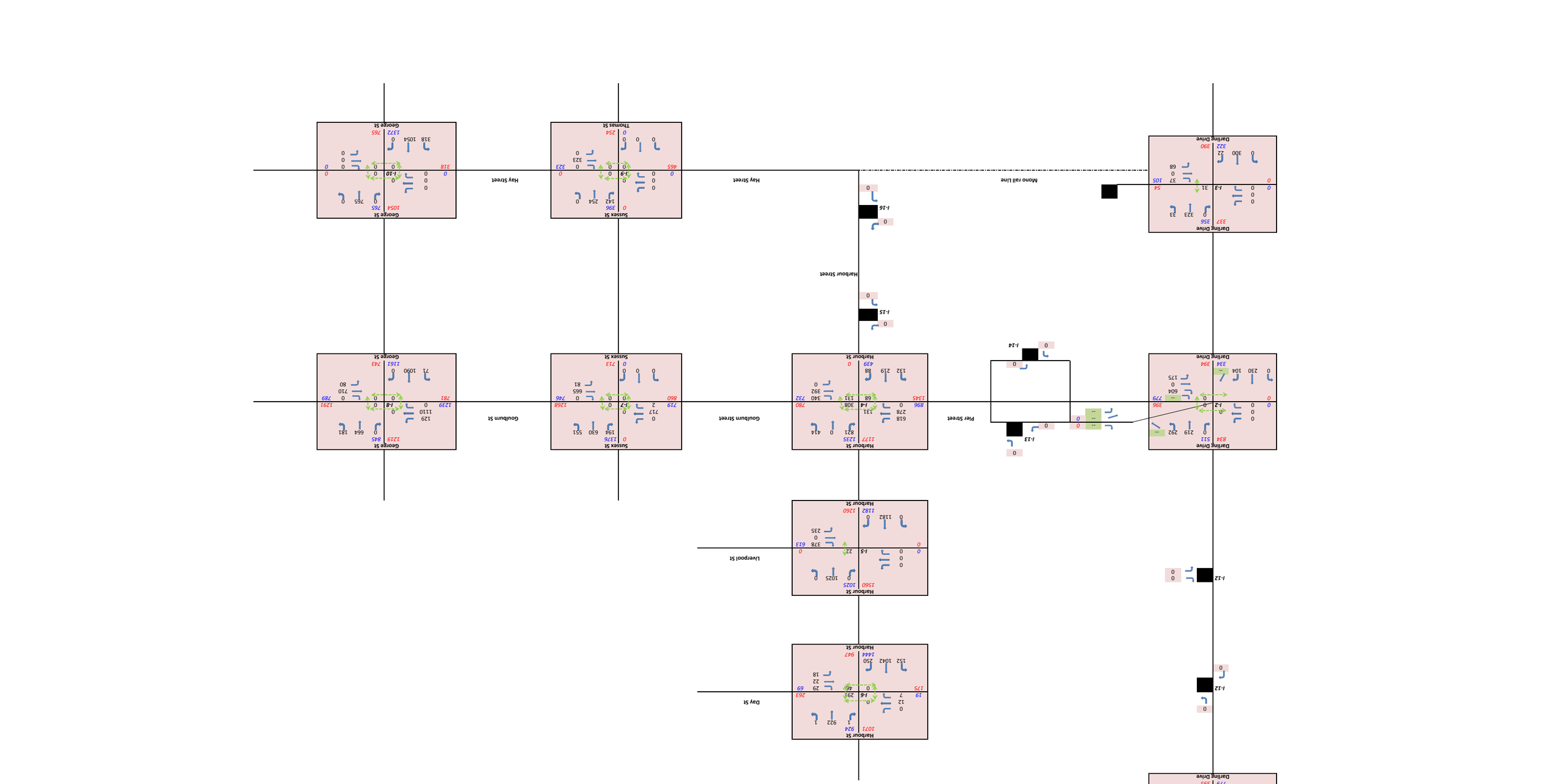
Total Dev (PPP+PDA)

