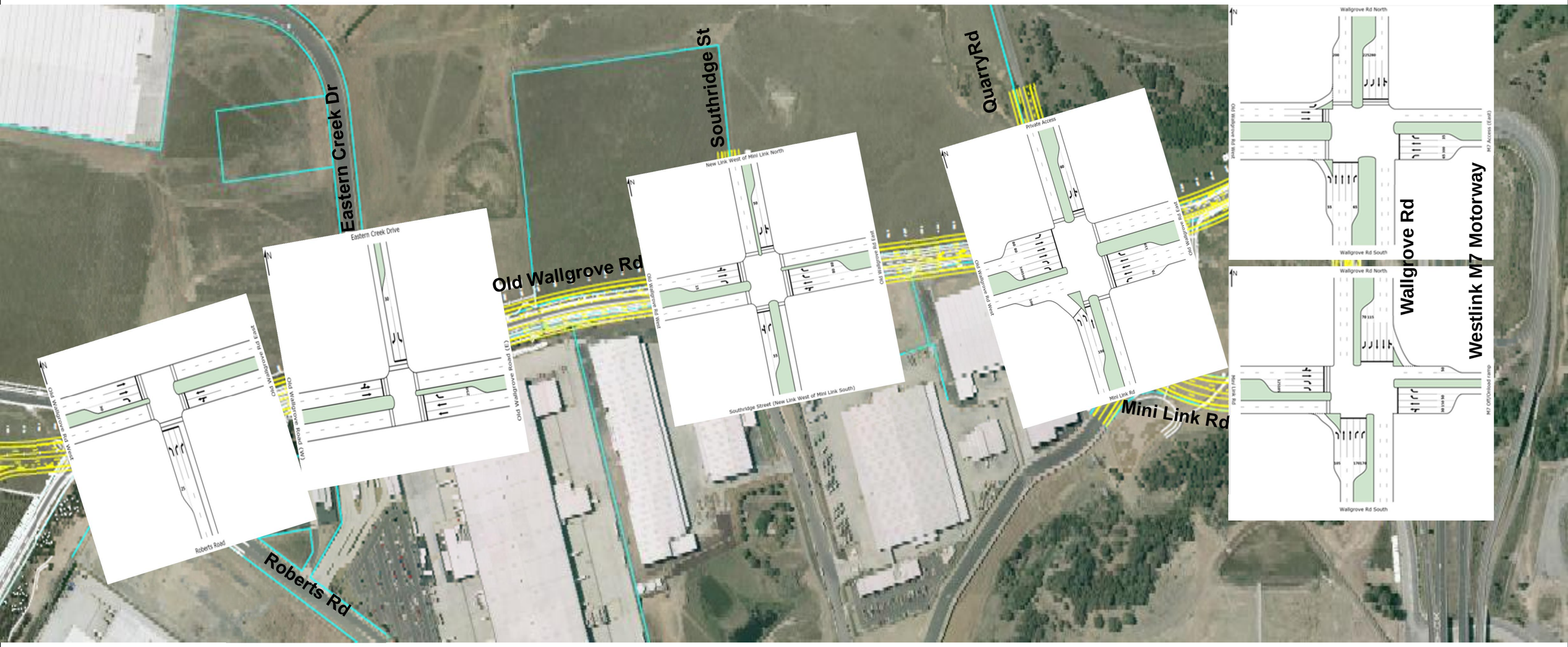
Appendix A

Recommended Intersection Layouts

Year 2021 Recommended Intersection Layouts



Appendix B

Intersection Analysis – Existing Conditions

Summary Results

Old Wallgrove Road – Roberts Road (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Roberts - Old Wallgrove_AM

Old Wallgrove Road / Roberts Road Intersection
2011 (AM peak) (current configuration - Access Road (North) has been fenced off)
Giveway / Yield (Two-Way)

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: Roberts Road											
1	L	1	0.0	0.001	10.4	LOS A	0.0	0.0	0.32	0.58	52.6
2	T	1	0.0	0.175	19.9	LOS B	0.7	7.4	0.60	0.74	43.3
3	R	43	69.8	0.175	24.1	LOS B	0.7	7.4	0.60	0.88	42.7
Approach		45	66.7	0.175	23.7	LOS B	0.7	7.4	0.60	0.87	42.9
East: Old Wallgrove Road (E)											
4	L	82	52.4	0.099	11.4	LOS A	0.4	3.6	0.16	0.56	53.6
5	T	149	24.8	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
6	R	1	0.0	0.001	10.0	LOS A	0.0	0.0	0.17	0.65	53.1
Approach		232	34.5	0.099	4.1	NA	0.4	3.6	0.06	0.20	63.1
North: Access Road											
7	L	1	0.0	0.001	10.1	LOS A	0.0	0.0	0.17	0.63	53.0
Approach		1	0.0	0.001	10.1	LOS A	0.0	0.0	0.17	0.63	53.0
West: Old Wallgrove Road (W)											
10	L	1	0.0	0.034	9.8	LOS A	0.0	0.0	0.00	1.21	53.9
11	T	46	87.4	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
12	R	1	0.0	0.001	10.4	LOS A	0.0	0.0	0.27	0.62	52.5
Approach		48	64.6	0.034	0.4	NA	0.0	0.0	0.01	0.04	69.1
All Vehicles		326	43.3	0.175	6.3	NA	0.7	7.4	0.12	0.27	60.0

Old Wallgrove Road – Roberts Road (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Roberts - Old Wallgrove_PM

Old Wallgrove Road / Roberts Road Intersection
2011 (PM peak) (current configuration - Access Road (North) has been fenced off)
Giveway / Yield (Two-Way)

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: Roberts Road											
1	L	1	0.0	0.001	9.7	LOS A	0.0	0.0	0.18	0.59	53.5
2	T	1	0.0	0.179	11.5	LOS A	0.8	6.5	0.41	0.63	51.6
3	R	96	28.1	0.179	13.8	LOS A	0.8	6.5	0.41	0.72	50.6
Approach		98	27.8	0.179	13.8	LOS A	0.8	6.5	0.41	0.72	50.7
East: Old Wallgrove Road (E)											
4	L	101	38.8	0.109	10.9	LOS A	0.4	3.7	0.17	0.55	53.6
5	T	15	26.7	0.009	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
6	R	1	0.0	0.001	10.1	LOS A	0.0	0.0	0.18	0.64	53.0
Approach		117	36.8	0.109	9.5	NA	0.4	3.7	0.15	0.48	55.2
North: Access Road											
7	L	1	0.0	0.001	10.1	LOS A	0.0	0.0	0.18	0.63	53.0
Approach		1	0.0	0.001	10.1	LOS A	0.0	0.0	0.18	0.63	53.0
West: Old Wallgrove Road (W)											
10	L	1	0.0	0.044	9.8	LOS A	0.0	0.0	0.00	1.22	53.9
11	T	85	0.0	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
12	R	1	0.0	0.001	9.9	LOS A	0.0	0.0	0.07	0.68	53.5
Approach		87	0.0	0.044	0.2	NA	0.0	0.0	0.00	0.02	69.5
All Vehicles		303	23.1	0.179	8.2	NA	0.8	6.5	0.19	0.43	56.9

Old Wallgrove Road – Eastern Creek Drive (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Eastern Creek Drive - Old Wallgrove_AM

