Appendices

Appendix A Traffic Counts
Appendix B Background Developments
Appendix C Traffic Volume Calculations
Appendix D Traffic Volume Schematics
Appendix E 2013 Amherst Roundabout Report
Appendix F Concepts
Appendix G GDOT Analysis
Appendix H-a Sidra Analysis: Existing
Appendix H-b Sidra Analysis: No-Build
Appendix H-c Sidra Analysis: 2018 Build
Appendix H-d Sidra Analysis: 2038 Build

Appendix A

Traffic Counts

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Meadow Street
Location: West of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Start	10-Oct-17	Eastbound		Westbound		Combined		11-Oct-	Eastbound		Westbound		Combined	
Time	Tue	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Wed	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		15	79	12	59	27	138		10	62	9	67	19	129
12:15		8	76	5	70	13	146		12	68	18	81	30	149
12:30		10	74	10	82	20	156		8	72	8	65	16	137
12:45		6	80	3	79	9	159		7	75	12	56	19	131
01:00		8	76	5	67	13	143		8	67	7	49	15	116
01:15		8	58	4	71	12	129		2	77	4	56	6	133
01:30		4	68	8	67	12	135		2	57	4	76	6	133
01:45		2	81	2	64	4	145		4	61	5	65	9	126
02:00		1	63	3	76	4	139		7	70	3	54	10	124
02:15		3	72	3	67	6	139		4	74	3	81	7	155
02:30		1	83	1	79	2	162		3	66	1	72	4	138
02:45		1	72	3	68	4	140		2	74	2	64	4	138
03:00		0	89	2	78	2	167		2	67	3	66	5	133
03:15		0	70	1	68	1	138		0	71	3	***79***	3	***150***
03:30		0	83	1	79	1	162		1	73	2	***80***	3	***153***
03:45		1	85	0	***84***	1	169		1	80	3	***95***	4	***175***
04:00		2	80	2	***88***	4	168		3	98	2	***80***	5	***178***
04:15		3	84	1	***63***	4	147		0	74	3	62	3	136
04:30		1	90	5	***86***	6	***176***		2	73	6	60	8	133
04:45		6	94	4	70	10	***164***		5	***101***	6	64	11	165
05:00		3	99	3	74	6	***173***		5	***84***	3	72	8	156
05:15		3	74	9	84	12	***158***		3	***94***	5	59	8	153
05:30		5	95	12	64	17	159		5	***86***	16	76	21	162
05:45		12	83	28	56	40	139		10	94	25	52	35	146
06:00		10	***102***	16	57	26	159		7	73	19	64	26	137
06:15		16	***88***	32	67	48	155		9	107	33	48	42	155
06:30		24	***88***	38	68	62	156		32	85	36	63	68	148
06:45		30	***96***	55	70	85	166		26	96	39	70	65	166
07:00		28	88	56	59	84	147		27	65	62	64	89	129
07:15		38	60	60	35	98	95		29	72	56	32	85	104
07:30		27	68	***75***	46	102	114		26	71	69	42	95	113
07:45		32	60	***97***	49	129	109		39	55	85	39	124	94
08:00		40	71	***102***	36	***142***	107		43	57	***104***	43	***147***	100
08:15		43	48	***83***	46	***126***	94		57	67	***92***	41	***149***	108
08:30		67	53	75	37	***142***	90		55	52	***96***	38	***151***	90
08:45		66	47	80	39	***146***	86		63	63	***92***	34	***155***	97
09:00		64	54	68	28	132	82		56	50	89	43	145	93
09:15		46	48	89	23	135	71		46	69	65	41	111	110
09:30		57	49	54	27	111	76		45	46	71	35	116	81
09:45		50	37	65	34	115	71		65	50	83	26	148	76
10:00		62	39	77	20	139	59		66	39	65	26	131	65
10:15		47	36	65	27	112	63		55	29	60	18	115	47
10:30		63	20	53	23	116	43		45	27	58	41	103	68
10:45		52	26	55	25	107	51		51	28	59	16	110	44
11:00		***62***	22	75	16	137	38		***62***	27	57	14	119	41
11:15		***49***	12	57	15	106	27		***54***	21	63	18	117	39
11:30		***62***	21	67	12	129	33		***60***	20	67	15	127	35
11:45		***73***	12	67	8	140	20		***68***	12	51	4	119	16
Total		1211	3153	1688	2610	2899	5763		1192	3099	1724	2506	2916	5605
Day Total		4364		4298		8662			4291		4230		8521	
% Total		14.0%	36.4%	19.5%	30.1%				14.0%	36.4%	20.2%	29.4%		
Peak		11:00	06:00	07:30	03:45	08:00	04:30		11:00	04:45	08:00	03:15	08:00	03:15
Vol.		246	374	357	321	556	671		244	365	384	334	602	656
P.H.F.		0.842	0.917	0.875	0.912	0.952	0.953		0.897	0.903	0.923	0.879	0.971	0.921

ADT	ADT 8,585	AADT 8,585

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Location: Meadow Street
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Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	9	10	10	8	1	1	0	0	0	0	0	0	39	36	39
01:00	0	0	3	2	7	6	4	0	0	0	0	0	0	0	22	41	43
02:00	0	0	1	1	2	2	0	0	0	0	0	0	0	0	6	*	*
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	*
04:00	0	0	1	1	5	4	1	0	0	0	0	0	0	0	12	38	39
05:00	0	0	0	2	11	8	2	0	0	0	0	0	0	0	23	38	40
06:00	0	2	1	6	33	28	8	2	0	0	0	0	0	0	80	39	43
07:00	0	0	10	20	41	35	**12**	**5**	**2**	0	0	0	0	0	125	40	45
08:00	0	4	21	50	89	40	12	0	0	0	0	0	0	0	216	37	40
09:00	2	3	16	48	83	**54**	9	2	0	0	0	0	0	0	217	37	40
10:00	**10**	**7**	**30**	64	73	35	5	0	0	0	0	0	0	0	224	35	39
11:00	1	4	27	**72**	**99**	37	5	1	0	0	0	0	0	0	**246**	36	39
12 PM	5	13	45	86	**119**	36	4	**1**	0	0	0	0	0	0	309	35	38
13:00	3	17	36	100	80	**41**	**5**	1	0	0	0	0	0	0	283	35	39
14:00	23	20	36	77	92	36	5	0	0	0	0	0	0	**1**	290	34	38
15:00	64	41	68	65	62	22	4	0	0	0	0	0	**1**	0	327	32	36
16:00	60	50	**76**	84	62	15	1	0	0	0	0	0	0	0	348	31	35
17:00	**191**	**68**	49	25	15	2	1	0	0	0	0	0	0	0	351	21	27
18:00	77	68	73	79	67	10	0	0	0	0	0	0	0	0	**374**	30	34
19:00	2	5	61	**103**	71	29	4	1	0	0	0	0	0	0	276	34	38
20:00	0	5	25	72	76	36	4	1	0	0	0	0	0	0	219	36	39
21:00	0	8	19	81	56	22	2	0	0	0	0	0	0	0	188	34	38
22:00	1	4	19	29	42	25	1	0	0	0	0	0	0	0	121	36	39
23:00	0	0	9	17	19	17	4	0	**1**	0	0	0	0	0	67	38	40
Total	439	319	635	1094	1214	548	95	15	3	0	0	0	1	1	4364		
Percent	10.1%	7.3%	14.6%	25.1%	27.8%	12.6%	2.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	11:00	11:00	09:00	07:00	07:00	07:00						11:00		
Vol.	10	7	30	72	99	54	12	5	2						246		
PM Peak	17:00	17:00	16:00	19:00	12:00	13:00	13:00	12:00	23:00				15:00	14:00	18:00		
Vol.	191	68	76	103	119	41	5	1	1				1	1	374		

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Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	2	6	11	15	3	0	0	0	0	0	0	0	0	37	34	36
01:00	0	0	2	4	4	5	1	0	0	0	0	0	0	0	16	38	40
02:00	0	1	1	2	6	5	0	1	0	0	0	0	0	0	16	38	39
03:00	0	0	1	1	1	0	1	0	0	0	0	0	0	0	4	*	*
04:00	0	0	1	2	2	4	1	0	0	0	0	0	0	0	10	39	39
05:00	1	0	2	3	6	6	2	3	0	0	0	0	0	0	23	45	47
06:00	0	0	1	7	31	22	**8**	**5**	0	0	0	0	0	0	74	41	46
07:00	1	0	11	19	45	33	8	3	**1**	0	0	0	0	0	121	39	42
08:00	1	4	**35**	75	63	32	7	1	0	0	0	0	0	0	218	36	39
09:00	**3**	4	21	71	71	34	8	0	0	0	0	0	0	0	212	36	40
10:00	0	4	25	58	76	**48**	6	0	0	0	0	0	0	0	217	37	40
11:00	3	**9**	26	**77**	**90**	36	3	0	0	0	0	0	0	0	**244**	35	38
12 PM	1	4	31	81	94	**57**	**8**	**1**	0	0	0	0	0	0	277	36	40
13:00	0	4	23	81	**101**	46	7	0	0	0	0	0	0	0	262	36	39
14:00	17	22	31	93	77	38	5	1	0	0	0	0	0	0	284	35	38
15:00	141	49	52	41	5	3	0	0	0	0	0	0	0	0	291	23	28
16:00	22	21	54	**122**	91	31	5	0	0	0	0	0	0	0	346	34	37
17:00	**212**	**79**	39	24	4	0	0	0	0	0	0	0	0	0	358	19	25
18:00	42	36	**82**	101	77	19	3	1	0	0	0	0	0	0	**361**	32	35
19:00	1	12	44	109	75	21	0	0	**1**	0	0	0	0	0	263	33	36
20:00	2	3	33	82	101	14	3	1	0	0	0	0	0	0	239	34	36
21:00	0	5	26	63	90	29	2	0	0	0	0	0	0	0	215	35	38
22:00	0	2	13	38	44	22	4	0	0	0	0	0	0	0	123	36	39
23:00	0	0	10	26	27	13	3	1	0	0	0	0	0	0	80	36	40
Total	447	261	570	1191	1196	521	85	18	2	0	0	0	0	0	4291		
Percent	10.4%	6.1%	13.3%	27.8%	27.9%	12.1%	2.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	08:00	11:00	11:00	10:00	06:00	06:00	07:00						11:00		
Vol.	3	9	35	77	90	48	8	5	1						244		
PM Peak	17:00	17:00	18:00	16:00	13:00	12:00	12:00	12:00	19:00						18:00		
Vol.	212	79	82	122	101	57	8	1	1						361		
Total	886	580	1205	2285	2410	1069	180	33	5	0	0	0	1	1	8655		
Percent	10.2%	6.7%	13.9%	26.4%	27.8%	12.4%	2.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	12 MPH
50th Percentile :	27 MPH
85th Percentile :	35 MPH
95th Percentile :	38 MPH

Stats	
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	3949
Percent in Pace :	45.6%
Number of Vehicles > 40 MPH :	292
Percent of Vehicles > 40 MPH :	3.4%
Mean Speed(Average) :	26 MPH

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Client: CDM Smith / L. Sherman

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	**2**	5	11	8	4	0	0	0	0	0	0	0	0	30	34	37
01:00	0	0	1	3	12	2	1	0	0	0	0	0	0	0	19	34	36
02:00	0	1	2	0	3	2	0	**2**	0	0	0	0	0	0	10	33	33
03:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	4	*	*
04:00	0	1	2	1	6	1	1	0	0	0	0	0	0	0	12	34	35
05:00	0	0	0	3	19	21	7	1	**1**	0	0	0	0	0	52	40	43
06:00	0	0	5	12	61	52	10	0	1	0	0	0	0	0	141	39	41
07:00	0	0	2	20	122	**124**	19	1	0	0	0	0	0	0	288	39	41
08:00	0	1	7	40	**166**	115	11	0	0	0	0	0	0	0	**340**	38	40
09:00	0	0	**13**	44	119	81	19	0	0	0	0	0	0	0	276	38	41
10:00	0	0	6	32	110	83	18	1	0	0	0	0	0	0	250	39	41
11:00	0	2	4	**56**	112	70	**20**	2	0	0	0	0	0	0	266	38	41
12 PM	0	0	8	57	134	74	16	0	**1**	0	0	0	0	0	290	38	41
13:00	3	0	11	35	126	86	8	0	0	0	0	0	0	0	269	38	40
14:00	0	1	14	51	119	86	**18**	0	1	0	0	0	0	0	290	38	41
15:00	0	3	12	55	128	**97**	13	1	0	0	0	0	0	0	**309**	38	40
16:00	1	9	15	58	**142**	73	9	0	0	0	0	0	0	0	307	37	40
17:00	**5**	**32**	**28**	66	112	28	5	**2**	0	0	0	0	0	0	278	34	38
18:00	1	10	24	**73**	97	50	7	0	0	0	0	0	0	0	262	36	39
19:00	0	2	16	66	67	32	5	1	0	0	0	0	0	0	189	36	39
20:00	1	2	13	41	70	25	4	2	0	0	0	0	0	0	158	36	40
21:00	0	4	16	31	42	17	1	1	0	0	0	0	0	0	112	35	38
22:00	0	3	19	34	29	9	1	0	0	0	0	0	0	0	95	34	37
23:00	0	0	10	19	13	8	1	0	0	0	0	0	0	0	51	35	38
Total	11	73	233	809	1818	1142	194	14	4	0	0	0	0	0	4298		
Percent	0.3%	1.7%	5.4%	18.8%	42.3%	26.6%	4.5%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		00:00	09:00	11:00	08:00	07:00	11:00	02:00	05:00						08:00		
Vol.		2	13	56	166	124	20	2	1						340		
PM Peak	17:00	17:00	17:00	18:00	16:00	15:00	14:00	17:00	12:00						15:00		
Vol.	5	32	28	73	142	97	18	2	1						309		

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Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	8	17	12	7	3	0	0	0	0	0	0	0	47	36	40
01:00	0	0	3	4	8	4	0	1	0	0	0	0	0	0	20	36	38
02:00	0	0	2	2	3	1	0	1	0	0	0	0	0	0	9	33	33
03:00	0	0	1	3	4	2	1	0	0	0	0	0	0	0	11	34	35
04:00	0	1	0	2	8	6	0	0	0	0	0	0	0	0	17	38	39
05:00	0	0	0	6	20	15	7	1	0	0	0	0	0	0	49	40	43
06:00	1	1	7	16	46	40	14	2	0	0	0	0	0	0	127	39	42
07:00	**2**	**3**	3	34	99	114	14	**3**	0	0	0	0	0	0	272	39	41
08:00	0	0	7	**61**	**169**	**132**	13	2	0	0	0	0	0	0	**384**	38	40
09:00	0	0	**14**	53	121	103	**17**	0	0	0	0	0	0	0	308	38	41
10:00	0	0	4	41	115	65	16	1	0	0	0	0	0	0	242	38	41
11:00	0	0	5	39	121	65	7	0	**1**	0	0	0	0	0	238	37	40
12 PM	0	1	8	37	**126**	79	15	**2**	**1**	0	0	0	0	0	269	38	41
13:00	0	1	3	34	118	73	**16**	1	0	0	0	0	0	0	246	38	41
14:00	0	1	12	41	125	77	15	0	0	0	0	0	0	0	271	38	41
15:00	0	32	**37**	**100**	109	39	2	0	0	**1**	0	0	0	0	**320**	34	38
16:00	0	1	2	42	124	**88**	8	1	0	0	0	0	0	0	266	38	40
17:00	**2**	**45**	28	55	83	37	7	1	0	1	0	0	0	0	259	35	39
18:00	0	10	26	60	102	40	7	0	0	0	0	0	0	0	245	36	39
19:00	0	0	16	43	83	30	5	0	0	0	0	0	0	0	177	36	39
20:00	0	2	21	45	66	18	4	0	0	0	0	0	0	0	156	35	38
21:00	0	4	22	49	45	18	6	1	0	0	0	0	0	0	145	36	40
22:00	0	0	10	30	40	16	5	0	0	0	0	0	0	0	101	36	40
23:00	0	0	4	17	14	12	4	0	0	0	0	0	0	0	51	38	41
Total	5	102	243	831	1761	1081	186	17	2	2	0	0	0	0	4230		
Percent	0.1%	2.4%	5.7%	19.6%	41.6%	25.6%	4.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	09:00	08:00	08:00	08:00	09:00	07:00	11:00						08:00		
Vol.	2	3	14	61	169	132	17	3	1						384		
PM Peak	17:00	17:00	15:00	15:00	12:00	16:00	13:00	12:00	12:00	15:00					15:00		
Vol.	2	45	37	100	126	88	16	2	1	1					320		
Total	16	175	476	1640	3579	2223	380	31	6	2	0	0	0	0	8528		
Percent	0.2%	2.1%	5.6%	19.2%	42.0%	26.1%	4.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	26 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH

Stats	
10 MPH Pace Speed :	29-38 MPH
Number in Pace :	5504
Percent in Pace :	64.5%
Number of Vehicles > 40 MPH :	633
Percent of Vehicles > 40 MPH :	7.4%
Mean Speed(Average) :	33 MPH

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Location: Meadow Street
Location: West of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	2	14	21	18	12	1	1	0	0	0	0	0	0	69	36	38
01:00	0	0	4	5	19	8	5	0	0	0	0	0	0	0	41	39	43
02:00	0	1	3	1	5	4	0	2	0	0	0	0	0	0	16	37	38
03:00	0	0	0	1	1	2	1	0	0	0	0	0	0	0	5	*	*
04:00	0	1	3	2	11	5	2	0	0	0	0	0	0	0	24	38	40
05:00	0	0	0	5	30	29	9	1	1	0	0	0	0	0	75	40	43
06:00	0	2	6	18	94	80	18	2	1	0	0	0	0	0	221	39	42
07:00	0	0	12	40	163	**159**	**31**	**6**	**2**	0	0	0	0	0	413	39	42
08:00	0	5	28	90	**255**	155	23	0	0	0	0	0	0	0	**556**	38	40
09:00	2	3	29	92	202	135	28	2	0	0	0	0	0	0	493	38	41
10:00	**10**	**7**	**36**	96	183	118	23	1	0	0	0	0	0	0	474	37	40
11:00	1	6	31	**128**	211	107	25	3	0	0	0	0	0	0	512	37	40
12 PM	5	13	53	143	**253**	110	20	1	**1**	0	0	0	0	0	599	36	40
13:00	6	17	47	135	206	**127**	13	1	0	0	0	0	0	0	552	37	39
14:00	23	21	50	128	211	122	**23**	0	1	0	0	0	0	**1**	580	37	40
15:00	64	44	80	120	190	119	17	1	0	0	0	0	**1**	0	636	36	39
16:00	61	59	91	142	204	88	10	0	0	0	0	0	0	0	**655**	35	38
17:00	**196**	**100**	77	91	127	30	6	2	0	0	0	0	0	0	629	31	35
18:00	78	78	**97**	152	164	60	7	0	0	0	0	0	0	0	636	33	37
19:00	2	7	77	**169**	138	61	9	2	0	0	0	0	0	0	465	35	39
20:00	1	7	38	113	146	61	8	**3**	0	0	0	0	0	0	377	36	39
21:00	0	12	35	112	98	39	3	1	0	0	0	0	0	0	300	35	38
22:00	1	7	38	63	71	34	2	0	0	0	0	0	0	0	216	35	38
23:00	0	0	19	36	32	25	5	0	1	0	0	0	0	0	118	37	40
Total	450	392	868	1903	3032	1690	289	29	7	0	0	0	1	1	8662		
Percent	5.2%	4.5%	10.0%	22.0%	35.0%	19.5%	3.3%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	11:00	08:00	07:00	07:00	07:00	07:00						08:00		
Vol.	10	7	36	128	255	159	31	6	2						556		
PM Peak	17:00	17:00	18:00	19:00	12:00	13:00	14:00	20:00	12:00				15:00	14:00	16:00		
Vol.	196	100	97	169	253	127	23	3	1				1	1	655		

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PO Box 468
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Location: Meadow Street
Location: West of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	2	14	28	27	10	3	0	0	0	0	0	0	0	84	35	39
01:00	0	0	5	8	12	9	1	1	0	0	0	0	0	0	36	37	40
02:00	0	1	3	4	9	6	0	2	0	0	0	0	0	0	25	36	38
03:00	0	0	2	4	5	2	2	0	0	0	0	0	0	0	15	35	36
04:00	0	1	1	4	10	10	1	0	0	0	0	0	0	0	27	38	40
05:00	1	0	2	9	26	21	9	4	0	0	0	0	0	0	72	41	45
06:00	1	1	8	23	77	62	22	**7**	0	0	0	0	0	0	201	40	44
07:00	**3**	3	14	53	144	147	22	6	**1**	0	0	0	0	0	393	39	41
08:00	1	4	**42**	**136**	**232**	**164**	20	3	0	0	0	0	0	0	**602**	37	40
09:00	3	4	35	124	192	137	**25**	0	0	0	0	0	0	0	520	38	40
10:00	0	4	29	99	191	113	22	1	0	0	0	0	0	0	459	37	40
11:00	3	**9**	31	116	211	101	10	0	1	0	0	0	0	0	482	36	39
12 PM	1	5	39	118	**220**	**136**	**23**	**3**	**1**	0	0	0	0	0	546	37	40
13:00	0	5	26	115	219	119	23	1	0	0	0	0	0	0	508	37	40
14:00	17	23	43	134	202	115	20	1	0	0	0	0	0	0	555	37	40
15:00	141	81	89	141	114	42	2	0	0	**1**	0	0	0	0	611	31	35
16:00	22	22	56	**164**	215	119	13	1	0	0	0	0	0	0	612	36	39
17:00	**214**	**124**	67	79	87	37	7	1	0	1	0	0	0	0	**617**	30	35
18:00	42	46	**108**	161	179	59	10	1	0	0	0	0	0	0	606	34	38
19:00	1	12	60	152	158	51	5	0	1	0	0	0	0	0	440	35	38
20:00	2	5	54	127	167	32	7	1	0	0	0	0	0	0	395	34	37
21:00	0	9	48	112	135	47	8	1	0	0	0	0	0	0	360	35	39
22:00	0	2	23	68	84	38	9	0	0	0	0	0	0	0	224	36	40
23:00	0	0	14	43	41	25	7	1	0	0	0	0	0	0	131	37	40
Total	452	363	813	2022	2957	1602	271	35	4	2	0	0	0	0	8521		
Percent	5.3%	4.3%	9.5%	23.7%	34.7%	18.8%	3.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	08:00	08:00	08:00	08:00	09:00	06:00	07:00						08:00		
Vol.	3	9	42	136	232	164	25	7	1						602		
PM Peak	17:00	17:00	18:00	16:00	12:00	12:00	12:00	12:00	12:00	15:00					17:00		
Vol.	214	124	108	164	220	136	23	3	1	1					617		
Total	902	755	1681	3925	5989	3292	560	64	11	2	0	0	1	1	17183		
Percent	5.2%	4.4%	9.8%	22.8%	34.9%	19.2%	3.3%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	19 MPH
50th Percentile :	30 MPH
85th Percentile :	36 MPH
95th Percentile :	40 MPH

Stats	
10 MPH Pace Speed :	28-37 MPH
Number in Pace :	9080
Percent in Pace :	52.8%
Number of Vehicles > 40 MPH :	907
Percent of Vehicles > 40 MPH :	5.3%
Mean Speed(Average) :	29 MPH

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Client: CDM Smith / L. Sherman

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	35	2	0	1	1	0	0	0	0	0	0	0	0	39
01:00	0	20	2	0	0	0	0	0	0	0	0	0	0	0	22
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	7	5	0	0	0	0	0	0	0	0	0	0	0	12
05:00	0	17	4	0	2	0	0	0	0	0	0	0	0	0	23
06:00	1	58	17	0	4	0	0	0	0	0	0	0	0	0	80
07:00	0	93	22	0	6	0	0	3	1	0	0	0	0	0	125
08:00	3	157	43	4	7	2	0	0	0	0	0	0	0	0	216
09:00	2	178	24	4	7	1	0	1	0	0	0	0	0	0	217
10:00	1	179	32	4	6	0	0	1	1	0	0	0	0	0	224
11:00	2	197	34	3	6	0	0	4	0	0	0	0	0	0	246
12 PM	3	253	33	3	10	3	1	1	2	0	0	0	0	0	309
13:00	2	224	42	5	9	0	0	1	0	0	0	0	0	0	283
14:00	3	226	42	7	7	0	0	0	1	1	0	0	0	3	290
15:00	5	261	44	5	8	1	0	2	1	0	0	0	0	0	327
16:00	4	302	32	4	2	3	0	1	0	0	0	0	0	0	348
17:00	4	314	21	1	8	1	0	0	0	0	0	0	0	2	351
18:00	5	343	22	3	1	0	0	0	0	0	0	0	0	0	374
19:00	0	251	16	4	3	1	0	1	0	0	0	0	0	0	276
20:00	2	196	14	1	5	0	0	1	0	0	0	0	0	0	219
21:00	3	168	12	2	3	0	0	0	0	0	0	0	0	0	188
22:00	0	105	14	2	0	0	0	0	0	0	0	0	0	0	121
23:00	1	62	2	1	1	0	0	0	0	0	0	0	0	0	67
Total	41	3653	479	53	96	13	1	16	6	1	0	0	0	5	4364
Percent	0.9%	83.7%	11.0%	1.2%	2.2%	0.3%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	08:00	11:00	08:00	08:00	08:00	08:00		11:00	07:00						
Vol.	3	197	43	4	7	2		4	1						
PM Peak	15:00	18:00	15:00	14:00	12:00	12:00	12:00	15:00	12:00	14:00				14:00	
Vol.	5	343	44	7	10	3	1	2	2	1				3	

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Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	32	3	2	0	0	0	0	0	0	0	0	0	0	37
01:00	0	16	0	0	0	0	0	0	0	0	0	0	0	0	16
02:00	0	13	1	1	1	0	0	0	0	0	0	0	0	0	16
03:00	0	2	1	0	1	0	0	0	0	0	0	0	0	0	4
04:00	0	5	3	0	1	0	0	0	1	0	0	0	0	0	10
05:00	0	18	4	0	1	0	0	0	0	0	0	0	0	0	23
06:00	0	50	20	1	3	0	0	0	0	0	0	0	0	0	74
07:00	1	91	20	2	6	1	0	0	0	0	0	0	0	0	121
08:00	0	165	36	5	10	1	0	0	1	0	0	0	0	0	218
09:00	0	166	33	6	4	1	0	1	1	0	0	0	0	0	212
10:00	0	166	32	4	12	0	1	1	1	0	0	0	0	0	217
11:00	2	190	38	4	4	1	0	3	2	0	0	0	0	0	244
12 PM	3	220	44	1	6	1	0	2	0	0	0	0	0	0	277
13:00	0	212	37	5	6	0	0	2	0	0	0	0	0	0	262
14:00	5	230	33	4	7	4	0	0	0	0	0	0	0	1	284
15:00	2	249	22	3	3	6	0	1	0	0	0	0	0	5	291
16:00	4	285	44	5	4	2	0	1	0	0	0	0	0	1	346
17:00	2	322	20	0	5	2	0	2	0	0	0	0	0	5	358
18:00	4	310	37	3	5	1	0	0	0	0	0	0	0	1	361
19:00	0	241	13	4	4	0	0	1	0	0	0	0	0	0	263
20:00	1	208	24	1	4	0	0	1	0	0	0	0	0	0	239
21:00	0	193	17	3	2	0	0	0	0	0	0	0	0	0	215
22:00	0	115	7	1	0	0	0	0	0	0	0	0	0	0	123
23:00	0	73	5	2	0	0	0	0	0	0	0	0	0	0	80
Total	24	3572	494	57	89	20	1	15	6	0	0	0	0	13	4291
Percent	0.6%	83.2%	11.5%	1.3%	2.1%	0.5%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	
AM Peak	11:00	11:00	11:00	09:00	10:00	07:00	10:00	11:00	11:00						
Vol.	2	190	38	6	12	1	1	3	2						
PM Peak	14:00	17:00	12:00	13:00	14:00	15:00		12:00						15:00	
Vol.	5	322	44	5	7	6		2						5	
Grand Total	65	7225	973	110	185	33	2	31	12	1	0	0	0	18	8655
Percent	0.8%	83.5%	11.2%	1.3%	2.1%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	

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Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	28	1	0	1	0	0	0	0	0	0	0	0	0	30
01:00	0	18	1	0	0	0	0	0	0	0	0	0	0	0	19
02:00	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	9	3	0	0	0	0	0	0	0	0	0	0	0	12
05:00	0	41	11	0	0	0	0	0	0	0	0	0	0	0	52
06:00	1	114	25	0	1	0	0	0	0	0	0	0	0	0	141
07:00	1	242	33	1	6	3	0	2	0	0	0	0	0	0	288
08:00	2	286	40	3	7	0	0	2	0	0	0	0	0	0	340
09:00	1	230	30	3	7	2	0	2	1	0	0	0	0	0	276
10:00	2	206	28	3	8	0	0	1	1	1	0	0	0	0	250
11:00	3	225	26	4	4	0	0	3	1	0	0	0	0	0	266
12 PM	2	249	24	6	5	2	0	1	1	0	0	0	0	0	290
13:00	1	220	35	3	9	1	0	0	0	0	0	0	0	0	269
14:00	2	235	32	7	9	1	0	4	0	0	0	0	0	0	290
15:00	2	260	36	6	4	0	0	1	0	0	0	0	0	0	309
16:00	3	261	28	3	8	0	0	3	1	0	0	0	0	0	307
17:00	3	247	19	1	7	0	0	0	0	0	0	0	0	1	278
18:00	2	233	20	3	3	0	0	1	0	0	0	0	0	0	262
19:00	0	169	12	3	4	0	0	1	0	0	0	0	0	0	189
20:00	1	146	7	2	2	0	0	0	0	0	0	0	0	0	158
21:00	2	102	5	3	0	0	0	0	0	0	0	0	0	0	112
22:00	0	81	12	1	1	0	0	0	0	0	0	0	0	0	95
23:00	0	46	2	3	0	0	0	0	0	0	0	0	0	0	51
Total	28	3661	431	55	86	9	0	21	5	1	0	0	0	1	4298
Percent	0.7%	85.2%	10.0%	1.3%	2.0%	0.2%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	08:00	11:00	10:00	07:00		11:00	09:00	10:00					
Vol.	3	286	40	4	8	3		3	1	1					
PM Peak	16:00	16:00	15:00	14:00	13:00	12:00		14:00	12:00					17:00	
Vol.	3	261	36	7	9	2		4	1					1	

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Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	45	1	1	0	0	0	0	0	0	0	0	0	0	47
01:00	0	20	0	0	0	0	0	0	0	0	0	0	0	0	20
02:00	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
03:00	0	5	4	0	2	0	0	0	0	0	0	0	0	0	11
04:00	0	15	2	0	0	0	0	0	0	0	0	0	0	0	17
05:00	0	36	10	0	0	3	0	0	0	0	0	0	0	0	49
06:00	0	94	30	2	0	0	0	1	0	0	0	0	0	0	127
07:00	2	235	28	1	4	1	0	1	0	0	0	0	0	0	272
08:00	1	327	48	3	2	2	0	1	0	0	0	0	0	0	384
09:00	0	249	44	5	5	0	0	2	0	3	0	0	0	0	308
10:00	1	203	27	7	3	0	0	1	0	0	0	0	0	0	242
11:00	1	199	27	4	5	0	0	1	1	0	0	0	0	0	238
12 PM	0	227	33	4	3	0	0	2	0	0	0	0	0	0	269
13:00	0	206	28	3	5	2	0	2	0	0	0	0	0	0	246
14:00	2	225	31	5	6	2	0	0	0	0	0	0	0	0	271
15:00	2	277	26	7	3	1	0	2	1	0	0	0	0	1	320
16:00	0	224	30	4	7	0	0	1	0	0	0	0	0	0	266
17:00	6	218	25	2	7	0	0	1	0	0	0	0	0	0	259
18:00	0	218	19	4	3	0	0	1	0	0	0	0	0	0	245
19:00	1	162	10	2	1	0	0	1	0	0	0	0	0	0	177
20:00	1	139	12	2	2	0	0	0	0	0	0	0	0	0	156
21:00	1	136	4	2	2	0	0	0	0	0	0	0	0	0	145
22:00	0	91	8	2	0	0	0	0	0	0	0	0	0	0	101
23:00	0	46	3	2	0	0	0	0	0	0	0	0	0	0	51
Total	18	3606	450	62	60	11	0	17	2	3	0	0	0	1	4230
Percent	0.4%	85.2%	10.6%	1.5%	1.4%	0.3%	0.0%	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	10:00	09:00	05:00		09:00	11:00	09:00					
Vol.	2	327	48	7	5	3		2	1	3					
PM Peak	17:00	15:00	12:00	15:00	16:00	13:00		12:00	15:00					15:00	
Vol.	6	277	33	7	7	2		2	1					1	
Grand Total	46	7267	881	117	146	20	0	38	7	4	0	0	0	2	8528
Percent	0.5%	85.2%	10.3%	1.4%	1.7%	0.2%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

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PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Meadow Street
Location: West of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	63	3	0	2	1	0	0	0	0	0	0	0	0	69
01:00	0	38	3	0	0	0	0	0	0	0	0	0	0	0	41
02:00	0	16	0	0	0	0	0	0	0	0	0	0	0	0	16
03:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	16	8	0	0	0	0	0	0	0	0	0	0	0	24
05:00	0	58	15	0	2	0	0	0	0	0	0	0	0	0	75
06:00	2	172	42	0	5	0	0	0	0	0	0	0	0	0	221
07:00	1	335	55	1	12	3	0	5	1	0	0	0	0	0	413
08:00	5	443	83	7	14	2	0	2	0	0	0	0	0	0	556
09:00	3	408	54	7	14	3	0	3	1	0	0	0	0	0	493
10:00	3	385	60	7	14	0	0	2	2	1	0	0	0	0	474
11:00	5	422	60	7	10	0	0	7	1	0	0	0	0	0	512
12 PM	5	502	57	9	15	5	1	2	3	0	0	0	0	0	599
13:00	3	444	77	8	18	1	0	1	0	0	0	0	0	0	552
14:00	5	461	74	14	16	1	0	4	1	1	0	0	0	3	580
15:00	7	521	80	11	12	1	0	3	1	0	0	0	0	0	636
16:00	7	563	60	7	10	3	0	4	1	0	0	0	0	0	655
17:00	7	561	40	2	15	1	0	0	0	0	0	0	0	3	629
18:00	7	576	42	6	4	0	0	1	0	0	0	0	0	0	636
19:00	0	420	28	7	7	1	0	2	0	0	0	0	0	0	465
20:00	3	342	21	3	7	0	0	1	0	0	0	0	0	0	377
21:00	5	270	17	5	3	0	0	0	0	0	0	0	0	0	300
22:00	0	186	26	3	1	0	0	0	0	0	0	0	0	0	216
23:00	1	108	4	4	1	0	0	0	0	0	0	0	0	0	118
Total	69	7314	910	108	182	22	1	37	11	2	0	0	0	6	8662
Percent	0.8%	84.4%	10.5%	1.2%	2.1%	0.3%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	08:00	08:00	08:00	08:00	08:00	07:00		11:00	10:00	10:00					
Vol.	5	443	83	7	14	3		7	2	1					
PM Peak	15:00	18:00	15:00	14:00	13:00	12:00	12:00	14:00	12:00	14:00				14:00	
Vol.	7	576	80	14	18	5	1	4	3	1				3	

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Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	77	4	3	0	0	0	0	0	0	0	0	0	0	84
01:00	0	36	0	0	0	0	0	0	0	0	0	0	0	0	36
02:00	0	22	1	1	1	0	0	0	0	0	0	0	0	0	25
03:00	0	7	5	0	3	0	0	0	0	0	0	0	0	0	15
04:00	0	20	5	0	1	0	0	0	1	0	0	0	0	0	27
05:00	0	54	14	0	1	3	0	0	0	0	0	0	0	0	72
06:00	0	144	50	3	3	0	0	1	0	0	0	0	0	0	201
07:00	3	326	48	3	10	2	0	1	0	0	0	0	0	0	393
08:00	1	492	84	8	12	3	0	1	1	0	0	0	0	0	602
09:00	0	415	77	11	9	1	0	3	1	3	0	0	0	0	520
10:00	1	369	59	11	15	0	1	2	1	0	0	0	0	0	459
11:00	3	389	65	8	9	1	0	4	3	0	0	0	0	0	482
12 PM	3	447	77	5	9	1	0	4	0	0	0	0	0	0	546
13:00	0	418	65	8	11	2	0	4	0	0	0	0	0	0	508
14:00	7	455	64	9	13	6	0	0	0	0	0	0	0	1	555
15:00	4	526	48	10	6	7	0	3	1	0	0	0	0	6	611
16:00	4	509	74	9	11	2	0	2	0	0	0	0	0	1	612
17:00	8	540	45	2	12	2	0	3	0	0	0	0	0	5	617
18:00	4	528	56	7	8	1	0	1	0	0	0	0	0	1	606
19:00	1	403	23	6	5	0	0	2	0	0	0	0	0	0	440
20:00	2	347	36	3	6	0	0	1	0	0	0	0	0	0	395
21:00	1	329	21	5	4	0	0	0	0	0	0	0	0	0	360
22:00	0	206	15	3	0	0	0	0	0	0	0	0	0	0	224
23:00	0	119	8	4	0	0	0	0	0	0	0	0	0	0	131
Total	42	7178	944	119	149	31	1	32	8	3	0	0	0	14	8521
Percent	0.5%	84.2%	11.1%	1.4%	1.7%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	
AM Peak	07:00	08:00	08:00	09:00	10:00	05:00	10:00	11:00	11:00	09:00					
Vol.	3	492	84	11	15	3	1	4	3	3					
PM Peak	17:00	17:00	12:00	15:00	14:00	15:00		12:00	15:00					15:00	
Vol.	8	540	77	10	13	7		4	1					6	
Grand Total	111	14492	1854	227	331	53	2	69	19	5	0	0	0	20	17183
Percent	0.6%	84.3%	10.8%	1.3%	1.9%	0.3%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	

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Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Start Time	10-Oct-17 Tue	Southbound A.M.	Southbound P.M.	Northbound A.M.	Northbound P.M.	Combined A.M.	Combined P.M.	11-Oct- Wed	Southbound A.M.	Southbound P.M.	Northbound A.M.	Northbound P.M.	Combined A.M.	Combined P.M.
12:00		1	74	0	39	1	113		3	58	7	19	10	77
12:15		3	62	3	40	6	102		6	72	3	47	9	119
12:30		5	50	1	44	6	94		4	58	5	31	9	89
12:45		4	67	3	43	7	110		5	55	14	34	19	89
01:00		3	49	3	40	6	89		7	35	5	33	12	68
01:15		1	60	3	36	4	96		4	50	2	33	6	83
01:30		0	39	2	34	2	73		1	45	2	31	3	76
01:45		1	55	1	31	2	86		2	49	0	33	2	82
02:00		3	68	2	34	5	102		1	56	1	37	2	93
02:15		1	57	2	42	3	99		3	54	3	35	6	89
02:30		1	46	4	55	5	101		1	35	1	50	2	85
02:45		4	52	1	51	5	103		0	59	0	52	0	111
03:00		3	51	0	51	3	102		2	53	0	38	2	91
03:15		3	***55***	0	38	3	93		4	50	0	42	4	92
03:30		1	***70***	0	50	1	120		4	***60***	1	62	5	122
03:45		1	***74***	0	57	1	131		0	***82***	0	39	0	121
04:00		2	***59***	0	75	2	134		3	***44***	1	63	4	107
04:15		7	50	2	66	9	116		4	***60***	0	57	4	117
04:30		8	62	0	60	8	122		15	54	1	55	16	109
04:45		18	52	0	***65***	18	***117***		11	57	1	***70***	12	***127***
05:00		6	70	1	***66***	7	***136***		5	68	2	***66***	7	***134***
05:15		6	59	1	***81***	7	***140***		6	58	1	***74***	7	***132***
05:30		14	54	6	***74***	20	***128***		16	58	5	***64***	21	***122***
05:45		31	57	7	50	38	107		27	53	3	53	30	106
06:00		24	58	4	49	28	107		24	61	4	53	28	114
06:15		39	68	6	41	45	109		31	47	6	47	37	94
06:30		50	51	9	53	59	104		45	62	10	52	55	114
06:45		64	51	7	73	71	124		71	56	13	52	84	108
07:00		48	40	22	41	70	81		53	41	20	55	73	96
07:15		64	41	16	40	80	81		60	30	22	34	82	64
07:30		77	29	19	36	96	65		60	29	18	42	78	71
07:45		84	24	10	29	94	53		80	19	18	27	98	46
08:00		***74***	36	25	32	99	68		78	25	21	30	99	55
08:15		***81***	35	22	34	***103***	69		***77***	21	20	33	***97***	54
08:30		***80***	29	26	24	***106***	53		***91***	19	30	26	***121***	45
08:45		***100***	29	27	19	***127***	48		***77***	21	27	37	***104***	58
09:00		71	16	34	29	***105***	45		***85***	29	33	29	***118***	58
09:15		64	34	19	17	83	51		64	26	24	37	88	63
09:30		70	18	24	22	94	40		69	30	20	35	89	65
09:45		50	17	31	29	81	46		81	24	***28***	17	109	41
10:00		62	17	22	29	84	46		54	19	***40***	17	94	36
10:15		50	12	42	16	92	28		54	13	***28***	16	82	29
10:30		46	11	29	10	75	21		50	16	***28***	15	78	31
10:45		51	20	29	14	80	34		55	25	16	18	71	43
11:00		53	9	***32***	9	85	18		49	14	30	15	79	29
11:15		44	6	***40***	7	84	13		55	6	20	6	75	12
11:30		56	6	***33***	9	89	15		56	11	34	7	90	18
11:45		66	5	***36***	4	102	9		45	5	40	1	85	6
Total		1595	2054	606	1888	2201	3942		1598	1972	608	1819	2206	3791
Day Total		3649		2494		6143			3570		2427		5997	
% Total		26.0%	33.4%	9.9%	30.7%				26.6%	32.9%	10.1%	30.3%		
Peak		08:00	03:15	11:00	04:45	08:15	04:45		08:15	03:30	09:45	04:45	08:15	04:45
Vol.		335	258	141	286	441	521		330	246	124	274	440	515
P.H.F.		0.838	0.872	0.881	0.883	0.868	0.930		0.907	0.750	0.775	0.926	0.909	0.961

ADT	ADT 6,069	AADT 6,069

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Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	5	2	3	1	2	0	0	0	0	0	0	0	0	13	20	27
01:00	0	2	1	1	1	0	0	0	0	0	0	0	0	0	5	*	*
02:00	0	1	2	3	1	1	1	0	0	0	0	0	0	0	9	27	27
03:00	0	3	1	1	2	1	0	0	0	0	0	0	0	0	8	17	17
04:00	4	6	9	4	6	3	2	**1**	0	0	0	0	0	0	35	32	36
05:00	2	14	14	10	16	1	0	0	0	0	0	0	0	0	57	32	34
06:00	3	49	43	55	24	3	0	0	0	0	0	0	0	0	177	29	33
07:00	13	61	72	69	49	9	0	0	0	0	0	0	0	0	273	31	34
08:00	**37**	**77**	**73**	**88**	52	8	0	0	0	0	0	0	0	0	**335**	30	34
09:00	5	44	59	69	58	17	**3**	0	0	0	0	0	0	0	255	33	36
10:00	3	32	54	48	54	**18**	0	0	0	0	0	0	0	0	209	33	36
11:00	6	36	50	52	**64**	11	0	0	0	0	0	0	0	0	219	33	35
12 PM	**22**	**62**	**65**	40	46	15	3	0	0	0	0	0	0	0	**253**	32	36
13:00	13	44	42	52	32	**19**	1	0	0	0	0	0	0	0	203	32	36
14:00	5	43	49	60	51	14	1	0	0	0	0	0	0	0	223	32	36
15:00	19	30	55	64	59	19	**4**	0	0	0	0	0	0	0	250	33	37
16:00	8	44	46	65	45	15	0	0	0	0	0	0	0	0	223	32	36
17:00	8	43	58	60	**64**	6	1	0	0	0	0	0	0	0	240	32	35
18:00	8	36	25	**92**	56	10	1	0	0	0	0	0	0	0	228	32	35
19:00	3	22	36	31	33	8	1	0	0	0	0	0	0	0	134	32	35
20:00	3	22	36	30	29	8	1	0	0	0	0	0	0	0	129	32	35
21:00	0	24	23	10	19	9	0	0	0	0	0	0	0	0	85	33	37
22:00	3	18	11	10	13	3	2	0	0	0	0	0	0	0	60	32	35
23:00	0	8	8	2	5	2	1	0	0	0	0	0	0	0	26	32	34
Total	165	726	834	919	780	202	22	1	0	0	0	0	0	0	3649		
Percent	4.5%	19.9%	22.9%	25.2%	21.4%	5.5%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	11:00	10:00	09:00	04:00							08:00		
Vol.	37	77	73	88	64	18	3	1							335		
PM Peak	12:00	12:00	12:00	18:00	17:00	13:00	15:00								12:00		
Vol.	22	62	65	92	64	19	4								253		

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Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	2	7	5	1	2	1	0	0	0	0	0	0	0	0	18	22	24
01:00	0	5	5	1	2	1	0	0	0	0	0	0	0	0	14	23	24
02:00	0	1	2	0	0	1	1	0	0	0	0	0	0	0	5	*	*
03:00	1	1	2	2	1	3	0	0	0	0	0	0	0	0	10	37	37
04:00	0	10	7	2	6	7	1	0	0	0	0	0	0	0	33	36	39
05:00	2	12	13	9	12	3	**3**	0	0	0	0	0	0	0	54	34	40
06:00	4	34	40	35	45	11	2	0	0	0	0	0	0	0	171	33	36
07:00	7	46	67	69	51	13	0	0	0	0	0	0	0	0	253	32	35
08:00	**53**	**76**	**80**	64	44	6	0	0	0	0	0	0	0	0	**323**	29	33
09:00	40	67	55	**76**	47	14	0	0	0	0	0	0	0	0	299	30	34
10:00	6	42	55	54	42	12	2	0	0	0	0	0	0	0	213	32	35
11:00	5	35	45	47	**52**	**19**	1	**1**	0	0	0	0	0	0	205	33	36
12 PM	9	52	40	67	**58**	17	0	0	0	0	0	0	0	0	243	32	36
13:00	3	33	24	52	49	17	1	0	0	0	0	0	0	0	179	33	37
14:00	9	40	39	46	47	**20**	**3**	0	0	0	0	0	0	0	204	33	37
15:00	**28**	**55**	**80**	54	25	3	0	0	0	0	0	0	0	0	**245**	28	32
16:00	6	30	49	69	54	7	0	0	0	0	0	0	0	0	215	32	35
17:00	26	40	62	59	44	5	1	0	0	0	0	0	0	0	237	31	34
18:00	5	42	51	**73**	44	9	2	0	0	0	0	0	0	0	226	31	35
19:00	3	15	33	36	25	6	0	**1**	0	0	0	0	0	0	119	32	35
20:00	1	15	29	12	21	7	1	0	0	0	0	0	0	0	86	33	36
21:00	3	18	39	26	15	6	1	1	0	0	0	0	0	0	109	31	35
22:00	5	16	21	11	20	0	0	0	0	0	0	0	0	0	73	31	34
23:00	1	5	12	11	7	0	0	0	0	0	0	0	0	0	36	30	34
Total	219	697	855	876	713	188	19	3	0	0	0	0	0	0	3570		
Percent	6.1%	19.5%	23.9%	24.5%	20.0%	5.3%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	09:00	11:00	11:00	05:00	11:00							08:00		
Vol.	53	76	80	76	52	19	3	1							323		
PM Peak	15:00	15:00	15:00	18:00	12:00	14:00	14:00	19:00							15:00		
Vol.	28	55	80	73	58	20	3	1							245		
Total	384	1423	1689	1795	1493	390	41	4	0	0	0	0	0	0	7219		
Percent	5.3%	19.7%	23.4%	24.9%	20.7%	5.4%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	13 MPH
50th Percentile :	23 MPH
85th Percentile :	32 MPH
95th Percentile :	35 MPH

Stats		
	10 MPH Pace Speed :	22-31 MPH
	Number in Pace :	2999
	Percent in Pace :	41.5%
	Number of Vehicles > 40 MPH :	76
	Percent of Vehicles > 40 MPH :	1.1%
	Mean Speed(Average) :	24 MPH

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Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	0	1	5	1	0	0	0	0	0	0	0	0	7	34	35
01:00	0	0	0	2	5	0	1	**1**	0	0	0	0	0	0	9	33	34
02:00	**1**	1	0	2	5	0	0	0	0	0	0	0	0	0	9	34	34
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	*	*
05:00	0	0	2	1	6	5	1	0	0	0	0	0	0	0	15	39	40
06:00	0	0	2	7	10	6	1	0	0	0	0	0	0	0	26	37	39
07:00	0	0	5	20	30	11	1	0	0	0	0	0	0	0	67	36	38
08:00	0	3	5	29	53	9	1	0	0	0	0	0	0	0	100	34	37
09:00	0	3	**12**	39	35	17	**2**	0	0	0	0	0	0	0	108	35	38
10:00	0	1	7	30	**62**	20	2	0	0	0	0	0	0	0	122	36	39
11:00	0	**5**	11	**56**	43	**25**	1	0	0	0	0	0	0	0	**141**	36	38
12 PM	**2**	**6**	27	42	59	28	2	0	0	0	0	0	0	0	166	35	38
13:00	0	0	10	40	65	24	2	0	0	0	0	0	0	0	141	36	38
14:00	1	4	14	49	78	28	**7**	**1**	0	0	0	0	0	0	182	36	40
15:00	0	4	10	66	82	**32**	2	0	0	0	0	0	0	0	196	35	38
16:00	0	5	**30**	82	114	31	3	1	0	0	0	0	0	0	266	35	38
17:00	1	5	21	**84**	**127**	31	1	1	0	0	0	0	0	0	**271**	35	37
18:00	0	0	27	72	94	21	2	0	0	0	0	0	0	0	216	34	37
19:00	0	3	18	42	62	20	1	0	0	0	0	0	0	0	146	35	38
20:00	0	5	5	36	54	9	0	0	0	0	0	0	0	0	109	34	36
21:00	0	3	10	29	44	11	0	0	0	0	0	0	0	0	97	34	37
22:00	0	1	9	17	34	8	0	0	0	0	0	0	0	0	69	35	37
23:00	0	0	3	7	12	7	0	0	0	0	0	0	0	0	29	36	39
Total	5	49	228	753	1081	344	30	4	0	0	0	0	0	0	2494		
Percent	0.2%	2.0%	9.1%	30.2%	43.3%	13.8%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	02:00	11:00	09:00	11:00	10:00	11:00	09:00	01:00							11:00		
Vol.	1	5	12	56	62	25	2	1							141		
PM Peak	12:00	12:00	16:00	17:00	17:00	15:00	14:00	14:00							17:00		
Vol.	2	6	30	84	127	32	7	1							271		

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	1	2	2	10	10	4	0	0	0	0	0	0	0	0	29	35	37
01:00	0	2	0	4	2	1	0	0	0	0	0	0	0	0	9	30	30
02:00	1	0	0	1	1	2	0	0	0	0	0	0	0	0	5	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	*
04:00	0	0	0	1	1	0	1	0	0	0	0	0	0	0	3	*	*
05:00	0	0	1	3	1	5	1	0	0	0	0	0	0	0	11	39	40
06:00	0	0	5	6	13	7	2	0	0	0	0	0	0	0	33	37	40
07:00	1	1	10	26	27	11	2	0	0	0	0	0	0	0	78	35	38
08:00	1	**7**	14	30	38	7	1	0	0	0	0	0	0	0	98	34	36
09:00	**2**	6	14	39	30	11	**3**	0	0	0	0	0	0	0	105	34	38
10:00	0	2	8	**45**	41	14	2	0	0	0	0	0	0	0	112	35	38
11:00	2	1	**15**	30	**55**	**21**	0	0	0	0	0	0	0	0	**124**	35	38
12 PM	0	1	15	47	50	16	2	0	0	0	0	0	0	0	131	35	38
13:00	1	7	11	36	64	11	0	0	0	0	0	0	0	0	130	34	36
14:00	0	5	21	54	69	22	**3**	0	0	0	0	0	0	0	174	35	38
15:00	1	**10**	23	72	65	8	2	0	0	0	0	0	0	0	181	33	36
16:00	0	5	12	61	**116**	**49**	2	0	0	0	0	0	0	0	245	36	38
17:00	0	4	**31**	**107**	100	14	1	0	0	0	0	0	0	0	**257**	33	36
18:00	1	6	21	86	73	16	1	0	0	0	0	0	0	0	204	34	36
19:00	0	6	12	49	60	28	2	**1**	0	0	0	0	0	0	158	35	38
20:00	0	1	13	35	62	14	1	0	0	0	0	0	0	0	126	35	37
21:00	**2**	2	12	30	54	15	3	0	0	0	0	0	0	0	118	35	39
22:00	0	2	3	18	32	11	0	0	0	0	0	0	0	0	66	35	38
23:00	0	0	1	7	17	4	0	0	0	0	0	0	0	0	29	35	37
Total	13	70	244	797	982	291	29	1	0	0	0	0	0	0	2427		
Percent	0.5%	2.9%	10.1%	32.8%	40.5%	12.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	11:00	10:00	11:00	11:00	09:00								11:00		
Vol.	2	7	15	45	55	21	3								124		
PM Peak	21:00	15:00	17:00	17:00	16:00	16:00	14:00	19:00							17:00		
Vol.	2	10	31	107	116	49	3	1							257		
Total	18	119	472	1550	2063	635	59	5	0	0	0	0	0	0	4921		
Percent	0.4%	2.4%	9.6%	31.5%	41.9%	12.9%	1.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	24 MPH
50th Percentile :	30 MPH
85th Percentile :	35 MPH
95th Percentile :	38 MPH

Stats		
	10 MPH Pace Speed :	27-36 MPH
	Number in Pace :	3280
	Percent in Pace :	66.7%
	Number of Vehicles > 40 MPH :	131
	Percent of Vehicles > 40 MPH :	2.7%
	Mean Speed(Average) :	31 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	5	2	4	6	3	0	0	0	0	0	0	0	0	20	34	36
01:00	0	2	1	3	6	0	1	**1**	0	0	0	0	0	0	14	33	34
02:00	1	2	2	5	6	1	1	0	0	0	0	0	0	0	18	34	35
03:00	0	3	1	1	2	1	0	0	0	0	0	0	0	0	8	17	17
04:00	4	6	9	4	8	3	2	1	0	0	0	0	0	0	37	32	36
05:00	2	14	16	11	22	6	1	0	0	0	0	0	0	0	72	34	37
06:00	3	49	45	62	34	9	1	0	0	0	0	0	0	0	203	31	35
07:00	13	61	77	89	79	20	1	0	0	0	0	0	0	0	340	32	36
08:00	**37**	**80**	**78**	**117**	105	17	1	0	0	0	0	0	0	0	**435**	32	35
09:00	5	47	71	108	93	34	**5**	0	0	0	0	0	0	0	363	34	37
10:00	3	33	61	78	**116**	**38**	2	0	0	0	0	0	0	0	331	34	37
11:00	6	41	61	108	107	36	1	0	0	0	0	0	0	0	360	34	37
12 PM	**24**	**68**	**92**	82	105	43	5	0	0	0	0	0	0	0	419	34	37
13:00	13	44	52	92	97	43	3	0	0	0	0	0	0	0	344	34	37
14:00	6	47	63	109	129	42	**8**	**1**	0	0	0	0	0	0	405	34	38
15:00	19	34	65	130	141	**51**	6	0	0	0	0	0	0	0	446	34	38
16:00	8	49	76	147	159	46	3	1	0	0	0	0	0	0	489	34	37
17:00	9	48	79	144	**191**	37	2	1	0	0	0	0	0	0	**511**	34	36
18:00	8	36	52	**164**	150	31	3	0	0	0	0	0	0	0	444	33	36
19:00	3	25	54	73	95	28	2	0	0	0	0	0	0	0	280	34	37
20:00	3	27	41	66	83	17	1	0	0	0	0	0	0	0	238	33	36
21:00	0	27	33	39	63	20	0	0	0	0	0	0	0	0	182	34	37
22:00	3	19	20	27	47	11	2	0	0	0	0	0	0	0	129	34	37
23:00	0	8	11	9	17	9	1	0	0	0	0	0	0	0	55	35	38
Total	170	775	1062	1672	1861	546	52	5	0	0	0	0	0	0	6143		
Percent	2.8%	12.6%	17.3%	27.2%	30.3%	8.9%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	10:00	10:00	09:00	01:00							08:00		
Vol.	37	80	78	117	116	38	5	1							435		
PM Peak	12:00	12:00	12:00	18:00	17:00	15:00	14:00	14:00							17:00		
Vol.	24	68	92	164	191	51	8	1							511		

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Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	3	9	7	11	12	5	0	0	0	0	0	0	0	0	47	34	37
01:00	0	7	5	5	4	2	0	0	0	0	0	0	0	0	23	31	33
02:00	1	1	2	1	1	3	1	0	0	0	0	0	0	0	10	37	37
03:00	1	1	2	2	2	3	0	0	0	0	0	0	0	0	11	37	37
04:00	0	10	7	3	7	7	2	0	0	0	0	0	0	0	36	36	40
05:00	2	12	14	12	13	8	**4**	0	0	0	0	0	0	0	65	36	41
06:00	4	34	45	41	58	18	4	0	0	0	0	0	0	0	204	34	37
07:00	8	47	77	95	78	24	2	0	0	0	0	0	0	0	331	33	36
08:00	**54**	**83**	**94**	94	82	13	1	0	0	0	0	0	0	0	**421**	31	34
09:00	42	73	69	**115**	77	25	3	0	0	0	0	0	0	0	404	32	36
10:00	6	44	63	99	83	26	4	0	0	0	0	0	0	0	325	33	37
11:00	7	36	60	77	**107**	**40**	1	**1**	0	0	0	0	0	0	329	34	37
12 PM	9	53	55	114	108	33	2	0	0	0	0	0	0	0	374	33	37
13:00	4	40	35	88	113	28	1	0	0	0	0	0	0	0	309	34	36
14:00	9	45	60	100	116	42	**6**	0	0	0	0	0	0	0	378	34	38
15:00	**29**	**65**	**103**	126	90	11	2	0	0	0	0	0	0	0	426	31	34
16:00	6	35	61	130	**170**	**56**	2	0	0	0	0	0	0	0	460	34	37
17:00	26	44	93	**166**	144	19	2	0	0	0	0	0	0	0	**494**	32	35
18:00	6	48	72	159	117	25	3	0	0	0	0	0	0	0	430	33	36
19:00	3	21	45	85	85	34	2	**2**	0	0	0	0	0	0	277	34	38
20:00	1	16	42	47	83	21	2	0	0	0	0	0	0	0	212	34	37
21:00	5	20	51	56	69	21	4	1	0	0	0	0	0	0	227	34	38
22:00	5	18	24	29	52	11	0	0	0	0	0	0	0	0	139	34	36
23:00	1	5	13	18	24	4	0	0	0	0	0	0	0	0	65	33	36
Total	232	767	1099	1673	1695	479	48	4	0	0	0	0	0	0	5997		
Percent	3.9%	12.8%	18.3%	27.9%	28.3%	8.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	09:00	11:00	11:00	05:00	11:00							08:00		
Vol.	54	83	94	115	107	40	4	1							421		
PM Peak	15:00	15:00	15:00	17:00	16:00	16:00	14:00	19:00							17:00		
Vol.	29	65	103	166	170	56	6	2							494		
Total	402	1542	2161	3345	3556	1025	100	9	0	0	0	0	0	0	12140		
Percent	3.3%	12.7%	17.8%	27.6%	29.3%	8.4%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	16 MPH
	50th Percentile :	27 MPH
	85th Percentile :	33 MPH
	95th Percentile :	37 MPH
Stats	10 MPH Pace Speed :	25-34 MPH
	Number in Pace :	5939
	Percent in Pace :	48.9%
	Number of Vehicles > 40 MPH :	202
	Percent of Vehicles > 40 MPH :	1.7%
	Mean Speed(Average) :	26 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	12	1	0	0	0	0	0	0	0	0	0	0	0	13
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	7	2	0	0	0	0	0	0	0	0	0	0	0	9
03:00	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
04:00	0	26	8	0	1	0	0	0	0	0	0	0	0	0	35
05:00	0	38	17	0	2	0	0	0	0	0	0	0	0	0	57
06:00	1	137	37	0	1	1	0	0	0	0	0	0	0	0	177
07:00	0	231	32	2	4	0	0	4	0	0	0	0	0	0	273
08:00	0	303	26	2	3	0	0	0	0	0	0	0	0	1	335
09:00	2	216	28	1	5	0	0	1	1	1	0	0	0	0	255
10:00	1	177	25	0	4	0	0	0	1	1	0	0	0	0	209
11:00	2	190	17	2	6	0	0	1	0	0	0	0	0	1	219
12 PM	1	206	33	1	4	5	0	1	1	0	0	0	0	1	253
13:00	1	165	26	1	9	0	0	1	0	0	0	0	0	0	203
14:00	4	189	21	4	3	1	0	1	0	0	0	0	0	0	223
15:00	2	212	25	3	2	1	0	0	1	0	0	0	0	4	250
16:00	0	194	19	1	6	2	0	1	0	0	0	0	0	0	223
17:00	3	215	14	0	7	1	0	0	0	0	0	0	0	0	240
18:00	1	200	23	0	4	0	0	0	0	0	0	0	0	0	228
19:00	0	124	6	0	3	1	0	0	0	0	0	0	0	0	134
20:00	1	123	4	0	1	0	0	0	0	0	0	0	0	0	129
21:00	0	77	7	1	0	0	0	0	0	0	0	0	0	0	85
22:00	0	57	3	0	0	0	0	0	0	0	0	0	0	0	60
23:00	0	25	0	0	0	0	0	1	0	0	0	0	0	0	26
Total	19	3135	376	18	65	12	0	11	4	2	0	0	0	7	3649
Percent	0.5%	85.9%	10.3%	0.5%	1.8%	0.3%	0.0%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	
AM Peak	09:00	08:00	06:00	07:00	11:00	06:00		07:00	09:00	09:00				08:00	
Vol.	2	303	37	2	6	1		4	1	1				1	
PM Peak	14:00	17:00	12:00	14:00	13:00	12:00		12:00	12:00					15:00	
Vol.	4	215	33	4	9	5		1	1					4	

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Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	17	1	0	0	0	0	0	0	0	0	0	0	0	18
01:00	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
03:00	0	6	3	0	1	0	0	0	0	0	0	0	0	0	10
04:00	0	25	8	0	0	0	0	0	0	0	0	0	0	0	33
05:00	0	38	15	0	1	0	0	0	0	0	0	0	0	0	54
06:00	1	123	39	2	6	0	0	0	0	0	0	0	0	0	171
07:00	2	211	34	2	1	2	0	0	0	0	0	0	0	1	253
08:00	0	276	38	2	5	1	0	1	0	0	0	0	0	0	323
09:00	3	253	34	3	4	0	0	0	0	0	0	0	0	2	299
10:00	2	182	24	0	5	0	0	0	0	0	0	0	0	0	213
11:00	1	165	31	1	7	0	0	0	0	0	0	0	0	0	205
12 PM	4	196	37	0	4	1	0	1	0	0	0	0	0	0	243
13:00	2	145	23	3	4	1	0	0	0	0	0	0	0	1	179
14:00	0	170	22	3	6	3	0	0	0	0	0	0	0	0	204
15:00	4	200	31	3	4	1	0	0	1	0	0	0	0	1	245
16:00	2	186	18	0	7	1	0	1	0	0	0	0	0	0	215
17:00	2	209	20	1	4	0	0	1	0	0	0	0	0	0	237
18:00	3	202	15	0	4	0	0	1	1	0	0	0	0	0	226
19:00	2	108	7	0	2	0	0	0	0	0	0	0	0	0	119
20:00	0	80	3	0	2	0	0	1	0	0	0	0	0	0	86
21:00	1	103	4	0	1	0	0	0	0	0	0	0	0	0	109
22:00	0	67	6	0	0	0	0	0	0	0	0	0	0	0	73
23:00	0	36	0	0	0	0	0	0	0	0	0	0	0	0	36
Total	29	3016	414	20	68	10	0	6	2	0	0	0	0	5	3570
Percent	0.8%	84.5%	11.6%	0.6%	1.9%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	09:00	08:00	06:00	09:00	11:00	07:00		08:00						09:00	
Vol.	3	276	39	3	7	2		1						2	
PM Peak	12:00	17:00	12:00	13:00	16:00	14:00		12:00	15:00					13:00	
Vol.	4	209	37	3	7	3		1	1					1	
Grand Total	48	6151	790	38	133	22	0	17	6	2	0	0	0	12	7219
Percent	0.7%	85.2%	10.9%	0.5%	1.8%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	

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Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	8	1	0	0	0	0	0	0	0	0	0	0	0	9
02:00	0	7	2	0	0	0	0	0	0	0	0	0	0	0	9
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
05:00	0	13	2	0	0	0	0	0	0	0	0	0	0	0	15
06:00	0	20	6	0	0	0	0	0	0	0	0	0	0	0	26
07:00	0	52	11	1	2	1	0	0	0	0	0	0	0	0	67
08:00	0	70	18	4	8	0	0	0	0	0	0	0	0	0	100
09:00	0	86	17	1	3	0	0	0	0	1	0	0	0	0	108
10:00	0	102	11	1	4	2	0	2	0	0	0	0	0	0	122
11:00	2	119	12	3	3	0	0	2	0	0	0	0	0	0	141
12 PM	2	141	16	1	3	1	0	0	2	0	0	0	0	0	166
13:00	1	120	16	1	2	0	0	1	0	0	0	0	0	0	141
14:00	2	155	19	3	1	0	0	1	0	1	0	0	0	0	182
15:00	3	167	20	1	2	2	0	1	0	0	0	0	0	0	196
16:00	3	240	21	0	2	0	0	0	0	0	0	0	0	0	266
17:00	0	248	19	1	2	0	0	0	1	0	0	0	0	0	271
18:00	1	206	7	1	1	0	0	0	0	0	0	0	0	0	216
19:00	0	140	4	2	0	0	0	0	0	0	0	0	0	0	146
20:00	0	102	7	0	0	0	0	0	0	0	0	0	0	0	109
21:00	4	84	7	0	2	0	0	0	0	0	0	0	0	0	97
22:00	0	65	4	0	0	0	0	0	0	0	0	0	0	0	69
23:00	0	27	2	0	0	0	0	0	0	0	0	0	0	0	29
Total	18	2179	222	20	36	7	0	7	3	2	0	0	0	0	2494
Percent	0.7%	87.4%	8.9%	0.8%	1.4%	0.3%	0.0%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	08:00	08:00	08:00	10:00		10:00		09:00					
Vol.	2	119	18	4	8	2		2		1					
PM Peak	21:00	17:00	16:00	14:00	12:00	15:00		13:00	12:00	14:00					
Vol.	4	248	21	3	3	2		1	2	1					

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	1	26	2	0	0	0	0	0	0	0	0	0	0	0	29
01:00	0	8	1	0	0	0	0	0	0	0	0	0	0	0	9
02:00	0	4	0	0	1	0	0	0	0	0	0	0	0	0	5
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	8	2	0	1	0	0	0	0	0	0	0	0	0	11
06:00	1	28	4	0	0	0	0	0	0	0	0	0	0	0	33
07:00	3	57	14	0	2	2	0	0	0	0	0	0	0	0	78
08:00	1	75	15	2	5	0	0	0	0	0	0	0	0	0	98
09:00	0	85	14	2	4	0	0	0	0	0	0	0	0	0	105
10:00	1	95	9	1	4	0	0	1	1	0	0	0	0	0	112
11:00	0	107	15	0	2	0	0	0	0	0	0	0	0	0	124
12 PM	3	113	12	1	1	1	0	0	0	0	0	0	0	0	131
13:00	0	105	20	0	3	0	0	2	0	0	0	0	0	0	130
14:00	2	151	15	1	4	0	0	1	0	0	0	0	0	0	174
15:00	1	146	25	1	7	0	0	0	0	0	0	0	0	1	181
16:00	1	220	21	0	3	0	0	0	0	0	0	0	0	0	245
17:00	0	232	22	1	1	1	0	0	0	0	0	0	0	0	257
18:00	3	187	12	0	2	0	0	0	0	0	0	0	0	0	204
19:00	0	150	4	1	3	0	0	0	0	0	0	0	0	0	158
20:00	0	121	4	0	1	0	0	0	0	0	0	0	0	0	126
21:00	1	106	7	1	3	0	0	0	0	0	0	0	0	0	118
22:00	0	61	4	0	1	0	0	0	0	0	0	0	0	0	66
23:00	0	29	0	0	0	0	0	0	0	0	0	0	0	0	29
Total	18	2117	223	11	48	4	0	4	1	0	0	0	0	1	2427
Percent	0.7%	87.2%	9.2%	0.5%	2.0%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	08:00	08:00	08:00	07:00		10:00	10:00						
Vol.	3	107	15	2	5	2		1	1						
PM Peak	12:00	17:00	15:00	12:00	15:00	12:00		13:00						15:00	
Vol.	3	232	25	1	7	1		2						1	
Grand Total	36	4296	445	31	84	11	0	11	4	2	0	0	0	1	4921
Percent	0.7%	87.3%	9.0%	0.6%	1.7%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

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Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	19	1	0	0	0	0	0	0	0	0	0	0	0	20
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	0	14
02:00	0	14	4	0	0	0	0	0	0	0	0	0	0	0	18
03:00	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
04:00	0	26	8	0	2	1	0	0	0	0	0	0	0	0	37
05:00	0	51	19	0	2	0	0	0	0	0	0	0	0	0	72
06:00	1	157	43	0	1	1	0	0	0	0	0	0	0	0	203
07:00	0	283	43	3	6	1	0	4	0	0	0	0	0	0	340
08:00	0	373	44	6	11	0	0	0	0	0	0	0	0	1	435
09:00	2	302	45	2	8	0	0	1	1	2	0	0	0	0	363
10:00	1	279	36	1	8	2	0	2	1	1	0	0	0	0	331
11:00	4	309	29	5	9	0	0	3	0	0	0	0	0	1	360
12 PM	3	347	49	2	7	6	0	1	3	0	0	0	0	1	419
13:00	2	285	42	2	11	0	0	2	0	0	0	0	0	0	344
14:00	6	344	40	7	4	1	0	2	0	1	0	0	0	0	405
15:00	5	379	45	4	4	3	0	1	1	0	0	0	0	4	446
16:00	3	434	40	1	8	2	0	1	0	0	0	0	0	0	489
17:00	3	463	33	1	9	1	0	0	1	0	0	0	0	0	511
18:00	2	406	30	1	5	0	0	0	0	0	0	0	0	0	444
19:00	0	264	10	2	3	1	0	0	0	0	0	0	0	0	280
20:00	1	225	11	0	1	0	0	0	0	0	0	0	0	0	238
21:00	4	161	14	1	2	0	0	0	0	0	0	0	0	0	182
22:00	0	122	7	0	0	0	0	0	0	0	0	0	0	0	129
23:00	0	52	2	0	0	0	0	1	0	0	0	0	0	0	55
Total	37	5314	598	38	101	19	0	18	7	4	0	0	0	7	6143
Percent	0.6%	86.5%	9.7%	0.6%	1.6%	0.3%	0.0%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	
AM Peak	11:00	08:00	09:00	08:00	08:00	10:00		07:00	09:00	09:00				08:00	
Vol.	4	373	45	6	11	2		4	1	2				1	
PM Peak	14:00	17:00	12:00	14:00	13:00	12:00		13:00	12:00	14:00				15:00	
Vol.	6	463	49	7	11	6		2	3	1				4	

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Location: Montague Road
Location: East of Sunderland Road
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	1	43	3	0	0	0	0	0	0	0	0	0	0	0	47
01:00	0	22	1	0	0	0	0	0	0	0	0	0	0	0	23
02:00	0	8	1	0	1	0	0	0	0	0	0	0	0	0	10
03:00	0	7	3	0	1	0	0	0	0	0	0	0	0	0	11
04:00	0	27	9	0	0	0	0	0	0	0	0	0	0	0	36
05:00	0	46	17	0	2	0	0	0	0	0	0	0	0	0	65
06:00	2	151	43	2	6	0	0	0	0	0	0	0	0	0	204
07:00	5	268	48	2	3	4	0	0	0	0	0	0	0	1	331
08:00	1	351	53	4	10	1	0	1	0	0	0	0	0	0	421
09:00	3	338	48	5	8	0	0	0	0	0	0	0	0	2	404
10:00	3	277	33	1	9	0	0	1	1	0	0	0	0	0	325
11:00	1	272	46	1	9	0	0	0	0	0	0	0	0	0	329
12 PM	7	309	49	1	5	2	0	1	0	0	0	0	0	0	374
13:00	2	250	43	3	7	1	0	2	0	0	0	0	0	1	309
14:00	2	321	37	4	10	3	0	1	0	0	0	0	0	0	378
15:00	5	346	56	4	11	1	0	0	1	0	0	0	0	2	426
16:00	3	406	39	0	10	1	0	1	0	0	0	0	0	0	460
17:00	2	441	42	2	5	1	0	1	0	0	0	0	0	0	494
18:00	6	389	27	0	6	0	0	1	1	0	0	0	0	0	430
19:00	2	258	11	1	5	0	0	0	0	0	0	0	0	0	277
20:00	0	201	7	0	3	0	0	1	0	0	0	0	0	0	212
21:00	2	209	11	1	4	0	0	0	0	0	0	0	0	0	227
22:00	0	128	10	0	1	0	0	0	0	0	0	0	0	0	139
23:00	0	65	0	0	0	0	0	0	0	0	0	0	0	0	65
Total	47	5133	637	31	116	14	0	10	3	0	0	0	0	6	5997
Percent	0.8%	85.6%	10.6%	0.5%	1.9%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	07:00	08:00	08:00	09:00	08:00	07:00		08:00	10:00					09:00	
Vol.	5	351	53	5	10	4		1	1					2	
PM Peak	12:00	17:00	15:00	14:00	15:00	14:00		13:00	15:00					15:00	
Vol.	7	441	56	4	11	3		2	1					2	
Grand Total	84	10447	1235	69	217	33	0	28	10	4	0	0	0	13	12140
Percent	0.7%	86.1%	10.2%	0.6%	1.8%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Start	10-Oct-17	Southbound		Northbound		Combined		11-Oct-	Southbound		Northbound		Combined	
Time	Tue	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Wed	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		16	75	14	51	30	126		12	73	19	60	31	133
12:15		12	53	13	74	25	127		5	62	16	73	21	135
12:30		12	53	12	69	24	122		4	49	17	44	21	93
12:45		10	65	9	75	19	140		6	72	28	71	34	143
01:00		5	66	8	58	13	124		10	61	10	49	20	110
01:15		5	81	8	63	13	144		5	55	11	50	16	105
01:30		2	55	4	51	6	106		6	41	5	68	11	109
01:45		1	62	4	48	5	110		3	47	5	53	8	100
02:00		1	82	1	57	2	139		2	69	4	57	6	126
02:15		1	57	3	69	4	126		3	58	3	62	6	120
02:30		4	63	5	68	9	131		1	44	1	89	2	133
02:45		0	50	3	115	3	165		2	57	3	119	5	176
03:00		3	57	0	89	3	146		1	52	2	78	3	130
03:15		1	63	2	61	3	124		4	67	2	63	6	130
03:30		1	67	0	91	1	158		4	77	2	81	6	158
03:45		2	62	3	95	5	157		1	71	2	79	3	150
04:00		5	39	3	***153***	8	192		5	55	2	134	7	189
04:15		8	41	1	***80***	9	121		6	45	2	88	8	133
04:30		13	72	0	***105***	13	***177***		15	55	0	***108***	15	***163***
04:45		18	56	1	***96***	19	***152***		12	68	1	***80***	13	***148***
05:00		4	69	0	106	4	***175***		5	64	3	***132***	8	***196***
05:15		9	51	3	118	12	***169***		9	64	4	***125***	13	***189***
05:30		15	***75***	5	96	20	171		16	55	4	108	20	163
05:45		26	***82***	11	71	37	153		21	***60***	11	72	32	132
06:00		16	***66***	8	66	24	132		19	***68***	9	54	28	122
06:15		31	***77***	9	67	40	144		33	***84***	8	61	41	145
06:30		66	74	11	90	77	164		67	***71***	15	75	82	146
06:45		62	72	19	80	81	152		77	44	23	63	100	107
07:00		50	55	24	70	74	125		35	45	21	82	56	127
07:15		77	50	31	55	108	105		66	57	23	60	89	117
07:30		100	40	23	68	123	108		82	50	29	56	111	106
07:45		104	39	29	72	133	111		104	42	34	58	138	100
08:00		84	47	33	51	117	98		***82***	52	29	55	111	107
08:15		***114***	29	28	61	***142***	90		***110***	48	28	55	***138***	103
08:30		***123***	39	42	48	***165***	87		***113***	39	***49***	56	***162***	95
08:45		***136***	34	54	45	***190***	79		***151***	32	***38***	65	***189***	97
09:00		***97***	50	47	43	***144***	93		82	39	***63***	50	***145***	89
09:15		84	38	29	41	113	79		75	35	***33***	77	108	112
09:30		94	31	33	68	127	99		71	37	41	52	112	89
09:45		74	29	37	49	111	78		83	26	30	42	113	68
10:00		69	35	59	37	128	72		52	37	56	33	108	70
10:15		69	22	38	33	107	55		59	21	28	34	87	55
10:30		65	24	38	32	103	56		63	23	27	41	90	64
10:45		72	20	***37***	39	109	59		64	36	39	37	103	73
11:00		62	22	***57***	28	119	50		51	25	42	29	93	54
11:15		54	19	***54***	25	108	44		55	15	43	19	98	34
11:30		65	13	***43***	16	108	29		56	14	44	19	100	33
11:45		73	18	32	33	105	51		77	9	53	16	130	25
Total		2015	2439	928	3176	2943	5615		1885	2370	962	3132	2847	5502
Day Total		4454		4104		8558			4255		4094		8349	
% Total		23.5%	28.5%	10.8%	37.1%				22.6%	28.4%	11.5%	37.5%		
Peak		08:15	05:30	10:45	04:00	08:15	04:30		08:00	05:45	08:30	04:30	08:15	04:30
Vol.		470	300	191	434	641	673		456	283	183	445	634	696
P.H.F.		0.864	0.915	0.838	0.709	0.843	0.876		0.755	0.842	0.726	0.843	0.839	0.888

ADT	ADT 8,442	AADT 8,442

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Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	0	3	17	21	7	1	**1**	0	0	0	0	0	50	40	43
01:00	0	0	0	0	5	3	4	1	0	0	0	0	0	0	13	42	44
02:00	0	0	0	1	2	2	0	0	1	0	0	0	0	0	6	*	*
03:00	0	0	0	1	3	2	1	0	0	0	0	0	0	0	7	34	34
04:00	0	0	1	3	10	19	7	2	1	0	0	**1**	0	0	44	41	45
05:00	0	0	0	2	17	21	12	2	0	0	0	0	0	0	54	42	44
06:00	0	0	0	3	54	84	28	5	1	0	0	0	0	0	175	41	45
07:00	0	0	0	11	94	146	69	10	1	0	0	0	0	0	331	42	45
08:00	0	**3**	**5**	**16**	**125**	**227**	71	10	0	0	0	0	0	0	**457**	41	44
09:00	0	2	2	13	91	164	65	12	0	0	0	0	0	0	349	41	45
10:00	0	1	2	9	49	126	**75**	13	0	0	0	0	0	0	275	43	46
11:00	0	0	2	16	62	98	61	**14**	1	0	0	0	0	0	254	43	46
12 PM	1	1	2	9	74	106	46	7	0	0	0	0	0	0	246	41	44
13:00	**4**	3	1	11	52	**119**	**63**	9	2	0	0	0	0	0	264	42	45
14:00	0	2	2	**26**	80	90	42	7	2	0	0	**1**	0	0	252	41	44
15:00	0	**4**	6	6	55	116	50	**11**	1	0	0	0	0	0	249	42	45
16:00	0	4	**7**	13	52	91	36	5	0	0	0	0	0	0	208	41	44
17:00	1	1	2	15	79	115	51	10	**3**	0	0	0	0	0	277	42	45
18:00	0	1	1	20	**89**	118	52	6	1	**1**	0	0	0	0	**289**	41	44
19:00	0	1	5	15	65	73	20	3	1	0	0	1	0	0	184	40	43
20:00	1	0	0	5	53	65	25	0	0	0	0	0	0	0	149	40	43
21:00	0	0	1	8	53	60	20	5	1	0	0	0	0	0	148	41	45
22:00	1	0	4	10	23	45	17	1	0	0	0	0	0	0	101	40	43
23:00	3	0	0	5	19	27	14	3	1	0	0	0	0	0	72	42	45
Total	11	23	43	221	1223	1938	836	137	18	1	0	3	0	0	4454		
Percent	0.2%	0.5%	1.0%	5.0%	27.5%	43.5%	18.8%	3.1%	0.4%	0.0%	0.0%	0.1%	0.0%	0.0%			
AM Peak		08:00	08:00	08:00	08:00	08:00	10:00	11:00	00:00			04:00			08:00		
Vol.		3	5	16	125	227	75	14	1			1			457		
PM Peak	13:00	15:00	16:00	14:00	18:00	13:00	13:00	15:00	17:00	18:00		14:00			18:00		
Vol.	4	4	7	26	89	119	63	11	3	1		1			289		

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	1	1	15	6	2	2	0	0	0	0	0	0	27	38	40
01:00	0	0	1	0	4	10	7	1	1	0	0	0	0	0	24	42	44
02:00	0	0	1	0	2	3	1	1	0	0	0	0	0	0	8	38	38
03:00	0	0	1	0	4	3	2	0	0	0	0	0	0	0	10	38	39
04:00	0	0	0	0	7	17	10	3	1	0	0	0	0	0	38	43	47
05:00	0	1	0	1	15	24	8	2	0	0	0	0	0	0	51	41	44
06:00	0	1	1	4	60	93	36	1	0	0	0	0	0	0	196	41	43
07:00	0	1	1	14	75	141	51	3	1	0	0	0	0	0	287	41	44
08:00	0	1	**2**	22	**168**	**201**	**52**	**8**	1	**1**	0	0	0	0	**456**	40	43
09:00	0	1	0	14	88	157	43	6	**2**	0	0	0	0	0	311	41	44
10:00	**5**	**2**	2	**25**	72	89	35	8	0	0	0	0	0	0	238	41	45
11:00	0	1	0	19	74	97	40	7	1	0	0	0	0	0	239	41	44
12 PM	1	1	**5**	18	70	110	45	5	0	**1**	0	0	0	0	256	41	44
13:00	0	0	2	4	51	79	59	7	2	0	0	0	0	0	204	43	45
14:00	0	1	3	9	32	119	**60**	3	1	0	0	0	0	0	228	42	44
15:00	0	**4**	1	15	79	109	43	**13**	**3**	0	0	0	0	0	**267**	42	46
16:00	0	0	3	8	77	93	29	10	3	0	0	0	0	0	223	41	45
17:00	**2**	2	5	**23**	81	93	26	10	1	0	0	0	0	0	243	40	45
18:00	0	1	2	12	**90**	**128**	28	6	0	0	0	0	0	0	267	40	43
19:00	2	0	1	13	72	89	16	1	0	0	0	0	0	0	194	39	42
20:00	1	0	2	3	46	92	23	4	0	0	0	0	0	0	171	40	44
21:00	0	0	1	9	48	54	20	5	0	0	0	0	0	0	137	41	45
22:00	1	0	0	7	45	43	18	3	0	0	0	0	0	0	117	41	44
23:00	1	1	3	2	18	29	8	1	0	0	0	0	0	0	63	40	43
Total	13	18	38	223	1293	1879	662	110	17	2	0	0	0	0	4255		
Percent	0.3%	0.4%	0.9%	5.2%	30.4%	44.2%	15.6%	2.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	08:00	10:00	08:00	08:00	08:00	08:00	09:00	08:00					08:00		
Vol.	5	2	2	25	168	201	52	8	2	1					456		
PM Peak	17:00	15:00	12:00	17:00	18:00	18:00	14:00	15:00	15:00	12:00					15:00		
Vol.	2	4	5	23	90	128	60	13	3	1					267		
Total	24	41	81	444	2516	3817	1498	247	35	3	0	3	0	0	8709		
Percent	0.3%	0.5%	0.9%	5.1%	28.9%	43.8%	17.2%	2.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats		
	10 MPH Pace Speed :	32-41 MPH
	Number in Pace :	5927
	Percent in Pace :	68.1%
	Number of Vehicles > 40 MPH :	2055
	Percent of Vehicles > 40 MPH :	23.6%
	Mean Speed(Average) :	37 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	2	5	20	11	8	2	0	0	0	0	0	0	48	41	44
01:00	0	1	0	1	12	5	4	1	0	0	0	0	0	0	24	41	43
02:00	0	0	0	2	5	4	1	0	0	0	0	0	0	0	12	38	39
03:00	0	0	0	1	2	2	0	0	0	0	0	0	0	0	5	*	*
04:00	0	0	1	0	2	1	1	0	0	0	0	0	0	0	5	*	*
05:00	**1**	0	0	1	6	9	2	0	0	0	0	0	0	0	19	39	41
06:00	0	1	1	4	15	21	4	0	**1**	0	0	0	0	0	47	39	41
07:00	0	**4**	1	7	42	42	8	3	0	0	0	0	0	0	107	39	42
08:00	1	0	**15**	4	52	55	24	**6**	0	0	0	0	0	0	157	41	45
09:00	0	1	1	11	60	53	18	2	0	0	0	0	0	0	146	40	43
10:00	0	2	0	**23**	51	**73**	19	4	0	0	0	0	0	0	172	40	43
11:00	0	0	6	19	**64**	67	**28**	2	0	0	0	0	0	0	**186**	40	43
12 PM	0	1	3	27	103	103	27	5	0	0	0	0	0	0	269	40	43
13:00	0	2	2	12	78	99	21	**6**	0	0	0	0	0	0	220	40	43
14:00	**4**	**4**	6	50	115	96	**32**	2	0	0	0	0	0	0	309	39	42
15:00	1	2	5	45	125	128	29	1	0	0	0	0	0	0	336	39	42
16:00	0	0	12	**84**	**189**	122	21	6	0	0	0	0	0	0	**434**	38	41
17:00	0	0	**15**	44	170	**136**	20	5	1	0	0	0	0	0	391	38	41
18:00	0	3	14	51	122	90	18	4	1	0	0	0	0	0	303	38	42
19:00	0	2	7	39	100	90	24	3	0	0	0	0	0	0	265	39	42
20:00	0	0	4	31	100	57	11	2	0	0	0	0	0	0	205	38	41
21:00	0	1	5	24	103	56	8	2	**2**	0	0	0	0	0	201	38	41
22:00	1	0	2	18	53	52	15	0	0	0	0	0	0	0	141	39	42
23:00	1	0	1	8	45	40	5	2	0	0	0	0	0	0	102	39	42
Total	9	24	103	511	1634	1412	348	58	5	0	0	0	0	0	4104		
Percent	0.2%	0.6%	2.5%	12.5%	39.8%	34.4%	8.5%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	07:00	08:00	10:00	11:00	10:00	11:00	08:00	06:00						11:00		
Vol.	1	4	15	23	64	73	28	6	1						186		
PM Peak	14:00	14:00	17:00	16:00	16:00	17:00	14:00	13:00	21:00						16:00		
Vol.	4	4	15	84	189	136	32	6	2						434		