Total

Ped_Friday

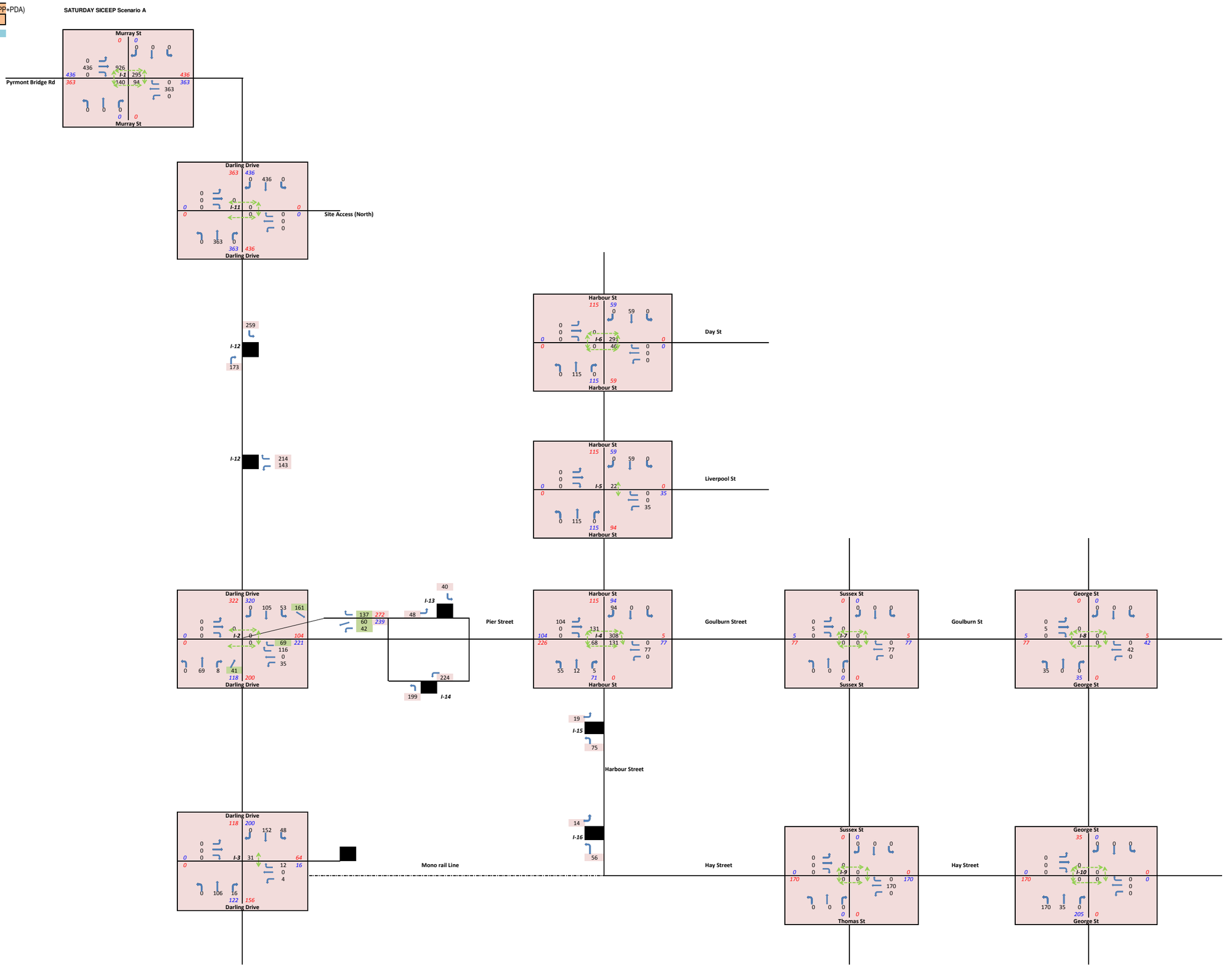
FRIDAY SICEEP Scenario B




SATURDAY EXISTING
Saturday_Final
Total
Ped Saturday
Murray St
Pyrmont Bridge Rd
Murray St
Darling Drive
Darling Drive
Darling Drive
Darling Drive
Darling Drive
Site Access (North)
Mono rail Line
Pier Street
Harbour St
Harbour St
Harbour St
Harbour St
Harbour St
Harbour St
Harbour St
Liverpool St
Day St
Gouldum Street
Gouldum St
Hay Street
Hay Street
Sussex St
Sussex St
Thomas St
George St
George St
George St
Harbour Street
I-12
I-13
I-14
I-15
I-16
I-1
I-2
I-3
I-4
I-5
I-6
I-7
I-8
I-9
I-10
I-11

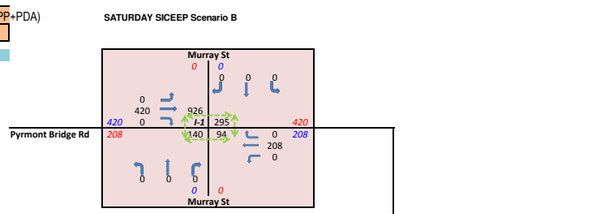
Total Dev (PPP+PDA)
Total
Ped_Saturday

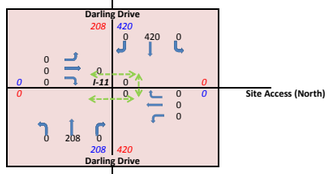
SATURDAY SICEEP Scenario A

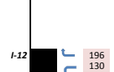


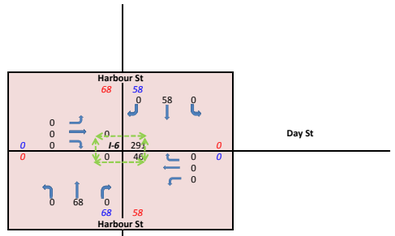
Total Dev (PPP+PDA)
Total
Ped_Saturday

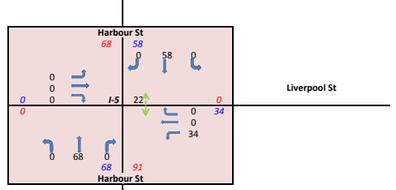
SATURDAY SICEEP Scenario B

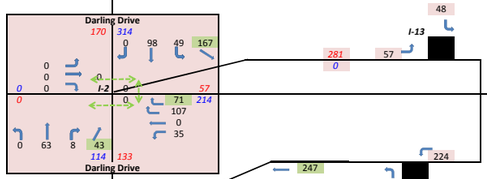


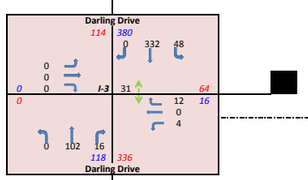












APPENDIX C

Detailed SIDRA Results

MOVEMENT SUMMARY

Site: Darling Dr/Murray St - Existing - Optimum Cycle Time

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Murray St (South)											
1	L	65	1.0	0.540	61.4	LOS E	3.6	25.7	0.96	0.76	20.2
2	T	68	1.0	0.589	54.1	LOS D	8.4	59.2	0.99	0.80	20.6
3	R	80	1.0	0.589	60.4	LOS E	8.4	59.2	0.99	0.80	20.7
Approach		213	1.0	0.589	58.7	LOS E	8.4	59.2	0.98	0.79	20.5
East: Darling Drive (East)											
4	L	173	1.0	0.126	7.6	LOS A	1.8	12.8	0.25	0.60	37.3
5	T	240	1.0	0.381	33.4	LOS C	10.8	76.0	0.82	0.69	18.8
6	R	217	1.0	1.000[3]	53.9	LOS D	11.6	81.6	0.97	0.82	14.4
Approach		630	1.0	1.000	33.4	LOS C	11.6	81.6	0.71	0.71	19.5
North: Murray St (North)											
7	L	110	1.0	0.163	33.7	LOS C	4.3	30.3	0.71	0.75	27.6
8	T	89	1.0	0.707	56.3	LOS D	10.5	73.8	1.00	0.86	20.2
9	R	89	1.0	0.707	62.7	LOS E	10.5	73.8	1.00	0.86	20.2
Approach		288	1.0	0.707	49.7	LOS D	10.5	73.8	0.89	0.82	22.5
West: Union St (West)											
10	L	91	1.0	0.443	72.9	LOS F	7.0	49.3	0.96	0.87	10.6
11	T	343	1.0	0.510	37.2	LOS C	15.1	107.0	0.87	0.75	16.3
12	R	152	1.0	0.852	64.7	LOS E	9.2	64.7	0.91	0.97	11.5
Approach		586	1.0	0.852	49.9	LOS D	15.1	107.0	0.89	0.82	13.7
All Vehicles		1717	1.0	1.000	44.9	LOS D	15.1	107.0	0.84	0.78	18.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	94	54.2	LOS E	0.3	0.3	0.95	0.95
P3	Across E approach	295	54.2	LOS E	1.0	1.0	0.95	0.95
P5	Across N approach	926	50.4	LOS E	2.9	2.9	0.92	0.92
P7	Across W approach	140	54.2	LOS E	0.5	0.5	0.95	0.95
All Pedestrians		1455	51.8	LOS E			0.93	0.93

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

LANE SUMMARY

Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: Darling Dr (South)																
Lane 1	0	224	113	337	1.0	907	0.371	100	7.9	LOS A	2.7	19.2	145	–	0.0	0.0
Approach	0	224	113	337	1.0		0.371		7.9	LOS A	2.7	19.2				
East: Pier St Ramp (East)																
Lane 1	129	0	0	129	1.0	1158[1]	0.111	100	4.0	LOS A	0.6	3.9	38	Turn Bay	0.0	0.0
Lane 2	0	0	450	450	1.0	1374	0.327	100	10.2	LOS A	2.4	16.8	145	–	0.0	0.0
Approach	129	0	450	579	1.0		0.327		8.9	LOS A	2.4	16.8				
North East: Loading Dock Access																
Lane 1	60	0	35	95	1.0	824	0.115	100	5.8	LOS A	0.5	3.7	200	–	0.0	0.0
Approach	60	0	35	95	1.0		0.115		5.8	LOS A	0.5	3.7				
North: Darling Dr (North)																
Lane 1	310	0	0	310	1.0	1548	0.200	100	4.1	LOS A	1.4	10.2	500	–	0.0	0.0
Lane 2	0	213	0	213	1.0	1283	0.166	83[5]	2.9	LOS A	1.1	7.9	500	–	0.0	0.0
Approach	310	213	0	523	1.0		0.200		3.6	LOS A	1.4	10.2				
Intersection				1534	1.0		0.371		6.7	LOS A	2.7	19.2				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