Old Wallgrove Road / Eastern Creek Drive Intersection
2011 (AM Peak)
Giveway / Yield (Two-Way)

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
East: Old Wallgrove Road (E)											
5	T	211	36.0	0.199	0.9	LOS A	1.1	9.7	0.33	0.00	60.8
6	R	78	6.4	0.199	9.6	LOS A	1.1	9.7	0.33	0.98	49.0
Approach		289	28.0	0.199	3.2	NA	1.1	9.7	0.33	0.26	57.3
North: Eastern Creek Drive											
7	L	4	100.0	0.012	15.8	LOS B	0.0	0.5	0.41	0.65	43.3
9	R	1	0.0	0.012	12.4	LOS A	0.0	0.5	0.41	0.75	44.8
Approach		5	80.0	0.012	15.1	LOS B	0.0	0.5	0.41	0.67	43.6
West: Old Wallgrove Road (W)											
10	L	2	0.0	0.077	8.2	LOS A	0.0	0.0	0.00	1.37	49.0
11	T	100	75.0	0.077	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		102	73.5	0.077	0.2	NA	0.0	0.0	0.00	0.03	69.5
All Vehicles		396	40.4	0.199	2.6	NA	1.1	9.7	0.25	0.21	59.8

Old Wallgrove – Eastern Creek Drive (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Eastern Creek Drive - Old Wallgrove_PM

Old Wallgrove Road / Eastern Creek Drive Intersection
2011 (PM Peak)
Giveway / Yield (Two-Way)

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
East: Old Wallgrove Road (E)											
5	T	108	45.4	0.086	1.8	LOS A	0.6	6.1	0.43	0.00	59.3
6	R	11	45.5	0.086	12.1	LOS A	0.6	6.1	0.43	1.23	49.4
Approach		119	45.4	0.086	2.7	NA	0.6	6.1	0.43	0.11	58.3
North: Eastern Creek Drive											
7	L	63	4.8	0.067	9.4	LOS A	0.2	1.8	0.31	0.65	47.6
9	R	1	0.0	0.067	9.5	LOS A	0.2	1.8	0.31	0.76	47.6
Approach		64	4.7	0.067	9.4	LOS A	0.2	1.8	0.31	0.65	47.6
West: Old Wallgrove Road (W)											
10	L	2	0.0	0.104	8.2	LOS A	0.0	0.0	0.00	1.39	49.0
11	T	183	14.2	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		185	14.1	0.104	0.1	NA	0.0	0.0	0.00	0.01	69.7
All Vehicles		368	22.6	0.104	2.6	NA	0.6	6.1	0.19	0.16	61.1

Old Wallgrove Road – Southridge (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Southridge - Old Wallgrove_AM

Old Wallgrove Road / Southridge Street Intersection
2011 (AM Peak)
Giveway / Yield (Two-Way)

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: Southridge Street											
1	L	1	0.0	0.001	10.7	LOS A	0.0	0.0	0.45	0.59	48.1
3	R	50	54.0	0.366	43.7	LOS D	1.5	15.1	0.84	1.02	29.2
Approach		51	52.9	0.366	43.0	LOS D	1.5	15.1	0.84	1.02	29.4
East: Old Wallgrove Road (E)											
4	L	163	13.5	0.147	9.1	LOS A	0.5	4.2	0.31	0.46	52.1
5	T	286	28.7	0.174	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		449	23.2	0.174	3.3	NA	0.5	4.2	0.11	0.17	62.4
West: Old Wallgrove Road (W)											
11	T	102	75.5	0.079	1.7	LOS A	0.4	4.7	0.42	0.00	59.9
12	R	1	0.0	0.079	10.8	LOS A	0.4	4.7	0.42	1.12	54.3
Approach		103	74.8	0.079	1.8	NA	0.4	4.7	0.42	0.01	59.8
All Vehicles		603	34.5	0.366	6.4	NA	1.5	15.1	0.23	0.21	56.6

Old Wallgrove Road – Southridge (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Southridge - Old Wallgrove_PM

Old Wallgrove Road / Southridge Street Intersection
2011 (PM Peak)

Giveway / Yield (Two-Way)

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: Southridge Street											
1	L	2	0.0	0.002	9.4	LOS A	0.0	0.1	0.31	0.57	48.8
3	R	194	12.4	0.520	22.4	LOS B	3.2	24.8	0.72	1.06	38.8
Approach		196	12.2	0.520	22.3	LOS B	3.2	24.8	0.72	1.05	38.8
East: Old Wallgrove Road (E)											
4	L	49	63.3	0.089	10.5	LOS A	0.2	2.4	0.15	0.53	53.1
5	T	137	39.4	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		186	45.7	0.089	2.8	NA	0.2	2.4	0.04	0.14	64.7
West: Old Wallgrove Road (W)											
11	T	247	11.7	0.137	0.8	LOS A	0.9	6.8	0.34	0.00	61.5
12	R	1	0.0	0.137	10.0	LOS A	0.9	6.8	0.34	1.13	54.4
Approach		248	11.7	0.137	0.9	NA	0.9	6.8	0.34	0.00	61.4
All Vehicles		630	21.9	0.520	8.1	NA	3.2	24.8	0.37	0.37	52.8

Old Wallgrove Road – Quarry Road (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Quarry Road - Old Wallgrove_AM

Quarry Road / Old Wallgrove Road Intersection
2011 (AM Peak)
Giveway / Yield (Two-Way)

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
East: Old Wallgrove Road (E)											
5	T	447	23.0	0.329	3.7	LOS A	3.9	33.7	0.68	0.00	54.5
6	R	44	52.3	0.329	14.3	LOS A	3.9	33.7	0.68	1.12	48.8
Approach		491	25.7	0.329	4.7	NA	3.9	33.7	0.68	0.10	53.9
North: Quarry Road											
7	L	31	64.5	0.093	17.3	LOS B	0.3	3.4	0.51	0.74	42.5
9	R	2	50.0	0.093	17.2	LOS B	0.3	3.4	0.51	0.87	42.4
Approach		33	63.6	0.093	17.3	LOS B	0.3	3.4	0.51	0.76	42.5
West: Old Wallgrove Road (W)											
10	L	5	40.0	0.113	9.7	LOS A	0.0	0.0	0.00	1.54	49.0
11	T	148	68.2	0.113	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		153	67.3	0.113	0.3	NA	0.0	0.0	0.00	0.05	69.1
All Vehicles		677	36.9	0.329	4.3	NA	3.9	33.7	0.52	0.12	56.0

Old Wallgrove Road – Quarry Road (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Quarry Road - Old Wallgrove_PM

Old Wallgrove Road / Quarry Road Intersection
2011 (PM Peak)
Giveway / Yield (Two-Way)