Innovative Data, LLC

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Belchertown, Massachusetts
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Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	**7**	4	24	35	9	0	0	0	**1**	0	0	0	80	40	42
01:00	0	0	2	2	5	10	8	**3**	0	**1**	0	0	0	0	31	43	46
02:00	0	0	0	1	1	6	1	2	0	0	0	0	0	0	11	39	40
03:00	0	0	0	1	0	4	3	0	0	0	0	0	0	0	8	41	42
04:00	0	1	0	0	2	0	2	0	0	0	0	0	0	0	5	*	*
05:00	1	0	0	2	7	8	3	1	0	0	0	0	0	0	22	41	43
06:00	**2**	0	0	9	18	21	4	1	0	0	0	0	0	0	55	39	42
07:00	1	**2**	0	8	43	42	8	2	**1**	0	0	0	0	0	107	39	42
08:00	0	1	1	**16**	53	48	**23**	2	0	0	0	0	0	0	144	40	43
09:00	1	1	1	10	62	73	18	1	0	0	0	0	0	0	167	40	42
10:00	0	1	3	15	**63**	49	17	1	1	0	0	0	0	0	150	39	42
11:00	2	2	6	13	51	**85**	23	0	0	0	0	0	0	0	**182**	40	43
12 PM	1	1	5	38	109	68	21	**4**	**1**	0	0	0	0	0	248	39	43
13:00	1	1	1	18	79	95	**22**	3	0	0	0	0	0	0	220	39	43
14:00	**2**	1	3	51	127	**119**	21	3	0	0	0	0	0	0	327	39	41
15:00	0	0	7	51	145	77	21	0	0	0	0	0	0	0	301	38	41
16:00	0	0	8	67	**198**	116	19	2	0	0	0	0	0	0	410	38	40
17:00	2	1	**33**	**130**	187	75	9	0	0	0	0	0	0	0	**437**	36	39
18:00	1	1	11	37	128	60	15	0	0	0	0	0	0	0	253	38	41
19:00	0	0	6	55	109	71	13	2	0	0	0	0	0	0	256	38	41
20:00	0	1	5	39	116	57	12	1	0	0	0	0	0	0	231	38	41
21:00	0	1	5	28	110	67	8	2	0	0	0	0	0	0	221	38	40
22:00	1	**2**	5	12	56	58	10	1	0	0	0	0	0	0	145	39	41
23:00	0	0	0	8	33	36	4	2	0	0	0	0	0	0	83	39	41
Total	15	17	109	615	1726	1280	294	33	3	1	1	0	0	0	4094		
Percent	0.4%	0.4%	2.7%	15.0%	42.2%	31.3%	7.2%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	07:00	00:00	08:00	10:00	11:00	08:00	01:00	07:00	01:00	00:00				11:00		
Vol.	2	2	7	16	63	85	23	3	1	1	1				182		
PM Peak	14:00	22:00	17:00	17:00	16:00	14:00	13:00	12:00	12:00						17:00		
Vol.	2	2	33	130	198	119	22	4	1						437		
Total	24	41	212	1126	3360	2692	642	91	8	1	1	0	0	0	8198		
Percent	0.3%	0.5%	2.6%	13.7%	41.0%	32.8%	7.8%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	28 MPH
	50th Percentile :	34 MPH
	85th Percentile :	39 MPH
	95th Percentile :	42 MPH
Stats	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	5541
	Percent in Pace :	67.6%
	Number of Vehicles > 40 MPH :	984
	Percent of Vehicles > 40 MPH :	12.0%
	Mean Speed(Average) :	34 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	2	8	37	32	15	3	1	0	0	0	0	0	98	41	45
01:00	0	1	0	1	17	8	8	2	0	0	0	0	0	0	37	42	45
02:00	0	0	0	3	7	6	1	0	1	0	0	0	0	0	18	38	40
03:00	0	0	0	2	5	4	1	0	0	0	0	0	0	0	12	38	39
04:00	0	0	2	3	12	20	8	2	1	0	0	**1**	0	0	49	41	44
05:00	**1**	0	0	3	23	30	14	2	0	0	0	0	0	0	73	41	44
06:00	0	1	1	7	69	105	32	5	**2**	0	0	0	0	0	222	41	44
07:00	0	**4**	1	18	136	188	77	13	1	0	0	0	0	0	438	41	45
08:00	1	3	**20**	20	**177**	**282**	**95**	16	0	0	0	0	0	0	**614**	41	44
09:00	0	3	3	24	151	217	83	14	0	0	0	0	0	0	495	41	44
10:00	0	3	2	32	100	199	94	**17**	0	0	0	0	0	0	447	42	45
11:00	0	0	8	**35**	126	165	89	16	1	0	0	0	0	0	440	42	45
12 PM	1	2	5	36	177	209	73	12	0	0	0	0	0	0	515	40	44
13:00	**4**	5	3	23	130	218	**84**	**15**	2	0	0	0	0	0	484	41	44
14:00	4	**6**	8	76	195	186	74	9	2	0	0	**1**	0	0	561	40	43
15:00	1	6	11	51	180	244	79	12	1	0	0	0	0	0	585	40	44
16:00	0	4	**19**	**97**	241	213	57	11	0	0	0	0	0	0	642	39	43
17:00	1	1	17	59	**249**	**251**	71	15	**4**	0	0	0	0	0	**668**	40	44
18:00	0	4	15	71	211	208	70	10	2	**1**	0	0	0	0	592	40	43
19:00	0	3	12	54	165	163	44	6	1	0	0	1	0	0	449	39	43
20:00	1	0	4	36	153	122	36	2	0	0	0	0	0	0	354	39	42
21:00	0	1	6	32	156	116	28	7	3	0	0	0	0	0	349	39	43
22:00	2	0	6	28	76	97	32	1	0	0	0	0	0	0	242	40	43
23:00	4	0	1	13	64	67	19	5	1	0	0	0	0	0	174	40	44
Total	20	47	146	732	2857	3350	1184	195	23	1	0	3	0	0	8558		
Percent	0.2%	0.5%	1.7%	8.6%	33.4%	39.1%	13.8%	2.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	07:00	08:00	11:00	08:00	08:00	08:00	10:00	06:00			04:00			08:00		
Vol.	1	4	20	35	177	282	95	17	2			1			614		
PM Peak	13:00	14:00	16:00	16:00	17:00	17:00	13:00	13:00	17:00	18:00		14:00			17:00		
Vol.	4	6	19	97	249	251	84	15	4	1		1			668		

Innovative Data, LLC

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Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	**8**	5	39	41	11	2	0	0	**1**	0	0	0	107	39	42
01:00	0	0	3	2	9	20	15	4	1	**1**	0	0	0	0	55	43	47
02:00	0	0	1	1	3	9	2	3	0	0	0	0	0	0	19	45	47
03:00	0	0	1	1	4	7	5	0	0	0	0	0	0	0	18	42	44
04:00	0	1	0	0	9	17	12	3	1	0	0	0	0	0	43	44	47
05:00	1	1	0	3	22	32	11	3	0	0	0	0	0	0	73	41	44
06:00	2	1	1	13	78	114	40	2	0	0	0	0	0	0	251	40	43
07:00	1	**3**	1	22	118	183	59	5	**2**	0	0	0	0	0	394	41	44
08:00	0	2	3	38	**221**	**249**	**75**	**10**	1	1	0	0	0	0	**600**	40	43
09:00	1	2	1	24	150	230	61	7	2	0	0	0	0	0	478	40	43
10:00	**5**	3	5	**40**	135	138	52	9	1	0	0	0	0	0	388	40	44
11:00	2	3	6	32	125	182	63	7	1	0	0	0	0	0	421	40	44
12 PM	2	2	10	56	179	178	66	9	1	**1**	0	0	0	0	504	40	44
13:00	1	1	3	22	130	174	**81**	10	2	0	0	0	0	0	424	41	44
14:00	2	2	6	60	159	**238**	81	6	1	0	0	0	0	0	555	40	43
15:00	0	**4**	8	66	224	186	64	**13**	**3**	0	0	0	0	0	568	40	44
16:00	0	0	11	75	**275**	209	48	12	3	0	0	0	0	0	633	39	43
17:00	**4**	3	**38**	**153**	268	168	35	10	1	0	0	0	0	0	**680**	38	41
18:00	1	2	13	49	218	188	43	6	0	0	0	0	0	0	520	39	42
19:00	2	0	7	68	181	160	29	3	0	0	0	0	0	0	450	39	41
20:00	1	1	7	42	162	149	35	5	0	0	0	0	0	0	402	39	42
21:00	0	1	6	37	158	121	28	7	0	0	0	0	0	0	358	39	43
22:00	2	2	5	19	101	101	28	4	0	0	0	0	0	0	262	40	43
23:00	1	1	3	10	51	65	12	3	0	0	0	0	0	0	146	39	42
Total	28	35	147	838	3019	3159	956	143	20	3	1	0	0	0	8349		
Percent	0.3%	0.4%	1.8%	10.0%	36.2%	37.8%	11.5%	1.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	07:00	00:00	10:00	08:00	08:00	08:00	08:00	07:00	01:00	00:00				08:00		
Vol.	5	3	8	40	221	249	75	10	2	1	1				600		
PM Peak	17:00	15:00	17:00	17:00	16:00	14:00	13:00	15:00	15:00	12:00					17:00		
Vol.	4	4	38	153	275	238	81	13	3	1					680		
Total	48	82	293	1570	5876	6509	2140	338	43	4	1	3	0	0	16907		
Percent	0.3%	0.5%	1.7%	9.3%	34.8%	38.5%	12.7%	2.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats		
	10 MPH Pace Speed :	31-40 MPH
	Number in Pace :	11291
	Percent in Pace :	66.8%
	Number of Vehicles > 40 MPH :	3039
	Percent of Vehicles > 40 MPH :	18.0%
	Mean Speed(Average) :	36 MPH

Innovative Data, LLC

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Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	43	4	0	2	1	0	0	0	0	0	0	0	0	50
01:00	0	11	2	0	0	0	0	0	0	0	0	0	0	0	13
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	0	0	1	0	0	0	0	0	0	0	0	0	7
04:00	0	32	7	0	5	0	0	0	0	0	0	0	0	0	44
05:00	0	38	11	1	4	0	0	0	0	0	0	0	0	0	54
06:00	3	100	51	2	16	1	0	2	0	0	0	0	0	0	175
07:00	2	267	39	5	14	2	0	2	0	0	0	0	0	0	331
08:00	2	384	47	11	9	2	0	2	0	0	0	0	0	0	457
09:00	2	286	34	8	15	2	0	1	0	1	0	0	0	0	349
10:00	2	228	23	5	14	1	0	1	1	0	0	0	0	0	275
11:00	4	206	33	6	4	1	0	0	0	0	0	0	0	0	254
12 PM	2	195	29	5	15	0	0	0	0	0	0	0	0	0	246
13:00	1	215	27	9	10	1	0	1	0	0	0	0	0	0	264
14:00	3	194	40	4	8	0	0	3	0	0	0	0	0	0	252
15:00	1	199	31	8	10	0	0	0	0	0	0	0	0	0	249
16:00	1	182	12	5	6	2	0	0	0	0	0	0	0	0	208
17:00	2	235	16	7	15	0	0	1	0	0	0	0	0	1	277
18:00	4	259	17	5	4	0	0	0	0	0	0	0	0	0	289
19:00	0	164	11	6	3	0	0	0	0	0	0	0	0	0	184
20:00	0	134	8	3	4	0	0	0	0	0	0	0	0	0	149
21:00	0	128	14	3	3	0	0	0	0	0	0	0	0	0	148
22:00	0	87	11	2	1	0	0	0	0	0	0	0	0	0	101
23:00	0	65	5	1	1	0	0	0	0	0	0	0	0	0	72
Total	29	3663	473	96	164	13	0	13	1	1	0	0	0	1	4454
Percent	0.7%	82.2%	10.6%	2.2%	3.7%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	06:00	08:00	06:00	07:00		06:00	10:00	09:00					
Vol.	4	384	51	11	16	2		2	1	1					
PM Peak	18:00	18:00	14:00	13:00	12:00	16:00		14:00						17:00	
Vol.	4	259	40	9	15	2		3						1	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	24	1	2	0	0	0	0	0	0	0	0	0	0	27
01:00	0	23	1	0	0	0	0	0	0	0	0	0	0	0	24
02:00	0	5	2	0	1	0	0	0	0	0	0	0	0	0	8
03:00	0	5	2	0	3	0	0	0	0	0	0	0	0	0	10
04:00	0	29	3	0	6	0	0	0	0	0	0	0	0	0	38
05:00	0	35	10	0	6	0	0	0	0	0	0	0	0	0	51
06:00	3	113	48	3	24	0	0	2	1	0	0	0	0	2	196
07:00	1	224	40	5	15	2	0	0	0	0	0	0	0	0	287
08:00	0	374	52	12	17	0	0	1	0	0	0	0	0	0	456
09:00	1	252	40	8	8	0	0	1	1	0	0	0	0	0	311
10:00	3	189	27	5	13	0	0	0	0	0	0	0	0	1	238
11:00	1	184	30	8	12	2	0	1	1	0	0	0	0	0	239
12 PM	2	198	33	4	15	1	1	2	0	0	0	0	0	0	256
13:00	2	166	18	7	11	0	0	0	0	0	0	0	0	0	204
14:00	0	181	28	5	12	1	0	1	0	0	0	0	0	0	228
15:00	3	216	31	7	9	0	0	1	0	0	0	0	0	0	267
16:00	5	183	20	7	7	1	0	0	0	0	0	0	0	0	223
17:00	0	217	15	4	5	2	0	0	0	0	0	0	0	0	243
18:00	0	229	22	7	9	0	0	0	0	0	0	0	0	0	267
19:00	2	174	8	6	2	2	0	0	0	0	0	0	0	0	194
20:00	0	151	12	3	4	0	0	1	0	0	0	0	0	0	171
21:00	0	124	8	3	2	0	0	0	0	0	0	0	0	0	137
22:00	0	104	8	2	3	0	0	0	0	0	0	0	0	0	117
23:00	0	57	5	1	0	0	0	0	0	0	0	0	0	0	63
Total	23	3457	464	99	184	11	1	10	3	0	0	0	0	3	4255
Percent	0.5%	81.2%	10.9%	2.3%	4.3%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	06:00	08:00	08:00	08:00	06:00	07:00		06:00	06:00					06:00	
Vol.	3	374	52	12	24	2		2	1					2	
PM Peak	16:00	18:00	12:00	13:00	12:00	17:00	12:00	12:00							
Vol.	5	229	33	7	15	2	1	2							
Grand Total	52	7120	937	195	348	24	1	23	4	1	0	0	0	4	8709
Percent	0.6%	81.8%	10.8%	2.2%	4.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	44	3	0	1	0	0	0	0	0	0	0	0	0	48
01:00	0	22	2	0	0	0	0	0	0	0	0	0	0	0	24
02:00	0	8	3	0	1	0	0	0	0	0	0	0	0	0	12
03:00	0	4	0	0	1	0	0	0	0	0	0	0	0	0	5
04:00	0	3	0	0	0	1	0	0	1	0	0	0	0	0	5
05:00	0	16	2	0	1	0	0	0	0	0	0	0	0	0	19
06:00	1	37	5	1	3	0	0	0	0	0	0	0	0	0	47
07:00	1	81	12	5	6	1	0	0	1	0	0	0	0	0	107
08:00	0	118	26	4	7	1	1	0	0	0	0	0	0	0	157
09:00	0	117	18	3	6	0	1	1	0	0	0	0	0	0	146
10:00	1	131	26	4	7	1	0	1	0	0	1	0	0	0	172
11:00	0	146	24	6	6	0	1	3	0	0	0	0	0	0	186
12 PM	3	220	26	7	9	0	1	1	2	0	0	0	0	0	269
13:00	1	173	30	5	9	1	0	1	0	0	0	0	0	0	220
14:00	3	249	36	6	14	0	1	0	0	0	0	0	0	0	309
15:00	1	284	34	2	14	0	0	1	0	0	0	0	0	0	336
16:00	3	377	34	6	12	1	0	1	0	0	0	0	0	0	434
17:00	2	343	31	5	9	0	0	1	0	0	0	0	0	0	391
18:00	0	278	15	4	6	0	0	0	0	0	0	0	0	0	303
19:00	1	238	21	3	2	0	0	0	0	0	0	0	0	0	265
20:00	0	186	13	2	4	0	0	0	0	0	0	0	0	0	205
21:00	2	179	14	2	4	0	0	0	0	0	0	0	0	0	201
22:00	0	123	15	1	2	0	0	0	0	0	0	0	0	0	141
23:00	0	90	7	2	3	0	0	0	0	0	0	0	0	0	102
Total	19	3467	397	68	127	6	5	10	4	0	1	0	0	0	4104
Percent	0.5%	84.5%	9.7%	1.7%	3.1%	0.1%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	08:00	11:00	08:00	04:00	08:00	11:00	04:00		10:00				
Vol.	1	146	26	6	7	1	1	3	1		1				
PM Peak	12:00	16:00	14:00	12:00	14:00	13:00	12:00	12:00	12:00						
Vol.	3	377	36	7	14	1	1	1	2						

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PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	69	9	1	1	0	0	0	0	0	0	0	0	0	80
01:00	0	26	3	0	2	0	0	0	0	0	0	0	0	0	31
02:00	0	7	3	0	1	0	0	0	0	0	0	0	0	0	11
03:00	0	7	0	0	1	0	0	0	0	0	0	0	0	0	8
04:00	0	4	0	0	1	0	0	0	0	0	0	0	0	0	5
05:00	0	16	4	0	1	1	0	0	0	0	0	0	0	0	22
06:00	1	41	8	1	4	0	0	0	0	0	0	0	0	0	55
07:00	0	75	12	7	10	2	0	0	0	0	0	0	0	1	107
08:00	0	105	23	6	8	0	0	2	0	0	0	0	0	0	144
09:00	1	117	33	5	9	0	1	1	0	0	0	0	0	0	167
10:00	0	101	29	8	10	1	0	1	0	0	0	0	0	0	150
11:00	1	139	27	5	7	1	0	2	0	0	0	0	0	0	182
12 PM	1	197	32	6	8	3	0	0	1	0	0	0	0	0	248
13:00	0	184	22	6	6	0	0	2	0	0	0	0	0	0	220
14:00	3	268	36	7	11	0	0	2	0	0	0	0	0	0	327
15:00	0	237	42	4	16	0	0	2	0	0	0	0	0	0	301
16:00	0	351	41	5	11	1	0	1	0	0	0	0	0	0	410
17:00	1	380	38	7	9	1	0	1	0	0	0	0	0	0	437
18:00	0	227	18	3	4	1	0	0	0	0	0	0	0	0	253
19:00	0	237	13	4	2	0	0	0	0	0	0	0	0	0	256
20:00	0	213	14	2	2	0	0	0	0	0	0	0	0	0	231
21:00	0	207	9	2	3	0	0	0	0	0	0	0	0	0	221
22:00	0	134	8	1	2	0	0	0	0	0	0	0	0	0	145
23:00	0	72	8	2	1	0	0	0	0	0	0	0	0	0	83
Total	8	3414	432	82	130	11	1	14	1	0	0	0	0	1	4094
Percent	0.2%	83.4%	10.6%	2.0%	3.2%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	09:00	10:00	07:00	07:00	09:00	08:00						07:00	
Vol.	1	139	33	8	10	2	1	2						1	
PM Peak	14:00	17:00	15:00	14:00	15:00	12:00		13:00	12:00						
Vol.	3	380	42	7	16	3		2	1						
Grand Total	27	6881	829	150	257	17	6	24	5	0	1	0	0	1	8198
Percent	0.3%	83.9%	10.1%	1.8%	3.1%	0.2%	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	87	7	0	3	1	0	0	0	0	0	0	0	0	98
01:00	0	33	4	0	0	0	0	0	0	0	0	0	0	0	37
02:00	0	13	4	0	1	0	0	0	0	0	0	0	0	0	18
03:00	0	10	0	0	2	0	0	0	0	0	0	0	0	0	12
04:00	0	35	7	0	5	1	0	0	1	0	0	0	0	0	49
05:00	0	54	13	1	5	0	0	0	0	0	0	0	0	0	73
06:00	4	137	56	3	19	1	0	2	0	0	0	0	0	0	222
07:00	3	348	51	10	20	3	0	2	1	0	0	0	0	0	438
08:00	2	502	73	15	16	3	1	2	0	0	0	0	0	0	614
09:00	2	403	52	11	21	2	1	2	0	1	0	0	0	0	495
10:00	3	359	49	9	21	2	0	2	1	0	1	0	0	0	447
11:00	4	352	57	12	10	1	1	3	0	0	0	0	0	0	440
12 PM	5	415	55	12	24	0	1	1	2	0	0	0	0	0	515
13:00	2	388	57	14	19	2	0	2	0	0	0	0	0	0	484
14:00	6	443	76	10	22	0	1	3	0	0	0	0	0	0	561
15:00	2	483	65	10	24	0	0	1	0	0	0	0	0	0	585
16:00	4	559	46	11	18	3	0	1	0	0	0	0	0	0	642
17:00	4	578	47	12	24	0	0	2	0	0	0	0	0	1	668
18:00	4	537	32	9	10	0	0	0	0	0	0	0	0	0	592
19:00	1	402	32	9	5	0	0	0	0	0	0	0	0	0	449
20:00	0	320	21	5	8	0	0	0	0	0	0	0	0	0	354
21:00	2	307	28	5	7	0	0	0	0	0	0	0	0	0	349
22:00	0	210	26	3	3	0	0	0	0	0	0	0	0	0	242
23:00	0	155	12	3	4	0	0	0	0	0	0	0	0	0	174
Total	48	7130	870	164	291	19	5	23	5	1	1	0	0	1	8558
Percent	0.6%	83.3%	10.2%	1.9%	3.4%	0.2%	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	08:00	09:00	07:00	08:00	11:00	04:00	09:00	10:00				
Vol.	4	502	73	15	21	3	1	3	1	1	1				
PM Peak	14:00	17:00	14:00	13:00	12:00	16:00	12:00	14:00	12:00					17:00	
Vol.	6	578	76	14	24	3	1	3	2					1	

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Location: North Pleasant
Location: South of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound, Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	93	10	3	1	0	0	0	0	0	0	0	0	0	107
01:00	0	49	4	0	2	0	0	0	0	0	0	0	0	0	55
02:00	0	12	5	0	2	0	0	0	0	0	0	0	0	0	19
03:00	0	12	2	0	4	0	0	0	0	0	0	0	0	0	18
04:00	0	33	3	0	7	0	0	0	0	0	0	0	0	0	43
05:00	0	51	14	0	7	1	0	0	0	0	0	0	0	0	73
06:00	4	154	56	4	28	0	0	2	1	0	0	0	0	2	251
07:00	1	299	52	12	25	4	0	0	0	0	0	0	0	1	394
08:00	0	479	75	18	25	0	0	3	0	0	0	0	0	0	600
09:00	2	369	73	13	17	0	1	2	1	0	0	0	0	0	478
10:00	3	290	56	13	23	1	0	1	0	0	0	0	0	1	388
11:00	2	323	57	13	19	3	0	3	1	0	0	0	0	0	421
12 PM	3	395	65	10	23	4	1	2	1	0	0	0	0	0	504
13:00	2	350	40	13	17	0	0	2	0	0	0	0	0	0	424
14:00	3	449	64	12	23	1	0	3	0	0	0	0	0	0	555
15:00	3	453	73	11	25	0	0	3	0	0	0	0	0	0	568
16:00	5	534	61	12	18	2	0	1	0	0	0	0	0	0	633
17:00	1	597	53	11	14	3	0	1	0	0	0	0	0	0	680
18:00	0	456	40	10	13	1	0	0	0	0	0	0	0	0	520
19:00	2	411	21	10	4	2	0	0	0	0	0	0	0	0	450
20:00	0	364	26	5	6	0	0	1	0	0	0	0	0	0	402
21:00	0	331	17	5	5	0	0	0	0	0	0	0	0	0	358
22:00	0	238	16	3	5	0	0	0	0	0	0	0	0	0	262
23:00	0	129	13	3	1	0	0	0	0	0	0	0	0	0	146
Total	31	6871	896	181	314	22	2	24	4	0	0	0	0	4	8349
Percent	0.4%	82.3%	10.7%	2.2%	3.8%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	08:00	06:00	07:00	09:00	08:00	06:00					06:00	
Vol.	4	479	75	18	28	4	1	3	1					2	
PM Peak	16:00	17:00	15:00	13:00	15:00	12:00	12:00	14:00	12:00						
Vol.	5	597	73	13	25	4	1	3	1						
Grand Total	79	14001	1766	345	605	41	7	47	9	1	1	0	0	5	16907
Percent	0.5%	82.8%	10.4%	2.0%	3.6%	0.2%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Start	10-Oct-17	Eastbound		Westbound		Combined		11-Oct-	Eastbound		Westbound		Combined	
Time	Tue	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Wed	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		10	54	8	64	18	118		5	47	2	61	7	108
12:15		6	82	7	56	13	138		8	60	7	69	15	129
12:30		2	58	3	60	5	118		7	58	3	63	10	121
12:45		5	75	0	66	5	141		6	71	10	55	16	126
01:00		4	72	1	60	5	132		8	71	0	43	8	114
01:15		3	50	1	80	4	130		2	54	3	56	5	110
01:30		1	55	5	66	6	121		1	62	3	56	4	118
01:45		2	75	3	47	5	122		3	39	4	59	7	98
02:00		1	70	2	70	3	140		5	67	0	62	5	129
02:15		2	74	1	54	3	128		4	58	3	63	7	121
02:30		1	69	1	74	2	143		2	57	0	65	2	122
02:45		4	72	3	78	7	150		2	72	1	70	3	142
03:00		0	71	2	64	2	135		0	80	1	58	1	138
03:15		1	82	0	***77***	1	***159***		1	74	1	***84***	2	158
03:30		0	85	0	***80***	0	***165***		0	69	1	***77***	1	146
03:45		2	86	0	***72***	2	***158***		3	90	2	***80***	5	170
04:00		2	77	2	***72***	4	***149***		2	87	1	***72***	3	159
04:15		1	90	3	62	4	152		0	77	4	72	4	149
04:30		3	77	5	85	8	162		5	***102***	4	59	9	***161***
04:45		3	80	6	62	9	142		1	***95***	7	72	8	***167***
05:00		2	***96***	3	62	5	158		2	***80***	7	82	9	***162***
05:15		5	***91***	13	78	18	169		4	***109***	13	74	17	***183***
05:30		7	***96***	22	54	29	150		4	93	23	66	27	159
05:45		16	***87***	17	66	33	153		15	82	16	80	31	162
06:00		6	89	18	64	24	153		5	71	17	49	22	120
06:15		28	83	43	56	71	139		25	79	31	51	56	130
06:30		29	60	38	60	67	120		35	76	39	60	74	136
06:45		30	73	56	53	86	126		47	65	41	39	88	104
07:00		22	67	68	33	90	100		24	46	66	49	90	95
07:15		32	56	83	40	115	96		38	52	62	33	100	85
07:30		35	52	90	22	125	74		31	49	84	29	115	78
07:45		42	27	***93***	22	135	49		50	29	***99***	32	149	61
08:00		49	46	***84***	22	***133***	68		48	32	***91***	29	***139***	61
08:15		***51***	43	***97***	32	***148***	75		49	40	***97***	35	***146***	75
08:30		***65***	34	***91***	25	***156***	59		48	45	***88***	33	***136***	78
08:45		***75***	40	92	22	***167***	62		72	39	91	40	***163***	79
09:00		***55***	28	69	29	124	57		46	20	85	22	131	42
09:15		41	44	68	22	109	66		44	50	66	24	110	74
09:30		45	22	73	23	118	45		42	29	76	24	118	53
09:45		34	21	68	14	102	35		55	31	62	19	117	50
10:00		46	12	73	16	119	28		46	26	79	20	125	46
10:15		43	16	71	9	114	25		52	34	47	10	99	44
10:30		45	18	66	12	111	30		38	25	62	17	100	42
10:45		57	15	63	7	120	22		45	19	48	11	93	30
11:00		45	7	75	13	120	20		***56***	8	58	9	114	17
11:15		48	4	53	4	101	8		***58***	10	64	13	122	23
11:30		54	7	71	8	125	15		***55***	7	59	7	114	14
11:45		59	7	73	3	132	10		***57***	8	55	1	112	9
Total		1119	2695	1784	2220	2903	4915		1156	2644	1683	2254	2839	4898
Day Total		3814		4004		7818			3800		3937		7737	
% Total		14.3%	34.5%	22.8%	28.4%				14.9%	34.2%	21.8%	29.1%		
Peak		08:15	05:00	07:45	03:15	08:00	03:15		11:00	04:30	07:45	03:15	08:00	04:30
Vol.		246	370	365	301	604	631		226	386	375	313	584	673
P.H.F.		0.820	0.964	0.941	0.941	0.904	0.956		0.785	0.885	0.947	0.932	0.896	0.919

ADT	ADT 7,773	AADT 7,773

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	1	13	8	1	0	0	0	0	0	0	0	0	23	32	34
01:00	**1**	0	2	3	3	1	0	0	0	0	0	0	0	0	10	31	32
02:00	0	0	2	5	1	0	0	0	0	0	0	0	0	0	8	29	30
03:00	0	0	0	2	0	1	0	0	0	0	0	0	0	0	3	*	*
04:00	0	0	0	2	7	0	0	0	0	0	0	0	0	0	9	34	35
05:00	0	0	2	16	9	3	0	0	0	0	0	0	0	0	30	33	36
06:00	0	3	7	49	29	5	0	0	0	0	0	0	0	0	93	33	36
07:00	1	2	26	67	33	2	0	0	0	0	0	0	0	0	131	32	34
08:00	0	4	46	**119**	**63**	7	1	0	0	0	0	0	0	0	**240**	32	35
09:00	1	5	34	88	37	8	**2**	0	0	0	0	0	0	0	175	32	36
10:00	1	**8**	30	94	47	**11**	0	0	0	0	0	0	0	0	191	33	36
11:00	0	6	**49**	89	52	9	0	**1**	0	0	0	0	0	0	206	32	35
12 PM	6	**14**	57	124	55	10	**2**	**1**	0	0	0	0	0	0	269	32	35
13:00	0	13	47	104	74	12	2	0	0	0	0	0	0	0	252	33	36
14:00	**8**	2	63	129	76	7	0	0	0	0	0	0	0	0	285	32	35
15:00	0	10	54	155	91	13	1	0	0	0	0	0	0	0	324	33	35
16:00	0	5	61	150	**92**	15	1	0	0	0	0	0	0	0	324	33	35
17:00	0	2	**71**	**214**	77	5	1	0	0	0	0	0	0	0	**370**	31	34
18:00	0	0	60	152	77	**16**	0	0	0	0	0	0	0	0	305	33	36
19:00	0	1	21	106	65	9	0	0	0	0	0	0	0	0	202	33	35
20:00	0	2	18	78	56	8	1	0	0	0	0	0	0	0	163	33	36
21:00	1	4	20	57	30	3	0	0	0	0	0	0	0	0	115	32	35
22:00	1	0	8	34	13	5	0	0	0	0	0	0	0	0	61	33	36
23:00	0	0	2	13	8	2	0	0	0	0	0	0	0	0	25	33	35
Total	20	81	681	1863	1003	153	11	2	0	0	0	0	0	0	3814		
Percent	0.5%	2.1%	17.9%	48.8%	26.3%	4.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	10:00	11:00	08:00	08:00	10:00	09:00	11:00							08:00		
Vol.	1	8	49	119	63	11	2	1							240		
PM Peak	14:00	12:00	17:00	17:00	16:00	18:00	12:00	12:00							17:00		
Vol.	8	14	71	214	92	16	2	1							370		

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Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	2	12	11	1	0	0	0	0	0	0	0	0	26	33	35
01:00	0	0	1	6	7	0	0	0	0	0	0	0	0	0	14	34	35
02:00	0	0	1	7	4	1	0	0	0	0	0	0	0	0	13	33	34
03:00	**2**	0	0	0	0	1	1	0	0	0	0	0	0	0	4	*	*
04:00	0	0	3	1	4	0	0	0	0	0	0	0	0	0	8	33	33
05:00	1	0	0	10	13	0	1	0	0	0	0	0	0	0	25	34	35
06:00	2	2	24	53	26	3	**2**	0	0	0	0	0	0	0	112	32	35
07:00	0	5	36	68	30	4	0	0	0	0	0	0	0	0	143	32	34
08:00	0	10	45	**105**	46	10	1	0	0	0	0	0	0	0	217	32	35
09:00	1	**14**	**50**	72	43	7	0	0	0	0	0	0	0	0	187	32	35
10:00	0	9	33	84	43	**12**	0	0	0	0	0	0	0	0	181	33	36
11:00	1	6	45	96	**66**	10	2	0	0	0	0	0	0	0	**226**	33	35
12 PM	1	2	27	124	75	7	0	0	0	0	0	0	0	0	236	33	35
13:00	0	8	36	110	64	8	0	0	0	0	0	0	0	0	226	32	35
14:00	0	11	42	130	62	8	0	**1**	0	0	0	0	0	0	254	32	35
15:00	1	**34**	**103**	119	52	4	0	0	0	0	0	0	0	0	313	30	33
16:00	0	5	64	**188**	**84**	**19**	**1**	0	0	0	0	0	0	0	361	32	36
17:00	**4**	13	101	160	81	5	0	0	0	0	0	0	0	0	**364**	31	34
18:00	1	1	34	162	84	9	0	0	0	0	0	0	0	0	291	32	35
19:00	0	5	38	86	40	6	1	0	0	0	0	0	0	0	176	32	35
20:00	0	1	11	83	52	9	0	0	0	0	0	0	0	0	156	33	36
21:00	0	1	12	66	43	8	0	0	0	0	0	0	0	0	130	33	36
22:00	0	0	15	56	27	6	0	0	0	0	0	0	0	0	104	33	35
23:00	0	0	7	15	8	3	0	0	0	0	0	0	0	0	33	33	36
Total	14	127	730	1813	965	141	9	1	0	0	0	0	0	0	3800		
Percent	0.4%	3.3%	19.2%	47.7%	25.4%	3.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	03:00	09:00	09:00	08:00	11:00	10:00	06:00								11:00		
Vol.	2	14	50	105	66	12	2								226		
PM Peak	17:00	15:00	15:00	16:00	16:00	16:00	16:00	14:00							17:00		
Vol.	4	34	103	188	84	19	1	1							364		
Total	34	208	1411	3676	1968	294	20	3	0	0	0	0	0	0	7614		
Percent	0.4%	2.7%	18.5%	48.3%	25.8%	3.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	22 MPH
50th Percentile :	27 MPH
85th Percentile :	32 MPH
95th Percentile :	35 MPH

Stats	
10 MPH Pace Speed :	24-33 MPH
Number in Pace :	5329
Percent in Pace :	70.0%
Number of Vehicles > 40 MPH :	55
Percent of Vehicles > 40 MPH :	0.7%
Mean Speed(Average) :	28 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	1	6	5	4	2	0	0	0	0	0	0	0	0	18	33	35
01:00	0	1	0	7	2	0	0	0	0	0	0	0	0	0	10	30	31
02:00	0	1	1	2	2	1	0	0	0	0	0	0	0	0	7	*	*
03:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	*	*
04:00	0	1	0	10	2	3	0	0	0	0	0	0	0	0	16	35	37
05:00	0	1	5	25	16	7	0	**1**	0	0	0	0	0	0	55	34	38
06:00	4	16	39	59	32	5	0	0	0	0	0	0	0	0	155	31	35
07:00	52	59	**103**	80	35	4	**1**	0	0	0	0	0	0	0	334	28	32
08:00	**73**	**101**	94	64	28	4	0	0	0	0	0	0	0	0	**364**	26	31
09:00	55	54	65	63	34	7	0	0	0	0	0	0	0	0	278	29	33
10:00	22	37	74	86	**45**	**8**	1	0	0	0	0	0	0	0	273	30	34
11:00	32	41	69	**95**	32	2	1	0	0	0	0	0	0	0	272	29	32
12 PM	21	41	72	83	20	8	1	0	0	0	0	0	0	0	246	29	33
13:00	16	33	64	96	**37**	6	1	0	0	0	0	0	0	0	253	30	34
14:00	39	**54**	81	78	23	1	0	0	0	0	0	0	0	0	276	28	31
15:00	**48**	43	**90**	75	28	7	**2**	0	0	0	0	0	0	0	**293**	29	33
16:00	24	36	84	92	33	**11**	1	0	0	0	0	0	0	0	281	30	34
17:00	34	40	64	**99**	19	4	0	0	0	0	0	0	0	0	260	29	32
18:00	17	34	60	95	21	6	0	0	0	0	0	0	0	0	233	29	33
19:00	0	3	28	52	25	7	2	0	0	0	0	0	0	0	117	33	36
20:00	3	4	11	40	35	6	1	**1**	0	0	0	0	0	0	101	33	36
21:00	2	5	14	41	19	7	0	0	0	0	0	0	0	0	88	33	36
22:00	1	1	5	17	17	3	0	0	0	0	0	0	0	0	44	34	36
23:00	0	1	5	13	7	2	0	0	0	0	0	0	0	0	28	32	35
Total	443	608	1034	1278	517	111	11	2	0	0	0	0	0	0	4004		
Percent	11.1%	15.2%	25.8%	31.9%	12.9%	2.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	07:00	11:00	10:00	10:00	07:00	05:00							08:00		
Vol.	73	101	103	95	45	8	1	1							364		
PM Peak	15:00	14:00	15:00	17:00	13:00	16:00	15:00	20:00							15:00		
Vol.	48	54	90	99	37	11	2	1							293		

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Location: Pine Street
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Client: CDM Smith / L. Sherman

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	1	4	11	6	0	0	0	0	0	0	0	0	22	36	38
01:00	0	0	0	2	5	2	0	**1**	0	0	0	0	0	0	10	35	36
02:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	*	*
03:00	1	0	0	2	1	1	0	0	0	0	0	0	0	0	5	*	*
04:00	0	0	0	9	4	3	0	0	0	0	0	0	0	0	16	35	37
05:00	0	2	8	15	27	7	0	0	0	0	0	0	0	0	59	35	38
06:00	2	11	26	47	**35**	7	0	0	0	0	0	0	0	0	128	33	35
07:00	43	63	**93**	75	32	5	0	0	0	0	0	0	0	0	311	28	32
08:00	**61**	**78**	87	**98**	32	10	1	0	0	0	0	0	0	0	**367**	28	32
09:00	40	57	86	70	29	7	0	0	0	0	0	0	0	0	289	28	33
10:00	27	33	76	65	22	**11**	**2**	0	0	0	0	0	0	0	236	29	35
11:00	26	32	59	82	31	5	1	0	0	0	0	0	0	0	236	30	34
12 PM	22	33	65	80	**45**	3	0	0	0	0	0	0	0	0	248	30	33
13:00	13	27	50	74	45	4	1	0	0	0	0	0	0	0	214	31	34
14:00	43	44	70	68	34	1	0	0	0	0	0	0	0	0	260	29	32
15:00	**97**	**81**	74	38	9	0	0	0	0	0	0	0	0	0	299	24	28
16:00	17	44	72	**96**	34	**12**	0	0	0	0	0	0	0	0	275	30	34
17:00	38	58	**99**	74	30	2	1	0	0	0	0	0	0	0	**302**	28	32
18:00	7	17	75	66	31	3	0	0	0	0	0	0	0	0	199	30	34
19:00	10	11	25	51	35	9	**2**	0	0	0	0	0	0	0	143	33	36
20:00	1	9	35	56	31	4	1	0	0	0	0	0	0	0	137	32	35
21:00	2	3	9	45	27	3	0	0	0	0	0	0	0	0	89	32	35
22:00	1	1	8	24	20	4	0	0	0	0	0	0	0	0	58	33	36
23:00	1	1	6	12	8	1	1	0	0	0	0	0	0	0	30	32	34
Total	452	605	1026	1155	578	110	10	1	0	0	0	0	0	0	3937		
Percent	11.5%	15.4%	26.1%	29.3%	14.7%	2.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	07:00	08:00	06:00	10:00	10:00	01:00							08:00		
Vol.	61	78	93	98	35	11	2	1							367		
PM Peak	15:00	15:00	17:00	16:00	12:00	16:00	19:00								17:00		
Vol.	97	81	99	96	45	12	2								302		
Total	895	1213	2060	2433	1095	221	21	3	0	0	0	0	0	0	7941		
Percent	11.3%	15.3%	25.9%	30.6%	13.8%	2.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	11 MPH
50th Percentile :	22 MPH
85th Percentile :	30 MPH
95th Percentile :	34 MPH

Stats

10 MPH Pace Speed :	21-30 MPH
Number in Pace :	3627
Percent in Pace :	45.7%
Number of Vehicles > 40 MPH :	41
Percent of Vehicles > 40 MPH :	0.5%
Mean Speed(Average) :	22 MPH

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Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	1	7	18	12	3	0	0	0	0	0	0	0	0	41	33	36
01:00	1	1	2	10	5	1	0	0	0	0	0	0	0	0	20	32	34
02:00	0	1	3	7	3	1	0	0	0	0	0	0	0	0	15	32	33
03:00	0	0	0	3	1	1	0	0	0	0	0	0	0	0	5	28	28
04:00	0	1	0	12	9	3	0	0	0	0	0	0	0	0	25	34	36
05:00	0	1	7	41	25	10	0	**1**	0	0	0	0	0	0	85	34	37
06:00	4	19	46	108	61	10	0	0	0	0	0	0	0	0	248	32	35
07:00	53	61	129	147	68	6	1	0	0	0	0	0	0	0	465	30	33
08:00	**73**	**105**	**140**	183	91	11	1	0	0	0	0	0	0	0	**604**	30	33
09:00	56	59	99	151	71	15	**2**	0	0	0	0	0	0	0	453	30	34
10:00	23	45	104	180	**92**	**19**	1	0	0	0	0	0	0	0	464	31	35
11:00	32	47	118	**184**	84	11	1	1	0	0	0	0	0	0	478	31	34
12 PM	27	55	129	207	75	18	**3**	**1**	0	0	0	0	0	0	515	31	34
13:00	16	46	111	200	111	18	3	0	0	0	0	0	0	0	505	32	35
14:00	47	**56**	144	207	99	8	0	0	0	0	0	0	0	0	561	30	34
15:00	**48**	53	144	230	119	20	3	0	0	0	0	0	0	0	617	31	35
16:00	24	41	**145**	242	**125**	**26**	2	0	0	0	0	0	0	0	605	32	35
17:00	34	42	135	**313**	96	9	1	0	0	0	0	0	0	0	**630**	30	33
18:00	17	34	120	247	98	22	0	0	0	0	0	0	0	0	538	31	35
19:00	0	4	49	158	90	16	2	0	0	0	0	0	0	0	319	33	36
20:00	3	6	29	118	91	14	2	1	0	0	0	0	0	0	264	33	36
21:00	3	9	34	98	49	10	0	0	0	0	0	0	0	0	203	32	35
22:00	2	1	13	51	30	8	0	0	0	0	0	0	0	0	105	33	36
23:00	0	1	7	26	15	4	0	0	0	0	0	0	0	0	53	33	36
Total	463	689	1715	3141	1520	264	22	4	0	0	0	0	0	0	7818		
Percent	5.9%	8.8%	21.9%	40.2%	19.4%	3.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	11:00	10:00	10:00	09:00	05:00							08:00		
Vol.	73	105	140	184	92	19	2	1							604		
PM Peak	15:00	14:00	16:00	17:00	16:00	16:00	12:00	12:00							17:00		
Vol.	48	56	145	313	125	26	3	1							630		

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	3	16	22	7	0	0	0	0	0	0	0	0	48	35	38
01:00	0	0	1	8	12	2	0	**1**	0	0	0	0	0	0	24	34	35
02:00	0	0	3	9	4	1	0	0	0	0	0	0	0	0	17	32	34
03:00	3	0	0	2	1	2	1	0	0	0	0	0	0	0	9	*	*
04:00	0	0	3	10	8	3	0	0	0	0	0	0	0	0	24	34	36
05:00	1	2	8	25	40	7	1	0	0	0	0	0	0	0	84	34	37
06:00	4	13	50	100	61	10	2	0	0	0	0	0	0	0	240	32	35
07:00	43	68	129	143	62	9	0	0	0	0	0	0	0	0	454	30	33
08:00	**61**	**88**	132	**203**	78	20	2	0	0	0	0	0	0	0	**584**	30	34
09:00	41	71	**136**	142	72	14	0	0	0	0	0	0	0	0	476	30	34
10:00	27	42	109	149	65	**23**	2	0	0	0	0	0	0	0	417	31	35
11:00	27	38	104	178	**97**	15	**3**	0	0	0	0	0	0	0	462	32	35
12 PM	23	35	92	204	**120**	10	0	0	0	0	0	0	0	0	484	32	34
13:00	13	35	86	184	109	12	1	0	0	0	0	0	0	0	440	32	35
14:00	43	55	112	198	96	9	0	**1**	0	0	0	0	0	0	514	31	34
15:00	**98**	**115**	177	157	61	4	0	0	0	0	0	0	0	0	612	28	32
16:00	17	49	136	**284**	118	**31**	1	0	0	0	0	0	0	0	636	32	35
17:00	42	71	**200**	234	111	7	1	0	0	0	0	0	0	0	**666**	30	33
18:00	8	18	109	228	115	12	0	0	0	0	0	0	0	0	490	32	34
19:00	10	16	63	137	75	15	**3**	0	0	0	0	0	0	0	319	32	35
20:00	1	10	46	139	83	13	1	0	0	0	0	0	0	0	293	33	35
21:00	2	4	21	111	70	11	0	0	0	0	0	0	0	0	219	33	35
22:00	1	1	23	80	47	10	0	0	0	0	0	0	0	0	162	33	36
23:00	1	1	13	27	16	4	1	0	0	0	0	0	0	0	63	33	36
Total	466	732	1756	2968	1543	251	19	2	0	0	0	0	0	0	7737		
Percent	6.0%	9.5%	22.7%	38.4%	19.9%	3.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	09:00	08:00	11:00	10:00	11:00	01:00							08:00		
Vol.	61	88	136	203	97	23	3	1							584		
PM Peak	15:00	15:00	17:00	16:00	12:00	16:00	19:00	14:00							17:00		
Vol.	98	115	200	284	120	31	3	1							666		
Total	929	1421	3471	6109	3063	515	41	6	0	0	0	0	0	0	15555		
Percent	6.0%	9.1%	22.3%	39.3%	19.7%	3.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	15 MPH
50th Percentile :	25 MPH
85th Percentile :	31 MPH
95th Percentile :	35 MPH

Stats		
	10 MPH Pace Speed :	23-32 MPH
	Number in Pace :	8612
	Percent in Pace :	55.4%
	Number of Vehicles > 40 MPH :	95
	Percent of Vehicles > 40 MPH :	0.6%
	Mean Speed(Average) :	25 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	22	1	0	0	0	0	0	0	0	0	0	0	0	23
01:00	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	0	8
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	6	3	0	0	0	0	0	0	0	0	0	0	0	9
05:00	0	20	7	0	3	0	0	0	0	0	0	0	0	0	30
06:00	0	68	19	0	6	0	0	0	0	0	0	0	0	0	93
07:00	2	89	28	3	5	0	0	3	1	0	0	0	0	0	131
08:00	3	190	34	0	11	2	0	0	0	0	0	0	0	0	240
09:00	1	143	25	0	4	1	0	0	0	1	0	0	0	0	175
10:00	0	144	39	0	4	0	0	2	2	0	0	0	0	0	191
11:00	0	172	28	0	3	0	0	1	0	1	0	0	0	1	206
12 PM	1	208	44	1	12	2	0	0	0	0	0	0	0	1	269
13:00	2	192	40	3	11	3	1	0	0	0	0	0	0	0	252
14:00	3	232	35	5	6	2	0	1	0	1	0	0	0	0	285
15:00	3	248	53	5	12	1	0	1	0	0	0	0	0	1	324
16:00	4	270	37	2	8	3	0	0	0	0	0	0	0	0	324
17:00	3	327	33	1	4	1	0	0	0	0	0	0	0	1	370
18:00	5	268	31	0	1	0	0	0	0	0	0	0	0	0	305
19:00	1	183	14	1	3	0	0	0	0	0	0	0	0	0	202
20:00	1	146	13	0	3	0	0	0	0	0	0	0	0	0	163
21:00	2	106	7	0	0	0	0	0	0	0	0	0	0	0	115
22:00	0	52	9	0	0	0	0	0	0	0	0	0	0	0	61
23:00	0	24	1	0	0	0	0	0	0	0	0	0	0	0	25
Total	31	3130	502	21	96	15	1	8	3	3	0	0	0	4	3814
Percent	0.8%	82.1%	13.2%	0.6%	2.5%	0.4%	0.0%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	
AM Peak	08:00	08:00	10:00	07:00	08:00	08:00		07:00	10:00	09:00				11:00	
Vol.	3	190	39	3	11	2		3	2	1				1	
PM Peak	18:00	17:00	15:00	14:00	12:00	13:00	13:00	14:00		14:00				12:00	
Vol.	5	327	53	5	12	3	1	1		1				1	

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Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	22	4	0	0	0	0	0	0	0	0	0	0	0	26
01:00	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
02:00	0	11	1	0	1	0	0	0	0	0	0	0	0	0	13
03:00	1	2	0	0	0	0	0	0	0	0	0	0	0	1	4
04:00	0	4	3	0	0	0	0	0	1	0	0	0	0	0	8
05:00	0	19	5	1	0	0	0	0	0	0	0	0	0	0	25
06:00	1	72	29	0	5	1	0	2	1	0	0	0	0	1	112
07:00	0	107	27	2	5	1	0	1	0	0	0	0	0	0	143
08:00	1	161	43	2	7	1	0	1	0	0	0	0	0	1	217
09:00	1	135	38	3	7	1	1	0	0	0	0	0	0	1	187
10:00	0	137	25	0	13	3	1	2	0	0	0	0	0	0	181
11:00	1	164	46	3	10	1	0	1	0	0	0	0	0	0	226
12 PM	3	182	41	0	7	2	0	1	0	0	0	0	0	0	236
13:00	1	180	34	4	5	2	0	0	0	0	0	0	0	0	226
14:00	3	210	30	1	5	4	0	1	0	0	0	0	0	0	254
15:00	3	245	52	3	7	2	0	0	0	0	0	0	0	1	313
16:00	2	297	50	2	5	1	0	3	0	0	0	0	0	1	361
17:00	1	314	41	1	3	1	0	1	0	0	0	0	0	2	364
18:00	2	249	36	0	3	0	0	1	0	0	0	0	0	0	291
19:00	0	153	19	0	4	0	0	0	0	0	0	0	0	0	176
20:00	0	136	16	0	4	0	0	0	0	0	0	0	0	0	156
21:00	0	118	12	0	0	0	0	0	0	0	0	0	0	0	130
22:00	0	99	3	0	0	0	0	1	0	1	0	0	0	0	104
23:00	0	28	5	0	0	0	0	0	0	0	0	0	0	0	33
Total	20	3059	560	22	91	20	2	15	2	1	0	0	0	8	3800
Percent	0.5%	80.5%	14.7%	0.6%	2.4%	0.5%	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	
AM Peak	03:00	11:00	11:00	09:00	10:00	10:00	09:00	06:00	04:00					03:00	
Vol.	1	164	46	3	13	3	1	2	1					1	
PM Peak	12:00	17:00	15:00	13:00	12:00	14:00		16:00		22:00				17:00	
Vol.	3	314	52	4	7	4		3		1				2	
Grand Total	51	6189	1062	43	187	35	3	23	5	4	0	0	0	12	7614
Percent	0.7%	81.3%	13.9%	0.6%	2.5%	0.5%	0.0%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	

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PO Box 468
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Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	17	1	0	0	0	0	0	0	0	0	0	0	0	18
01:00	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	11	4	0	1	0	0	0	0	0	0	0	0	0	16
05:00	0	42	12	0	0	0	0	1	0	0	0	0	0	0	55
06:00	0	118	31	1	4	1	0	0	0	0	0	0	0	0	155
07:00	1	269	47	2	8	3	0	2	0	0	1	0	0	1	334
08:00	6	304	41	1	6	1	0	2	0	0	0	0	0	3	364
09:00	2	225	40	3	3	1	0	1	1	0	1	0	0	1	278
10:00	2	231	28	1	7	2	0	2	0	0	0	0	0	0	273
11:00	4	229	29	4	6	0	0	0	0	0	0	0	0	0	272
12 PM	1	202	29	3	7	4	0	0	0	0	0	0	0	0	246
13:00	3	208	32	1	8	1	0	0	0	0	0	0	0	0	253
14:00	2	216	41	6	6	1	0	2	1	0	0	0	0	1	276
15:00	3	233	43	3	5	1	1	3	0	0	0	0	0	1	293
16:00	2	236	35	0	6	1	0	1	0	0	0	0	0	0	281
17:00	2	235	15	2	1	0	0	1	0	2	0	0	0	2	260
18:00	2	215	13	0	3	0	0	0	0	0	0	0	0	0	233
19:00	0	107	7	1	1	1	0	0	0	0	0	0	0	0	117
20:00	0	90	7	1	2	0	0	0	0	0	0	0	0	1	101
21:00	0	83	5	0	0	0	0	0	0	0	0	0	0	0	88
22:00	0	40	4	0	0	0	0	0	0	0	0	0	0	0	44
23:00	0	27	1	0	0	0	0	0	0	0	0	0	0	0	28
Total	30	3356	466	29	74	17	1	15	2	2	2	0	0	10	4004
Percent	0.7%	83.8%	11.6%	0.7%	1.8%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	
AM Peak	08:00	08:00	07:00	11:00	07:00	07:00		07:00	09:00		07:00			08:00	
Vol.	6	304	47	4	8	3		2	1		1			3	
PM Peak	13:00	16:00	15:00	14:00	13:00	12:00	15:00	15:00	14:00	17:00				17:00	
Vol.	3	236	43	6	8	4	1	3	1	2				2	

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Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	21	1	0	0	0	0	0	0	0	0	0	0	0	22
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	0	10
02:00	0	3	0	0	1	0	0	0	0	0	0	0	0	0	4
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	11	4	0	1	0	0	0	0	0	0	0	0	0	16
05:00	0	39	18	0	0	2	0	0	0	0	0	0	0	0	59
06:00	0	95	25	0	4	1	0	1	0	0	0	0	0	2	128
07:00	2	249	46	3	7	1	0	1	0	0	0	0	1	1	311
08:00	5	310	44	1	3	0	1	0	0	0	0	0	0	3	367
09:00	0	244	34	3	3	0	0	2	0	0	0	0	0	3	289
10:00	2	180	37	2	6	2	0	3	1	0	0	0	0	3	236
11:00	4	188	35	1	5	1	0	1	1	0	0	0	0	0	236
12 PM	4	188	45	2	5	1	0	3	0	0	0	0	0	0	248
13:00	0	176	28	2	3	2	0	2	0	0	0	0	0	1	214
14:00	4	191	49	4	9	0	0	2	0	0	0	0	0	1	260
15:00	5	239	36	3	9	1	0	4	0	0	1	0	0	1	299
16:00	1	233	26	0	8	0	0	2	0	0	0	1	0	4	275
17:00	5	259	30	2	4	1	0	1	0	0	0	0	0	0	302
18:00	3	174	18	0	3	0	0	0	0	0	0	0	0	1	199
19:00	0	124	15	1	2	0	0	0	0	0	0	0	0	1	143
20:00	0	124	10	1	2	0	0	0	0	0	0	0	0	0	137
21:00	0	79	8	0	2	0	0	0	0	0	0	0	0	0	89
22:00	0	52	4	1	1	0	0	0	0	0	0	0	0	0	58
23:00	0	29	1	0	0	0	0	0	0	0	0	0	0	0	30
Total	35	3222	515	26	78	12	1	22	2	0	1	1	1	21	3937
Percent	0.9%	81.8%	13.1%	0.7%	2.0%	0.3%	0.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.5%	
AM Peak	08:00	08:00	07:00	07:00	07:00	05:00	08:00	10:00	10:00				07:00	08:00	
Vol.	5	310	46	3	7	2	1	3	1				1	3	
PM Peak	15:00	17:00	14:00	14:00	14:00	13:00		15:00			15:00	16:00		16:00	
Vol.	5	259	49	4	9	2		4			1	1		4	
Grand Total	65	6578	981	55	152	29	2	37	4	2	3	1	1	31	7941
Percent	0.8%	82.8%	12.4%	0.7%	1.9%	0.4%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	

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Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	39	2	0	0	0	0	0	0	0	0	0	0	0	41
01:00	0	20	0	0	0	0	0	0	0	0	0	0	0	0	20
02:00	0	13	2	0	0	0	0	0	0	0	0	0	0	0	15
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	17	7	0	1	0	0	0	0	0	0	0	0	0	25
05:00	0	62	19	0	3	0	0	1	0	0	0	0	0	0	85
06:00	0	186	50	1	10	1	0	0	0	0	0	0	0	0	248
07:00	3	358	75	5	13	3	0	5	1	0	1	0	0	1	465
08:00	9	494	75	1	17	3	0	2	0	0	0	0	0	3	604
09:00	3	368	65	3	7	2	0	1	1	1	1	0	0	1	453
10:00	2	375	67	1	11	2	0	4	2	0	0	0	0	0	464
11:00	4	401	57	4	9	0	0	1	0	1	0	0	0	1	478
12 PM	2	410	73	4	19	6	0	0	0	0	0	0	0	1	515
13:00	5	400	72	4	19	4	1	0	0	0	0	0	0	0	505
14:00	5	448	76	11	12	3	0	3	1	1	0	0	0	1	561
15:00	6	481	96	8	17	2	1	4	0	0	0	0	0	2	617
16:00	6	506	72	2	14	4	0	1	0	0	0	0	0	0	605
17:00	5	562	48	3	5	1	0	1	0	2	0	0	0	3	630
18:00	7	483	44	0	4	0	0	0	0	0	0	0	0	0	538
19:00	1	290	21	2	4	1	0	0	0	0	0	0	0	0	319
20:00	1	236	20	1	5	0	0	0	0	0	0	0	0	1	264
21:00	2	189	12	0	0	0	0	0	0	0	0	0	0	0	203
22:00	0	92	13	0	0	0	0	0	0	0	0	0	0	0	105
23:00	0	51	2	0	0	0	0	0	0	0	0	0	0	0	53
Total	61	6486	968	50	170	32	2	23	5	5	2	0	0	14	7818
Percent	0.8%	83.0%	12.4%	0.6%	2.2%	0.4%	0.0%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	
AM Peak	08:00	08:00	07:00	07:00	08:00	07:00		07:00	10:00	09:00	07:00			08:00	
Vol.	9	494	75	5	17	3		5	2	1	1			3	
PM Peak	18:00	17:00	15:00	14:00	12:00	12:00	13:00	15:00	14:00	17:00				17:00	
Vol.	7	562	96	11	19	6	1	4	1	2				3	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Pine Street
Location: East of North Pleasant
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	43	5	0	0	0	0	0	0	0	0	0	0	0	48
01:00	0	23	1	0	0	0	0	0	0	0	0	0	0	0	24
02:00	0	14	1	0	2	0	0	0	0	0	0	0	0	0	17
03:00	1	7	0	0	0	0	0	0	0	0	0	0	0	1	9
04:00	0	15	7	0	1	0	0	0	1	0	0	0	0	0	24
05:00	0	58	23	1	0	2	0	0	0	0	0	0	0	0	84
06:00	1	167	54	0	9	2	0	3	1	0	0	0	0	3	240
07:00	2	356	73	5	12	2	0	2	0	0	0	0	1	1	454
08:00	6	471	87	3	10	1	1	1	0	0	0	0	0	4	584
09:00	1	379	72	6	10	1	1	2	0	0	0	0	0	4	476
10:00	2	317	62	2	19	5	1	5	1	0	0	0	0	3	417
11:00	5	352	81	4	15	2	0	2	1	0	0	0	0	0	462
12 PM	7	370	86	2	12	3	0	4	0	0	0	0	0	0	484
13:00	1	356	62	6	8	4	0	2	0	0	0	0	0	1	440
14:00	7	401	79	5	14	4	0	3	0	0	0	0	0	1	514
15:00	8	484	88	6	16	3	0	4	0	0	1	0	0	2	612
16:00	3	530	76	2	13	1	0	5	0	0	0	1	0	5	636
17:00	6	573	71	3	7	2	0	2	0	0	0	0	0	2	666
18:00	5	423	54	0	6	0	0	1	0	0	0	0	0	1	490
19:00	0	277	34	1	6	0	0	0	0	0	0	0	0	1	319
20:00	0	260	26	1	6	0	0	0	0	0	0	0	0	0	293
21:00	0	197	20	0	2	0	0	0	0	0	0	0	0	0	219
22:00	0	151	7	1	1	0	0	1	0	1	0	0	0	0	162
23:00	0	57	6	0	0	0	0	0	0	0	0	0	0	0	63
Total	55	6281	1075	48	169	32	3	37	4	1	1	1	1	29	7737
Percent	0.7%	81.2%	13.9%	0.6%	2.2%	0.4%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	
AM Peak	08:00	08:00	08:00	09:00	10:00	10:00	08:00	10:00	04:00				07:00	08:00	
Vol.	6	471	87	6	19	5	1	5	1				1	4	
PM Peak	15:00	17:00	15:00	13:00	15:00	13:00		16:00		22:00	15:00	16:00		16:00	
Vol.	8	573	88	6	16	4		5		1	1	1		5	
Grand Total	116	12767	2043	98	339	64	5	60	9	6	3	1	1	43	15555
Percent	0.7%	82.1%	13.1%	0.6%	2.2%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Start	10-Oct-17	Northbound		Southbound		Combined		11-Oct-	Northbound		Southbound		Combined	
Time	Tue	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Wed	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		7	43	5	48	12	91		6	32	5	34	11	66
12:15		5	52	5	61	10	113		4	42	5	43	9	85
12:30		6	52	4	45	10	97		6	49	3	42	9	91
12:45		4	46	5	52	9	98		8	47	3	55	11	102
01:00		1	53	2	57	3	110		1	37	4	50	5	87
01:15		6	48	2	41	8	89		4	41	1	38	5	79
01:30		2	52	2	54	4	106		2	47	2	38	4	85
01:45		2	46	0	59	2	105		1	28	1	28	2	56
02:00		1	36	0	73	1	109		2	49	1	48	3	97
02:15		0	45	0	52	0	97		0	43	0	38	0	81
02:30		0	54	0	57	0	111		0	55	1	43	1	98
02:45		1	81	0	49	1	130		0	73	0	49	0	122
03:00		1	57	0	52	1	109		2	50	0	53	2	103
03:15		0	60	0	58	0	118		0	47	0	45	0	92
03:30		0	53	0	46	0	99		0	58	1	67	1	125
03:45		0	62	2	58	2	120		1	69	0	52	1	121
04:00		2	***85***	3	41	5	126		2	64	3	51	5	115
04:15		1	***64***	4	35	5	99		2	63	6	46	8	109
04:30		0	***47***	4	***64***	4	***111***		1	***69***	3	***61***	4	***130***
04:45		2	***70***	3	***56***	5	***126***		2	***52***	5	***70***	7	***122***
05:00		2	60	4	***70***	6	***130***		8	***88***	2	***64***	10	***152***
05:15		7	69	8	***55***	15	***124***		8	***72***	9	***60***	17	***132***
05:30		12	47	17	57	29	104		10	67	12	58	22	125
05:45		6	39	18	61	24	100		7	50	17	47	24	97
06:00		12	51	12	48	24	99		8	25	17	40	25	65
06:15		10	39	21	41	31	80		12	31	27	43	39	74
06:30		24	38	53	38	77	76		29	42	50	44	79	86
06:45		37	37	43	45	80	82		25	35	56	22	81	57
07:00		37	28	35	39	72	67		25	39	30	24	55	63
07:15		57	28	45	25	102	53		40	31	41	33	81	64
07:30		42	19	78	19	120	38		***53***	19	70	21	123	40
07:45		37	29	70	14	107	43		***55***	30	79	20	134	50
08:00		45	29	***72***	30	***117***	59		***39***	29	***61***	27	***100***	56
08:15		***43***	31	***76***	22	***119***	53		***45***	30	***80***	30	***125***	60
08:30		***47***	20	***74***	18	***121***	38		50	22	***75***	21	***125***	43
08:45		***49***	21	***93***	13	***142***	34		42	35	***108***	17	***150***	52
09:00		***49***	15	66	22	115	37		39	26	43	15	82	41
09:15		36	22	61	17	97	39		33	23	39	14	72	37
09:30		24	31	44	7	68	38		37	25	60	18	97	43
09:45		39	19	39	13	78	32		33	20	48	10	81	30
10:00		49	14	51	7	100	21		42	16	46	20	88	36
10:15		39	11	47	9	86	20		17	15	39	26	56	41
10:30		41	12	46	13	87	25		29	10	36	17	65	27
10:45		36	9	51	4	87	13		27	9	44	11	71	20
11:00		42	13	40	4	82	17		38	12	51	4	89	16
11:15		41	12	48	10	89	22		35	6	35	5	70	11
11:30		39	6	41	3	80	9		29	11	41	4	70	15
11:45		41	9	53	4	94	13		40	7	57	5	97	12
Total		984	1864	1347	1766	2331	3630		899	1840	1317	1671	2216	3511
Day Total		2848		3113		5961			2739		2988		5727	
% Total		16.5%	31.3%	22.6%	29.6%				15.7%	32.1%	23.0%	29.2%		
Peak		08:15	04:00	08:00	04:30	08:00	04:30		07:30	04:30	08:00	04:30	08:00	04:30
Vol.		188	266	315	245	499	491		192	281	324	255	500	536
P.H.F.		0.959	0.782	0.847	0.839	0.879	0.944		0.873	0.798	0.750	0.911	0.833	0.882

ADT	ADT 5,837	AADT 5,837

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	0	4	12	5	1	0	0	0	0	0	0	0	22	37	39
01:00	0	0	1	3	3	3	1	0	0	0	0	0	0	0	11	37	38
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	*
04:00	0	0	0	0	4	1	0	0	0	0	0	0	0	0	5	34	34
05:00	0	0	0	2	12	12	1	0	0	0	0	0	0	0	27	39	40
06:00	2	0	4	9	43	24	1	0	0	0	0	0	0	0	83	37	39
07:00	0	1	2	32	**102**	34	2	0	0	0	0	0	0	0	173	36	39
08:00	0	0	**13**	**40**	96	31	3	**1**	0	0	0	0	0	0	**184**	36	39
09:00	**7**	1	3	19	71	38	9	0	0	0	0	0	0	0	148	38	41
10:00	1	**4**	12	19	83	36	**10**	0	0	0	0	0	0	0	165	37	41
11:00	1	1	2	35	80	**40**	4	0	0	0	0	0	0	0	163	37	40
12 PM	0	1	2	43	89	50	8	0	0	0	0	0	0	0	193	37	40
13:00	1	1	8	21	91	64	11	1	**1**	0	0	0	0	0	199	38	41
14:00	2	1	4	40	97	65	6	1	0	0	0	0	0	0	216	38	40
15:00	0	0	5	35	**121**	65	4	1	1	0	0	0	0	0	232	37	40
16:00	1	0	0	**47**	114	**89**	**14**	1	0	0	0	0	0	0	**266**	38	41
17:00	**4**	0	3	32	109	57	8	**2**	0	0	0	0	0	0	215	37	40
18:00	3	0	**11**	36	78	32	5	0	0	0	0	0	0	0	165	36	39
19:00	0	1	2	10	46	38	7	0	0	0	0	0	0	0	104	39	41
20:00	0	**2**	0	17	56	22	3	1	0	0	0	0	0	0	101	37	40
21:00	0	0	0	8	47	28	4	0	0	0	0	0	0	0	87	38	40
22:00	0	0	0	8	16	19	3	0	0	0	0	0	0	0	46	39	40
23:00	0	0	0	4	14	18	3	1	0	0	0	0	0	0	40	39	42
Total	22	13	72	466	1385	771	108	9	2	0	0	0	0	0	2848		
Percent	0.8%	0.5%	2.5%	16.4%	48.6%	27.1%	3.8%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	08:00	08:00	07:00	11:00	10:00	08:00							08:00		
Vol.	7	4	13	40	102	40	10	1							184		
PM Peak	17:00	20:00	18:00	16:00	15:00	16:00	16:00	17:00	13:00						16:00		
Vol.	4	2	11	47	121	89	14	2	1						266		

Innovative Data, LLC

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Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	0	4	10	8	2	0	0	0	0	0	0	0	24	38	40
01:00	0	0	0	0	5	2	1	0	0	0	0	0	0	0	8	35	36
02:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	*
03:00	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3	*	*
04:00	0	0	0	1	2	3	1	0	0	0	0	0	0	0	7	38	38
05:00	0	0	0	3	12	16	1	1	0	0	0	0	0	0	33	38	40
06:00	0	0	0	8	26	32	6	**2**	0	0	0	0	0	0	74	39	43
07:00	0	0	4	20	65	**69**	**14**	1	0	0	0	0	0	0	173	39	42
08:00	2	**5**	5	30	**72**	47	12	2	**1**	0	0	0	0	0	**176**	38	41
09:00	0	1	2	24	63	42	7	2	1	0	0	0	0	0	142	38	41
10:00	1	1	3	31	46	29	4	0	0	0	0	0	0	0	115	37	40
11:00	**3**	2	**10**	**47**	57	22	1	0	0	0	0	0	0	0	142	35	38
12 PM	0	0	3	41	86	35	5	0	0	0	0	0	0	0	170	37	39
13:00	1	**2**	1	14	78	47	**10**	0	0	0	0	0	0	0	153	38	41
14:00	3	2	**11**	49	98	51	6	0	0	0	0	0	0	0	220	37	40
15:00	**4**	1	9	**70**	106	28	6	0	0	0	0	0	0	0	224	35	39
16:00	0	1	10	58	100	68	10	**1**	0	0	0	0	0	0	248	38	40
17:00	1	1	2	44	**139**	**83**	7	0	0	0	0	0	0	0	**277**	37	40
18:00	0	0	1	25	66	37	4	0	0	0	0	0	0	0	133	37	40
19:00	1	0	1	10	66	35	5	0	**1**	0	0	0	0	0	119	38	40
20:00	0	0	0	10	47	49	10	0	0	0	0	0	0	0	116	39	42
21:00	0	0	2	8	48	32	3	1	0	0	0	0	0	0	94	38	40
22:00	0	0	0	5	35	9	1	0	0	0	0	0	0	0	50	36	39
23:00	0	0	1	5	20	8	2	0	0	0	0	0	0	0	36	37	40
Total	16	16	65	507	1248	755	119	10	3	0	0	0	0	0	2739		
Percent	0.6%	0.6%	2.4%	18.5%	45.6%	27.6%	4.3%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	08:00	11:00	11:00	08:00	07:00	07:00	06:00	08:00						08:00		
Vol.	3	5	10	47	72	69	14	2	1						176		
PM Peak	15:00	13:00	14:00	15:00	17:00	17:00	13:00	16:00	19:00						17:00		
Vol.	4	2	11	70	139	83	10	1	1						277		
Total	38	29	137	973	2633	1526	227	19	5	0	0	0	0	0	5587		
Percent	0.7%	0.5%	2.5%	17.4%	47.1%	27.3%	4.1%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH

Stats	
10 MPH Pace Speed :	29-38 MPH
Number in Pace :	3906
Percent in Pace :	69.9%
Number of Vehicles > 40 MPH :	404
Percent of Vehicles > 40 MPH :	7.2%
Mean Speed(Average) :	33 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	1	4	9	4	0	1	0	0	0	0	0	0	19	36	38
01:00	0	0	1	2	2	1	0	0	0	0	0	0	0	0	6	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	*	*
04:00	0	0	0	2	4	5	1	1	0	**1**	0	0	0	0	14	39	40
05:00	0	0	0	10	27	8	2	0	0	0	0	0	0	0	47	36	39
06:00	1	1	4	21	74	26	1	1	0	0	0	0	0	0	129	36	38
07:00	0	3	2	54	122	41	6	0	0	0	0	0	0	0	228	36	39
08:00	**2**	2	**17**	**77**	**149**	**61**	6	1	0	0	0	0	0	0	**315**	36	39
09:00	0	**4**	5	53	88	50	7	**3**	0	0	0	0	0	0	210	37	40
10:00	0	0	2	40	97	50	5	1	0	0	0	0	0	0	195	37	40
11:00	1	0	8	53	72	36	**11**	1	0	0	0	0	0	0	182	37	41
12 PM	0	1	**14**	52	106	29	4	0	0	0	0	0	0	0	206	36	39
13:00	1	2	9	44	100	53	2	0	0	0	0	0	0	0	211	37	39
14:00	0	**6**	10	**65**	85	**55**	5	**5**	0	0	0	0	0	0	231	37	40
15:00	3	3	4	39	104	53	8	0	0	0	0	0	0	0	214	37	40
16:00	1	0	6	36	98	48	7	0	0	0	0	0	0	0	196	37	40
17:00	**4**	6	7	64	**111**	40	**10**	1	0	0	0	0	0	0	**243**	36	40
18:00	0	0	1	30	93	40	8	0	0	0	0	0	0	0	172	37	40
19:00	2	0	6	19	47	18	4	1	0	0	0	0	0	0	97	37	40
20:00	2	2	1	28	35	12	3	0	0	0	0	0	0	0	83	36	39
21:00	0	0	1	10	34	13	0	1	0	0	0	0	0	0	59	37	39
22:00	0	0	0	7	11	11	4	0	0	0	0	0	0	0	33	39	42
23:00	0	0	0	2	10	4	4	1	0	0	0	0	0	0	21	41	43
Total	17	30	99	712	1479	658	99	18	0	1	0	0	0	0	3113		
Percent	0.5%	1.0%	3.2%	22.9%	47.5%	21.1%	3.2%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	09:00	08:00	08:00	08:00	08:00	11:00	09:00		04:00					08:00		
Vol.	2	4	17	77	149	61	11	3		1					315		
PM Peak	17:00	14:00	12:00	14:00	17:00	14:00	17:00	14:00							17:00		
Vol.	4	6	14	65	111	55	10	5							243		

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	0	2	7	6	1	0	0	0	0	0	0	0	16	39	40
01:00	0	0	0	1	4	3	0	0	0	0	0	0	0	0	8	36	37
02:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	*
04:00	0	0	0	4	3	8	0	**1**	**1**	0	0	0	0	0	17	38	40
05:00	0	0	0	9	18	10	3	0	0	0	0	0	0	0	40	38	41
06:00	0	1	3	30	79	35	2	0	0	0	0	0	0	0	150	36	39
07:00	0	**10**	6	40	101	53	10	0	0	0	0	0	0	0	220	37	40
08:00	3	5	**19**	**85**	**145**	**62**	5	0	0	0	0	0	0	0	**324**	36	39
09:00	**4**	4	10	53	78	28	**13**	0	0	0	0	0	0	0	190	37	41
10:00	1	3	7	46	58	46	4	0	0	0	0	0	0	0	165	37	39
11:00	1	3	7	53	81	32	7	0	0	0	0	0	0	0	184	36	40
12 PM	0	1	5	47	71	43	6	**1**	0	0	0	0	0	0	174	37	40
13:00	2	1	5	27	77	30	**12**	0	0	0	0	0	0	0	154	37	41
14:00	1	1	9	38	78	43	8	0	0	0	0	0	0	0	178	37	40
15:00	1	2	**33**	**61**	80	36	4	0	0	0	0	0	0	0	217	36	39
16:00	2	**5**	12	44	**112**	49	4	0	0	0	0	0	0	0	228	36	39
17:00	**3**	4	17	40	96	**56**	12	1	0	0	0	0	0	0	**229**	37	40
18:00	2	2	12	28	71	28	5	1	0	0	0	0	0	0	149	37	40
19:00	0	0	3	26	49	20	0	0	0	0	0	0	0	0	98	36	39
20:00	0	0	2	18	53	22	0	0	0	0	0	0	0	0	95	36	39
21:00	1	1	0	8	24	21	1	1	0	0	0	0	0	0	57	38	40
22:00	0	0	0	14	37	17	5	1	0	0	0	0	0	0	74	38	42
23:00	0	0	2	4	7	5	0	0	0	0	0	0	0	0	18	37	39
Total	21	43	152	678	1330	654	103	6	1	0	0	0	0	0	2988		
Percent	0.7%	1.4%	5.1%	22.7%	44.5%	21.9%	3.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	07:00	08:00	08:00	08:00	08:00	09:00	04:00	04:00						08:00		
Vol.	4	10	19	85	145	62	13	1	1						324		
PM Peak	17:00	16:00	15:00	15:00	16:00	17:00	13:00	12:00							17:00		
Vol.	3	5	33	61	112	56	12	1							229		
Total	38	73	251	1390	2809	1312	202	24	1	1	0	0	0	0	6101		
Percent	0.6%	1.2%	4.1%	22.8%	46.0%	21.5%	3.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	26 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	40 MPH

Stats

10 MPH Pace Speed :	28-37 MPH
Number in Pace :	4123
Percent in Pace :	67.6%
Number of Vehicles > 40 MPH :	357
Percent of Vehicles > 40 MPH :	5.9%
Mean Speed(Average) :	32 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound, Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/10/17	0	0	1	8	21	9	1	1	0	0	0	0	0	0	41	37	40
01:00	0	0	2	5	5	4	1	0	0	0	0	0	0	0	17	37	39
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	*	*
03:00	0	0	0	0	2	0	1	0	0	0	0	0	0	0	3	*	*
04:00	0	0	0	2	8	6	1	1	0	**1**	0	0	0	0	19	38	40
05:00	0	0	0	12	39	20	3	0	0	0	0	0	0	0	74	37	40
06:00	3	1	8	30	117	50	2	1	0	0	0	0	0	0	212	36	39
07:00	0	4	4	86	224	75	8	0	0	0	0	0	0	0	401	36	39
08:00	2	2	**30**	**117**	**245**	**92**	9	2	0	0	0	0	0	0	**499**	36	39
09:00	**7**	**5**	8	72	159	88	**16**	**3**	0	0	0	0	0	0	358	37	41
10:00	1	4	14	59	180	86	15	1	0	0	0	0	0	0	360	37	40
11:00	2	1	10	88	152	76	15	1	0	0	0	0	0	0	345	37	40
12 PM	0	2	16	95	195	79	12	0	0	0	0	0	0	0	399	36	39
13:00	2	3	**17**	65	191	117	13	1	**1**	0	0	0	0	0	410	37	40
14:00	2	**7**	14	**105**	182	120	11	**6**	0	0	0	0	0	0	447	37	40
15:00	3	3	9	74	**225**	118	12	1	1	0	0	0	0	0	446	37	40
16:00	2	0	6	83	212	**137**	**21**	1	0	0	0	0	0	0	**462**	38	40
17:00	**8**	6	10	96	220	97	18	3	0	0	0	0	0	0	458	37	40
18:00	3	0	12	66	171	72	13	0	0	0	0	0	0	0	337	37	40
19:00	2	1	8	29	93	56	11	1	0	0	0	0	0	0	201	38	41
20:00	2	4	1	45	91	34	6	1	0	0	0	0	0	0	184	36	39
21:00	0	0	1	18	81	41	4	1	0	0	0	0	0	0	146	37	40
22:00	0	0	0	15	27	30	7	0	0	0	0	0	0	0	79	39	42
23:00	0	0	0	6	24	22	7	2	0	0	0	0	0	0	61	40	44
Total	39	43	171	1178	2864	1429	207	27	2	1	0	0	0	0	5961		
Percent	0.7%	0.7%	2.9%	19.8%	48.0%	24.0%	3.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	08:00	08:00	08:00	08:00	09:00	09:00		04:00					08:00		
Vol.	7	5	30	117	245	92	16	3		1					499		
PM Peak	17:00	14:00	13:00	14:00	15:00	16:00	16:00	14:00	13:00						16:00		
Vol.	8	7	17	105	225	137	21	6	1						462		

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
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Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound, Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/11/17	0	0	0	6	17	14	3	0	0	0	0	0	0	0	40	38	41
01:00	0	0	0	1	9	5	1	0	0	0	0	0	0	0	16	38	40
02:00	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4	38	38
03:00	0	0	0	0	2	1	1	0	0	0	0	0	0	0	4	*	*
04:00	0	0	0	5	5	11	1	1	**1**	0	0	0	0	0	24	38	40
05:00	0	0	0	12	30	26	4	1	0	0	0	0	0	0	73	39	41
06:00	0	1	3	38	105	67	8	**2**	0	0	0	0	0	0	224	38	40
07:00	0	**10**	10	60	166	**122**	**24**	1	0	0	0	0	0	0	393	38	41
08:00	**5**	10	**24**	**115**	**217**	109	17	2	1	0	0	0	0	0	**500**	37	40
09:00	4	5	12	77	141	70	20	2	1	0	0	0	0	0	332	37	41
10:00	2	4	10	77	104	75	8	0	0	0	0	0	0	0	280	37	40
11:00	4	5	17	100	138	54	8	0	0	0	0	0	0	0	326	36	39
12 PM	0	1	8	88	157	78	11	1	0	0	0	0	0	0	344	37	40
13:00	3	3	6	41	155	77	**22**	0	0	0	0	0	0	0	307	38	41
14:00	4	3	20	87	176	94	14	0	0	0	0	0	0	0	398	37	40
15:00	**5**	3	**42**	**131**	186	64	10	0	0	0	0	0	0	0	441	35	39
16:00	2	**6**	22	102	212	117	14	1	0	0	0	0	0	0	476	37	40
17:00	4	5	19	84	**235**	**139**	19	1	0	0	0	0	0	0	**506**	37	40
18:00	2	2	13	53	137	65	9	1	0	0	0	0	0	0	282	37	40
19:00	1	0	4	36	115	55	5	0	**1**	0	0	0	0	0	217	37	40
20:00	0	0	2	28	100	71	10	0	0	0	0	0	0	0	211	38	40
21:00	1	1	2	16	72	53	4	**2**	0	0	0	0	0	0	151	38	40
22:00	0	0	0	19	72	26	6	1	0	0	0	0	0	0	124	37	40
23:00	0	0	3	9	27	13	2	0	0	0	0	0	0	0	54	37	39
Total	37	59	217	1185	2578	1409	222	16	4	0	0	0	0	0	5727		
Percent	0.6%	1.0%	3.8%	20.7%	45.0%	24.6%	3.9%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	08:00	08:00	08:00	07:00	07:00	06:00	04:00						08:00		
Vol.	5	10	24	115	217	122	24	2	1						500		
PM Peak	15:00	16:00	15:00	15:00	17:00	17:00	13:00	21:00	19:00						17:00		
Vol.	5	6	42	131	235	139	22	2	1						506		
Total	76	102	388	2363	5442	2838	429	43	6	1	0	0	0	0	11688		
Percent	0.7%	0.9%	3.3%	20.2%	46.6%	24.3%	3.7%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	27 MPH
	50th Percentile :	32 MPH
	85th Percentile :	37 MPH
	95th Percentile :	40 MPH
Stats	10 MPH Pace Speed :	29-38 MPH
	Number in Pace :	8013
	Percent in Pace :	68.6%
	Number of Vehicles > 40 MPH :	761
	Percent of Vehicles > 40 MPH :	6.5%
	Mean Speed(Average) :	33 MPH

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	21	0	0	1	0	0	0	0	0	0	0	0	0	22
01:00	0	11	0	0	0	0	0	0	0	0	0	0	0	0	11
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	4	0	0	0	0	0	0	1	0	0	0	0	0	5
05:00	0	15	11	0	0	0	0	1	0	0	0	0	0	0	27
06:00	0	65	14	0	2	1	0	0	0	0	0	0	0	1	83
07:00	2	126	34	3	5	1	0	1	1	0	0	0	0	0	173
08:00	1	140	37	1	4	0	1	0	0	0	0	0	0	0	184
09:00	0	109	25	1	9	2	1	0	1	0	0	0	0	0	148
10:00	0	112	39	0	11	1	1	1	0	0	0	0	0	0	165
11:00	1	121	32	1	5	1	1	1	0	0	0	0	0	0	163
12 PM	0	151	24	3	11	2	1	0	1	0	0	0	0	0	193
13:00	3	147	39	1	9	0	0	0	0	0	0	0	0	0	199
14:00	3	142	44	5	16	2	1	1	1	0	0	0	0	1	216
15:00	4	158	53	2	12	2	0	1	0	0	0	0	0	0	232
16:00	3	213	34	4	12	0	0	0	0	0	0	0	0	0	266
17:00	0	186	23	1	4	0	0	1	0	0	0	0	0	0	215
18:00	1	149	10	0	5	0	0	0	0	0	0	0	0	0	165
19:00	1	92	8	0	3	0	0	0	0	0	0	0	0	0	104
20:00	0	93	6	0	2	0	0	0	0	0	0	0	0	0	101
21:00	0	83	3	0	1	0	0	0	0	0	0	0	0	0	87
22:00	0	44	1	0	1	0	0	0	0	0	0	0	0	0	46
23:00	0	35	4	0	1	0	0	0	0	0	0	0	0	0	40
Total	19	2219	442	22	114	12	6	7	5	0	0	0	0	2	2848
Percent	0.7%	77.9%	15.5%	0.8%	4.0%	0.4%	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	07:00	08:00	10:00	07:00	10:00	09:00	08:00	05:00	04:00					06:00	
Vol.	2	140	39	3	11	2	1	1	1					1	
PM Peak	15:00	16:00	15:00	14:00	14:00	12:00	12:00	14:00	12:00					14:00	
Vol.	4	213	53	5	16	2	1	1	1					1	

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Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	20	4	0	0	0	0	0	0	0	0	0	0	0	24
01:00	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	4	1	0	2	0	0	0	0	0	0	0	0	0	7
05:00	0	20	11	0	1	1	0	0	0	0	0	0	0	0	33
06:00	0	54	15	0	4	1	0	0	0	0	0	0	0	0	74
07:00	2	125	35	4	5	2	0	0	0	0	0	0	0	0	173
08:00	2	137	27	0	6	0	1	2	0	0	0	0	0	1	176
09:00	2	111	22	2	5	0	0	0	0	0	0	0	0	0	142
10:00	0	73	26	2	9	3	1	1	0	0	0	0	0	0	115
11:00	2	97	28	2	8	3	0	1	1	0	0	0	0	0	142
12 PM	2	122	33	2	8	2	1	0	0	0	0	0	0	0	170
13:00	1	114	23	3	8	3	0	1	0	0	0	0	0	0	153
14:00	3	147	49	3	15	0	0	0	1	0	0	0	0	2	220
15:00	4	144	52	0	15	1	1	7	0	0	0	0	0	0	224
16:00	1	198	35	1	8	2	0	2	1	0	0	0	0	0	248
17:00	3	236	30	2	5	0	0	1	0	0	0	0	0	0	277
18:00	0	117	12	0	4	0	0	0	0	0	0	0	0	0	133
19:00	1	103	15	0	0	0	0	0	0	0	0	0	0	0	119
20:00	1	104	10	1	0	0	0	0	0	0	0	0	0	0	116
21:00	0	86	8	0	0	0	0	0	0	0	0	0	0	0	94
22:00	0	50	0	0	0	0	0	0	0	0	0	0	0	0	50
23:00	0	31	4	0	1	0	0	0	0	0	0	0	0	0	36
Total	24	2104	442	22	104	18	4	15	3	0	0	0	0	3	2739
Percent	0.9%	76.8%	16.1%	0.8%	3.8%	0.7%	0.1%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	07:00	08:00	07:00	07:00	10:00	10:00	08:00	08:00	11:00					08:00	
Vol.	2	137	35	4	9	3	1	2	1					1	
PM Peak	15:00	17:00	15:00	13:00	14:00	13:00	12:00	15:00	14:00					14:00	
Vol.	4	236	52	3	15	3	1	7	1					2	
Grand Total	43	4323	884	44	218	30	10	22	8	0	0	0	0	5	5587
Percent	0.8%	77.4%	15.8%	0.8%	3.9%	0.5%	0.2%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	