1 Reduced capacity due to a short lane effect
5 Lane underutilisation determined by program

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Darling Dr / Car Park Access (SEC) - Existing - Optimum Cycle Time - Vehicle Actuation

Signals - Actuated Cycle Time = 120 seconds

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Darling Drive (S)											
2	T	292	1.0	0.173	12.9	LOS A	5.2	36.9	0.50	0.42	29.5
3	R	21	1.0	0.171	65.1	LOS E	1.2	8.6	0.98	0.70	10.7
Approach		313	1.0	0.173	16.4	LOS B	5.2	36.9	0.53	0.44	26.8
South East: Light Rail (SE)											
22	T	13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
Approach		13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
East: Car park Access (E)											
4	L	66	1.0	0.179	46.8	LOS D	3.2	22.8	0.87	0.74	12.9
6	R	37	1.0	0.100	45.9	LOS D	1.8	12.5	0.85	0.71	13.4
Approach		103	1.0	0.179	46.5	LOS D	3.2	22.8	0.86	0.72	13.1
North: Darling Drive (N)											
7	L	32	1.0	0.024	4.7	LOS A	0.1	0.8	0.11	0.49	35.3
8	T	314	1.0	0.180	20.9	LOS B	5.4	38.2	0.63	0.52	20.1
Approach		346	1.0	0.180	19.4	LOS B	5.4	38.2	0.59	0.52	20.9
North West: Light Rail (NW)											
28	T	13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
Approach		13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
All Vehicles		788	1.0	0.180	23.0	LOS B	5.4	38.2	0.61	0.52	21.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	31	54.2	LOS E	0.1	0.1	0.95	0.95
All Pedestrians		31	54.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Harbour St/Pier St/Goulburn St - Existing - Optimum Cycle Time

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour St (South)											
1	L	111	1.0	0.509	57.3	LOS E	5.8	41.0	0.98	0.79	16.1
2	T	261	1.0	0.463	47.5	LOS D	6.6	46.5	0.96	0.77	17.4
3	R	96	1.0	0.663	54.5	LOS D	4.9	34.5	0.94	0.82	16.6
Approach		468	1.0	0.663	51.3	LOS D	6.6	46.5	0.96	0.78	16.9
East: Goulburn St (East)											
5	T	640	1.0	0.355	19.5	LOS B	10.9	77.1	0.68	0.58	19.0
6	R	302	1.0	1.000[3]	47.8	LOS D	6.9	49.0	0.97	0.79	11.3
Approach		942	1.0	1.000	28.6	LOS C	10.9	77.1	0.77	0.65	15.5
North: Harbour St (North)											
7	L	552	1.0	0.421	9.3	LOS A	8.6	61.0	0.40	0.67	31.3
9	R	786	1.0	0.977	97.9	LOS F	31.9	225.0	1.00	1.29	6.9
Approach		1338	1.0	0.977	61.4	LOS E	31.9	225.0	0.75	1.03	10.2
West: Pier St (West)											
10	L	751	1.0	0.505	27.4	LOS B	15.8	111.6	0.71	0.76	28.5
11	T	419	1.0	0.626	46.4	LOS D	10.7	75.3	0.98	0.81	20.9
Approach		1170	1.0	0.626	34.2	LOS C	15.8	111.6	0.81	0.78	25.3
All Vehicles		3918	1.0	1.000	44.2	LOS D	31.9	225.0	0.80	0.84	16.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	5	22.9	LOS C	0.0	0.0	0.65	0.65
P3	Across E approach	86	47.3	LOS E	0.2	0.2	0.93	0.93
P5	Across N approach	68	49.2	LOS E	0.2	0.2	0.95	0.95
P7	Across W approach	36	49.2	LOS E	0.1	0.1	0.95	0.95
All Pedestrians		195	47.7	LOS E			0.93	0.93

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Harbour St / Liverpool St - Existing - Optimum Cycle Time

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour St (South)											
2	T	1530	1.0	0.811	31.8	LOS C	31.9	225.0	0.92	0.85	27.2
Approach		1530	1.0	0.811	31.8	LOS C	31.9	225.0	0.92	0.85	27.2
East: Liverpool Street (East)											
4	L	536	1.0	0.820	45.5	LOS D	28.2	198.9	0.98	0.92	16.3
6	R	169	1.0	0.129	32.1	LOS C	3.0	21.4	0.71	0.74	20.3
Approach		705	1.0	0.820	42.3	LOS C	28.2	198.9	0.91	0.88	17.1
North: Harbour St (North)											
8	T	904	1.0	0.380	24.3	LOS B	11.2	79.2	0.75	0.64	30.5
Approach		904	1.0	0.380	24.3	LOS B	11.2	79.2	0.75	0.64	30.5
West: Car Park Exit (West)											
10	L	100	1.0	0.746	65.8	LOS E	5.8	40.6	1.00	0.88	11.4
12	R	100	1.0	0.746	65.8	LOS E	5.8	40.6	1.00	0.87	11.4
Approach		200	1.0	0.746	65.8	LOS E	5.8	40.6	1.00	0.87	11.4
All Vehicles		3339	1.0	0.820	34.0	LOS C	31.9	225.0	0.87	0.80	25.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	98	23.6	LOS C	0.2	0.2	0.65	0.65
All Pedestrians		98	23.6	LOS C			0.65	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Darling Dr/Murray St - ExistingSat - Optimum Cycle Time

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Murray St (South)											
1	L	90	1.0	0.750	65.7	LOS E	5.3	37.7	0.98	0.88	19.4
2	T	127	1.0	0.821	61.1	LOS E	13.0	91.7	1.00	0.97	19.4
3	R	81	1.0	0.821	67.3	LOS E	13.0	91.7	1.00	0.97	19.4
Approach		298	1.0	0.821	64.2	LOS E	13.0	91.7	0.99	0.94	19.4
East: Darling Drive (East)											
4	L	246	1.0	0.177	8.0	LOS A	2.9	20.6	0.27	0.61	36.8
5	T	357	1.0	0.462	28.3	LOS B	15.2	107.6	0.79	0.68	20.7
6	R	197	1.0	1.000[3]	62.5	LOS E	11.6	81.6	1.00	0.82	13.0
Approach		800	1.0	1.000	30.5	LOS C	15.2	107.6	0.68	0.69	20.5
North: Murray St (North)											
7	L	125	1.0	0.232	41.1	LOS C	5.5	39.1	0.80	0.77	25.1
8	T	99	1.0	0.855	63.7	LOS E	13.8	97.7	1.00	1.01	18.8
9	R	116	1.0	0.855	70.1	LOS E	13.8	97.7	1.00	1.01	18.8
Approach		340	1.0	0.855	57.6	LOS E	13.8	97.7	0.93	0.92	20.7
West: Union St (West)											
10	L	351	1.0	0.914	74.4	LOS F	24.6	174.0	1.00	1.04	10.4
11	T	363	1.0	0.469	28.4	LOS B	15.5	109.7	0.79	0.69	19.3
12	R	161	1.0	1.000[3]	61.4	LOS E	9.2	65.3	1.00	0.80	12.0
Approach		875	1.0	1.000	52.9	LOS D	24.6	174.0	0.91	0.85	13.2
All Vehicles		2313	1.0	1.000	47.3	LOS D	24.6	174.0	0.85	0.82	17.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	94	45.9	LOS E	0.3	0.3	0.88	0.88
P3	Across E approach	295	54.2	LOS E	1.0	1.0	0.95	0.95
P5	Across N approach	926	50.4	LOS E	2.9	2.9	0.92	0.92
P7	Across W approach	140	54.2	LOS E	0.5	0.5	0.95	0.95
All Pedestrians		1455	51.2	LOS E			0.92	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Darling Dr/Pier St - ExistingSat