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
East: Old Wallgrove Road (E)											
5	T	180	45.6	0.140	8.0	LOS A	1.9	18.7	0.75	0.00	52.2
6	R	8	62.5	0.140	19.0	LOS B	1.9	18.7	0.75	1.23	45.2
Approach		188	46.3	0.140	8.5	NA	1.9	18.7	0.75	0.05	51.9
North: Quarry Road											
7	L	52	36.5	0.124	15.5	LOS B	0.4	4.0	0.56	0.85	43.1
9	R	1	0.0	0.124	14.5	LOS A	0.4	4.0	0.56	0.88	43.0
Approach		53	35.8	0.124	15.5	LOS B	0.4	4.0	0.56	0.85	43.1
West: Old Wallgrove Road (W)											
10	L	1	0.0	0.237	8.2	LOS A	0.0	0.0	0.00	1.40	49.0
11	T	423	14.2	0.237	0.0	LOS A	0.0	0.0	0.00	0.00	70.0
Approach		424	14.2	0.237	0.0	NA	0.0	0.0	0.00	0.00	69.9
All Vehicles		665	25.0	0.237	3.6	NA	1.9	18.7	0.26	0.09	61.1

Old Wallgrove Road – Wallgrove Road (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Old Wallgrove - Wallgrove_AM

Old Wallgrove Road / Wallgrove Road Intersection
2011 (AM Peak)
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
1	L	178	29.0	0.506	11.9	LOS A	3.2	25.6	0.10	1.09	51.6
2	T	921	11.0	0.506	1.7	LOS A	3.2	25.6	0.10	0.11	65.6
3	R	6	66.0	0.506	13.3	LOS A	2.8	21.8	0.11	1.51	52.0
Approach		1105	14.2	0.506	3.4	LOS A	3.2	25.6	0.10	0.27	63.0
East: M7 Access (Southbound only)											
4	L	98	28.0	1.107	188.6	LOS F	21.0	187.3	1.00	1.41	10.0
5	T	89	37.0	1.107	178.4	LOS F	21.0	187.3	1.00	1.41	10.6
6	R	35	20.0	0.199	84.1	LOS E	1.9	15.8	0.95	0.74	22.9
Approach		222	30.3	1.107	164.9	LOS F	21.0	187.3	0.99	1.30	11.3
North: Wallgrove Road (N)											
7	L	121	28.0	0.911	19.2	LOS B	31.1	234.7	0.42	1.19	45.7
8	T	1019	7.0	0.911	9.0	LOS A	31.1	234.7	0.42	0.43	52.6
9	R	234	20.0	1.129	198.4	LOS F	32.5	266.4	1.00	1.41	9.5
Approach		1374	11.1	1.129	42.2	LOS C	32.5	266.4	0.52	0.67	30.1
West: Old Wallgrove Road											
10	L	77	67.0	1.117	200.4	LOS F	9.5	104.1	1.00	1.30	9.5
11	T	31	64.0	1.117	188.7	LOS F	9.5	106.2	1.00	1.30	10.1
12	R	57	72.0	1.117	200.5	LOS F	9.5	106.2	1.00	1.30	9.6
Approach		165	68.2	1.117	198.2	LOS F	9.5	106.2	1.00	1.30	9.6
All Vehicles		2866	17.1	1.129	45.7	LOS D	32.5	266.4	0.42	0.60	28.9

Old Wallgrove Road – Wallgrove Road (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Old Wallgrove - Wallgrove - PM

Old Wallgrove Road / Wallgrove Road Intersection
2011 (PM Peak)
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
1	L	70	51.4	0.590	13.3	LOS A	4.3	32.5	0.12	1.32	51.4
2	T	1215	4.4	0.590	2.1	LOS A	4.3	32.5	0.12	0.12	64.8
3	R	5	20.0	0.590	11.9	LOS A	4.2	30.9	0.13	1.35	51.6
Approach		1290	7.1	0.590	2.8	LOS A	4.3	32.5	0.12	0.19	63.9
East: M7 Access (Southbound only)											
4	L	16	31.3	0.719	79.0	LOS F	3.1	34.4	1.00	0.84	20.6
5	T	32	84.4	0.719	68.7	LOS E	3.1	34.4	1.00	0.84	21.5
6	R	8	37.5	0.109	73.2	LOS F	0.5	4.4	0.98	0.67	21.0
Approach		56	62.5	0.719	72.3	LOS F	3.1	34.4	1.00	0.81	21.2
North: Wallgrove Road (N)											
7	L	156	14.1	0.825	13.4	LOS A	15.4	113.7	0.31	1.10	50.5
8	T	813	4.7	0.825	5.0	LOS A	15.4	113.7	0.32	0.30	58.3
9	R	72	40.3	0.825	44.0	LOS D	5.0	43.9	0.56	0.99	29.7
Approach		1041	8.5	0.825	8.9	LOS A	15.4	113.7	0.34	0.47	53.7
West: Old Wallgrove Road											
10	L	269	10.0	0.810	65.2	LOS E	16.4	124.7	1.00	0.90	22.5
11	T	48	31.3	0.674	50.0	LOS D	11.9	98.0	0.98	0.83	25.4
12	R	165	17.0	0.674	59.7	LOS E	11.9	98.0	0.98	0.84	24.3
Approach		482	14.5	0.810	61.8	LOS E	16.4	124.7	0.99	0.87	23.4
All Vehicles		2869	9.9	0.825	16.3	LOS B	16.4	124.7	0.36	0.42	46.1

Wallgrove Road – Wonderland Drive (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Wonderland - Wallgrove_AM

1. Wonderland Drive / Wallgrove Road Intersection
2011 (AM Peak)
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
1	L	136	19.1	0.136	13.0	LOS A	2.0	16.6	0.32	0.69	49.2
2	T	935	15.7	0.857	33.7	LOS C	25.4	202.1	0.93	0.88	32.8
3	R	13	0.0	0.140	71.2	LOS F	0.8	5.4	0.98	0.68	21.1
Approach		1084	16.0	0.857	31.6	LOS C	25.4	202.1	0.85	0.85	34.0
East: Carpark Access											
4	L	4	25.0	0.045	60.2	LOS E	0.5	4.3	0.91	0.69	23.9
5	T	1	0.0	0.045	50.2	LOS D	0.5	4.3	0.91	0.62	23.4
6	R	5	20.0	0.045	59.9	LOS E	0.5	4.3	0.91	0.69	23.9
Approach		10	20.0	0.045	59.0	LOS E	0.5	4.3	0.91	0.68	23.9
North: Wallgrove Road (N)											
7	L	33	9.1	0.647	20.0	LOS B	12.6	98.1	0.37	1.18	44.1
8	T	1150	13.0	0.647	8.8	LOS A	12.6	98.1	0.37	0.34	53.3
9	R	373	8.3	0.851	63.4	LOS E	23.3	174.5	1.00	0.94	23.0
Approach		1556	11.8	0.851	22.1	LOS B	23.3	174.5	0.52	0.50	40.8
West: Wonderland Drive											
10	L	97	37.1	0.066	8.6	X	X	X	X	0.59	49.8
11	T	1	0.0	0.139	44.0	LOS D	1.9	17.9	0.87	0.66	25.2
12	R	64	40.8	0.139	53.9	LOS D	1.9	17.9	0.86	0.73	25.7
Approach		162	38.3	0.139	26.7	LOS B	1.9	17.9	0.35	0.65	36.0
All Vehicles		2812	15.0	0.857	26.2	LOS B	25.4	202.1	0.64	0.64	37.5

Wallgrove Road – Wonderland Drive (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Wonderland - Wallgrove_PM