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Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	17	1	0	1	0	0	0	0	0	0	0	0	0	19
01:00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	9	5	0	0	0	0	0	0	0	0	0	0	0	14
05:00	0	35	9	0	3	0	0	0	0	0	0	0	0	0	47
06:00	3	78	39	2	5	1	0	1	0	0	0	0	0	0	129
07:00	2	180	31	2	9	3	0	0	0	0	0	0	0	1	228
08:00	2	252	42	6	9	2	0	2	0	0	0	0	0	0	315
09:00	0	171	27	3	6	1	0	1	0	1	0	0	0	0	210
10:00	0	145	34	1	8	2	0	3	2	0	0	0	0	0	195
11:00	2	149	20	3	5	1	0	1	0	1	0	0	0	0	182
12 PM	2	156	35	1	11	1	0	0	0	0	0	0	0	0	206
13:00	0	165	27	4	10	1	1	1	0	1	0	0	0	1	211
14:00	2	180	36	1	8	2	0	1	0	1	0	0	0	0	231
15:00	3	155	35	5	13	0	0	1	0	0	0	0	0	2	214
16:00	1	162	25	1	5	2	0	0	0	0	0	0	0	0	196
17:00	3	201	27	4	5	1	0	0	0	0	0	0	0	2	243
18:00	2	151	14	3	2	0	0	0	0	0	0	0	0	0	172
19:00	0	84	8	2	3	0	0	0	0	0	0	0	0	0	97
20:00	1	72	8	1	1	0	0	0	0	0	0	0	0	0	83
21:00	1	54	2	1	1	0	0	0	0	0	0	0	0	0	59
22:00	0	30	2	0	1	0	0	0	0	0	0	0	0	0	33
23:00	0	19	2	0	0	0	0	0	0	0	0	0	0	0	21
Total	24	2473	429	40	106	17	1	11	2	4	0	0	0	6	3113
Percent	0.8%	79.4%	13.8%	1.3%	3.4%	0.5%	0.0%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	
AM Peak	06:00	08:00	08:00	08:00	07:00	07:00		10:00	10:00	09:00				07:00	
Vol.	3	252	42	6	9	3		3	2	1				1	
PM Peak	15:00	17:00	14:00	15:00	15:00	14:00	13:00	13:00		13:00				15:00	
Vol.	3	201	36	5	13	2	1	1		1				2	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	16	0	0	0	0	0	0	0	0	0	0	0	0	16
01:00	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
02:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	13	4	0	0	0	0	0	0	0	0	0	0	0	17
05:00	0	28	9	1	1	1	0	0	0	0	0	0	0	0	40
06:00	2	86	46	1	9	1	1	2	2	0	0	0	0	0	150
07:00	0	183	27	1	6	1	0	2	0	0	0	0	0	0	220
08:00	1	266	44	4	8	0	0	1	0	0	0	0	0	0	324
09:00	0	142	32	4	9	1	1	1	0	0	0	0	0	0	190
10:00	2	130	21	1	7	3	0	0	0	0	0	0	0	1	165
11:00	0	134	33	4	6	4	1	1	1	0	0	0	0	0	184
12 PM	1	130	34	0	7	2	0	0	0	0	0	0	0	0	174
13:00	0	124	20	2	7	1	0	0	0	0	0	0	0	0	154
14:00	0	131	35	2	6	4	0	0	0	0	0	0	0	0	178
15:00	3	174	28	0	9	2	0	0	0	0	1	0	0	0	217
16:00	2	175	36	3	11	0	0	1	0	0	0	0	0	0	228
17:00	2	181	38	1	7	0	0	0	0	0	0	0	0	0	229
18:00	0	134	9	2	3	0	0	0	0	0	0	0	0	1	149
19:00	0	82	11	0	4	1	0	0	0	0	0	0	0	0	98
20:00	0	84	8	0	3	0	0	0	0	0	0	0	0	0	95
21:00	0	53	3	0	1	0	0	0	0	0	0	0	0	0	57
22:00	0	68	5	0	0	0	0	1	0	0	0	0	0	0	74
23:00	0	12	6	0	0	0	0	0	0	0	0	0	0	0	18
Total	13	2356	449	26	105	21	3	9	3	0	1	0	0	2	2988
Percent	0.4%	78.8%	15.0%	0.9%	3.5%	0.7%	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	06:00	08:00	06:00	08:00	06:00	11:00	06:00	06:00	06:00					10:00	
Vol.	2	266	46	4	9	4	1	2	2					1	
PM Peak	15:00	17:00	17:00	16:00	16:00	14:00		16:00			15:00			18:00	
Vol.	3	181	38	3	11	4		1			1			1	
Grand Total	37	4829	878	66	211	38	4	20	5	4	1	0	0	8	6101
Percent	0.6%	79.2%	14.4%	1.1%	3.5%	0.6%	0.1%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/10/17	0	38	1	0	2	0	0	0	0	0	0	0	0	0	41
01:00	0	17	0	0	0	0	0	0	0	0	0	0	0	0	17
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	13	5	0	0	0	0	0	1	0	0	0	0	0	19
05:00	0	50	20	0	3	0	0	1	0	0	0	0	0	0	74
06:00	3	143	53	2	7	2	0	1	0	0	0	0	0	1	212
07:00	4	306	65	5	14	4	0	1	1	0	0	0	0	1	401
08:00	3	392	79	7	13	2	1	2	0	0	0	0	0	0	499
09:00	0	280	52	4	15	3	1	1	1	1	0	0	0	0	358
10:00	0	257	73	1	19	3	1	4	2	0	0	0	0	0	360
11:00	3	270	52	4	10	2	1	2	0	1	0	0	0	0	345
12 PM	2	307	59	4	22	3	1	0	1	0	0	0	0	0	399
13:00	3	312	66	5	19	1	1	1	0	1	0	0	0	1	410
14:00	5	322	80	6	24	4	1	2	1	1	0	0	0	1	447
15:00	7	313	88	7	25	2	0	2	0	0	0	0	0	2	446
16:00	4	375	59	5	17	2	0	0	0	0	0	0	0	0	462
17:00	3	387	50	5	9	1	0	1	0	0	0	0	0	2	458
18:00	3	300	24	3	7	0	0	0	0	0	0	0	0	0	337
19:00	1	176	16	2	6	0	0	0	0	0	0	0	0	0	201
20:00	1	165	14	1	3	0	0	0	0	0	0	0	0	0	184
21:00	1	137	5	1	2	0	0	0	0	0	0	0	0	0	146
22:00	0	74	3	0	2	0	0	0	0	0	0	0	0	0	79
23:00	0	54	6	0	1	0	0	0	0	0	0	0	0	0	61
Total	43	4692	871	62	220	29	7	18	7	4	0	0	0	8	5961
Percent	0.7%	78.7%	14.6%	1.0%	3.7%	0.5%	0.1%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	
AM Peak	07:00	08:00	08:00	08:00	10:00	07:00	08:00	10:00	10:00	09:00				06:00	
Vol.	4	392	79	7	19	4	1	4	2	1				1	
PM Peak	15:00	17:00	15:00	15:00	15:00	14:00	12:00	14:00	12:00	13:00				15:00	
Vol.	7	387	88	7	25	4	1	2	1	1				2	

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Location: Sunderland Road
Location: North of Pine & Meadow
Location: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
10/11/17	0	36	4	0	0	0	0	0	0	0	0	0	0	0	40
01:00	0	14	2	0	0	0	0	0	0	0	0	0	0	0	16
02:00	0	3	0	0	1	0	0	0	0	0	0	0	0	0	4
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	17	5	0	2	0	0	0	0	0	0	0	0	0	24
05:00	0	48	20	1	2	2	0	0	0	0	0	0	0	0	73
06:00	2	140	61	1	13	2	1	2	2	0	0	0	0	0	224
07:00	2	308	62	5	11	3	0	2	0	0	0	0	0	0	393
08:00	3	403	71	4	14	0	1	3	0	0	0	0	0	1	500
09:00	2	253	54	6	14	1	1	1	0	0	0	0	0	0	332
10:00	2	203	47	3	16	6	1	1	0	0	0	0	0	1	280
11:00	2	231	61	6	14	7	1	2	2	0	0	0	0	0	326
12 PM	3	252	67	2	15	4	1	0	0	0	0	0	0	0	344
13:00	1	238	43	5	15	4	0	1	0	0	0	0	0	0	307
14:00	3	278	84	5	21	4	0	0	1	0	0	0	0	2	398
15:00	7	318	80	0	24	3	1	7	0	0	1	0	0	0	441
16:00	3	373	71	4	19	2	0	3	1	0	0	0	0	0	476
17:00	5	417	68	3	12	0	0	1	0	0	0	0	0	0	506
18:00	0	251	21	2	7	0	0	0	0	0	0	0	0	1	282
19:00	1	185	26	0	4	1	0	0	0	0	0	0	0	0	217
20:00	1	188	18	1	3	0	0	0	0	0	0	0	0	0	211
21:00	0	139	11	0	1	0	0	0	0	0	0	0	0	0	151
22:00	0	118	5	0	0	0	0	1	0	0	0	0	0	0	124
23:00	0	43	10	0	1	0	0	0	0	0	0	0	0	0	54
Total	37	4460	891	48	209	39	7	24	6	0	1	0	0	5	5727
Percent	0.6%	77.9%	15.6%	0.8%	3.6%	0.7%	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	
AM Peak	08:00	08:00	08:00	09:00	10:00	11:00	06:00	08:00	06:00					08:00	
Vol.	3	403	71	6	16	7	1	3	2					1	
PM Peak	15:00	17:00	14:00	13:00	15:00	12:00	12:00	15:00	14:00		15:00			14:00	
Vol.	7	417	84	5	24	4	1	7	1		1			2	
Grand Total	80	9152	1762	110	429	68	14	42	13	4	1	0	0	13	11688
Percent	0.7%	78.3%	15.1%	0.9%	3.7%	0.6%	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

N / S: North Pleasant Street
E / W: Meadow & Pine
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - N Pleasant @ Meadow & Pine
Site Code : 2
Start Date : 10/10/2017
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	22	44	15	0	81	25	35	3	2	65	1	13	7	0	21	4	3	22	0	29	196
07:15 AM	26	58	20	0	104	50	26	8	0	84	2	19	6	0	27	10	10	16	2	38	253
07:30 AM	34	79	29	1	143	37	30	13	1	81	2	11	7	0	20	6	14	9	0	29	273
07:45 AM	37	78	31	1	147	35	50	14	5	104	2	11	14	0	27	12	11	10	0	33	311
Total	119	259	95	2	475	147	141	38	8	334	7	54	34	0	95	32	38	57	2	129	1033
08:00 AM	36	71	24	0	131	38	41	9	0	88	6	15	11	0	32	9	16	12	0	37	288
08:15 AM	28	80	31	1	140	45	32	7	1	85	1	17	12	0	30	11	19	14	0	44	299
08:30 AM	32	96	32	1	161	37	28	15	2	82	4	21	11	0	36	14	30	19	3	66	345
08:45 AM	17	99	37	0	153	41	33	16	1	91	4	26	9	0	39	23	23	16	1	63	346
Total	113	346	124	2	585	161	134	47	4	346	15	79	43	0	137	57	88	61	4	210	1278
Grand Total	232	605	219	4	1060	308	275	85	12	680	22	133	77	0	232	89	126	118	6	339	2311
Apprch %	21.9	57.1	20.7	0.4		45.3	40.4	12.5	1.8		9.5	57.3	33.2	0		26.3	37.2	34.8	1.8		
Total %	10	26.2	9.5	0.2	45.9	13.3	11.9	3.7	0.5	29.4	1	5.8	3.3	0	10	3.9	5.5	5.1	0.3	14.7	
PCs and Peds	227	584	211	3	1025	302	270	83	12	667	22	124	73	0	219	82	123	112	6	323	2234
% PCs and Peds	97.8	96.5	96.3	75	96.7	98.1	98.2	97.6	100	98.1	100	93.2	94.8	0	94.4	92.1	97.6	94.9	100	95.3	96.7
Heavy Vehicles	5	18	8	0	31	6	3	1	0	10	0	9	4	0	13	6	3	6	0	15	69
% Heavy Vehicles	2.2	3	3.7	0	2.9	1.9	1.1	1.2	0	1.5	0	6.8	5.2	0	5.6	6.7	2.4	5.1	0	4.4	3
Bicycles	0	3	0	1	4	0	2	1	0	3	0	0	0	0	0	1	0	0	0	1	8
% Bicycles	0	0.5	0	25	0.4	0	0.7	1.2	0	0.4	0	0	0	0	0	1.1	0	0	0	0.3	0.3

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**36**	71	24	0	131	38	**41**	9	0	88	**6**	15	11	0	32	9	16	12	0	37	288
08:15 AM	28	80	31	**1**	140	**45**	32	7	1	85	1	17	**12**	0	30	11	19	14	0	44	299
08:30 AM	32	96	32	1	**161**	37	28	15	**2**	82	4	21	11	0	36	14	**30**	**19**	**3**	**66**	345
08:45 AM	17	**99**	**37**	0	153	41	33	**16**	1	**91**	4	**26**	9	0	**39**	**23**	23	16	1	63	**346**
Total Volume	113	346	124	2	585	161	134	47	4	346	15	79	43	0	137	57	88	61	4	210	1278
% App. Total	19.3	59.1	21.2	0.3		46.5	38.7	13.6	1.2		10.9	57.7	31.4	0		27.1	41.9	29	1.9		
PHF	.785	.874	.838	.500	.908	.894	.817	.734	.500	.951	.625	.760	.896	.000	.878	.620	.733	.803	.333	.795	.923
PCs and Peds																					
% PCs and Peds	98.2	96.0	97.6	100	96.8	98.1	99.3	100	100	98.8	100	96.2	95.3	0	96.4	93.0	98.9	96.7	100	96.7	97.3
Heavy Vehicles	2	11	3	0	16	3	1	0	0	4	0	3	2	0	5	4	1	2	0	7	32
% Heavy Vehicles	1.8	3.2	2.4	0	2.7	1.9	0.7	0	0	1.2	0	3.8	4.7	0	3.6	7.0	1.1	3.3	0	3.3	2.5
Bicycles	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Bicycles	0	0.9	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2

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N / S: North Pleasant Street
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City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - N Pleasant @ Meadow & Pine
Site Code : 2
Start Date : 10/10/2017
Page No : 1

Groups Printed- Heavy Vehicles

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	2	0	0	3	0	1	0	0	1	0	2	1	0	3	0	0	0	0	0	7
07:15 AM	0	0	2	0	2	2	1	1	0	4	0	3	0	0	3	0	0	1	0	1	10
07:30 AM	1	3	1	0	5	0	0	0	0	0	0	0	1	0	1	1	2	0	0	3	9
07:45 AM	1	2	2	0	5	1	0	0	0	1	0	1	0	0	1	1	0	3	0	4	11
Total	3	7	5	0	15	3	2	1	0	6	0	6	2	0	8	2	2	4	0	8	37
08:00 AM	0	3	0	0	3	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	6
08:15 AM	1	3	2	0	6	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	8
08:30 AM	0	2	1	0	3	1	1	0	0	2	0	1	0	0	1	2	1	1	0	4	10
08:45 AM	1	3	0	0	4	1	0	0	0	1	0	1	1	0	2	1	0	0	0	1	8
Total	2	11	3	0	16	3	1	0	0	4	0	3	2	0	5	4	1	2	0	7	32
Grand Total	5	18	8	0	31	6	3	1	0	10	0	9	4	0	13	6	3	6	0	15	69
Apprch %	16.1	58.1	25.8	0		60	30	10	0		0	69.2	30.8	0		40	20	40	0		
Total %	7.2	26.1	11.6	0	44.9	8.7	4.3	1.4	0	14.5	0	13	5.8	0	18.8	8.7	4.3	8.7	0	21.7	

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**1**	2	0	0	3	0	**1**	0	0	1	0	2	**1**	0	**3**	0	0	0	0	0	7
07:15 AM	0	0	**2**	0	2	**2**	1	**1**	0	**4**	0	**3**	0	0	3	0	0	1	0	1	10
07:30 AM	1	**3**	1	0	**5**	0	0	0	0	0	0	0	1	0	1	**1**	**2**	0	0	3	9
07:45 AM	1	2	2	0	5	1	0	0	0	1	0	1	0	0	1	1	0	**3**	0	**4**	**11**
Total Volume	3	7	5	0	15	3	2	1	0	6	0	6	2	0	8	2	2	4	0	8	37
% App. Total	20	46.7	33.3	0		50	33.3	16.7	0		0	75	25	0		25	25	50	0		
PHF	.750	.583	.625	.000	.750	.375	.500	.250	.000	.375	.000	.500	.500	.000	.667	.500	.250	.333	.000	.500	.841

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

N / S: Sunderland & N Pleasant
E / W: Montague Road
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - N Pleasant @ Sunderland & Montague
Site Code : 1
Start Date : 10/10/2017
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:30 AM	0	75	0	0	75	2	0	75	0	77	26	44	0	0	70	0	0	0	0	0	222
07:45 AM	0	66	2	0	68	2	0	78	0	80	24	38	0	0	62	0	0	0	0	0	210
Total	0	141	2	0	143	4	0	153	0	157	50	82	0	0	132	0	0	0	0	0	432
08:00 AM	0	72	0	0	72	2	0	71	0	73	30	42	0	0	72	0	0	0	0	0	217
08:15 AM	0	72	2	0	74	2	0	74	0	76	41	44	0	0	85	0	0	0	0	0	235
08:30 AM	0	83	0	0	83	2	0	78	0	80	45	45	0	0	90	0	0	0	0	0	253
08:45 AM	0	91	0	0	91	2	0	84	0	86	40	54	0	0	94	0	0	0	0	0	271
Total	0	318	2	0	320	8	0	307	0	315	156	185	0	0	341	0	0	0	0	0	976
Grand Total	0	459	4	0	463	12	0	460	0	472	206	267	0	0	473	0	0	0	0	0	1408
Apprch %	0	99.1	0.9	0		2.5	0	97.5	0		43.6	56.4	0	0		0	0	0	0		
Total %	0	32.6	0.3	0	32.9	0.9	0	32.7	0	33.5	14.6	19	0	0	33.6	0	0	0	0	0	
PCs and Peds	0	443	4	0	447	12	0	458	0	470	199	263	0	0	462	0	0	0	0	0	1379
% PCs and Peds	0	96.5	100	0	96.5	100	0	99.6	0	99.6	96.6	98.5	0	0	97.7	0	0	0	0	0	97.9
Heavy Vehicles	0	14	0	0	14	0	0	2	0	2	6	3	0	0	9	0	0	0	0	0	25
% Heavy Vehicles	0	3.1	0	0	3	0	0	0.4	0	0.4	2.9	1.1	0	0	1.9	0	0	0	0	0	1.8
Bicycles	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	4
% Bicycles	0	0.4	0	0	0.4	0	0	0	0	0	0.5	0.4	0	0	0.4	0	0	0	0	0	0.3

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	72	0	0	72	**2**	0	71	0	73	30	42	0	0	72	0	0	0	0	0	217
08:15 AM	0	72	**2**	0	74	2	0	74	0	76	41	44	0	0	85	0	0	0	0	0	235
08:30 AM	0	83	0	0	83	2	0	78	0	80	**45**	45	0	0	90	0	0	0	0	0	253
08:45 AM	0	**91**	0	0	**91**	2	0	**84**	0	**86**	40	**54**	0	0	**94**	0	0	0	0	0	**271**
Total Volume	0	318	2	0	320	8	0	307	0	315	156	185	0	0	341	0	0	0	0	0	976
% App. Total	0	99.4	0.6	0		2.5	0	97.5	0		45.7	54.3	0	0		0	0	0	0		
PHF	.000	.874	.250	.000	.879	1.00	.000	.914	.000	.916	.867	.856	.000	.000	.907	.000	.000	.000	.000	.000	.900
PCs and Peds																					
% PCs and Peds	0	96.5	100	0	96.6	100	0	99.3	0	99.4	96.8	98.9	0	0	97.9	0	0	0	0	0	98.0
Heavy Vehicles	0	9	0	0	9	0	0	2	0	2	5	1	0	0	6	0	0	0	0	0	17
% Heavy Vehicles	0	2.8	0	0	2.8	0	0	0.7	0	0.6	3.2	0.5	0	0	1.8	0	0	0	0	0	1.7
Bicycles	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% Bicycles	0	0.6	0	0	0.6	0	0	0	0	0	0	0.5	0	0	0.3	0	0	0	0	0	0.3

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N / S: Sunderland & N Pleasant
E / W: Montague Road
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - N Pleasant @ Sunderland & Montague
Site Code : 1
Start Date : 10/10/2017
Page No : 1

Groups Printed- Heavy Vehicles

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	3	0	0	3	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	6
Total	0	5	0	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	8
08:00 AM	0	2	0	0	2	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	4
08:15 AM	0	3	0	0	3	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	5
08:30 AM	0	1	0	0	1	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	4
08:45 AM	0	3	0	0	3	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	4
Total	0	9	0	0	9	0	0	2	0	2	5	1	0	0	6	0	0	0	0	0	17
Grand Total	0	14	0	0	14	0	0	2	0	2	6	3	0	0	9	0	0	0	0	0	25
Apprch %	0	100	0	0		0	0	100	0		66.7	33.3	0	0		0	0	0	0		
Total %	0	56	0	0	56	0	0	8	0	8	24	12	0	0	36	0	0	0	0	0	

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**3**	0	0	**3**	0	0	0	0	0	1	**2**	0	0	**3**	0	0	0	0	0	**6**
08:00 AM	0	2	0	0	2	0	0	**1**	0	**1**	1	0	0	0	1	0	0	0	0	0	4
08:15 AM	0	3	0	0	3	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	5
08:30 AM	0	1	0	0	1	0	0	0	0	0	**2**	1	0	0	3	0	0	0	0	0	4
Total Volume	0	9	0	0	9	0	0	2	0	2	5	3	0	0	8	0	0	0	0	0	19
% App. Total	0	100	0	0		0	0	100	0		62.5	37.5	0	0		0	0	0	0		
PHF	.000	.750	.000	.000	.750	.000	.000	.500	.000	.500	.625	.375	.000	.000	.667	.000	.000	.000	.000	.000	.792

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N / S: Montague Road
E / W: Plaza Driveway (North)
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - Montague @ Plaza (North)
Site Code : 4
Start Date : 10/10/2017
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	42	7	0	49	6	0	17	1	24	0	16	0	0	16	0	0	0	0	0	89
07:15 AM	0	47	3	0	50	6	0	16	4	26	0	22	0	0	22	0	0	0	0	0	98
07:30 AM	0	54	12	0	66	11	0	21	2	34	0	13	0	0	13	0	0	0	0	0	113
07:45 AM	0	59	5	0	64	6	0	24	2	32	0	14	0	0	14	0	0	0	0	0	110
Total	0	202	27	0	229	29	0	78	9	116	0	65	0	0	65	0	0	0	0	0	410
08:00 AM	0	58	5	0	63	3	0	9	1	13	0	22	0	0	22	0	0	0	0	0	98
08:15 AM	0	55	8	0	63	10	0	22	2	34	0	22	0	0	22	0	0	0	0	0	119
08:30 AM	0	67	2	0	69	8	0	15	3	26	1	29	0	0	30	0	0	0	0	0	125
08:45 AM	0	61	8	0	69	6	0	24	1	31	1	25	0	0	26	0	0	0	0	0	126
Total	0	241	23	0	264	27	0	70	7	104	2	98	0	0	100	0	0	0	0	0	468
Grand Total	0	443	50	0	493	56	0	148	16	220	2	163	0	0	165	0	0	0	0	0	878
Apprch %	0	89.9	10.1	0		25.5	0	67.3	7.3		1.2	98.8	0	0		0	0	0	0		
Total %	0	50.5	5.7	0	56.2	6.4	0	16.9	1.8	25.1	0.2	18.6	0	0	18.8	0	0	0	0	0	
PCs and Peds	0	435	49	0	484	53	0	145	0	198	2	150	0	0	152	0	0	0	0	0	834
% PCs and Peds	0	98.2	98	0	98.2	94.6	0	98	0	90	100	92	0	0	92.1	0	0	0	0	0	95
Heavy Vehicles	0	7	0	0	7	3	0	3	0	6	0	13	0	0	13	0	0	0	0	0	26
% Heavy Vehicles	0	1.6	0	0	1.4	5.4	0	2	0	2.7	0	8	0	0	7.9	0	0	0	0	0	3
Bicycles	0	1	1	0	2	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	18
% Bicycles	0	0.2	2	0	0.4	0	0	0	100	7.3	0	0	0	0	0	0	0	0	0	0	2.1

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	58	5	0	63	3	0	9	1	13	0	22	0	0	22	0	0	0	0	0	98
08:15 AM	0	55	**8**	0	63	**10**	0	22	2	**34**	0	22	0	0	22	0	0	0	0	0	119
08:30 AM	0	**67**	2	0	**69**	8	0	15	**3**	26	**1**	**29**	0	0	**30**	0	0	0	0	0	125
08:45 AM	0	61	8	0	69	6	0	**24**	1	31	1	25	0	0	26	0	0	0	0	0	**126**
Total Volume	0	241	23	0	264	27	0	70	7	104	2	98	0	0	100	0	0	0	0	0	468
% App. Total	0	91.3	8.7	0		26	0	67.3	6.7		2	98	0	0		0	0	0	0		
PHF	.000	.899	.719	.000	.957	.675	.000	.729	.583	.765	.500	.845	.000	.000	.833	.000	.000	.000	.000	.000	.929
PCs and Peds																					
% PCs and Peds	0	98.3	100	0	98.5	96.3	0	98.6	0	91.3	100	91.8	0	0	92.0	0	0	0	0	0	95.5
Heavy Vehicles	0	3	0	0	3	1	0	1	0	2	0	8	0	0	8	0	0	0	0	0	13
% Heavy Vehicles	0	1.2	0	0	1.1	3.7	0	1.4	0	1.9	0	8.2	0	0	8.0	0	0	0	0	0	2.8
Bicycles	0	1	0	0	1	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	8
% Bicycles	0	0.4	0	0	0.4	0	0	0	100	6.7	0	0	0	0	0	0	0	0	0	0	1.7

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N / S: Montague Road
E / W: Plaza Driveway (North)
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - Montague @ Plaza (North)
Site Code : 4
Start Date : 10/10/2017
Page No : 1

Groups Printed- Heavy Vehicles

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	2	0	0	2	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	5
07:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	5
Total	0	4	0	0	4	2	0	2	0	4	0	5	0	0	5	0	0	0	0	0	13
08:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	4
08:30 AM	0	0	0	0	0	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	3
08:45 AM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
Total	0	3	0	0	3	1	0	1	0	2	0	8	0	0	8	0	0	0	0	0	13
Grand Total	0	7	0	0	7	3	0	3	0	6	0	13	0	0	13	0	0	0	0	0	26
Apprch %	0	100	0	0		50	0	50	0		0	100	0	0		0	0	0	0		
Total %	0	26.9	0	0	26.9	11.5	0	11.5	0	23.1	0	50	0	0	50	0	0	0	0	0	

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**1**	0	0	**1**	0	0	**1**	0	**1**	0	**3**	0	0	**3**	0	0	0	0	0	**5**
08:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	4
08:30 AM	0	0	0	0	0	**1**	0	0	0	1	0	2	0	0	2	0	0	0	0	0	3
Total Volume	0	2	0	0	2	1	0	2	0	3	0	9	0	0	9	0	0	0	0	0	14
% App. Total	0	100	0	0		33.3	0	66.7	0		0	100	0	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.250	.000	.500	.000	.750	.000	.750	.000	.000	.750	.000	.000	.000	.000	.000	.700

INNOVATIVE DATA, LLC.
50 ALDEN AVENUE
BELCHERTOWN, MA 01007

Summary of Driveway Activity:
Sunderland, Montague & North Pleasant
Amherst, Massachusetts

Date: Tuesday
10/10//2017

AM Peak: 7:00 to 9:00 am
PM Peak: 4:00 to 6:00 pm

AM Peak Period – 7:00 to 9:00 AM

Int. Start Time	Plaza Driveway (South Driveway) along Montague				Amherst Family Center (North Driveway) along Sunderland				Amherst Family Center (South Driveway) along Sunderland			
	In		Out		In		Out		In		Out	
	L	R	L	R	L	R	L	R	L	R	L	R
7:00	2	13	1	0	1	0	0	0	0	0	0	0
7:15	1	16	0	0	0	0	0	0	0	0	0	0
7:30	3	18	0	0	1	0	0	0	0	0	0	0
7:45	2	21	2	0	1	0	0	0	0	0	0	0
8:00	4	6	0	1	0	0	0	0	0	0	0	0
8:15	2	20	0	0	2	1	0	0	0	0	0	0
8:30	3	17	0	0	4	2	2	4	0	0	0	0
8:45	2	19	1	0	2	0	0	0	0	0	0	0

USE MORE INTENSE PEAK PERIOD FOR SATURDAY

PM Peak Period – 4:00 to 6:00 PM

Int. Start Time	Plaza Driveway (South Driveway) along Montague				Amherst Family Center (North Driveway) along Sunderland				Amherst Family Center (South Driveway) along Sunderland			
	In		Out		In		Out		In		Out	
	L	R	L	R	L	R	L	R	L	R	L	R
4:00	5	21	1	0	0	0	0	0	0	0	0	0
4:15	3	30	0	0	0	0	0	0	0	0	0	0
4:30	2	19	2	0	0	0	0	0	0	0	0	0
4:45	2	24	2	0	0	0	0	0	0	0	0	0
5:00	4	11	0	0	0	0	0	0	0	0	0	0
5:15	1	25	1	1	0	0	0	0	0	0	0	0
5:30	2	14	1	0	0	0	0	1	0	0	0	0
5:45	4	24	1	0	0	0	0	1	0	0	0	0

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PO Box 468
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N / S: North Pleasant Street
E / W: Meadow & Pine
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - N Pleasant @ Meadow & Pine
Site Code : 2
Start Date : 10/10/2017
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	12	120	28	0	160	9	34	36	3	82	28	29	37	0	94	41	27	5	3	76	412
04:15 PM	8	62	18	0	88	19	38	41	1	99	28	22	37	3	90	44	29	3	6	82	359
04:30 PM	6	62	25	1	94	21	41	31	3	96	32	43	42	3	120	39	33	8	6	86	396
04:45 PM	12	73	20	1	106	19	26	43	0	88	24	43	42	2	111	32	25	4	4	65	370
Total	38	317	91	2	448	68	139	151	7	365	112	137	158	8	415	156	114	20	19	309	1537
05:00 PM	9	80	16	1	106	16	45	36	3	100	33	48	53	3	137	38	23	8	4	73	416
05:15 PM	12	82	26	0	120	21	30	39	1	91	31	27	52	1	111	43	32	6	5	86	408
05:30 PM	10	61	22	0	93	21	44	44	2	111	26	45	48	2	121	29	23	7	4	63	388
05:45 PM	8	47	22	0	77	34	36	23	5	98	17	48	46	8	119	37	24	9	6	76	370
Total	39	270	86	1	396	92	155	142	11	400	107	168	199	14	488	147	102	30	19	298	1582
Grand Total	77	587	177	3	844	160	294	293	18	765	219	305	357	22	903	303	216	50	38	607	3119
Apprch %	9.1	69.5	21	0.4		20.9	38.4	38.3	2.4		24.3	33.8	39.5	2.4		49.9	35.6	8.2	6.3		
Total %	2.5	18.8	5.7	0.1	27.1	5.1	9.4	9.4	0.6	24.5	7	9.8	11.4	0.7	29	9.7	6.9	1.6	1.2	19.5	
PCs and Peds	74	563	167	3	807	152	287	288	18	745	211	293	354	21	879	293	208	48	38	587	3018
% PCs and Peds	96.1	95.9	94.4	100	95.6	95	97.6	98.3	100	97.4	96.3	96.1	99.2	95.5	97.3	96.7	96.3	96	100	96.7	96.8
Heavy Vehicles	2	6	9	0	17	8	5	4	0	17	7	8	3	0	18	10	5	1	0	16	68
% Heavy Vehicles	2.6	1	5.1	0	2	5	1.7	1.4	0	2.2	3.2	2.6	0.8	0	2	3.3	2.3	2	0	2.6	2.2
Bicycles	1	18	1	0	20	0	2	1	0	3	1	4	0	1	6	0	3	1	0	4	33
% Bicycles	1.3	3.1	0.6	0	2.4	0	0.7	0.3	0	0.4	0.5	1.3	0	4.5	0.7	0	1.4	2	0	0.7	1.1

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	6	62	25	**1**	94	**21**	41	31	**3**	96	32	43	42	**3**	120	39	**33**	**8**	**6**	**86**	396
04:45 PM	**12**	73	20	1	106	19	26	**43**	0	88	24	43	42	2	111	32	25	4	4	65	370
05:00 PM	9	80	16	1	106	16	**45**	36	3	**100**	**33**	**48**	**53**	3	**137**	38	23	8	4	73	**416**
05:15 PM	12	**82**	**26**	0	**120**	21	30	39	1	91	31	27	52	1	111	**43**	32	6	5	86	408
Total Volume	39	297	87	3	426	77	142	149	7	375	120	161	189	9	479	152	113	26	19	310	1590
% App. Total	9.2	69.7	20.4	0.7		20.5	37.9	39.7	1.9		25.1	33.6	39.5	1.9		49	36.5	8.4	6.1		
PHF	.813	.905	.837	.750	.888	.917	.789	.866	.583	.938	.909	.839	.892	.750	.874	.884	.856	.813	.792	.901	.956
PCs and Peds																					
% PCs and Peds	94.9	95.3	95.4	100	95.3	93.5	98.6	99.3	100	97.9	98.3	96.3	100	88.9	98.1	97.4	96.5	100	100	97.4	97.2
Heavy Vehicles	2	4	4	0	10	5	1	1	0	7	2	5	0	0	7	4	2	0	0	6	30
% Heavy Vehicles	5.1	1.3	4.6	0	2.3	6.5	0.7	0.7	0	1.9	1.7	3.1	0	0	1.5	2.6	1.8	0	0	1.9	1.9
Bicycles	0	10	0	0	10	0	1	0	0	1	0	1	0	1	2	0	2	0	0	2	15
% Bicycles	0	3.4	0	0	2.3	0	0.7	0	0	0.3	0	0.6	0	11.1	0.4	0	1.8	0	0	0.6	0.9

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

N / S: North Pleasant Street
E / W: Meadow & Pine
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - N Pleasant @ Meadow & Pine
Site Code : 2
Start Date : 10/10/2017
Page No : 1

Groups Printed- Heavy Vehicles

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	2	0	2	1	1	0	0	2	3	0	0	0	3	1	2	0	0	3	10
04:15 PM	0	0	1	0	1	0	2	2	0	4	1	0	0	0	1	4	0	0	0	4	10
04:30 PM	1	2	1	0	4	2	0	1	0	3	0	1	0	0	1	2	0	0	0	2	10
04:45 PM	1	0	2	0	3	1	1	0	0	2	0	1	0	0	1	0	0	0	0	0	6
Total	2	2	6	0	10	4	4	3	0	11	4	2	0	0	6	7	2	0	0	9	36
05:00 PM	0	2	0	0	2	1	0	0	0	1	2	1	0	0	3	2	1	0	0	3	9
05:15 PM	0	0	1	0	1	1	0	0	0	1	0	2	0	0	2	0	1	0	0	1	5
05:30 PM	0	1	1	0	2	1	0	0	0	1	1	1	1	0	3	0	1	0	0	1	7
05:45 PM	0	1	1	0	2	1	1	1	0	3	0	2	2	0	4	1	0	1	0	2	11
Total	0	4	3	0	7	4	1	1	0	6	3	6	3	0	12	3	3	1	0	7	32
Grand Total	2	6	9	0	17	8	5	4	0	17	7	8	3	0	18	10	5	1	0	16	68
Apprch %	11.8	35.3	52.9	0		47.1	29.4	23.5	0		38.9	44.4	16.7	0		62.5	31.2	6.2	0		
Total %	2.9	8.8	13.2	0	25	11.8	7.4	5.9	0	25	10.3	11.8	4.4	0	26.5	14.7	7.4	1.5	0	23.5	

	N Pleasant From North					Pine From East					N Pleasant From South					Meadow From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	**2**	0	2	1	1	0	0	2	**3**	0	0	0	**3**	1	**2**	0	0	3	**10**
04:15 PM	0	0	1	0	1	0	**2**	**2**	0	**4**	1	0	0	0	1	**4**	0	0	0	**4**	10
04:30 PM	**1**	**2**	1	0	**4**	**2**	0	1	0	3	0	**1**	0	0	1	2	0	0	0	2	10
04:45 PM	1	0	2	0	3	1	1	0	0	2	0	1	0	0	1	0	0	0	0	0	6
Total Volume	2	2	6	0	10	4	4	3	0	11	4	2	0	0	6	7	2	0	0	9	36
% App. Total	20	20	60	0		36.4	36.4	27.3	0		66.7	33.3	0	0		77.8	22.2	0	0		
PHF	.500	.250	.750	.000	.625	.500	.500	.375	.000	.688	.333	.500	.000	.000	.500	.438	.250	.000	.000	.563	.900

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

N / S: Sunderland & N Pleasant
E / W: Montague Road
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - N Pleasant @ Sunderland & Montague
Site Code : 1
Start Date : 10/10/2017
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	46	2	0	48	1	0	46	0	47	106	85	0	0	191	0	0	0	0	0	286
04:15 PM	0	33	3	0	36	1	0	47	0	48	85	64	0	0	149	0	0	0	0	0	233
04:30 PM	0	62	0	0	62	1	0	62	0	63	82	49	0	0	131	0	0	0	0	0	256
04:45 PM	0	50	1	0	51	2	0	50	0	52	81	68	0	0	149	0	0	0	0	0	252
Total	0	191	6	0	197	5	0	205	0	210	354	266	0	0	620	0	0	0	0	0	1027
05:00 PM	0	69	2	0	71	2	0	61	0	63	95	56	0	0	151	0	0	0	0	0	285
05:15 PM	0	57	2	0	59	5	0	53	0	58	98	65	0	0	163	0	0	0	0	0	280
05:30 PM	0	55	0	0	55	1	0	59	0	60	88	48	0	0	136	0	0	0	0	0	251
05:45 PM	0	64	0	0	64	1	0	52	0	53	67	38	0	0	105	0	0	0	0	0	222
Total	0	245	4	0	249	9	0	225	0	234	348	207	0	0	555	0	0	0	0	0	1038
Grand Total	0	436	10	0	446	14	0	430	0	444	702	473	0	0	1175	0	0	0	0	0	2065
Apprch %	0	97.8	2.2	0		3.2	0	96.8	0		59.7	40.3	0	0		0	0	0	0		
Total %	0	21.1	0.5	0	21.6	0.7	0	20.8	0	21.5	34	22.9	0	0	56.9	0	0	0	0	0	
PCs and Peds	0	427	10	0	437	14	0	422	0	436	686	467	0	0	1153	0	0	0	0	0	2026
% PCs and Peds	0	97.9	100	0	98	100	0	98.1	0	98.2	97.7	98.7	0	0	98.1	0	0	0	0	0	98.1
Heavy Vehicles	0	9	0	0	9	0	0	8	0	8	13	6	0	0	19	0	0	0	0	0	36
% Heavy Vehicles	0	2.1	0	0	2	0	0	1.9	0	1.8	1.9	1.3	0	0	1.6	0	0	0	0	0	1.7
Bicycles	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
% Bicycles	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0.3	0	0	0	0	0	0.1

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	62	0	0	62	1	0	**62**	0	**63**	82	49	0	0	131	0	0	0	0	0	256
04:45 PM	0	50	1	0	51	2	0	50	0	52	81	**68**	0	0	149	0	0	0	0	0	252
05:00 PM	0	**69**	**2**	0	**71**	2	0	61	0	63	95	56	0	0	151	0	0	0	0	0	**285**
05:15 PM	0	57	2	0	59	**5**	0	53	0	58	**98**	65	0	0	**163**	0	0	0	0	0	280
Total Volume	0	238	5	0	243	10	0	226	0	236	356	238	0	0	594	0	0	0	0	0	1073
% App. Total	0	97.9	2.1	0		4.2	0	95.8	0		59.9	40.1	0	0		0	0	0	0		
PHF	.000	.862	.625	.000	.856	.500	.000	.911	.000	.937	.908	.875	.000	.000	.911	.000	.000	.000	.000	.000	.941
PCs and Peds																					
% PCs and Peds	0	98.3	100	0	98.4	100	0	99.1	0	99.2	97.5	99.2	0	0	98.1	0	0	0	0	0	98.4
Heavy Vehicles	0	4	0	0	4	0	0	2	0	2	7	2	0	0	9	0	0	0	0	0	15
% Heavy Vehicles	0	1.7	0	0	1.6	0	0	0.9	0	0.8	2.0	0.8	0	0	1.5	0	0	0	0	0	1.4
Bicycles	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
% Bicycles	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0.3	0	0	0	0	0	0.2

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

N / S: Sunderland & N Pleasant
E / W: Montague Road
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - N Pleasant @ Sunderland & Montague
Site Code : 1
Start Date : 10/10/2017
Page No : 1

Groups Printed- Heavy Vehicles

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	2	0	0	2	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	2	0	2	1	2	0	0	3	0	0	0	0	0	5
04:30 PM	0	1	0	0	1	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	4
04:45 PM	0	1	0	0	1	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	5
Total	0	4	0	0	4	0	0	4	0	4	5	5	0	0	10	0	0	0	0	0	18
05:00 PM	0	1	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	3
05:15 PM	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	3
05:30 PM	0	2	0	0	2	0	0	2	0	2	2	1	0	0	3	0	0	0	0	0	7
05:45 PM	0	1	0	0	1	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	5
Total	0	5	0	0	5	0	0	4	0	4	8	1	0	0	9	0	0	0	0	0	18
Grand Total	0	9	0	0	9	0	0	8	0	8	13	6	0	0	19	0	0	0	0	0	36
Apprch %	0	100	0	0		0	0	100	0		68.4	31.6	0	0		0	0	0	0		
Total %	0	25	0	0	25	0	0	22.2	0	22.2	36.1	16.7	0	0	52.8	0	0	0	0	0	

	Sunderland From North					Montague From East					N Pleasant From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**2**	0	0	**2**	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	**2**	0	**2**	1	**2**	0	0	**3**	0	0	0	0	0	**5**
04:30 PM	0	1	0	0	1	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	4
04:45 PM	0	1	0	0	1	0	0	1	0	1	**3**	0	0	0	3	0	0	0	0	0	5
Total Volume	0	4	0	0	4	0	0	4	0	4	5	5	0	0	10	0	0	0	0	0	18
% App. Total	0	100	0	0		0	0	100	0		50	50	0	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.500	.000	.500	.417	.625	.000	.000	.833	.000	.000	.000	.000	.000	.900

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
Innovativedatallc.com or 1.413.668.5094

N / S: Montague Road
E / W: Plaza Driveway (North)
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - Montague @ Plaza (North)
Site Code : 4
Start Date : 10/10/2017
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	25	2	0	27	14	0	15	4	33	7	65	0	0	72	0	0	0	0	0	132
04:15 PM	0	22	5	0	27	12	0	24	5	41	1	59	0	0	60	0	0	0	0	0	128
04:30 PM	0	44	6	0	50	8	0	18	8	34	2	64	0	0	66	0	0	0	0	0	150
04:45 PM	0	44	0	0	44	9	0	14	6	29	0	60	0	0	60	0	0	0	0	0	133
Total	0	135	13	0	148	43	0	71	23	137	10	248	0	0	258	0	0	0	0	0	543
05:00 PM	0	42	3	0	45	5	0	16	1	22	6	67	0	0	73	0	0	0	0	0	140
05:15 PM	0	38	2	0	40	14	0	14	9	37	2	78	0	0	80	0	0	0	0	0	157
05:30 PM	0	44	3	0	47	7	0	11	3	21	1	70	0	0	71	0	0	0	0	0	139
05:45 PM	0	39	2	0	41	11	0	16	2	29	1	44	0	0	45	0	0	0	0	0	115
Total	0	163	10	0	173	37	0	57	15	109	10	259	0	0	269	0	0	0	0	0	551
Grand Total	0	298	23	0	321	80	0	128	38	246	20	507	0	0	527	0	0	0	0	0	1094
Apprch %	0	92.8	7.2	0		32.5	0	52	15.4		3.8	96.2	0	0		0	0	0	0		
Total %	0	27.2	2.1	0	29.3	7.3	0	11.7	3.5	22.5	1.8	46.3	0	0	48.2	0	0	0	0	0	
PCs and Peds	0	296	23	0	319	79	0	126	0	205	20	499	0	0	519	0	0	0	0	0	1043
% PCs and Peds	0	99.3	100	0	99.4	98.8	0	98.4	0	83.3	100	98.4	0	0	98.5	0	0	0	0	0	95.3
Heavy Vehicles	0	2	0	0	2	1	0	2	0	3	0	8	0	0	8	0	0	0	0	0	13
% Heavy Vehicles	0	0.7	0	0	0.6	1.2	0	1.6	0	1.2	0	1.6	0	0	1.5	0	0	0	0	0	1.2
Bicycles	0	0	0	0	0	0	0	0	38	38	0	0	0	0	0	0	0	0	0	0	38
% Bicycles	0	0	0	0	0	0	0	0	100	15.4	0	0	0	0	0	0	0	0	0	0	3.5

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**44**	**6**	0	**50**	8	0	**18**	8	34	2	64	0	0	66	0	0	0	0	0	150
04:45 PM	0	44	0	0	44	9	0	14	6	29	0	60	0	0	60	0	0	0	0	0	133
05:00 PM	0	42	3	0	45	5	0	16	1	22	**6**	67	0	0	73	0	0	0	0	0	140
05:15 PM	0	38	2	0	40	**14**	0	14	**9**	**37**	2	**78**	0	0	**80**	0	0	0	0	0	**157**
Total Volume	0	168	11	0	179	36	0	62	24	122	10	269	0	0	279	0	0	0	0	0	580
% App. Total	0	93.9	6.1	0		29.5	0	50.8	19.7		3.6	96.4	0	0		0	0	0	0		
PHF	.000	.955	.458	.000	.895	.643	.000	.861	.667	.824	.417	.862	.000	.000	.872	.000	.000	.000	.000	.000	.924
PCs and Peds																					
% PCs and Peds	0	99.4	100	0	99.4	100	0	98.4	0	79.5	100	98.9	0	0	98.9	0	0	0	0	0	95.0
Heavy Vehicles	0	1	0	0	1	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	5
% Heavy Vehicles	0	0.6	0	0	0.6	0	0	1.6	0	0.8	0	1.1	0	0	1.1	0	0	0	0	0	0.9
Bicycles	0	0	0	0	0	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	24
% Bicycles	0	0	0	0	0	0	0	0	100	19.7	0	0	0	0	0	0	0	0	0	0	4.1

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N / S: Montague Road
E / W: Plaza Driveway (North)
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - Montague @ Plaza (North)
Site Code : 4
Start Date : 10/10/2017
Page No : 1

Groups Printed- Heavy Vehicles

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	7
05:00 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	4
Total	0	0	0	0	0	1	0	1	0	2	0	4	0	0	4	0	0	0	0	0	6
Grand Total	0	2	0	0	2	1	0	2	0	3	0	8	0	0	8	0	0	0	0	0	13
Apprch %	0	100	0	0		33.3	0	66.7	0		0	100	0	0		0	0	0	0		
Total %	0	15.4	0	0	15.4	7.7	0	15.4	0	23.1	0	61.5	0	0	61.5	0	0	0	0	0	

	Montague From North					Plaza (North) From East					Montague From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	**1**	0	**1**	0	**2**	0	0	**2**	0	0	0	0	0	**3**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
04:45 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
Total Volume	0	1	0	0	1	0	0	2	0	2	0	5	0	0	5	0	0	0	0	0	8
% App. Total	0	100	0	0		0	0	100	0		0	100	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.500	.000	.500	.000	.625	.000	.000	.625	.000	.000	.000	.000	.000	.667

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N/S: N Pleasant / Sunderland / Montague
E/W: Pine & Meadow
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - N. Pleasant & Sunderland & Montague @ Pine & Meadow
Site Code : 1
Start Date : 5/3/2013
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
07:30 AM	3	32	20	1	0	56	1	19	35	17	0	72	14	31	29	3	0	77	3	9	6	10	1	29	29	8	5	4	0	46	280
07:45 AM	9	53	26	0	0	88	0	36	27	18	0	81	13	25	27	4	0	69	2	5	13	9	0	29	14	6	11	1	0	32	299
Total	12	85	46	1	0	144	1	55	62	35	0	153	27	56	56	7	0	146	5	14	19	19	1	58	43	14	16	5	0	78	579
08:00 AM	8	33	24	0	0	65	0	25	30	13	0	68	7	28	45	4	5	89	1	13	15	12	0	41	11	9	6	5	2	33	296
08:15 AM	10	47	24	0	0	81	1	22	34	19	0	76	12	19	41	2	1	75	0	4	5	9	0	18	10	19	7	9	3	48	298
08:30 AM	11	50	15	1	0	77	0	14	31	10	0	55	12	22	36	12	6	88	4	8	10	8	0	30	18	25	9	7	4	63	313
08:45 AM	14	45	26	0	0	85	0	26	27	8	0	61	10	20	34	4	0	68	3	9	13	13	0	38	16	21	14	6	2	59	311
Total	43	175	89	1	0	308	1	87	122	50	0	260	41	89	156	22	12	320	8	34	43	42	0	127	55	74	36	27	11	203	1218
09:00 AM	2	41	15	1	0	59	1	17	17	7	0	42	8	13	23	7	1	52	6	9	9	12	3	39	10	12	12	7	1	42	234
09:15 AM	7	34	14	3	0	58	1	16	30	6	0	53	7	14	16	4	2	43	3	13	16	7	2	41	13	13	12	8	1	47	242
Grand Total	64	335	164	6	0	569	4	175	231	98	0	508	83	172	251	40	15	561	22	70	87	80	6	265	121	113	76	47	13	370	2273
Apprch %	11.2	58.9	28.8	1.1	0		0.8	34.4	45.5	19.3	0		14.8	30.7	44.7	7.1	2.7		8.3	26.4	32.8	30.2	2.3		32.7	30.5	20.5	12.7	3.5		
Total %	2.8	14.7	7.2	0.3	0	25	0.2	7.7	10.2	4.3	0	22.3	3.7	7.6	11	1.8	0.7	24.7	1	3.1	3.8	3.5	0.3	11.7	5.3	5	3.3	2.1	0.6	16.3	
PCs and Peds	61	311	154	5	0	531	4	172	225	95	0	496	76	167	245	33	15	536	21	60	77	71	6	235	111	104	70	46	13	344	2142
% PCs and Peds																															
Heavy Vehicles	2	19	10	1	0	32	0	2	3	3	0	8	7	5	5	4	0	21	1	9	9	9	0	28	8	9	6	1	0	24	113
% Heavy Vehicles	3.1	5.7	6.1	16.7	0	5.6	0	1.1	1.3	3.1	0	1.6	8.4	2.9	2	10	0	3.7	4.5	12.9	10.3	11.2	0	10.6	6.6	8	7.9	2.1	0	6.5	5
Bicycles	1	5	0	0	0	6	0	1	3	0	0	4	0	0	1	3	0	4	0	1	1	0	0	2	2	0	0	0	0	2	18
% Bicycles	1.6	1.5	0	0	0	1.1	0	0.6	1.3	0	0	0.8	0	0	0.4	7.5	0	0.7	0	1.4	1.1	0	0	0.8	1.7	0	0	0	0	0.5	0.8

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:15 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 08:00 AM																															
08:00 AM	8	33	24	0	0	65	0	25	30	13	0	68	7	28	45			89		13	15			41							
08:15 AM	10	47	24	0	0	81	1	22	34	19	0	76	12	19	41	2	1	75	0	4	5	9	0	18	10	19	7	9	3	48	298
08:30 AM	11	50	15	1	0	77	0	14	31	10	0	55	12	22	36	12	6	88	4	8	10	8	0	30	18	25	9	7	4	63	313
08:45 AM	14	45	26	0	0	85	0	26	27	8	0	61	10	20	34	4	0	68	3	9	13	13	0	38	16	21	14	6	2	59	311
Total Volume	43	175	89	1	0	308	1	87	122	50	0	260	41	89	156	22	12	320	8	34	43	42	0	127	55	74	36	27	11	203	1218
% App. Total	14	56.8	28.9	0.3	0		0.4	33.5	46.9	19.2	0		12.8	27.8	48.8	6.9	3.8		6.3	26.8	33.9	33.1	0		27.1	36.5	17.7	13.3	5.4		
PHF	.768	.875	.856	.250	.00 0	.906	.250	.837	.897	.658	.00 0	.855	.854	.795	.867	.458	.500	.899	.500	.654	.717	.808	.00 0	.774	.764	.740	.643	.750	.688	.806	.973

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N/S: N Pleasant / Sunderland / Montague
E/W: Pine & Meadow
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : AM Peak - N. Pleasant & Sunderland & Montague @ Pine & Meadow
Site Code : 1
Start Date : 5/3/2013
Page No : 1

Groups Printed- Heavy Vehicles

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
07:30 AM	0	2	2	0	0	4	0	1	0	1	0	2	1	0	0	0	0	1	0	2	1	1	0	4	1	1	1	0	0	3	14
07:45 AM	0	3	0	0	0	3	0	0	0	0	0	0	2	0	0	0	0	2	0	2	1	1	0	4	1	0	1	0	0	2	11
Total	0	5	2	0	0	7	0	1	0	1	0	2	3	0	0	0	0	3	0	4	2	2	0	8	2	1	2	0	0	5	25
08:00 AM	1	3	1	0	0	5	0	0	0	0	0	0	0	2	1	1	0	4	0	2	1	1	0	4	2	1	0	0	0	3	16
08:15 AM	1	3	0	0	0	4	0	1	0	2	0	3	0	1	1	0	0	2	0	0	1	0	0	1	3	3	0	1	0	7	17
08:30 AM	0	1	1	0	0	2	0	0	0	0	0	0	3	1	1	1	0	6	1	2	1	2	0	6	1	0	0	0	0	1	15
08:45 AM	0	3	1	0	0	4	0	0	1	0	0	1	0	0	1	1	0	2	0	0	1	1	0	2	0	1	1	0	0	2	11
Total	2	10	3	0	0	15	0	1	1	2	0	4	3	4	4	3	0	14	1	4	4	4	0	13	6	5	1	1	0	13	59
09:00 AM	0	0	1	0	0	1	0	0	2	0	0	2	1	0	0	1	0	2	0	0	0	1	0	1	0	1	1	0	0	2	8
09:15 AM	0	4	4	1	0	9	0	0	0	0	0	0	0	1	1	0	0	2	0	1	3	2	0	6	0	2	2	0	0	4	21
Grand Total	2	19	10	1	0	32	0	2	3	3	0	8	7	5	5	4	0	21	1	9	9	9	0	28	8	9	6	1	0	24	113
Apprch %	6.2	59.4	31.2	3.1	0		0	25	37.5	37.5	0		33.3	23.8	23.8	19	0		3.6	32.1	32.1	32.1	0		33.3	37.5	25	4.2	0		
Total %	1.8	16.8	8.8	0.9	0	28.3	0	1.8	2.7	2.7	0	7.1	6.2	4.4	4.4	3.5	0	18.6	0.9	8	8	8	0	24.8	7.1	8	5.3	0.9	0	21.2	

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:15 AM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 07:45 AM																															
07:45 AM	0	**3**	0	0	0	3	0	0	0	0	0	0	2	0	0	0	0	2	0	**2**	**1**	1	0	4	1	0	**1**	0	0	2	11
08:00 AM	**1**	3	**1**	0	0	**5**	0	0	0	0	0	0	0	**2**	**1**	**1**	0	4	0	2	1	1	0	4	2	1	0	0	0	3	16
08:15 AM	1	3	0	0	0	4	0	**1**	0	**2**	0	**3**	0	1	1	0	0	2	0	0	1	0	0	1	**3**	**3**	0	**1**	0	**7**	**17**
08:30 AM	0	1	1	0	0	2	0	0	0	0	0	0	**3**	1	1	1	0	**6**	**1**	2	1	**2**	0	**6**	1	0	0	0	0	1	15
Total Volume	2	10	2	0	0	14	0	1	0	2	0	3	5	4	3	2	0	14	1	6	4	4	0	15	7	4	1	1	0	13	59
% App. Total	14.3	71.4	14.3	0	0		0	33.3	0	66.7	0		35.7	28.6	21.4	14.3	0		6.7	40	26.7	26.7	0		53.8	30.8	7.7	7.7	0		
PHF	.500	.833	.500	.000	.000	.700	.000	.250	.000	.250	.000	.250	.417	.500	.750	.500	.000	.583	.250	.750	1.00	.500	.000	.625	.583	.333	.250	.250	.000	.464	.868

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N/S: N Pleasant / Sunderland / Montague
E/W: Pine & Meadow
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - N. Pleasant & Sunderland & Montague @ Pine & Meadow
Site Code : 2
Start Date : 5/3/2013
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
03:00 PM	10	17	21	0	0	48	1	20	31	15	0	67	10	19	22	10	4	65	1	31	29	13	0	74	21	37	27	6	0	91	345
03:15 PM	6	16	34	0	0	56	1	20	20	9	0	50	10	27	28	12	5	82	7	30	34	18	0	89	10	29	24	8	0	71	348
03:30 PM	2	40	42	0	0	84	0	18	24	10	0	52	29	32	36	6	1	104	4	33	37	12	5	91	25	31	25	1	1	83	414
03:45 PM	2	24	33	0	0	59	3	18	28	10	0	59	11	35	35	0	11	92	2	24	35	21	3	85	34	29	32	4	1	100	395
Total	20	97	130	0	0	247	5	76	103	44	0	228	60	113	121	28	21	343	14	118	135	64	8	339	90	126	108	19	2	345	1502
04:00 PM	7	22	30	0	0	59	0	16	31	29	0	76	7	38	24	12	5	86	8	23	42	14	14	101	18	33	22	0	0	73	395
04:15 PM	8	26	21	0	0	55	1	20	18	11	0	50	12	32	28	7	3	82	10	22	55	22	11	120	14	41	35	0	0	90	397
04:30 PM	5	24	28	1	0	58	1	15	34	19	0	69	5	24	32	10	0	71	9	33	51	20	15	128	12	36	33	6	2	89	415
04:45 PM	10	33	47	1	0	91	0	16	34	17	0	67	2	29	35	1	0	67	8	23	49	9	7	96	15	48	32	0	0	95	416
Total	30	105	126	2	0	263	2	67	117	76	0	262	26	123	119	30	8	306	35	101	197	65	47	445	59	158	122	6	2	347	1623
Grand Total	50	202	256	2	0	510	7	143	220	120	0	490	86	236	240	58	29	649	49	219	332	129	55	784	149	284	230	25	4	692	3125
Apprch %	9.8	39.6	50.2	0.4	0		1.4	29.2	44.9	24.5	0		13.3	36.4	37	8.9	4.5		6.2	27.9	42.3	16.5	7		21.5	41	33.2	3.6	0.6		
Total %	1.6	6.5	8.2	0.1	0	16.3	0.2	4.6	7	3.8	0	15.7	2.8	7.6	7.7	1.9	0.9	20.8	1.6	7	10.6	4.1	1.8	25.1	4.8	9.1	7.4	0.8	0.1	22.1	
PCs and Peds	49	197	249	2	0	497	7	141	216	117	0	481	84	229	232	55	29	629	48	213	315	120	55	751	140	280	225	25	4	674	3032
% PCs and Peds																															
Heavy Vehicles	1	4	4	0	0	9	0	2	3	1	0	6	2	7	8	3	0	20	1	2	12	8	0	23	9	4	5	0	0	18	76
% Heavy Vehicles	2	2	1.6	0	0	1.8	0	1.4	1.4	0.8	0	1.2	2.3	3	3.3	5.2	0	3.1	2	0.9	3.6	6.2	0	2.9	6	1.4	2.2	0	0	2.6	2.4
Bicycles	0	1	3	0	0	4	0	0	1	2	0	3	0	0	0	0	0	0	0	4	5	1	0	10	0	0	0	0	0	0	17
% Bicycles	0	0.5	1.2	0	0	0.8	0	0	0.5	1.7	0	0.6	0	0	0	0	0	0	0	1.8	1.5	0.8	0	1.3	0	0	0	0	0	0	0.5

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 04:00 PM																															
04:00 PM	7	22	30	0	0	59	0	16	31	29		76		38		12	5	86							18						
04:15 PM	8	26	21	0	0	55	1	20	18	11	0	50	12	32	28	7	3	82	10	22	55	22	11	120	14	41	35	0	0	90	397
04:30 PM	5	24	28	1	0	58	1	15	34	19	0	69	5	24	32	10	0	71	9	33	51	20	15	128	12	36	33	6	2	89	415
04:45 PM	10	33	47	1	0	91	0	16	34	17	0	67	2	29	35	1	0	67	8	23	49	9	7	96	15	48	32	0	0	95	416
Total Volume	30	105	126	2	0	263	2	67	117	76	0	262	26	123	119	30	8	306	35	101	197	65	47	445	59	158	122	6	2	347	1623
% App. Total	11.4	39.9	47.9	0.8	0		0.8	25.6	44.7	29	0		8.5	40.2	38.9	9.8	2.6		7.9	22.7	44.3	14.6	10.6		17	45.5	35.2	1.7	0.6		
PHF	.750	.795	.670	.500	.000	.723	.500	.838	.860	.655	.000	.862	.542	.809	.850	.625	.400	.890	.875	.765	.895	.739	.783	.869	.819	.823	.871	.250	.250	.913	.975

Innovative Data, LLC

PO Box 468
Belchertown, Massachusetts
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N/S: N Pleasant / Sunderland / Montague
E/W: Pine & Meadow
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : PM Peak - N. Pleasant & Sunderland & Montague @ Pine & Meadow
Site Code : 2
Start Date : 5/3/2013
Page No : 1

Groups Printed- Heavy Vehicles

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	1	0	1	2	2	0	5	2	1	0	0	0	3	11
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	3	0	0	1	0	0	1	1	1	1	0	0	3	7
03:30 PM	0	2	1	0	0	3	0	0	1	0	0	1	1	1	3	1	0	6	0	0	3	1	0	4	1	0	1	0	0	2	16
03:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0	0	2	0	0	1	1	0	2	2	0	1	0	0	3	8
Total	0	2	1	0	0	3	0	1	3	0	0	4	2	2	6	2	0	12	0	1	7	4	0	12	6	2	3	0	0	11	42
04:00 PM	1	0	1	0	0	2	0	0	0	0	0	0	0	1	0	1	0	2	0	0	1	2	0	3	1	0	0	0	0	1	8
04:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	2	1	0	0	3	1	1	1	1	0	4	1	1	1	0	0	3	11
04:30 PM	0	2	1	0	0	3	0	0	0	0	0	0	0	1	1	0	0	2	0	0	3	1	0	4	0	0	1	0	0	1	10
04:45 PM	0	0	1	0	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	2	5
Total	1	2	3	0	0	6	0	1	0	1	0	2	0	5	2	1	0	8	1	1	5	4	0	11	3	2	2	0	0	7	34
Grand Total	1	4	4	0	0	9	0	2	3	1	0	6	2	7	8	3	0	20	1	2	12	8	0	23	9	4	5	0	0	18	76
Apprch %	11.1	44.4	44.4	0	0		0	33.3	50	16.7	0		10	35	40	15	0		4.3	8.7	52.2	34.8	0		50	22.2	27.8	0	0		
Total %	1.3	5.3	5.3	0	0	11.8	0	2.6	3.9	1.3	0	7.9	2.6	9.2	10.5	3.9	0	26.3	1.3	2.6	15.8	10.5	0	30.3	11.8	5.3	6.6	0	0	23.7	

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 03:30 PM																															
03:30 PM	0	**2**	**1**	0	0	**3**	0	0	**1**	0	0	**1**	**1**	1	**3**	**1**	0	**6**	0	0	**3**	1	0	**4**	1	0	**1**	0	0	2	**16**
03:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0	0	2	0	0	1	1	0	2	**2**	0	1	0	0	**3**	8
04:00 PM	**1**	0	1	0	0	2	0	0	0	0	0	0	0	1	0	1	0	2	0	0	1	**2**	0	3	1	0	0	0	0	1	8
04:15 PM	0	0	0	0	0	0	0	**1**	0	0	0	1	0	**2**	1	0	0	3	**1**	**1**	1	1	0	4	1	**1**	1	0	0	3	11
Total Volume	1	2	2	0	0	5	0	1	2	0	0	3	1	4	6	2	0	13	1	1	6	5	0	13	5	1	3	0	0	9	43
% App. Total	20	40	40	0	0		0	33.3	66.7	0	0		7.7	30.8	46.2	15.4	0		7.7	7.7	46.2	38.5	0		55.6	11.1	33.3	0	0		
PHF	.250	.250	.500	.000	.000	.417	.000	.250	.500	.000	.000	.750	.250	.500	.500	.500	.000	.542	.250	.250	.500	.625	.000	.813	.625	.250	.750	.000	.000	.750	.672

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N/S: N Pleasant / Sunderland / Montague
E/W: Pine & Meadow
City, State: Amherst, Massachusetts
Client: CDM Smith / L. Sherman

File Name : Sat Peak - N. Pleasant & Sunderland & Montague @ Pine & Meadow
Site Code : 3
Start Date : 5/4/2013
Page No : 1

Groups Printed- PCs and Peds - Heavy Vehicles - Bicycles

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
11:00 AM	1	26	27	0	0	54	1	29	18	11	0	59	11	21	34	6	4	76	2	17	10	16	9	54	17	17	26	4	0	64	307
11:15 AM	9	23	9	1	0	42	0	21	20	20	0	61	8	30	36	10	0	84	11	24	16	21	6	78	17	20	22	6	3	68	333
11:30 AM	5	18	22	1	0	46	2	25	27	12	0	66	13	33	28	8	0	82	3	16	10	20	8	57	14	31	29	2	0	76	327
11:45 AM	6	22	22	1	0	51	0	28	28	9	0	65	16	27	32	6	0	81	9	19	13	15	4	60	21	24	21	0	0	66	323
Total	21	89	80	3	0	193	3	103	93	52	0	251	48	111	130	30	4	323	25	76	49	72	27	249	69	92	98	12	3	274	1290
12:00 PM	4	20	22	1	0	47	2	27	17	11	0	57	22	20	27	3	0	72	4	19	19	20	13	75	25	24	36	1	1	87	338
12:15 PM	6	17	18	1	0	42	2	15	30	15	0	62	10	21	49	9	0	89	5	25	25	14	3	72	14	30	35	6	2	87	352
12:30 PM	13	18	16	1	0	48	0	21	21	17	0	59	21	33	39	12	0	105	7	24	17	17	0	65	16	30	30	4	0	80	357
12:45 PM	10	21	19	0	0	50	2	21	22	18	0	63	28	21	33	9	0	91	4	30	11	25	5	75	20	27	30	1	3	81	360
Total	33	76	75	3	0	187	6	84	90	61	0	241	81	95	148	33	0	357	20	98	72	76	21	287	75	111	131	12	6	335	1407
01:00 PM	2	17	27	0	0	46	1	23	25	16	0	65	12	22	30	6	0	70	4	15	28	14	8	69	14	49	31	5	1	100	350
01:15 PM	10	27	25	1	0	63	1	21	16	9	0	47	11	31	28	3	1	74	7	18	20	23	2	70	36	41	31	0	0	108	362
01:30 PM	4	23	22	0	0	49	0	21	25	15	0	61	1	12	17	9	0	39	6	15	24	20	3	68	11	43	24	4	2	84	301
01:45 PM	7	21	13	1	0	42	1	25	33	7	0	66	9	22	29	6	1	67	12	32	18	22	3	87	13	25	30	0	0	68	330
Total	23	88	87	2	0	200	3	90	99	47	0	239	33	87	104	24	2	250	29	80	90	79	16	294	74	158	116	9	3	360	1343
Grand Total	77	253	242	8	0	580	12	277	282	160	0	731	162	293	382	87	6	930	74	254	211	227	64	830	218	361	345	33	12	969	4040
Apprch %	13.3	43.6	41.7	1.4	0		1.6	37.9	38.6	21.9	0		17.4	31.5	41.1	9.4	0.6		8.9	30.6	25.4	27.3	7.7		22.5	37.3	35.6	3.4	1.2		
Total %	1.9	6.3	6	0.2	0	14.4	0.3	6.9	7	4	0	18.1	4	7.3	9.5	2.2	0.1	23	1.8	6.3	5.2	5.6	1.6	20.5	5.4	8.9	8.5	0.8	0.3	24	
PCs and Peds	74	245	237	8	0	564	12	270	280	160	0	722	157	280	357	87	6	887	71	242	198	223	64	798	216	357	335	33	12	953	3924
% PCs and Peds																															
Heavy Vehicles	0	1	2	0	0	3	0	3	1	0	0	4	4	12	10	0	0	26	2	7	8	3	0	20	2	4	6	0	0	12	65
% Heavy Vehicles	0	0.4	0.8	0	0	0.5	0	1.1	0.4	0	0	0.5	2.5	4.1	2.6	0	0	2.8	2.7	2.8	3.8	1.3	0	2.4	0.9	1.1	1.7	0	0	1.2	1.6
Bicycles	3	7	3	0	0	13	0	4	1	0	0	5	1	1	15	0	0	17	1	5	5	1	0	12	0	0	4	0	0	4	51
% Bicycles	3.9	2.8	1.2	0	0	2.2	0	1.4	0.4	0	0	0.7	0.6	0.3	3.9	0	0	1.8	1.4	2	2.4	0.4	0	1.4	0	0	1.2	0	0	0.4	1.3

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 12:00 PM																															
12:00 PM	4	20	22	1			2	27															13	75	25		36			87	
12:15 PM	6	17	18	1	0	42	2	15	30	15	0	62	10	21	49	9	0	89	5	25	25	14	3	72	14	30	35	6	2	87	352
12:30 PM	13	18	16	1	0	48	0	21	21	17	0	59	21	33	39	12	0	105	7	24	17	17	0	65	16	30	30	4	0	80	357
12:45 PM	10	21	19	0	0	50	2	21	22	18	0	63	28	21	33	9	0	91	4	30	11	25	5	75	20	27	30	1	3	81	360
Total Volume	33	76	75	3	0	187	6	84	90	61	0	241	81	95	148	33	0	357	20	98	72	76	21	287	75	111	131	12	6	335	1407
% App. Total	17.6	40.6	40.1	1.6	0		2.5	34.9	37.3	25.3	0		22.7	26.6	41.5	9.2	0		7	34.1	25.1	26.5	7.3		22.4	33.1	39.1	3.6	1.8		
PHF	.635	.905	.852	.750	.000	.935	.750	.778	.750	.847	.000	.956	.723	.720	.755	.688	.000	.850	.714	.817	.720	.760	.404	.957	.750	.925	.910	.500	.500	.963	.977

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N/S: N Pleasant / Sunderland / Montague
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City, State: Amherst, Massachusetts
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File Name : Sat Peak - N. Pleasant & Sunderland & Montague @ Pine & Meadow
Site Code : 3
Start Date : 5/4/2013
Page No : 1

Groups Printed- Heavy Vehicles

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	2	0	0	0	0	0	0	3
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5	0	1	1	0	0	2	0	0	0	0	0	0	7
11:30 AM	0	0	1	0	0	1	0	0	1	0	0	1	1	1	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	0	0	2	1	1	2	1	0	5	0	0	1	0	0	1	9
Total	0	0	1	0	0	1	0	1	1	0	0	2	2	4	5	0	0	11	2	3	3	1	0	9	0	0	1	0	0	1	24
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2	0	0	4	5
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	2	0	0	0	0	0	0	3
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	6	1	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
12:45 PM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	1	0	0	1	0	2	0	0	0	2	0	0	1	0	0	1	6
Total	0	0	0	0	0	0	0	2	0	0	0	2	1	6	3	0	0	10	0	3	1	1	0	5	0	2	3	0	0	5	22
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	1	0	3	1	0	0	0	0	1	5
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	1	0	0	3	4
01:30 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	2	0	1	2	0	0	3	0	0	1	0	0	1	7
01:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	3
Total	0	1	1	0	0	2	0	0	0	0	0	0	1	2	2	0	0	5	0	1	4	1	0	6	2	2	2	0	0	6	19
Grand Total	0	1	2	0	0	3	0	3	1	0	0	4	4	12	10	0	0	26	2	7	8	3	0	20	2	4	6	0	0	12	65
Apprch %	0	33.3	66.7	0	0		0	75	25	0	0		15.4	46.2	38.5	0	0		10	35	40	15	0		16.7	33.3	50	0	0		
Total %	0	1.5	3.1	0	0	4.6	0	4.6	1.5	0	0	6.2	6.2	18.5	15.4	0	0	40	3.1	10.8	12.3	4.6	0	30.8	3.1	6.2	9.2	0	0	18.5	

	Sunderland From North						Montague From Northeast						Pine From East						North Pleasant From South						Meadow From West						
Start Time	Right	Thru	Left	Hard Left to Montag.	Peds	App. Total	Hard Right to Sundlnd.	Bear Right to Meadow	Bear Left to Pleasant	Hard Left to Pine	Peds	App. Total	Hard Right to Montag.	Right	Thru	Left	Peds	App. Total	Right	Bear Right to Montag.	Thru	Left	Peds	App. Total	Right	Thru	Bear Left to Montag.	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																															
Peak Hour for Entire Intersection Begins at 11:15 AM																															
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**2**	0	0	**5**	0	**1**	1	0	0	2	0	0	0	0	0	0	7
11:30 AM	0	0	**1**	0	0	**1**	0	0	**1**	0	0	**1**	**1**	1	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
11:45 AM	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	2	0	0	2	**1**	1	**2**	**1**	0	**5**	0	0	1	0	0	1	**9**
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	**2**	**2**	0	0	**4**	5
Total Volume	0	0	1	0	0	1	0	1	1	0	0	2	1	4	5	0	0	10	1	3	3	1	0	8	0	2	3	0	0	5	26
% App. Total	0	0	100	0	0		0	50	50	0	0		10	40	50	0	0		12.5	37.5	37.5	12.5	0		0	40	60	0	0		
PHF	.000	.000	.250	.000	.000	.250	.000	.250	.250	.000	.000	.500	.250	.333	.625	.000	.000	.500	.250	.750	.375	.250	.000	.400	.000	.250	.375	.000	.000	.313	.722

Innovative Data, LLC

50 Alden Avenue
Belchertown, Massachusetts
www.datayourequested.com or 1.413.668.5094

N/S: Montague Rd / N. Pleasant St
E/W: Meadow St / Pine St
City, State: North Amherst, MA
Client: Cowls

File Name : AM - Montague & N. Pleasant @ Meadow & Pine
Site Code : 88888888
Start Date : 12/9/2010
Page No : 1

Groups Printed- Passenger Cars and Peds - HVs - Bikes

	Montague Rd From North				Pine St From East				N. Pleasant St From South				Meadow St From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	11	26	19	0	22	18	4	1	2	13	3	1	6	9	12	0	147
07:15 AM	20	51	31	0	35	32	4	1	2	12	3	0	5	14	9	0	219
07:30 AM	30	64	33	0	47	42	5	0	6	12	6	0	16	15	12	0	288
07:45 AM	39	91	35	0	43	34	6	0	3	17	9	0	11	12	16	0	316
Total	100	232	118	0	147	126	19	2	13	54	21	1	38	50	49	0	970
08:00 AM	28	71	38	1	26	35	1	1	4	20	11	0	12	13	22	0	283
08:15 AM	41	61	41	4	34	40	5	5	1	15	7	2	12	17	15	1	301
08:30 AM	38	82	39	1	35	42	5	7	2	18	9	0	14	12	20	0	324
08:45 AM	37	94	24	1	29	28	7	3	1	29	9	1	16	13	18	4	314
Total	144	308	142	7	124	145	18	16	8	82	36	3	54	55	75	5	1222
Grand Total	244	540	260	7	271	271	37	18	21	136	57	4	92	105	124	5	2192
Apprch %	23.2	51.4	24.7	0.7	45.4	45.4	6.2	3	9.6	62.4	26.1	1.8	28.2	32.2	38	1.5	
Total %	11.1	24.6	11.9	0.3	12.4	12.4	1.7	0.8	1	6.2	2.6	0.2	4.2	4.8	5.7	0.2	
Passenger Cars and Peds	241	522	248	7	262	264	33	17	16	121	47	4	79	96	118	5	2080
% Passenger Cars and Peds	98.8	96.7	95.4	100	96.7	97.4	89.2	94.4	76.2	89	82.5	100	85.9	91.4	95.2	100	94.9
HVs	3	16	12	0	9	6	4	0	5	15	10	0	13	9	6	0	108
% HVs	1.2	3	4.6	0	3.3	2.2	10.8	0	23.8	11	17.5	0	14.1	8.6	4.8	0	4.9
Bikes	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	4
% Bikes	0	0.4	0	0	0	0.4	0	5.6	0	0	0	0	0	0	0	0	0.2

	Montague Rd From North					Pine St From East					N. Pleasant St From South					Meadow St From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	39	**91**	35	0	**165**	**43**	34	**6**	0	83	3	17	9	0	29	11	12	16	0	39	316
08:00 AM	28	71	38	1	138	26	35	1	1	63	**4**	**20**	**11**	0	**35**	12	13	**22**	0	**47**	283
08:15 AM	**41**	61	**41**	**4**	147	34	40	5	5	84	1	15	7	**2**	25	12	**17**	15	**1**	45	301
08:30 AM	38	82	39	1	160	35	**42**	5	**7**	**89**	2	18	9	0	29	**14**	12	20	0	46	**324**
Total Volume	146	305	153	6	610	138	151	17	13	319	10	70	36	2	118	49	54	73	1	177	1224
% App. Total	23.9	50	25.1	1		43.3	47.3	5.3	4.1		8.5	59.3	30.5	1.7		27.7	30.5	41.2	0.6		
PHF	.890	.838	.933	.375	.924	.802	.899	.708	.464	.896	.625	.875	.818	.250	.843	.875	.794	.830	.250	.941	.944

Innovative Data, LLC

50 Alden Avenue
Belchertown, Massachusetts
www.datayourequested.com or 1.413.668.5094

N/S: Montague Rd / N. Pleasant St
E/W: Meadow St / Pine St
City, State: North Amherst, MA
Client: Cowls

File Name : PM - Montague & N. Pleasant St @ Meadow & Pine
Site Code : 00009999
Start Date : 12/8/2010
Page No : 1

Groups Printed- Passenger Cars and Peds - HVs - Bikes

	Montague Rd From North				Pine St From East				N. Pleasnt St From South				Meadow St From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	28	38	29	0	34	33	3	0	11	70	20	0	26	34	44	0	370
04:15 PM	28	40	36	1	39	20	7	2	4	53	21	0	32	38	48	1	370
04:30 PM	31	34	24	0	26	39	3	5	3	57	19	0	26	37	41	0	345
04:45 PM	33	40	45	1	32	27	6	4	5	68	22	0	29	45	46	0	403
Total	120	152	134	2	131	119	19	11	23	248	82	0	113	154	179	1	1488
05:00 PM	36	39	36	0	38	19	6	3	6	64	23	1	27	39	58	0	395
05:15 PM	29	38	30	0	42	21	7	2	7	78	27	1	21	35	39	3	380
05:30 PM	27	37	44	2	23	15	3	4	10	65	24	0	36	47	34	0	371
05:45 PM	30	44	28	1	25	17	5	1	6	41	32	0	24	35	58	0	347
Total	122	158	138	3	128	72	21	10	29	248	106	2	108	156	189	3	1493
Grand Total	242	310	272	5	259	191	40	21	52	496	188	2	221	310	368	4	2981
Apprch %	29.2	37.4	32.8	0.6	50.7	37.4	7.8	4.1	7	67.2	25.5	0.3	24.5	34.3	40.8	0.4	
Total %	8.1	10.4	9.1	0.2	8.7	6.4	1.3	0.7	1.7	16.6	6.3	0.1	7.4	10.4	12.3	0.1	
Passenger Cars and Peds	239	307	270	4	258	190	39	21	51	488	179	2	213	308	362	4	2935
% Passenger Cars and Peds	98.8	99	99.3	80	99.6	99.5	97.5	100	98.1	98.4	95.2	100	96.4	99.4	98.4	100	98.5
HVs	3	3	2	1	1	1	1	0	1	5	9	0	8	2	6	0	43
% HVs	1.2	1	0.7	20	0.4	0.5	2.5	0	1.9	1	4.8	0	3.6	0.6	1.6	0	1.4
Bikes	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
% Bikes	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0	0.1

	Montague Rd From North					Pine St From East					N. Pleasnt St From South					Meadow St From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	33	**40**	**45**	1	**119**	32	**27**	6	**4**	69	5	68	22	0	95	29	45	46	0	120	**403**
05:00 PM	**36**	39	36	0	111	38	19	6	3	66	6	64	23	**1**	94	27	39	**58**	0	**124**	395
05:15 PM	29	38	30	0	97	**42**	21	**7**	2	**72**	7	**78**	**27**	1	**113**	21	35	39	**3**	98	380
05:30 PM	27	37	44	**2**	110	23	15	3	4	45	**10**	65	24	0	99	**36**	**47**	34	0	117	371
Total Volume	125	154	155	3	437	135	82	22	13	252	28	275	96	2	401	113	166	177	3	459	1549
% App. Total	28.6	35.2	35.5	0.7		53.6	32.5	8.7	5.2		7	68.6	23.9	0.5		24.6	36.2	38.6	0.7		
PHF	.868	.963	.861	.375	.918	.804	.759	.786	.813	.875	.700	.881	.889	.500	.887	.785	.883	.763	.250	.925	.961

Appendix B

Background Developments

TRAFFIC IMPACT STATEMENT
169 Meadow Street
Amherst, Massachusetts
April 4, 2016

April 4, 2016

Town of Amherst Zoning Board of Appeals
Jeff Bagg, Senior Planner
Town Hall
4 Boltwood Avenue
Amherst, MA 01002

RE: 169 Meadow Street
Traffic Impact Statement for Registered Marijuana Dispensary

Dear Mr. Bagg and Board Members:

On behalf of GTI Massachusetts NP Corporation (the "Applicant"), Hayes Engineering, Inc. (HEI) has prepared a Traffic Impact Statement for the above referenced project. The Project, as proposed, will convert the existing commercial use (Kimball's Auction House) at the above referenced property to a registered marijuana dispensary (RMD) use.

Trip generation rates indicate a decrease of approximately eight (8) vehicle trip ends per day per 1,000 square feet (sf.) of gross floor area (GFA) as compared to the previous land use at the property. RMDs are not high impact traffic generators with anticipated vehicle trip ends of ±36 per 1,000 square feet of gross floor area. The following table summarizes trip generation of the proposed Medical Office (RMD) use within the current Specialty Retail (Auction House) use in trip generation rates per 1,000 sf. of gross floor area as published in the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual:

Land Use (ITE Code)	Average Daily Vehicle Trip Ends per 1,000 sf of GFA	Average Daily Vehicle Trip Ends for 6,500sf. GFA Facility
Medical Office (720)	36.13	235
Specialty Retail (826)	44.32	288

Based on the published trip generation rates a decrease of approximately 53 trip ends is anticipated at the 6,500 sf. facilty due to the change in use.

Should you have any questions or concerns please do not hesitate to contact me using the information provided above.

Regards,

Anthony M. Capachietti,
Project Manager

Enclosures

TRAFFIC IMPACT STATEMENT
169 Meadow Street
Amherst, Massachusetts
April 4, 2016

The methodology selected for analysis of traffic impacts for the proposed RMD project at 169 Meadow Street in Amherst, MA is based on the approach outlined by the Massachusetts Department of Transportation (MassDOT) Highway Division in Section 2. IV. of the MassDOT Transportation Impact Assessment (TIA) Guidelines.

Existing Traffic Conditions:

Existing traffic conditions including average daily traffic and design hour volumes on adjacent streets are provided on the accompanying plan identified as Figure 1. Note that Design Hour Volume is equal to the D-factor times the average annual daily traffic (AADT) for the roadway.

Trip Generation:

Average Daily Vehicle Trips calculated below using information published by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition.

Existing Facility:
The existing facility at 169 Meadow Street is currently occupied by Kimball's Auction House; this use is best represented by ITE Land Use Code 826, Specialty Retail.

The selected independent variable used in analysis for the use is "1,000 Square Feet Gross Floor Area."

The number of Average Vehicle Trip Ends (Weekday) presented by the ITE for Land Use Code 826 can be calculated as presented below:

$$T = 44.32(X)$$

Where T represents the number of Average Vehicle Trip Ends and X represents 1,000 sf of GFA. The number of vehicle trip ends for the 6,500± sf. facility is:

$$T = 44.32(X) = \mathbf{288\ AVTE}$$

The facility, as currently occupied is anticipated to generate 288 trip ends daily.

Proposed Facility:

The proposed facility is best represented by ITE Land Use Code 720, Medical Office.

The selected independent variable used in analysis is "1,000 Square Feet Gross Floor Area."

The relationship between weekday AVTE and GFA for medical office use is identified by ITE as follows:

$$T = 36.13(X)$$

Where T represents the number of Average Vehicle Trip Ends and X represents 1,000 sf of GFA. The number of vehicle trip ends for the 6,500± sf. facility is:

$$T = 36.13(X) = \mathbf{235\ AVTE}$$

The total AVTE generated for the proposed RMD facility is 235, a decrease of 53 trip ends (26 trips) from the existing facility as currently occupied.

The Following Peak Hour Trip Ends for the proposed RMD (Land Use 720) can be calculated as follows:

AM Peak Hour Adjacent Street Traffic = 2.39 TE/(1,000sf) x 6.5k sf. = 16 Trip Ends = 8 Trips
PM Peak Hour Adjacent Street Traffic = 3.57 TE/(1,000sf) x 6.5k sf. = 23 Trip Ends = 12 Trips

AM Peak Hour Generator = 3.5 TE/(1,000sf) x 6.5k sf. = 23 Trip Ends = 12 Trips
PM Peak Hour Generator = 4.27TE/(1,000sf) x 6.5k sf. = 28 Trip Ends = 14 Trips

Level of Service on Adjacent Intersections:

The project site is located between the intersections of Meadow Street and Russelville Road to the west and Meadow Street and Route 116 to the east. The proposed facility represents a decrease in projected trip ends for both average daily and peak hour trips as compared to the existing use. As such, no decrease in level of service is anticipated for either adjacent intersection as a result of this project.

Street Capacity – Meadow Street:

The proposed facility represents a decrease in projected trip ends for both average daily and peak hour trips as compared to the existing use. As such, no decrease in capacity for Meadow Street is anticipated as a result of this project.

Proposed Pedestrian Flow On-Site:

There are no sidewalks along Meadow Street in the vicinity of the project. Pedestrian traffic will be limited to the parking lot(s) to the north and east of the facility. Walkways along the building and compliant access routes are provided to the customer entrance from the parking areas.

Sight Distances:

The existing driveway entrance/exits to the facility shall remain in their existing location(s). The required stopping sight distance (SSD) for the posted 35 miles per hour (mph) speed limit is 250 feet.