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Darling Dr (South)											
2	T	230	1.0	0.440	7.5	LOS A	3.5	24.8	0.86	0.83	32.3
3	R	109	1.0	0.440	13.9	LOS A	3.5	24.8	0.86	0.92	30.4
Approach		339	1.0	0.440	9.6	LOS A	3.5	24.8	0.86	0.86	31.6
East: Pier St Ramp (East)											
1	L	175	1.0	0.151	4.1	LOS A	0.8	5.5	0.44	0.44	36.8
3	R	609	1.0	0.441	10.4	LOS A	3.6	25.1	0.59	0.67	31.3
Approach		784	1.0	0.441	9.0	LOS A	3.6	25.1	0.55	0.62	32.2
North East: Loading Dock Access											
24	L	35	1.0	0.078	3.2	LOS A	0.4	2.5	0.56	0.49	28.5
26	R	30	1.0	0.078	9.5	LOS A	0.4	2.5	0.56	0.81	28.0
Approach		65	1.0	0.078	6.1	LOS A	0.4	2.5	0.56	0.64	28.3
North: Darling Dr (North)											
7	L	297	1.0	0.192	4.1	LOS A	1.4	9.9	0.35	0.41	44.0
8	T	219	1.0	0.169	2.9	LOS A	1.2	8.3	0.36	0.33	45.0
Approach		516	1.0	0.192	3.6	LOS A	1.4	9.9	0.35	0.38	44.4
All Vehicles		1704	1.0	0.441	7.4	LOS A	3.6	25.1	0.55	0.59	37.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: Darling Dr / Car Park Access (SEC) - ExistingSat - Optimum Cycle Time - Vehicle Actuation

Signals - Actuated Cycle Time = 120 seconds

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Darling Drive (S)											
2	T	300	1.0	0.178	12.9	LOS A	5.4	38.1	0.50	0.42	29.5
3	R	22	1.0	0.179	65.2	LOS E	1.3	9.0	0.98	0.71	10.7
Approach		322	1.0	0.179	16.5	LOS B	5.4	38.1	0.53	0.44	26.7
South East: Light Rail (SE)											
22	T	13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
Approach		13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
East: Car park Access (E)											
4	L	68	1.0	0.184	46.8	LOS D	3.3	23.5	0.87	0.74	12.9
6	R	37	1.0	0.100	45.9	LOS D	1.8	12.5	0.85	0.71	13.1
Approach		105	1.0	0.184	46.5	LOS D	3.3	23.5	0.86	0.73	12.9
North: Darling Drive (N)											
7	L	33	1.0	0.024	4.7	LOS A	0.1	0.9	0.11	0.50	35.3
8	T	323	1.0	0.185	20.9	LOS B	5.6	39.4	0.64	0.53	20.1
Approach		356	1.0	0.185	19.4	LOS B	5.6	39.4	0.59	0.52	20.8
North West: Light Rail (NW)											
28	T	13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
Approach		13	0.0	0.080	57.6	LOS E	0.7	5.0	0.93	0.64	22.4
All Vehicles		809	1.0	0.185	23.0	LOS B	5.6	39.4	0.61	0.52	21.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	31	54.2	LOS E	0.1	0.1	0.95	0.95
All Pedestrians		31	54.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Harbour St/Pier St/Goulburn St - ExistingSat - Optimum Cycle Time

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour St (South)											
1	L	132	1.0	0.606	58.1	LOS E	7.0	49.5	1.00	0.80	15.9
2	T	219	1.0	0.389	46.9	LOS D	5.5	38.5	0.95	0.75	17.5
3	R	88	1.0	0.607	53.4	LOS D	4.4	31.0	0.94	0.79	16.9
Approach		439	1.0	0.607	51.6	LOS D	7.0	49.5	0.96	0.78	16.9
East: Goulburn St (East)											
5	T	437	1.0	0.250	19.6	LOS B	7.2	50.6	0.65	0.55	19.2
6	R	295	1.0	1.000[3]	48.8	LOS D	6.9	49.0	0.97	0.79	11.1
Approach		732	1.0	1.000	31.3	LOS C	7.2	50.6	0.78	0.65	14.8
North: Harbour St (North)											
7	L	414	1.0	0.302	7.7	LOS A	4.5	31.8	0.29	0.63	33.5
9	R	821	1.0	0.942	77.2	LOS F	29.1	205.5	1.00	1.15	8.4
Approach		1235	1.0	0.942	53.9	LOS D	29.1	205.5	0.76	0.98	11.3
West: Pier St (West)											
10	L	618	1.0	0.400	25.2	LOS B	12.0	84.5	0.66	0.74	29.5
11	T	278	1.0	0.415	44.4	LOS D	6.8	47.8	0.94	0.75	21.5
Approach		896	1.0	0.415	31.2	LOS C	12.0	84.5	0.75	0.75	26.5
All Vehicles		3302	1.0	1.000	42.4	LOS C	29.1	205.5	0.79	0.81	17.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	131	21.6	LOS C	0.3	0.3	0.63	0.63
P3	Across E approach	308	45.5	LOS E	0.9	0.9	0.91	0.91
P5	Across N approach	131	49.2	LOS E	0.4	0.4	0.95	0.95
P7	Across W approach	68	49.2	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		638	41.7	LOS E			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Harbour St / Liverpool St - ExistingSat - Optimum Cycle Time

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Harbour St (South)											
2	T	1182	1.0	0.532	20.5	LOS B	18.4	129.7	0.73	0.64	32.3
Approach		1182	1.0	0.532	20.5	LOS B	18.4	129.7	0.73	0.64	32.3
East: Liverpool Street (East)											
4	L	235	1.0	0.519	45.5	LOS D	11.0	77.8	0.92	0.82	16.3
6	R	378	1.0	0.418	44.4	LOS D	8.6	60.7	0.89	0.80	16.5
Approach		613	1.0	0.519	44.8	LOS D	11.0	77.8	0.90	0.81	16.4
North: Harbour St (North)											
8	T	1025	1.0	0.366	19.1	LOS B	11.4	80.4	0.67	0.58	33.1
Approach		1025	1.0	0.366	19.1	LOS B	11.4	80.4	0.67	0.58	33.1
West: Car Park Exit (West)											
10	L	100	1.0	0.497	58.2	LOS E	5.3	37.2	0.99	0.78	12.6
12	R	100	1.0	0.497	58.2	LOS E	5.3	37.2	0.99	0.78	12.5
Approach		200	1.0	0.497	58.2	LOS E	5.3	37.2	0.99	0.78	12.6
All Vehicles		3020	1.0	0.532	27.5	LOS B	18.4	129.7	0.76	0.66	27.7