1. Wonderland Drive / Wallgrove Road Intersection
2011 (PM Peak)
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
1	L	26	73.1	0.028	11.3	LOS A	0.1	1.4	0.13	0.63	53.2
2	T	1455	4.3	0.755	7.8	LOS A	17.8	129.4	0.46	0.42	54.2
3	R	4	25.0	0.051	71.7	LOS F	0.2	2.0	0.97	0.64	21.2
Approach		1485	5.6	0.755	8.0	LOS A	17.8	129.4	0.45	0.42	54.0
East: Carpark Access											
4	L	12	0.0	0.130	57.9	LOS E	1.9	13.0	0.91	0.74	24.1
5	T	1	0.0	0.130	49.0	LOS D	1.9	13.0	0.91	0.67	23.6
6	R	23	0.0	0.130	57.8	LOS E	1.9	13.0	0.91	0.73	24.2
Approach		36	0.0	0.130	57.6	LOS E	1.9	13.0	0.91	0.73	24.1
North: Wallgrove Road (N)											
7	L	5	40.0	0.456	24.2	LOS B	15.8	119.1	0.26	1.35	41.2
8	T	892	8.4	0.478	9.9	LOS A	15.8	119.1	0.27	0.24	52.6
9	R	52	25.0	0.660	76.4	LOS F	3.3	28.1	1.00	0.80	20.4
Approach		949	9.5	0.660	13.6	LOS A	15.8	119.1	0.31	0.28	48.5
West: Wonderland Drive											
10	L	337	3.0	0.185	7.7	X	X	X	X	0.60	49.8
11	T	1	0.0	0.242	44.8	LOS D	4.0	30.7	0.89	0.70	24.9
12	R	135	11.1	0.242	53.5	LOS D	4.0	30.7	0.88	0.76	25.5
Approach		473	5.3	0.242	20.8	LOS B	4.0	30.7	0.25	0.65	38.8
All Vehicles		2943	6.7	0.755	12.5	LOS A	17.8	129.4	0.38	0.42	48.5

Wallgrove Road South – M7 Access (2011 AM)

MOVEMENT SUMMARY — Site: 2011 Wallgrove - M7 Ramps (NB)_AM

M7 Ramps (NB) / Wallgrove Road Intersection
2011 (AM Peak)
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
2	T	884	10.9	0.540	13.2	LOS A	17.8	136.2	0.54	0.48	47.6
3	R	43	67.4	0.540	57.7	LOS E	10.0	84.5	0.84	0.84	25.9
Approach		927	13.5	0.540	15.3	LOS B	17.8	136.2	0.56	0.50	45.8
East: M7 Access (Northbound On/Off Ramps)											
4	L	19	36.8	0.067	14.0	LOS A	0.3	2.6	0.32	0.66	46.1
6	R	232	27.2	0.497	61.8	LOS E	6.4	55.5	0.97	0.80	23.5
Approach		251	27.9	0.497	58.2	LOS E	6.4	55.5	0.92	0.79	24.4
North: Wallgrove Road (N)											
7	L	34	79.4	0.029	9.8	X	X	X	X	0.59	49.8
8	T	1131	10.8	0.564	18.7	LOS B	21.3	162.9	0.70	0.63	42.4
Approach		1165	12.8	0.564	18.4	LOS B	21.3	162.9	0.68	0.63	42.6
All Vehicles		2343	14.7	0.564	21.4	LOS B	21.3	162.9	0.66	0.60	40.5

Wallgrove Road South – M7 Access (2011 PM)

MOVEMENT SUMMARY — Site: 2011 Wallgrove - M7 Ramps (NB)_ PM

M7 Ramps (NB) / Wallgrove Road Intersection
2011 (PM Peak)
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
2	T	1163	4.3	0.577	14.1	LOS A	20.8	150.7	0.59	0.53	46.5
3	R	69	5.8	0.577	40.3	LOS C	18.9	137.7	0.85	0.90	31.2
Approach		1232	4.4	0.577	15.6	LOS B	20.8	150.7	0.60	0.55	45.2
East: M7 Access (Northbound On/Off Ramps)											
4	L	2	50.0	0.008	13.7	LOS A	0.0	0.3	0.29	0.63	46.7
6	R	140	27.1	0.300	60.0	LOS E	3.7	32.3	0.93	0.77	23.9
Approach		142	27.5	0.300	59.3	LOS E	3.7	32.3	0.92	0.77	24.1
North: Wallgrove Road (N)											
7	L	101	18.8	0.062	8.1	X	X	X	X	0.60	49.8
8	T	862	5.9	0.587	30.2	LOS C	20.1	147.9	0.84	0.74	34.8
Approach		963	7.2	0.587	27.9	LOS B	20.1	147.9	0.75	0.73	35.8
All Vehicles		2357	7.0	0.587	23.4	LOS B	20.8	150.7	0.69	0.64	38.9

Appendix C

Calibration and Validation and Modelling Results

Summary Results

Regional Area Model – Strategic EMME model

Calibration and Validation

The calibration and validation of the AM and PM peak Base 2011 models was conducted with reference to industry practice and the approach agreed with RMS.

Criteria

Standard model calibration evaluation criteria were adopted, namely:

- GEH statistics for link and turning movement counts with at least 85 per cent of sites having GEH statistics less than 5. The GEH statistic is defined as:

$$GEH = \sqrt{\frac{(V_{observed} - V_{modelled})^2}{(0.5 \times (V_{observed} + V_{modelled}))}}$$

- Slope factors between 0.9 and 1.1; and,
- R^2 factors between 0.9 and 1.0.

Calibration results

Both the AM and PM Base 2011 models exceed standard target criteria set for the calibration and validation of the base model.

Summary results of the process are as follows:

- AM Peak Modelling Results Summary
  - Total Observed = 114,923
  - Total Modelled = 114,746
  - Difference = -177
  - Per Cent Difference = 0 per cent
  - GEH = 0.5
- PM Peak Modelling Results Summary
  - Total Observed = 108,699
  - Total Modelled = 108,784
  - Difference = 85
  - Per Cent Difference = 0 per cent
  - GEH = 0.3

Summary

GHD has developed an appropriate Sub Regional Base Year (SRB) network model for the purpose of replicating existing traffic conditions along Old Wallgrove Road and throughout the study area.

Key inputs and data sources used in the model included aerial photography, turning-movement and road link volume surveys, and trip matrices from RMS's cordoned strategic model for years 2007

and 2016, observed and RMS modelled travel time surveys, data obtained during site visits and trip generation rates obtained from surveys of similar existing sites.

The calibration and validation of the AM and PM peak Base 2011 models was conducted with reference to industry practice and the approach agreed with RMS. Both the AM and PM Base 2011 models exceed standard target criteria set for the calibration and validation of the base model.

Based on the observed findings in this process, the model has been demonstrated to be robust and suitable to be used for developing future study area network forecasts for the Old Wallgrove Road Traffic Study and providing data sets that are required for associated project analysis tasks (SIDRA and PARAMICS models).

Corridor Operations/Microsimulation Model

Model Calibration and Validation

The purpose of the calibration criterion for the PARAMICS Base models is to match the observed traffic volume information (intersection turning-movement surveys) with the following requirements for each hour of the AM and PM models:

- GEH statistics for individual intersection turning-movement volumes with no fewer than 85 per cent less than 5; and
- R^2 statistic between 0.9 and 1.0 and slope factors between 0.9 and 1.1, of modelled vs. observed flow plots.