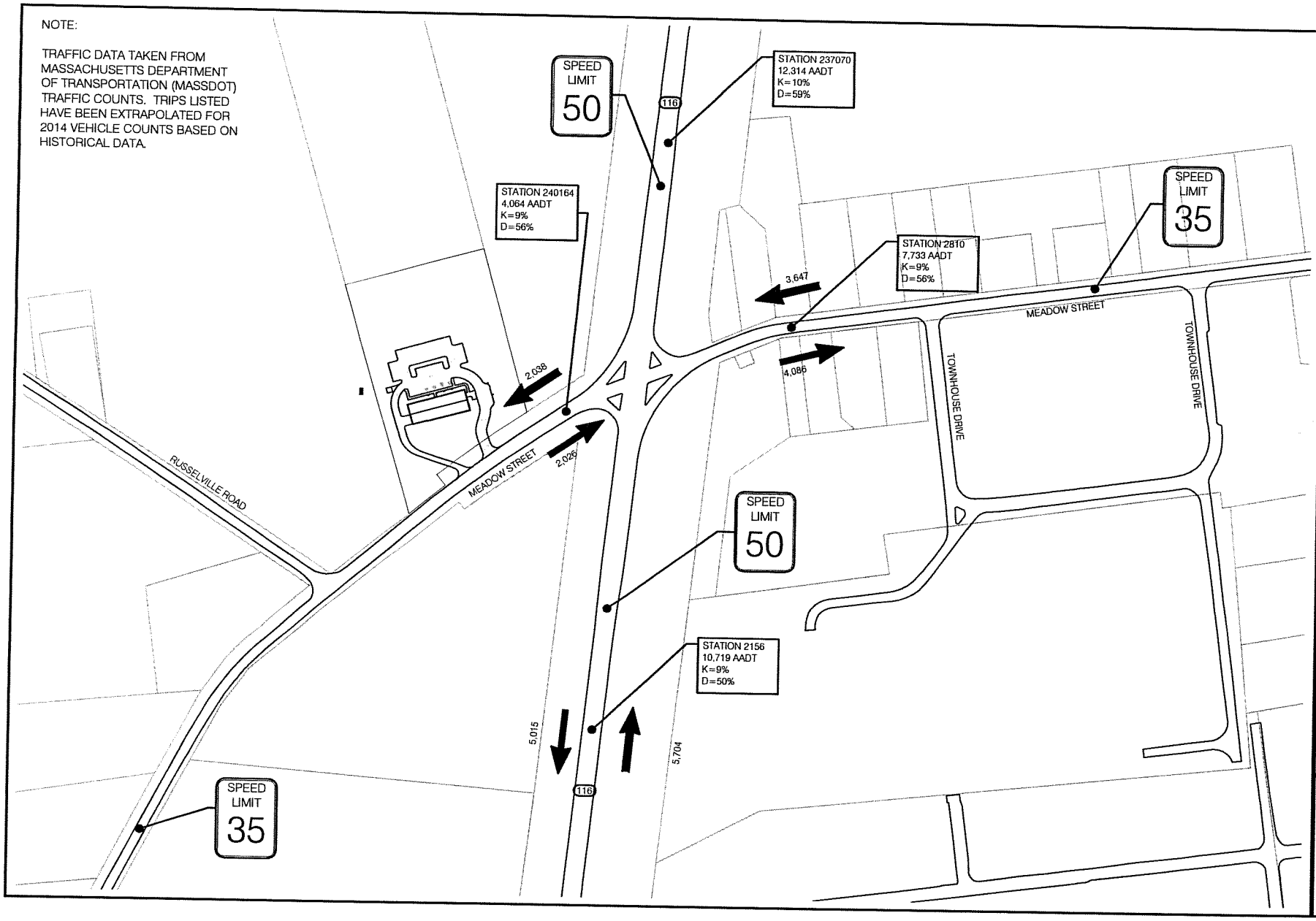
The easterly driveway has clear sight line of 275 feet from a point 10.5 feet back from the edge of pavement to the center line of the travelled way to the east and 715 feet to the westerly approach.

The westerly driveway has clear sight line of 380 feet from a point 10.5 feet back from the edge of pavement to the center line of the travelled way to the east and 350 feet to the westerly approach.

Adequate sight distance is provided for both site driveways on Meadow Street.

NOTE:

TRAFFIC DATA TAKEN FROM MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) TRAFFIC COUNTS. TRIPS LISTED HAVE BEEN EXTRAPOLATED FOR 2014 VEHICLE COUNTS BASED ON HISTORICAL DATA.



N

SCHEMATIC SITE PLAN
SHOWING TRAFFIC DATA

169 MEADOW STREET - AMHERST, MA

SCALE: 1" = 200'±

DATE: APRIL 2, 2016

Hayes Engineering, Inc.
603 Salem Street
Wakefield, MA 01880
Ph: 781.246.2800
Fax: 781.246.7596
www.hayesenc.com

FIG. 1

M:\AMH1\TRAFFICMAP.dwg, 4/4/2016 2:29:48 PM, TC

Transportation Impact Assessment

North Square at the Mill District

Amherst, MA

Prepared for:

Beacon Communities
Boston, Massachusetts

Vanasse & Associates, Inc.
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1066

TRANSPORTATION IMPACT ASSESSMENT

NORTH SQUARE AT THE MILL DISTRICT
AMHERST, MASSACHUSETTS

Prepared for:

Beacon Communities
Boston, Massachusetts

October 2016

Prepared by:

VANASSE & ASSOCIATES, INC.
35 New England Business Center Drive
Suite 140
Andover, MA 01810
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CONTENTS

EXECUTIVE SUMMARY 1

Recommendations 2

INTRODUCTION 4

Project Description 4
Study Methodology 4

EXISTING CONDITIONS 6

Existing Traffic Volumes 8
Pedestrian and Bicycle Facilities 9
Public Transportation 9
Spot Speed Measurements 9
Motor Vehicle Crash Data 10

FUTURE CONDITIONS 13

Future Traffic Growth 13
Project-Generated Traffic 14
Future Traffic Volumes - Build Condition 16

TRAFFIC OPERATIONS ANALYSIS 18

Methodology 18
Analysis Results 21

CONTENTS (Continued)

CONCLUSIONS AND RECOMMENDATIONS 27

Conclusions 32
Recommendations 30

FIGURES

No.	Title
1	Site Location Map
2	Existing Intersection Lane Use and Travel Lane Width
3	2016 Existing Weekday Morning Peak-Hour Traffic Volumes
4	2016 Existing Weekday Evening Peak-Hour Traffic Volumes
5	2016 Existing Saturday Midday Peak-Hour Traffic Volumes
6	2023 No-Build Weekday Morning Peak-Hour Traffic Volumes
7	2023 No-Build Weekday Evening Peak-Hour Traffic Volumes
8	2023 No-Build Saturday Midday Peak-Hour Traffic Volumes
9	Trip-Distribution Map
10	Project-Generated Weekday Morning Peak-Hour Traffic Volumes
11	Project-Generated Weekday Evening Peak-Hour Traffic Volumes
12	Project-Generated Saturday Midday Peak-Hour Traffic Volumes
13	2023 Build Weekday Morning Peak-Hour Traffic Volumes
14	2023 Build Weekday Evening Peak-Hour Traffic Volumes
15	2023 Build Saturday Midday Peak-Hour Traffic Volumes

TABLES

No.	Title
1	Study Area Intersection Description
2	2016 Existing Traffic Volumes
3	Vehicle Travel Speed Measurements
4	Motor Vehicle Crash Data Summary
5	Trip-Generation Summary
6	Trip Distribution Summary
7	Peak-Hour Traffic Volume Increases
8	Level-of-Service Criteria for Unsignalized Intersections
9	Level-of-Service Criteria for Signalized Intersections
10	Signalized Intersection Level-of-Service and Vehicle Queue Summary
11	Unsignalized Intersection Level-of-Service and Vehicle Queue Summary
12	Potential Roadway Realignment Signalized Intersection Level-of-Service and Vehicle Queue Summary
13	Optimized Signalized Intersection Level-of-Service and Vehicle Queue Summary

EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of 130 apartment units, 6,000 sf of restaurant/small café – food service, and 16,000 sf of retail to be located on Cowls Road in Amherst, Massachusetts (hereafter referred to as the "Project"). This assessment was prepared in consultation with the Town of Amherst and the Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*; and was conducted pursuant to the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports. Based on this assessment, we have concluded the following with respect to the Project:

1. The project is expected to generate 2,384 new vehicle trips on an average weekday (1,192 entering and 1,192 exiting), with approximately 148 new vehicle trips (59 entering and 89 exiting) expected during the weekday morning peak hour and 208 new vehicle trips (119 entering and 89 exiting) during the weekday evening peak hour. During an average Saturday, the project is expected to generate 2,454 new vehicle trips (1,227 entering and 1,227 exiting), with approximately 174 new vehicle trips (91 entering and 83 exiting) during the Saturday midday peak hour.

2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing along the area roadways, including but not limited to Cowls Road, Sunderland Road, Montague Road (Route 63) and North Pleasant Street.

3. No apparent safety deficiencies are expected at the study intersections.

4. The project will be primarily served by two full-access driveways on Cowls Road, with the western drive providing access for the residential use and the central drive providing access for both the commercial and residential uses. In addition, there is a site drive at Atkins Farm (the east drive), which is not formerly part of the project.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

Project Access

Access to the project will be primarily served by two full-access driveways on Cowls Road (the Middle and West Site Drives). In addition, there is a site drive at Atkins Farm (the East Site Drive), which is not formerly part of the project.

- The Cowls Road proposed West Site Drive should be a minimum of 24-feet in width and accommodate two-way traffic.
- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site shall conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[1]
- Wheelchair ramps should be provided for crossing the Project site driveways where a sidewalk is present.
- Signs and landscaping to be installed along the Project site driveways should be designed and maintained so as not to restrict lines of sight.

All of the above recommendations are incorporated into the final design plans.

Roadways

Independent of the proposed project the signal timings at the intersections of North Pleasant Street at Meadow Street and Pine Street and Route 116 at Meadow Street should be periodically optimized.

Transportation Demand Management

The Project site is ideally situated to take advantage of available public transportation opportunities in the area, including bus service along Montague Road (Route 63), Cowls Road and Sunderland Road. In an effort to the encourage use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location;
- A packet will be provided to new residents of the Project detailing available public transportation services, bicycle and walking alternatives.
- Pedestrian accommodations will be incorporated within the Project site; and

[1] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

- Secure bicycle parking for residents will be provided, including both an exterior bicycle rack and weather protected bicycle parking in a secure area.

All of the above recommendations are incorporated into the final plans.

With implementation of the above recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a mixed-use development to be located on Cowls Road in Amherst, Massachusetts (hereafter referred to as the "Project"). This study evaluates the following specific areas as they relate to the Project: i) access requirements; and ii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Cowls Road and at the following intersections: Route 116 at Meadow Street; North Pleasant Street at Meadow Street and Pine Street; North Pleasant Street at Sunderland Road and Montague Road (Route 63); Montague Road (Route 63) at Cowls Road; Sunderland Road at Cowls Road; and Sunderland Road at Route 116.

PROJECT DESCRIPTION

As proposed, the Project will entail the construction of 130 apartment units, 6,000 sf of restaurant/small café – food service, and 16,000 sf of retail to be located on Cowls Road in Amherst, Massachusetts. Figure 1 depicts the Project site location in relation to the existing roadway network. Access to the project will be primarily served by two full-access driveways on Cowls Road (the Middle and West Site Drives). At present, the Project site contains Atkins Market, which would neighbor the Project, and has a separate site drive (East Site Drive).

STUDY METHODOLOGY

This study was prepared in consultation with the Town of Amherst and the Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; public transportation services; observations of traffic flow; and collection of daily and peak period traffic counts.

Figure 1

Site Location Map

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for analyses consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Included in the seven year horizon is the MassWorks application project. The MassWorks project supports the North Amherst Redevelopment Project, which would include roadway improvements, pedestrian safety and signal improvements. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in September 2016 The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area for the Project was selected to contain the major roadway providing access to the Project site, Cowls Road, as well as the following specific intersections: Route 116 at Meadow Street; North Pleasant Street at Meadow Street and Pine Street; North Pleasant Street at Sunderland Road and Montague Road (Route 63); Montague Road (Route 63) at Cowls Road; Sunderland Road at Cowls Road; and Sunderland Road at Route 116.

The following describes the study area roadway and intersections.

Roadway

Cowls Road

- Two-lane local roadway under Town jurisdiction
- Traverses study area in a general east-west direction
- Provides one 11-foot wide travel lane in each direction, with no pavement markings separating direction of travel and no marked shoulders provided
- A sidewalk is provided continuously along the south side of the roadway in the vicinity of the project site
- Land use consists of the Project site, commercial and residential properties

Intersections

Table 1 and Figure 2 summarize lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in September 2016.

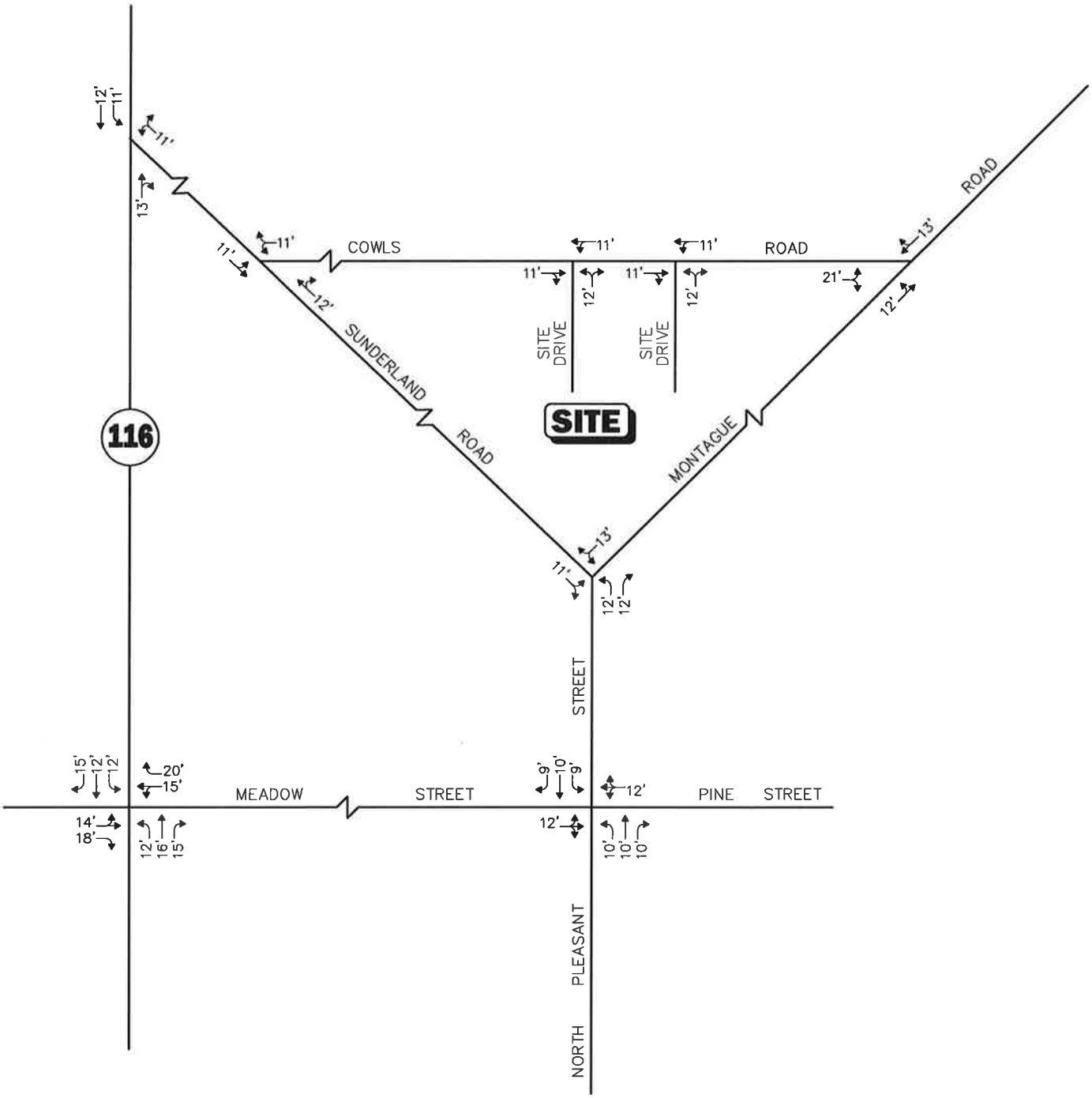

Figure 2

Existing Intersection Lane Use and Travel Lane Width

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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Table 1
STUDY AREA INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided?	Pedestrian Accommodations?
Meadow Street/ Route 116	TS	Meadow Street approaches accommodate a through lane and a channelized right-turn lane; Route 116 approaches accommodate a left-turn lane, a through travel lane and a right-turn lane	Yes; 1-5 feet on all approaches	No crosswalks or sidewalks
North Pleasant Street/Meadow Street/Pine Street	TS	The Meadow Street and Pine Street approaches accommodate a general purpose travel lane; Pleasant Street approaches accommodate a left-turn lane, a through travel lane and a right-turn lane	Yes; 2-7 feet on Meadow Street and Pine Street; no shoulders on North Pleasant Street	Yes – sidewalks are present along both sides of all roadways, except for the south side of Pine Street. Crosswalks are present across all legs, except the south leg of North Pleasant Street
Sunderland Road/ Montague Road (Route 63)/North Pleasant Street	S	Montague Street and Sunderland Street approaches accommodate a general purpose travel lane; the North Pleasant Street approach accommodates a left-turn and a right-turn lane	Yes; 2-6 feet on all approaches	Yes – Sidewalks on both sides of Montague Road and North Pleasant Street, and along the east side of Sunderland Road, which crosses over to the west side; Crosswalks on Montague Road and Sunderland Road set back from the intersection
Sunderland Road/ Cowls Road	S	All approaches provide 1 general purpose travel lane	Yes; 2-3 feet on Sunderland Road, no shoulders on Cowls Road	No crosswalks or sidewalks
Montague Road (Route 63) /Cowls Road	S	All approaches provide 1 general purpose travel lane	Yes; 4-5 feet on Montague Road, no shoulders on Cowls Road	Yes – sidewalks are present along both sides of all roadways, except for the north side of Cowls Road. No crosswalks are present.
Cowls Road/Site Drive	S	All approaches provide 1 general purpose travel lane	No	Yes – On the south side of Cowls Road. No crosswalks are present.

[a]TS = traffic signal control; S = STOP-sign control

EXISTING TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs) and vehicle classification counts were completed in September and October 2016. The ATR counts were conducted on Cowls Road and Montague Road (Route 63) in the vicinity of the Project site in order to record weekday daily traffic conditions over an extended period, with weekday morning (7:00 to 9:00 AM), weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak period manual TMCs performed at the study intersections. These time periods were selected for analysis purposes as they are representative of the peak traffic volume hours for both the Project and the adjacent roadway network.

Traffic Volume Adjustments

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, a MassDOT permanent count station was reviewed. Based on a review of this data, it was determined that traffic volumes for the months of September and October are approximately 10 to 11 percent above average-month conditions and, therefore, were not adjusted downward in order to provide a conservative (above-average) analysis condition. The 2016 Existing traffic volumes are summarized in Table 2, with the weekday morning, weekday evening and Saturday midday peak-hour traffic volumes graphically depicted on Figures 3, 4 and 5, respectively. Note that the peak-hour traffic volumes presented in Table 2 were obtained from the TMCs and are reflected on the aforementioned figure.

Table 2
2016 EXISTING TRAFFIC VOLUMES

Location	AWT[a]	Saturday ADT	VPH[b]	K Factor[c]	Directional Distribution
Montague Road (Route 63), south of	5,900	5,000	--	--	--
Cowls Road:	--	--	374	6.3	73% SB
Weekday Morning Peak Hour	--	--	442	7.5	60% NB
Weekday Evening Peak Hour	--	--	384	7.7	55% SB
Saturday Midday Peak Hour					
	1,300	1,000	--	--	--
Cowls Road, west of Atkins Farm Drive:	--	--	88	6.8	70% WB
Weekday Morning Peak Hour	--	--	122	9.4	52% EB
Weekday Evening Peak Hour	--	--	123	12.3	51% WB
Saturday Midday Peak Hour					

[a]Average weekday traffic in vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak-hour.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound.

As can be seen in Table 2, Montague Road (Route 63) in the vicinity of the Project site was found to accommodate approximately 5,900 vehicles on an average weekday (two-way, 24-hour volumes), with approximately 406 vehicles per hour (vph) during the weekday morning peak-hour and 452 vph during the weekday evening peak-hour. During an average Saturday, Montague Road was found to accommodate 5,000 vehicles, with approximately 384 vph during the Saturday midday peak hour.

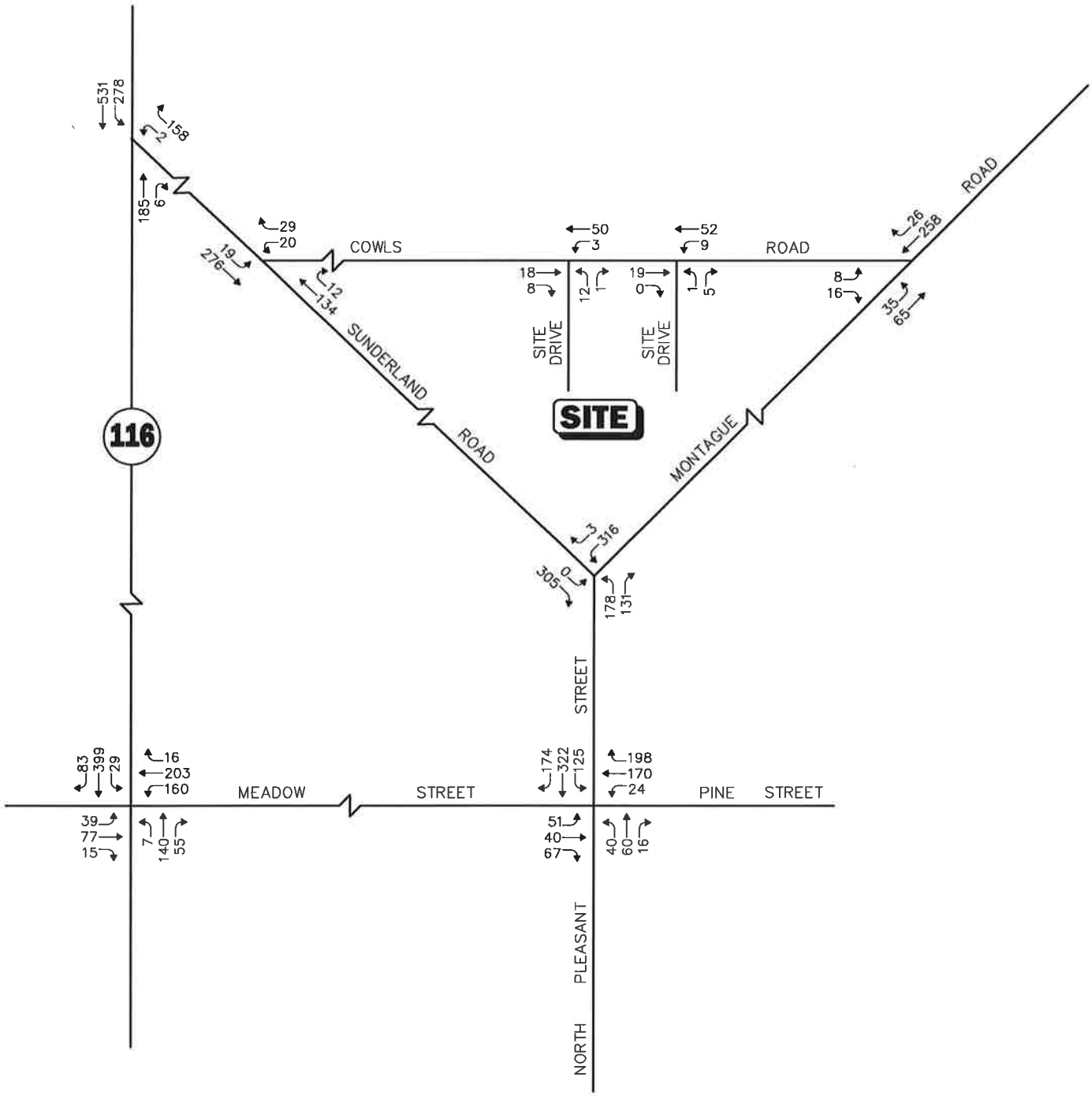

Figure 3

2016 Existing Weekday Morning Peak Hour Traffic Volumes

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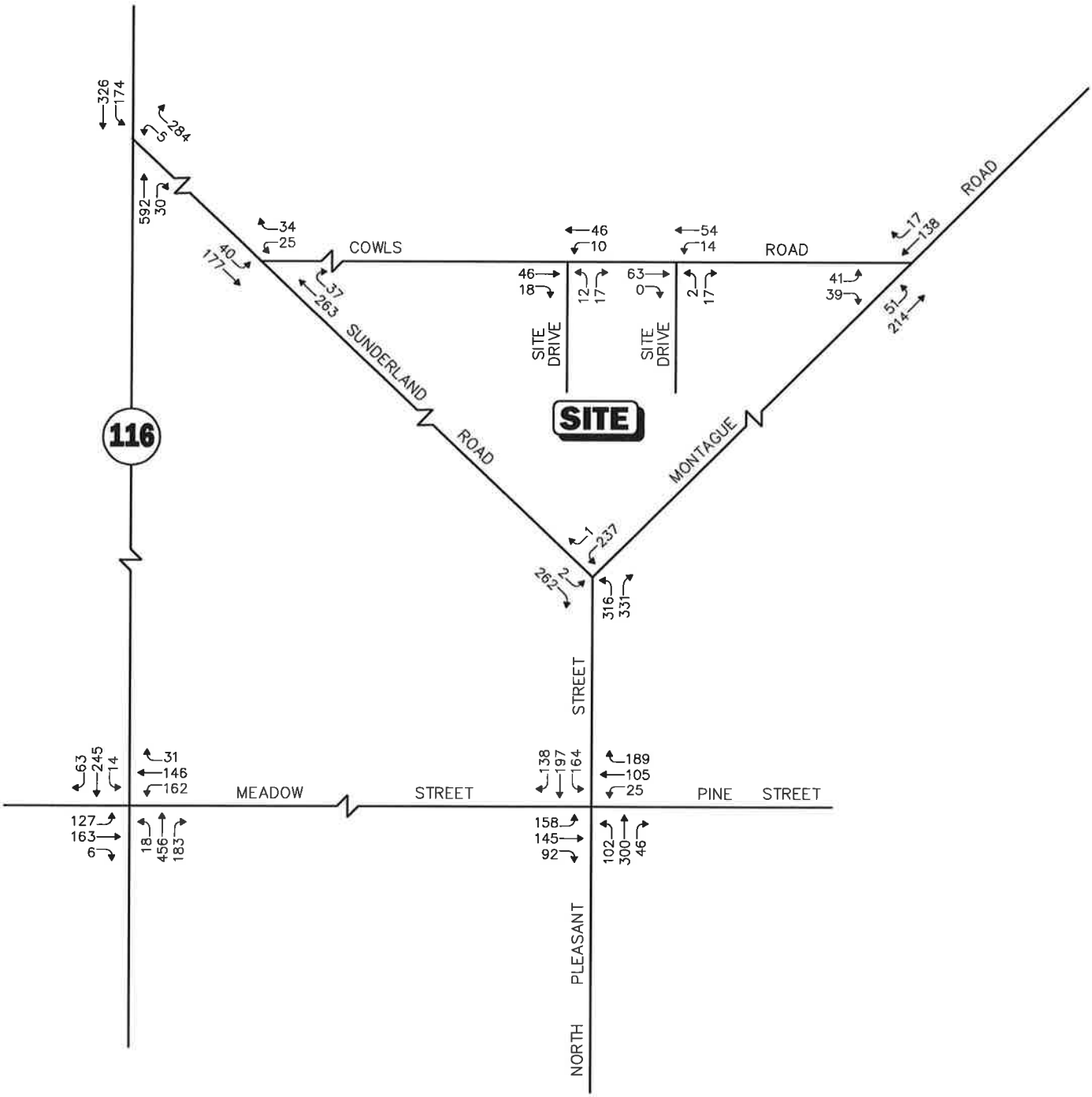

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Figure 4

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2016 Existing Weekday Evening Peak Hour Traffic Volumes

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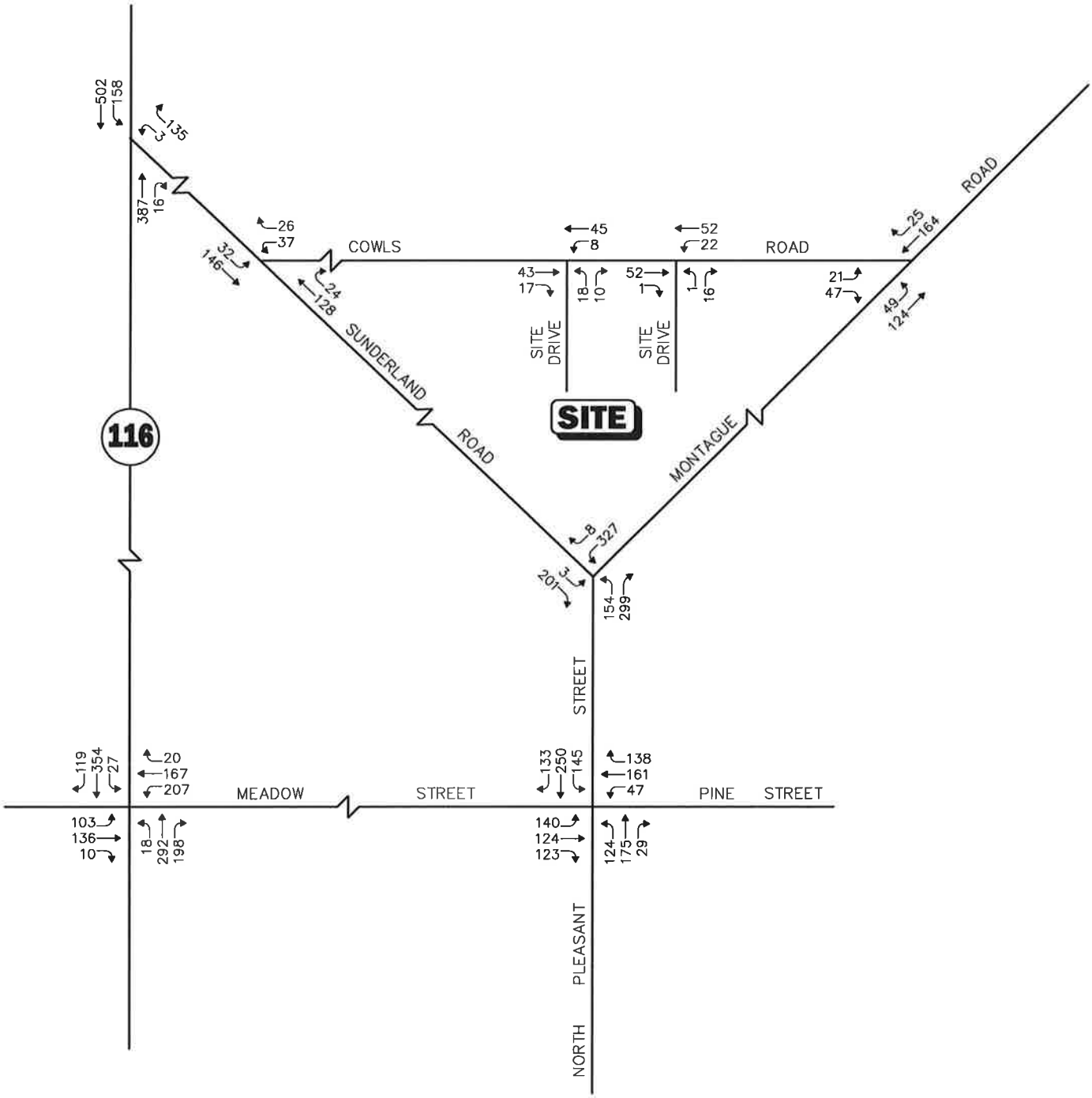

Figure 5

2016 Existing Saturday Midday Peak Hour Traffic Volumes

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Cowls Road in the vicinity of the Project site was found to accommodate approximately 1,300 vehicles on an average weekday (two-way, 24-hour volumes), with approximately 88 vehicles per hour (vph) during the weekday morning peak-hour and 122 vph during the weekday evening peak-hour. During an average Saturday, Cowls Road was found to accommodate 1,000 vehicles, with approximately 123 vph during the Saturday midday peak hour.

PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in September 2016. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. In general, sidewalks are provided along study area roadways, with the exception of Route 116. In general, crosswalks are provided at all signalized intersections, with exception of Meadow Street at Route 116. Formal bicycle facilities were not identified within the study area.

PUBLIC TRANSPORTATION

Public transportation services are provided within the study area by PVTA, the Pioneer Valley Transit Authority. The PVTA operates a fixed-route bus service (Route 33) along Montague Road (Route 63), Cowls Road and Sunderland Road within the study area. The closest regular stop to the Project site is located at The Mill District which is located directly across from the project site. Routes 31 and 46 are also serviced in the vicinity of the project site.

SPOT SPEED MEASUREMENTS

Vehicle travel speed measurements were performed on Montague Road (Route 63) and Cowls Road in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Montague Road (Route 63)		Cowls Road	
	Northbound	Southbound	Eastbound	Westbound
Mean Travel Speed (mph)	36	36	22	22
85th Percentile Speed (mph)	42	41	31	30
Posted Speed Limit (mph)	30	30	N/A	N/A

mph = miles per hour.

As can be seen in Table 3, the mean (average) vehicle travel speed along Montague Road (Route 63) in the vicinity of the Project site was found to be approximately 36 mph in both directions. The average measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be approximately 42 mph in the northbound direction and 41 mph in the southbound direction. The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances, and is often used in establishing posted speed limits. The posted speed limit on Montague Road is 30 mph.

The mean vehicle travel speed along Cowls Road in the vicinity of the Project site was found to be approximately 22 mph in both directions. The average measured 85th percentile vehicle travel speed was found to be approximately 31 mph in the eastbound direction and 30 mph in the westbound direction. There was no posted speed limit in the vicinity of the project site.

MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2009 through 2013, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, and roadway condition, and presented in Table 4.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Meadow St/ North Pleasant St	Meadow St/ Route 116	North Pleasant St/ Sunderland Rd/ Montague Rd (Route 63)	Sunderland Rd/ Route 116	Sunderland Rd/ Cowls Rd	Montague Rd (Route 63)/ Cowls Rd
Traffic Control Type:[b]	TS	TS	U	U	U	U
Year:						
2009	1	1	0	0	0	0
2010	2	7	1	3	0	0
2011	3	2	0	3	0	0
2012	6	2	1	0	0	0
2013	8	0	0	0	0	0
Total	20	12	2	6	0	0
Average	4.00	2.40	0.40	1.20	0.00	0.00
Rate[c]	0.59	0.37	0.09	0.21	0.00	0.00
Significant?[e]	No	No	No	No	No	No
Type:						
Angle	6	6	2	4	0	0
Rear-End	10	4	0	0	0	0
Head-On	0	0	0	0	0	0
Sideswipe	1	2	0	1	0	0
Fixed Object	2	0	0	1	0	0
Pedestrian/Bicycle	0	0	0	0	0	0
Unknown/Other	1	0	0	0	0	0
Total	20	12	2	6	0	0
Roadway Surface:						
Dry	19	11	1	4	0	0
Wet	1	1	1	1	0	0
Ice/Snow	0	0	0	1	0	0
Other	0	0	0	0	0	0
Total	20	12	2	6	0	0
Severity:						
Property Damage Only	15	8	2	6	0	0
Personal Injury	5	4	0	0	0	0
Fatality	0	0	0	0	0	0
Total	20	12	2	6	0	0

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2009 through 2013.
[b]Traffic Control Type: U = unsignalized; TS = traffic signal.
[c]Crash rate per million vehicles entering the intersection.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 2).

As can be seen in Table 4, the study area intersections were found to have experienced an average of four (4) or less reported motor vehicle crash per year over the five-year review period and were found to have a motor vehicle crash rate below both the MassDOT statewide and District averages for a signalized or unsignalized intersection, as appropriate, for the MassDOT Highway Division District in which the intersections are located (District 2).

The North Pleasant Street at Meadow Street and Pine Street intersection was reported to have experienced a total of 20 crashes over the five-year review period, or an average of approximately 4 crashes per year, the majority of which occurred during dry conditions, involved rear-end collisions and resulted in property damage only. It should be noted that the intersection was listed on MassDOT's *HSIP Cluster (2012-2014)*.

No fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2023, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2023 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2023 No-Build traffic volumes reflect 2023 Build traffic volume conditions with the Project.

FUTURE TRAFFIC GROWTH

Future traffic growth is a function of the expected land development in the immediate area and the surrounding region. In order to estimate future traffic conditions, an annual percentage increase in traffic growth was applied to all existing traffic volumes under study. In addition, the location and type of planned development was identified based upon discussions with the Town and also incorporated into the future project. This information is provided in more detail below.

Specific Development by Others

The Town of Amherst Planning Department was contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on this discussion, no developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in the area were reviewed in order to determine general traffic growth trends. Based on a review of this data it was determined that traffic volumes within the Town of Amherst have declined slightly over the past several years. In order to provide a conservative (high) analysis condition, a 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The Amherst Planning Department was contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2023 within the study area. The Town Of Amherst has submitted a MassWorks application in order to further support growth and development in the area. The MassWorks Project includes roadway improvements, pedestrian safety and signal improvements. Specifically, Sunderland Road would be realigned at Montague Road to form a new signalized intersection to be coordinated with the adjacent traffic signal at North Pleasant Street. Construction is expected to be completed by 2018 and a conceptual plan is provided in the appendix.

No-Build Traffic Volumes

The 2023 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2016 Existing peak-hour traffic volumes. The resulting 2023 No-Build weekday morning, weekday evening and Saturday midday peak-hour traffic volumes are shown on Figures 6, 7 and 8, respectively.

PROJECT-GENERATED TRAFFIC

Design year (2023 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of 130 apartment units, 6,000 sf of restaurant and 16,000 sf of retail. Trip-generation statistics published by the ITE[2] for LUC 220 - Apartments; LUC 932 – High Turnover Restaurant; and LUC 826 – Specialty Retail, were used to develop the traffic characteristics of the project. Table 5 summarizes the anticipated traffic characteristics of the Project using the above methodology.

[2]Ibid 1.

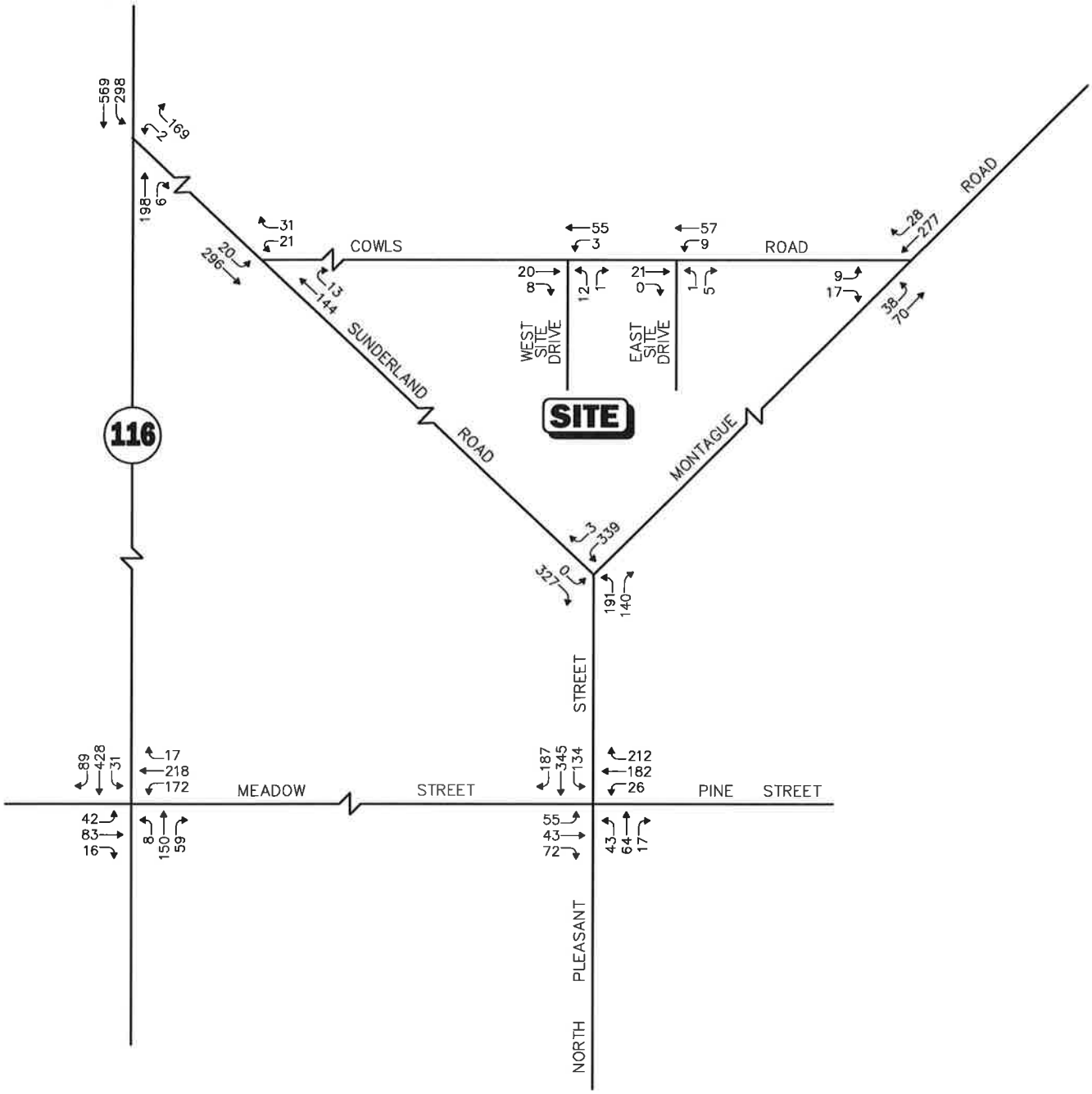

Figure 6

2023 No-Build Weekday Morning Peak Hour Traffic Volumes

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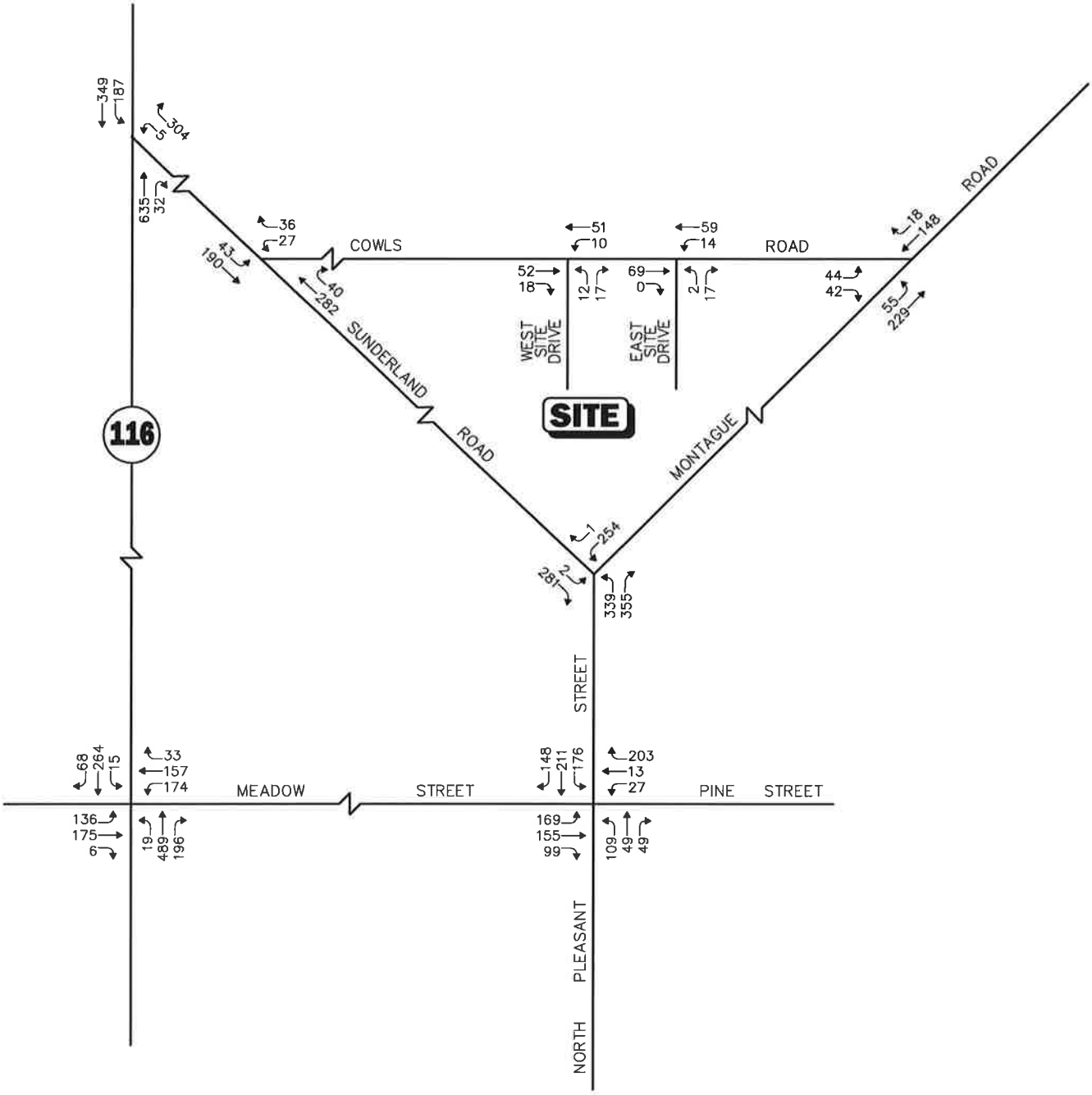

Figure 7

2023 No-Build Weekday Evening Peak Hour Traffic Volumes

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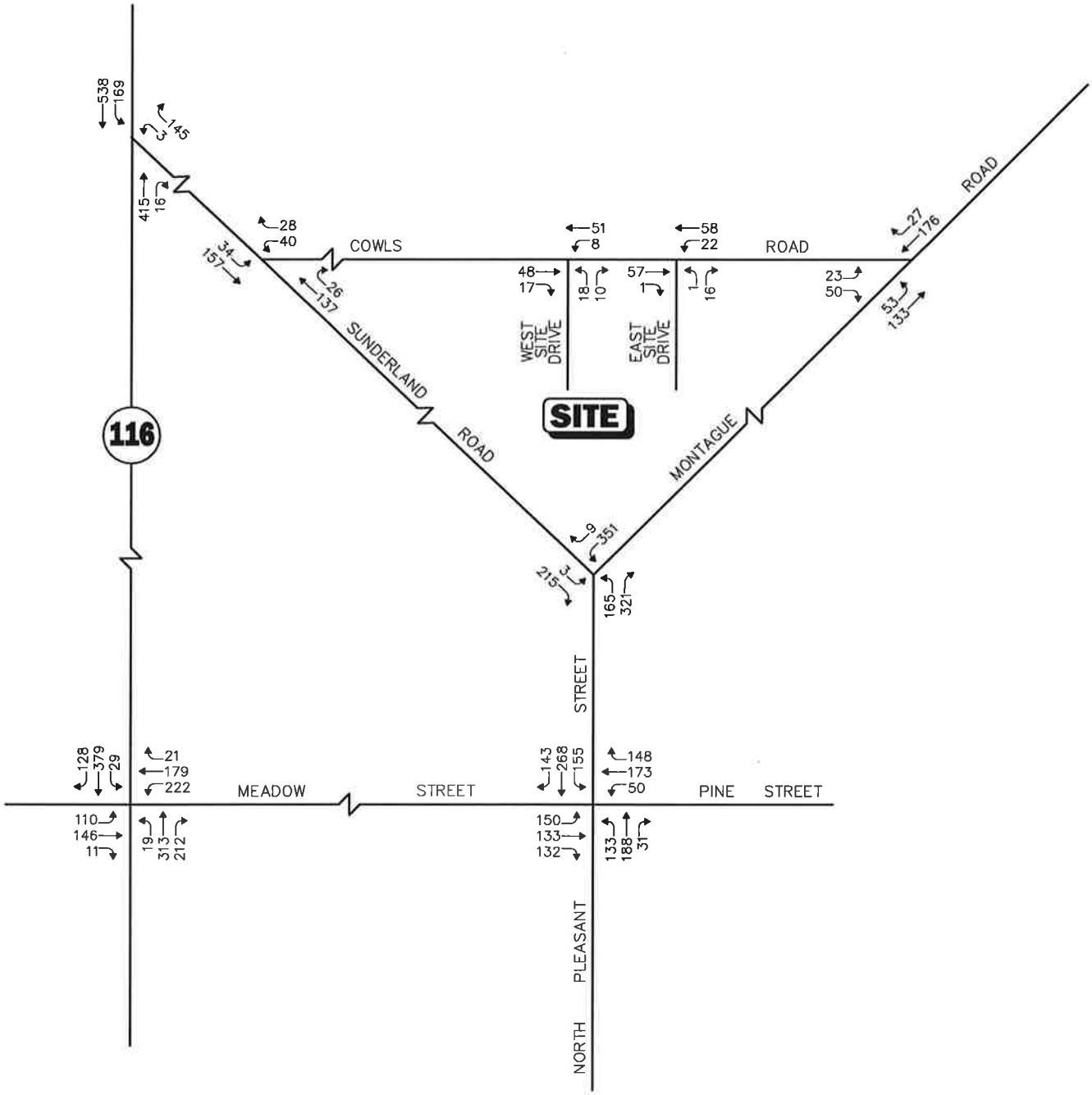

Figure 8

2023 No-Build
Saturday Midday
Peak Hour Traffic Volumes

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TABLE 5
TRIP-GENERATION SUMMARY

Time Period/Direction	Residential 130 units[a]	Restaurant 6,000 sf[b]	Retail 16,000 sf[c]	Total
Weekday Daily	912	762	710	2,384
Weekday Morning Peak Hour:				
Entering	13	36	10	59
Exiting	54	29	6	89
Total	67	65	16	148
Weekday Evening Peak Hour:				
Entering	58	35	26	119
Exiting	31	24	34	89
Total	89	59	60	208
Saturday Daily	832	950	672	2,454
Saturday Midday Peak Hour:				
Entering	36	21	34	91
Exiting	32	20	31	83
Total	68	41	65	174

[a]Based on ITE LUC 220 - Apartment
[b] Based on ITE LUC 932 - High Turnover Restaurant
[c] Based on ITE LUC 826 - Specialty Retail

As can be seen in Table 5, the project is expected to generate approximately 2,384 new vehicle trips on an average weekday (1,192 entering and 1,192 exiting), with approximately 148 new vehicle trips (59 entering and 89 exiting) expected during the weekday morning peak hour and 208 new vehicle trips (119 entering and 89 exiting) during the weekday evening peak hour. During an average Saturday, the project is expected to generate 2,454 new vehicle trips (1,227 entering and 1,227 exiting), with approximately 174 new vehicle trips (91 entering and 83 exiting) during the Saturday midday peak hour.

Trip Distribution and Assignment

The directional distribution of generated trips to and from the Project site was determined based on a review of Journey to Work data and existing travel patterns during the peak periods. The general trip distribution for the Project is graphically depicted on Figure 9 and summarized in Table 6. The additional traffic expected to be generated by the Project was assigned on the study area roadway network as shown on Figures 10, 11 and 12 for the weekday morning, weekday evening and Saturday midday peak hours, respectively.

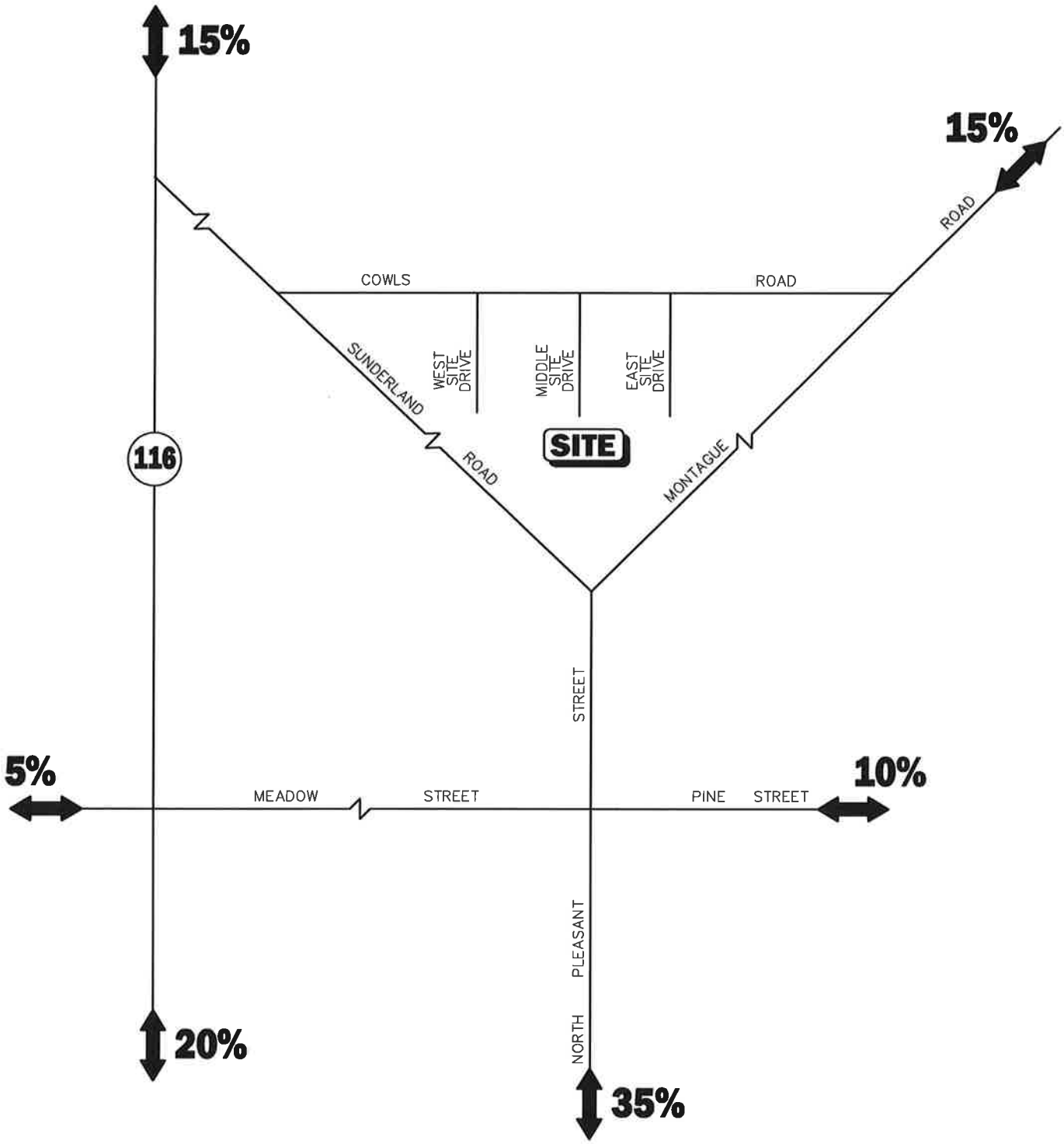

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Figure 9

Trip Distribution Map

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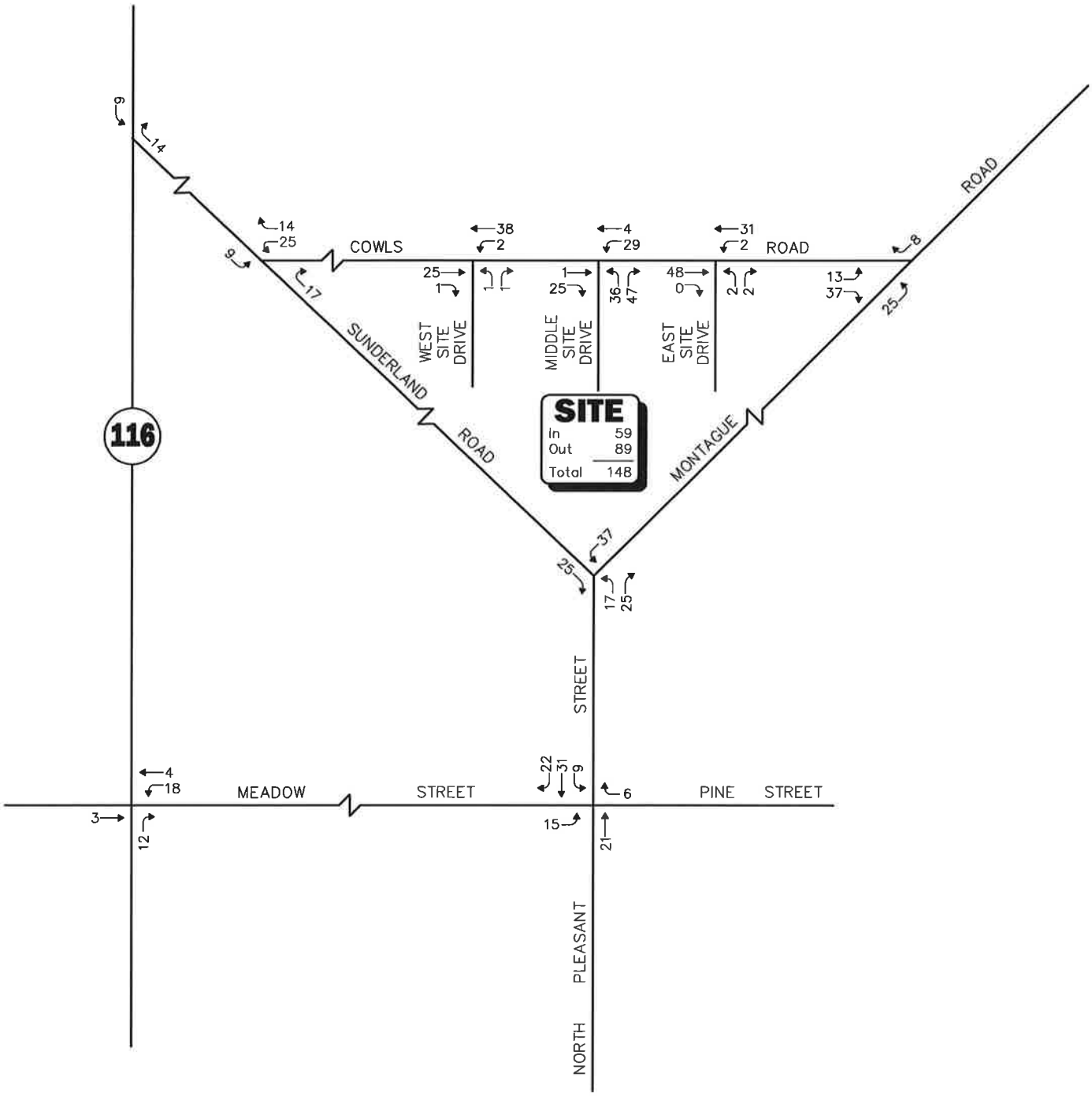

Figure 10

Site Generated Weekday Morning

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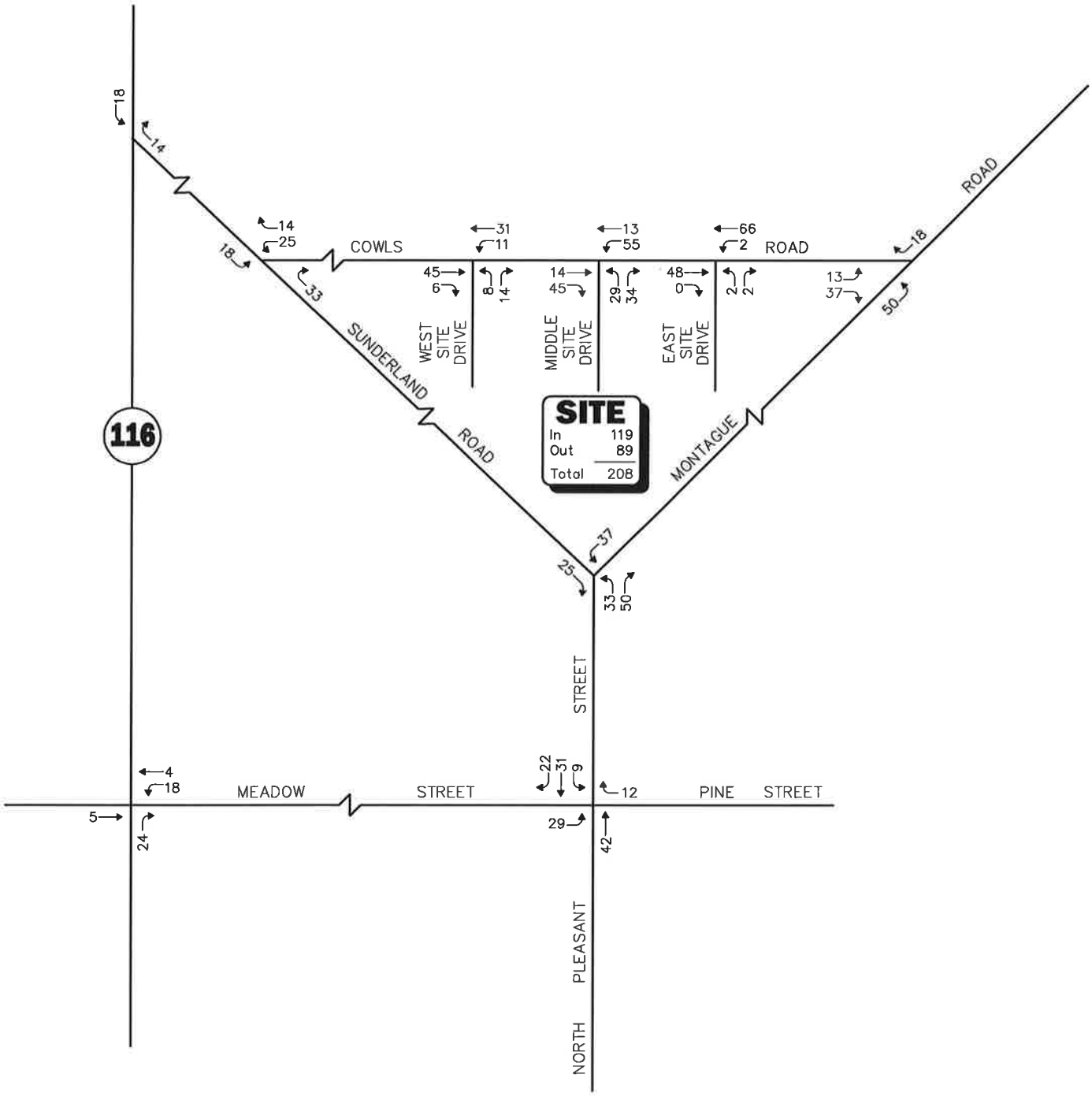

Figure 11

Site Generated
Weekday Evening

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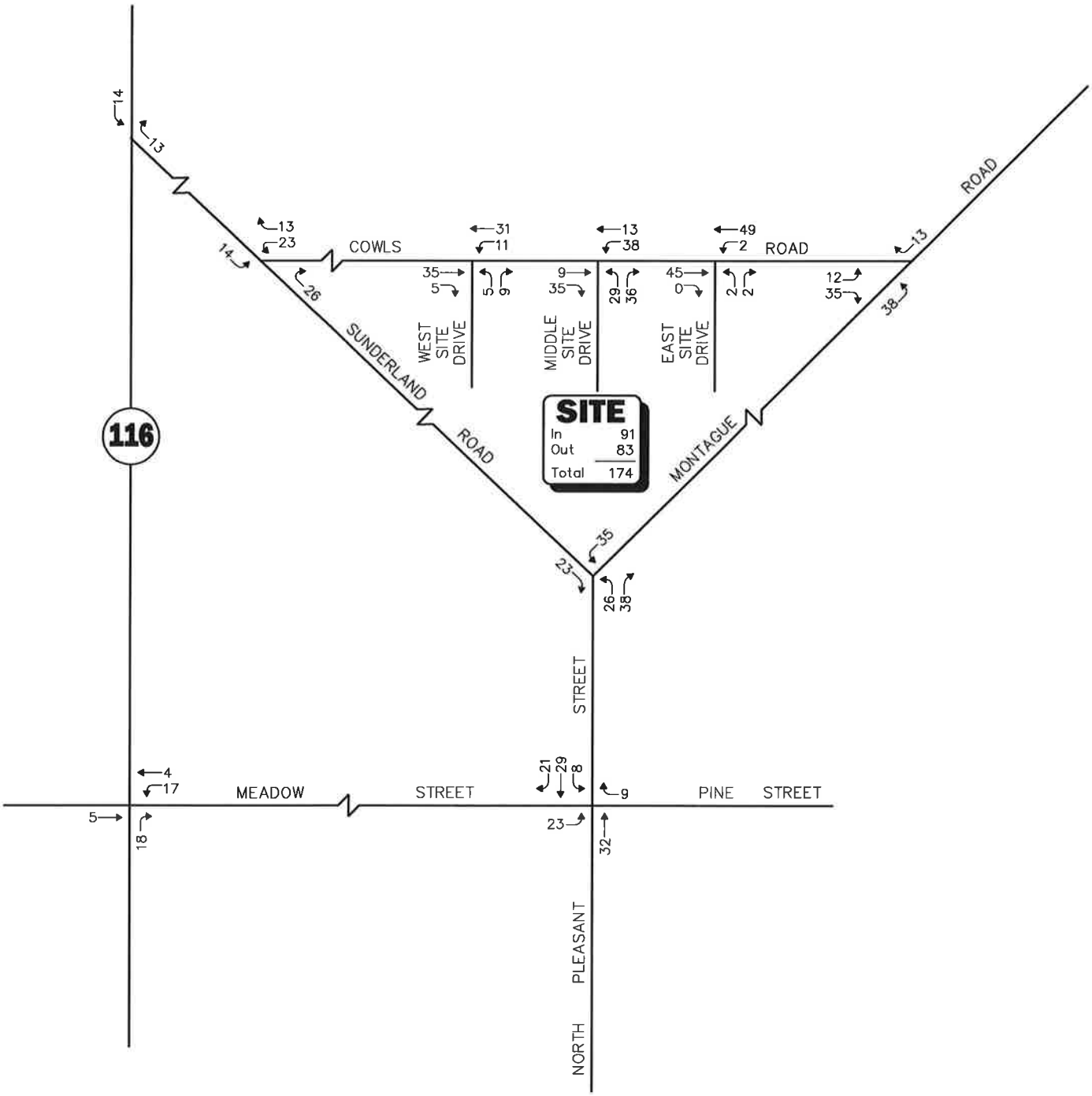

Figure 12

Site Generated
Saturday Midday

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Table 6
TRIP-DISTRIBUTION SUMMARY

Roadway	Direction (to/from)	Percent
North Pleasant Street	South	35%
Route 116	North	20%
Montague Road (Route 63)	Northeast	15%
Route 116	South	15%
Pine Street	Southeast	10%
Meadow Street	Southwest	5%
TOTAL		100%

FUTURE TRAFFIC VOLUMES - BUILD CONDITION

The 2023 Build condition traffic volumes consist of the 2023 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2023 Build weekday morning, weekday evening and Saturday midday peak-hour traffic-volumes are graphically depicted on Figures 13, 14 and 15, respectively.

A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 7. These volumes are based on the expected increases from the Project.

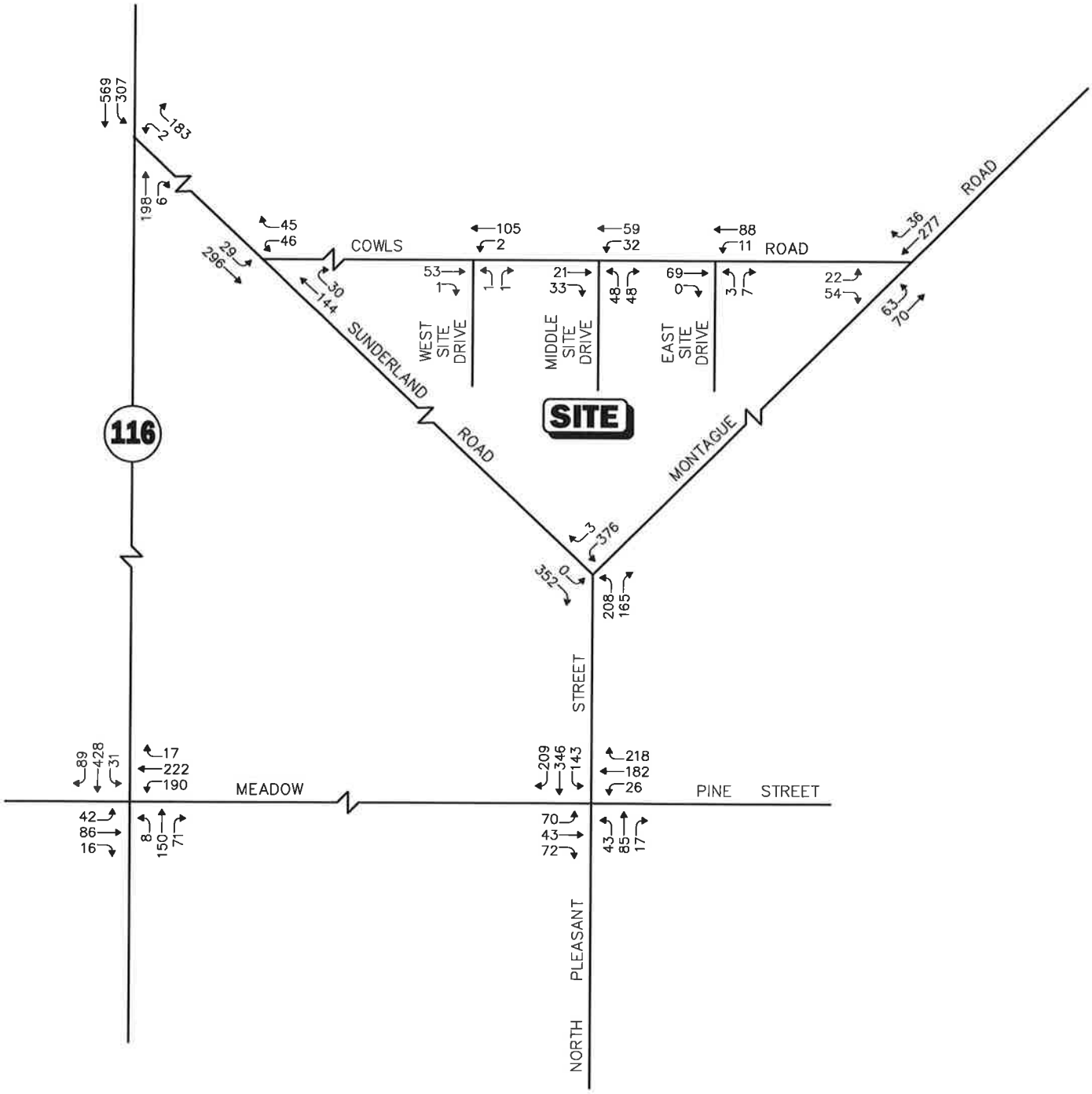

Figure 13

2023 Build
Weekday Morning
Peak Hour Traffic Volumes

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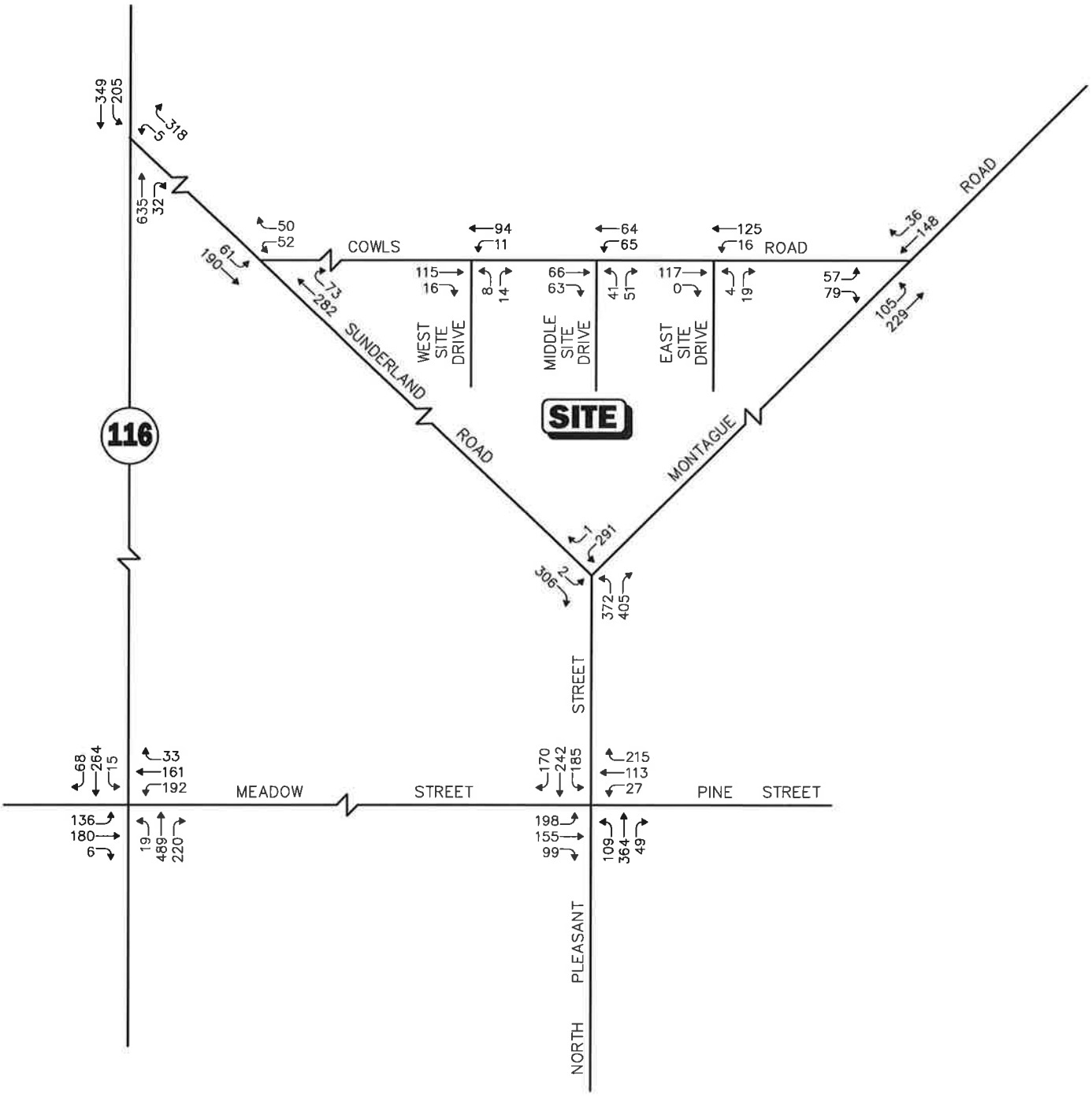

Figure 14

2023 Build
Weekday Evening
Peak Hour Traffic Volumes

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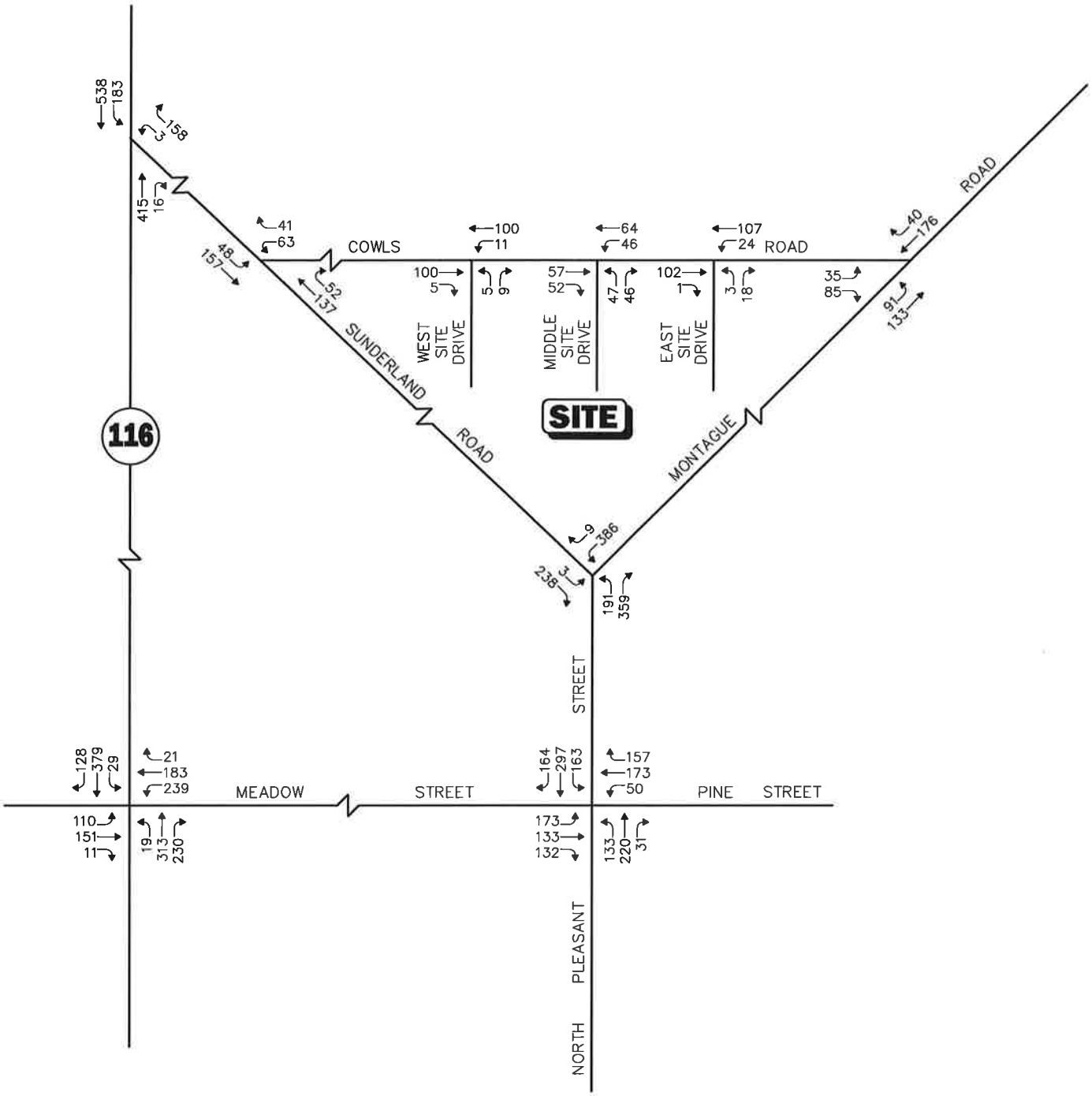

Figure 15

2023 Build
Saturday Midday
Peak Hour Traffic Volumes

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Table 7
PEAK-HOUR TRAFFIC-VOLUME INCREASES

Location/Peak Hour	2023 No-Build	2023 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
Route 116, north of Sunderland Road:				
Weekday Morning	1,234	1,257	23	1.9
Weekday Evening	1,475	1,507	32	2.2
Saturday Midday	1,267	1,294	27	2.1
Montague Road (Route 63), north of Cowls Road:				
Weekday Morning	384	405	21	5.5
Weekday Evening	439	470	31	7.1
Saturday Midday	359	384	25	7.0
Pine Street, east of North Pleasant Street:				
Weekday Morning	614	629	15	2.4
Weekday Evening	723	744	21	2.9
Saturday Midday	690	707	17	2.5
North Pleasant Street, south of Pine Street:				
Weekday Morning	567	619	52	9.2
Weekday Evening	817	890	73	8.9
Saturday Midday	802	863	61	7.6
Meadow Street, west of Route 116:				
Weekday Morning	456	463	7	1.5
Weekday Evening	561	570	9	1.6
Saturday Midday	593	602	9	1.5
Route 116, south of Meadow Street:				
Weekday Morning	833	863	30	3.6
Weekday Evening	1,148	1,190	42	3.7
Saturday Midday	1,156	1,191	35	3.0

As shown in Table 7, Project-related traffic-volume increases external to the study area relative to 2023 No-Build conditions are anticipated to range from 1.5 to 9.2 percent during the peak periods.

TRAFFIC OPERATIONS ANALYSIS

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under Existing, No-Build and Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[3] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

[3]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* Transportation Research Board; Washington, DC; 2010.

Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2000 *Highway Capacity Manual.*[4] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2000 *Highway Capacity Manual.* Table 8 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

Table 8
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[a]

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay
$v/c \leq 1.0$	$v/c > 1.0$	(Seconds Per Vehicle)
A	F	≤10.0
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	>50.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000

[4]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Signalized Intersections

The six levels of service for signalized intersections may be described as follows:

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than LOS A.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of service for signalized intersections are calculated using the operational analysis methodology of the 2000 *Highway Capacity Manual*. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 9 summarizes the relationship between level of service and control delay. The tabulated control delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 9
LEVEL-OF-SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS[a]

Level of Service	Control (Signal) Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000; page 16-2.

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2016 Existing, 2023 No-Build and 2023 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 10 and 11. The detailed analysis results are presented in the Appendix. The following is a summary of the level-of-service and vehicle queue analyses for the intersections within the study area.

Signalized Intersections

Route 116 at Meadow Street

Under Existing and No-Build conditions, this signalized intersection overall operates at LOS B during the weekday morning peak hour, and at LOS C during the weekday evening peak hour and Saturday midday peak hour. Under Build conditions, this signalized intersection overall operates at LOS B during the weekday morning peak hour, at LOS D during the weekday evening peak hour and at LOS C during the Saturday midday peak hour.

Pleasant Street at Meadow Street and Pine Street

Under Existing conditions, this signalized intersection overall operates at LOS C during the weekday morning peak hour, at LOS F during the weekday evening peak hour, and at LOS E during the Saturday midday peak hour. Under No-Build and Build conditions, this signalized intersection operates at LOS C during the weekday morning peak hour and at LOS F during the weekday evening and Saturday midday peak hours.

Unsignalized Intersections

North Pleasant Street at Sunderland Road and Montague Road (Route 63)

Under Existing conditions, the critical movements (all turning movements from Montague Road), operated at LOS D during both the weekday morning and weekday evening peak hours, and at LOS C during the Saturday midday peak hour. Under the No-Build condition, the critical movements operated at LOS E during the weekday morning peak hour and at LOS D during the weekday evening and Saturday midday peak hours. Under the Build condition, the critical movements operated at LOS F during the weekday morning and evening peak hours and at LOS E during the Saturday midday peak hour. Overall, this analysis is very conservative and should delays increase on the Montague Road approach, then site traffic would direct to Sunderland Road as an alternate route.

Montague Road (Route 63) at Cowls Road

Under the all conditions, the critical movements (turns from Cowls Road), operated at LOS B during the weekday morning, weekday evening and Saturday midday peak hours.

Cowls Road at East Site Drive

Under all conditions, the critical movements (all turning movements from Site Drive), operated at LOS A during the weekday morning, weekday evening and Saturday midday peak hours.

Cowls Road at Middle Site Drive

Under Existing and No-Build conditions, the critical movements (all turning movements from Site Drive), operated at LOS A during the weekday morning, weekday evening and Saturday midday peak hours. Under Build conditions, the critical movements operated at LOS A during the weekday morning peak hour and at LOS B during the weekday evening and Saturday midday peak hours.

Cowls Road at West Site Drive

Under the Build condition, the critical movements (all turning movements from Site Drive), operated at LOS A during the weekday morning, weekday evening and Saturday midday peak hours.

Sunderland Road at Cowls Road

Under all conditions, the critical movements (all turning movements from Cowls Road), operate at LOS B during the weekday morning and Saturday midday peak hours. For the weekday evening peak hour, the critical movements operate at LOS B under Existing and No-Build conditions, and at LOS C under Build conditions.

Route 116 at Sunderland Road

Under Existing conditions, the critical movements at this intersection (all turns from Sunderland Road) operates at LOS B during the weekday morning and Saturday midday peak hours, at LOS E during the weekday evening peak hour. Under No-Build and Build conditions, this intersection operates at LOS B during the weekday morning and Saturday midday peak hours and at LOS F during the weekday evening peak hour.

Table 10
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Route 116 at Meadow Street												
Weekday Morning:												
Meadow Street EB LT/TH	0.18	13.8	B	37/71	0.20	14.0	B	40/76	0.22	14.2	B	41/78
Meadow Street EB RT	0.01	8.4	A	0/5	0.01	8.4	A	0/6	0.01	8.4	A	0/6
Meadow Street WB LT/TH	0.59	19.8	B	147/226	0.64	21.1	C	163/248	0.68	22.5	C	176/268
Meadow Street WB RT	0.01	9.9	A	0/5	0.01	9.9	A	0/6	0.01	9.9	A	0/6
Route 116 NB LT	0.03	14.7	B	2/8	0.04	15.0	B	2/8	0.04	15.0	B	2/8
Route 116 NB TH	0.24	16.9	B	58/89	0.25	17.0	B	63/95	0.25	17.0	B	63/95
Route 116 NB RT	0.04	15.1	B	0/13	0.04	15.1	B	0/15	0.05	15.2	B	0/21
Route 116 SB LT	0.08	13.0	B	8/21	0.08	13.0	B	8/22	0.08	13.0	B	8/22
Route 116 SB TH	0.62	22.5	C	135/271	0.67	23.8	C	148/298	0.67	23.8	C	148/298
Route 116 SB RT	0.05	14.5	B	0/28	0.06	14.5	B	0/28	0.06	14.5	B	0/28
Overall	0.59	**18.7**	**B**	--	**0.63**	**19.6**	**B**	--	**0.66**	**20.0**	**B**	--
Weekday Evening:												
Meadow Street EB LT/TH	0.80	31.2	C	151/203	0.92	47.3	D	177/266	0.99	62.0	E	191/282
Meadow Street EB RT	0.00	8.4	A	0/0	0.00	8.4	A	0/0	0.00	8.4	A	0/0
Meadow Street WB LT/TH	0.82	34.1	C	144/276	0.94	52.2	D	169/320	1.04	75.8	E	213/353
Meadow Street WB RT	0.02	9.9	A	1/11	0.03	9.9	A	1/12	0.03	9.9	A	2/12
Route 116 NB LT	0.05	14.2	B	4/15	0.05	14.2	B	5/15	0.05	14.2	B	5/15
Route 116 NB TH	0.61	22.6	C	187/286	0.66	23.7	C	204/311	0.66	23.7	C	204/311
Route 116 NB RT	0.11	15.7	B	0/40	0.12	15.8	B	0/41	0.13	15.9	B	0/43
Route 116 SB LT	0.08	14.3	B	4/163	0.09	14.8	B	4/14	0.09	14.8	B	4/14
Route 116 SB TH	0.38	17.9	B	74/158	0.41	18.4	B	81/171	0.41	18.4	B	81/171
Route 116 SB RT	0.04	14.4	B	0/19	0.04	14.4	B	0/21	0.04	14.4	B	0/21
Overall	0.69	**24.4**	**C**	--	**0.77**	**31.6**	**C**	--	**0.82**	**39.5**	**D**	--
Saturday Midday:												
Meadow Street EB LT/TH	0.59	21.8	C	95/172	0.70	26.9	C	108/224	0.76	30.8	C	114/242
Meadow Street EB RT	0.01	8.4	A	0/3	0.01	8.4	A	0/3	0.01	8.4	A	0/3
Meadow Street WB LT/TH	0.84	33.7	C	187/305	0.94	47.0	D	214/349	1.00	61.9	E	261/378
Meadow Street WB RT	0.01	9.9	A	0/7	0.01	9.9	A	0/8	0.01	9.9	A	0/8
Route 116 NB LT	0.07	14.5	B	5/15	0.07	14.6	B	5/16	0.07	14.6	B	5/16
Route 116 NB TH	0.43	19.1	B	119/182	0.46	19.6	B	129/195	0.46	19.6	B	129/195
Route 116 NB RT	0.13	15.9	B	0/39	0.14	16.0	B	0/40	0.15	16.1	B	0/41
Route 116 SB LT	0.08	13.3	B	7/20	0.09	13.5	B	7/21	0.09	13.5	B	7/21
Route 116 SB TH	0.53	20.3	C	108/225	0.56	21.0	C	118/244	0.56	21.0	C	118/244
Route 116 SB RT	0.07	14.6	B	0/33	0.08	14.7	B	0/34	0.08	14.7	B	0/34
Overall	0.67	**22.3**	**C**	--	**0.74**	**26.5**	**C**	--	**0.77**	**30.9**	**C**	--

See notes at end of table.