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	22	18.6	LOS B	0.0	0.0	0.58	0.58
All Pedestrians		22	18.6	LOS B			0.58	0.58

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

APPENDIX D

Detailed AIMSUN Results

OVERALL LOS

Friday

ID	Intersection	Control Type	Friday - Non Event (Existing)		Friday - Event	
			Overall Average Day	Overall LoS	Overall Average Day	Overall LoS
I-1	Darling Drive / Murray Street	Signals	30.9	C	29.5	C
I-2	Darling Drive / Pier Street	Roundabout	1.5	A	9.3	A
I-3	Darling Drive / Quay Street	Signals	20.2	B	20.1	B
I-4	Harbour Street / Pier Street	Signals	32.4	C	41.8	C
I-5	Harbour Street / Liverpool Street	Signals	51.6	D	93.9	F
I-6	Harbour Street / Day Street	Signals	18.7	B	18.9	B
I-7	Goulburn Street / Sussex Street	Signals	495.3	F	549.0	F
I-8	Goulburn Street / George Street	Signals	114.6	F	185.1	F
I-9	Sussex Street / Hay Street	Signals	13.9	A	12.9	A
I-10	George Street / Hay Street	Signals	20.2	B	120.6	F
I-12	Darling Drive / Car park entrance	Priority			2.7	A
I-13	Darling Drive / Car park exit	Priority			133.1	F
I-15	Harbour Street / Car park access	Priority			28.0	B
I-16	Harbour Street / Car park access	Priority			2.5	A

Saturday

ID	Intersection	Control Type	Friday - Non Event (Existing)		Friday - Event	
			Overall Average Day	Overall LoS	Overall Average Day	Overall LoS
I-1	Darling Drive / Murray Street	Signals	33.0	C	172.0	F
I-2	Darling Drive / Pier Street	Roundabout	1.9	A	5.3	A
I-3	Darling Drive / Quay Street	Signals	21.0	B	17.6	B
I-4	Harbour Street / Pier Street	Signals	29.0	C	33.2	C
I-5	Harbour Street / Liverpool Street	Signals	53.6	D	122.5	F
I-6	Harbour Street / Day Street	Signals	20.2	B	229.5	F
I-7	Goulburn Street / Sussex Street	Signals	305.7	F	288.2	F
I-8	Goulburn Street / George Street	Signals	30.2	C	32.9	C
I-9	Sussex Street / Hay Street	Signals	13.8	A	13.4	A
I-10	George Street / Hay Street	Signals	8.7	A	10.0	A
I-12	Darling Drive / Car park entrance	Priority			0.8	A
I-13	Darling Drive / Car park exit	Priority			68.5	E
I-15	Harbour Street / Car park access	Priority			4.3	A
I-16	Harbour Street / Car park access	Priority			0.7	A

DETAILED LOS BY MOVEMENT

Friday Non-event (Existing)

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Darling Drive / Murray Street (I-1)	North-Right	49.7	3.0	24.0	LOS D	C
	North-Through	47.7	3.0	24.0	LOS D	
	North-Left	31.0	3.0	24.0	LOS C	
	East-Right	23.4	2.0	16.0	LOS B	
	East-Through	13.8	2.0	16.0	LOS A	
	East-Left	1.3	2.2	17.6	LOS A	
	South-Right	50.2	4.6	36.8	LOS D	
	South-Through	48.8	2.1	16.8	LOS D	
	South-Left	50.1	5.0	40.0	LOS D	
	West-Right	56.0	9.4	75.2	LOS E	
	West-Through	27.1	5.2	41.6	LOS B	
	West-Left	36.2	5.0	40.0	LOS C	
Darling Drive / Pier Street (I-2)	East-Entrance	2.8	3.0	24.0	LOS A	A
	East-Entrance	0.1	0.0	0.0	LOS A	
	East-Exit to RB	1.8	2.4	19.2	LOS A	
	East-Left	1.1	2.0	16.0	LOS A	
	North-Entrance	0.4	0.0	0.0	LOS A	
	North-Exit	4.6	6.6	52.8	LOS A	
	South-Entrance	0.2	0.0	0.0	LOS A	
Darling Drive / Quay Street (I-3)	South-Exit	20.7	6.0	48.0	LOS B	B
	North-Left	3.0	0.8	6.4	LOS A	
	East-Right	47.6	2.2	17.6	LOS D	
	East-Left	45.1	3.2	25.6	LOS D	
	South-Right	51.0	2.4	19.2	LOS D	
	South-Through	10.5	2.5	20.0	LOS A	
Harbour Street / Pier Street (I-4)	North-Right	13.1	2.0	16.0	LOS A	C
	North-Left	8.5	4.0	32.0	LOS A	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
	East-Right	45.5	4.0	32.0	LOS D	
	East-Through	23.8	3.7	29.6	LOS B	
	South-Right	93.2	9.6	76.8	LOS F	
	South-Through	68.0	5.9	47.5	LOS E	
	South-Left	63.5	8.2	65.6	LOS E	
	West-Through	46.6	4.1	32.8	LOS D	
Harbour Street / Liverpool Street (I-5)	North-Through	33.7	7.8	62.4	LOS C	D
	East-Right	39.1	4.6	36.8	LOS C	
	East-Left	134.3	11.8	94.4	LOS F	
	South-Through	40.6	18.2	145.6	LOS C	
	South-Through	40.6	18.2	145.6	LOS C	
Harbour Street / Day Street (I-6)	North-Through	27.1	4.9	38.9	LOS B	B
	East-Left	46.5	2.4	19.2	LOS D	
	South-Right	36.5	14.4	115.2	LOS C	
	South-Through	8.1	14.3	114.4	LOS A	
Goulburn Street / Sussex Street (I-7)	North-Right	1024.8	14.2	113.6	LOS F	F
	North-Through	1068.1	13.9	111.2	LOS F	
	North-Left	1853.5	11.5	92.0	LOS F	
	East-Through	41.4	10.9	87.2	LOS C	
	East-Left	29.6	4.4	35.2	LOS C	
	West-Through	66.0	17.9	143.2	LOS E	
Goulburn Street / George Street (I-8)	North-Through	27.1	7.6	60.8	LOS B	F
	North-Left	32.3	11.6	92.8	LOS C	
	East-Through	439.0	5.8	46.4	LOS F	
	East-Left	443.6	3.2	25.6	LOS F	
	South-through	56.7	17.5	139.7	LOS E	
	South-Left	76.9	6.8	54.4	LOS F	
	West-Through	29.8	10.9	87.2	LOS C	
	West-Left	31.6	5.4	43.2	LOS C	
Sussex Street / Hay Street (I-9)	North-Right	11.4	8.8	70.4	LOS A	A

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
	North-Through	14.4	14.8	118.4	LOS B	
	East-Through	15.1	4.0	32.0	LOS B	
George Street / Hay Street (I-10)	North-Through	7.7	9.9	78.9	LOS A	B
	South-Through	25.6	8.6	68.8	LOS B	
	South-Left	35.2	10.4	83.2	LOS C	