In addition to the above GEH and R^2 criteria, the following criterion was also targeted for modelled intersection flows (which has been adopted from RTA PARAMICS Microsimulation Modelling Manual):

- For observed flows less than 700 vehicles per hour, at least 85 per cent of all individual flows to be within 100 vehicles per hour of observed flows.
- For observed flows between 700 and 2700 vehicles per hour, at least 85 per cent of all individual modelled flows to be within 15 per cent of observed flows.
- For observed flows greater than 2700 vehicles per hour, at least 85 per cent of all individual flows to be within 400 vehicles per hour of observed flows.

GHD has carried out the model calibration using 5 different seed values. The seed values used are the 5 recommended by RMS (28, 560, 2849, 7771 and 86524).

AM Peak Calibration Summary Statistics

	Per Cent GEH < 5	R^2	Slope	Flow < 700vph within 100vph	100vph < Flow < 2700vph within 15 Per Cent	2700vph < Flow within 400 vph
07:00 – 08:00	100%	0.9996	0.9674	100%	100%	100%
08:00 – 09:00	100%	0.9997	1.0080	100%	100%	100%
Meet Criteria?	✓	✓	✓	✓	✓	✓

PM Peak Calibration Summary Statistics

	Per Cent GEH < 5	R^2	Slope	Flow < 700vph within 100vph	100vph < Flow < 2700vph within 15 Per Cent	2700vph < Flow within 400 vph
16:00 – 17:00	100%	0.9998	0.9865	100%	100%	100%
17:00 – 18:00	100%	0.9995	1.0017	100%	100%	100%
Meet Criteria?	✓	✓	✓	✓	✓	✓

Summary

GHD has developed an accurate simulation model to replicate the existing conditions throughout the Old Wallgrove Road study area network. The calibration and validation of the AM and PM peak Base models was conducted with reference to good industry practice and the RTA's *PARAMICS Microsimulation Modelling Manual*. Both the AM and PM Base models exceed the targeted criteria for traffic volume calibration and travel time validation.

Appendix D

Intersection Analysis – 2021

Summary Results

Old Wallgrove Road – Roberts Road (2021 AM)

MOVEMENT SUMMARY — Site: 2021 Old Wallgrove - Roberts_AM

Old Wallgrove Road and Roberts Road
2021 AM Peak Hour
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Roberts Road											
1	L	58	14.0	0.622	62.6	LOS E	3.2	25.3	0.95	0.79	22.1
3	R	65	14.0	0.154	60.3	LOS E	1.7	13.6	0.93	0.73	22.6
Approach		123	14.0	0.622	61.4	LOS E	3.2	25.3	0.94	0.76	22.4
East: Old Wallgrove Rd East											
4	L	165	14.0	0.637	26.8	LOS B	20.2	158.0	0.65	0.91	35.9
5	T	1001	14.0	0.637	17.1	LOS B	20.2	158.0	0.62	0.56	38.9
Approach		1166	14.0	0.637	18.5	LOS B	20.2	158.0	0.62	0.61	38.5
West: Old Wallgrove Rd West											
11	T	879	14.0	0.317	0.9	LOS A	1.8	14.1	0.08	0.07	58.1
12	R	79	14.0	0.638	53.2	LOS D	4.0	31.4	0.87	0.80	24.5
Approach		958	14.0	0.638	5.2	LOS A	4.0	31.4	0.14	0.13	52.2
All Vehicles		2247	14.0	0.638	15.2	LOS B	20.2	158.0	0.44	0.41	41.5

Old Wallgrove Road – Roberts Road (2021 PM)

MOVEMENT SUMMARY — Site: 2021 Old Wallgrove - Roberts_PM

Old Wallgrove Road and Roberts Road
2021 PM Peak Hour
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Roberts Road											
1	L	67	14.0	0.634	52.4	LOS D	3.3	26.2	0.85	0.80	24.7
3	R	193	14.0	0.264	51.1	LOS D	4.7	37.1	0.87	0.78	25.0
Approach		260	14.0	0.634	51.5	LOS D	4.7	37.1	0.87	0.79	24.9
East: Old Wallgrove Rd East											
4	L	55	14.0	0.630	20.0	LOS B	17.2	134.5	0.49	0.99	40.5
5	T	1255	14.0	0.630	11.0	LOS A	17.2	134.5	0.48	0.44	44.4
Approach		1310	14.0	0.630	11.4	LOS A	17.2	134.5	0.48	0.46	44.2
West: Old Wallgrove Rd West											
11	T	715	14.0	0.293	2.6	LOS A	2.5	19.5	0.13	0.11	55.4
12	R	9	14.0	0.107	70.6	LOS F	0.5	4.2	0.98	0.67	20.5
Approach		724	14.0	0.293	3.4	LOS A	2.5	19.5	0.14	0.12	54.2
All Vehicles		2294	14.0	0.634	13.4	LOS A	17.2	134.5	0.42	0.39	43.0

Old Wallgrove Road – Eastern Creek Drive (2021 AM)

MOVEMENT SUMMARY — Site: 2021 Old Wallgrove - Eastern Creek Dr_AM

Old Wallgrove Road and Eastern Creek Drive
2021 AM Peak
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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
East: Old Wallgrove Road (E)											
5	T	1110	14.0	0.428	1.5	LOS A	2.7	21.0	0.09	0.08	66.4
6	R	454	14.0	0.787	49.6	LOS D	25.0	196.3	0.97	0.90	25.5
Approach		1564	14.0	0.787	15.4	LOS B	25.0	196.3	0.34	0.32	46.0
North: Eastern Creek Drive											
7	L	556	14.0	0.581	26.6	LOS B	20.8	162.9	0.70	0.83	34.9
9	R	56	14.0	0.472	54.8	LOS D	2.8	22.2	0.89	0.75	24.0
Approach		612	14.0	0.581	29.1	LOS C	20.8	162.9	0.72	0.82	33.5
West: Old Wallgrove Road (W)											
10	L	17	14.0	0.793	48.2	LOS D	24.6	193.0	0.92	0.96	27.7
11	T	927	14.0	0.793	39.5	LOS C	24.6	193.0	0.92	0.84	30.4
Approach		944	14.0	0.793	39.6	LOS C	24.6	193.0	0.92	0.85	30.3
All Vehicles		3120	14.0	0.793	25.4	LOS B	25.0	196.3	0.59	0.58	37.4

Old Wallgrove Road – Eastern Creek Drive (2021 PM)

MOVEMENT SUMMARY — Site: 2021 Old Wallgrove - Eastern Creek Dr_PM

Old Wallgrove Road and Eastern Creek Drive
2021 PM Peak
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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
East: Old Wallgrove Road (E)											
5	T	1296	14.0	0.500	1.6	LOS A	3.5	27.8	0.10	0.09	66.0
6	R	541	14.0	0.855	53.4	LOS D	32.5	254.9	0.99	0.94	24.4
Approach		1837	14.0	0.855	16.8	LOS B	32.5	254.9	0.36	0.34	44.7
North: Eastern Creek Drive											
7	L	521	14.0	0.514	23.4	LOS B	17.4	136.4	0.62	0.81	36.8
9	R	14	14.0	0.117	53.2	LOS D	0.7	5.4	0.86	0.69	24.5
Approach		535	14.0	0.514	24.2	LOS B	17.4	136.4	0.63	0.81	36.3
West: Old Wallgrove Road (W)											
10	L	58	14.0	0.850	56.6	LOS E	26.4	206.9	0.98	0.98	24.9
11	T	850	14.0	0.850	47.7	LOS D	26.4	206.9	0.98	0.94	27.3
Approach		908	14.0	0.850	48.3	LOS D	26.4	206.9	0.98	0.94	27.1
All Vehicles		3280	14.0	0.855	26.7	LOS B	32.5	254.9	0.58	0.58	36.6