Table 10 (Continued)
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2016 Existing				2023 No-Build				2023 Build			
Signalized Intersection/Peak Hour/Movement	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
North Pleasant Street at Meadow Street and Pine Street												
Weekday Morning:												
Meadow Street EB LT/TH/RT	0.63	38.6	D	80/129	0.53	33.7	C	69/141	0.69	42.8	D	84/193
Pine Street WB LT/TH/RT	0.91	54.9	D	241/345	0.84	46.2	D	216/387	0.86	47.6	D	220/395
North Pleasant Street NB LT	0.18	19.0	B	18/38	0.18	19.0	B	17/42	0.20	19.5	B	17/43
North Pleasant Street NB TH	0.11	17.3	B	27/47	0.10	17.2	B	24/51	0.13	17.5	B	32/64
North Pleasant Street NB RT	0.01	16.3	B	0/0	0.01	16.3	B	0/0	0.01	16.3	B	0/0
North Pleasant Street SB LT	0.27	19.6	B	49/92	0.29	19.9	B	53/98	0.32	20.3	C	57/105
North Pleasant Street SB TH	0.48	22.5	C	138/217	0.52	23.2	C	151/234	0.56	24.3	C	169/260
North Pleasant Street SB RT	0.12	17.5	B	0/39	0.13	17.6	B	0/40	0.16	17.9	B	3/46
Overall	**0.52**	**34.0**	**C**	--	**0.51**	**30.1**	**C**	--	**0.54**	**31.6**	**C**	--
Weekday Evening:												
Meadow Street EB LT/TH/RT	1.59	>80.0	F	357/536	1.71	>80.0	F	383/573	1.96	>80.0	F	433/627
Pine Street WB LT/TH/RT	0.63	34.1	C	137/235	0.67	35.5	D	148/251	0.69	36.3	D	153/260
North Pleasant Street NB LT	0.34	21.2	C	50/82	0.32	20.7	C	45/89	0.34	21.4	C	46/91
North Pleasant Street NB TH	0.54	23.5	C	161/208	0.49	22.6	C	145/226	0.56	24.0	C	170/261
North Pleasant Street NB RT	0.04	16.6	B	0/16	0.04	16.5	B	0/19	0.04	16.5	B	0/19
North Pleasant Street SB LT	0.73	39.1	D	89/190	0.68	34.6	C	87/192	0.81	48.2	D	99/227
North Pleasant Street SB TH	0.32	19.8	B	86/136	0.33	19.9	B	88/144	0.37	20.6	C	103/167
North Pleasant Street SB RT	0.11	17.3	B	0/33	0.11	17.3	B	0/37	0.13	17.5	B	0/39
Overall	**0.85**	**>80.0**	**F**	--	**0.87**	**>80.0**	**F**	--	**1.01**	**>80.0**	**F**	--
Saturday Midday:												
Meadow Street EB LT/TH/RT	1.37	>80.0	F	297/477	1.53	>80.0	F	339/525	1.72	>80.0	F	379/569
Pine Street WB LT/TH/RT	0.79	42.4	D	183/330	0.84	46.7	D	197/359	0.85	48.1	D	202/368
North Pleasant Street NB LT	0.43	23.5	C	60/105	0.44	23.8	C	59/115	0.47	25.1	C	60/119
North Pleasant Street NB TH	0.29	19.4	B	79/121	0.29	19.3	B	77/129	0.34	20.0	C	92/151
North Pleasant Street NB RT	0.02	16.4	B	0/7	0.02	16.4	B	0/9	0.02	16.4	B	0/9
North Pleasant Street SB LT	0.41	22.5	C	64/120	0.42	22.8	C	68/126	0.48	24.5	C	73/137
North Pleasant Street SB TH	0.39	20.8	C	110/176	0.41	21.1	C	116/184	0.46	21.9	C	132/206
North Pleasant Street SB RT	0.10	17.2	B	0/36	0.11	17.3	B	0/37	0.12	17.5	B	0/39
Overall	**0.65**	**70.9**	**E**	--	**0.70**	**>80.0**	**F**	--	**0.78**	**>80.0**	**F**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in feet.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 11
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2016 Existing				2023 No-Build				2023 Build			
Unsignalized Intersection/Peak Hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
North Pleasant Street at Montague Road (Route 63) and Sunderland Road												
Weekday Morning:												
Montague Road WB LT/RT	319	27.9	D	6	342	36.9	E	7	379	>50.0	F	11
Sunderland Road SB LT	0	0.0	A	0	0	0.0	A	0	0	0.0	A	0
Weekday Evening:												
Montague Road WB LT/RT	238	25.3	D	4	255	31.5	D	5	292	>50.0	F	8
Sunderland Road SB LT	2	0.1	A	0	2	0.1	A	0	2	0.0	A	0
Saturday Midday:												
Montague Road WB LT/RT	335	21.5	C	5	360	26.0	D	6	395	40.2	E	9
Sunderland Road SB LT	3	0.1	A	0	3	0.1	A	0	3	0.0	A	0
Montague Road (Route 63) and Cowls Road												
Weekday Morning:												
Cowls Road EB LT/RT	24	11.0	B	0	26	10.9	B	0	76	12.6	B	1
Montague Road NB LT	35	3.1	A	0	38	3.1	A	0	63	4.3	A	0
Weekday Evening:												
Cowls Road EB LT/RT	80	11.6	B	1	86	12.0	B	1	136	13.7	B	1
Montague Road NB LT	51	1.8	A	0	55	1.8	A	0	105	3.0	A	0
Saturday Midday:												
Cowls Road EB LT/RT	68	10.6	B	1	73	10.9	B	1	120	12.1	B	1
Montague Road NB LT	49	2.4	A	0	53	2.5	A	0	91	3.6	A	0
Cowls Road at East Site Drive												
Weekday Morning:												
Cowls Road WB LT	9	1.1	A	0	9	1.0	A	0	11	0.9	A	0
Site Drive NB LT/RT	6	8.6	A	0	6	8.6	A	0	10	9.1	A	0
Weekday Evening:												
Cowls Road WB LT	14	1.6	A	0	14	1.5	A	0	16	0.9	A	0
Site Drive NB LT/RT	19	8.8	A	0	19	8.9	A	0	23	9.3	A	0
Saturday Midday:												
Cowls Road WB LT	22	2.3	A	0	22	2.2	A	0	24	1.5	A	0
Site Drive NB LT/RT	17	8.8	A	0	17	8.8	A	0	21	9.4	A	0
Cowls Road at Middle Site Drive												
Weekday Morning:												
Cowls Road WB LT	3	0.4	A	0	3	0.4	A	0	32	2.7	A	0
Site Drive NB LT/RT	13	9.0	A	0	13	9.0	A	0	96	9.6	A	1
Weekday Evening:												
Cowls Road WB LT	10	1.4	A	0	10	1.3	A	0	65	4.1	A	0
Site Drive NB LT/RT	29	9.1	A	0	29	9.1	A	0	92	10.5	B	1
Saturday Midday:												
Cowls Road WB LT	8	1.2	A	0	8	1.0	A	0	46	3.4	A	0
Site Drive NB LT/RT	28	9.2	A	0	28	9.3	A	0	93	10.3	B	1

See notes at end of table.

Table 11
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2016 Existing				2023 No-Build				2023 Build			
Unsignalized Intersection/Peak Hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Cowls Road at West Site Drive												
Weekday Morning:												
Cowls Road WB LT	--	--	--	--	--	--	--	--	2	0.1	A	0
Site Drive NB LT/RT	--	--	--	--	--	--	--	--	2	9.1	A	0
Weekday Evening:												
Cowls Road WB LT	--	--	--	--	--	--	--	--	11	0.9	A	0
Site Drive NB LT/RT	--	--	--	--	--	--	--	--	22	9.5	A	0
Saturday Midday:												
Cowls Road WB LT	--	--	--	--	--	--	--	--	11	0.8	A	0
Site Drive NB LT/RT	--	--	--	--	--	--	--	--	14	9.5	A	0
Sunderland Road and Cowls Road												
Weekday Morning:												
Cowls Road WB LT/RT	49	11.0	B	0	52	11.3	B	0	91	12.8	B	1
Sunderland Road SB LT	19	0.6	A	0	20	0.6	A	0	29	0.9	A	0
Weekday Evening:												
Cowls Road WB LT/RT	59	12.7	B	1	63	13.3	B	1	102	15.8	C	1
Sunderland Road SB LT	40	1.8	A	0	43	1.9	A	0	61	2.5	A	0
Saturday Midday:												
Cowls Road WB LT/RT	63	11.3	B	1	68	11.6	B	1	104	13.0	B	1
Sunderland Road SB LT	32	1.6	A	0	34	1.6	A	0	48	2.1	A	0
Route 116 at Sunderland Road												
Weekday Morning:												
Sunderland Road WB LT/RT	160	11.6	B	1	171	12.0	B	1	185	12.2	B	1
Route 116 SB LT	278	8.5	A	1	298	8.7	A	1	307	8.7	A	1
Weekday Evening:												
Sunderland Road WB LT/RT	289	48.7	E	8	309	77.2	F	11	323	>80.0	F	13
Route 116 SB LT	174	10.4	B	1	187	10.9	B	1	205	11.1	B	1
Saturday Midday:												
Sunderland Road WB LT/RT	138	13.4	B	1	148	14.2	B	1	161	14.5	B	1
Route 116 SB LT	158	8.8	A	1	169	8.8	A	1	183	9.0	A	1

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level-of-Service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; SEB = southeastbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

POTENTIAL ROADWAY REALIGNMENT

As requested by the Town of Amherst, the concept of a roadway realignment of the Montague Road (Route 63) at Sunderland Road and North Pleasant Street was analyzed. The intersection of Montague Road (Route 63) at Sunderland Road would be realigned to form a signalized intersection, where Sunderland Road becomes a perpendicular side road to Montague Road (Route 63). Table 12 summarizes the results of the intersection capacity analysis and vehicle queue analysis for this concept under 2023 Build conditions. The concept plan, vehicle networks and capacity analysis results are provided in the Appendix.

TABLE 12
POTENTIAL ROADWAY REALIGNMENT INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2023 Build			
Signalized Intersection/Peak Hour/Movement	V/C	Delay	LOS	Queue 50th/95th
Montague Road (Route 63) at Sunderland Road				
Weekday Morning:	0.23	13.4	B	0/41
Montague Road EB LT/RT	0.39	5.9	A	15/66
Montague Road NB LT	0.16	3.6	A	10/39
Montague Road NB TH	0.36	4.7	A	28/90
Montague Road SB TH/RT	0.35	**7.5**	**A**	--
Overall				
Weekday Evening:	0.21	13.7	B	0/42
Montague Road EB LT/RT	0.62	9.0	A	34/182
Montague Road NB LT	0.38	4.8	A	30/98
Montague Road NB TH	0.27	4.1	A	20/67
Montague Road SB TH/RT	0.52	**7.8**	**A**	--
Overall				
Saturday Midday:	0.17	14.5	B	1/38
Montague Road EB LT/RT	0.34	4.7	A	14/58
Montague Road NB LT	0.32	3.8	A	26/84
Montague Road NB TH	0.35	4.0	A	29/93
Montague Road SB TH/RT	0.32	**6.2**	**A**	--
Overall				

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in vehicles.

As can be seen in Table 12, under Build conditions, this signalized intersection overall operates at LOS A during the weekday morning, weekday evening and Saturday midday peak hours.

OPTIMIZED SIGNAL TIMINGS

Level-of-service and vehicle queue analyses were conducted for 2023 No-Build and 2023 Build conditions for the signalized intersections of North Pleasant Street at Meadow Street and Pine Street and at Route 116 at Meadow Street with optimized signal timings. The results of the revised intersection capacity and vehicle queue analyses are summarized in Table 13. The detailed analysis results are presented in the Appendix.

Table 13
OPTIMIZED SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/ Peak Hour/Movement	2023 No-Build				2023 Build				2023 Build Optimized Timing			
	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
North Pleasant Street at Meadow Street and Pine Street												
Weekday Morning:												
Meadow Street EB LT/TH/RT	0.53	33.7	C	69/141	0.69	42.8	D	84/193	0.38	25.8	C	88/153
Pine Street WB LT/TH/RT	0.84	46.2	D	216/387	0.86	47.6	D	220/395	0.60	30.2	C	242/355
North Pleasant Street NB LT	0.18	19.0	B	17/42	0.20	19.5	B	17/43	0.29	33.2	C	26/62
North Pleasant Street NB TH	0.10	17.2	B	24/51	0.13	17.5	B	32/64	0.16	28.0	C	49/89
North Pleasant Street NB RT	0.01	16.3	B	0/0	0.01	16.3	B	0/0	0.01	26.2	C	0/3
North Pleasant Street SB LT	0.29	19.9	B	53/98	0.32	20.3	C	57/105	0.37	32.4	C	86/147
North Pleasant Street SB TH	0.52	23.2	C	151/234	0.56	24.3	C	169/260	0.66	39.2	D	257/369
North Pleasant Street SB RT	0.13	17.6	B	0/40	0.16	17.9	B	3/46	0.25	29.7	C	41/105
Overall	**0.51**	**30.1**	**C**	--	**0.54**	**31.6**	**C**	--	**0.53**	**31.9**	**C**	--
Weekday Evening:												
Meadow Street EB LT/TH/RT	1.71	>80.0	F	383/573	1.96	>80.0	F	433/627	0.98	74.6	E	456/710
Pine Street WB LT/TH/RT	0.67	35.5	D	148/251	0.69	36.3	D	153/260	0.46	29.1	C	210/306
North Pleasant Street NB LT	0.32	20.7	C	45/89	0.34	21.4	C	46/91	0.42	40.0	D	86/150
North Pleasant Street NB TH	0.49	22.6	C	145/226	0.56	24.0	C	170/261	0.61	43.0	D	315/431
North Pleasant Street NB RT	0.04	16.5	B	0/19	0.04	16.5	B	0/19	0.06	31.0	C	14/45
North Pleasant Street SB LT	0.68	34.6	C	87/192	0.81	48.2	D	99/227	1.07	>80.0	F	217/385
North Pleasant Street SB TH	0.33	19.9	B	88/144	0.37	20.6	C	103/167	0.41	37.3	D	191/275
North Pleasant Street SB RT	0.11	17.3	B	0/37	0.13	17.5	B	0/39	0.17	32.8	C	23/81
Overall	**0.87**	**>80.0**	**F**	--	**1.01**	**>80.0**	**F**	--	**0.90**	**54.4**	**D**	--
Saturday Midday:												
Meadow Street EB LT/TH/RT	1.53	>80.0	F	339/525	1.72	>80.0	F	379/569	0.86	51.5	D	381/604
Pine Street WB LT/TH/RT	0.84	46.7	D	197/359	0.85	48.1	D	202/368	0.53	30.4	C	259/365
North Pleasant Street NB LT	0.44	23.8	C	59/115	0.47	25.1	C	60/119	0.67	57.1	E	121/213
North Pleasant Street NB TH	0.29	19.3	B	77/129	0.34	20.0	C	92/151	0.40	39.7	D	179/260
North Pleasant Street NB RT	0.02	16.4	B	0/9	0.02	16.4	B	0/9	0.02	33.0	C	0/25
North Pleasant Street SB LT	0.42	22.8	C	68/126	0.48	24.5	C	73/137	0.64	52.5	D	146/241
North Pleasant Street SB TH	0.41	21.1	C	116/184	0.46	21.9	C	132/206	0.54	43.4	D	255/357
North Pleasant Street SB RT	0.11	17.3	B	0/37	0.12	17.5	B	0/39	0.21	36.2	D	45/108
Overall	**0.70**	**>80.0**	**F**	--	**0.78**	**>80.0**	**F**	--	**0.68**	**43.1**	**D**	--

See notes at end of table.

Table 13 (Continued)
MITIGATED SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/ Peak Hour/Movement	2023 No-Build				2023 Build				2023 Build Optimized Timing			
	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Route 116 at Meadow Street												
Weekday Evening:												
Meadow Street EB LT/TH	0.92	47.3	D	177/266	0.99	62.0	E	191/282	0.93	47.1	D	174/270
Meadow Street EB RT	0.00	8.4	A	0/0	0.00	8.4	A	0/0	0.00	7.6	A	0/0
Meadow Street WB LT/TH	0.94	52.2	D	169/320	1.04	75.8	E	213/353	0.98	59.4	E	180/341
Meadow Street WB RT	0.03	9.9	A	1/12	0.03	9.9	A	2/12	0.03	9.1	A	1/11
Route 116 NB LT	0.05	14.2	B	5/15	0.05	14.2	B	5/15	0.05	14.7	B	5/15
Route 116 NB TH	0.66	23.7	C	204/311	0.66	23.7	C	204/311	0.70	25.5	C	204/323
Route 116 NB RT	0.12	15.8	B	0/41	0.13	15.9	B	0/43	0.13	16.5	B	0/45
Route 116 SB LT	0.09	14.8	B	4/14	0.09	14.8	B	4/14	0.10	15.2	B	4/14
Route 116 SB TH	0.41	18.4	B	81/171	0.41	18.4	B	81/171	0.43	19.2	B	81/175
Route 116 SB RT	0.04	14.4	B	0/21	0.04	14.4	B	0/21	0.04	14.9	B	0/22
Overall	**0.77**	**31.6**	**C**	--	**0.82**	**39.5**	**D**	--	**0.81**	**33.8**	**C**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in feet.

Optimized Timing

Pleasant Street at Meadow Street and Pine Street

With optimized timings, this signalized intersection operates at LOS C during the weekday morning peak hour and at LOS D during the weekday evening and Saturday midday peak hours.

Route 116 at Meadow Street

With Build optimized timings, this signalized intersection overall operates at LOS C during the weekday evening peak hour.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of 130 apartment units, 6,000 sf of restaurant/small café – food service, and 16,000 sf of retail to be located on Cowls Road in Amherst, Massachusetts (hereafter referred to as the "Project"). This assessment was prepared in consultation with the Town of Amherst and the Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*; and was conducted pursuant to the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports. Based on this assessment, we have concluded the following with respect to the Project:

5. The project is expected to generate 2,384 new vehicle trips on an average weekday (1,192 entering and 1,192 exiting), with approximately 148 new vehicle trips (59 entering and 89 exiting) expected during the weekday morning peak hour and 208 new vehicle trips (119 entering and 89 exiting) during the weekday evening peak hour. During an average Saturday, the project is expected to generate 2,454 new vehicle trips (1,227 entering and 1,227 exiting), with approximately 174 new vehicle trips (91 entering and 83 exiting) during the Saturday midday peak hour.

6. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing along the area roadways, including but not limited to Cowls Road, Sunderland Road, Montague Road (Route 63) and North Pleasant Street.

7. No apparent safety deficiencies are expected at the study intersections.

8. The project will be primarily served by two full-access driveways on Cowls Road, with the western drive providing access for the residential use and the central drive providing access for both the commercial and residential uses. In addition, there is a site drive at Atkins Farm (the east drive), which is not formerly part of the project.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

Project Access

Access to the project will be primarily served by two full-access driveways on Cowls Road (the Middle and West Site Drives). In addition, there is a site drive at Atkins Farm (the East Site Drive), which is not formerly part of the project.

- The Cowls Road proposed West Site Drive should be a minimum of 24-feet in width and accommodate two-way traffic.
- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site shall conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[5]
- Wheelchair ramps should be provided for crossing the Project site driveways where a sidewalk is present.
- Signs and landscaping to be installed along the Project site driveways should be designed and maintained so as not to restrict lines of sight.

All of the above recommendations are incorporated into the final design plans.

Roadways

Independent of the proposed project the signal timings at the intersections of North Pleasant Street at Meadow Street and Pine Street and Route 116 at Meadow Street should be periodically optimized.

Transportation Demand Management

The Project site is ideally situated to take advantage of available public transportation opportunities in the area, including bus service along Montague Road (Route 63), Cowls Road and Sunderland Road. In an effort to the encourage use of alternative modes of transportation to single-occupant

[5] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

vehicles, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location;
- A packet will be provided to new residents of the Project detailing available public transportation services, bicycle and walking alternatives.
- Pedestrian accommodations will be incorporated within the Project site; and
- Secure bicycle parking for residents will be provided, including both an exterior bicycle rack and weather protected bicycle parking in a secure area.

All of the above recommendations are incorporated into the design plans.

With implementation of the above recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

Appendix C

Traffic Volume Calculations

Growth Rate Calculations

	2010	2013	Growth	2017	Growth	2010 to 2017 Growth	
AM TMC	1224	1216	-0.22%	1278	1.25%	0.62%	Use 1%
PM TMC	1549	1619	1.48%	1590	-0.45%	0.37%	

ATR Growth Data

Location	2007	2008	2009	2010	2011	Growth
2112	9113		8663		8619	-1.38%
2100	2205		1836	2103	1969	-2.60%
2122	8060	7003	7134	7110	7203	-2.57%
2110	10510	9703	9314	9039	9563	-2.21%
2111	2849	2913	3048	4445	3349	7.01%
2114	11520		9806		10953	-1.03%
2113	2085		2109		2391	3.52%
2099		2772		3028		4.52%
2109	4188		3576		3797	-2.28%

Location	2005	2006	2007	2008	2009	Growth
2112	8995		9113		8663	-0.92%
2100	2140	2006	2205		1836	-1.27%
2122	8867	7311	8060	7003	7134	-4.64%
2110	10206	9385	10510	9703	9314	-1.94%
2111	3041	2884	2849	2913	3048	0.13%
2114	10324		11520		9806	-1.05%
2113	2190		2085		2109	-0.93%
2099		2780		2772		-0.14%
2109	4340		4188		3576	-4.68%

		2017 AM	2018 AM	2018 AM Balanced	2038 AM no-build	2038 AM including dev	2038 AM incl. dev Balanced	2017 PM	2018 PM	2018 PM Balanced	2038 PM no-build	2038 PM including dev	2038 PM incl. dev Balanced	2013 Sat	2018 Sat	2018 Sat Balanced	2038 Sat no-build	2038 Sat including dev	2038 Sat incl. dev Balanced
North Pleasant Street	Left	43	43	43	53	53	53	189	191	191	233	233	233	76	80	80	97	97	97
	Thru	79	80	91	111	132	133	161	163	279	340	382	388	170	179	179	218	250	255
	Right	15	15	15	18	18	18	120	121	121	148	148	148	20	21	21	26	26	26
Meadow Street	Left	61	62	70	85	100	101	26	26	146	179	208	210	143	150	150	183	206	210
	Thru	88	89	89	108	108	108	113	114	114	139	139	139	111	117	117	142	142	142
	Right	57	58	58	70	70	70	152	154	154	187	187	187	75	79	79	96	96	96
NORTH	Left	124	125	134	164	173	173	87	88	96	117	126	126	136	143	143	174	182	182
	Thru	346	349	375	458	495	495	297	300	329	401	432	433	166	174	174	212	241	241
	Right	113	114	122	149	171	171	39	39	43	52	74	74	117	123	123	150	171	171
Pine Street	Left	47	47	47	58	58	58	149	150	150	184	184	184	33	35	35	42	42	42
	Thru	134	135	135	165	165	165	142	143	143	175	175	175	148	156	156	190	190	190
	Right	161	163	184	224	230	232	77	78	175	214	226	229	176	185	185	226	235	238
Sunderland Road	Thru	318	321	321	392	417	420	238	240	240	293	318	318	184	193	193	235	258	258
	Left	2	2	2	2	2	3	5	5	5	6	6	6	3	3	3	4	4	4
Montague Road	Right	8	8	8	10	10	10	10	10	10	12	12	12	6	6	6	8	8	8
	Left	307	310	310	378	415	419	226	228	228	278	315	315	235	247	247	301	336	336
North Pleasant Street	Right	156	158	158	193	218	221	356	360	360	439	489	501	310	326	326	398	436	447
	Thru	185	187	187	228	245	245	238	240	240	293	326	326	179	188	188	230	256	256
Montague Road (SOUTH)	Thru		98	98	120	145	147		286	286	349	399	411		250	250	305	343	355
	Right	62	62	62	76	76	76	79	79	79	96	96	96	79	79	79	96	96	96
South Plaza Drive	Left	1	1	1	1	1	1	5	5	5	5	5	5	5	5	5	5	5	5
	Right	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Montague Road (NORTH)	Thru		317	317	387	424	428		233	233	284	321	322		248	248	303	338	339
	Left	11	11	11	13	13	13	9	9	9	11	11	11	9	9	9	11	11	11
Montague Road (SOUTH)	Thru	98	99	99	121	146	146	269	272	287	350	400	400	269	272	251	306	344	344
	Right	2	2	2	2	2	2	10	10	10	12	12	12	10	10	10	12	12	12
North Plaza Drive	Left	70	70	70	70	70	70	62	62	62	62	62	62	62	62	62	62	62	62
	Right	27	27	27	27	27	27	36	36	36	36	36	36	36	36	36	36	36	36
Montague Road (NORTH)	Thru	241	243	258	315	352	371	168	170	180	219	256	271	168	170	180	219	254	288
	Left	23	23	23	28	28	28	11	11	11	13	13	13	11	11	11	13	13	13

Appendix D

Traffic Volume Schematics

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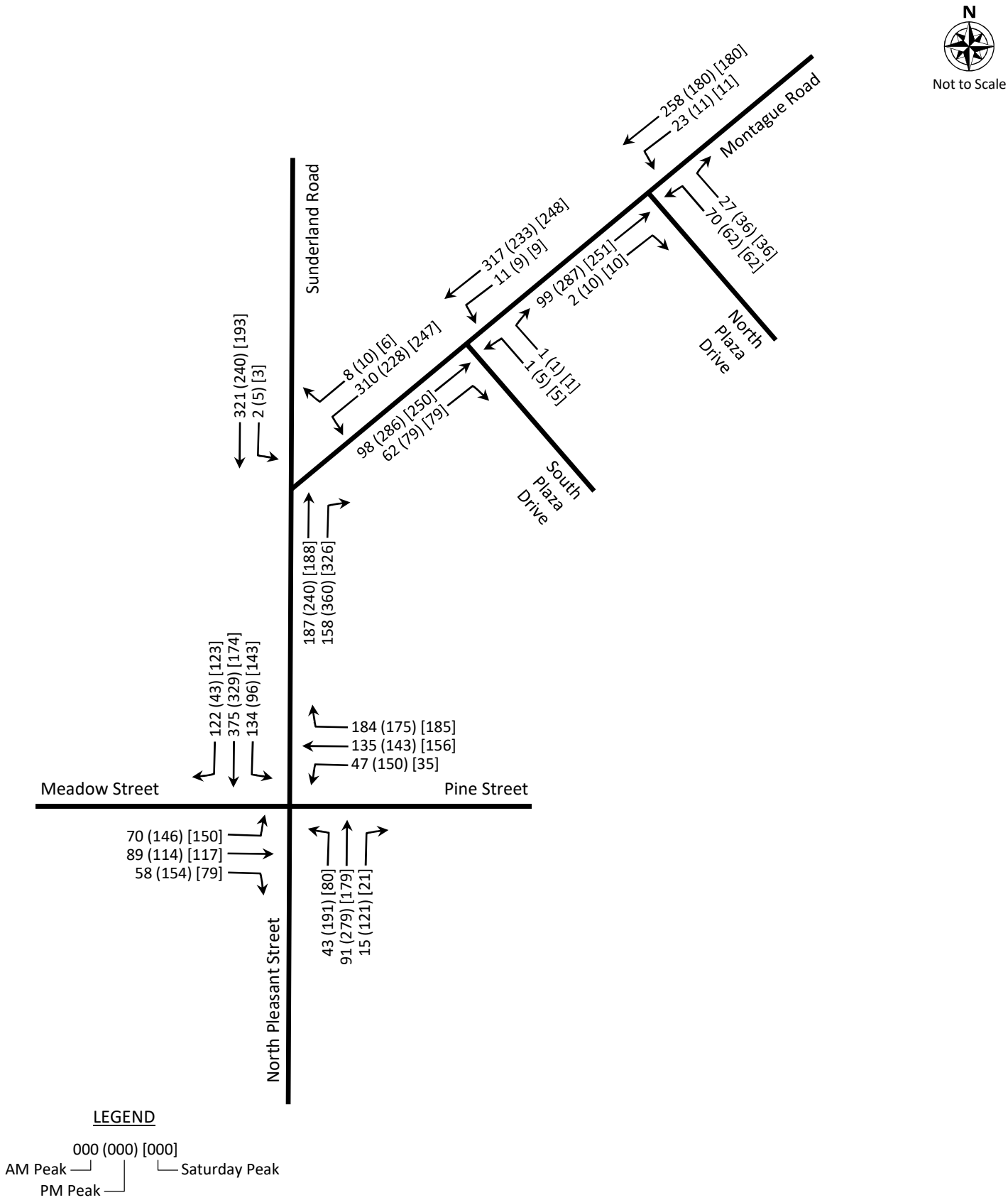
STUDY AREA

FIGURE 1



EXISTING CONDITIONS PEAK HOUR TRAFFIC VOLUMES

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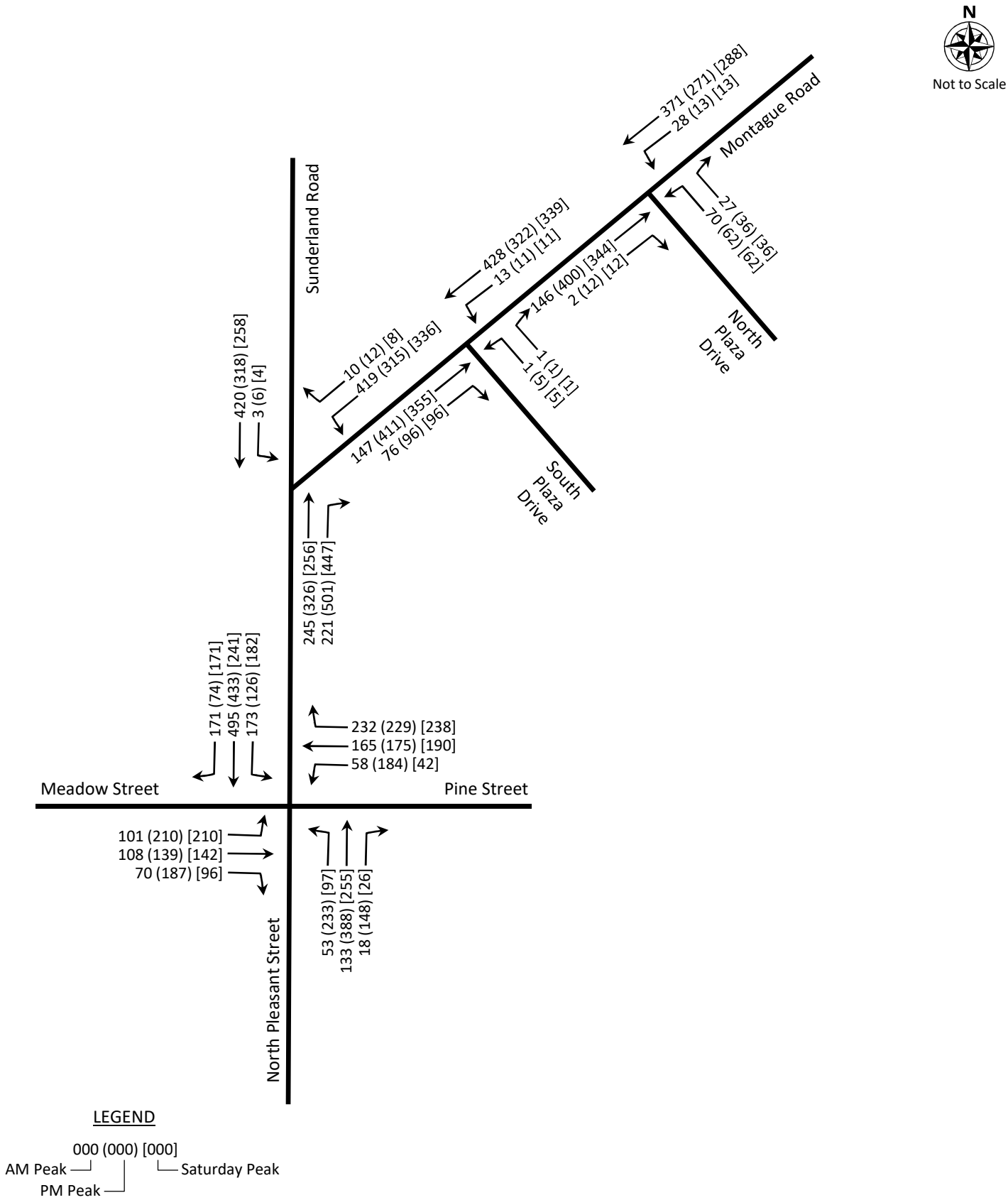
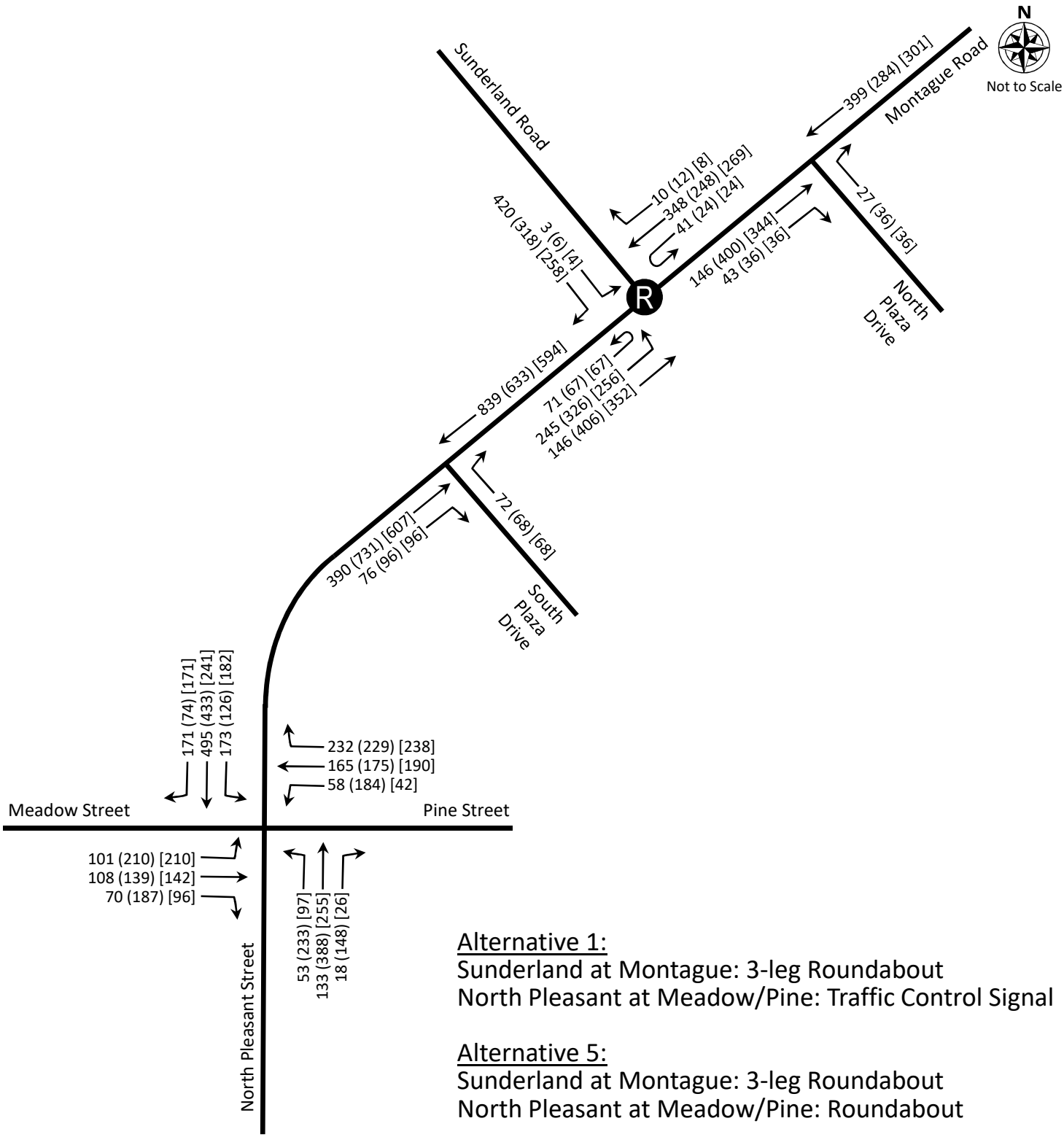
FIGURE 2



2038 NO-BUILD CONDITIONS PEAK HOUR TRAFFIC VOLUMES

CDM Smith

FIGURE 3



Alternative 1:
Sunderland at Montague: 3-leg Roundabout
North Pleasant at Meadow/Pine: Traffic Control Signal

Alternative 5:
Sunderland at Montague: 3-leg Roundabout
North Pleasant at Meadow/Pine: Roundabout

LEGEND

000 (000) [000]
AM Peak — PM Peak — Saturday Peak

R Roundabout

2038 ALTERNATIVE 1/5 CONDITIONS
PEAK HOUR TRAFFIC VOLUMES

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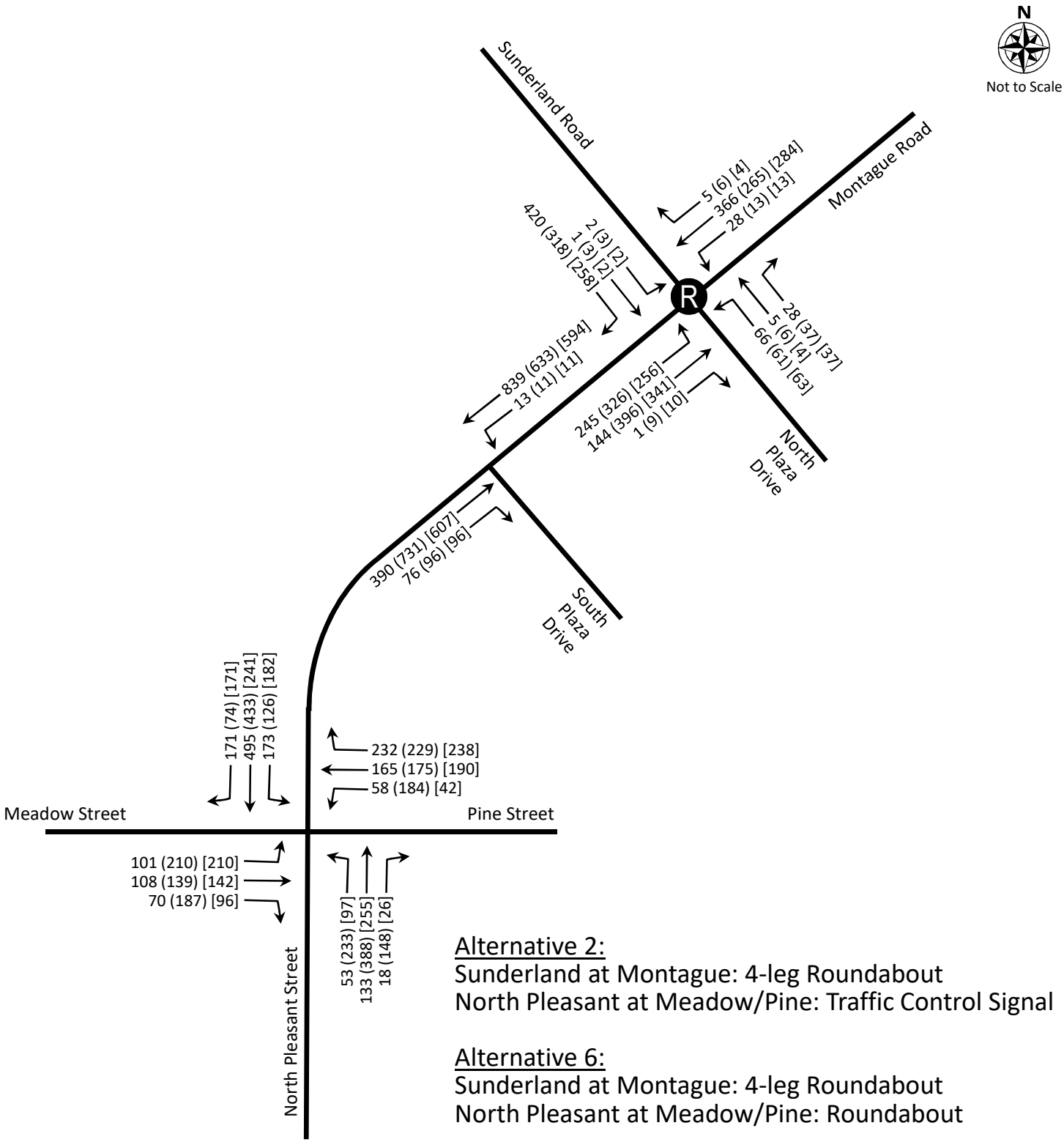
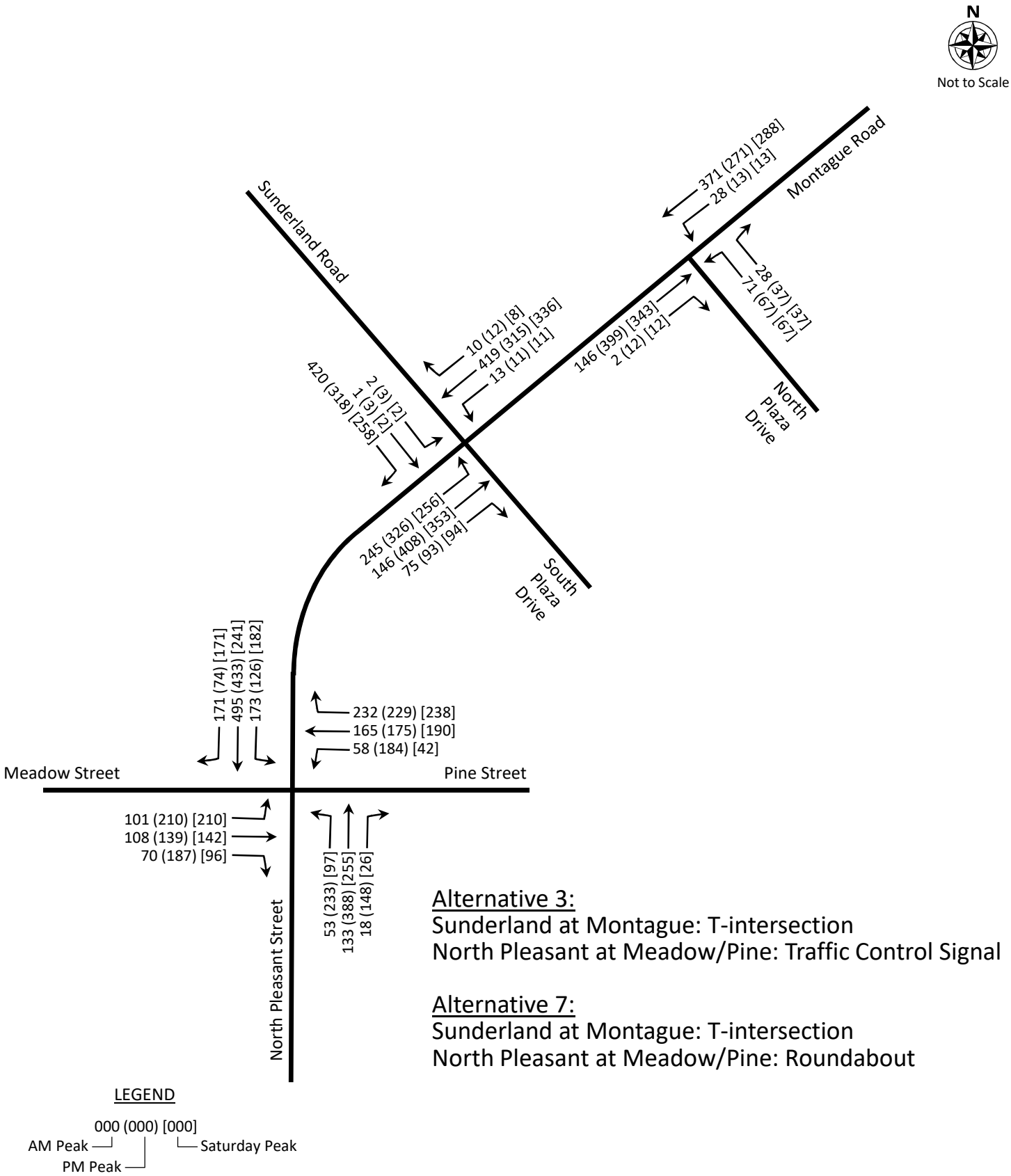
FIGURE 4



2038 ALTERNATIVE 2/6 CONDITIONS PEAK HOUR TRAFFIC VOLUMES

CDM Smith

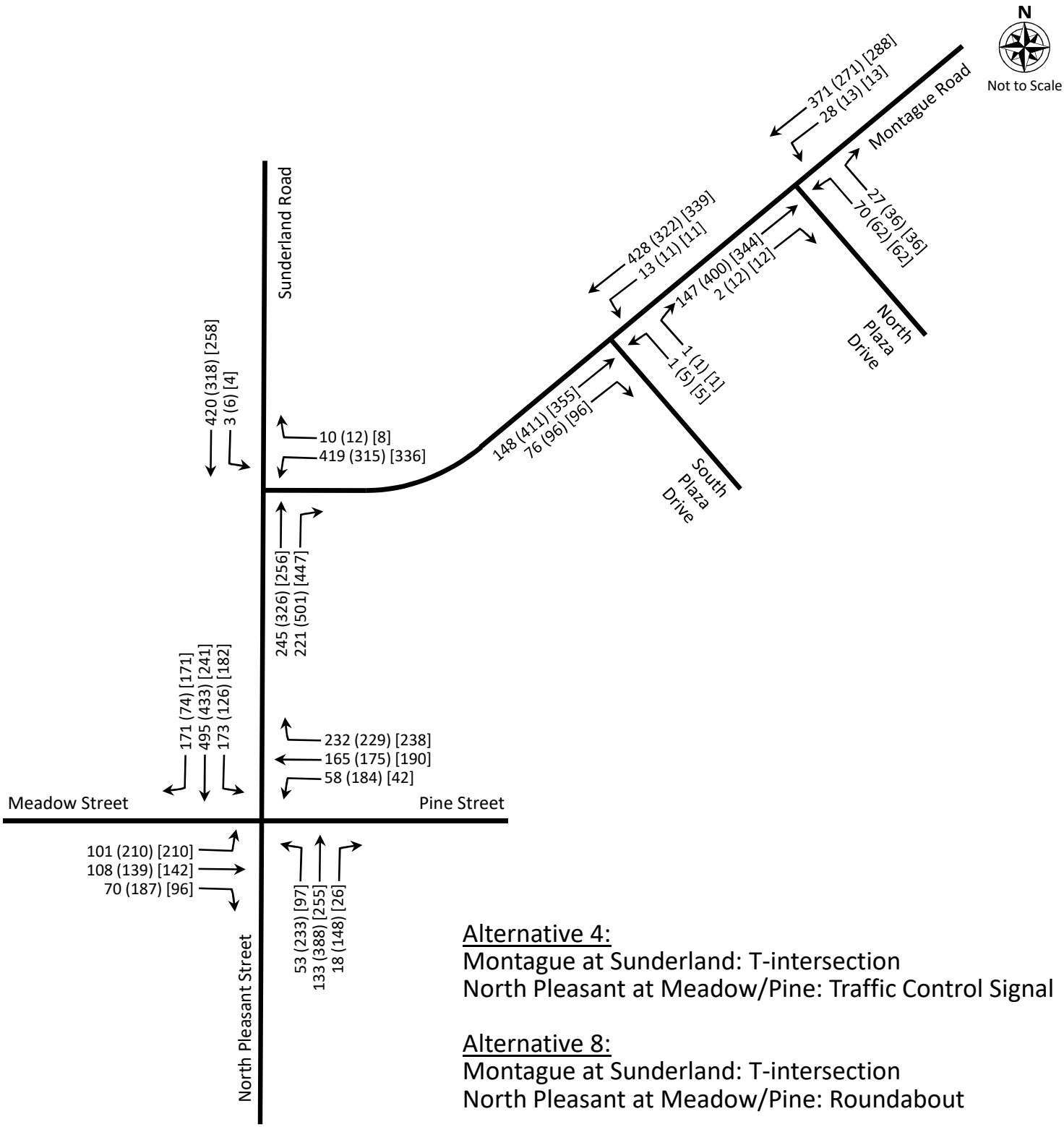
FIGURE 5



2038 ALTERNATIVE 3/7 CONDITIONS PEAK HOUR TRAFFIC VOLUMES

CDM Smith

FIGURE 6



Alternative 4:
Montague at Sunderland: T-intersection
North Pleasant at Meadow/Pine: Traffic Control Signal

Alternative 8:
Montague at Sunderland: T-intersection
North Pleasant at Meadow/Pine: Roundabout

LEGEND

000 (000) [000]
AM Peak
PM Peak
Saturday Peak

2038 ALTERNATIVE 4/8 CONDITIONS PEAK HOUR TRAFFIC VOLUMES

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FIGURE 7

Appendix E

2013 Amherst Roundabout Report

RESEARCH AND DEVELOPMENT

POST CONSTRUCTION EVALUATION

Twin Roundabout Installation
Amherst, Massachusetts

December 2013

CDM Smith

Table of Contents

Section 1

Introduction and Background **1-1**

Section 2

Design Parameters and Traffic Data **2-1**

Section 3

Capacity Analysis **3-1**

Section 4

Vehicle Speeds **4-1**

Section 5

Collision Analysis **5-1**

Section 6

Conclusions **6-1**

Appendix A Figures

Appendix B Traffic Data

Appendix C Capacity Analysis

Appendix D Crash Rate Worksheets

Section 1
Introduction and Background

Introduction

In November 2010, CDM Smith completed the design of the first modern twin roundabout installation in the northeast for the town of Amherst, MA and the Massachusetts Department of Transportation – Highway Division (MassDOT).

The purpose of this Research and Development Project is to provide a post-construction evaluation of the roundabout operations with respect to capacity, vehicular speeds, and safety.

Background

The town of Amherst is a western Massachusetts community, home to roughly 40,000 people while school is in session, including students and faculty from five local universities and colleges, and a substantial biking population.

Figure 1 in Appendix A illustrates the project area. West Street, also known as State Numbered Route 116, is functionally classified as an Urban Principal Arterial according to the MassDOT Office of Transportation Planning and provides a major north-south connection between South Hadley and the town of Amherst. MassDOT jurisdiction over Route 116 begins at the South Hadley town line and ends south of Country Corners Road. Amherst is responsible for the ownership and maintenance of West Street beyond the state highway limits.

The project limits along West Street are from 300 feet south of its intersection with Country Corners Road, northerly to 900 feet north of its intersection with the Hampshire College drive; the project also includes Bay Road, to 350 feet east of its intersection with West Street and West Bay Road, to 800 feet west of its intersection with Route 116.

Land use along West Street within the project limits is a mixture of residential and commercial uses, with the Hampshire College located along the west side near the intersection with Bay Road, and the Atkins Farm Country Market located on the southwest corner of the intersection of West Street at West Bay Road. West Street consists of one lane in each direction and the existing width varied from 24 to 33 feet. West Street, as it passed through the project area, was an "S-curve" alignment with restricted sight distance.

Amherst officials desired an efficient hub at the location for pedestrian, bicycle and vehicle traffic that safely linked important businesses like the Atkins Farms Country Market with other major area employers and the Five College Consortium—Hampshire College, Amherst College, University of Massachusetts Amherst (UMass Amherst), Smith College and Mount Holyoke College. The town's planning department created a "Workbook of Design Options for Sustainable Development – Atkins Corner Plan" which called for the creation of a 'Town Village" with the intersections of West Street, West Bay Road and Bay Road serving as the cornerstones. While the preferred alternative for the village

creation had not yet been determined, the possibility of the development had to be taken into consideration during the design process.

West Bay Road/Bay Road is functionally classified as a minor urban arterial and runs in a generally east-west direction traversing the southerly portion of Amherst. Land use along Bay Road/West Bay Road is primarily residential, but has some commercial use. Bay Road/West Bay Road in the project area consist of one lane in each direction, with double yellow center lines and solid white edge lines.

The intersection of West Street at West Bay Road was an unsignalized three-legged or "T" intersection. The West Bay Road eastbound approach was under STOP control while the West Street approaches were uncontrolled.

The intersection of West Street at Bay Road was offset to approximately 370 feet north of the intersection at West Bay Road. While the Bay Road westbound approach was under STOP control, the West Street approaches were uncontrolled. The Bay Road alignment with West Street was skewed at an undesirable angle and hampered by limited intersection sight distance.

Section 2

Design Parameters and Traffic Data

Design Parameters

While roundabouts have been designed across the country for a few years, at the time the design began, the Federal Highway Administration (FHWA) had not yet issued the updated Report 672: Roundabout Design Guide. Working closely with MassDOT, CDM Smith designed both roundabouts to provide tangential exits (versus the traditional radial exits of previous roundabout designs). In addition, the roundabouts are designed to convert into double lane roundabouts in the future if traffic volume growth warrants it by collapsing the central island smaller and shifting the truck apron inward.

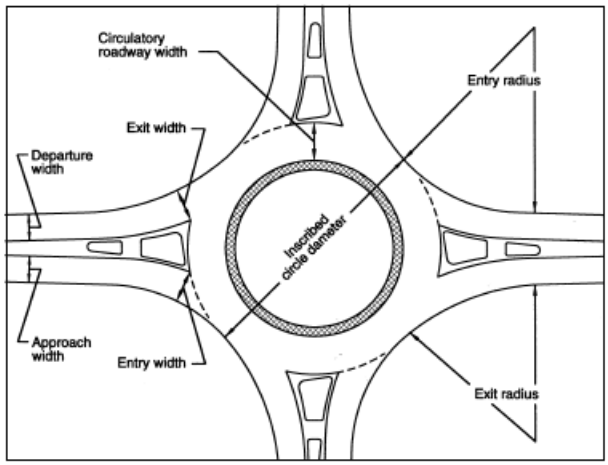


Figure 1

Exhibit 1-3. Drawing of key roundabout dimensions.[1]

Table 1 – Bay Road at West Street Design Criteria

Bay Road at West Street (Northern Roundabout)			
Design Criteria	Approach		
	N	SW	E
Circulating Width (feet)	16.0	16.0	16.0
Island Diameter (feet)	128.0	128.0	128.0
Inscribed Diameter (feet)	160.0	160.0	160.0
Entry Radius (feet)	150.0	110.0	195.0
Entry Angle (degrees)	20.0	72.0	32.0

[1] Roundabouts: An Informational Guide, 2000. Federal Highway Administration.

West Bay Road at West Street (Southern Roundabout)			
Design Criteria	Approach		
	NE	NW	SW
Circulating Width (feet)	16.0	16.0	16.0
Island Diameter (feet)	128.0	128.0	128.0
Inscribed Diameter (feet)	160.0	160.0	160.0
Entry Radius (feet)	110.0	200.0	150.0
Entry Angle (degrees)	17.0	30.0	33.0

Table 2 – West Bay Road at West Street Design Criteria

Turning Movement Data

Post construction traffic conditions at the project area locations were developed by conducting manual turning movement counts (TMCs) and vehicle classification counts. The TMCs and vehicle classification counts were performed during the weekday AM peak period (7:00 to 9:00 AM), and the weekday PM peak period (4:00 to 6:00 PM). Turning movement volumes were collected at the intersection of West Street at Bay Road and West Bay Road on September 11, 2013 to reflect current conditions following construction completion. According to the traffic data collected, the morning peak hour for both intersections occurs between 7:45 AM and 8:45 AM. The evening peak hour occurs between 4:15 PM and 5:15 PM for Bay Road at West Street, and for West Bay Road and West Street the evening peak hour is from 4:30 PM to 5:30 PM. The turning movement diagram can be found in Appendix A, Figure 2.

Gap Acceptance Data

A gap is a break or interval, measured in seconds, between vehicles circulating a roundabout. Gap acceptance is described in the NCHRP Report 672[2] as the process by which, "entering vehicles look for and accept gaps in circulating traffic." The University of Massachusetts (UMass) located in Amherst, Massachusetts, has been conducting research and collecting field data on the twin roundabouts. Their main focus has been on gap acceptance and critical gap at the intersections under pre-and post-construction conditions. For the purposes of this research and development project, CDM Smith has requested information related to UMass' gap acceptance data. While there are numerous methods to computing the critical gap from field data UMass has used two to analyze the data collected; the Raff Method and the Cumulative Acceptance Method. According to the Raff Method the critical gap value is determined when the percentage of gaps rejected is equal to the percentage of gaps accepted. In other words, the critical gap is when a driver has a 50% chance of accepting or rejecting a gap. The Cumulative Acceptance Method identifies the critical gap as the gap at which 85 percent of drivers would accept.

For the Raff Method, the rejected and accepted gaps were combined into intervals of one second, and the number of gaps either rejected or accepted was tallied. For the Cumulative Acceptance method, gaps were grouped into 0.25 second intervals, and the gap length that was accepted by 85 percent of drivers was determined to be the critical gap.[3]

---

[2] Roundabouts: An Information Guide, Second Edition, Report #672. National Cooperative Highway Research Program, 2010.
[3] Knodler, Michael. *Atkin's Corner Double Roundabout After Study Data Collection Results.* Amherst, University of Massachusetts, 2012.

UMass collected data during the morning and afternoon peak hours for both roundabouts. Data was collected between 7:30 AM and 9:00 AM, and between 4:00 PM and 6:00 PM. Table 3 illustrates the critical gap calculated using each method based on the collected field data:

Table 3 – UMass Critical Gap Values

Critical gap determination using field data			
Method	Intersection	AM	PM
Raff	Bay Road	4.50 s	4.50 s
	West Bay Road	2.50 s	2.50 s
Cumulative Acceptance	Bay Road	3.75 s	6.50 s
	West Bay Road	5.50 s	3.50 s

According to the calculations, using the Raff method, the critical gap at the intersection of West Bay Rd. and West Street is 2.5 seconds while the cumulative acceptance method indicates a critical gap between 3.5 seconds and 5.5 seconds depending on the time of day. The critical gap at the intersection of Bay road and West Street is 4.5 seconds according to the Raff method and varies between 3.75 seconds and 6.5 seconds using the cumulative acceptance method. These values will be compared to the default critical gap values in the SIDRA Intersection 6.0 program, and how this affects the capacity and LOS analysis results.

Section 3
Capacity Analysis

The primary results of a capacity analysis are to assign a level of service (LOS) to traffic facilities under various traffic flow conditions. A LOS is determined using the concepts and procedures in the Highway Capacity Manual and is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A LOS definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Unlike traffic signals which clearly define vehicular right-of-way using "stop and go" operation, roundabouts operate on a "slow and go" operation, relying more heavily on driver behavior. Therefore it has been more challenging to estimate the capacity a roundabout may offer versus traditional traffic signal installations. Over the years, there have been numerous research studies conducted to evaluate capacity at existing roundabout installations, and develop parameters that better reflect actual capacity. This research has indicated that roundabout capacity is dictated by driver behavior and is a function of two behavioral parameters – critical gap and follow-up headway. These parameters help estimate capacity as each determine the ability of a driver to enter a roundabout and merge into the circulating flow.

For the purposes of this R&D project, comparison between analysis scenarios will focus only on critical gap settings. A future study may evaluate follow-up headway and its impact on capacity.

HCM 2010 versus Sidra

While there are several roundabout capacity analysis packages available, CDM Smith has used SIDRA Intersection 6.0 for the purposes of this R&D project. SIDRA is the most widely used program for roundabout capacity evaluation in the US.

Within the SIDRA package, we have applied two methodologies to perform the analysis: the Highway Capacity Manual (HCM) 2010 method [4]and the SIDRA Standard Intersection 6.0 method. There are two key distinctions between the HCM 2010 method and the SIDRA method; gap acceptance (driver behavior) and geometric parameters.

The SIDRA Standard method uses a less conservative gap acceptance and is based on actual roundabout geometry. The SIDRA Standard analysis method is modeled after Australian and European driver behavior. Roundabouts are more prevalent in Australia and Europe, where driver behavior tends to be more aggressive than that of the US. These drivers are willing to accept smaller gaps when entering the roundabout, resulting in an increased capacity. The SIDRA Standard analysis approach also takes into consideration basic geometric elements.

In recent research studying US driver behavior in roundabouts, the HCM 2010 method has been developed. In 2003, existing US roundabouts were studied; the outcomes of this study evolved into the methodologies used in the HCM 2010 analysis of roundabouts. This study concluded that driver

[4] Highway Capacity Manual 2010, Volumes 1-4. Transportation Research Board, 2010.

behavior was the largest determining factor of the capacity of a roundabout in the US. The NCHRP Report 672 states, "Recent U.S.-based research has suggested that while aggregate changes in geometry are statistically significant, minor changes in geometry are masked by the large variation in behavior from driver to driver." Therefore, the gap acceptance is set at a conservative 5.19 seconds and is not based on geometric design elements using the HCM 2010 method.

Before the HCM 2010 method had been developed, it was an industry standard practice to apply an environmental factor to roundabouts being analyzed in the US using the SIDRA Standard approach. An environmental factor of 1.2 was applied to roundabouts for a more conservative model, replicating US driver behavior.

The HCM 2010 method uses a standard default value for critical gap and follow-up headway under all conditions. The default value for critical gap is 5.19 seconds, and follow-up headway is 3.19 seconds. Depending on geometry, the SIDRA Standard values for critical gap and follow-up headway vary. Using the geometry described in Section 2 for the twin roundabouts, the SIDRA Standard critical gap values created by the program are shown in Table 5.

HCM Critical Gap Values			
	Default	Field	
Intersection	HCM 2010	Raff	Cumulative Acceptance
Bay Road AM	5.19 s	4.50 s	3.75 s
Bay Road PM	5.19 s	4.50 s	6.50 s
West Bay Road AM	5.19 s	2.50 s	5.50 s
West Bay Road PM	5.19 s	2.50 s	3.50 s

Table 4 – Critical Gap Value Comparison of HCM 2010 Default and Field Determined

SIDRA Standard Critical Gap Values								
Intersection	Approach		Default		Field			
					Raff		Cumulative Acceptance	
		Turn	AM	PM	AM	PM	AM	PM
Bay Road at West Street	NB	L	5.01 s	5.31 s	4.50 s	4.50 s	3.75 s	6.50 s
		R	5.04 s	5.35 s	4.50 s	4.50 s	3.75 s	6.50 s
	SB	L	5.53 s	4.80 s	4.50 s	4.50 s	3.75 s	6.50 s
		R	4.95 s	4.85 s	4.50 s	4.50 s	3.75 s	6.50 s
	WB	L	4.03 s	4.20 s	4.50 s	4.50 s	3.75 s	6.50 s
		R	4.09 s	4.17 s	4.50 s	4.50 s	3.75 s	6.50 s
West Bay Road at West Street	SWB	T	5.01 s	4.80 s	2.50s	2.50 s	5.50 s	3.50 s
		R	4.86 s	4.83 s	2.50s	2.50s	5.50 s	3.50 s
	SEB	L	5.30 s	4.71 s	2.50s	2.50s	5.50 s	3.50 s
		R	5.25 s	4.81 s	2.50s	2.50s	5.50 s	3.50 s
	NEB	L	5.04 s	5.17 s	2.50s	2.50s	5.50 s	3.50 s
		T	4.99 s	5.02 s	2.50s	2.50s	5.50 s	3.50 s

Table 5 – SIDRA Standard Critical Gap Values for the Twin Roundabouts

To make a comparison of how the default critical gap values and the actual critical gap values affect the capacity analysis, the following steps were taken:

- *Analyze roundabout using current volumes and default gap acceptance*
- *Analyze roundabout using current volumes and actual gap acceptance*
- *Compare results*

Elements that will be compared for each scenario are LOS, delay, volume to capacity ratio, and the queue length. This will demonstrate the significance that gap acceptance has on the capacity of a roundabout. The LOS analysis results for the existing condition comparing the HCM 2010 method and the SIDRA Standard method are illustrated in Table 6 and 7.

Capacity Analysis Using Default Gap Acceptance Values for AM										
Intersection	Approach	Lane	HCM 2010				SIDRA Standard			
			LOS	Delay	V/C	95th Queue	LOS	Delay	V/C	95th Queue
Bay Road at West Street	NB	L T R	A	9.4	0.52	4	A	2.7	0.41	4
	SB	L T R	B	11.2	0.45	3	A	4.8	0.38	3
	WB	L T R	C	16.9	0.63	5	A	1.9	0.48	4
	ALL	-	B	12.3	-	-	A	2.7	-	-
West Bay Road at West Street	SWB	L T R	C	17.7	0.73	7	A	1.9	0.58	6
	SEB	L T R	A	7.4	0.25	1	A	2.2	0.22	2
	NEB	L T R	B	13.4	0.65	5	A	1.2	0.53	5
	ALL	-	B	14.5	-	-	A	1.6	-	-

Table 6 – Comparing AM Values of the HCM 2010 Method and SIDRA Standard Method

Capacity Analysis Using Default Gap Acceptance Values for PM										
Intersection	Approach	Lane	HCM 2010				SIDRA Standard			
			LOS	Delay	V/C	95th Queue	LOS	Delay	V/C	95th Queue
Bay Road at West Street	NB	L T R	B	11.5	0.61	5	A	0.5	0.52	5
	SB	L T R	B	12.8	0.61	5	A	1.4	0.49	4
	WB	L T R	A	7.1	0.25	1	A	1.5	0.20	1
	ALL	-	B	11.4	-	-	A	1.0	-	-
West Bay Road at West Street	SWB	L T R	C	15.8	0.71	7	A	1.2	0.56	6
	SEB	L T R	D	27.8	0.81	8	A	8.9	0.70	8
	NEB	L T R	B	12.2	0.54	4	A	2.7	0.49	4
	ALL	-	C	18.8	-	-	A	4.1	-	-

Table 7 – Comparing PM Values of the HCM 2010 Method and SIDRA Standard Method

As portrayed in the above tables comparing the HCM 2010 and the SIDRA Standard analyses, there is a difference in the LOS, delay, and volume to capacity ratio between the two methods. SIDRA Standard results in lower delay and v/c ratios, and higher level of service, for most movements than the HCM 2010even with an environmental factor of 1.2.

HCM 2010 Method – Gap Acceptance Field Values

A capacity analysis was performed on the twin roundabouts for the HCM 2010 method using three different critical gap values. Between the three scenarios, the sole difference between them was the critical gap value. The first scenario used the program default critical gap of 5.19 seconds, and the other two scenarios used critical gap values determined from field data from UMass, as outlined in Table 3. All three results are summarized in Table 8:

AM Peak								
Intersection	Approach	Lane	HCM 2010 Default gap		Raff Method gap		Cumulative Acceptance Method gap	
			LOS	Delay	LOS	Delay	LOS	Delay
Bay Road at West Street	NB	L T R	A	9.4	A	9.4	A	9.3
	SB	L T R	B	11.2	A	9.9	A	8.8
	WB	L T R	C	16.9	B	14.0	B	11.6
	ALL	-	B	12.3	B	11.0	A	9.9
West Bay Road at West Street	SWB	L T R	C	17.7	B	12.2	C	18.7
	SEB	L T R	A	7.4	A	5.5	A	7.7
	NEB	L T R	B	13.4	B	10.9	B	13.8
	ALL	-	B	14.5	B	10.8	C	15.2
PM Peak								
Bay Road at West Street	NB	L T R	B	11.5	A	5.3	B	11.9
	SB	L T R	B	12.8	A	5.8	B	14.8
	WB	L T R	A	7.1	A	6.6	A	8.3
	ALL	-	B	11.4	A	5.7	B	12.5
West Bay Road at West Street	SWB	L T R	C	15.8	B	12.4	B	13.5
	SEB	L T R	D	27.8	B	10.8	B	14.4
	NEB	L T R	B	12.2	A	8.2	A	9.4
	ALL	-	C	18.8	B	10.8	B	12.7

Table 8 – Capacity Analysis Results for HCM 2010 Method

As shown above, the Raff Method resulted in an improved LOS for each scenario. This is because the Raff Method used smaller critical gap values. For the Bay Road roundabout, 4.50 s was used in the AM and PM, and for West Bay Road roundabout, 2.5 s was used for the AM and PM. During the PM peak, this resulted in an improvement in overall LOS from a C to a B at the West Bay Road roundabout and an improvement from a LOS B to an A for the Bay Road roundabout.

The Cumulative Acceptance method had mixed results; in the AM peak for West Bay Road, and the PM peak for Bay Road, the critical gap was measured higher than the default value. For full analysis results, see Appendix C.

SIDRA Standard Method – Gap Acceptance Field Values

A capacity analysis for the SIDRA Standard roundabout method was completed with the same approach as the HCM 2010 method. Three scenarios were completed, with the only difference between them being the critical gap value. Table 9 summarizes the results.

AM Peak								
Intersection	Approach	Lane	SIDRA Standard Default		Raff Method		Cumulative Acceptance Method	
			LOS	Delay	LOS	Delay	LOS	Delay
Bay Road at West Street	NB	L T R	A	2.7	A	0.1	A	0.1
	SB	L T R	A	4.8	A	3.3	A	2.3
	WB	L T R	A	1.9	A	5.9	A	4.1
	ALL	-	A	2.7	A	2.8	A	1.9
West Bay Road at West Street	SWB	L T R	A	1.9	A	1	A	5.9
	SEB	L T R	A	2.2	A	0.8	A	2.8
	NEB	L T R	A	1.2	A	0.4	A	1.8
	ALL	-	A	1.6	A	0.7	A	3.8
PM Peak								
Bay Road at West Street	NB	L T R	A	0.5	A	0.4	A	0.9
	SB	L T R	A	1.4	A	1.5	A	3.8
	WB	L T R	A	1.5	A	1.8	A	3.5
	ALL	-	A	1.0	A	1.1	A	2.4
West Bay Road at West Street	SWB	L T R	A	1.2	A	0.5	A	0.9
	SEB	L T R	A	8.9	A	3.3	A	6.2
	NEB	L T R	A	2.7	A	1	A	1.8
	ALL	-	A	4.1	A	1.6	A	2.9

Table 9 – Capacity Analysis Results for SIDRA Standard Method

The critical gap values did not have as significant an effect on the SIDRA Standard method as they did on the HCM 2010 method. The delay for all scenarios remained minimal resulting in LOS A for all movements. Even with some of the field determined critical gaps higher than those listed as default gaps in the program in Table 5. For full analysis results, see Appendix C.

The following can be surmised from the analysis results:

- The capacity results using the HCM 2010 method appear to be more conservative than the Sidra Standard method.
- The Raff method is a more aggressive method for determining critical gap than the Cumulative Acceptance method.
- Critical gap values appear to have a more significant impact on LOS using the HCM 2010 method than using the Sidra Standard method.

It should be noted that the conclusive remarks of this analysis apply solely to the twin-roundabouts studied, and results may vary for other existing roundabouts. For future analysis of other roundabouts

in different geographic areas, it is recommended that a gap study be performed at existing roundabouts in the area.

Section 4
Vehicle Speeds

According to the NCHRP report 672 "Roundabouts can have traffic calming effects on streets by reducing vehicle speeds using geometric design rather than traffic control devices or traffic volumes."

Attachment B illustrates the existing posted speed limits, the 85th percentile speed collected before construction and the 85th percentile speed under post-construction conditions.

Since the twin roundabout configuration and roadway realignment were implemented, vehicle speeds have certainly decreased along the corridor. Vehicle speed data were collected along Route 116 during the initial study phases of the project where the 85th percentile speed ranged between 36mph to 55mph. Following construction completion, speed data were again collected, resulting in 85th percentile speeds ranging between 36mph to 47mph. In all, speeds throughout the project limits have been reduced anywhere between 4 and 26 percent; the most significant decrease in speed was witnessed along both the northbound and southbound approaches to the two roundabouts, where speeds were reduced between 25 and 26 percent. Charts 1 and 2 illustrate the speed data comparisons.

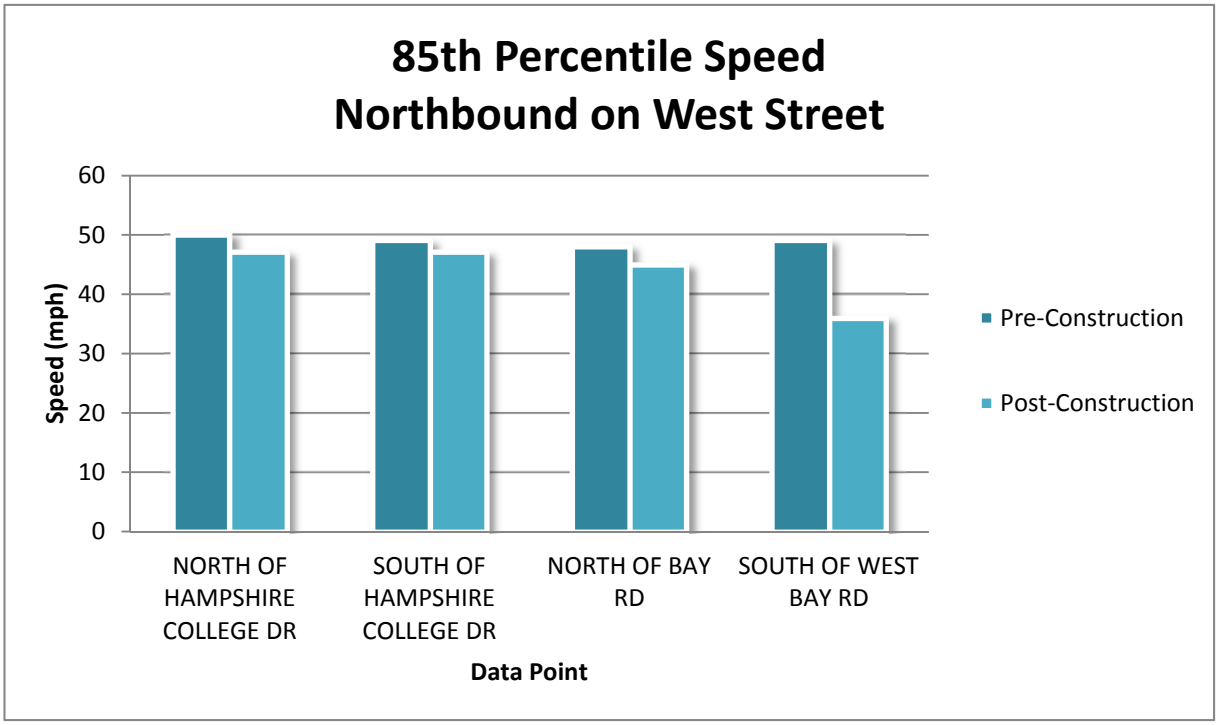


Chart 1

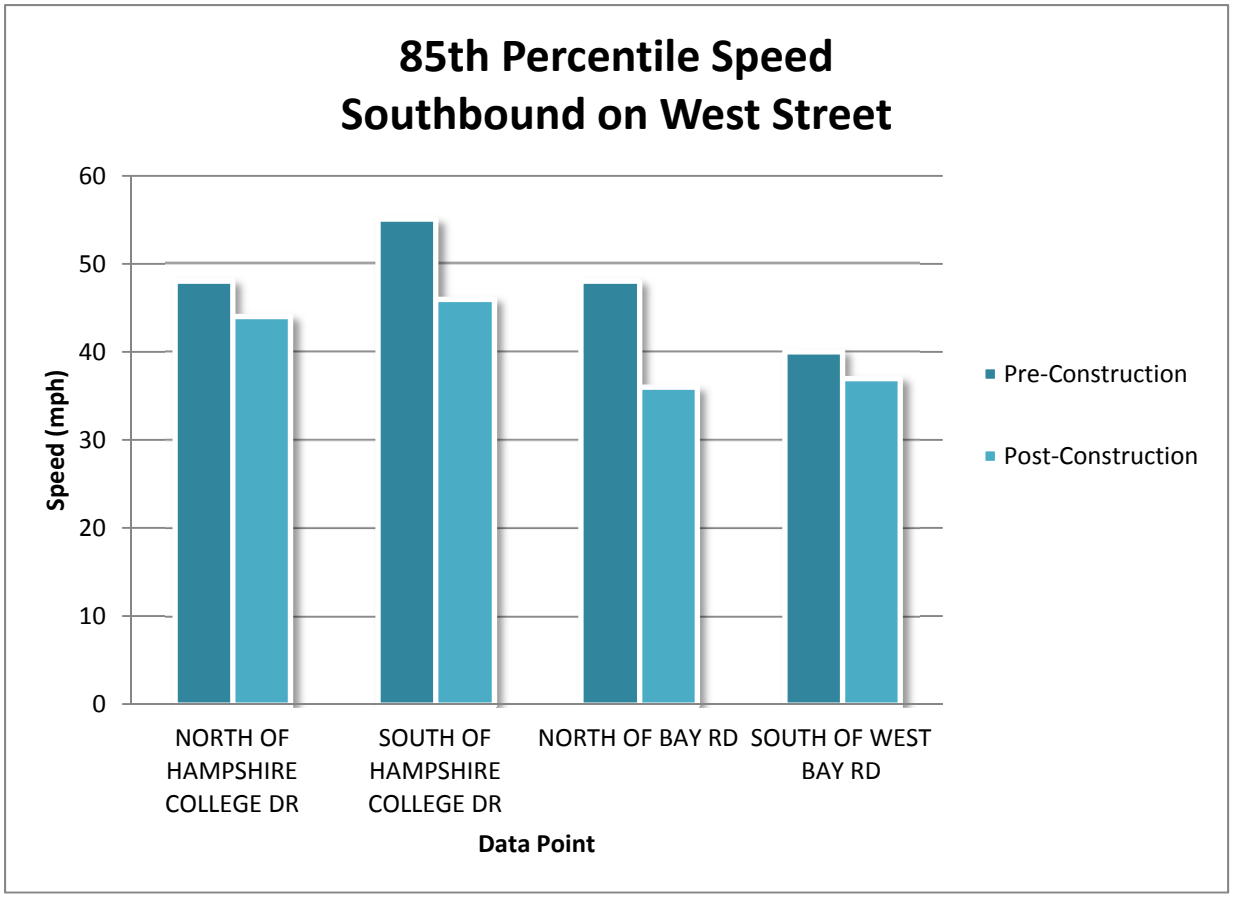

85th Percentile Speed
Southbound on West Street
60
50
40
30
20
10
0
Speed (mph)
NORTH OF HAMPSHIRE COLLEGE DR
SOUTH OF HAMPSHIRE COLLEGE DR
NORTH OF BAY RD
SOUTH OF WEST BAY RD
Data Point
Pre-Construction
Post-Construction

Chart 2

Section 5
Collision Analysis

Collision data for the project area intersections were obtained from the Town of Amherst Police Department for the most recent available three-year period at the time the initial study was performed (2002 through 2004).

Collision or crash occurrence should be compared to the volume of traffic through a particular intersection to determine any statistical significance. Accordingly, the crash rates were calculated for the intersections and compared with the statewide average. An intersection crash rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev). At the time the initial study began, for unsignalized intersections, the statewide average was 0.66 acc/mev while the District 2 average was 0.85 acc/mev. A comparison of the calculated accident rate to these averages can be used to establish the significance of crash occurrence and whether or not potential safety problems exist.

West Street at West Bay Road

At the intersection of West Bay Road and Route 116, ten accidents occurred - 60% of which were rear-end types of collisions. This location experienced an average of approximately 3.3 collisions per year or 0.65 acc/mev. This crash rate was equivalent to the statewide average and about 20% lower than the District 2 average.

West Street at Bay Road

At the intersection of Bay Road and Route 116, five collisions over the three years evaluated were predominantly angle type; the intersection experienced a crash rating of 0.34, which is approximately 50% lower than the statewide average rate.

Since the opening of the roundabouts, a total of 11 collisions have occurred. Compiling accident reports for both roundabouts, five were vehicles colliding with edge of road curbing, four were rear ends, one was a sign hit, and one was a sideswipe. All of these accidents were minor in severity, and some of the curb hits were weather related. For post-construction conditions, West Street at West Bay Road has an accident rate of 0.55 acc/mev, an average of 3.0 per year. This is a reduction from the preconstruction accident rate of 0.65acc/mev. West Street at Bay Road has an accident rate of 0.56 acc/mev, an average of 2.5 per year. This is an increase in the accident rate, although two of these were only curb strike and sign hit. Overall, the intersection continues to operate with a lower accident rate than the statewide and District 2 averages.

Section 6
Conclusions

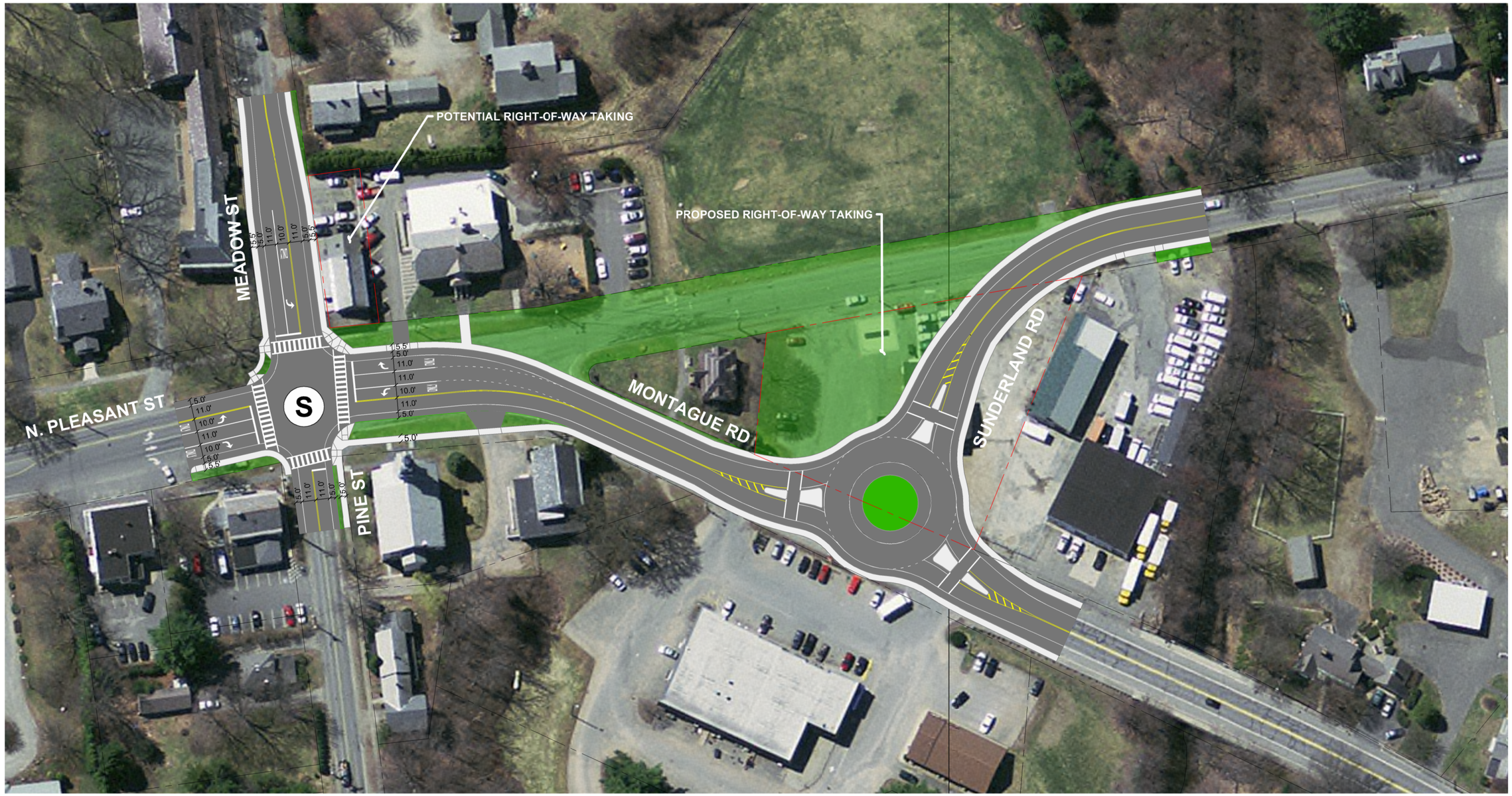
The goal of this study was to investigate the post-construction operations of the twin-roundabouts with regards to capacity, vehicular speeds, and safety. The capacity of the roundabouts were compared using default SIDRA gap acceptance values, and using two different field measured gap acceptance values. Vehicular speeds were compared to pre and post-construction conditions. An accident analysis was conducted for the roundabouts.

Based on the results of the field data collection, the capacity analysis and the collision history, the following conclusions have been made:

- An overall reduction in vehicular speeds
- An overall reduction in the severity of collisions
- A change in critical gap values have more of an impact in the HCM2010 method then the SIDRA Standard method
- Capacity analysis results are much more conservative in the HCM 2010 method than the SIDRA Standard method
- For the Raff and Cumulative Acceptance Methods, the critical gap values were predominantly lower than the default HCM 2010 critical gap values.