Friday Event

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Darling Drive / Murray Street (I-1)	North-Right	52.3	2.6	20.8	LOS D	C
	North-Through	56.4	3.0	24.0	LOS E	
	North-Left	29.8	3.0	24.0	LOS C	
	East-Right	23.0	2.0	16.0	LOS B	
	East-Through	6.5	2.0	16.0	LOS A	
	East-Left	0.5	0.2	1.6	LOS A	
	South-Right	51.8	5.6	44.8	LOS D	
	South-Through	49.9	2.5	20.0	LOS D	
	South-Left	51.1	6.2	49.6	LOS D	
	West-Right	90.8	12.4	99.2	LOS F	
	West-Through	33.5	11.5	92.0	LOS C	
	West-Left	40.7	5.4	43.2	LOS C	
Darling Drive / Pier Street (I-2)	East-Entrance	11.9	3.2	25.6	LOS A	A
	East-Entrance	0.8	1.8	14.4	LOS A	
	East-Exit to RB	1.8	2.6	20.8	LOS A	
	East-Left	4.4	6.9	55.2	LOS A	
	North-Entrance	0.9	2.8	22.4	LOS A	
	North-Exit	60.4	8.2	65.6	LOS E	
	South-Entrance	0.3	0.8	6.4	LOS A	
Darling Drive / Quay Street (I-3)	South-Exit	19.7	5.8	46.4	LOS B	B
	North-Left	1.9	0.0	0.0	LOS A	
	East-Right	45.1	2.8	22.4	LOS D	
	East-Left	53.0	1.0	8.0	LOS D	
	South-Right	46.3	2.4	19.2	LOS D	
	South-Through	17.4	6.5	52.0	LOS B	
Harbour Street / Pier Street (I-4)	North-Right	13.2	2.0	16.0	LOS A	C
	North-Left	12.0	4.0	32.0	LOS A	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
	East-Right	56.6	4.2	33.6	LOS E	
	East-Through	23.6	3.8	30.4	LOS B	
	South-Right	120.0	10.8	86.4	LOS F	
	South-Through	107.1	6.4	51.2	LOS F	
	South-Left	83.7	8.4	67.2	LOS F	
	West-Through	54.1	4.6	36.8	LOS D	
Harbour Street / Liverpool Street (I-5)	North-Through	42.5	11.5	92.3	LOS D	F
	East-Right	37.6	4.6	36.8	LOS C	
	East-Left	463.2	12.0	96.0	LOS F	
	South-Through	46.0	18.3	146.4	LOS D	
	South-Through	46.0	18.3	146.4	LOS D	
Harbour Street / Day Street (I-6)	North-Through	28.0	6.9	55.5	LOS B	B
	East-Left	37.7	2.2	17.6	LOS C	
	South-Right	37.3	13.4	107.2	LOS C	
	South-Through	8.3	14.9	119.2	LOS A	
Goulburn Street / Sussex Street (I-7)	North-Right	1093.8	13.4	107.2	LOS F	F
	North-Through	1207.5	12.9	103.2	LOS F	
	North-Left	1962.0	11.4	91.2	LOS F	
	East-Through	56.4	10.7	85.6	LOS E	
	East-Left	42.7	5.8	46.4	LOS D	
	West-Through	73.1	18.1	144.8	LOS F	
Goulburn Street / George Street (I-8)	North-Through	27.6	9.2	73.6	LOS B	F
	North-Left	30.9	10.2	81.6	LOS C	
	East-Through	894.9	5.8	46.4	LOS F	
	East-Left	929.4	2.4	19.2	LOS F	
	South-through	66.6	18.9	150.9	LOS E	
	South-Left	90.5	7.8	62.4	LOS F	
	West-Through	29.7	10.9	87.2	LOS C	
	West-Left	33.0	5.0	40.0	LOS C	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Sussex Street / Hay Street (I-9)	North-Right	10.3	9.0	72.0	LOS A	A
	North-Through	13.2	13.8	110.4	LOS A	
	East-Through	13.7	4.0	32.0	LOS A	
George Street / Hay Street (I-10)	North-Through	7.6	10.2	81.6	LOS A	F
	South-Through	169.5	8.8	70.4	LOS F	
	South-Left	205.8	10.6	84.8	LOS F	
Darling Drive / Car park entrance (I-12)	North-Left	0.6	0.0	0.0	LOS A	A
	North-Through	0.0	0.0	0.0	LOS A	
	South-Right	9.7	3.4	27.2	LOS A	
	South-Through	3.8	8.8	70.4	LOS A	
Darling Drive / Car park exit (I-13)	East-Left	44.3	3.6	28.8	LOS D	F
	East-Right	1875.4	4.8	38.4	LOS F	
	North-Through	0.0	0.2	1.6	LOS A	
	South-Through	2.3	7.0	56.0	LOS A	
Harbour Street / Car park access (I-15)	South-Through	25.3	10.9	86.9	LOS B	B
	South-Left	34.5	6.4	51.2	LOS C	
	West-Left	67.9	3.4	27.2	LOS E	
Harbour Street / Car park access (I-16)	South-Through	1.9	3.7	29.9	LOS A	A
	South-Left	4.9	2.4	19.2	LOS A	
	West-Left	11.0	1.4	11.2	LOS A	

Saturday Non-event (Existing)