Old Wallgrove Road – Southridge Street (2021 AM)

MOVEMENT SUMMARY — Site: 2021 Old Wallgrove - Southridge_AM

Old Wallgrove Road & Southridge Street
2021 AM Peak Hour
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Southridge Street (New Link West of Mini Link South)											
1	L	3	14.0	0.047	65.0	LOS E	0.3	2.6	0.94	0.67	15.2
2	T	3	14.0	0.047	56.2	LOS D	0.3	2.6	0.94	0.63	15.4
3	R	57	14.0	0.401	67.2	LOS E	3.3	25.6	0.97	0.75	14.7
Approach		63	14.0	0.401	66.6	LOS E	3.3	25.6	0.97	0.74	14.7
East: Old Wallgrove Rd East											
4	L	40	14.0	0.861	21.3	LOS B	28.6	224.4	0.63	1.01	40.0
5	T	1538	14.0	0.861	12.0	LOS A	28.6	224.4	0.62	0.60	43.1
6	R	498	14.0	0.876	70.3	LOS E	15.8	124.2	1.00	0.94	20.6
Approach		2076	14.0	0.876	26.2	LOS B	28.6	224.4	0.71	0.69	34.1
North: New Link West of Mini Link North											
7	L	116	14.0	0.416	44.9	LOS D	5.2	40.7	0.89	0.81	27.0
8	T	6	14.0	0.416	36.2	LOS C	5.2	40.7	0.89	0.73	27.5
9	R	23	14.0	0.162	65.6	LOS E	1.3	10.2	0.96	0.71	21.6
Approach		145	14.0	0.416	47.9	LOS D	5.2	40.7	0.90	0.79	26.0
West: Old Wallgrove Rd West											
10	L	159	14.0	0.865	31.0	LOS C	32.9	257.8	0.80	0.96	31.2
11	T	1267	14.0	0.865	19.1	LOS B	32.9	257.8	0.77	0.74	34.7
12	R	57	14.0	1.000[3]	61.0	LOS E	3.1	24.5	0.94	0.74	20.1
Approach		1483	14.0	1.000	22.0	LOS B	32.9	257.8	0.78	0.76	33.3
All Vehicles		3767	14.0	1.000	26.0	LOS B	32.9	257.8	0.75	0.72	32.9

Old Wallgrove Road – Southridge Street (2021 PM)

MOVEMENT SUMMARY — Site: 2021 Old Wallgrove - Southridge_PM

Old Wallgrove Road & Southridge Street
2021 PM Peak Hour
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Southridge Street (New Link West of Mini Link South)											
1	L	42	14.0	0.274	61.0	LOS E	3.1	24.2	0.93	0.76	15.7
2	T	15	14.0	0.274	52.3	LOS D	3.1	24.2	0.93	0.71	15.9
3	R	143	14.0	1.004	106.8	LOS F	11.4	89.8	1.00	1.13	10.1
Approach		200	14.0	1.004	93.0	LOS F	11.4	89.8	0.98	1.02	11.3
East: Old Wallgrove Rd East											
4	L	30	14.0	0.956	37.7	LOS C	51.7	405.5	0.89	1.08	31.2
5	T	1690	14.0	0.956	28.4	LOS B	51.7	405.5	0.89	0.96	32.1
6	R	136	14.0	0.399	38.5	LOS C	2.2	17.3	0.95	0.75	29.3
Approach		1856	14.0	0.956	29.3	LOS C	51.7	405.5	0.90	0.95	31.9
North: New Link West of Mini Link North											
7	L	497	14.0	0.972	73.3	LOS F	34.6	271.3	1.00	1.07	20.0
8	T	12	14.0	0.972	64.6	LOS E	34.6	271.3	1.00	1.07	20.1
9	R	105	14.0	0.564	57.1	LOS E	5.6	43.7	0.93	0.78	23.5
Approach		614	14.0	0.972	70.3	LOS E	34.6	271.3	0.99	1.02	20.5
West: Old Wallgrove Rd West											
10	L	32	14.0	0.951	47.6	LOS D	44.4	347.8	0.99	1.07	24.8
11	T	1335	14.0	0.951	38.1	LOS C	44.4	348.1	0.99	1.05	25.3
12	R	4	14.0	0.077	69.7	LOS E	0.2	1.8	0.97	0.63	18.4
Approach		1371	14.0	0.951	38.4	LOS C	44.4	348.1	0.99	1.05	25.2
All Vehicles		4041	14.0	1.004	41.8	LOS C	51.7	405.5	0.94	1.00	25.9

Old Wallgrove Road – Mini Link Road (2021 AM)

MOVEMENT SUMMARY — **Site: AM 2021 Final**

Old Wallgrove and Quarry Rd (Mini Link Roads)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Mini Link Rd											
1	L	818	14.0	0.464	27.6	LOS B	15.1	118.0	0.68	0.79	34.5
2	T	337	14.0	0.974	81.0	LOS F	25.5	200.2	1.00	1.17	18.0
Approach		1155	14.0	0.974	43.2	LOS D	25.5	200.2	0.78	0.90	27.3
East: Old Wallgrove Rd East											
4	L	50	14.0	0.172	42.7	LOS D	2.1	16.8	0.77	0.74	13.5
5	T	1255	14.0	0.947	44.3	LOS D	32.2	252.6	0.95	0.97	26.0
6	R	200	14.0	0.490	46.7	LOS D	9.7	75.8	0.87	0.80	12.7
Approach		1505	14.0	0.947	44.6	LOS D	32.2	252.6	0.93	0.94	24.4
North: Private Access											
7	L	21	14.0	0.132	41.4	LOS C	3.0	23.3	0.76	0.62	29.0
8	T	49	14.0	0.132	32.7	LOS C	3.0	23.3	0.76	0.60	29.9
9	R	3	14.0	0.035	68.9	LOS E	0.2	1.4	0.97	0.63	21.1
Approach		73	14.0	0.132	36.7	LOS C	3.0	23.3	0.77	0.66	29.2
West: Old Wallgrove Rd West											
10	L	81	14.0	0.221	34.2	LOS C	3.0	23.8	0.68	0.75	31.1
11	T	430	14.0	0.319	36.1	LOS C	7.5	58.9	0.83	0.67	28.9
12	R	916	14.0	0.976	78.7	LOS F	33.3	261.1	1.00	1.03	9.0
Approach		1427	14.0	0.976	63.4	LOS E	33.3	261.1	0.93	0.90	15.3
All Vehicles		4160	14.0	0.976	50.5	LOS D	33.3	261.1	0.88	0.91	22.0

Old Wallgrove Road – Mini Link Road (2021 PM)

MOVEMENT SUMMARY — **Site: PM 2021 Final**

Old Wallgrove and Quarry Rd (Mini Link Roads)