Appendix F

Concepts



0 40 100 160

SCALE: 1" = 40'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: S. MURPHY
DRAWN BY: S. MURPHY
SHEET CHK'D BY: L. SHERMAN
CROSS CHK'D BY: T. DUPUIS
APPROVED BY: T. DUPUIS
DATE: APRIL 2015

CDM Smith
260 West Exchange Street
Suite 300
Providence, RI 02903
Tel: (401) 751-5360

TOWN OF AMHERST

NORTH PLEASANT STREET AT PINE STREET,
SUNDERLAND ROAD AND MONTAGUE ROAD

ALTERNATIVE 1
3-WAY ROUNDABOUT
SUNDERLAND ROAD AT MONTAGUE ROAD

PROJECT NO.
FILE NAME:

SHEET NO.
3 OF 3

PRELIMINARY

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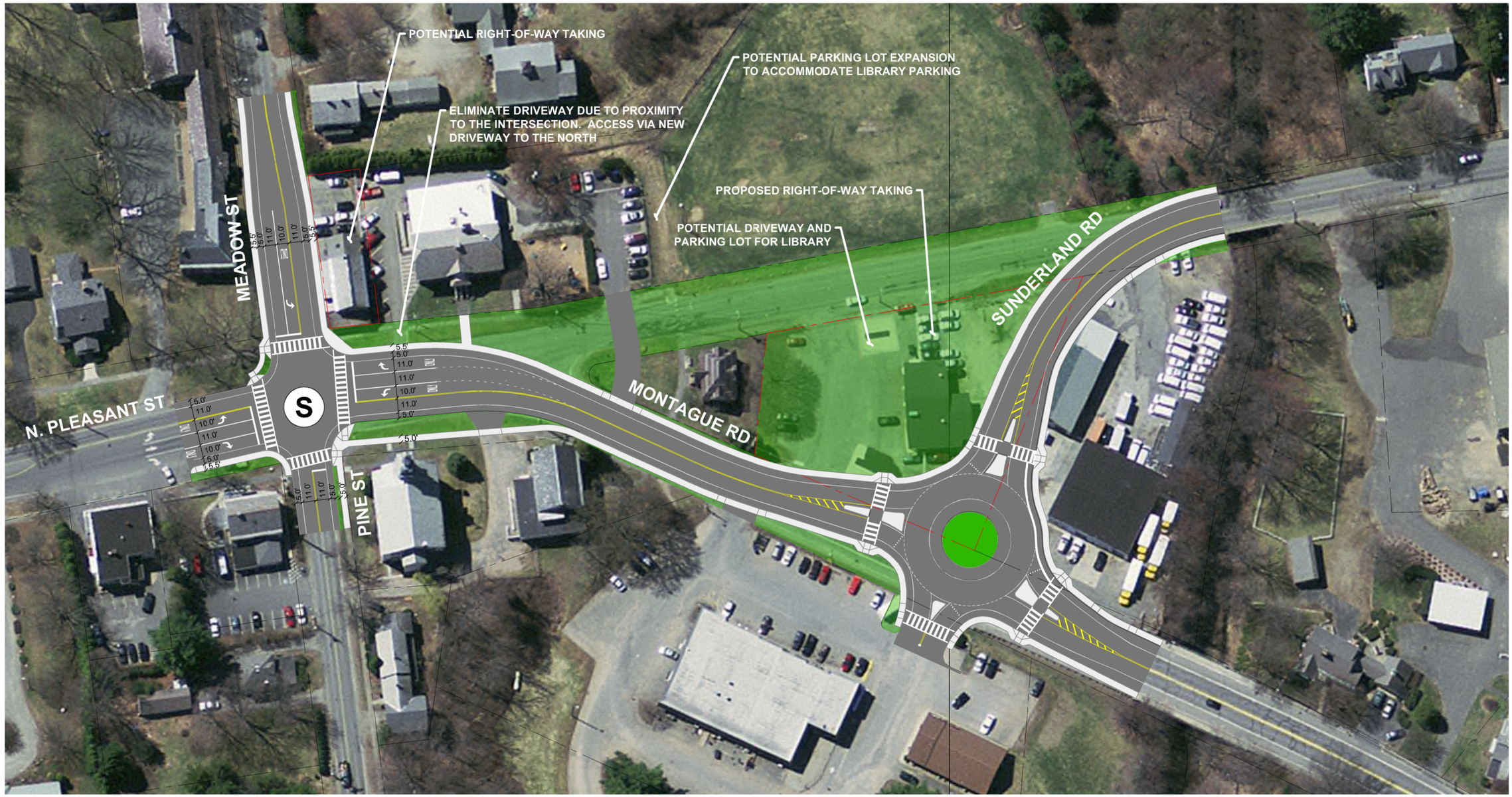

0 40 100 160

SCALE: 1" = 40'

REV. NO.	DATE	DRWN	CHKD	REMARKS

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CROSS CHK'D BY: T. DUPUIS
APPROVED BY: T. DUPUIS
DATE: APRIL 2015

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Tel: (401) 751-5360

TOWN OF AMHERST

NORTH PLEASANT STREET AT PINE STREET, SUNDERLAND ROAD AND MONTAGUE ROAD

ALTERNATIVE 2
4-WAY ROUNDABOUT
SUNDERLAND ROAD AT MONTAGUE ROAD

PROJECT NO.
FILE NAME:
SHEET NO.
2 OF 2

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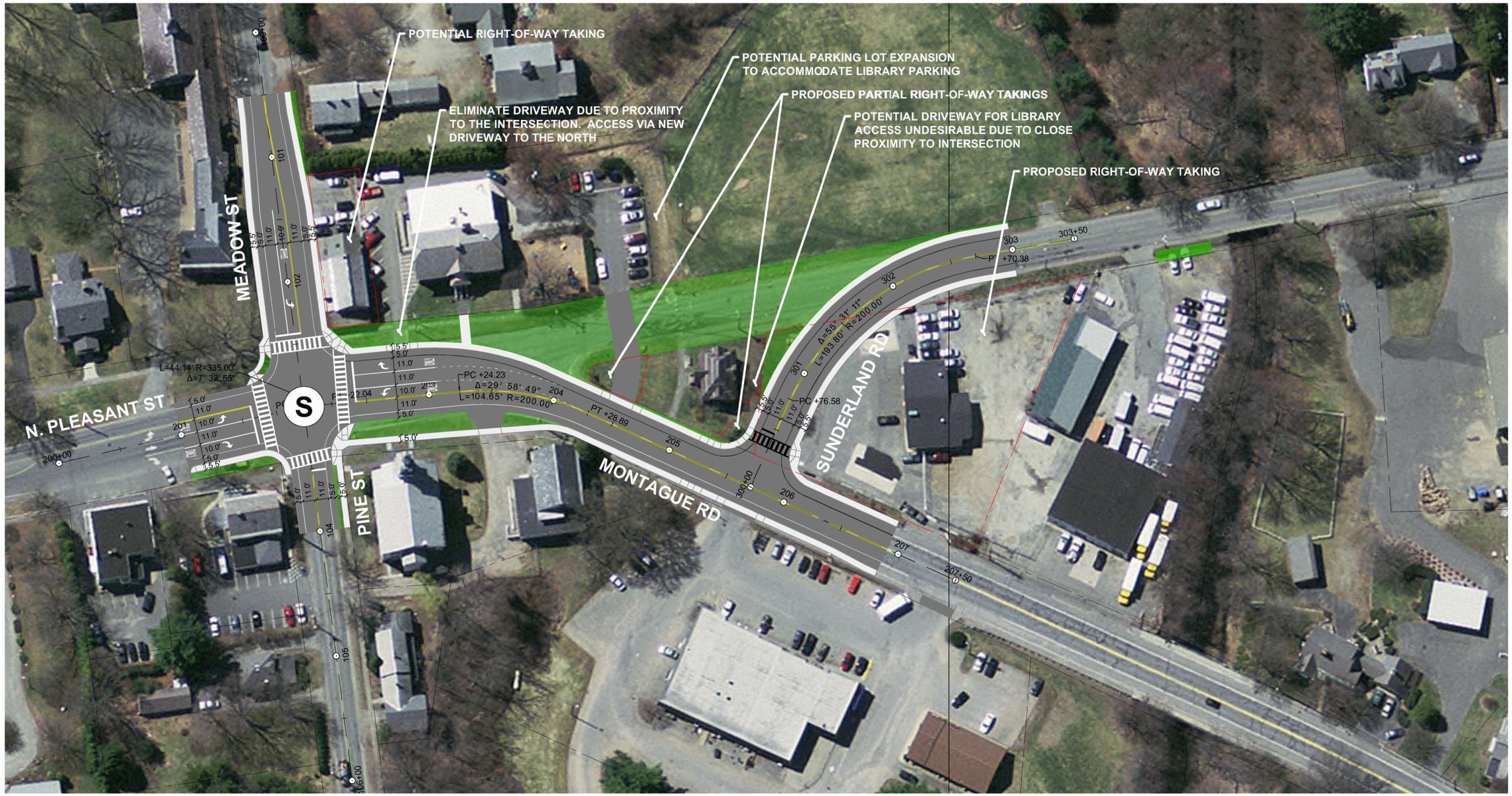

0 40 100 160

SCALE: 1" = 40'

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: S. MURPHY
DRAWN BY: S. MURPHY
SHEET CHK'D BY: L. SHERMAN
CROSS CHK'D BY: T. DUPUIS
APPROVED BY: T. DUPUIS
DATE: APRIL 2015

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TOWN OF AMHERST

NORTH PLEASANT STREET AT PINE STREET, SUNDERLAND ROAD AND MONTAGUE ROAD

ALTERNATIVE 3
T-INTERSECTION
SUNDERLAND ROAD AT MONTAGUE ROAD

PROJECT NO.
FILE NAME:
SHEET NO.
1 OF 2

PRELIMINARY

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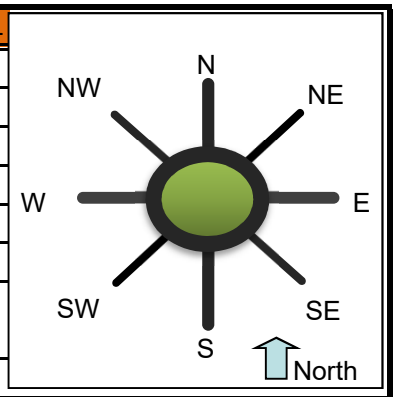
Appendix G

GDOT Analysis

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, AM
County/District:	
Intersection Name:	Montague Road at Sunderland Road (3-way)



Volumes		Entry Legs (FROM) N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph								
	NE (2), vph		41				146		3
	E (3), vph								
	SE (4), vph								
	S (5), vph								
	SW (6), vph		348				71		420
	W (7), vph								
	NW (8), vph		10				245		
Output	Total Vehicles	0	399	0	0	0	462	0	423

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	99.4%	100.0%	100.0%	100.0%	97.9%	100.0%	96.6%
% Heavy Vehicles	0.0%	0.6%	0.0%	0.0%	0.0%	1.8%	0.0%	2.8%
% Bicycle	0.0%	0.0%	0.0%	0.0%	0.0%	**0.3%**	0.0%	**0.6%**
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.92*	*0.95*	*0.95*	*0.95*	*0.91*	*0.95*	*0.88*
F_{HV}	1.000	0.994	1.000	1.000	1.000	0.984	1.000	0.976
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	0	0	0	0
NE (2), pcu/h	0	45	0	0	0	164	0	3
E (3), pcu/h	0	0	0	0	0	0	0	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	0	0	0	0	0	0	0	0
SW (6), pcu/h	0	382	0	0	0	80	0	490
W (7), pcu/h	0	0	0	0	0	0	0	0
NW (8), pcu/h	0	11	0	0	0	275	0	0
Entry flow, pcu/h	0	438	0	0	0	518	0	493
Conflicting flow, pcu/h	0	354	0	0	0	49	0	507

Results: Approach Measures of Effectiveness

HCM 6th Edition	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	NA	956	NA	NA	NA	1292	NA	803
Entry Flow Rates, vph	NA	436	NA	NA	NA	509	NA	481
V/C ratio		**0.46**				**0.39**		**0.60**
Control Delay, sec/pcu		**9**				**7**		**14**
LOS		A				A		B
95th % Queue (ft)		**61**				**49**		**104**

Notes: v 4.0

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

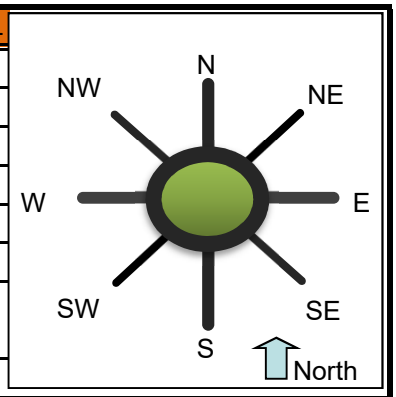
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF						
F_{HV}						
F_{ped}						
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr						
Conflicting Flow, pcu/hr						
Bypass Lane Results (HCM 6th Edition)						
Entry Capacity of Bypass, vph						
Flow Rates of Exiting Traffic, vph						
V/C ratio						
Control Delay, s/veh						
LOS						
95th % Queue (ft)						
Approach w/Bypass Delay, s/veh						
Approach w/Bypass LOS						

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, PM
County/District:	
Intersection Name:	Montague Road at Sunderland Road (3-way)



Volumes		Entry Legs (FROM) N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph								
	NE (2), vph		24				406		6
	E (3), vph								
	SE (4), vph								
	S (5), vph								
	SW (6), vph		248				67		318
	W (7), vph								
	NW (8), vph		12				326		
Output	Total Vehicles	0	284	0	0	0	799	0	324

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	99.2%	100.0%	100.0%	100.0%	98.2%	100.0%	98.4%
% Heavy Vehicles	0.0%	0.8%	0.0%	0.0%	0.0%	1.5%	0.0%	1.6%
% Bicycle	0.0%	0.0%	0.0%	0.0%	0.0%	**0.3%**	0.0%	0.0%
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.94*	*0.95*	*0.95*	*0.95*	*0.91*	*0.95*	*0.86*
F_{HV}	1.000	0.992	1.000	1.000	1.000	0.987	1.000	0.984
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	0	0	0	0
NE (2), pcu/h	0	26	0	0	0	452	0	7
E (3), pcu/h	0	0	0	0	0	0	0	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	0	0	0	0	0	0	0	0
SW (6), pcu/h	0	267	0	0	0	75	0	377
W (7), pcu/h	0	0	0	0	0	0	0	0
NW (8), pcu/h	0	13	0	0	0	363	0	0
Entry flow, pcu/h	0	306	0	0	0	889	0	385
Conflicting flow, pcu/h	0	437	0	0	0	33	0	367

Results: Approach Measures of Effectiveness

HCM 6th Edition	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	NA	876	NA	NA	NA	1317	NA	934
Entry Flow Rates, vph	NA	303	NA	NA	NA	877	NA	379
V/C ratio		**0.35**				**0.67**		**0.41**
Control Delay, sec/pcu		**8**				**11**		**8**
LOS		A				B		A
95th % Queue (ft)		**39**				**138**		**50**

Notes: v 4.0

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

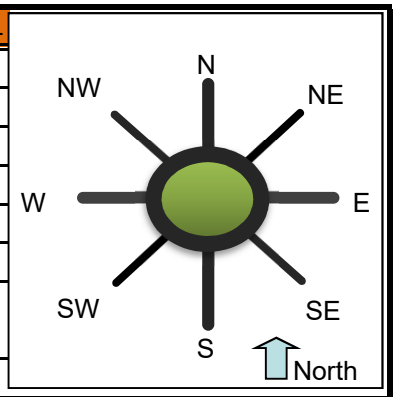
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF						
F_{HV}						
F_{ped}						
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr						
Conflicting Flow, pcu/hr						
Bypass Lane Results (HCM 6th Edition)						
Entry Capacity of Bypass, vph						
Flow Rates of Exiting Traffic, vph						
V/C ratio						
Control Delay, s/veh						
LOS						
95th % Queue (ft)						
Approach w/Bypass Delay, s/veh						
Approach w/Bypass LOS						

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, Saturday
County/District:	
Intersection Name:	Montague Road at Sunderland Road (3-way)



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph								
	NE (2), vph		24				352		4
	E (3), vph								
	SE (4), vph								
	S (5), vph								
	SW (6), vph		269				67		258
	W (7), vph								
	NW (8), vph		8				256		
Output	Total Vehicles	0	301	0	0	0	675	0	262

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	98.8%	100.0%	100.0%	100.0%	96.7%	100.0%	97.3%
% Heavy Vehicles	0.0%	0.5%	0.0%	0.0%	0.0%	2.1%	0.0%	0.5%
% Bicycle	0.0%	**0.7%**	0.0%	0.0%	0.0%	**1.2%**	0.0%	**2.2%**
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.96*	*0.95*	*0.95*	*0.95*	*0.92*	*0.95*	*0.94*
F_{HV}	1.000	0.999	1.000	1.000	1.000	0.985	1.000	1.006
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	0	0	0	0
NE (2), pcu/h	0	25	0	0	0	387	0	4
E (3), pcu/h	0	0	0	0	0	0	0	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	0	0	0	0	0	0	0	0
SW (6), pcu/h	0	282	0	0	0	74	0	274
W (7), pcu/h	0	0	0	0	0	0	0	0
NW (8), pcu/h	0	8	0	0	0	282	0	0
Entry flow, pcu/h	0	315	0	0	0	742	0	279
Conflicting flow, pcu/h	0	355	0	0	0	29	0	381

Results: Approach Measures of Effectiveness

HCM 6th Edition	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	NA	959	NA	NA	NA	1319	NA	942
Entry Flow Rates, vph	NA	315	NA	NA	NA	731	NA	280
V/C ratio		**0.33**				**0.55**		**0.30**
Control Delay, sec/pcu		**7**				**9**		**7**
LOS		A				A		A
95th % Queue (ft)		**36**				**90**		**31**

Notes: v 4.0

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

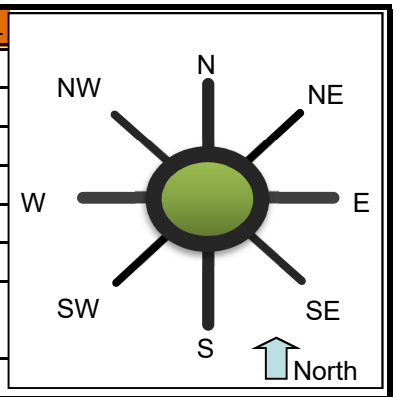
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF						
F_{HV}						
F_{ped}						
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr						
Conflicting Flow, pcu/hr						
Bypass Lane Results (HCM 6th Edition)						
Entry Capacity of Bypass, vph						
Flow Rates of Exiting Traffic, vph						
V/C ratio						
Control Delay, s/veh						
LOS						
95th % Queue (ft)						
Approach w/Bypass Delay, s/veh						
Approach w/Bypass LOS						

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, AM
County/District:	
Intersection Name:	Montague Road at Sunderland Road (4-way)



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph								
	NE (2), vph				28		144		2
	E (3), vph								
	SE (4), vph		28				1		1
	S (5), vph								
	SW (6), vph		366		66				420
	W (7), vph								
	NW (8), vph		5		5		245		
Output	Total Vehicles	0	399	0	99	0	390	0	423

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	98.5%	100.0%	91.4%	100.0%	92.0%	100.0%	96.6%
% Heavy Vehicles	0.0%	1.1%	0.0%	1.9%	0.0%	8.0%	0.0%	2.8%
% Bicycle	0.0%	**0.4%**	0.0%	**6.7%**	0.0%	0.0%	0.0%	**0.6%**
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.96*	*0.95*	*0.77*	*0.95*	*0.83*	*0.95*	*0.88*
F_{HV}	1.000	0.991	1.000	1.015	1.000	0.926	1.000	0.976
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	0	0	0	0
NE (2), pcu/h	0	0	0	36	0	187	0	2
E (3), pcu/h	0	0	0	0	0	0	0	0
SE (4), pcu/h	0	30	0	0	0	1	0	1
S (5), pcu/h	0	0	0	0	0	0	0	0
SW (6), pcu/h	0	386	0	85	0	0	0	490
W (7), pcu/h	0	0	0	0	0	0	0	0
NW (8), pcu/h	0	5	0	6	0	318	0	0
Entry flow, pcu/h	0	421	0	128	0	506	0	493
Conflicting flow, pcu/h	0	409	0	507	0	33	0	500

Results: Approach Measures of Effectiveness

HCM 6th Edition	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	NA	901	NA	835	NA	1235	NA	808
Entry Flow Rates, vph	NA	417	NA	129	NA	468	NA	481
V/C ratio		**0.46**		**0.15**		**0.38**		**0.60**
Control Delay, sec/pcu		**10**		**6**		**7**		**14**
LOS		A		A		A		B
95th % Queue (ft)		**63**		**13**		**49**		**103**

Notes:

v 4.0

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

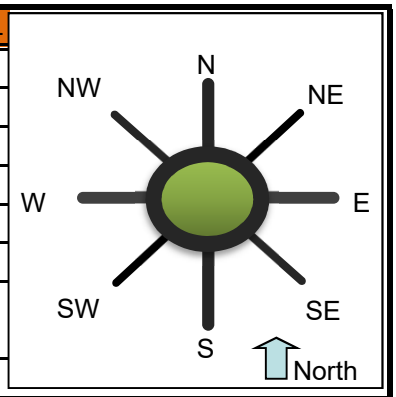
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF						
F_{HV}						
F_{ped}						
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr						
Conflicting Flow, pcu/hr						
Bypass Lane Results (HCM 6th Edition)						
Entry Capacity of Bypass, vph						
Flow Rates of Exiting Traffic, vph						
V/C ratio						
Control Delay, s/veh						
LOS						
95th % Queue (ft)						
Approach w/Bypass Delay, s/veh						
Approach w/Bypass LOS						

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, PM
County/District:	
Intersection Name:	Montague Road at Sunderland Road (4-way)



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph								
	NE (2), vph				37		396		3
	E (3), vph								
	SE (4), vph		13				9		3
	S (5), vph								
	SW (6), vph		265		61				318
	W (7), vph								
	NW (8), vph		6		6		326		
Output	Total Vehicles	0	284	0	104	0	731	0	324

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	99.4%	100.0%	79.5%	100.0%	98.9%	100.0%	98.4%
% Heavy Vehicles	0.0%	0.6%	0.0%	0.8%	0.0%	1.1%	0.0%	1.6%
% Bicycle	0.0%	0.0%	0.0%	19.7%	0.0%	0.0%	0.0%	0.0%
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.90*	*0.95*	*0.82*	*0.95*	*0.87*	*0.95*	*0.86*
F_{HV}	1.000	0.994	1.000	1.100	1.000	0.989	1.000	0.984
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	0	0	0	0
NE (2), pcu/h	0	0	0	41	0	459	0	4
E (3), pcu/h	0	0	0	0	0	0	0	0
SE (4), pcu/h	0	15	0	0	0	10	0	4
S (5), pcu/h	0	0	0	0	0	0	0	0
SW (6), pcu/h	0	298	0	67	0	0	0	377
W (7), pcu/h	0	0	0	0	0	0	0	0
NW (8), pcu/h	0	7	0	7	0	378	0	0
Entry flow, pcu/h	0	319	0	115	0	848	0	385
Conflicting flow, pcu/h	0	452	0	841	0	22	0	380

Results: Approach Measures of Effectiveness

HCM 6th Edition	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	NA	865	NA	644	NA	1335	NA	922
Entry Flow Rates, vph	NA	317	NA	126	NA	838	NA	379
V/C ratio		**0.37**		**0.20**		**0.63**		**0.41**
Control Delay, sec/pcu		**8**		**8**		**10**		**9**
LOS		A		A		B		A
95th % Queue (ft)		**43**		**16**		**119**		**52**

Notes: v 4.0

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

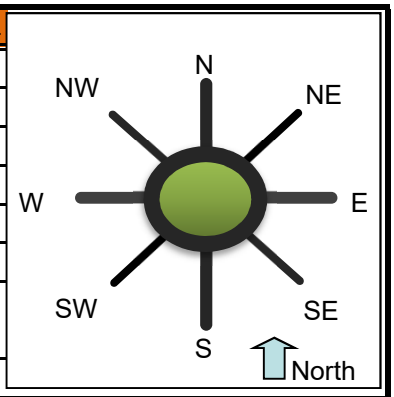
Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF						
F_{HV}						
F_{ped}						
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr						
Conflicting Flow, pcu/hr						
Bypass Lane Results (HCM 6th Edition)						
Entry Capacity of Bypass, vph						
Flow Rates of Exiting Traffic, vph						
V/C ratio						
Control Delay, s/veh						
LOS						
95th % Queue (ft)						
Approach w/Bypass Delay, s/veh						
Approach w/Bypass LOS						

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, Saturday
County/District:	
Intersection Name:	Montague Road at Sunderland Road (4-way)



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph								
	NE (2), vph				37		341		2
	E (3), vph								
	SE (4), vph		13				10		2
	S (5), vph								
	SW (6), vph		284		63				258
	W (7), vph								
	NW (8), vph		4		4		256		
Output	Total Vehicles	0	301	0	104	0	607	0	262

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	99.4%	100.0%	79.5%	100.0%	98.9%	100.0%	98.4%
% Heavy Vehicles	0.0%	0.6%	0.0%	0.8%	0.0%	1.1%	0.0%	1.6%
% Bicycle	0.0%	0.0%	0.0%	19.7%	0.0%	0.0%	0.0%	0.0%
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.90*	*0.95*	*0.82*	*0.95*	*0.87*	*0.95*	*0.86*
F_{HV}	1.000	0.994	1.000	1.100	1.000	0.989	1.000	0.984
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	0	0	0	0	0	0
NE (2), pcu/h	0	0	0	41	0	395	0	2
E (3), pcu/h	0	0	0	0	0	0	0	0
SE (4), pcu/h	0	15	0	0	0	12	0	2
S (5), pcu/h	0	0	0	0	0	0	0	0
SW (6), pcu/h	0	319	0	70	0	0	0	306
W (7), pcu/h	0	0	0	0	0	0	0	0
NW (8), pcu/h	0	4	0	4	0	297	0	0
Entry flow, pcu/h	0	338	0	115	0	704	0	311
Conflicting flow, pcu/h	0	371	0	695	0	19	0	403

Results: Approach Measures of Effectiveness

HCM 6th Edition	N	NE	E	SE	S	SW	W	NW
Entry Capacity, vph	NA	940	NA	747	NA	1338	NA	900
Entry Flow Rates, vph	NA	336	NA	126	NA	696	NA	306
V/C ratio		**0.36**		**0.17**		**0.52**		**0.34**
Control Delay, sec/pcu		**8**		**7**		**8**		**8**
LOS		A		A		A		A
95th % Queue (ft)		**41**		**14**		**79**		**38**

Notes: v 4.0

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF						
F_{HV}						
F_{ped}						
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow, pcu/hr						
Conflicting Flow, pcu/hr						
Bypass Lane Results (HCM 6th Edition)						
Entry Capacity of Bypass, vph						
Flow Rates of Exiting Traffic, vph						
V/C ratio						
Control Delay, s/veh						
LOS						
95th % Queue (ft)						
Approach w/Bypass Delay, s/veh						
Approach w/Bypass LOS						

Georgia Department of Transportation

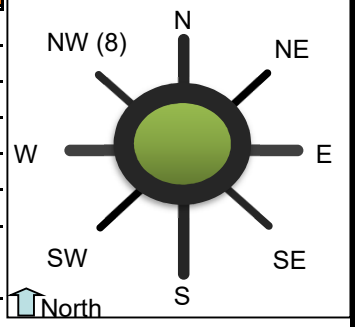
Roundabout Analysis Tool
Multi-Lane

2/15/2019
Version 4.1

General & Site Information

v 4.1

Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, AM
County/District:	
Intersection:	North Pleasant Street at Pine Street and Meadow Street



Volumes

Volumes	Entry Legs (FROM)							
	N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation	Left-Thru	Right-Thru	SELECT	SELECT	Left-Thru	Right only	SELECT	SELECT
N (1), vph						232		
NE (2), vph								
E (3), vph	173							
SE (4), vph								
S (5), vph	221	274			58			
SW (6), vph								
W (7), vph		171			165			
NW (8), vph								
Entry Volume, vph	394	445	0	0	223	232	0	0

Exit Legs (TO)

	S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation	Left-Thru	Right-Thru	SELECT	SELECT	Lf-Th-Rt	SELECT	SELECT	SELECT
N (1), vph	43	90			101			
NE (2), vph								
E (3), vph		18			108			
SE (4), vph								
S (5), vph					70			
SW (6), vph								
W (7), vph	53							
NW (8), vph								
Entry Volume, vph	96	108	0	0	279	0	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	1	0
# of Conflict Flow Lanes	2	2	2	2	2	2	2	2

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Heavy Vehicles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Bicycles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
F_{hv}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows		N	NE	E	SE	S	SW	W	NW
Flow to	N (1), pcu/h	0	0	244	0	140	0	106	0

Leg #								
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	182	0	0	0	19	0	114	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	521	0	61	0	0	0	74	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	180	0	174	0	56	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	883	0	479	0	215	0	294	0
Entry flow Lane 1, pcu/h	415	0	235	0	101	0	294	0
Entry flow Lane 2, pcu/h	468	0	244	0	114	0	0	0
Conflicting flow, pcu/h	291	0	302	0	402	0	764	0

Results: Approach Measures of Effectiveness

HCM 6th Edition	N		E		S		W	
Lane Designations	*Left-Thru*	*Right-Thru*	*Left-Thru*	*Right only*	*Left-Thru*	*Right-Thru*	*Lf-Th-Rt*	*Lane 2*
Entry Capacity, veh/h	1033	1109	1022	1098	933	1009	742	NA
Entry Flow Rates, veh/h	415	468	235	244	101	114	294	NA
V/C ratio	**0.40**	**0.42**	**0.23**	**0.22**	**0.11**	**0.11**	**0.40**	
Control Delay, s/veh	**7.8**	**7.7**	**5.7**	**5.3**	**4.9**	**4.6**	**10.0**	
LOS	A	A	A	A	A	A	A	
95th % Queue (ft)	**49**	**53**	**22**	**21**	**9**	**9**	**48**	
Approach Delay, LOS	7.8 sec, LOS A		5.5 sec, LOS A		4.7 sec, LOS A		10 sec, LOS A	

	NE		SE		SW		NW	
Lane Designations	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio			#VALUE!	#VALUE!			#VALUE!	#VALUE!
Control Delay, sec/pcu			#VALUE!	#VALUE!			#VALUE!	#VALUE!
LOS			#VALUE!	#VALUE!			#VALUE!	#VALUE!
95th % Queue (ft)			#VALUE!	#VALUE!			#VALUE!	#VALUE!
Approach Delay, LOS			#N/A				#N/A	

v 4.0

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	**2**	**2**	**2**	**2**	**2**	**2**
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						

F_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

Georgia Department of Transportation

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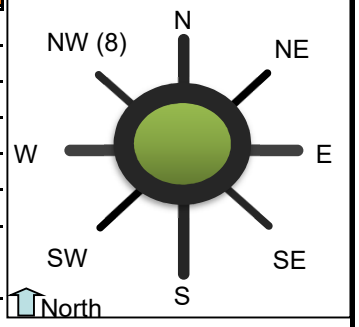

Volumes

Volumes	Entry Legs (FROM)							
	N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation	Left-Thru	Right-Thru	SELECT	SELECT	Left-Thru	Right only	SELECT	SELECT
N (1), vph						229		
NE (2), vph								
E (3), vph	126							
SE (4), vph								
S (5), vph	172	261			184			
SW (6), vph								
W (7), vph		74			175			
NW (8), vph								
Entry Volume, vph	298	335	0	0	359	229	0	0

Exit Legs (TO)

	S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation	Left-Thru	Right-Thru	SELECT	SELECT	Lf-Th-Rt	No Lane	SELECT	SELECT
N (1), vph	128	260			210			
NE (2), vph								
E (3), vph		148			139			
SE (4), vph								
S (5), vph					187			
SW (6), vph								
W (7), vph	233							
NW (8), vph								
Entry Volume, vph	361	408	0	0	536	0	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	1	0
# of Conflict Flow Lanes	1	2	2	2	1	2	2	2

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	95.4%	100.0%	97.8%	100.0%	98.1%	100.0%	97.5%	100.0%
% Heavy Vehicles	2.3%	0.0%	1.9%	0.0%	1.5%	0.0%	1.9%	0.0%
% Bicycles	2.3%	0.0%	0.3%	0.0%	0.4%	0.0%	0.6%	0.0%
# of Pedestrians **(ped/hr)**	3	0	7	0	9	0	19	0
PHF	*0.89*	*0.95*	*0.94*	*0.95*	*0.87*	*0.95*	*0.90*	*0.95*
F_{hv}	0.989	1.000	0.983	1.000	0.987	1.000	0.984	1.000
F_{ped}	0.999	1.000	1.000	1.000	0.995	1.000	0.997	1.000

Entry/Conflicting Flows		N	NE	E	SE	S	SW	W	NW
Flow to	N (1), pcu/h	0	0	248	0	452	0	237	0

Leg #								
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	143	0	0	0	172	0	157	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	492	0	199	0	0	0	211	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	84	0	189	0	271	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	719	0	636	0	895	0	605	0
Entry flow Lane 1, pcu/h	339	0	389	0	420	0	605	0
Entry flow Lane 2, pcu/h	381	0	248	0	475	0	0	0
Conflicting flow, pcu/h	660	0	960	0	537	0	834	0

Results: Approach Measures of Effectiveness

HCM 6th Edition	N		E		S		W	
Lane Designations	*Left-Thru*	*Right-Thru*	*Left-Thru*	*Right only*	*Left-Thru*	*Right-Thru*	*Lf-Th-Rt*	*No Lane*
Entry Capacity, veh/h	769	769	548	617	855	855	686	NA
Entry Flow Rates, veh/h	335	376	382	244	415	469	596	NA
V/C ratio	**0.44**	**0.49**	**0.70**	**0.39**	**0.49**	**0.55**	**0.87**	
Control Delay, s/veh	**10.4**	**11.5**	**23.7**	**11.6**	**10.5**	**11.9**	**34.1**	
LOS	B	B	C	B	B	B	D	
95th % Queue (ft)	**56**	**69**	**139**	**48**	**68**	**86**	**263**	
Approach Delay, LOS	11 sec, LOS B		19 sec, LOS C		11.3 sec, LOS B		34.1 sec, LOS D	

	NE		SE		SW		NW	
Lane Designations	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio			#VALUE!	#VALUE!			#VALUE!	#VALUE!
Control Delay, sec/pcu			#VALUE!	#VALUE!			#VALUE!	#VALUE!
LOS			#VALUE!	#VALUE!			#VALUE!	#VALUE!
95th % Queue (ft)			#VALUE!	#VALUE!			#VALUE!	#VALUE!
Approach Delay, LOS			#N/A				#N/A	

v 4.0

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	**2**	**2**	**2**	**2**	**2**	**2**
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						

F_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

Georgia Department of Transportation

Roundabout Analysis Tool
Multi-Lane

2/15/2019
Version 4.1

General & Site Information

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Analyst:	Connor Lauzon
Agency/Co:	CDM Smith
Date:	12/3/2018
Project or PI#:	North Amherst Updated Analysis
Year, Peak Hour:	2038, Saturday
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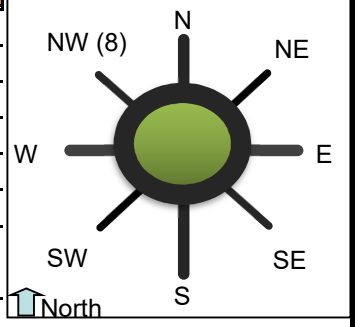
Intersection:	North Pleasant Street at Pine Street and Meadow Street



Volumes

Entry Legs (FROM)

	N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT
Exit Legs (TO) N (1), vph						238		
NE (2), vph								
E (3), vph	182							
SE (4), vph								
S (5), vph	97	144			42			
SW (6), vph								
W (7), vph		171			190			
NW (8), vph								
Entry Volume, vph	279	315	0	0	232	238	0	0

	S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT	SELECT
N (1), vph	81	174			210			
NE (2), vph								
E (3), vph		26			142			
SE (4), vph								
S (5), vph					96			
SW (6), vph								
W (7), vph	97							
NW (8), vph								
Entry Volume, vph	178	200	0	0	448	0	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	1	0
# of Conflict Flow Lanes	2	2	2	2	2	2	2	2

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Heavy Vehicles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Bicycles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
# of Pedestrians **(ped/hr)**	0	0	0	0	0	0	0	0
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
F_{hv}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
F_{ped}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	251	0	268	0	221	0

Leg #								
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	192	0	0	0	27	0	149	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	254	0	44	0	0	0	101	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	180	0	200	0	102	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	625	0	495	0	398	0	472	0
Entry flow Lane 1, pcu/h	294	0	244	0	187	0	472	0
Entry flow Lane 2, pcu/h	332	0	251	0	211	0	0	0
Conflicting flow, pcu/h	346	0	592	0	562	0	489	0

Results: Approach Measures of Effectiveness

HCM 6th Edition	N		E		S		W	
Lane Designations	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*
Entry Capacity, veh/h	982	1058	783	859	805	881	937	NA
Entry Flow Rates, veh/h	294	332	244	251	187	211	472	NA
V/C ratio	**0.30**	**0.31**	**0.31**	**0.29**	**0.23**	**0.24**	**0.50**	
Control Delay, s/veh	**6.7**	**6.5**	**8.2**	**7.4**	**7.0**	**6.6**	**10.2**	
LOS	A	A	A	A	A	A	B	
95th % Queue (ft)	**32**	**34**	**33**	**30**	**22**	**23**	**72**	
Approach Delay, LOS	6.6 sec, LOS A		7.8 sec, LOS A		6.8 sec, LOS A		10.2 sec, LOS B	
	NE		**SE**		**SW**		**NW**	
Lane Designations	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*	*Lane 1*	*Lane 2*
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio			#VALUE!	#VALUE!			#VALUE!	#VALUE!
Control Delay, sec/pcu			#VALUE!	#VALUE!			#VALUE!	#VALUE!
LOS			#VALUE!	#VALUE!			#VALUE!	#VALUE!
95th % Queue (ft)			#VALUE!	#VALUE!			#VALUE!	#VALUE!
Approach Delay, LOS			#N/A				#N/A	

v 4.0

Bypass Lane Merge Point Analysis (if applicable)

Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	**2**	**2**	**2**	**2**	**2**	**2**
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						

F_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

Appendix H-a

Sidra Analysis: Existing

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	48	4.7	231	0.207	100	22.0	LOS C	1.3	34.2	Short	100	0.0	NA
Lane 2	120	3.8	704	0.170	100	13.3	LOS B	2.6	66.0	Full	1600	0.0	0.0
Lane 3	24	0.0	1180	0.020	100	0.6	LOS A	0.1	2.8	Short	100	0.0	NA
Approach	192	3.5		0.207		13.9	LOS B	2.6	66.0				
East: Pine Street													
Lane 1	435	1.2	778	0.559	100	11.1	LOS B	9.3	233.8	Full	1600	0.0	0.0
Approach	435	1.2		0.559		11.1	LOS B	9.3	233.8				
North: North Pleasant Street													
Lane 1	160	2.4	481	0.332	100	15.7	LOS B	3.9	99.1	Short	100	0.0	NA
Lane 2	429	3.2	577[1]	0.744	100	21.0	LOS C	12.8	329.1	Full	150	0.0	78.3
Lane 3	155	1.8	1119	0.139	100	0.8	LOS A	0.9	22.9	Short	100	0.0	NA
Approach	744	2.7		0.744		15.6	LOS B	12.8	329.1				
West: Meadow Street													
Lane 1	302	3.6	616	0.490	100	12.7	LOS B	6.8	175.0	Full	1600	0.0	0.0
Approach	302	3.6		0.490		12.7	LOS B	6.8	175.0				
Intersection	1673	2.6		0.744		13.7	LOS B	12.8	329.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

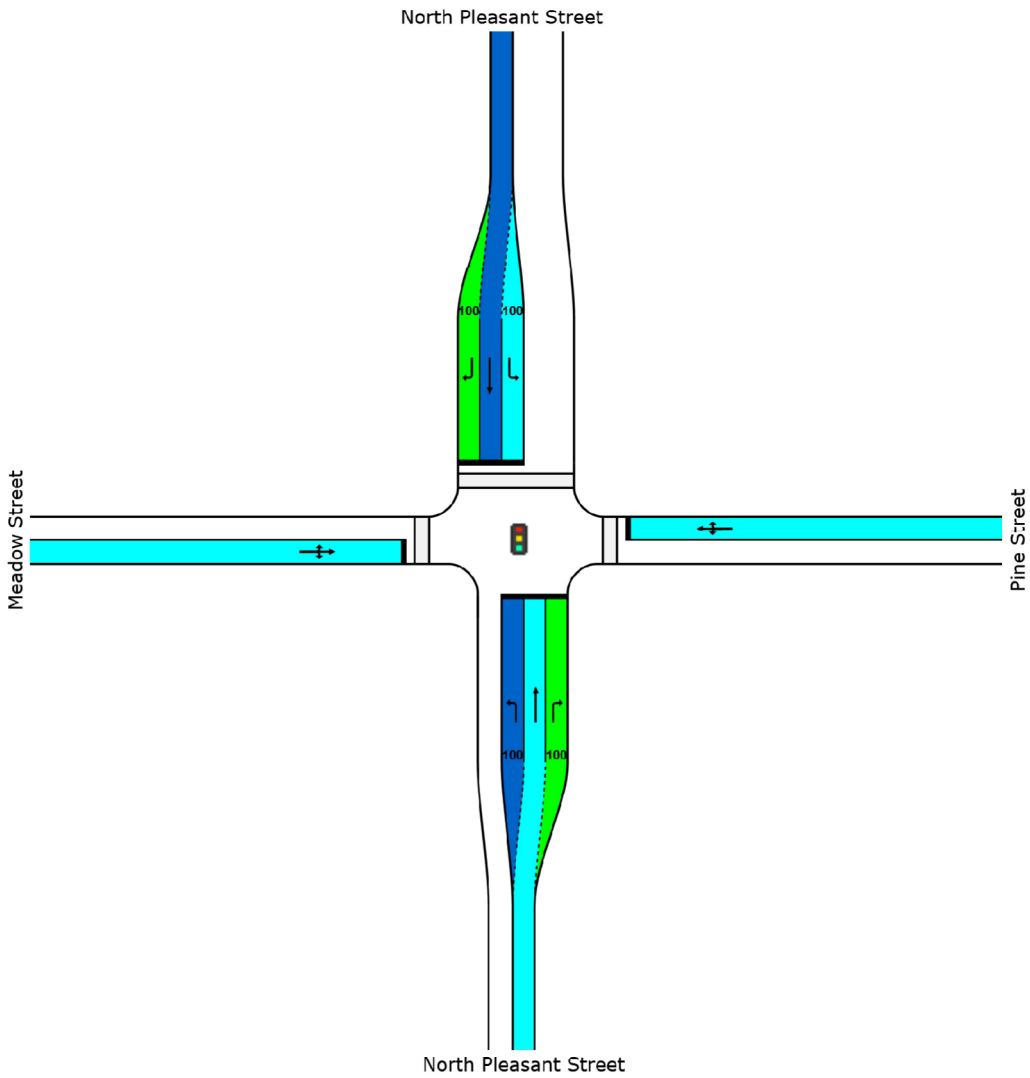
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	B	B	B	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

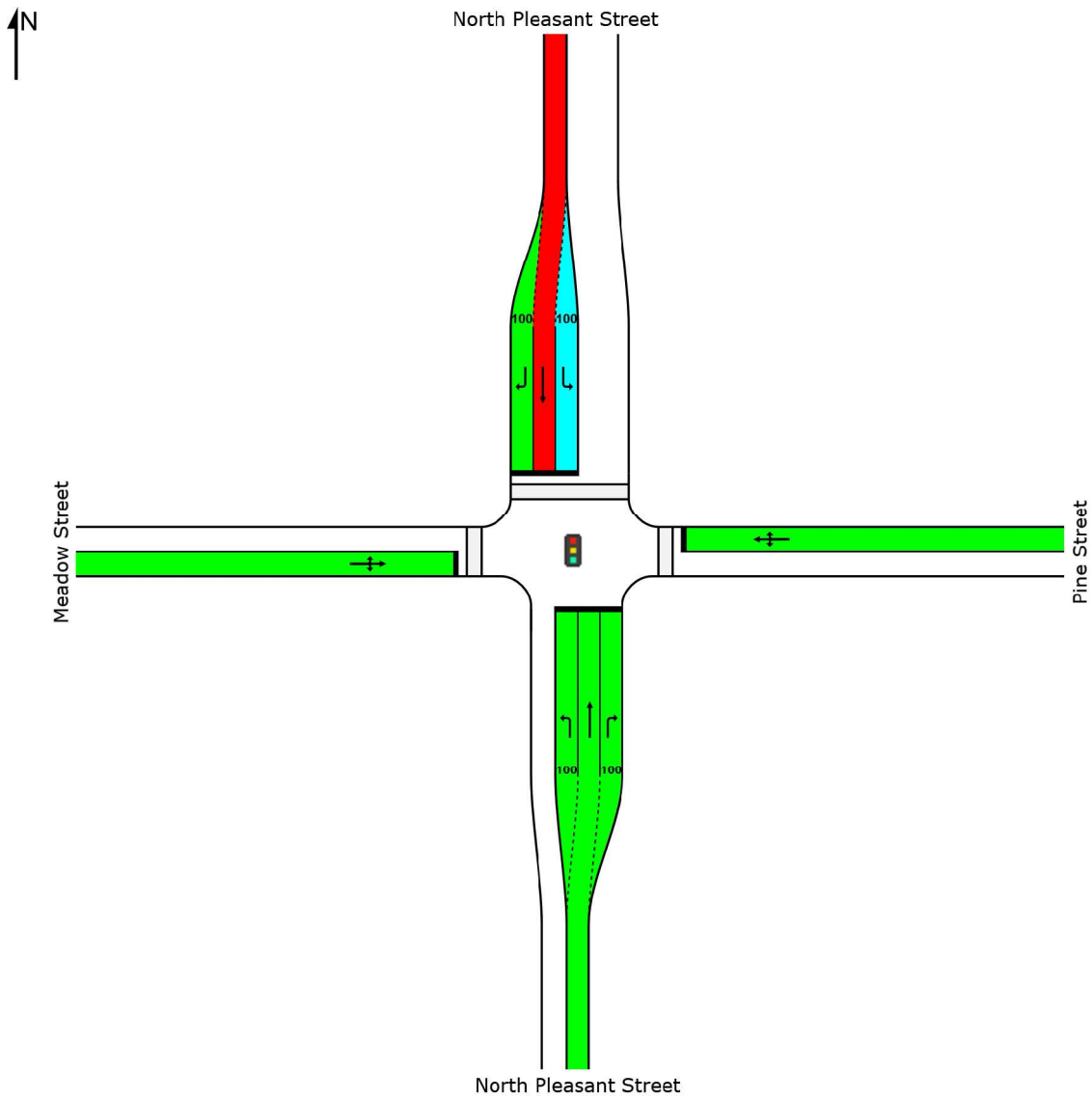
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	40	143	202	107	202



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	218	0.5	1891	0.116	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 2	182	3.2	1164	0.157	100	4.4	LOS A	0.9	22.8	Short	75	0.0	NA
Approach	401	1.7		0.157		2.0	LOS A	0.9	22.8				
NorthEast: Montague Road													
Lane 1	347	0.7	401	0.865	100	50.1	LOS F	12.7	318.9	Full	1600	0.0	0.0
Approach	347	0.7		0.865		50.1	LOS F	12.7	318.9				
North: Sunderland Road													
Lane 1	375	2.7	1828	0.205	100	1.7	LOS A	0.1	1.8	Full	1600	0.0	0.0
Approach	375	2.7		0.205		1.7	NA	0.1	1.8				
Intersection	1123	1.7		0.865		16.8	NA	12.7	318.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

AM PEAK

LANE LEVEL OF SERVICE

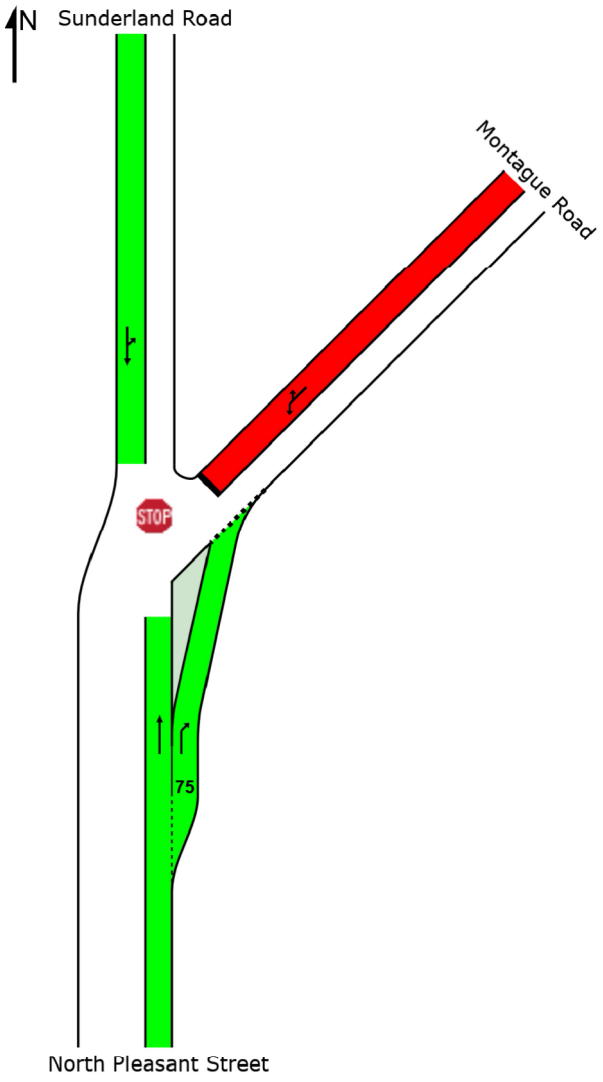
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
LOS	A	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

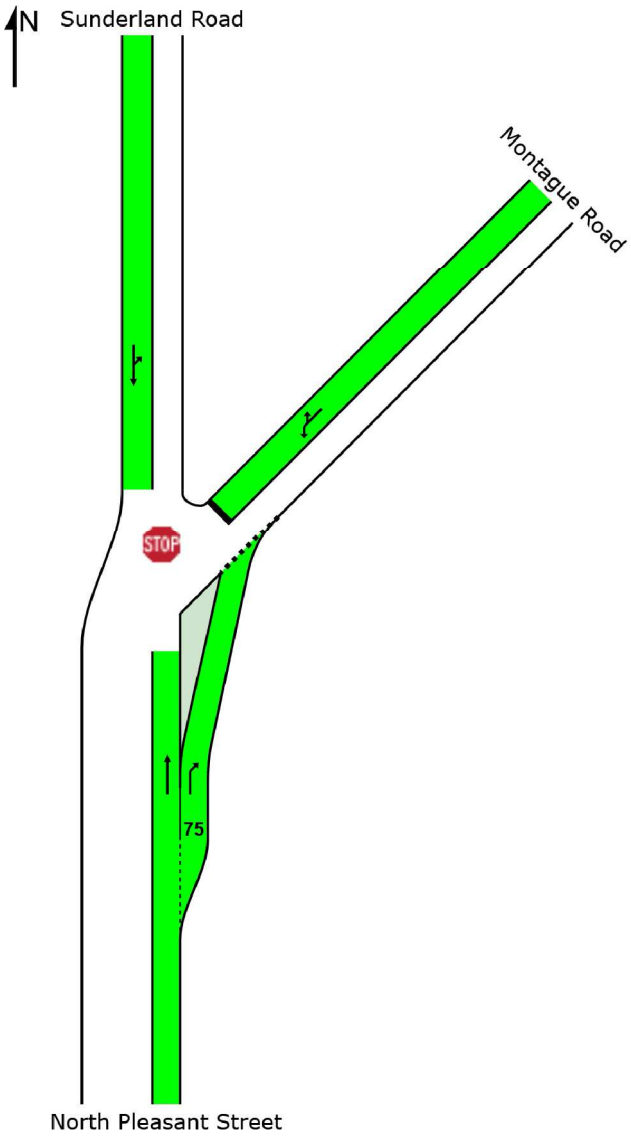
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
Queue Distance (Aver)	9	128	1	128



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	214	0.0	312	0.686	100	27.9	LOS C	7.1	176.6	Short	100	0.0	NA
Lane 2	333	3.1	578[1]	0.576	100	16.2	LOS B	8.7	222.7	Full	1600	0.0	0.0
Lane 3	133	1.7	1139	0.117	100	0.9	LOS A	0.8	20.7	Short	100	0.0	NA
Approach	680	1.8		0.686		16.9	LOS B	8.7	222.7				
East: Pine Street													
Lane 1	545	2.7	617	0.883	100	31.2	LOS C	19.8	506.8	Full	1600	0.0	0.0
Approach	545	2.7		0.883		31.2	LOS C	19.8	506.8				
North: North Pleasant Street													
Lane 1	115	4.6	290	0.395	100	20.4	LOS C	3.2	82.6	Short	100	0.0	NA
Lane 2	364	1.3	616[1]	0.590	100	16.6	LOS B	9.7	243.9	Full	150	0.0	49.7
Lane 3	53	5.1	1061	0.050	100	1.0	LOS A	0.3	8.6	Short	100	0.0	NA
Approach	531	2.4		0.590		15.8	LOS B	9.7	243.9				
West: Meadow Street													
Lane 1	487	1.4	549	0.887	100	33.8	LOS C	18.0	454.2	Full	1600	0.0	0.0
Approach	487	1.4		0.887		33.8	LOS C	18.0	454.2				
Intersection	2243	2.1		0.887		23.8	LOS C	19.8	506.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

PM PEAK

LANE LEVEL OF SERVICE

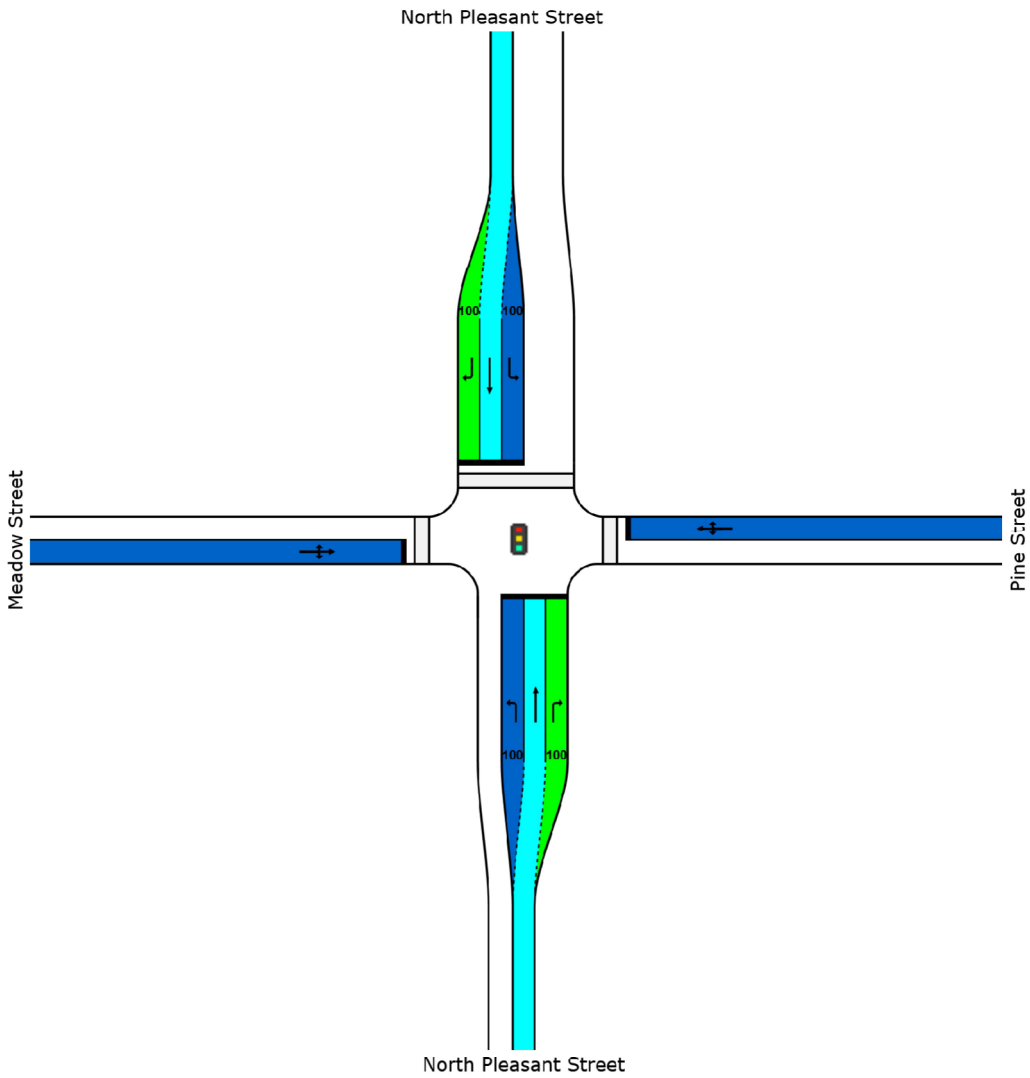
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	B	C	B	C	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

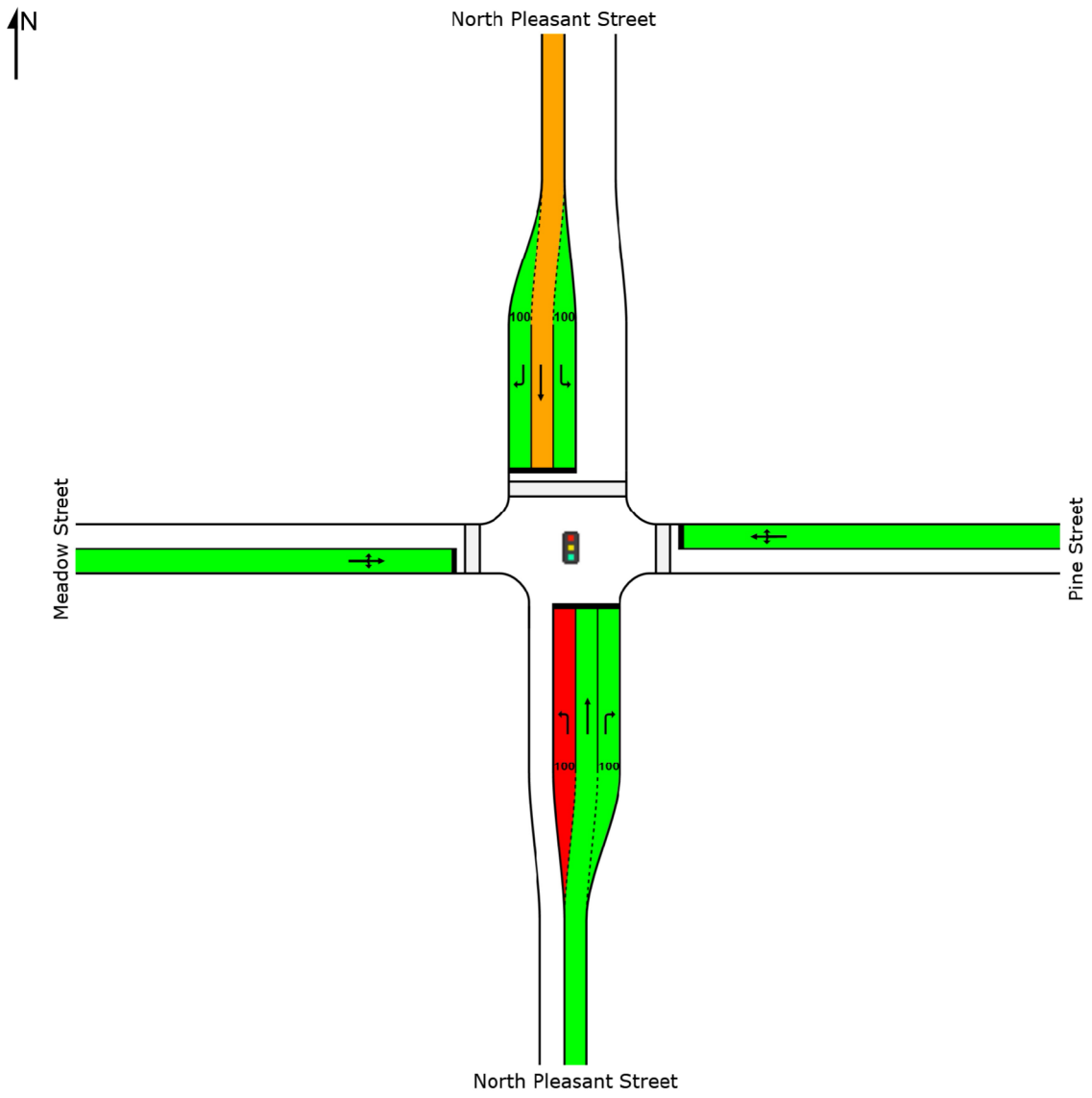
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	136	311	149	278	311



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	274	0.8	1885	0.146	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 2	396	2.0	1173	0.338	100	6.3	LOS A	2.4	62.2	Short	75	0.0	NA
Approach	671	1.5		0.338		3.7	LOS A	2.4	62.2				
NorthEast: Montague Road													
Lane 1	270	0.8	372	0.727	100	36.6	LOS E	7.0	176.3	Full	1600	0.0	0.0
Approach	270	0.8		0.727		36.6	LOS E	7.0	176.3				
North: Sunderland Road													
Lane 1	286	1.7	1837	0.156	100	1.3	LOS A	0.1	1.8	Full	1600	0.0	0.0
Approach	286	1.7		0.156		1.3	NA	0.1	1.8				
Intersection	1227	1.4		0.727		10.4	NA	7.0	176.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

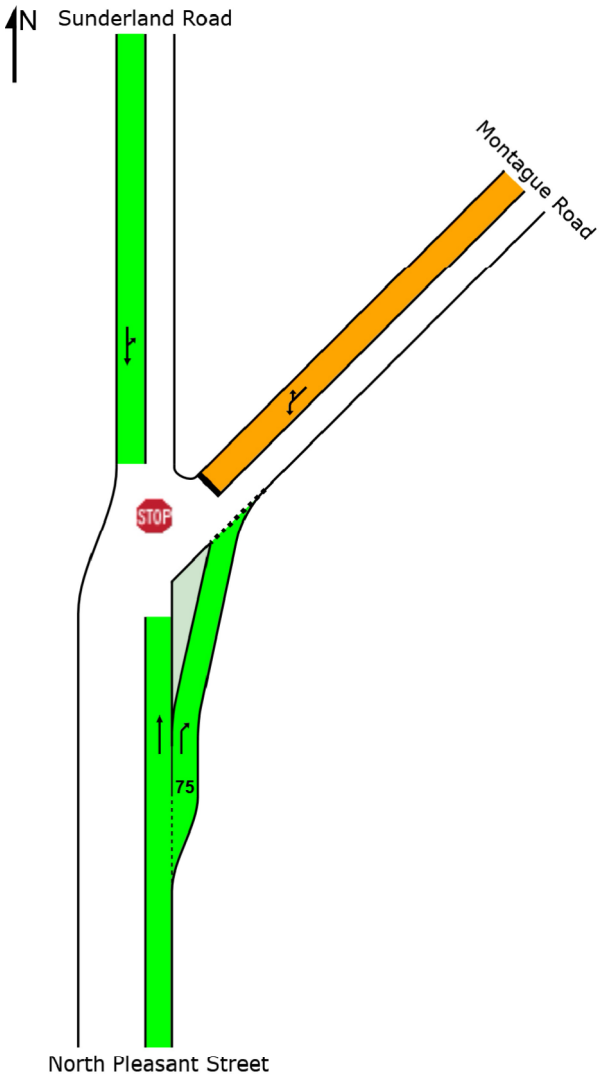
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
LOS	A	E	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

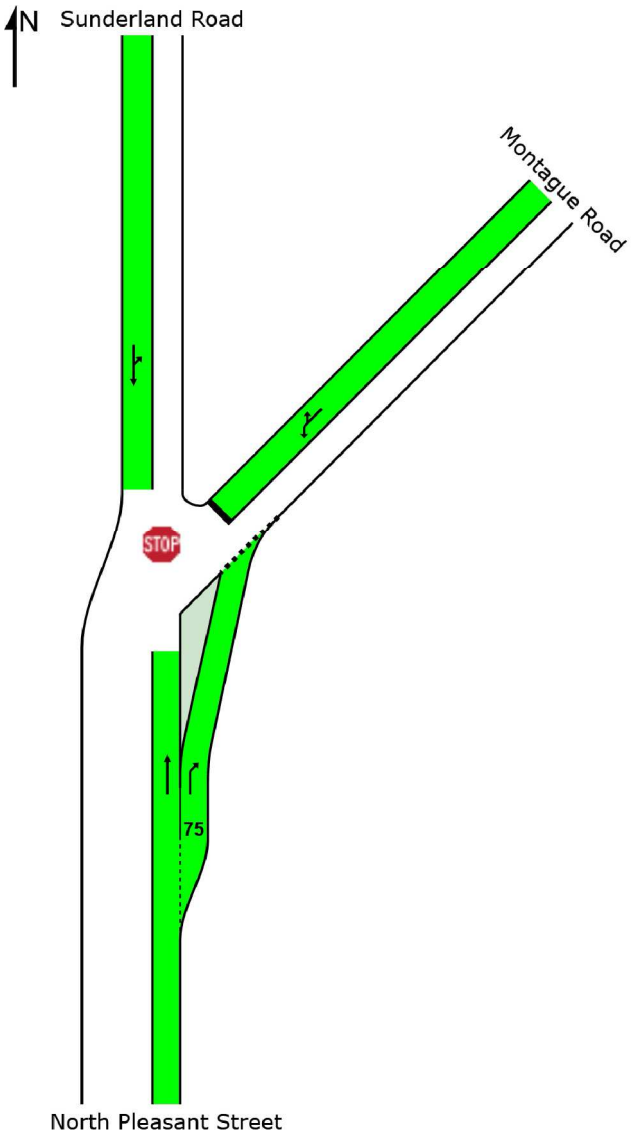
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
Queue Distance (Aver)	25	71	1	71



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	105	1.3	382	0.276	100	17.3	LOS B	2.6	66.5	Short	100	0.0	NA
Lane 2	232	3.4	707	0.329	100	14.3	LOS B	5.4	138.5	Full	1600	0.0	0.0
Lane 3	30	2.7	1136	0.026	100	0.7	LOS A	0.2	3.9	Short	100	0.0	NA
Approach	367	2.7		0.329		14.1	LOS B	5.4	138.5				
East: Pine Street													
Lane 1	516	2.9	781	0.661	100	12.4	LOS B	12.3	315.5	Full	1600	0.0	0.0
Approach	516	2.9		0.661		12.4	LOS B	12.3	315.5				
North: North Pleasant Street													
Lane 1	168	0.5	405	0.415	100	18.4	LOS B	4.5	112.6	Short	100	0.0	NA
Lane 2	212	0.4	728	0.292	100	14.0	LOS B	4.8	120.9	Full	150	0.0	0.0
Lane 3	171	0.9	1095	0.156	100	1.0	LOS A	1.1	27.8	Short	100	0.0	NA
Approach	551	0.6		0.415		11.3	LOS B	4.8	120.9				
West: Meadow Street													
Lane 1	399	1.3	494	0.807	100	26.8	LOS C	13.3	336.2	Full	1600	0.0	0.0
Approach	399	1.3		0.807		26.8	LOS C	13.3	336.2				
Intersection	1834	1.8		0.807		15.5	LOS B	13.3	336.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SATURDAY PEAK

LANE LEVEL OF SERVICE

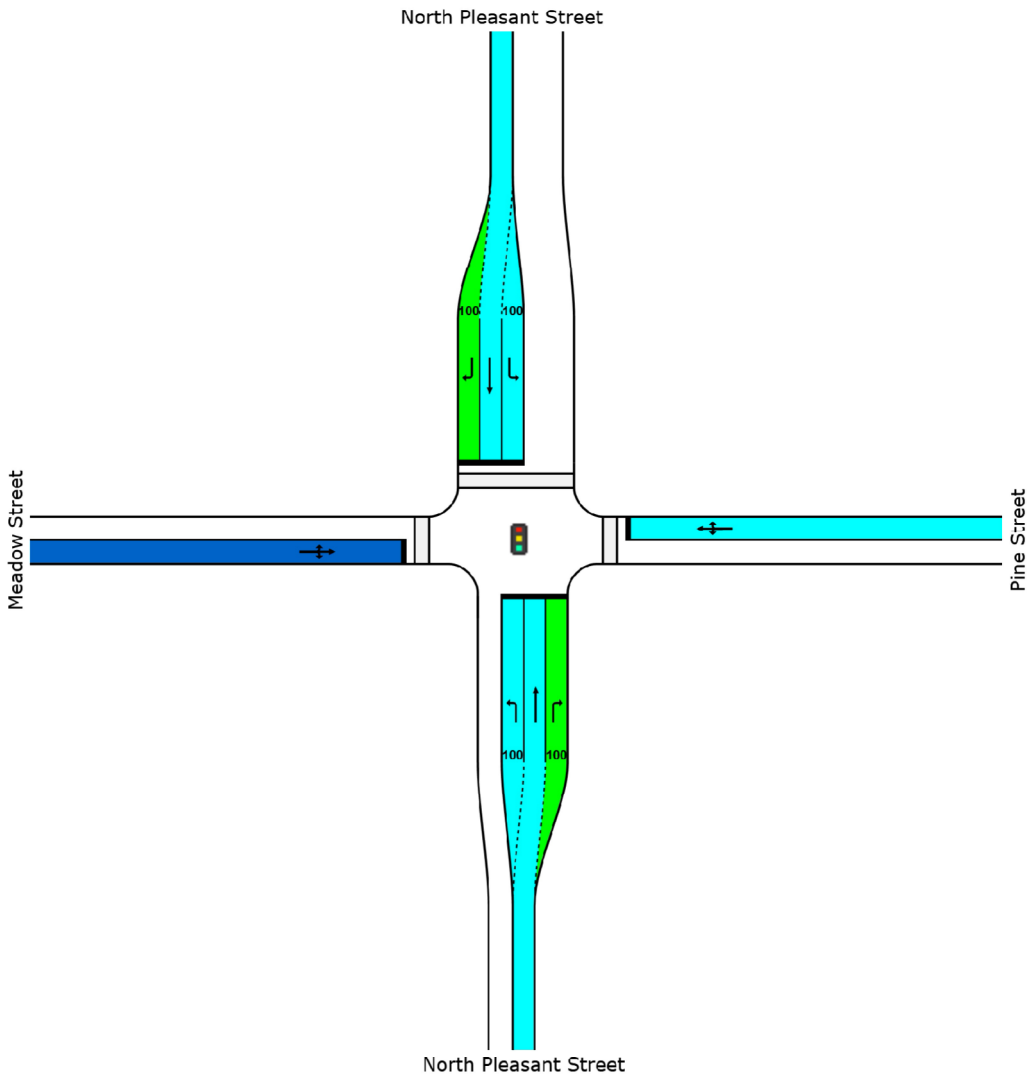
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	B	B	B	C	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

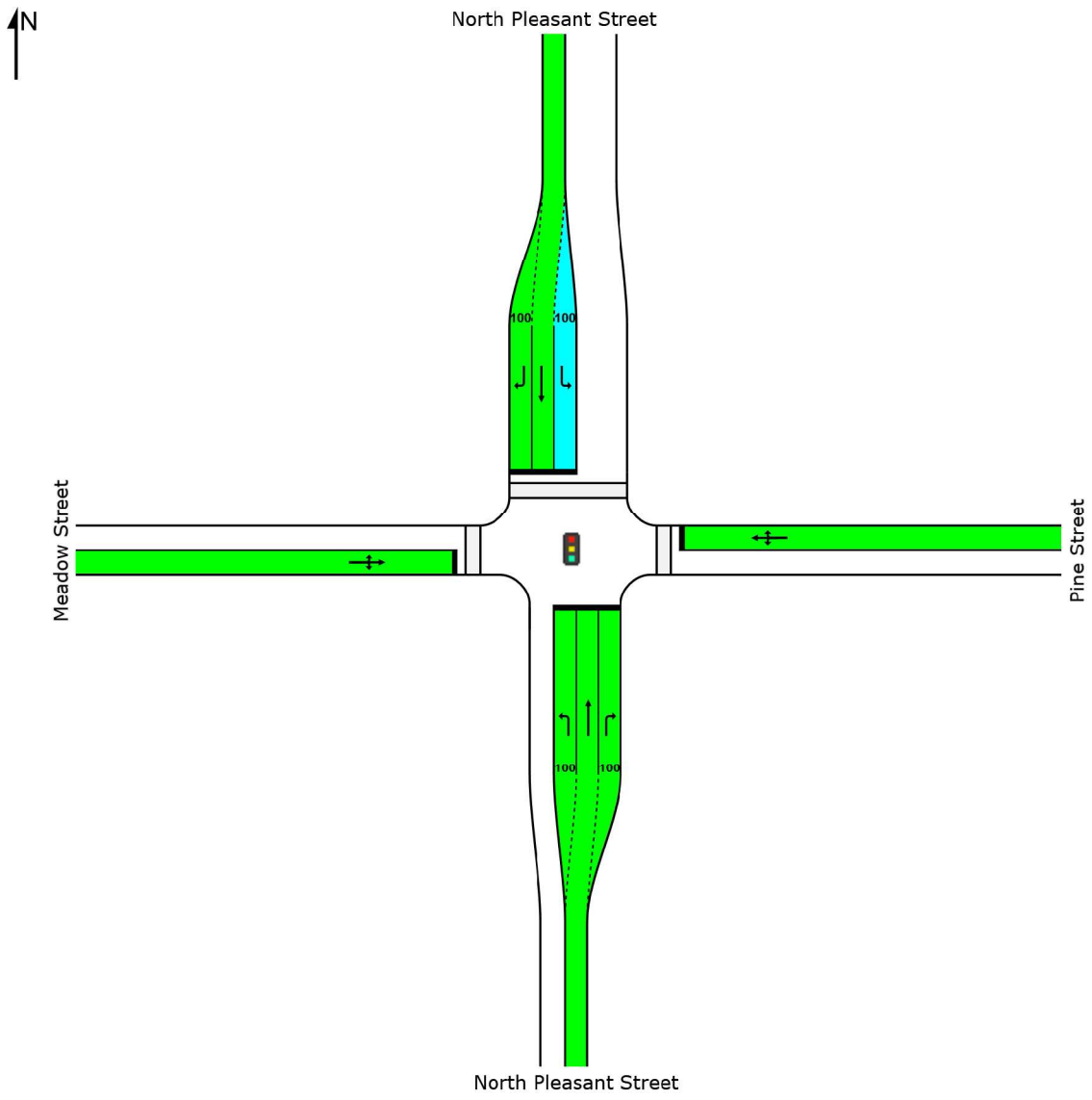
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	85	193	74	206	206



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	269	3.7	1832	0.147	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 2	398	2.2	1178	0.338	100	6.3	LOS A	2.4	62.3	Short	75	0.0	NA
Approach	666	2.8		0.338		3.8	LOS A	2.4	62.3				
NorthEast: Montague Road													
Lane 1	325	0.5	394	0.823	100	44.8	LOS E	10.5	264.7	Full	1600	0.0	0.0
Approach	325	0.5		0.823		44.8	LOS E	10.5	264.7				
North: Sunderland Road													
Lane 1	231	0.5	1870	0.124	100	1.0	LOS A	0.0	0.9	Full	1600	0.0	0.0
Approach	231	0.5		0.124		1.0	NA	0.0	0.9				
Intersection	1222	1.8		0.823		14.1	NA	10.5	264.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

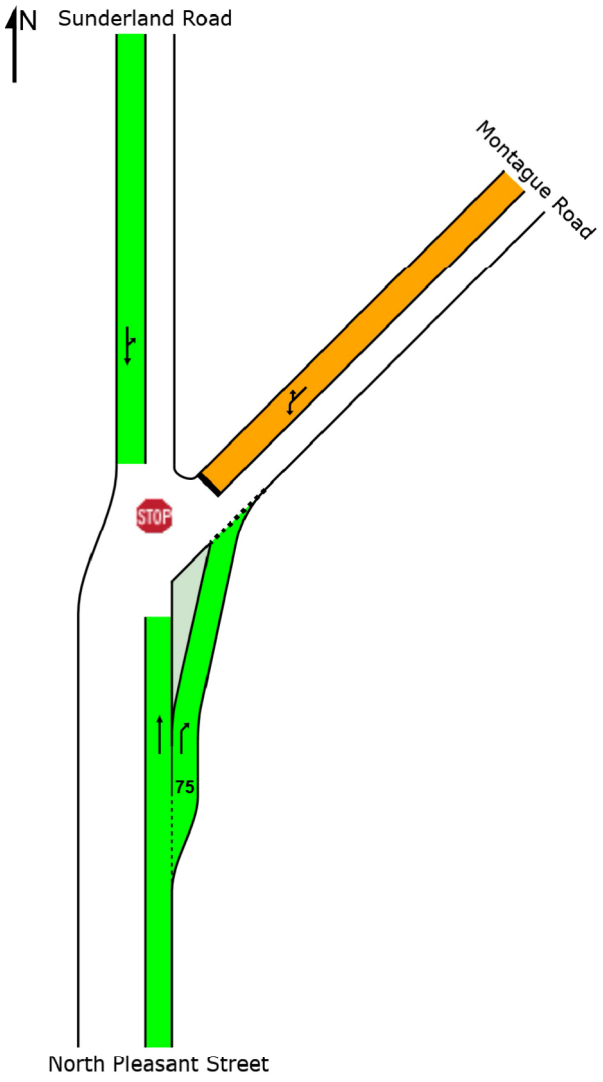
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
LOS	A	E	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

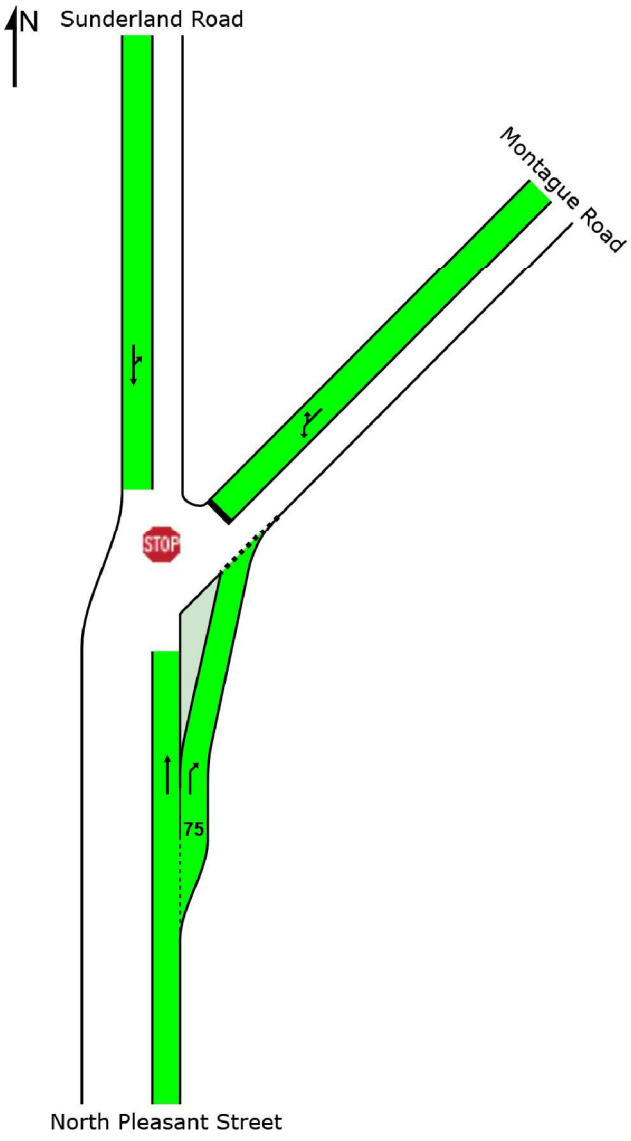
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
Queue Distance (Aver)	25	106	0	106



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Appendix H-b

Sidra Analysis: No-Build

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	59	4.7	108	0.546	100	35.7	LOS D	2.1	54.0	Short	100	0.0	NA
Lane 2	175	3.8	704	0.249	100	13.7	LOS B	3.9	100.2	Full	1600	0.0	0.0
Lane 3	29	0.0	1158	0.025	100	0.8	LOS A	0.2	4.1	Short	100	0.0	NA
Approach	263	3.6		0.546		17.3	LOS B	3.9	100.2				
East: Pine Street													
Lane 1	540	1.2	757	0.714	100	16.1	LOS B	14.3	359.8	Full	1600	0.0	0.0
Approach	540	1.2		0.714		16.1	LOS B	14.3	359.8				
North: North Pleasant Street													
Lane 1	206	2.4	436	0.474	100	18.2	LOS B	5.6	142.6	Short	100	0.0	NA
Lane 2	566	3.2	528[1]	1.072	100	78.5	LOS F	31.7	813.5	Full	150	0.0	100.0
Lane 3	218	1.8	1082	0.201	100	1.2	LOS A	1.6	40.4	Short	100	0.0	NA
Approach	991	2.7		1.072		48.9	LOS D	31.7	813.5				
West: Meadow Street													
Lane 1	386	3.5	512	0.754	100	23.8	LOS C	12.0	308.3	Full	1600	0.0	0.0
Approach	386	3.5		0.754		23.8	LOS C	12.0	308.3				
Intersection	2180	2.6		1.072		32.5	LOS C	31.7	813.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

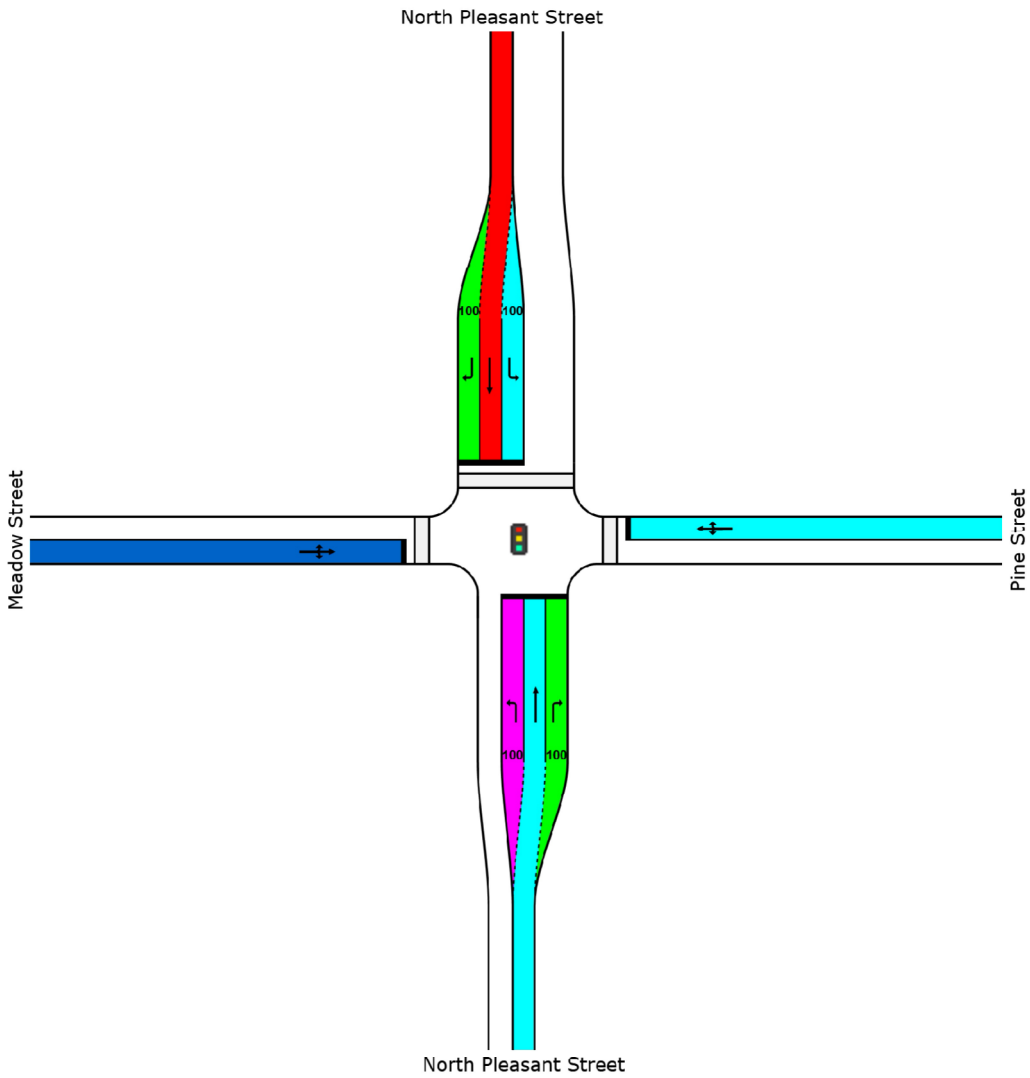
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	B	B	D	C	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

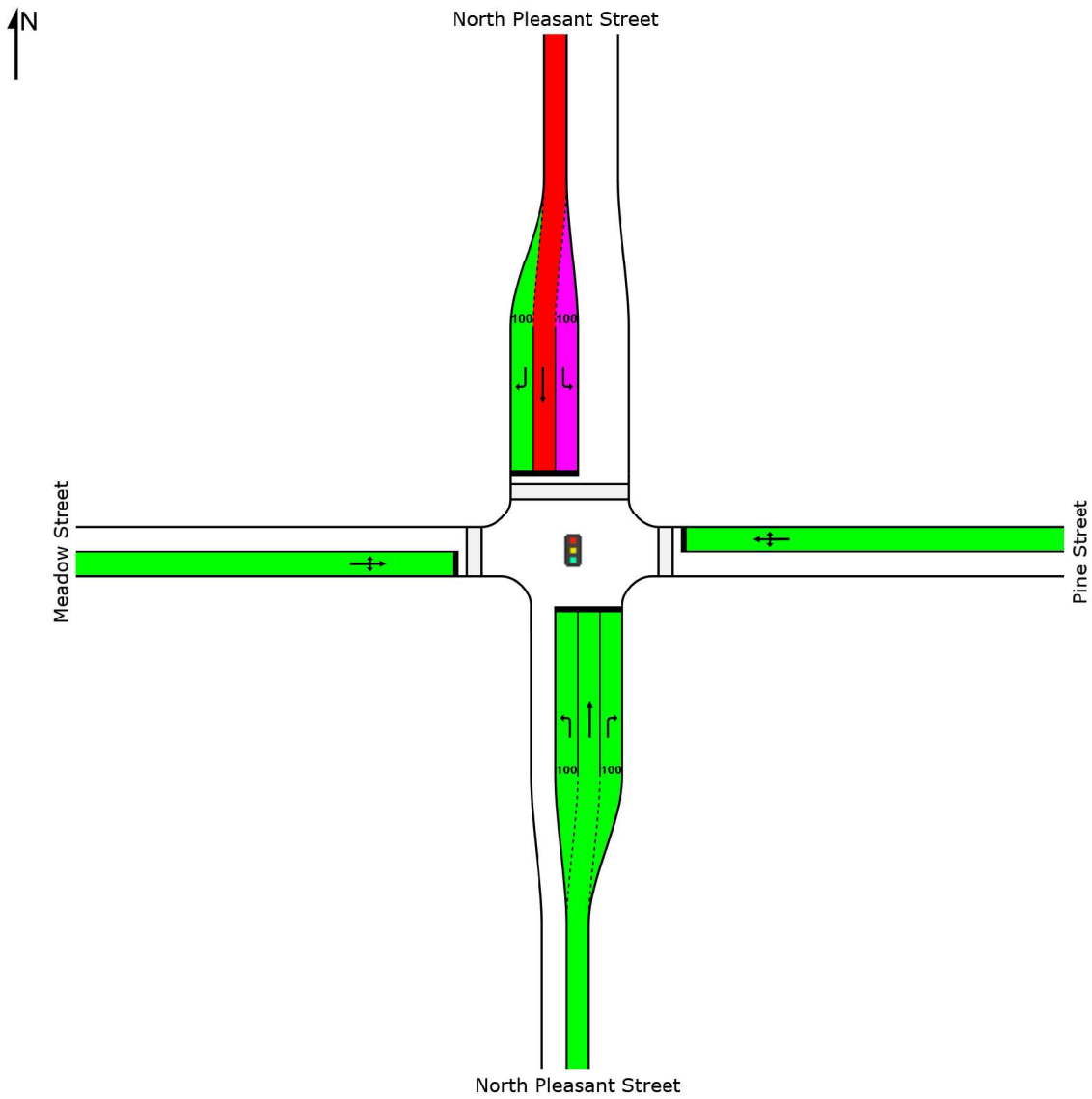
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	61	220	498	189	498



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	286	0.5	1891	0.151	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Lane 2	255	3.2	1158	0.220	100	5.1	LOS A	1.3	34.6	Short	75	0.0	NA
Approach	541	1.8		0.220		2.4	LOS A	1.3	34.6				
NorthEast: Montague Road													
Lane 1	468	0.7	293	1.597	100	315.5	LOS F	66.4	1669.8	Full	1600	0.0	6.3
Approach	468	0.7		1.597		315.5	LOS F	66.4	1669.8				
North: Sunderland Road													
Lane 1	493	2.7	1822	0.270	100	2.2	LOS A	0.1	3.1	Full	1600	0.0	0.0
Approach	493	2.7		0.270		2.2	NA	0.1	3.1				
Intersection	1502	1.7		1.597		100.0	NA	66.4	1669.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

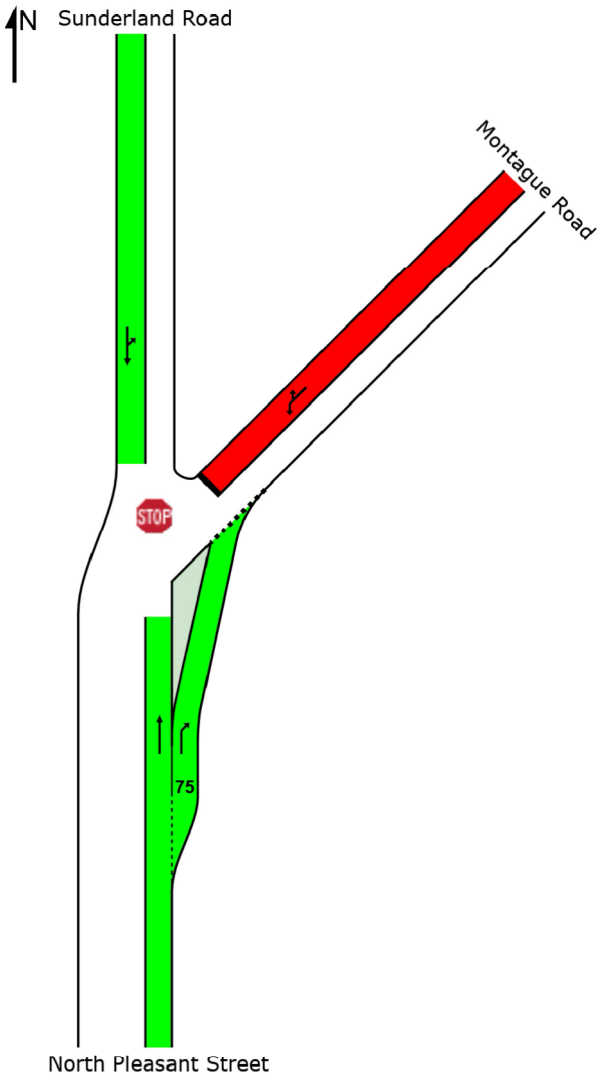
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
LOS	A	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