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Darling Drive / Murray Street (I-1)	North-Right	53.5	3.0	24.0	LOS D	C
	North-Through	50.8	3.0	24.0	LOS D	
	North-Left	31.1	3.0	24.0	LOS C	
	East-Right	24.7	2.0	16.0	LOS B	
	East-Through	9.8	2.0	16.0	LOS A	
	East-Left	1.1	2.4	19.2	LOS A	
	South-Right	52.1	5.0	40.0	LOS D	
	South-Through	49.7	3.5	28.0	LOS D	
	South-Left	52.0	5.0	40.0	LOS D	
	West-Right	75.4	12.8	102.4	LOS F	
	West-Through	29.9	5.9	47.2	LOS C	
	West-Left	43.9	13.8	110.4	LOS D	
Darling Drive / Pier Street (I-2)	East-Entrance	2.9	3.0	24.0	LOS A	A
	East-Entrance	0.1	0.0	0.0	LOS A	
	East-Exit to RB	1.7	2.8	22.4	LOS A	
	East-Left	1.0	2.2	17.6	LOS A	
	North-Entrance	0.4	0.0	0.0	LOS A	
	North-Exit	8.5	7.8	62.4	LOS A	
	South-Entrance	0.2	0.0	0.0	LOS A	
Darling Drive / Quay Street (I-3)	South-Exit	21.2	6.7	53.6	LOS B	B
	North-Left	2.8	1.2	9.6	LOS A	
	East-Right	47.2	3.0	24.0	LOS D	
	East-Left	48.7	3.4	27.2	LOS D	
	South-Right	48.7	2.8	22.4	LOS D	
	South-Through	11.1	2.7	21.6	LOS A	
Harbour Street / Pier Street (I-4)	North-Right	13.7	2.0	16.0	LOS A	C
	North-Left	4.2	4.2	33.6	LOS A	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
	East-Right	42.2	4.0	32.0	LOS D	
	East-Through	19.4	3.5	28.0	LOS B	
	South-Right	67.2	9.2	73.6	LOS E	
	South-Through	58.5	5.3	42.7	LOS E	
	South-Left	56.4	8.4	67.2	LOS E	
	West-Through	46.2	3.1	24.8	LOS D	
Harbour Street / Liverpool Street (I-5)	North-Through	87.1	19.1	153.1	LOS F	D
	East-Right	40.1	6.9	55.2	LOS C	
	East-Left	102.7	12.2	97.6	LOS F	
	South-Through	36.4	17.4	139.2	LOS C	
	South-Through	36.4	17.4	139.2	LOS C	
Harbour Street / Day Street (I-6)	North-Through	32.9	7.1	56.5	LOS C	B
	East-Left	43.7	1.6	12.8	LOS D	
	South-Right	36.3	12.8	102.4	LOS C	
	South-Through	6.9	13.6	108.8	LOS A	
Goulburn Street / Sussex Street (I-7)	North-Right	512.8	11.6	92.8	LOS F	F
	North-Through	548.6	12.6	100.8	LOS F	
	North-Left	1002.2	11.9	95.2	LOS F	
	East-Through	14.7	10.2	81.6	LOS B	
	East-Left	15.3	4.4	35.2	LOS B	
	West-Through	50.4	17.4	139.2	LOS D	
Goulburn Street / George Street (I-8)	North-Through	25.6	5.9	46.9	LOS B	C
	North-Left	27.6	6.8	54.4	LOS B	
	East-Through	32.7	5.1	40.8	LOS C	
	East-Left	32.9	3.2	25.6	LOS C	
	South-through	31.3	11.0	88.0	LOS C	
	South-Left	32.8	4.2	33.6	LOS C	
	West-Through	30.1	10.9	87.2	LOS C	
	West-Left	34.9	5.8	46.4	LOS C	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Sussex Street / Hay Street (I-9)	North-Right	11.4	9.8	78.4	LOS A	A
	North-Through	14.1	15.6	124.8	LOS B	
	East-Through	15.2	4.0	32.0	LOS B	
George Street / Hay Street (I-10)	North-Through	7.1	7.3	58.1	LOS A	A
	South-Through	9.0	4.5	36.3	LOS A	
	South-Left	11.4	6.4	51.2	LOS A	

Saturday Event

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Darling Drive / Murray Street (I-1)	North-Right	52.3	3.0	24.0	LOS D	F
	North-Through	52.6	3.0	24.0	LOS D	
	North-Left	31.0	3.0	24.0	LOS C	
	East-Right	24.4	2.0	16.0	LOS B	
	East-Through	7.1	2.0	16.0	LOS A	
	East-Left	0.5	0.6	4.8	LOS A	
	South-Right	51.2	5.0	40.0	LOS D	
	South-Through	52.0	3.4	27.2	LOS D	
	South-Left	49.5	5.6	44.8	LOS D	
	West-Right	443.4	12.2	97.6	LOS F	
	West-Through	367.9	11.1	88.8	LOS F	
	West-Left	400.5	12.2	97.6	LOS F	
Darling Drive / Pier Street (I-2)	East-Entrance	8.3	3.0	24.0	LOS A	A
	East-Entrance	0.2	0.2	1.6	LOS A	
	East-Exit to RB	3.2	2.8	22.4	LOS A	
	East-Left	3.7	4.5	36.0	LOS A	
	North-Entrance	0.5	0.0	0.0	LOS A	
	North-Exit	26.5	8.2	65.6	LOS B	
	South-Entrance	0.4	0.0	0.0	LOS A	
Darling Drive / Quay Street (I-3)	South-Exit	22.2	8.8	70.4	LOS B	B
	North-Left	4.5	1.6	12.8	LOS A	
	East-Right	45.6	1.0	8.0	LOS D	
	East-Left	52.7	1.0	8.0	LOS D	
	South-Right	49.8	1.6	12.8	LOS D	
	South-Through	11.0	3.5	28.0	LOS A	
Harbour Street / Pier Street (I-4)	North-Right	16.9	2.2	17.6	LOS B	C
	North-Left	2.8	4.0	32.0	LOS A	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
	East-Right	45.1	4.0	32.0	LOS D	
	East-Through	20.0	3.5	28.0	LOS B	
	South-Right	70.8	9.2	73.6	LOS F	
	South-Through	63.6	5.2	41.6	LOS E	
	South-Left	64.6	9.0	72.0	LOS E	
	West-Through	46.2	3.2	25.6	LOS D	
Harbour Street / Liverpool Street (I-5)	North-Through	308.8	21.5	172.3	LOS F	F
	East-Right	43.1	8.6	68.8	LOS D	
	East-Left	480.8	12.4	99.2	LOS F	
	South-Through	38.5	18.5	148.0	LOS C	
	South-Through	38.5	18.5	148.0	LOS C	
Harbour Street / Day Street (I-6)	North-Through	792.8	7.8	62.4	LOS F	F
	East-Left	49.9	1.8	14.4	LOS D	
	South-Right	36.0	12.0	96.0	LOS C	
	South-Through	7.0	14.4	115.2	LOS A	
Goulburn Street / Sussex Street (I-7)	North-Right	456.8	12.0	96.0	LOS F	F
	North-Through	516.4	12.9	103.2	LOS F	
	North-Left	934.5	12.0	96.0	LOS F	
	East-Through	21.2	10.7	85.6	LOS B	
	East-Left	20.5	4.2	33.6	LOS B	
	West-Through	42.3	17.0	136.0	LOS D	
Goulburn Street / George Street (I-8)	North-Through	25.0	6.0	48.0	LOS B	C
	North-Left	30.1	8.4	67.2	LOS C	
	East-Through	43.2	5.3	42.4	LOS D	
	East-Left	40.2	2.8	22.4	LOS C	
	South-through	32.6	11.1	89.1	LOS C	
	South-Left	36.4	6.2	49.6	LOS C	
	West-Through	30.6	10.9	87.2	LOS C	
	West-Left	32.6	5.6	44.8	LOS C	

Intersection	Approach/Turn	Average Delay Approach (second)	Approach Max. Queue (vehicles)	Approach Max. Queue (metres)	Approach LoS	Overall LoS
Sussex Street / Hay Street (I-9)	North-Right	11.3	8.6	68.8	LOS A	A
	North-Through	14.5	14.6	116.8	LOS B	
	East-Through	13.6	4.0	32.0	LOS A	
George Street / Hay Street (I-10)	North-Through	6.9	7.5	60.3	LOS A	A
	South-Through	9.9	4.8	38.4	LOS A	
	South-Left	15.1	9.6	76.8	LOS B	
Darling Drive / Car park entrance (I-12)	North-Left	0.6	0.0	0.0	LOS A	A
	North-Through	0.0	0.0	0.0	LOS A	
	South-Right	10.6	3.4	27.2	LOS A	
	South-Through	0.0	0.0	0.0	LOS A	
Darling Drive / Car park exit (I-13)	East-Left	8.3	2.6	20.8	LOS A	E
	East-Right	857.5	5.2	41.6	LOS F	
	North-Through	0.0	0.0	0.0	LOS A	
	South-Through	0.0	0.0	0.0	LOS A	
Harbour Street / Car park access (I-15)	South-Through	3.5	2.6	20.8	LOS A	A
	South-Left	7.4	3.4	27.2	LOS A	
	West-Left	16.8	1.2	9.6	LOS B	
Harbour Street / Car park access (I-16)	South-Through	0.4	0.1	0.5	LOS A	A
	South-Left	2.2	0.0	0.0	LOS A	
	West-Left	7.7	1.0	8.0	LOS A	