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Mini Link Rd											
1	L	992	14.0	0.472	21.1	LOS B	15.5	121.2	0.58	0.77	38.4
2	T	273	14.0	0.955	75.9	LOS F	19.7	154.1	1.00	1.11	18.8
Approach		1265	14.0	0.955	33.0	LOS C	19.7	154.1	0.67	0.85	31.4
East: Old Wallgrove Rd East											
4	L	53	14.0	0.207	53.6	LOS D	2.6	20.7	0.88	0.75	11.3
5	T	805	14.0	0.939	53.8	LOS D	20.6	161.6	0.97	0.96	23.3
6	R	72	14.0	0.317	60.1	LOS E	3.9	30.7	0.95	0.77	10.3
Approach		930	14.0	0.939	54.3	LOS D	20.6	161.6	0.97	0.93	22.0
North: Private Access											
7	L	194	14.0	0.877	64.6	LOS E	27.2	213.1	1.00	1.00	22.2
8	T	227	14.0	0.877	55.9	LOS D	27.2	213.1	1.00	1.00	22.3
9	R	59	14.0	0.692	74.5	LOS F	3.7	29.4	1.00	0.82	20.0
Approach		480	14.0	0.877	61.7	LOS E	27.2	213.1	1.00	0.98	21.9
West: Old Wallgrove Rd West											
10	L	7	14.0	0.016	23.4	LOS B	0.2	1.5	0.50	0.68	36.8
11	T	778	14.0	0.376	22.2	LOS B	11.8	92.5	0.69	0.59	35.8
12	R	1200	14.0	0.975	46.6	LOS D	33.3	261.1	0.96	0.91	13.9
Approach		1985	14.0	0.975	36.9	LOS C	33.3	261.1	0.87	0.78	22.6
All Vehicles		4660	14.0	0.975	41.9	LOS C	33.3	261.1	0.85	0.85	24.7

Wallgrove Road – Old Wallgrove Road (2021 AM)

MOVEMENT SUMMARY — Site: AM 2021

(Northern Insection) Wallgrove Road & Old Wallgrove Road

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Rd South											
1	L	163	14.0	0.542	16.8	LOS B	2.7	21.3	0.31	0.70	36.5
2	T	779	14.0	0.575	34.4	LOS C	11.8	92.2	0.81	0.71	23.3
3	R	5	14.0	0.059	66.4	LOS E	0.3	2.2	0.94	0.65	15.0
Approach		947	14.0	0.575	31.6	LOS C	11.8	92.2	0.73	0.70	24.8
East: M7 Access (East)											
4	L	469	14.0	0.833	43.6	LOS D	33.6	263.5	0.93	0.93	27.7
5	T	715	14.0	0.833	36.8	LOS C	33.6	263.5	0.92	0.87	28.3
6	R	24	14.0	0.241	69.8	LOS E	1.4	11.0	0.97	0.71	20.8
Approach		1208	14.0	0.833	40.1	LOS C	33.6	263.5	0.93	0.89	27.9
North: Wallgrove Rd North											
7	L	401	14.0	0.622	24.4	LOS B	24.9	194.9	0.69	0.90	40.1
8	T	877	14.0	0.622	18.4	LOS B	26.6	208.5	0.73	0.70	41.6
9	R	620	14.0	0.606	50.1	LOS D	17.1	134.3	0.95	0.88	27.0
Approach		1898	14.0	0.622	30.0	LOS C	26.6	208.5	0.80	0.80	35.1
West: Old Wallgrove Rd West											
10	L	257	14.0	0.261	10.9	LOS A	3.8	30.1	0.32	0.68	44.6
11	T	194	14.0	0.201	36.6	LOS C	4.4	34.4	0.81	0.65	26.1
Approach		451	14.0	0.261	22.0	LOS B	4.4	34.4	0.53	0.67	34.2
All Vehicles		4504	14.0	0.833	32.3	LOS C	33.6	263.5	0.79	0.79	30.9

Wallgrove Road – Old Wallgrove Road (2021 PM)

MOVEMENT SUMMARY — Site: PM 2021

(Northern Insection) Wallgrove Road & Old Wallgrove Road
Signals - Fixed Time Cycle Time = 105 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: Wallgrove Rd South											
1	L	179	14.0	0.286	9.7	LOS A	0.5	3.9	0.07	0.64	45.6
2	T	809	14.0	0.523	26.2	LOS B	9.7	76.2	0.74	0.65	27.5
3	R	10	14.0	0.103	60.5	LOS E	0.5	3.9	0.94	0.67	16.4
Approach		998	14.0	0.523	23.6	LOS B	9.7	76.2	0.62	0.65	29.4
East: M7 Access (East)											
4	L	215	14.0	0.429	26.6	LOS B	10.5	82.7	0.64	0.84	35.4
5	T	455	14.0	0.429	19.6	LOS B	10.5	82.7	0.63	0.54	37.2
6	R	3	14.0	0.031	60.8	LOS E	0.1	1.2	0.95	0.63	22.7
Approach		673	14.0	0.429	22.0	LOS B	10.5	82.7	0.63	0.64	36.5
North: Wallgrove Rd North											
7	L	542	14.0	0.726	20.5	LOS B	15.4	120.4	0.57	0.81	42.1
8	T	483	14.0	0.726	21.3	LOS B	17.2	134.6	0.76	0.69	39.9
9	R	277	14.0	0.656	54.0	LOS D	6.9	53.7	0.96	0.81	25.8
Approach		1302	14.0	0.726	27.9	LOS B	17.2	134.6	0.73	0.77	36.4
West: Old Wallgrove Rd West											
10	L	438	14.0	0.450	11.0	LOS A	7.1	55.9	0.41	0.72	44.5
11	T	534	14.0	0.485	32.2	LOS C	11.2	88.0	0.87	0.74	27.7
Approach		972	14.0	0.485	22.6	LOS B	11.2	88.0	0.66	0.73	33.5
All Vehicles		3945	14.0	0.726	24.5	LOS B	17.2	134.6	0.67	0.71	34.3

Wallgrove Road – Wonderland Drive (2021 AM)

MOVEMENT SUMMARY — Site: 2021 Wonderland - Wallgrove_AM_Final

Wonderland Drive / Wallgrove Road Intersection
2021 AM Peak
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
1	L	79	14.0	0.107	9.9	LOS A	0.2	1.8	0.06	0.64	52.8
2	T	970	14.0	0.814	28.3	LOS B	23.9	187.5	0.87	0.80	35.7
3	R	11	14.0	0.130	72.0	LOS F	0.7	5.1	0.98	0.68	21.0
Approach		1060	14.0	0.814	27.4	LOS B	23.9	187.5	0.81	0.79	36.3
East: Carpark Access											
4	L	5	14.0	0.056	61.8	LOS E	0.6	4.9	0.92	0.69	23.5
5	T	3	4.0	0.056	52.3	LOS D	0.6	4.9	0.92	0.64	23.0
6	R	4	14.0	0.056	61.6	LOS E	0.6	4.9	0.92	0.69	23.6
Approach		12	11.5	0.056	59.4	LOS E	0.6	4.9	0.92	0.68	23.4
North: Wallgrove Road (N)											
7	L	14	14.0	0.829	13.1	LOS A	13.6	107.0	0.26	1.28	50.9
8	T	1888	14.0	0.829	2.9	LOS A	13.6	107.0	0.26	0.24	62.4
9	R	1001	14.0	0.827	48.6	LOS D	27.0	211.6	0.93	0.90	27.4
Approach		2903	14.0	0.829	18.7	LOS B	27.0	211.6	0.49	0.47	43.7
West: Wonderland Drive											
10	L	185	14.0	0.110	8.0	X	X	X	X	0.60	49.8
11	T	1	14.0	0.035	61.0	LOS E	0.2	1.4	0.97	0.61	21.1
12	R	5	14.0	0.035	70.3	LOS E	0.2	1.4	0.97	0.63	21.6
Approach		191	14.0	0.110	9.9	LOS A	0.2	1.4	0.03	0.60	47.7
All Vehicles		4166	14.0	0.829	20.6	LOS B	27.0	211.6	0.55	0.56	41.6