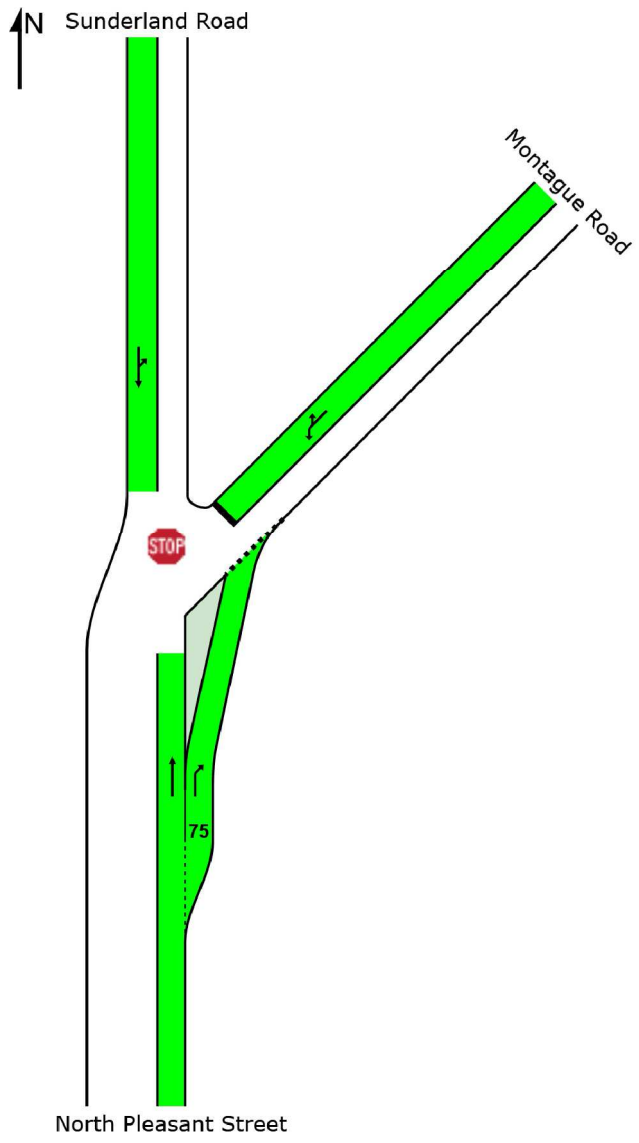
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
Queue Distance (Aver)	14	672	1	672



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	261	0.0	226[1]	1.154	100	130.8	LOS F	17.6	440.9	Short	100	0.0	NA
Lane 2	462	3.1	486[1]	0.952	100	45.4	LOS D	18.3	469.4	Full	1600	0.0	0.0
Lane 3	163	1.7	1157	0.141	100	0.8	LOS A	0.9	23.9	Short	100	0.0	NA
Approach	886	1.9		1.154		62.4	LOS E	18.3	469.4				
East: Pine Street													
Lane 1	683	2.8	680	1.005	100	44.7	LOS F	26.6	679.1	Full	1600	0.0	0.0
Approach	683	2.8		1.005		44.7	LOS D	26.6	679.1				
North: North Pleasant Street													
Lane 1	151	4.6	213	0.706	100	34.4	LOS C	5.3	136.6	Short	100	0.0	NA
Lane 2	478	1.3	552[1]	0.867	100	30.0	LOS C	16.5	416.3	Full	150	0.0	100.0
Lane 3	91	5.1	1011	0.090	100	1.4	LOS A	0.7	17.8	Short	100	0.0	NA
Approach	720	2.5		0.867		27.3	LOS C	16.5	416.3				
West: Meadow Street													
Lane 1	581	1.2	388	1.500	100	247.5	LOS F	53.6	1351.9	Full	1600	0.0	0.0
Approach	581	1.2		1.500		247.5	LOS F	53.6	1351.9				
Intersection	2871	2.1		1.500		86.9	LOS F	53.6	1351.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

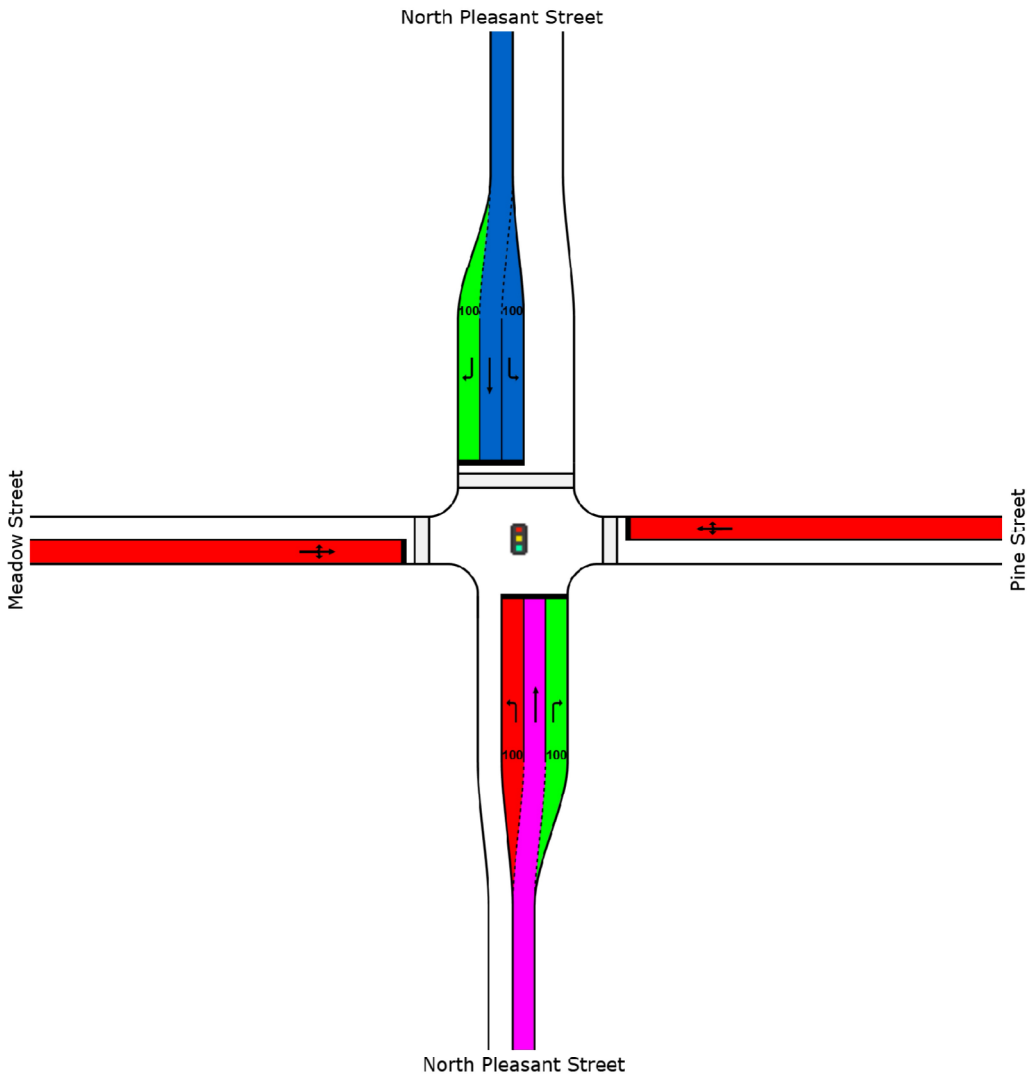
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	E	D	C	F	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

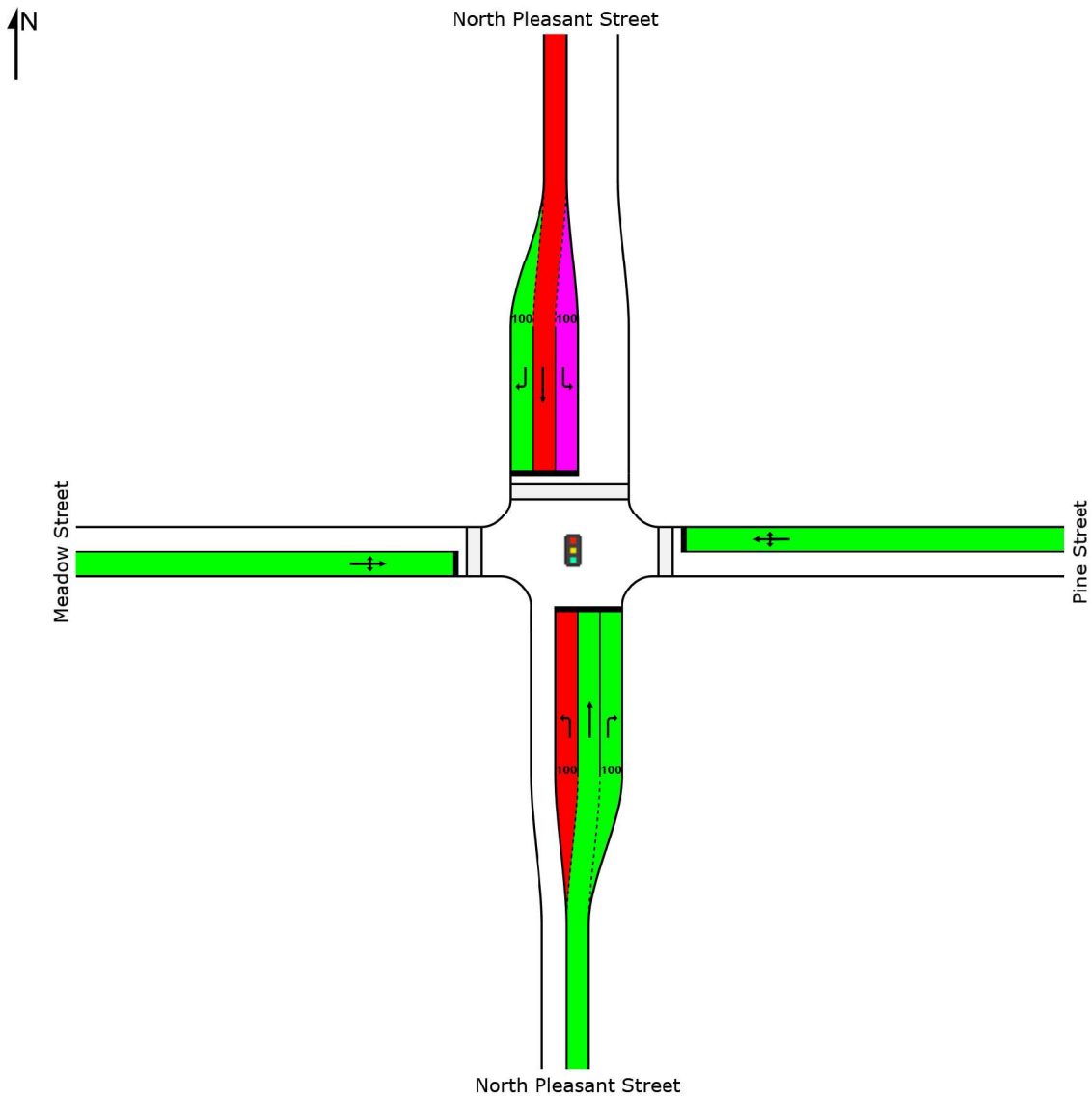
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	288	416	255	828	828



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	373	0.8	1866	0.200	100	1.1	LOS A	1.5	36.9	Full	150	0.0	0.0
Lane 2	552	2.0	1170	0.471	100	8.1	LOS A	4.2	107.6	Short	75	0.0	NA
Approach	924	1.5		0.471		5.3	LOS A	4.2	107.6				
NorthEast: Montague Road													
Lane 1	370	0.8	254	1.455	100	262.1	LOS F	46.6	1171.6	Full	1600	0.0	0.0
Approach	370	0.8		1.455		262.1	LOS F	46.6	1171.6				
North: Sunderland Road													
Lane 1	379	1.7	1834	0.206	100	1.7	LOS A	0.1	2.5	Full	1600	0.0	0.0
Approach	379	1.7		0.206		1.7	NA	0.1	2.5				
Intersection	1673	1.4		1.455		61.4	NA	46.6	1171.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

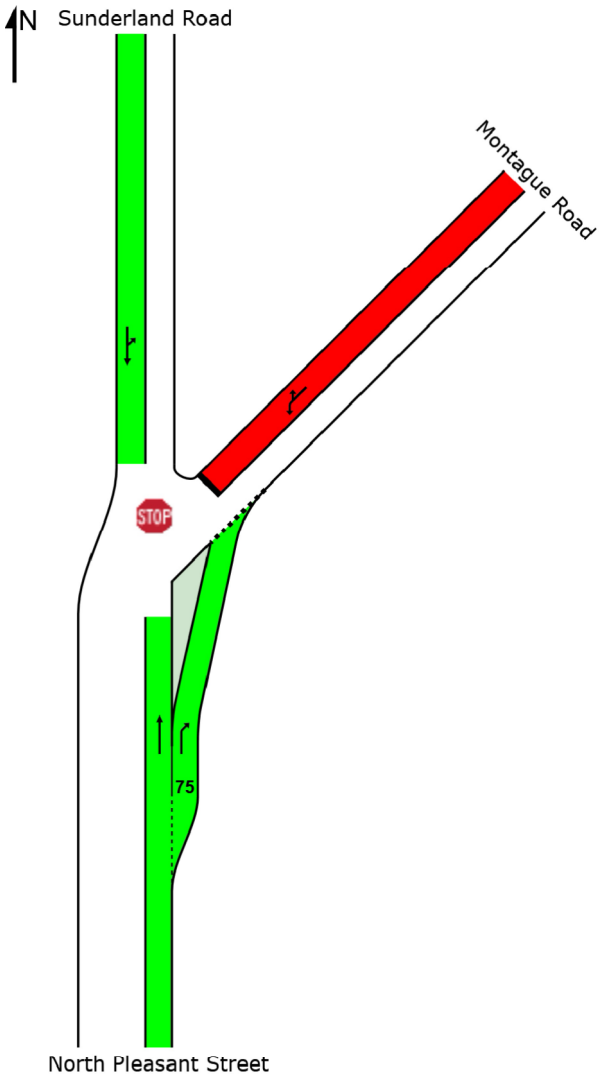
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
LOS	A	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

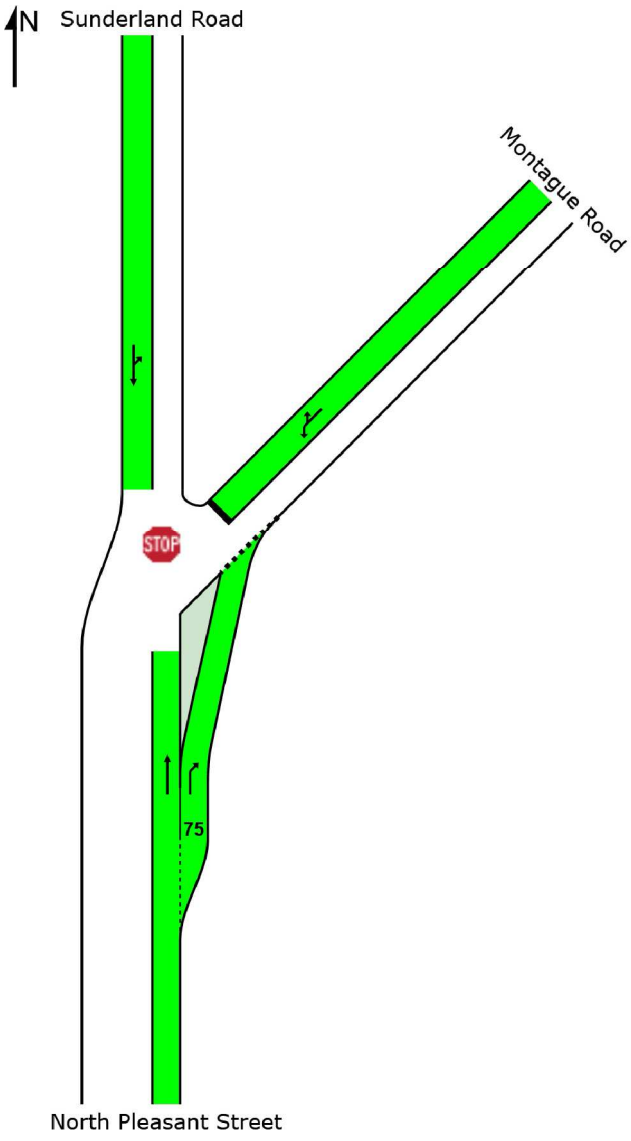
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
Queue Distance (Aver)	43	471	1	471



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	128	1.3	316	0.404	100	19.7	LOS B	3.5	88.6	Short	100	0.0	NA
Lane 2	331	3.4	627[1]	0.528	100	15.7	LOS B	8.5	218.3	Full	1600	0.0	0.0
Lane 3	37	2.7	1151	0.032	100	0.7	LOS A	0.2	4.9	Short	100	0.0	NA
Approach	495	2.8		0.528		15.6	LOS B	8.5	218.3				
East: Pine Street													
Lane 1	646	2.9	794	0.813	100	18.9	LOS B	19.3	493.8	Full	1600	0.0	0.0
Approach	646	2.9		0.813		18.9	LOS B	19.3	493.8				
North: North Pleasant Street													
Lane 1	214	0.5	331	0.648	100	25.3	LOS C	6.8	170.8	Short	100	0.0	NA
Lane 2	294	0.4	728	0.404	100	14.8	LOS B	7.1	178.2	Full	150	0.0	20.6
Lane 3	238	0.9	1053	0.226	100	1.5	LOS A	1.9	48.5	Short	100	0.0	NA
Approach	746	0.6		0.648		13.6	LOS B	7.1	178.2				
West: Meadow Street													
Lane 1	516	1.3	362	1.423	100	217.3	LOS F	45.2	1142.5	Full	1600	0.0	0.0
Approach	516	1.3		1.423		217.3	LOS F	45.2	1142.5				
Intersection	2402	1.8		1.423		59.2	LOS E	45.2	1142.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

SATURDAY PEAK

LANE LEVEL OF SERVICE

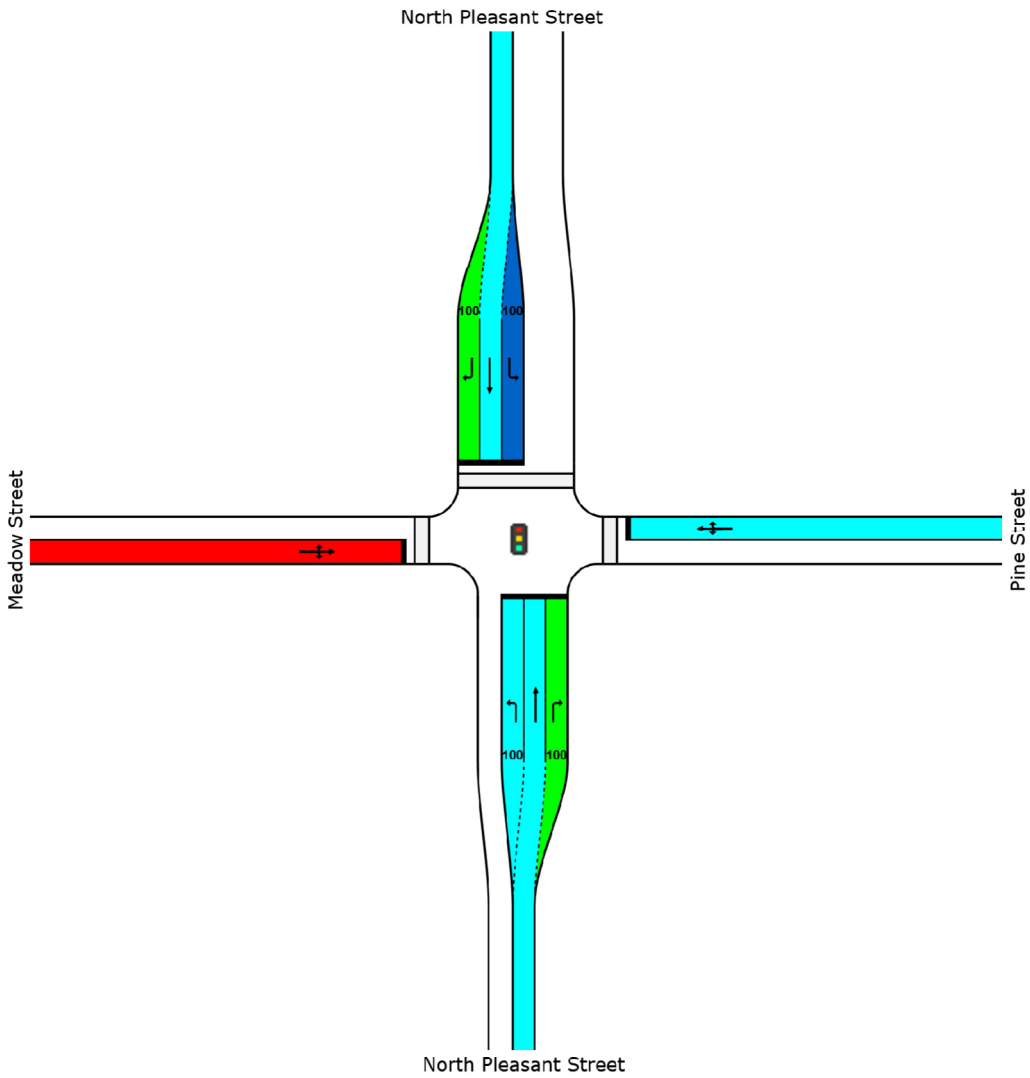
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	B	B	B	F	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

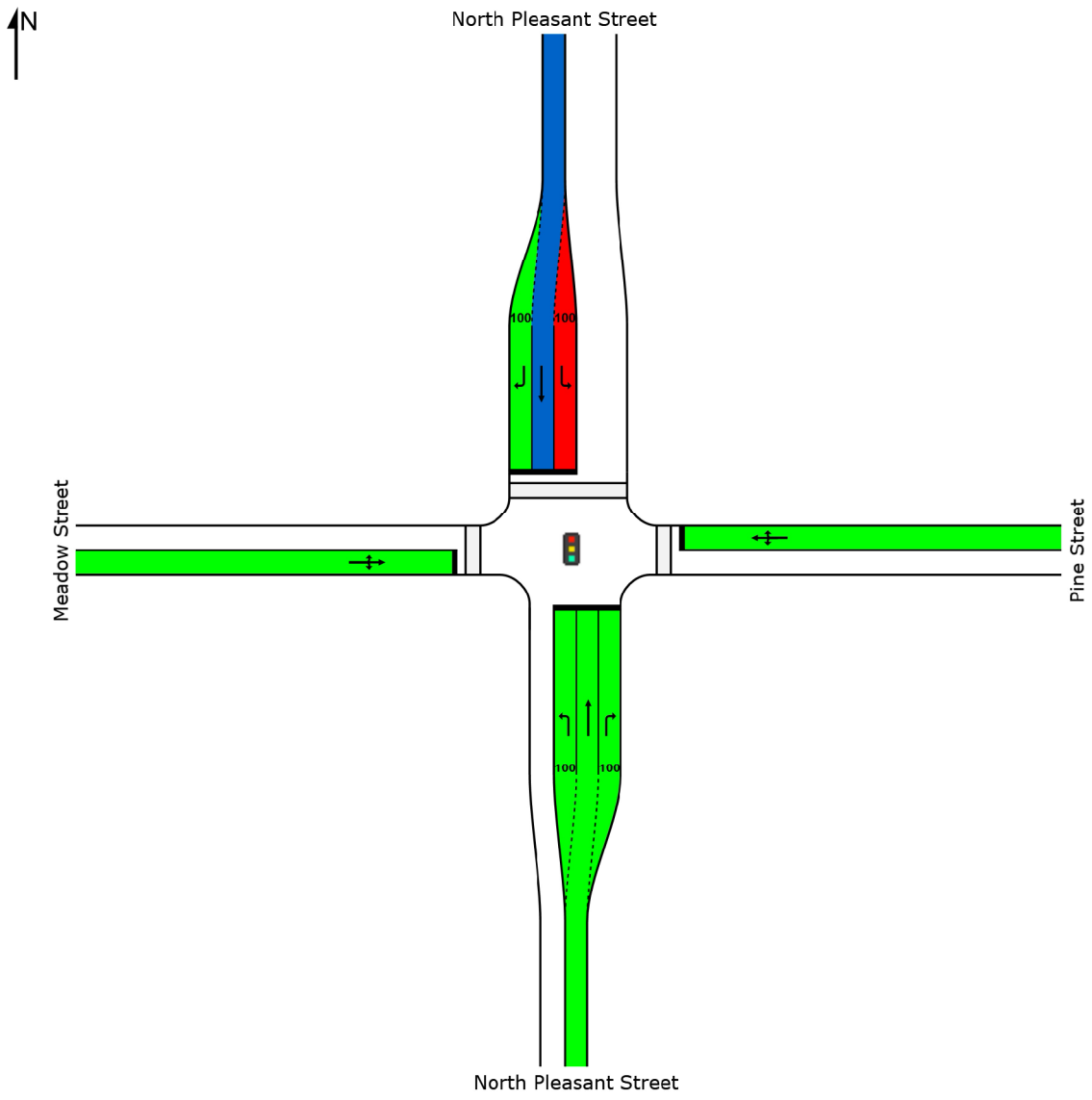
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 65 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	134	303	109	700	700



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	366	3.7	1822	0.201	100	1.1	LOS A	1.4	36.8	Full	150	0.0	0.0
Lane 2	545	2.2	1176	0.464	100	8.0	LOS A	4.1	105.1	Short	75	0.0	NA
Approach	911	2.8		0.464		5.2	LOS A	4.1	105.1				
NorthEast: Montague Road													
Lane 1	441	0.5	277	1.591	100	315.4	LOS F	62.4	1567.3	Full	1600	0.0	4.4
Approach	441	0.5		1.591		315.4	LOS F	62.4	1567.3				
North: Sunderland Road													
Lane 1	309	0.5	1866	0.166	100	1.3	LOS A	0.1	1.3	Full	1600	0.0	0.0
Approach	309	0.5		0.166		1.3	NA	0.1	1.3				
Intersection	1661	1.8		1.591		87.1	NA	62.4	1567.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SATURDAY PEAK

LANE LEVEL OF SERVICE

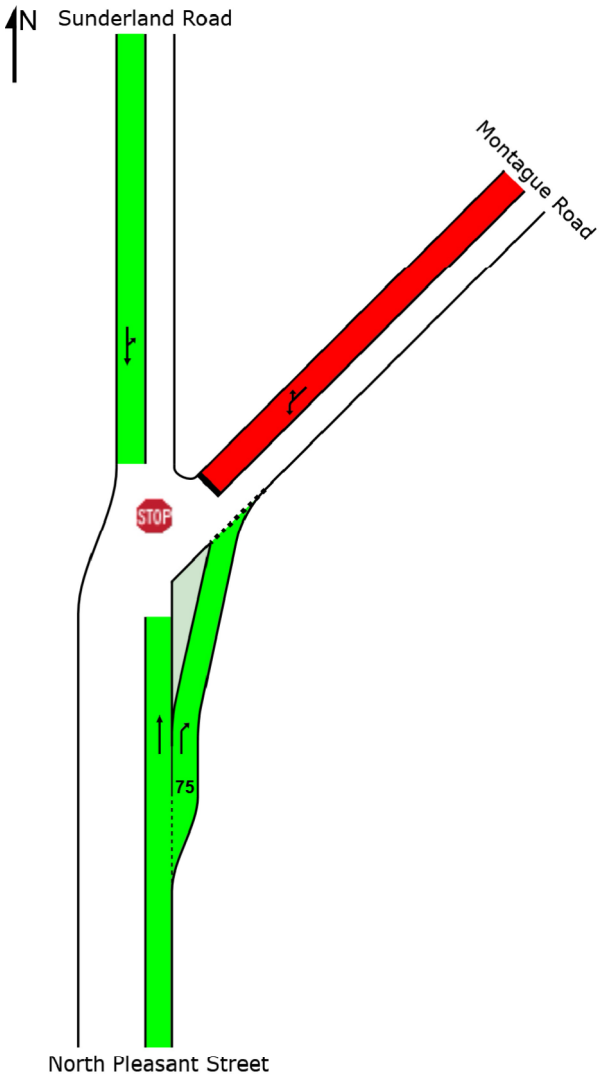
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
LOS	A	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

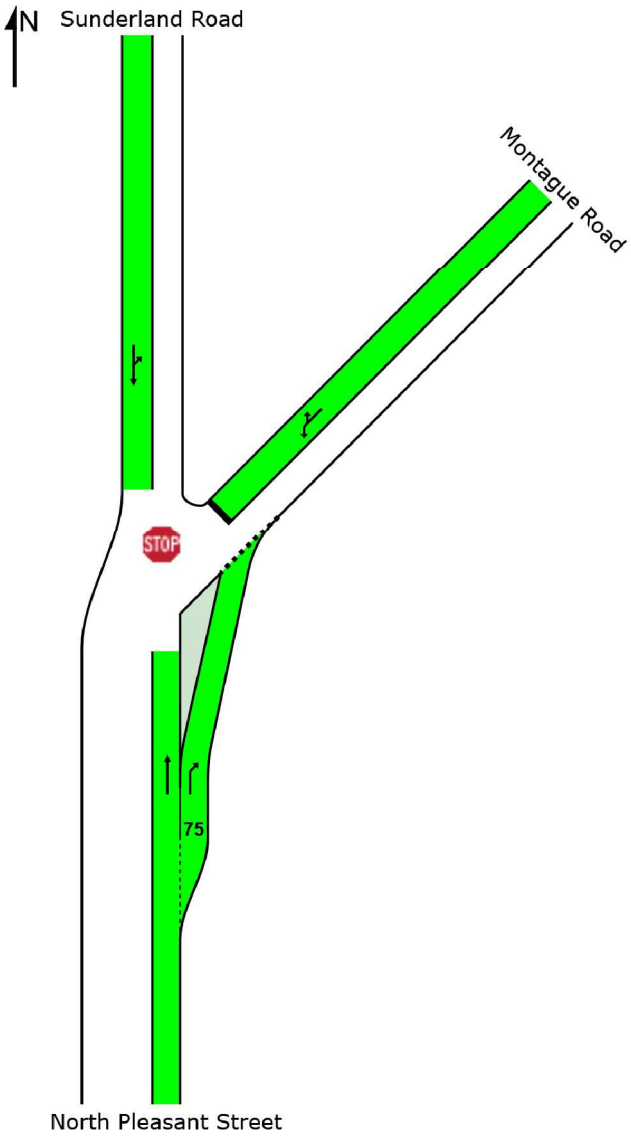
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	Northeast	North	Intersection
Queue Distance (Aver)	42	631	1	631



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Appendix H-c

Sidra Analysis: 2018 Build

Alternative 1

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	48	4.7	183	0.262	100	35.5	LOS D	1.9	49.1	Short	100	0.0	NA
Lane 2	143	3.8	474	0.303	100	25.6	LOS C	4.9	126.3	Full	1600	0.0	0.0
Lane 3	24	0.0	988	0.024	100	1.3	LOS A	0.2	5.0	Short	100	0.0	NA
Approach	215	3.6		0.303		25.1	LOS C	4.9	126.3				
East: Pine Street													
Lane 1	443	1.2	664	0.667	100	19.3	LOS B	14.9	375.7	Full	1600	0.0	0.0
Approach	443	1.2		0.667		19.3	LOS B	14.9	375.7				
North: North Pleasant Street													
Lane 1	169	2.4	172[1]	0.985	100	101.6	LOS F	10.5	266.4	Short	100	0.0	NA
Lane 2	465	3.2	359[1]	1.294	100	176.0	LOS F	42.8	1096.9	Full	400	0.0	100.0
Lane 3	178	1.8	1030	0.173	100	2.2	LOS A	2.0	50.8	Short	100	0.0	NA
Approach	812	2.7		1.294		122.3	LOS F	42.8	1096.9				
West: Meadow Street													
Lane 1	103	3.3	379	0.273	100	13.7	LOS B	2.5	63.6	Short	100	0.0	NA
Lane 2	213	3.6	870	0.245	100	9.4	LOS A	3.9	99.9	Full	1600	0.0	0.0
Approach	317	3.5		0.273		10.8	LOS B	3.9	99.9				
Intersection	1788	2.6		1.294		65.3	LOS E	42.8	1096.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

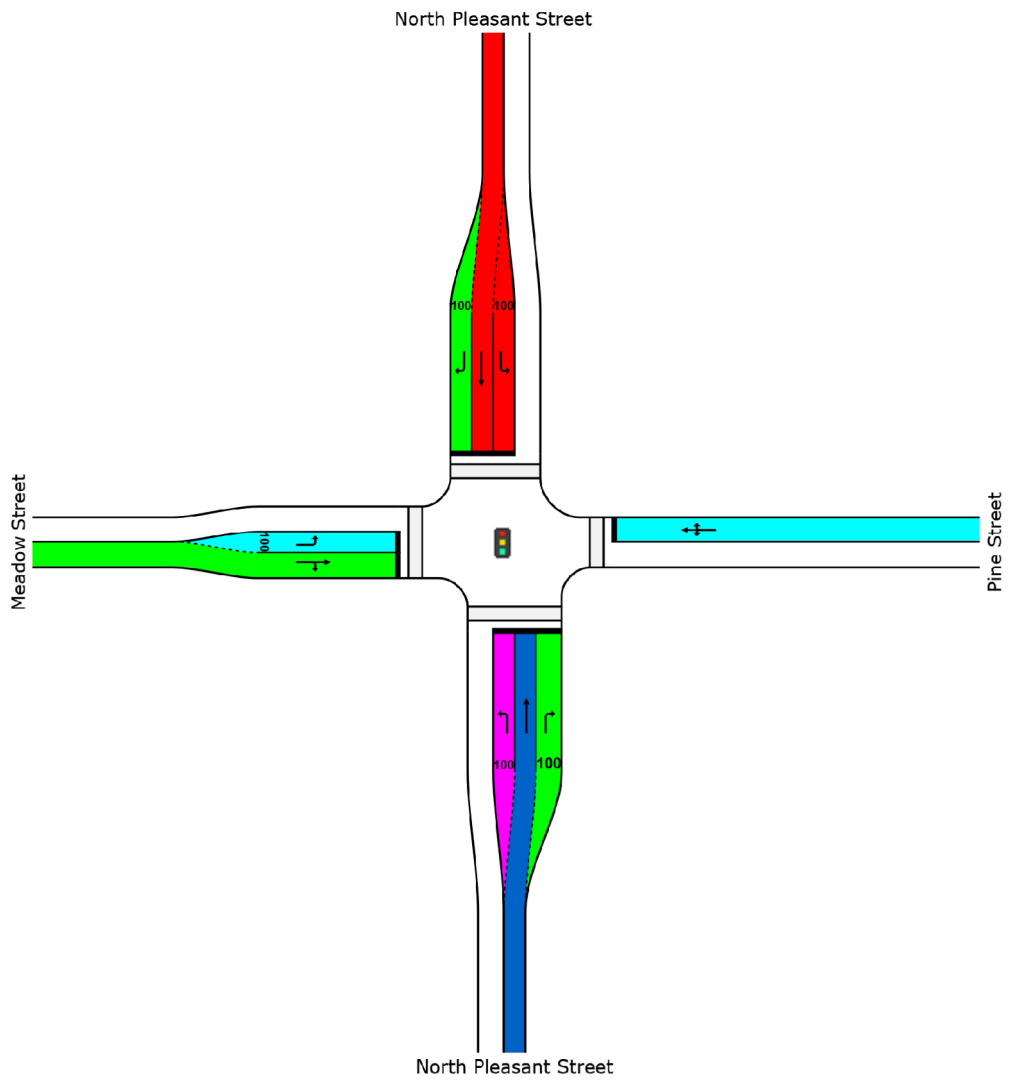
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	B	F	B	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

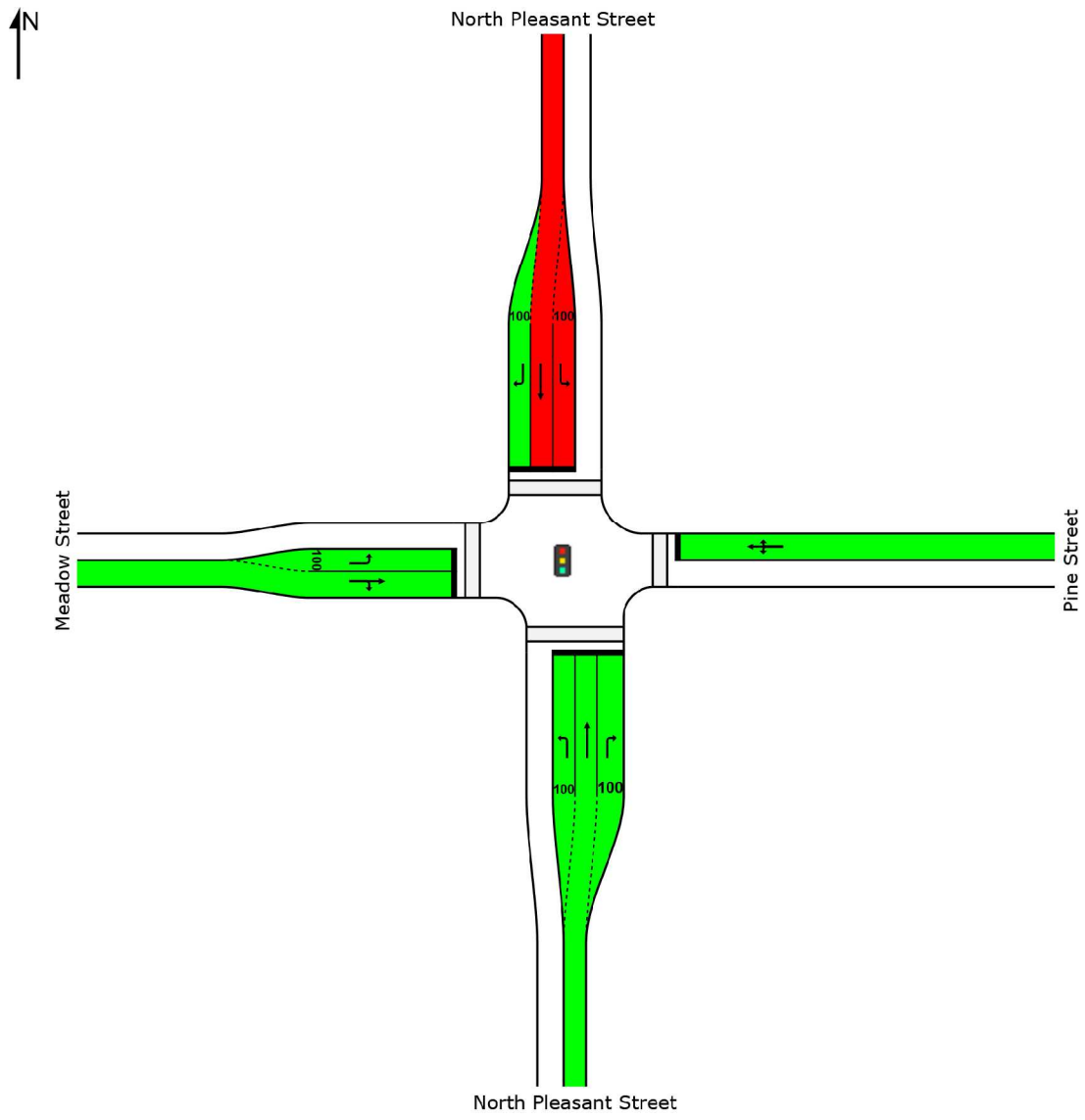
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	77	230	672	61	672



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	373	0.6	1021	0.366	100	7.4	LOS A	2.0	50.3	Full	1600	0.0	0.0
Approach	373	0.6		0.366		7.4	LOS A	2.0	50.3				
NorthWest: Sunderland Road													
Lane 1[d]	393	2.8	865	0.455	100	9.9	LOS A	2.8	72.7	Full	1600	0.0	0.0
Approach	393	2.8		0.455		9.9	LOS A	2.8	72.7				
SouthWest: Montague Road													
Lane 1[d]	416	1.8	1288	0.323	100	5.7	LOS A	1.9	48.1	Full	400	0.0	0.0
Approach	416	1.8		0.323		5.7	LOS A	1.9	48.1				
Intersection	1183	1.8		0.455		7.6	LOS A	2.8	72.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

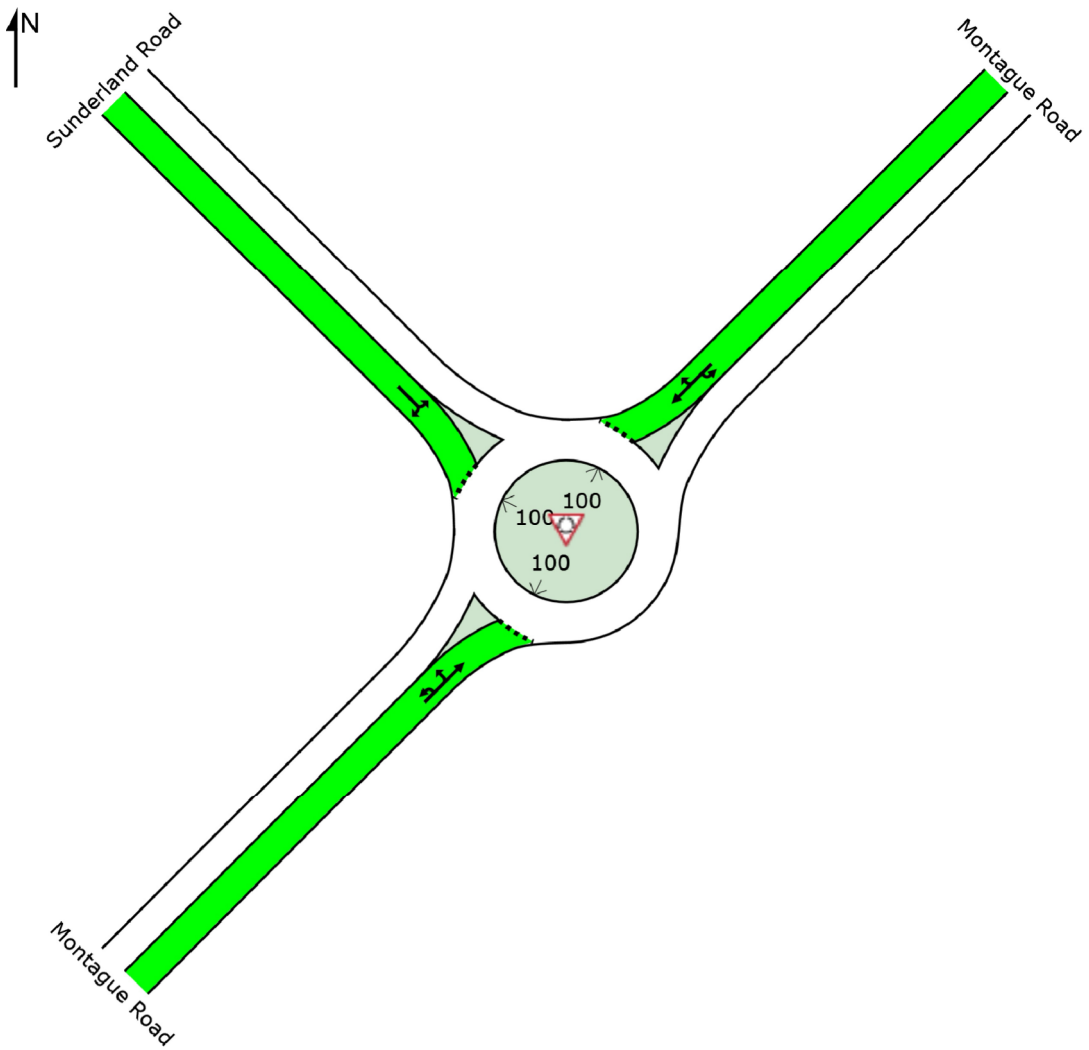
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

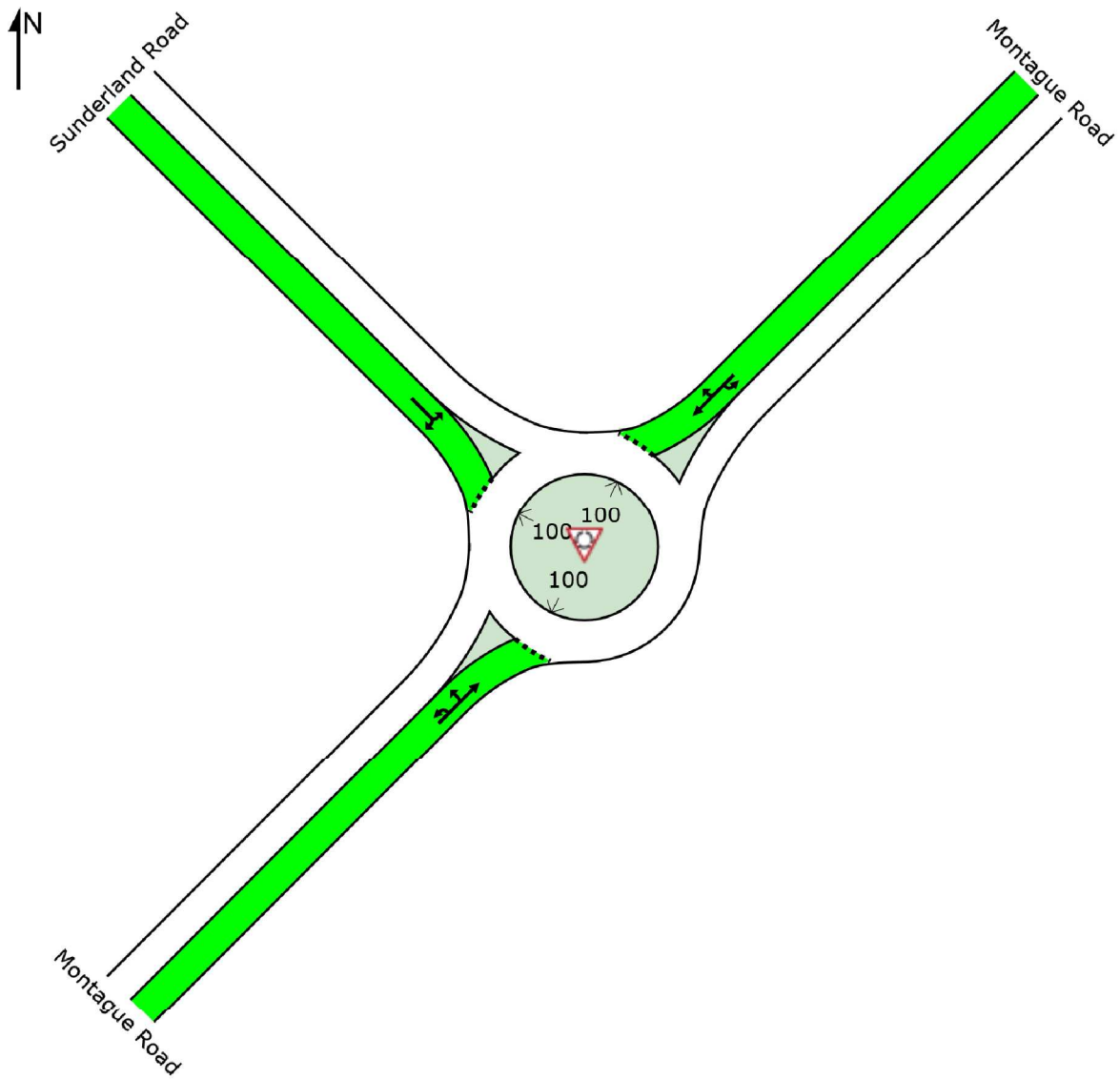
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	20	29	19	29



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	214	0.0	178[1]	1.206	100	165.4	LOS F	18.1	452.2	Short	100	0.0	NA
Lane 2	379	3.1	360[1]	1.054	100	92.2	LOS F	25.0	641.6	Full	1600	0.0	0.0
Lane 3	133	1.7	1002	0.133	100	1.1	LOS A	1.1	27.9	Short	100	0.0	NA
Approach	726	1.9		1.206		97.1	LOS F	25.0	641.6				
East: Pine Street													
Lane 1	560	2.8	591	0.948	100	48.2	LOS D	29.1	743.0	Full	1600	0.0	0.0
Approach	560	2.8		0.948		48.2	LOS D	29.1	743.0				
North: North Pleasant Street													
Lane 1	123	4.6	183	0.672	100	45.1	LOS D	5.6	145.0	Short	100	0.0	NA
Lane 2	392	1.3	403[1]	0.972	100	66.9	LOS E	21.8	551.1	Full	400	0.0	34.2
Lane 3	75	5.1	916	0.082	100	2.7	LOS A	0.9	23.0	Short	100	0.0	NA
Approach	590	2.5		0.972		54.2	LOS D	21.8	551.1				
West: Meadow Street													
Lane 1	212	0.0	343	0.617	100	20.3	LOS C	5.9	147.6	Short	100	0.0	NA
Lane 2	306	2.3	887	0.345	100	8.4	LOS A	5.6	142.8	Full	1600	0.0	0.0
Approach	518	1.3		0.617		13.2	LOS B	5.9	147.6				
Intersection	2395	2.1		1.206		57.0	LOS E	29.1	743.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

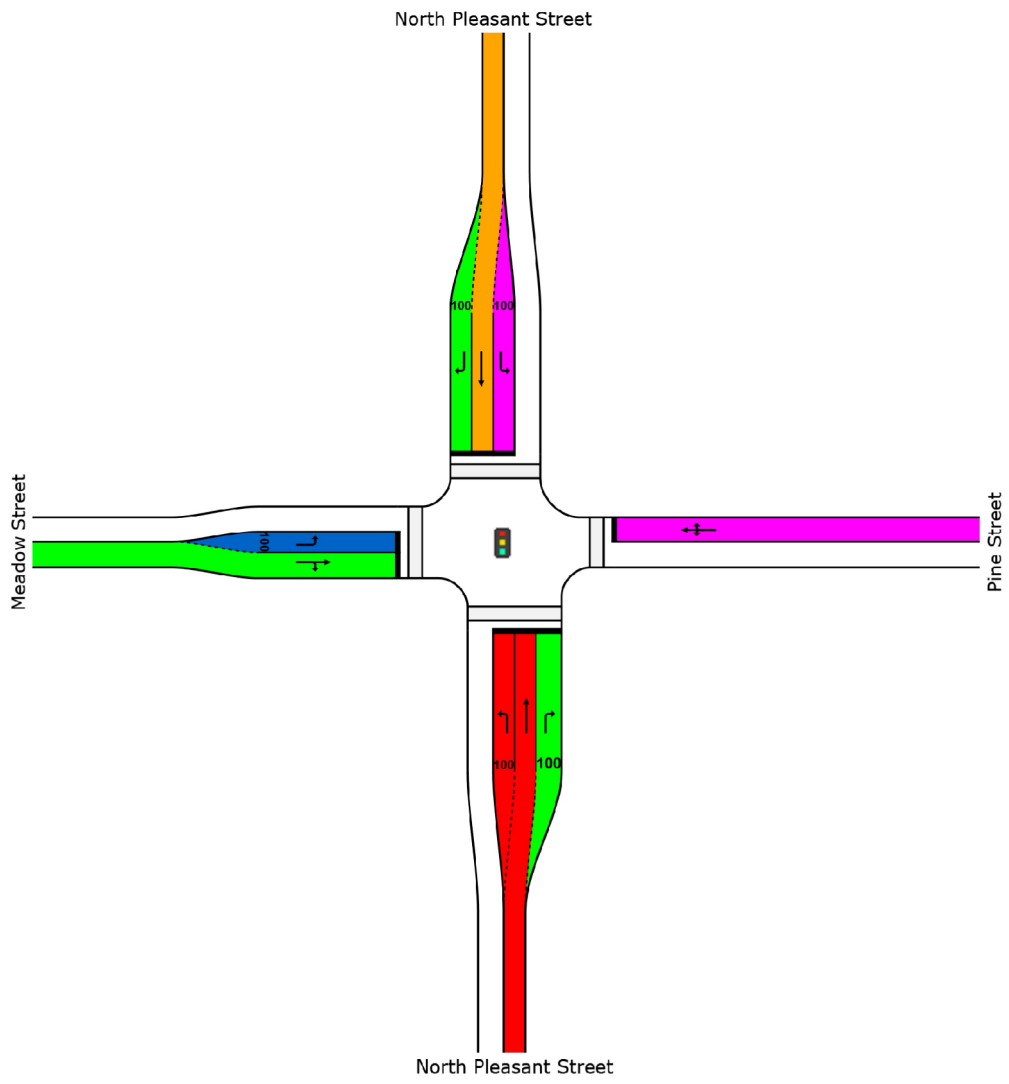
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	D	D	B	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

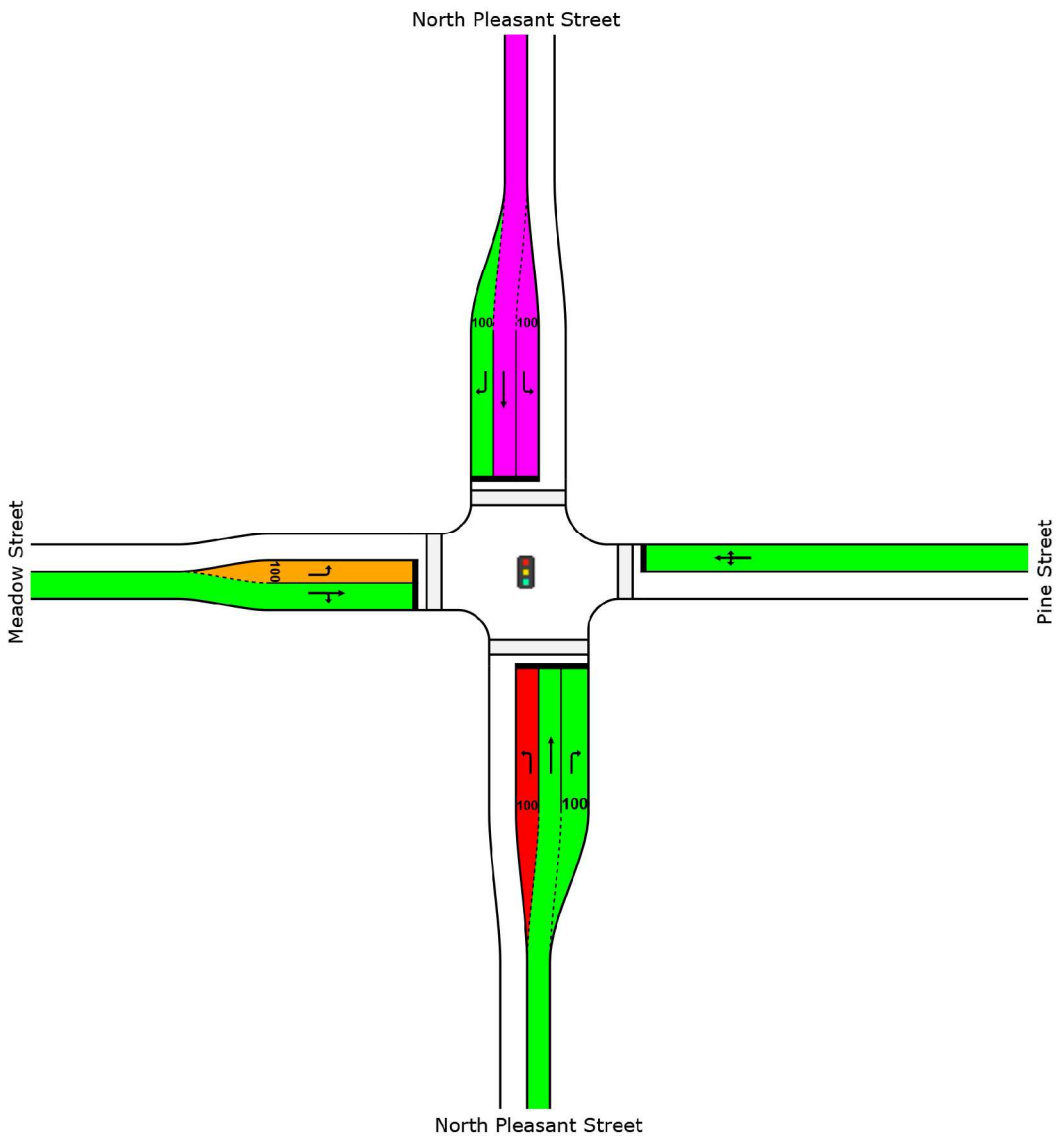
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	393	455	338	90	455



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	248	0.8	949	0.261	100	6.4	LOS A	1.3	31.6	Full	1600	0.0	0.0
Approach	248	0.8		0.261		6.4	LOS A	1.3	31.6				
NorthWest: Sunderland Road													
Lane 1[d]	309	1.6	1000	0.309	100	6.8	LOS A	1.6	39.8	Full	1600	0.0	0.0
Approach	309	1.6		0.309		6.8	LOS A	1.6	39.8				
SouthWest: Montague Road													
Lane 1[d]	720	1.5	1322	0.544	100	8.6	LOS A	4.7	118.6	Full	400	0.0	0.0
Approach	720	1.5		0.544		8.6	LOS A	4.7	118.6				
Intersection	1277	1.4		0.544		7.8	LOS A	4.7	118.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

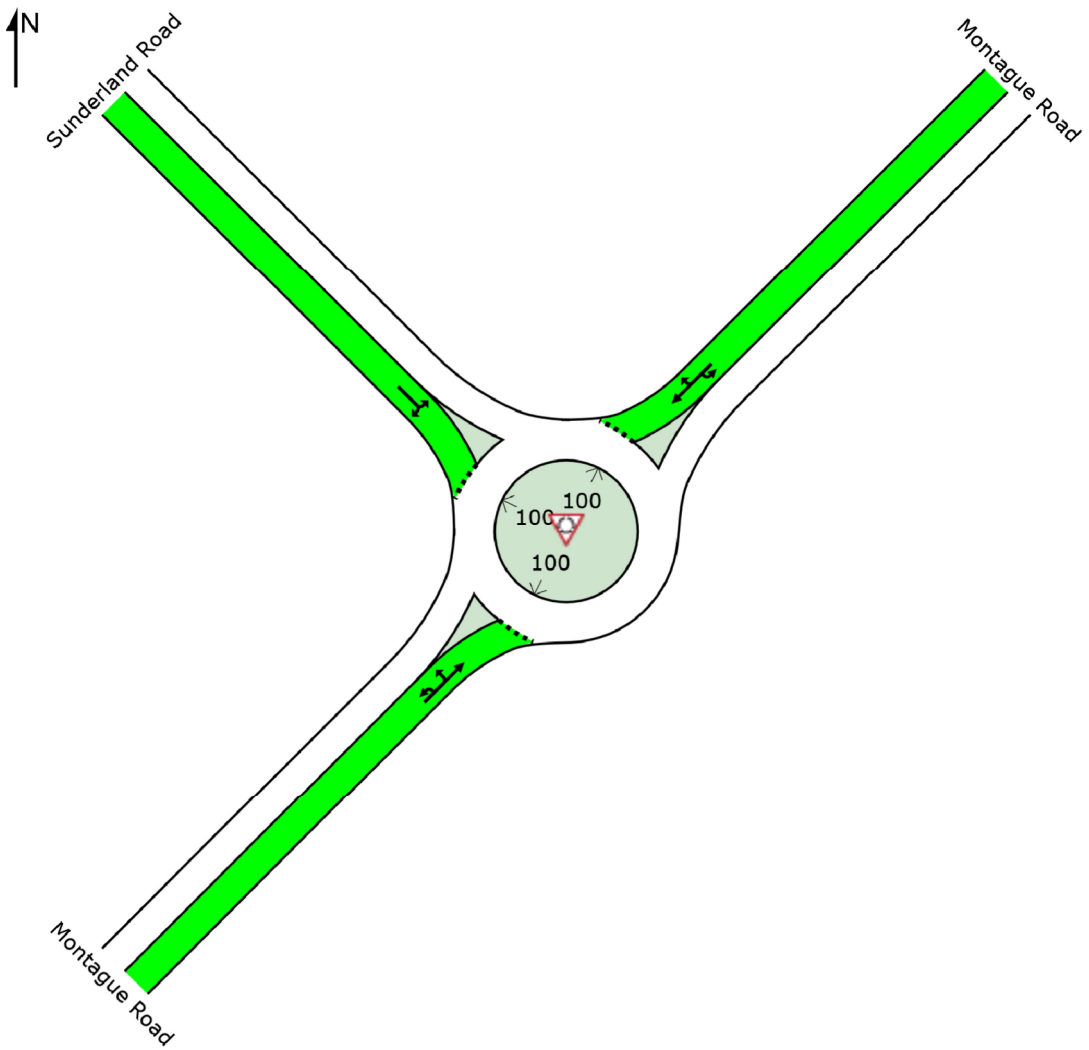
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

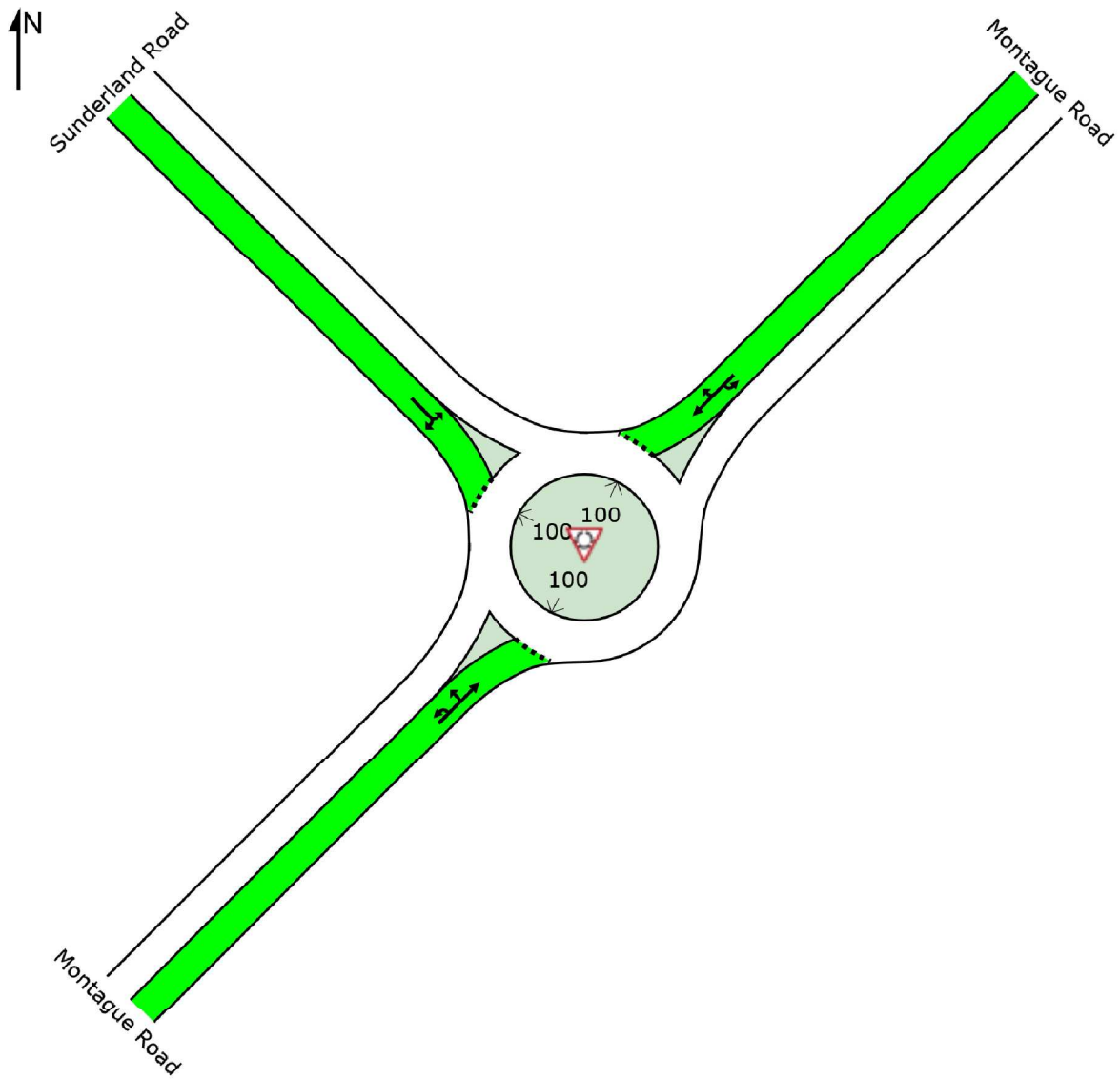
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	13	16	48	48



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	104	1.3	189	0.550	100	38.9	LOS D	4.5	112.6	Short	100	0.0	NA
Lane 2	271	3.4	403[1]	0.674	100	31.5	LOS C	10.9	280.7	Full	1600	0.0	0.0
Lane 3	30	2.7	945	0.031	100	1.3	LOS A	0.2	6.4	Short	100	0.0	NA
Approach	405	2.8		0.674		31.2	LOS C	10.9	280.7				
East: Pine Street													
Lane 1	529	2.9	671	0.789	100	25.1	LOS C	20.4	521.5	Full	1600	0.0	0.0
Approach	529	2.9		0.789		25.1	LOS C	20.4	521.5				
North: North Pleasant Street													
Lane 1	175	0.5	178[1]	0.984	100	100.0	LOS F	10.8	270.5	Short	100	0.0	NA
Lane 2	241	0.4	365[1]	0.662	100	30.8	LOS C	9.5	239.0	Full	400	0.0	0.0
Lane 3	194	0.9	1034	0.188	100	2.0	LOS A	2.1	53.6	Short	100	0.0	NA
Approach	611	0.6		0.984		41.5	LOS D	10.8	270.5				
West: Meadow Street													
Lane 1	191	1.6	312	0.613	100	19.4	LOS B	5.4	135.6	Short	100	0.0	NA
Lane 2	231	1.0	894	0.259	100	7.0	LOS A	4.2	106.0	Full	1600	0.0	0.0
Approach	423	1.3		0.613		12.6	LOS B	5.4	135.6				
Intersection	1968	1.8		0.984		28.8	LOS C	20.4	521.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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SATURDAY PEAK

LANE LEVEL OF SERVICE

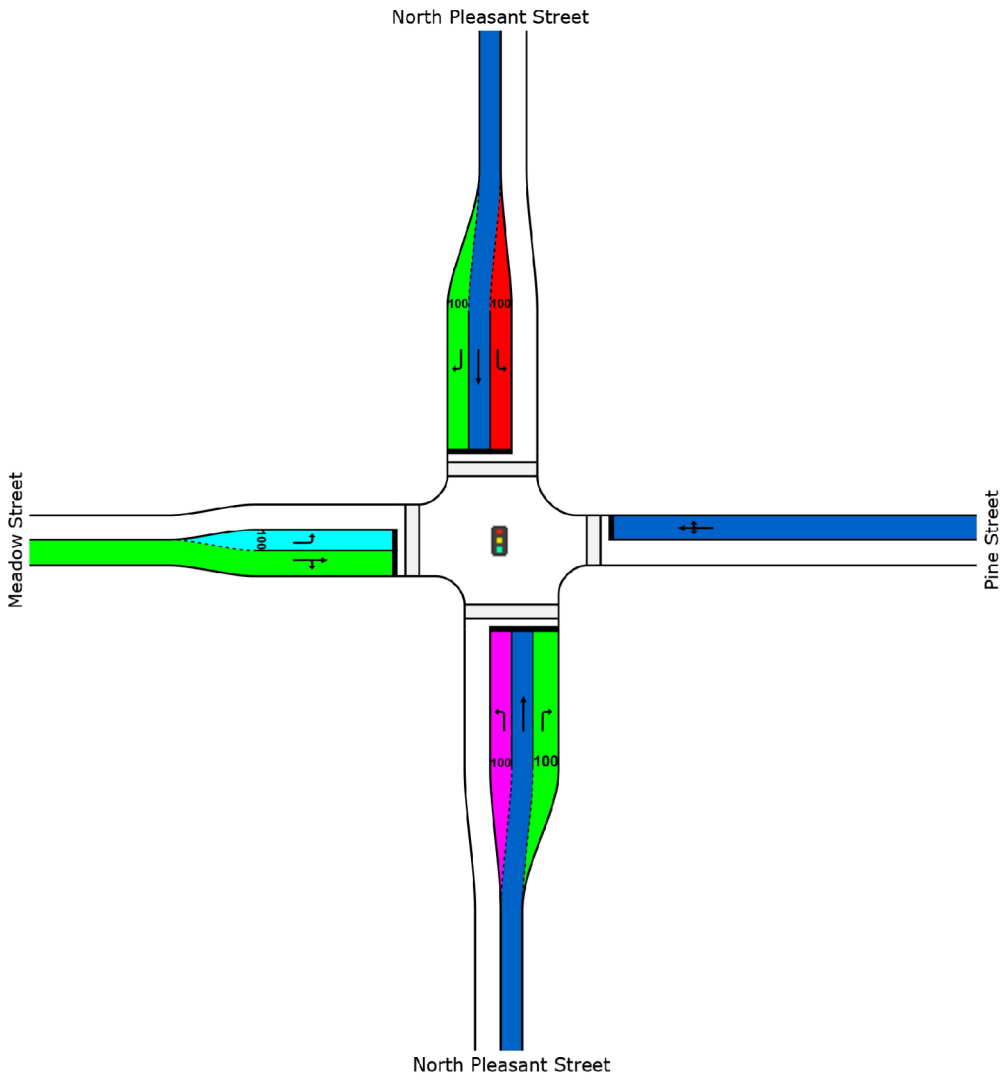
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	D	B	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

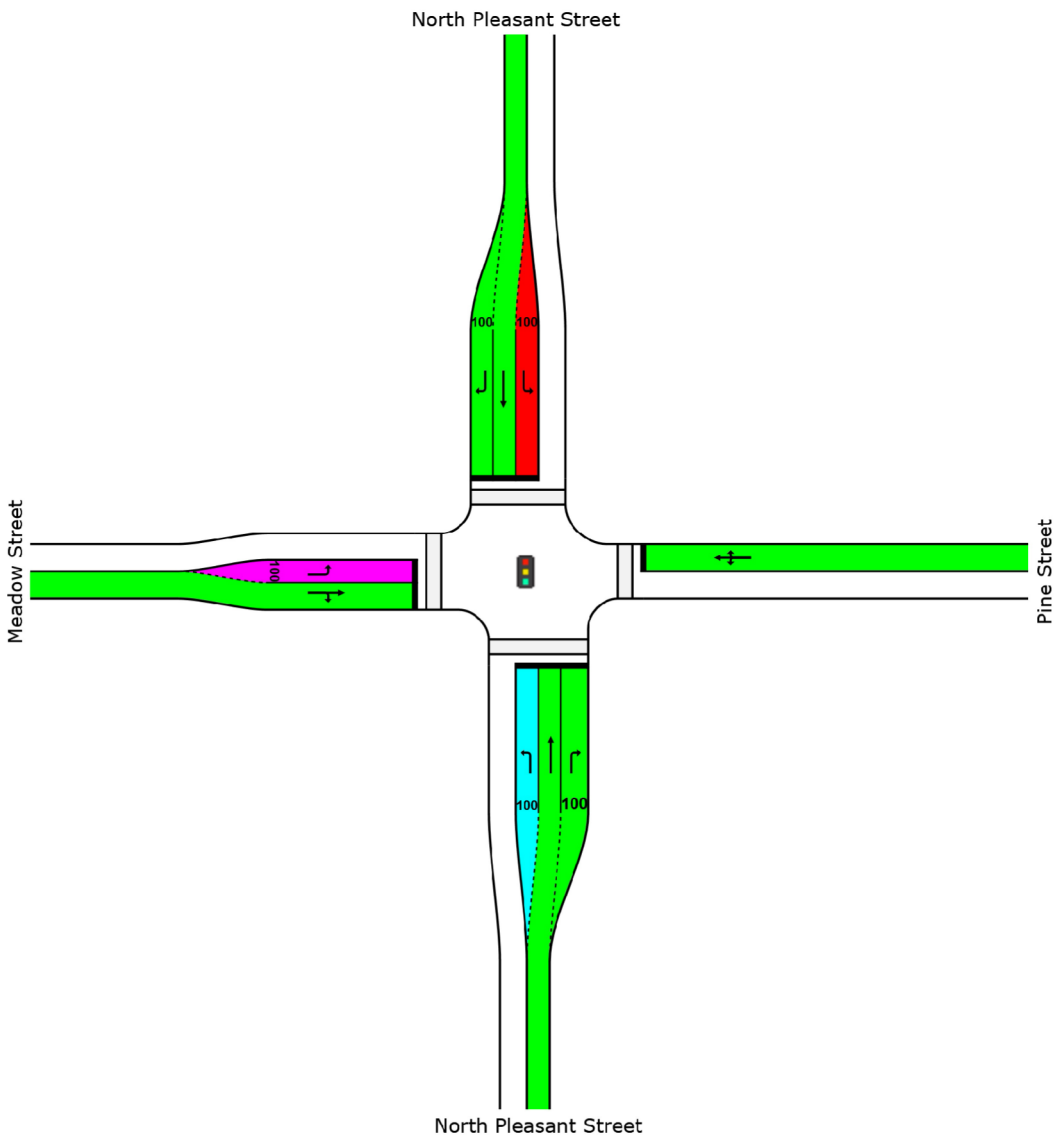
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	172	320	166	83	320



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	257	0.5	1017	0.253	100	6.0	LOS A	1.2	31.2	Full	1600	0.0	0.0
Approach	257	0.5		0.253		6.0	LOS A	1.2	31.2				
NorthWest: Sunderland Road													
Lane 1[d]	228	0.5	999	0.228	100	5.8	LOS A	1.1	27.3	Full	1600	0.0	0.0
Approach	228	0.5		0.228		5.8	LOS A	1.1	27.3				
SouthWest: Montague Road													
Lane 1[d]	601	2.1	1319	0.456	100	7.3	LOS A	3.3	84.1	Full	400	0.0	0.0
Approach	601	2.1		0.456		7.3	LOS A	3.3	84.1				
Intersection	1086	1.4		0.456		6.7	LOS A	3.3	84.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

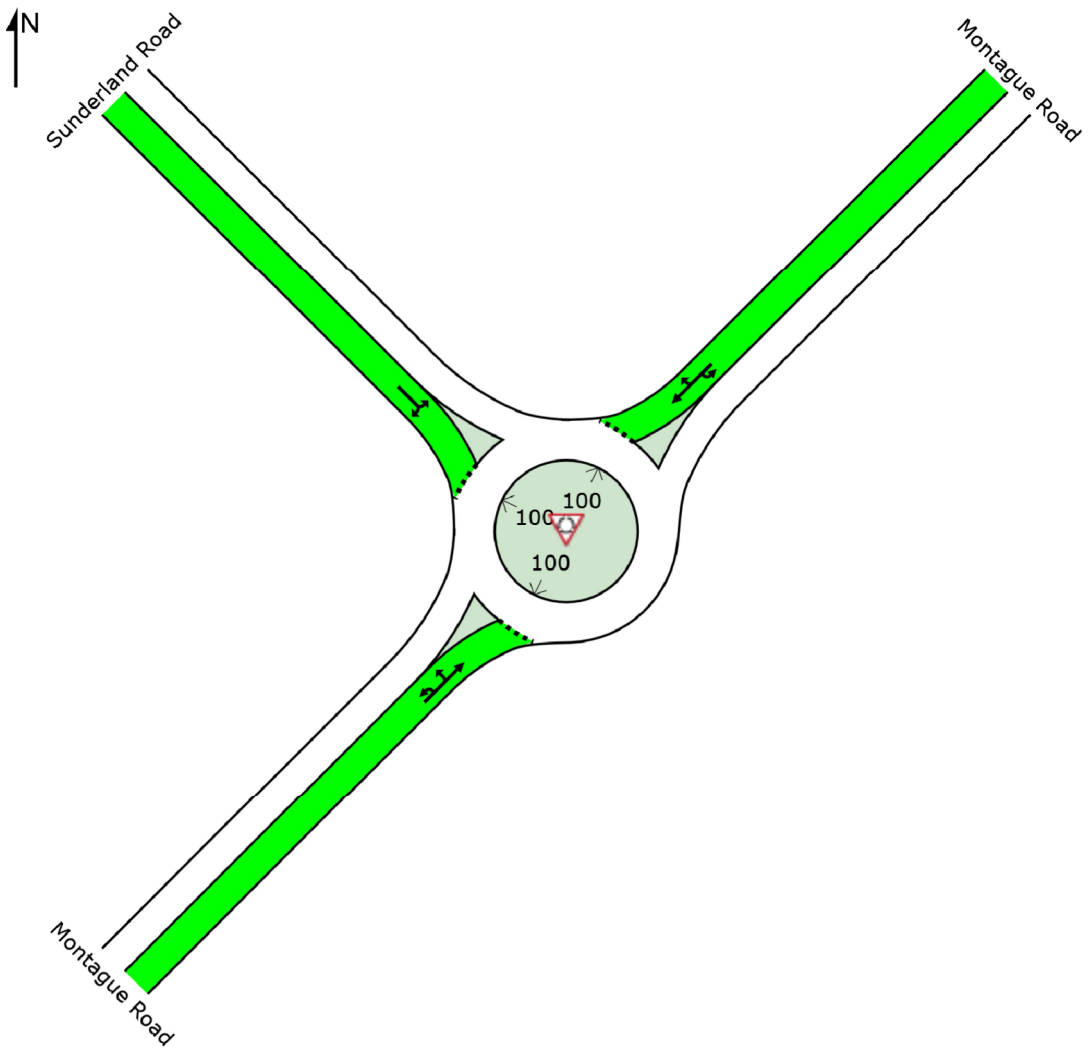
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

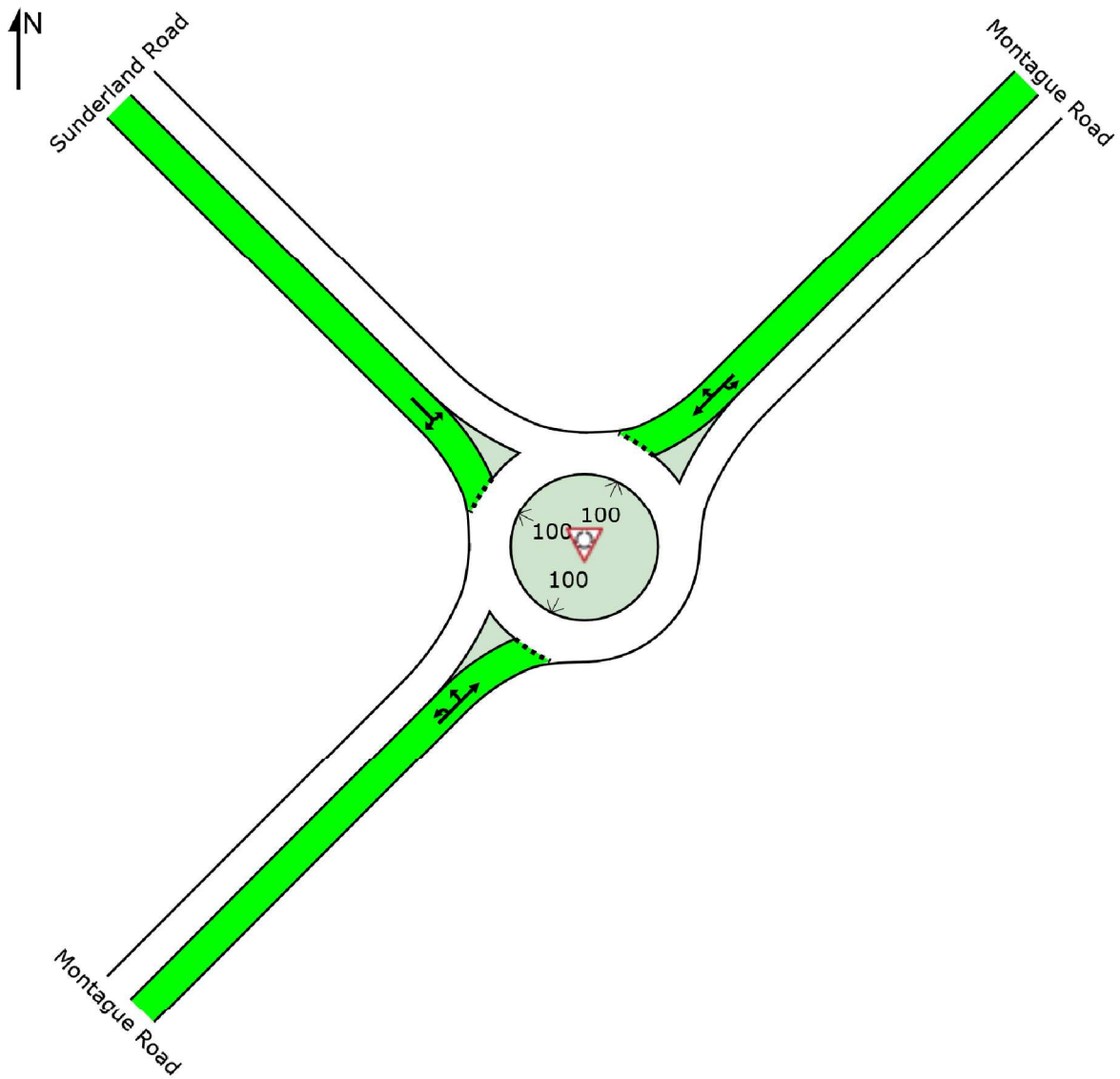
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	13	11	34	34



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 2

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	48	4.7	183	0.262	100	35.5	LOS D	1.9	49.1	Short	100	0.0	NA
Lane 2	143	3.8	474	0.303	100	25.6	LOS C	4.9	126.3	Full	1600	0.0	0.0
Lane 3	24	0.0	988	0.024	100	1.3	LOS A	0.2	5.0	Short	100	0.0	NA
Approach	215	3.6		0.303		25.1	LOS C	4.9	126.3				
East: Pine Street													
Lane 1	443	1.2	664	0.667	100	19.3	LOS B	14.9	375.7	Full	1600	0.0	0.0
Approach	443	1.2		0.667		19.3	LOS B	14.9	375.7				
North: North Pleasant Street													
Lane 1	169	2.4	172[1]	0.985	100	101.6	LOS F	10.5	266.4	Short	100	0.0	NA
Lane 2	465	3.2	359[1]	1.294	100	176.0	LOS F	42.8	1096.9	Full	400	0.0	100.0
Lane 3	178	1.8	1030	0.173	100	2.2	LOS A	2.0	50.8	Short	100	0.0	NA
Approach	812	2.7		1.294		122.3	LOS F	42.8	1096.9				
West: Meadow Street													
Lane 1	103	3.3	379	0.273	100	13.7	LOS B	2.5	63.6	Short	100	0.0	NA
Lane 2	213	3.6	870	0.245	100	9.4	LOS A	3.9	99.9	Full	1600	0.0	0.0
Approach	317	3.5		0.273		10.8	LOS B	3.9	99.9				
Intersection	1788	2.6		1.294		65.3	LOS E	42.8	1096.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

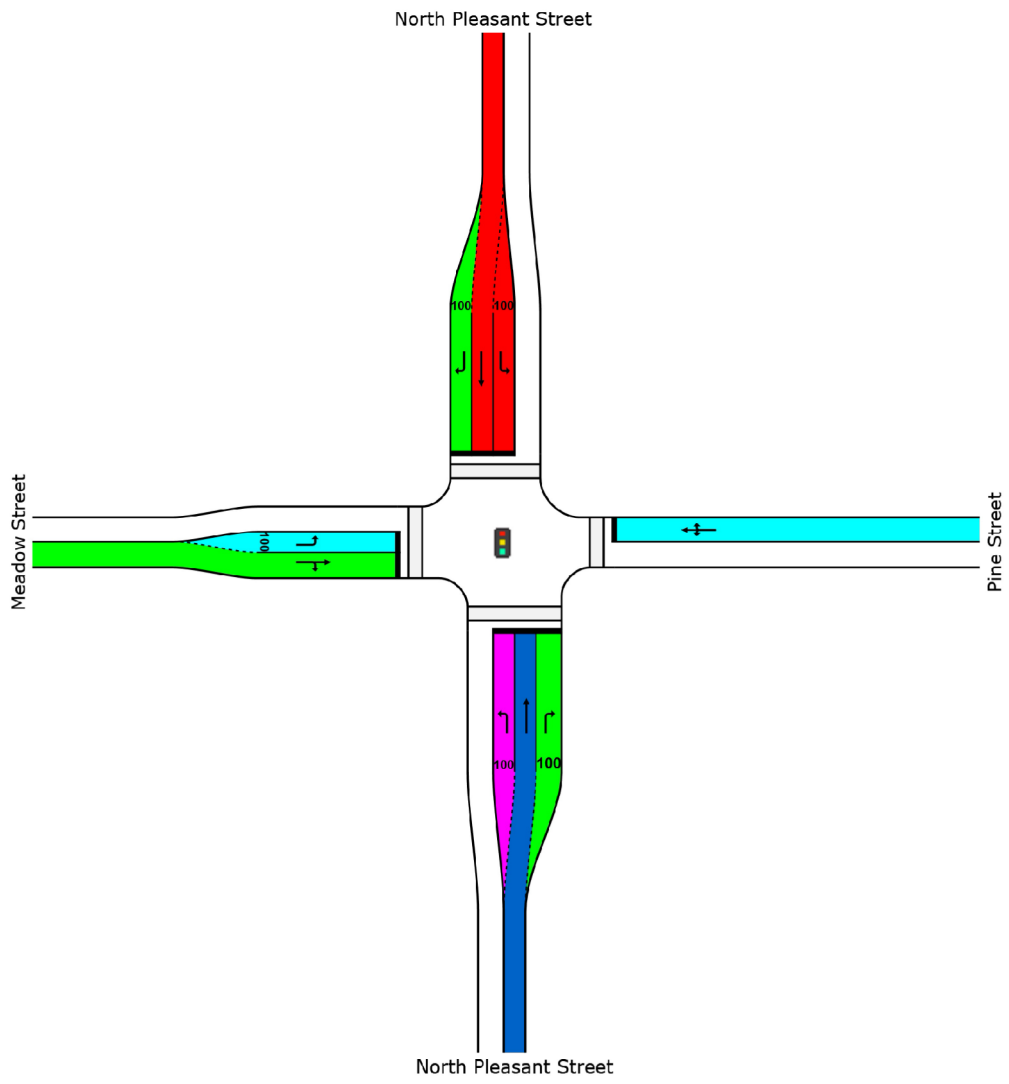
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	B	F	B	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