MODEL CALIBRATION RESULTS – APPENDIX

Friday Eixting

Intersection	Approach/Turn	Friday PM Peak 1 Hour (5:30-6:30)			
		Count	Modelled	% Diff	GEH
Darling Drive / Murray Street (I-1)	North-Right	89	94	6%	0.6
	North-Through	89	84	-6%	0.6
	North-Left	110	110	0%	0.0
	East-Right	223	239	7%	1.1
	East-Through	234	225	-4%	0.6
	East-Left	173	167	-3%	0.4
	South-Right	80	77	-4%	0.3
	South-Through	68	58	-14%	1.2
	South-Left	65	78	19%	1.5
	West-Right	152	166	9%	1.1
	West-Through	343	332	-3%	0.6
	West-Left	91	87	-5%	0.4
Darling Drive / Pier Street (I-2)	East-Entrance	445	469	5%	1.1
	East-Exit to RB	129	129	0%	0.0
Darling Drive / Quay Street (I-3)	South-Exit	314	330	5%	0.9
	North-Left	32	36	13%	0.7
	East-Right	36	38	6%	0.3
	East-Left	66	64	-3%	0.2
	South-Right	21	22	5%	0.2
	South-Through	292	290	-1%	0.1
Hurbour Street / Pier Street (I-4)	North-Right	786	781	-1%	0.2
	North-Left	522	510	-2%	0.5
	East-Right	506	483	-4%	1.0
	East-Through	436	473	8%	1.7
	South-Right	96	97	1%	0.1
	South-Through	261	286	9%	1.5
	South-Left	111	126	13%	1.3
	West-Through	419	361	-14%	2.9
Hurbour Street / Liverpool Street (I-5)	North-Through	904	695	-23%	7.4
	East-Right	169	172	2%	0.2
	East-Left	536	511	-5%	1.1

Intersection	Approach/Turn	Friday PM Peak 1 Hour (5:30-6:30)			
	South-Through	1530	1483	-3%	1.2
	South-Through	1530	1483	-3%	1.2
Goulburn Street / Sussex Street (I-7)	North-Right	259	156	-40%	7.2
	North-Through	840	502	-40%	13.0
	North-Left	735	330	-55%	17.5
	East-Through	887	798	-10%	3.1
	East-Left	108	81	-25%	2.8
	West-Through	956	976	2%	0.6
Goulburn Street / George Street (I-8)	North-Through	885	880	-1%	0.2
	North-Left	241	256	6%	1.0
	East-Through	946	790	-16%	5.3
	East-Left	106	96	-9%	1.0
	South-through	1453	1347	-7%	2.8
	South-Left	95	79	-17%	1.7
	West-Through	1480	1155	-22%	8.9
	West-Left	172	132	-23%	3.3
Sussex Street / Hay Street (I-9)	North-Right	142	218	53%	5.6
	North-Through	254	367	45%	6.4
	East-Through	323	294	-9%	1.7
George Street / Hay Street (I-10)	North-Through	1020	970	-5%	1.6
	South-Through	1405	1416	1%	0.3
	South-Left	318	294	-7%	1.4
UK Design Manual criteria for acceptable model performance					
1)				Target	Achieve
Links with difference in flow within 100 vph for flows <700 vph				85%	97%
Links with difference in flow within 15% for flows between 700 and 1700 vph				85%	64%
Links with difference in flow within 400 vph for flows >1700 vph				85%	n/a
2)					
links with GEH Statistic < 5				85%	85%
Note:					
Large traffic flow difference is obserbed at Goulburn Street / Sussex Street (I-7) and Sussex Street / Hay Street (I-9) due to up and down stream congestion. However, it does not impact the study area.					

Saturday Existing

Intersection	Approach/Turn	Saturday PM Peak 1 Hour (6:00-7:00)			
		Count	Modelled	% Diff	GEH
Darling Drive / Murray Street (I-1)	North-Right	116	108	-7%	0.8
	North-Through	99	95	-4%	0.4
	North-Left	125	137	10%	1.1
	East-Right	217	230	6%	0.9
	East-Through	337	368	9%	1.6
	East-Left	246	281	14%	2.1
	South-Right	81	80	-1%	0.1
	South-Through	127	130	3%	0.3
	South-Left	90	88	-2%	0.2
	West-Right	178	179	1%	0.1
	West-Through	346	345	0%	0.1
	West-Left	351	350	0%	0.1
Darling Drive / Pier Street (I-2)	East-Entrance	604	651	8%	1.9
	East-Exit to RB	175	183	5%	0.6
Darling Drive / Quay Street (I-3)	South-Exit	323	369	14%	2.5
	North-Left	33	39	17%	1.0
	East-Right	37	34	-9%	0.6
	East-Left	68	70	4%	0.3
	South-Right	22	25	17%	0.7
	South-Through	300	295	-2%	0.3
Harbour Street / Pier Street (I-4)	North-Right	821	822	0%	0.0
	North-Left	414	412	-1%	0.1
	East-Right	340	416	22%	3.9
	East-Through	392	449	15%	2.8
	South-Right	88	109	23%	2.1
	South-Through	219	267	22%	3.1
	South-Left	132	167	27%	2.9
	West-Through	278	282	1%	0.2
Harbour Street / Liverpool Street (I-5)	North-Through	1025	927	-10%	3.1
	East-Right	378	377	0%	0.0
	East-Left	235	234	0%	0.0
	South-Through	1182	1308	11%	3.6
	South-Through	1182	1308	11%	3.6

Intersection	Approach/Turn	Saturday PM Peak 1 Hour (6:00-7:00)			
Goulburn Street / Sussex Street (I-7)	North-Right	194	164	-15%	2.2
	North-Through	630	522	-17%	4.5
	North-Left	551	384	-30%	7.7
	East-Through	665	690	4%	1.0
	East-Left	81	75	-7%	0.7
	West-Through	717	805	12%	3.2
Goulburn Street / George Street (I-8)	North-Through	664	679	2%	0.6
	North-Left	181	178	-2%	0.2
	East-Through	710	696	-2%	0.5
	East-Left	80	77	-3%	0.3
	South-through	1090	1015	-7%	2.3
	South-Left	71	63	-12%	1.0
	West-Through	1110	1060	-4%	1.5
	West-Left	129	120	-7%	0.8
Sussex Street / Hay Street (I-9)	North-Right	142	233	64%	6.6
	North-Through	254	365	44%	6.3
	East-Through	323	314	-3%	0.5
George Street / Hay Street (I-10)	North-Through	765	755	-1%	0.4
	South-Through	1054	1065	1%	0.3
	South-Left	318	313	-2%	0.3
UK Design Manual criteria for acceptable model performance					
1)				Target	Achieve
Links with difference in flow within 100 vph for flows <700 vph				85%	98%
Links with difference in flow within 15% for flows between 700 and 1700 vph				85%	100%
Links with difference in flow within 400 vph for flows >1700 vph				85%	n/a
2)					
links with GEH Statistic < 5				85%	94%