Wallgrove Road – Wonderland Drive (2021 PM)

MOVEMENT SUMMARY — Site: 2021 Wonderland - Wallgrove_PM_Final

Wonderland Drive / Wallgrove Road Intersection
2021 PM Peak
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Road (S)											
1	L	3	14.0	0.002	9.2	LOS A	0.0	0.0	0.05	0.63	53.6
2	T	1241	14.0	0.641	4.3	LOS A	8.3	64.8	0.25	0.23	60.3
3	R	6	14.0	0.071	71.4	LOS F	0.4	2.8	0.98	0.66	21.2
Approach		1250	14.0	0.641	4.7	LOS A	8.3	64.8	0.25	0.23	59.7
East: Carpark Access											
4	L	4	14.0	0.038	57.5	LOS E	0.5	3.9	0.89	0.69	24.5
5	T	1	4.0	0.038	48.0	LOS D	0.5	3.9	0.89	0.61	24.0
6	R	5	14.0	0.038	57.3	LOS E	0.5	3.9	0.89	0.69	24.5
Approach		10	13.0	0.038	56.5	LOS D	0.5	3.9	0.89	0.68	24.4
North: Wallgrove Road (N)											
7	L	15	14.0	0.545	12.1	LOS A	4.1	31.9	0.11	1.33	51.0
8	T	1219	14.0	0.545	2.1	LOS A	4.1	31.9	0.11	0.11	64.9
9	R	303	14.0	0.633	63.5	LOS E	8.5	66.4	0.97	0.81	23.1
Approach		1537	14.0	0.633	14.3	LOS A	8.5	66.4	0.28	0.26	48.3
West: Wonderland Drive											
10	L	1322	14.0	0.783	8.2	X	X	X	X	0.60	49.4
11	T	1	14.0	0.474	64.6	LOS E	2.5	19.3	1.00	0.73	20.2
12	R	79	14.0	0.474	73.7	LOS F	2.5	19.3	1.00	0.73	20.9
Approach		1402	14.0	0.783	12.0	LOS A	2.5	19.3	0.06	0.60	45.7
All Vehicles		4199	14.0	0.783	10.8	LOS A	8.5	66.4	0.20	0.37	50.2

Wallgrove Road South – M7 Access (2021 AM)

MOVEMENT SUMMARY — Site: AM 2021

(Southern Intersection) Wallgrove Rd, Mini Link Rd and M7 Ramp

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Rd South											
1	L	778	14.0	1.000[3]	18.0	LOS B	21.9	171.6	0.63	0.91	33.2
2	T	455	14.0	0.552	44.0	LOS D	11.4	89.6	0.88	0.74	16.6
3	R	339	14.0	0.852	64.9	LOS E	10.4	81.7	1.00	0.90	15.2
Approach		1572	14.0	1.000	35.7	LOS C	21.9	171.6	0.78	0.86	22.4
East: M7 Off/Onload ramp											
4	L	13	14.0	1.000[3]	56.2	LOS D	6.2	49.0	0.97	0.80	24.7
5	T	473	14.0	1.004	88.9	LOS F	31.2	244.8	0.99	1.18	16.9
6	R	494	14.0	0.595	32.6	LOS C	12.3	96.5	0.68	0.77	32.0
Approach		NaN	NaN	1.004	NaN	LOS A	31.2	244.8	0.83	0.95	22.3
North: Wallgrove Rd North											
7	L	35	14.0	0.914	79.1	LOS F	28.4	222.8	1.00	1.06	13.4
8	T	1042	14.0	0.914	56.4	LOS D	28.4	222.8	1.00	1.02	15.8
9	R	293	14.0	0.859	75.3	LOS F	9.6	75.2	1.00	0.96	13.6
Approach		1370	14.0	0.914	61.0	LOS E	28.4	222.8	1.00	1.01	15.2
West: Mini Link Rd											
10	L	50	0.0	0.287	55.1	LOS D	4.7	34.3	0.91	0.79	21.7
11	T	231	14.0	0.704	53.4	LOS D	11.1	87.1	0.96	0.84	20.8
12	R	734	14.0	0.870	63.4	LOS E	25.4	198.8	0.99	0.97	19.7
Approach		1015	13.3	0.870	60.7	LOS E	25.4	198.8	0.96	0.93	20.1
All Vehicles		4937	NaN	1.004	52.6	LOS D	31.2	244.8	0.89	0.93	19.7

Wallgrove Road South – M7 Access (2021 PM)

MOVEMENT SUMMARY — Site: PM 2021

(Southern Intersection) Wallgrove Rd, Mini Link Rd and M7 Ramp
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

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: Wallgrove Rd South											
1	L	600	14.0	0.668	9.2	LOS A	4.4	34.1	0.15	0.67	42.7
2	T	619	14.0	0.663	43.2	LOS D	15.5	121.7	0.90	0.77	18.9
3	R	511	14.0	0.817	54.8	LOS D	14.7	115.3	0.96	0.88	17.2
Approach		1930	14.0	0.817	32.2	LOS C	15.5	121.7	0.61	0.76	23.8
East: M7 Off/Onload ramp											
4	L	2	14.0	0.663	65.3	LOS E	4.3	33.6	0.97	0.84	22.5
5	T	206	14.0	0.663	57.9	LOS E	8.0	62.4	0.99	0.83	22.3
6	R	322	14.0	0.817	62.0	LOS E	10.4	81.8	0.99	0.87	22.5
Approach		530	14.0	0.817	60.4	LOS E	10.4	81.8	0.99	0.86	22.4
North: Wallgrove Rd North											
7	L	88	14.0	0.828	67.2	LOS E	12.6	99.0	1.00	1.03	15.0
8	T	538	14.0	0.828	54.8	LOS D	12.6	99.0	1.00	0.93	16.0
9	R	153	14.0	0.769	75.1	LOS F	4.9	38.4	1.00	0.87	13.6
Approach		779	14.0	0.828	60.2	LOS E	12.6	99.0	1.00	0.93	15.4
West: Mini Link Rd											
10	L	52	0.0	0.342	37.6	LOS C	9.5	72.9	0.77	0.87	27.8
11	T	717	14.0	0.839	40.1	LOS C	31.6	248.0	0.93	0.86	24.6
12	R	713	14.0	0.754	42.1	LOS C	18.4	144.6	0.85	0.85	25.5
Approach		1482	13.5	0.839	40.9	LOS C	31.6	248.0	0.89	0.86	25.2
All Vehicles		4721	13.8	0.839	42.7	LOS D	31.6	248.0	0.80	0.83	22.4

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