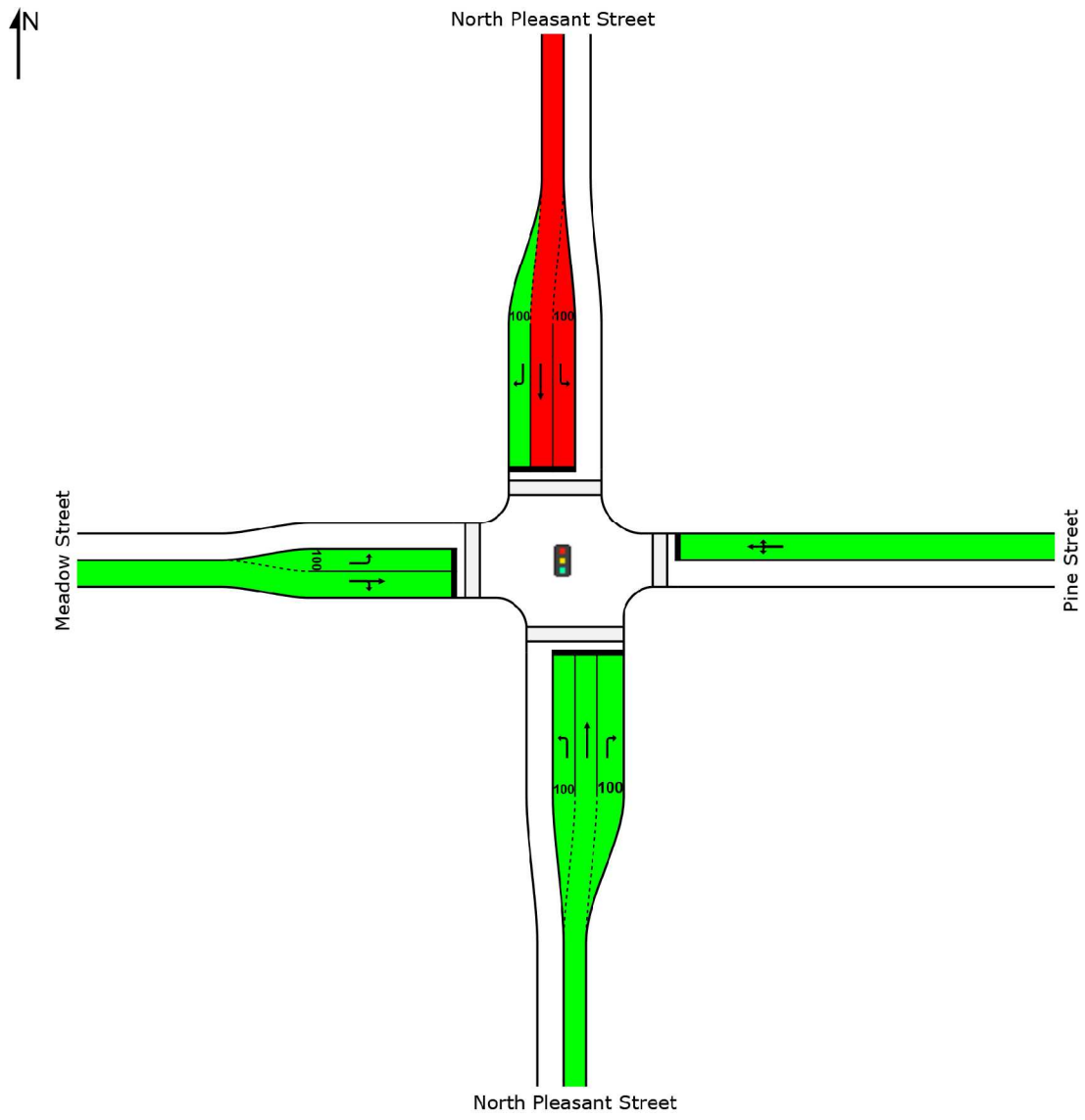
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	77	230	672	61	672



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	105	1.9	939	0.112	100	4.9	LOS A	0.5	12.0	Full	20	0.0	0.0
Approach	105	1.9		0.112		4.9	LOS A	0.5	12.0				
NorthEast: Montague Road													
Lane 1[d]	370	0.5	1009	0.367	100	7.5	LOS A	2.0	50.2	Full	1600	0.0	0.0
Approach	370	0.5		0.367		7.5	LOS A	2.0	50.2				
NorthWest: Sunderland Road													
Lane 1[d]	394	2.8	858	0.460	100	10.0	LOS B	2.9	74.7	Full	1600	0.0	0.0
Approach	394	2.8		0.460		10.0	LOS B	2.9	74.7				
SouthWest: Montague Road													
Lane 1[d]	353	1.8	1308	0.270	100	5.1	LOS A	1.5	37.7	Full	400	0.0	0.0
Approach	353	1.8		0.270		5.1	LOS A	1.5	37.7				
Intersection	1222	1.7		0.460		7.4	LOS A	2.9	74.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

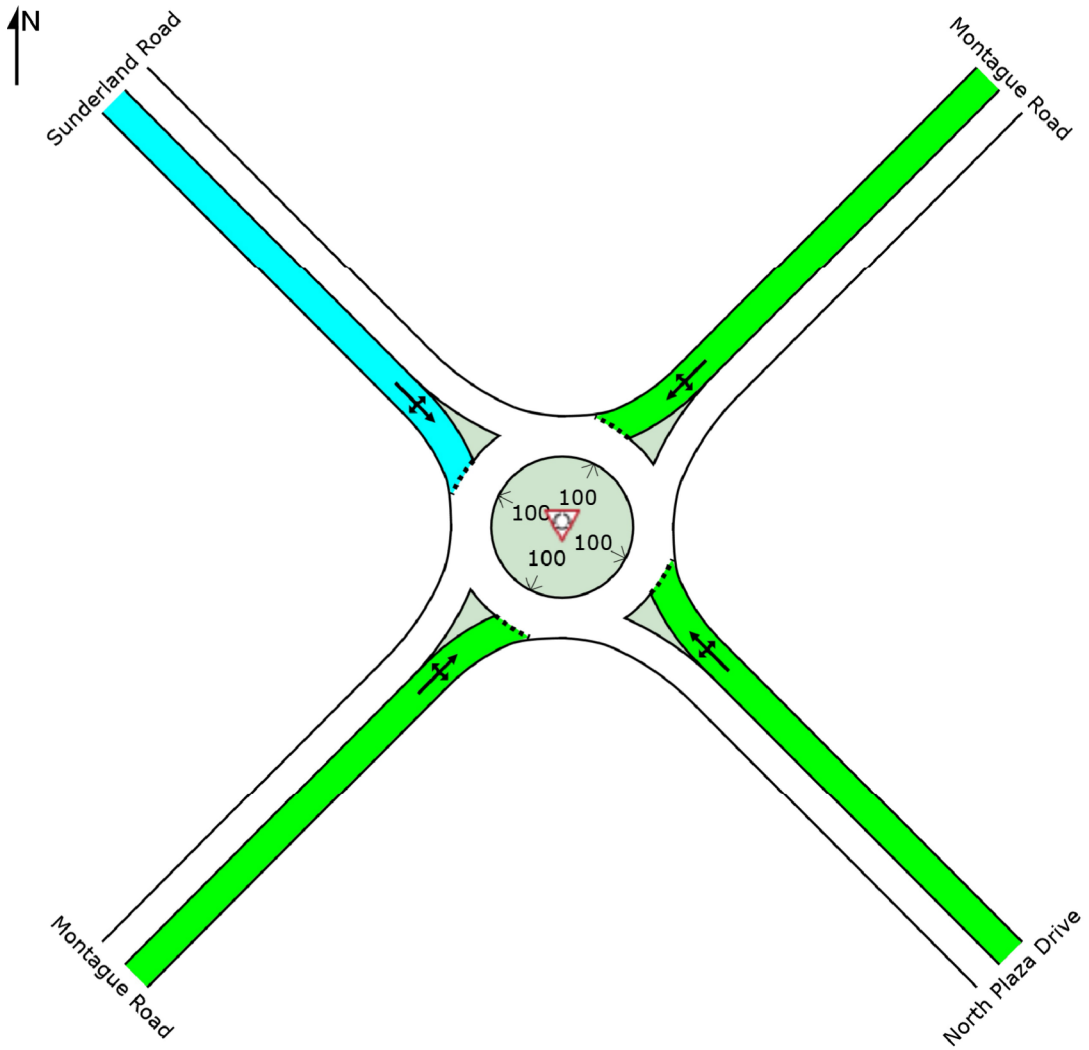
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

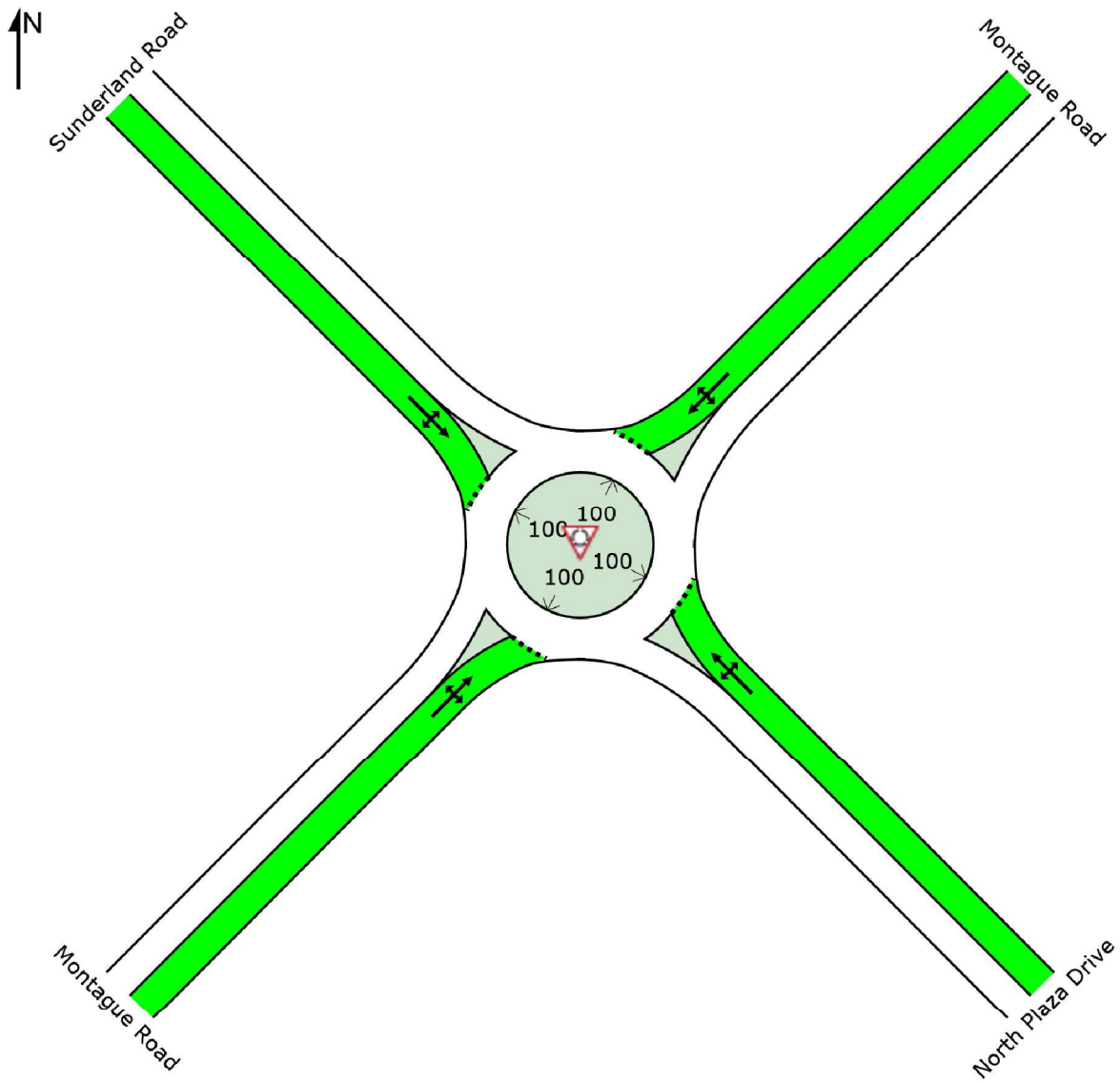
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	5	20	30	15	30



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	214	0.0	178[1]	1.206	100	165.4	LOS F	18.1	452.2	Short	100	0.0	NA
Lane 2	379	3.1	360[1]	1.054	100	92.2	LOS F	25.0	641.6	Full	1600	0.0	0.0
Lane 3	133	1.7	1002	0.133	100	1.1	LOS A	1.1	27.9	Short	100	0.0	NA
Approach	726	1.9		1.206		97.1	LOS F	25.0	641.6				
East: Pine Street													
Lane 1	560	2.8	591	0.948	100	48.2	LOS D	29.1	743.0	Full	1600	0.0	0.0
Approach	560	2.8		0.948		48.2	LOS D	29.1	743.0				
North: North Pleasant Street													
Lane 1	123	4.6	183	0.672	100	45.1	LOS D	5.6	145.0	Short	100	0.0	NA
Lane 2	392	1.3	403[1]	0.972	100	66.9	LOS E	21.8	551.1	Full	400	0.0	34.2
Lane 3	75	5.1	916	0.082	100	2.7	LOS A	0.9	23.0	Short	100	0.0	NA
Approach	590	2.5		0.972		54.2	LOS D	21.8	551.1				
West: Meadow Street													
Lane 1	212	0.0	343	0.617	100	20.3	LOS C	5.9	147.6	Short	100	0.0	NA
Lane 2	306	2.3	887	0.345	100	8.4	LOS A	5.6	142.8	Full	1600	0.0	0.0
Approach	518	1.3		0.617		13.2	LOS B	5.9	147.6				
Intersection	2395	2.1		1.206		57.0	LOS E	29.1	743.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

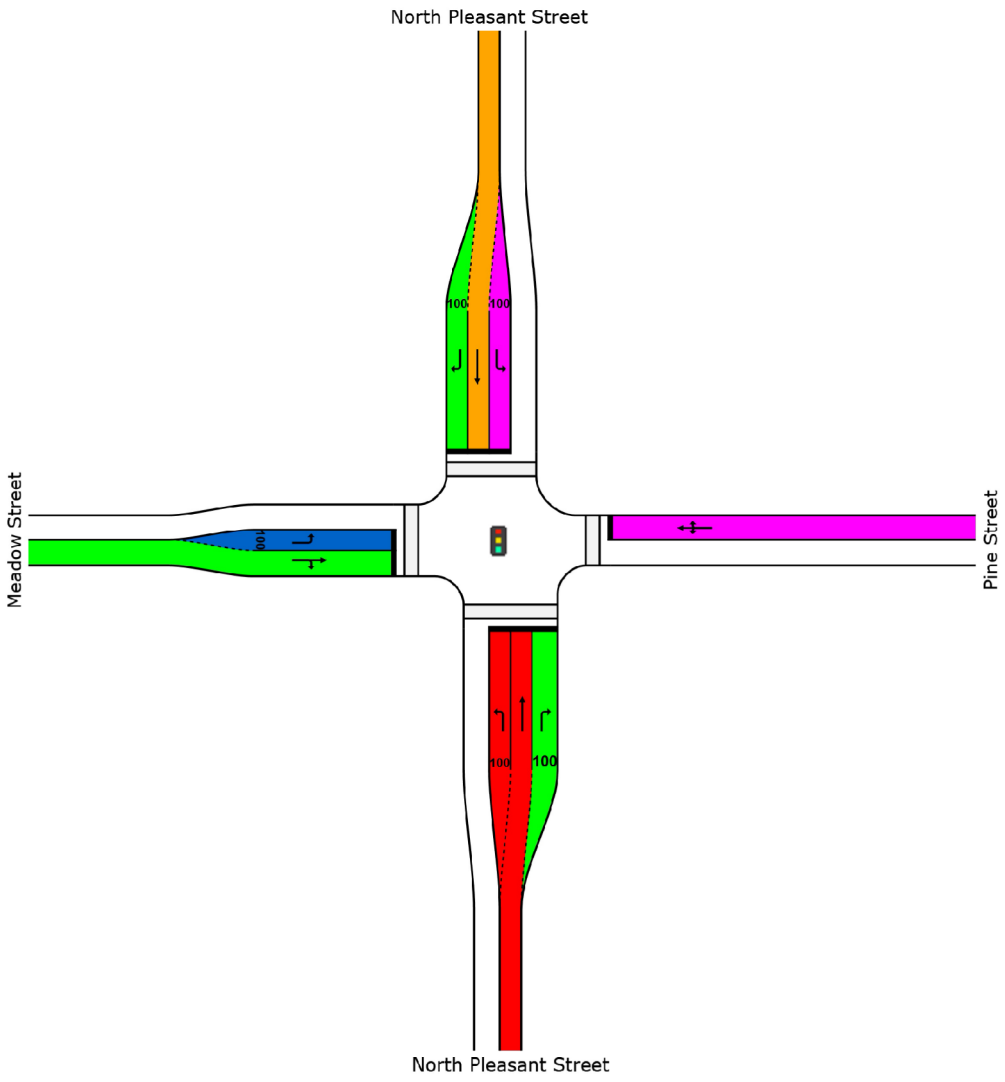
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	D	D	B	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

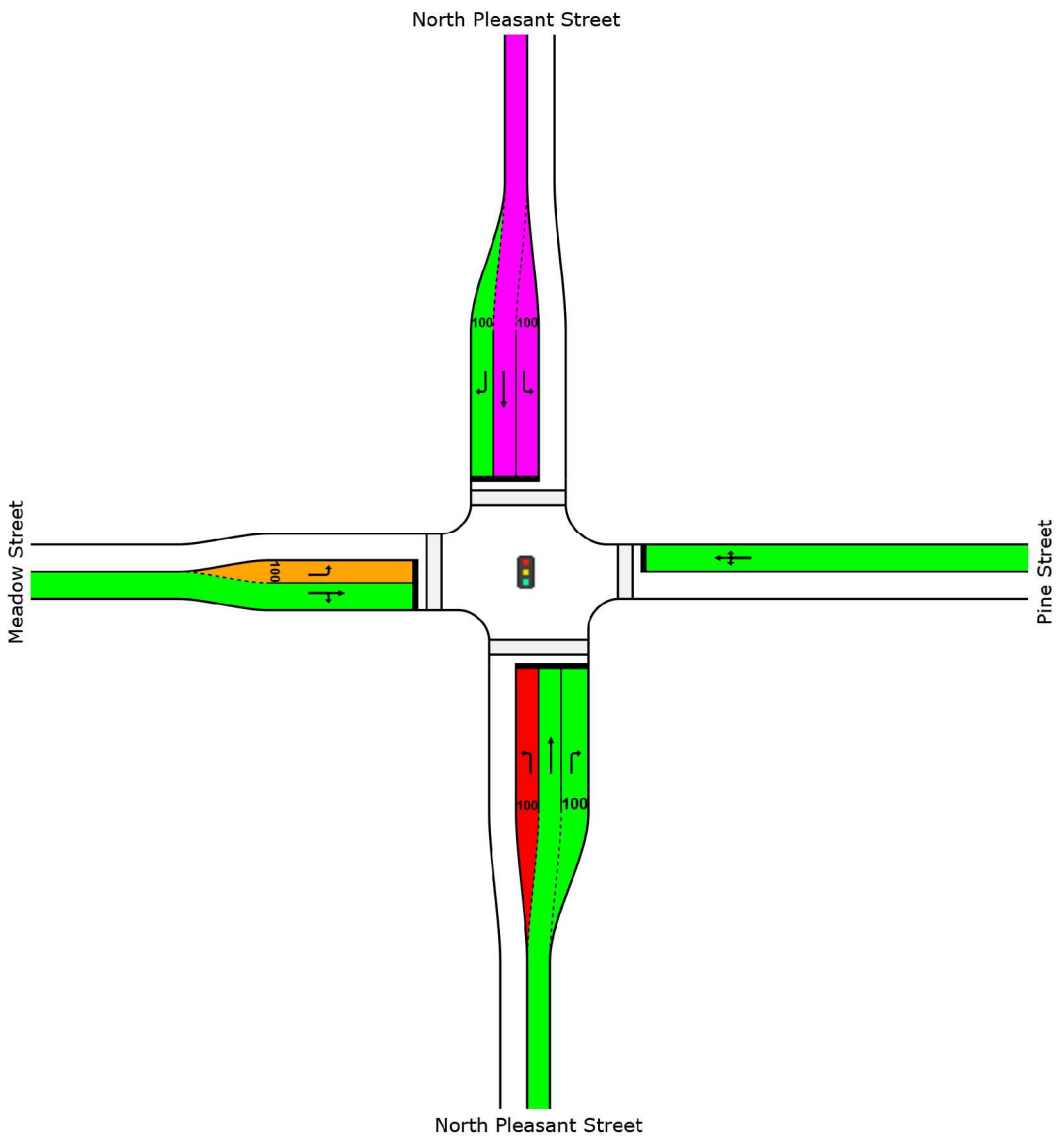
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	393	455	338	90	455



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	111	0.9	670	0.165	100	7.3	LOS A	0.7	16.8	Full	20	0.0	0.1
Approach	111	0.9		0.165		7.3	LOS A	0.7	16.8				
NorthEast: Montague Road													
Lane 1[d]	256	0.5	932	0.275	100	6.7	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	256	0.5		0.275		6.7	LOS A	1.3	33.4				
NorthWest: Sunderland Road													
Lane 1[d]	633	1.6	988	0.640	100	13.1	LOS B	7.8	197.8	Full	1600	0.0	0.0
Approach	633	1.6		0.640		13.1	LOS B	7.8	197.8				
SouthWest: Montague Road													
Lane 1[d]	704	1.5	1317	0.534	100	8.5	LOS A	4.5	113.5	Full	400	0.0	0.0
Approach	704	1.5		0.534		8.5	LOS A	4.5	113.5				
Intersection	1704	1.3		0.640		9.8	LOS A	7.8	197.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

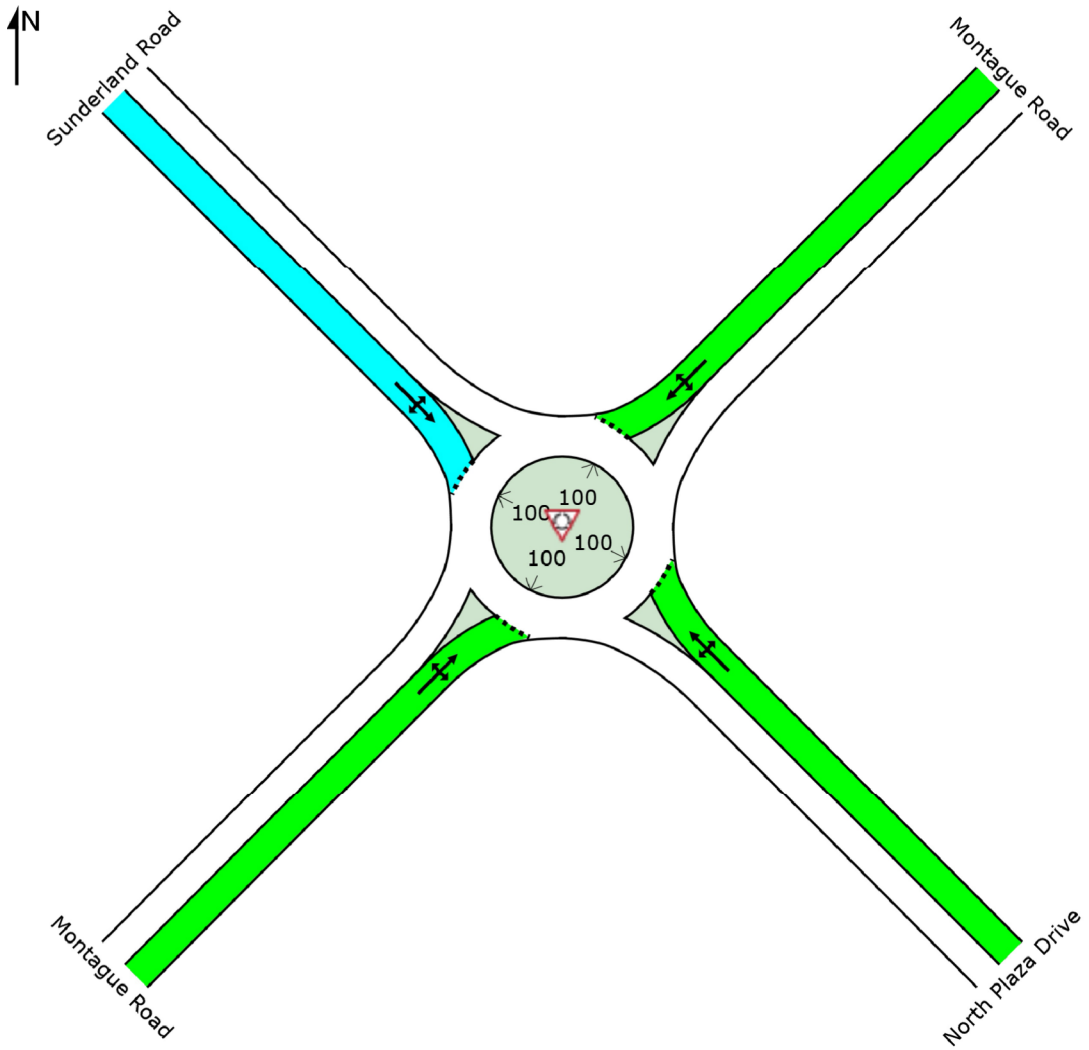
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

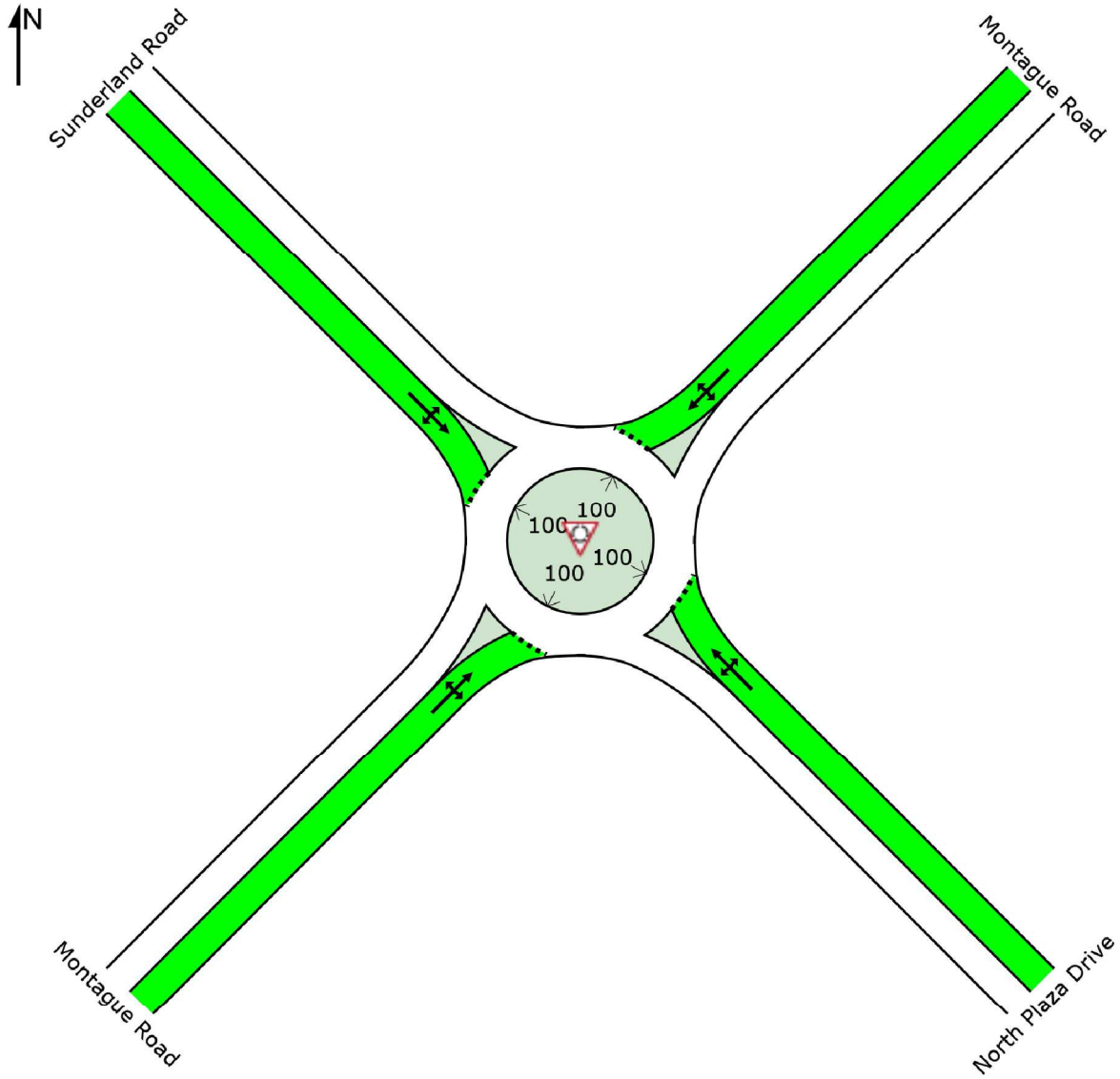
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	7	13	80	46	80



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	104	1.3	189	0.550	100	38.9	LOS D	4.5	112.6	Short	100	0.0	NA
Lane 2	271	3.4	403[1]	0.674	100	31.5	LOS C	10.9	280.7	Full	1600	0.0	0.0
Lane 3	30	2.7	945	0.031	100	1.3	LOS A	0.2	6.4	Short	100	0.0	NA
Approach	405	2.8		0.674		31.2	LOS C	10.9	280.7				
East: Pine Street													
Lane 1	529	2.9	671	0.789	100	25.1	LOS C	20.4	521.5	Full	1600	0.0	0.0
Approach	529	2.9		0.789		25.1	LOS C	20.4	521.5				
North: North Pleasant Street													
Lane 1	175	0.5	178[1]	0.984	100	100.0	LOS F	10.8	270.5	Short	100	0.0	NA
Lane 2	241	0.4	365[1]	0.662	100	30.8	LOS C	9.5	239.0	Full	400	0.0	0.0
Lane 3	194	0.9	1034	0.188	100	2.0	LOS A	2.1	53.6	Short	100	0.0	NA
Approach	611	0.6		0.984		41.5	LOS D	10.8	270.5				
West: Meadow Street													
Lane 1	191	1.6	312	0.613	100	19.4	LOS B	5.4	135.6	Short	100	0.0	NA
Lane 2	231	1.0	894	0.259	100	7.0	LOS A	4.2	106.0	Full	1600	0.0	0.0
Approach	423	1.3		0.613		12.6	LOS B	5.4	135.6				
Intersection	1968	1.8		0.984		28.8	LOS C	20.4	521.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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SATURDAY PEAK

LANE LEVEL OF SERVICE

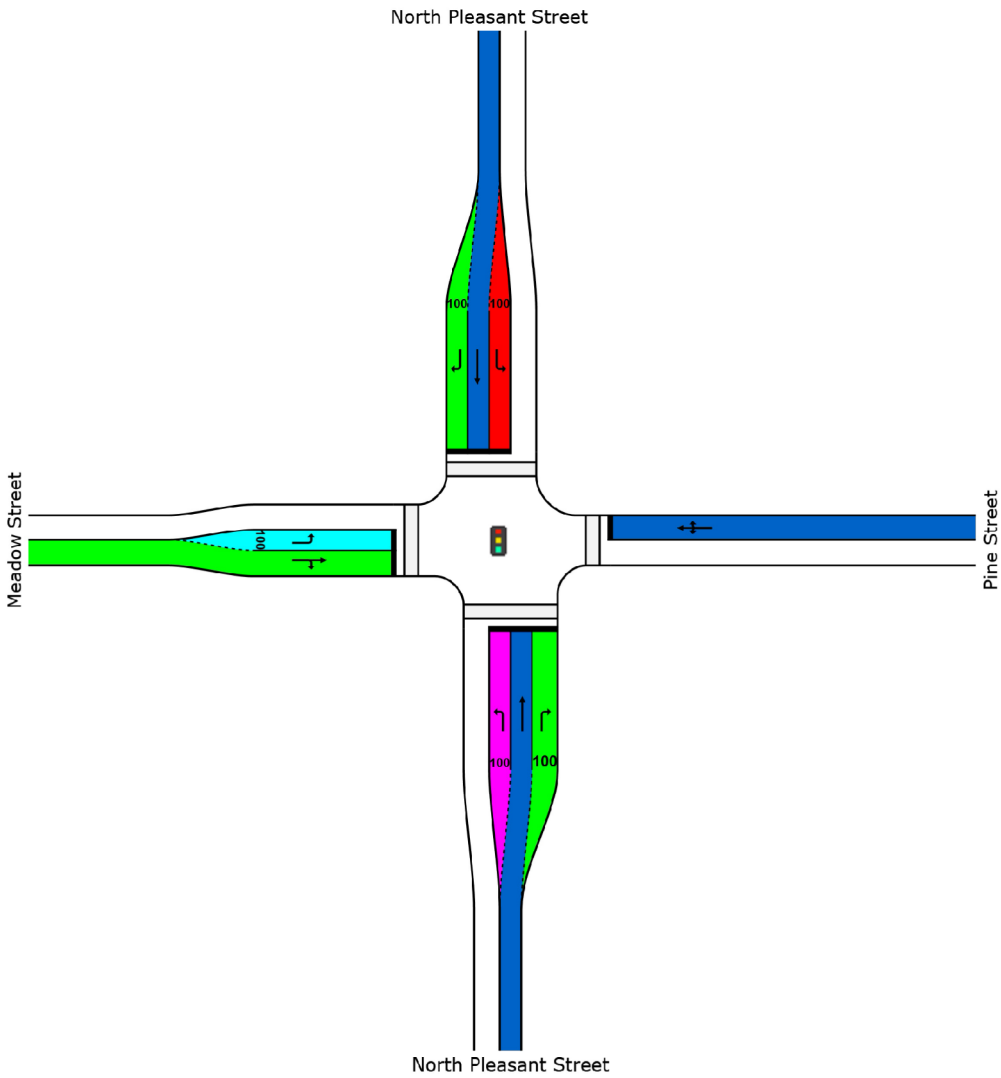
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	D	B	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

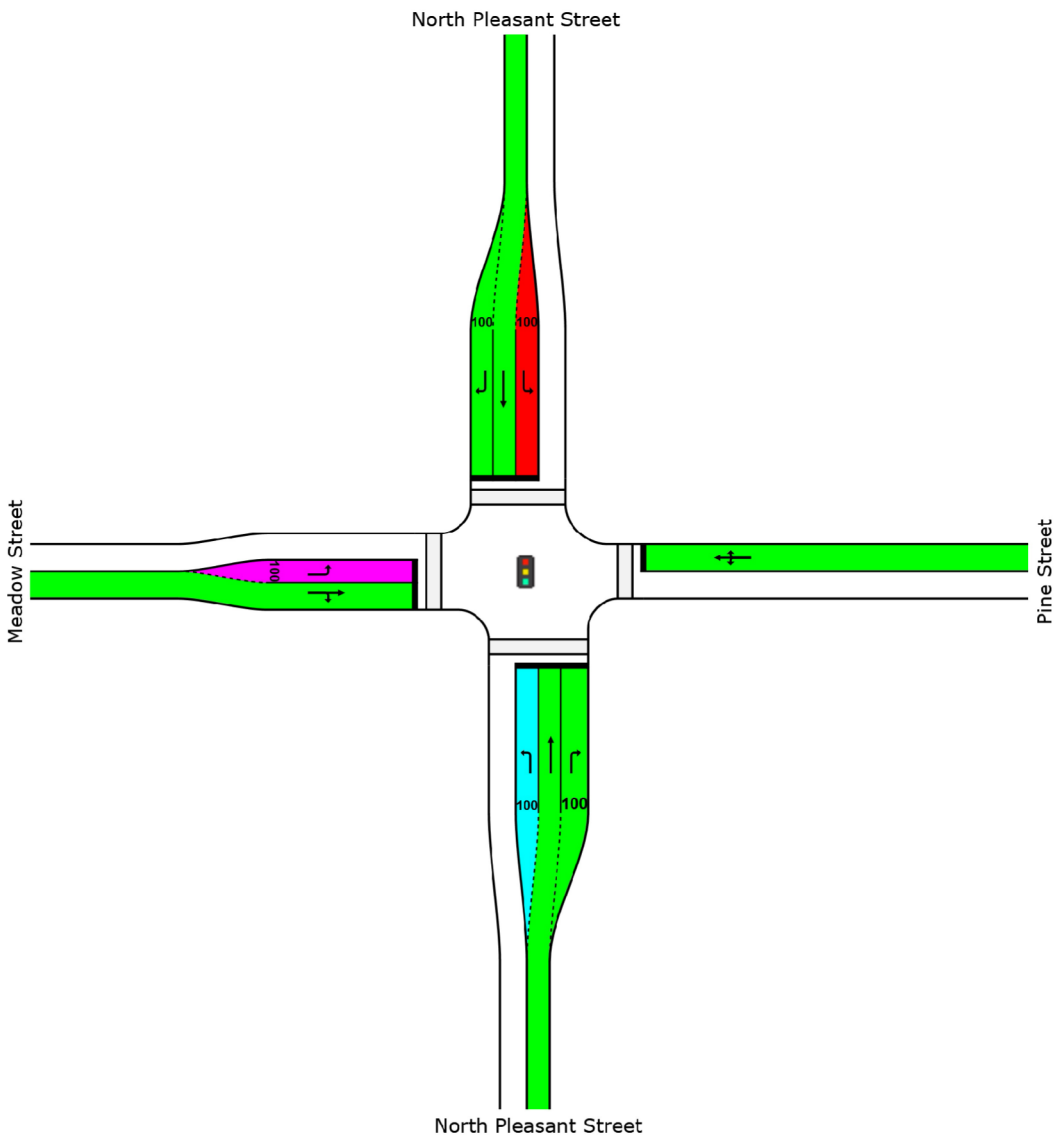
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	172	320	166	83	320



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	104	0.8	765	0.136	100	6.1	LOS A	0.6	14.0	Full	20	0.0	0.0
Approach	104	0.8		0.136		6.1	LOS A	0.6	14.0				
NorthEast: Montague Road													
Lane 1[d]	274	0.6	998	0.275	100	6.3	LOS A	1.4	34.3	Full	1600	0.0	0.0
Approach	274	0.6		0.275		6.3	LOS A	1.4	34.3				
NorthWest: Sunderland Road													
Lane 1[d]	250	1.6	964	0.259	100	6.3	LOS A	1.2	31.5	Full	1600	0.0	0.0
Approach	250	1.6		0.259		6.3	LOS A	1.2	31.5				
SouthWest: Montague Road													
Lane 1[d]	571	1.1	1341	0.426	100	6.8	LOS A	3.0	75.9	Full	400	0.0	0.0
Approach	571	1.1		0.426		6.8	LOS A	3.0	75.9				
Intersection	1199	1.1		0.426		6.5	LOS A	3.0	75.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

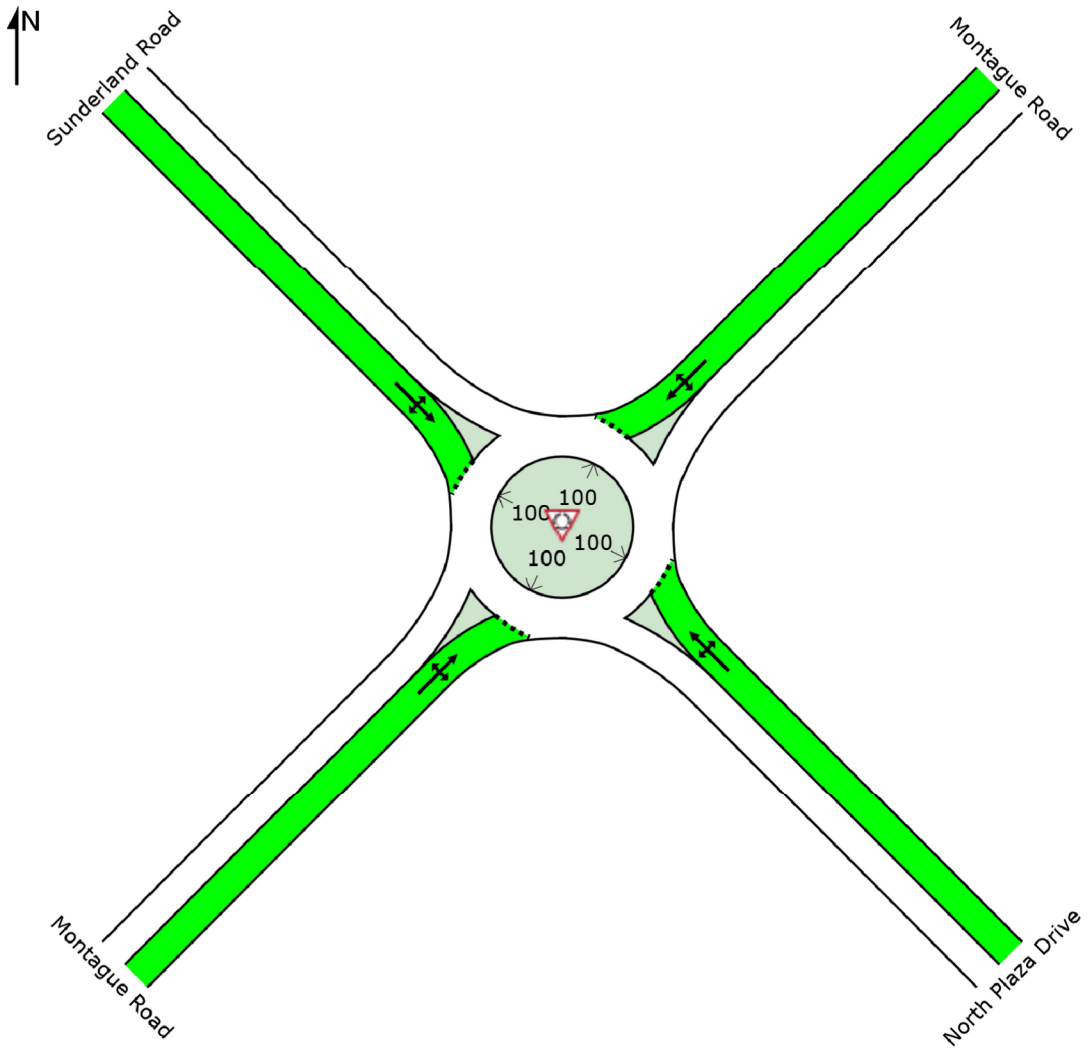
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

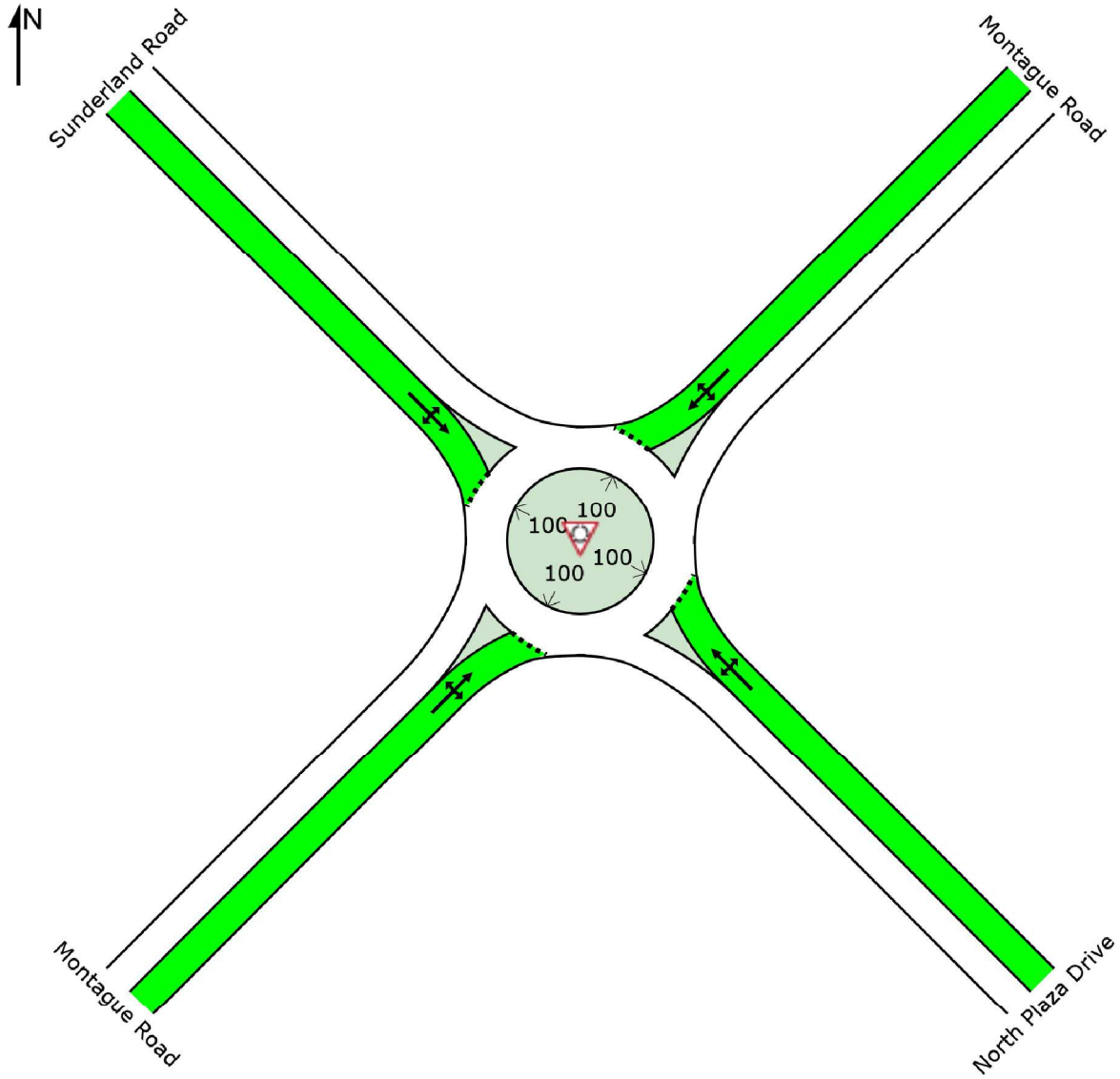
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	6	14	13	31	31



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 3

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	48	4.7	183	0.262	100	35.5	LOS D	1.9	49.1	Short	100	0.0	NA
Lane 2	143	3.8	474	0.303	100	25.6	LOS C	4.9	126.3	Full	1600	0.0	0.0
Lane 3	24	0.0	988	0.024	100	1.3	LOS A	0.2	5.0	Short	100	0.0	NA
Approach	215	3.6		0.303		25.1	LOS C	4.9	126.3				
East: Pine Street													
Lane 1	443	1.2	664	0.667	100	19.3	LOS B	14.9	375.7	Full	1600	0.0	0.0
Approach	443	1.2		0.667		19.3	LOS B	14.9	375.7				
North: North Pleasant Street													
Lane 1	169	2.4	172[1]	0.985	100	101.6	LOS F	10.5	266.4	Short	100	0.0	NA
Lane 2	465	3.2	359[1]	1.294	100	176.0	LOS F	42.8	1096.9	Full	400	0.0	100.0
Lane 3	178	1.8	1030	0.173	100	2.2	LOS A	2.0	50.8	Short	100	0.0	NA
Approach	812	2.7		1.294		122.3	LOS F	42.8	1096.9				
West: Meadow Street													
Lane 1	103	3.3	379	0.273	100	13.7	LOS B	2.5	63.6	Short	100	0.0	NA
Lane 2	213	3.6	870	0.245	100	9.4	LOS A	3.9	99.9	Full	1600	0.0	0.0
Approach	317	3.5		0.273		10.8	LOS B	3.9	99.9				
Intersection	1788	2.6		1.294		65.3	LOS E	42.8	1096.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

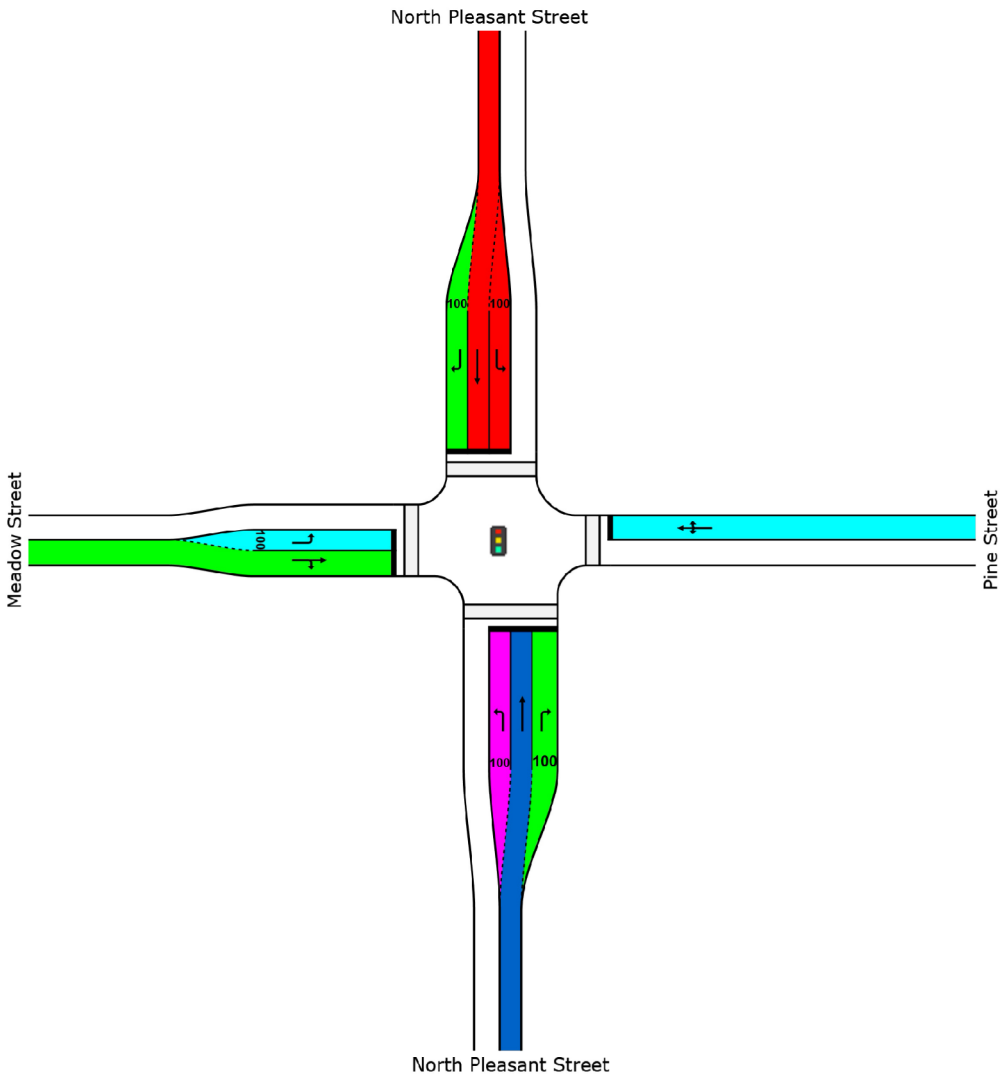
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	B	F	B	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

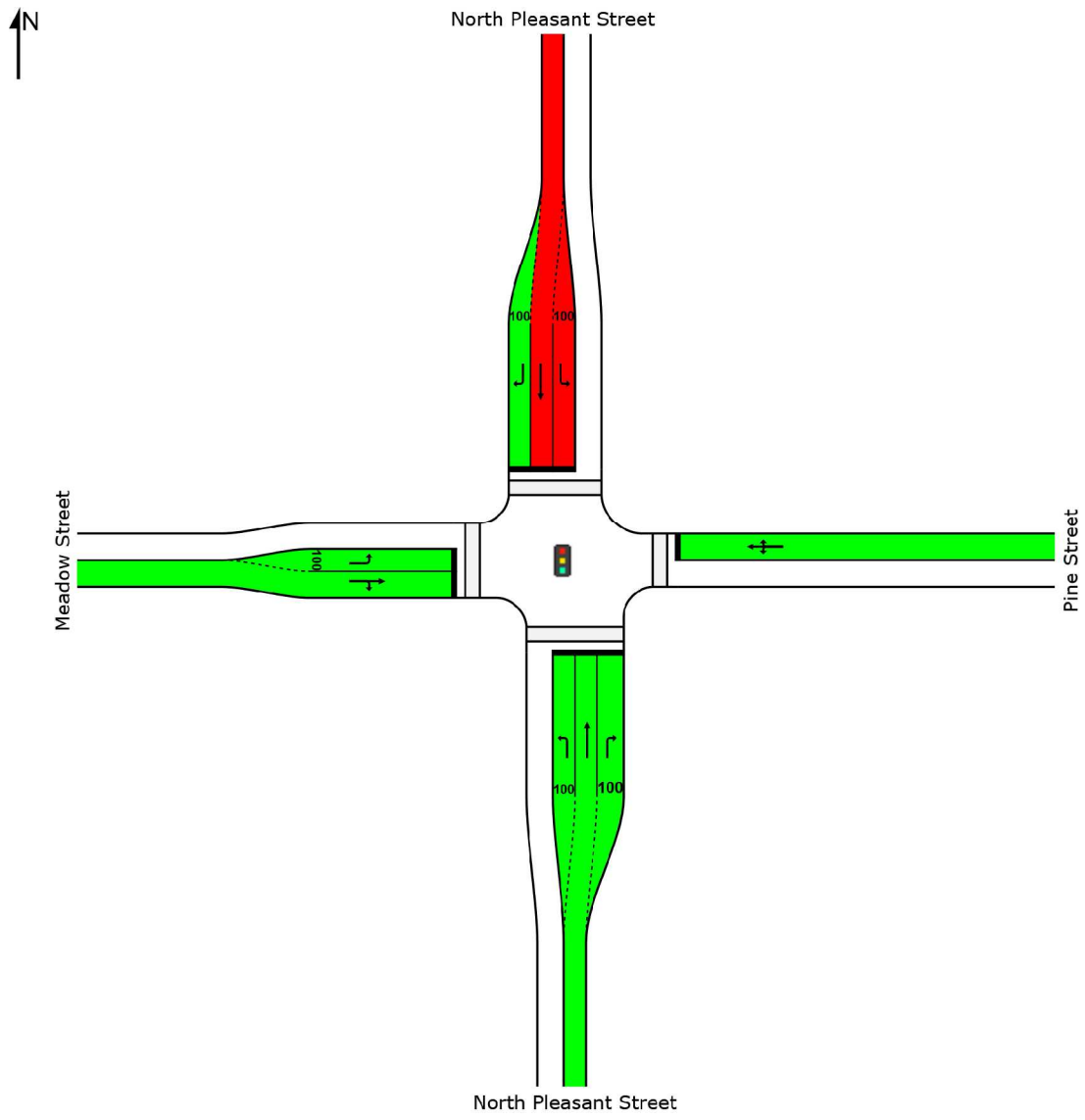
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	77	230	672	61	672



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	406	0.6	1849	0.219	100	1.9	LOS A	0.2	4.1	Full	1600	0.0	0.0
Approach	406	0.6		0.219		1.9	NA	0.2	4.1				
NorthWest: Sunderland Road													
Lane 1	394	2.8	617	0.639	100	20.6	LOS C	9.1	233.1	Full	1600	0.0	0.0
Approach	394	2.8		0.639		20.6	LOS C	9.1	233.1				
SouthWest: Montague Road													
Lane 1	475	1.3	1395	0.340	100	6.0	LOS A	2.3	58.6	Full	400	0.0	0.0
Approach	475	1.3		0.340		6.0	NA	2.3	58.6				
Intersection	1275	1.5		0.639		9.2	NA	9.1	233.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

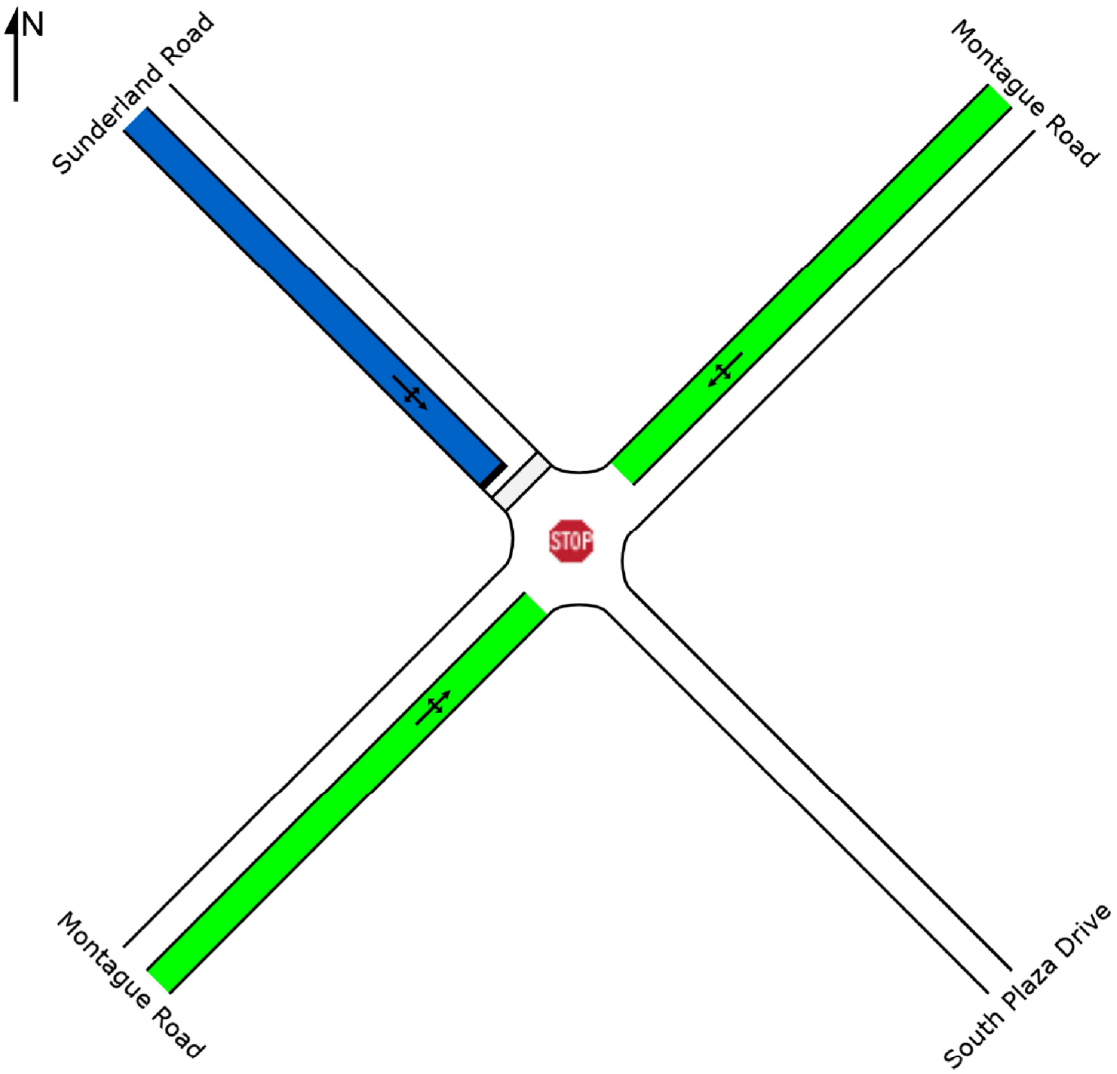
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	C	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

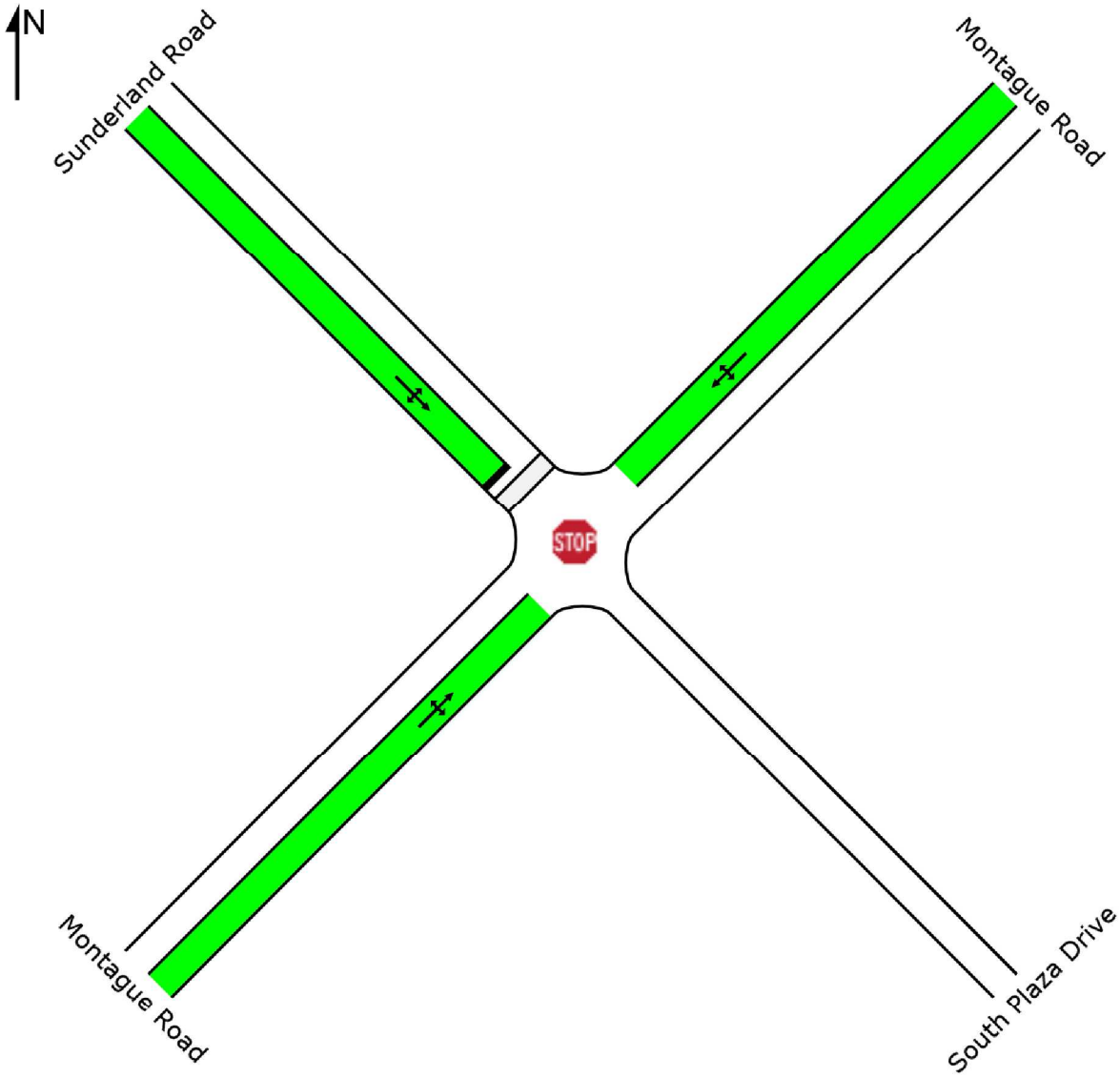
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	2	94	24	94



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	214	0.0	324	0.662	100	21.6	LOS C	6.0	150.1	Short	100	0.0	NA
Lane 2	379	3.1	360[1]	1.054	100	92.2	LOS F	25.0	641.6	Full	1600	0.0	0.0
Lane 3	133	1.7	1002	0.133	100	1.1	LOS A	1.1	27.9	Short	100	0.0	NA
Approach	726	1.9		1.054		54.7	LOS D	25.0	641.6				
East: Pine Street													
Lane 1	560	2.8	591	0.948	100	48.2	LOS D	29.1	743.0	Full	1600	0.0	0.0
Approach	560	2.8		0.948		48.2	LOS D	29.1	743.0				
North: North Pleasant Street													
Lane 1	123	4.6	183	0.672	100	45.1	LOS D	5.6	145.0	Short	100	0.0	NA
Lane 2	392	1.3	403[1]	0.973	100	67.1	LOS E	21.8	551.6	Full	400	0.0	34.3
Lane 3	75	5.1	951	0.079	100	2.0	LOS A	0.8	20.1	Short	100	0.0	NA
Approach	590	2.5		0.973		54.2	LOS D	21.8	551.6				
West: Meadow Street													
Lane 1	212	0.0	343	0.617	100	20.3	LOS C	5.9	147.6	Short	100	0.0	NA
Lane 2	306	2.3	887	0.345	100	8.4	LOS A	5.6	142.8	Full	1600	0.0	0.0
Approach	518	1.3		0.617		13.2	LOS B	5.9	147.6				
Intersection	2395	2.1		1.054		44.1	LOS D	29.1	743.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

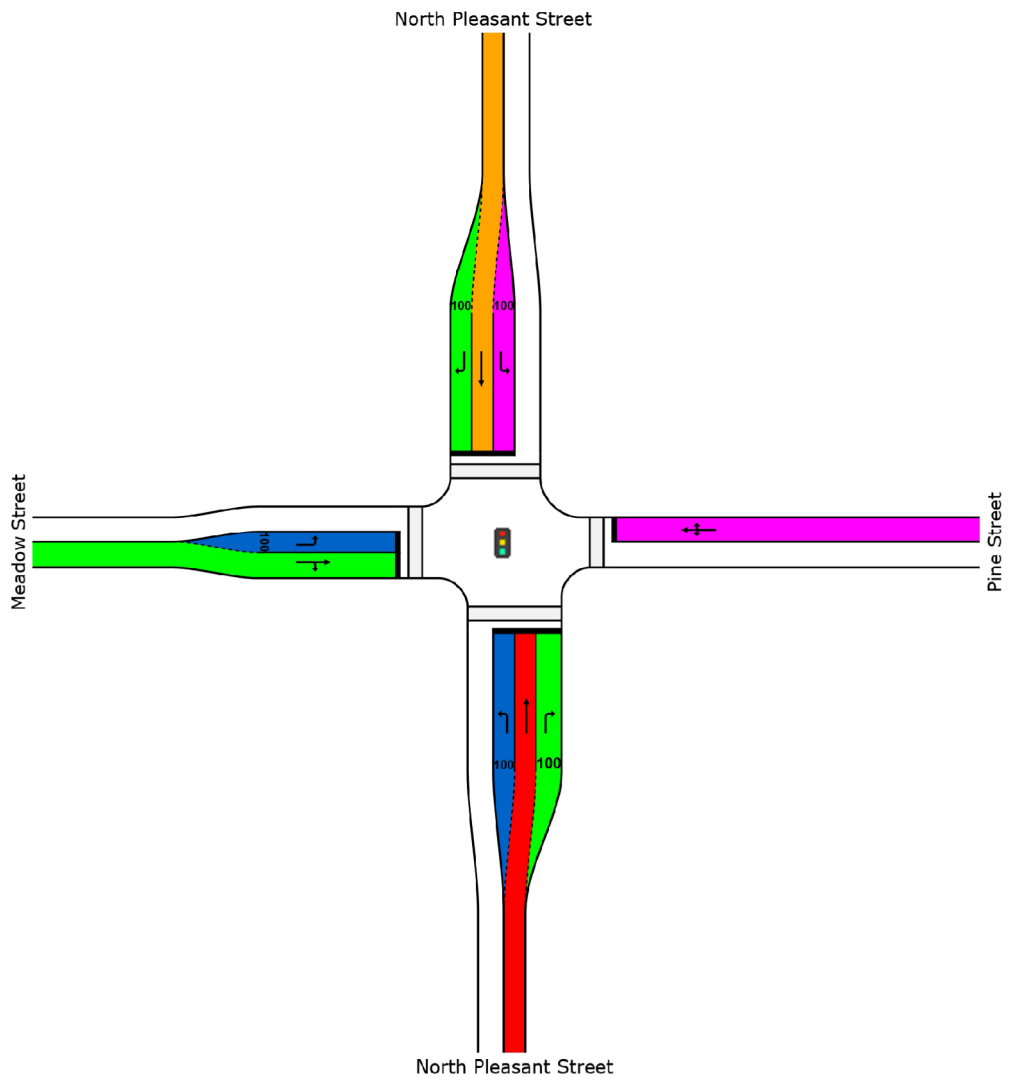
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	D	D	D	B	D



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

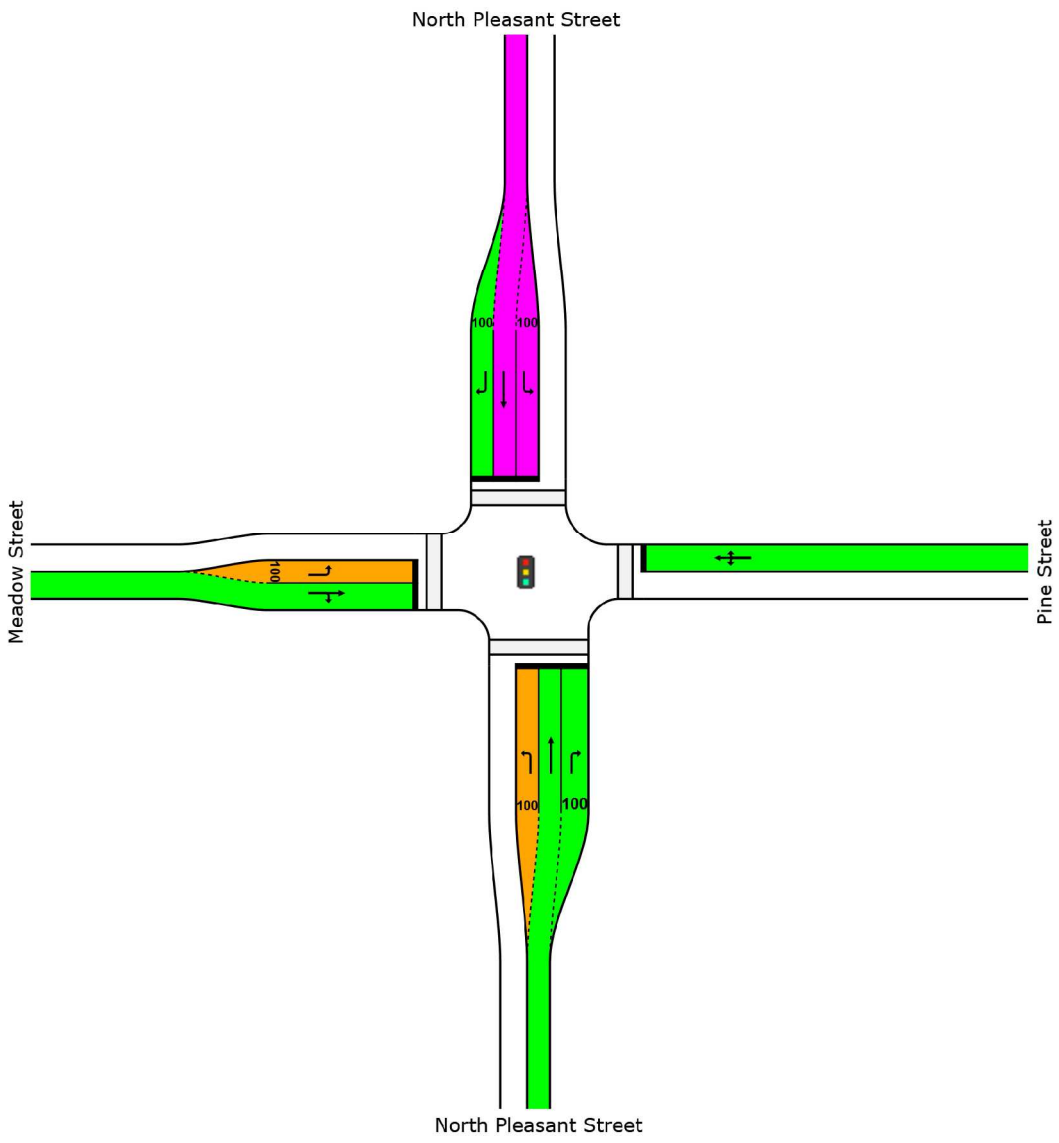
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	393	455	338	90	455



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	300	0.6	1772	0.169	100	2.0	LOS A	0.3	6.7	Full	1600	0.0	0.0
Approach	300	0.6		0.169		2.0	NA	0.3	6.7				
NorthWest: Sunderland Road													
Lane 1	633	1.6	720	0.880	100	35.0	LOS E	34.4	871.0	Full	1600	0.0	0.0
Approach	633	1.6		0.880		35.0	LOS E	34.4	871.0				
SouthWest: Montague Road													
Lane 1	879	1.2	1549	0.568	100	8.1	LOS A	12.3	310.6	Full	400	0.0	0.0
Approach	879	1.2		0.568		8.1	NA	12.3	310.6				
Intersection	1813	1.2		0.880		16.5	NA	34.4	871.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

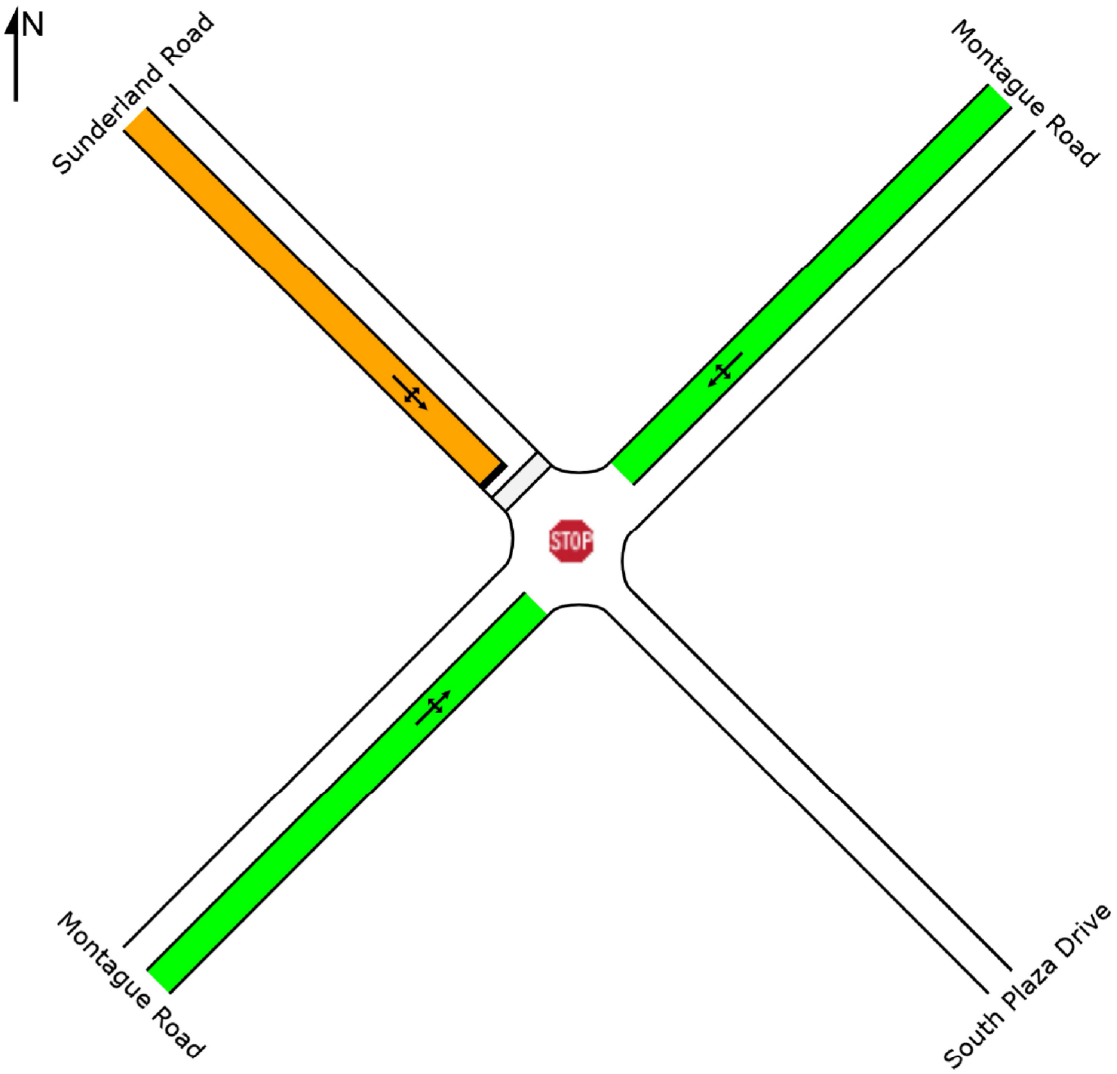
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	E	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

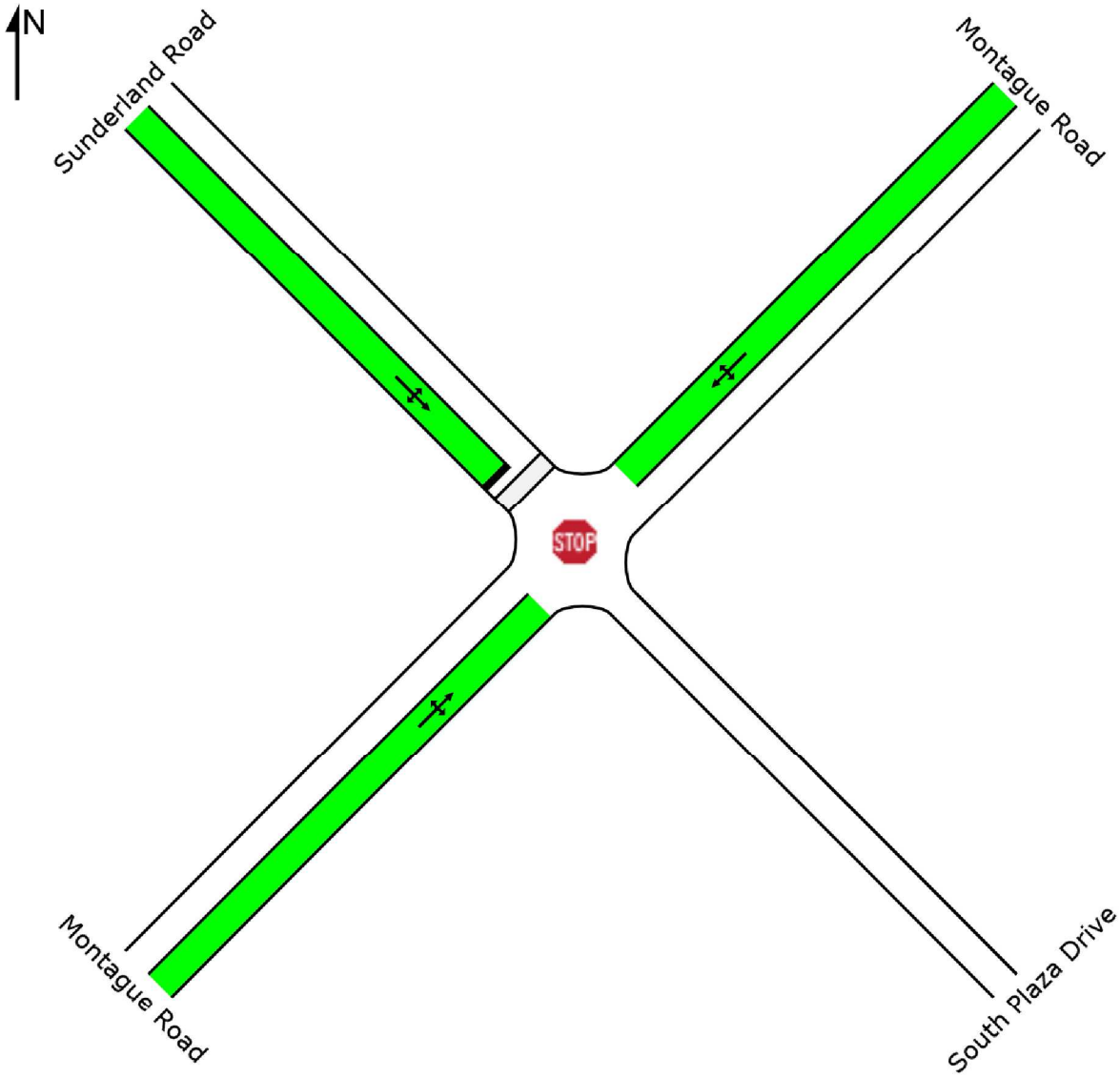
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	3	350	125	350



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	104	1.3	189	0.550	100	38.9	LOS D	4.5	112.6	Short	100	0.0	NA
Lane 2	271	3.4	403[1]	0.674	100	31.5	LOS C	10.9	280.7	Full	1600	0.0	0.0
Lane 3	30	2.7	945	0.031	100	1.3	LOS A	0.2	6.4	Short	100	0.0	NA
Approach	405	2.8		0.674		31.2	LOS C	10.9	280.7				
East: Pine Street													
Lane 1	529	2.9	671	0.789	100	25.1	LOS C	20.4	521.5	Full	1600	0.0	0.0
Approach	529	2.9		0.789		25.1	LOS C	20.4	521.5				
North: North Pleasant Street													
Lane 1	175	0.5	178[1]	0.984	100	100.0	LOS F	10.8	270.5	Short	100	0.0	NA
Lane 2	241	0.4	365[1]	0.662	100	30.8	LOS C	9.5	239.0	Full	400	0.0	0.0
Lane 3	194	0.9	1034	0.188	100	2.0	LOS A	2.1	53.6	Short	100	0.0	NA
Approach	611	0.6		0.984		41.5	LOS D	10.8	270.5				
West: Meadow Street													
Lane 1	191	1.6	312	0.613	100	19.4	LOS B	5.4	135.6	Short	100	0.0	NA
Lane 2	231	1.0	894	0.259	100	7.0	LOS A	4.2	106.0	Full	1600	0.0	0.0
Approach	423	1.3		0.613		12.6	LOS B	5.4	135.6				
Intersection	1968	1.8		0.984		28.8	LOS C	20.4	521.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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SATURDAY PEAK

LANE LEVEL OF SERVICE

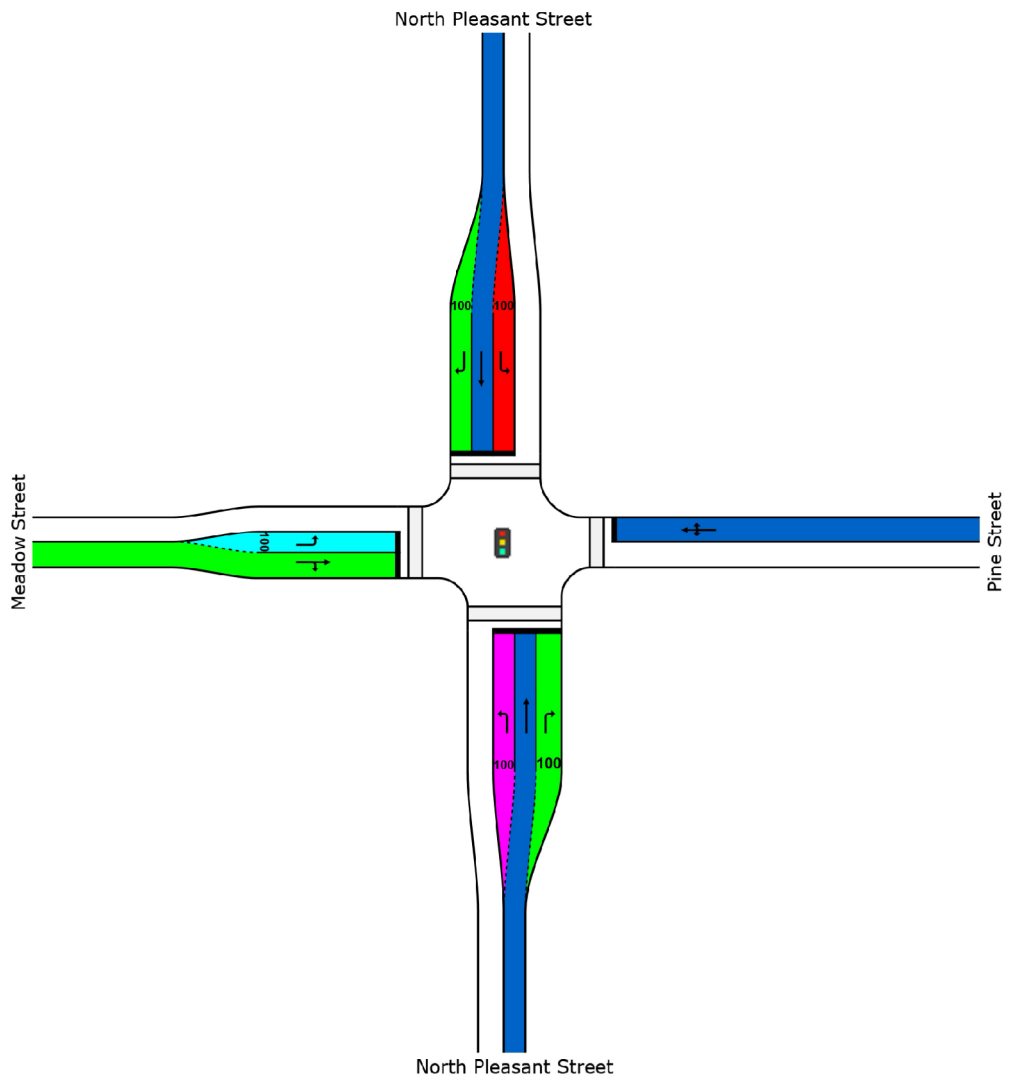
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	D	B	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

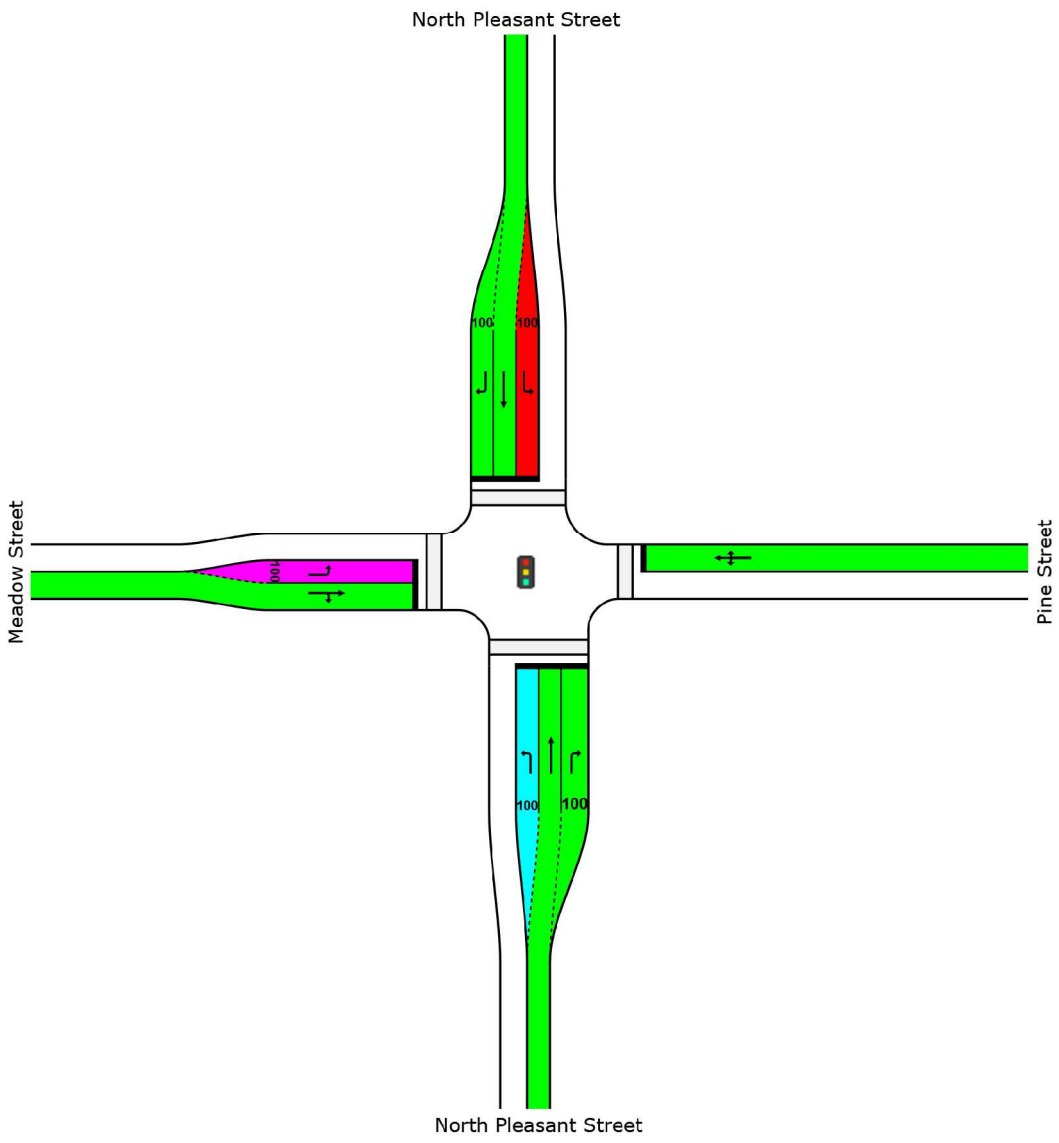
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	172	320	166	83	320



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	323	0.6	1840	0.176	100	1.6	LOS A	0.1	3.2	Full	1600	0.0	0.0
Approach	323	0.6		0.176		1.6	NA	0.1	3.2				
NorthWest: Sunderland Road													
Lane 1	250	1.6	685	0.365	100	13.2	LOS B	2.5	63.4	Full	1600	0.0	0.0
Approach	250	1.6		0.365		13.2	LOS B	2.5	63.4				
SouthWest: Montague Road													
Lane 1	662	1.1	1539	0.430	100	6.3	LOS A	4.4	111.8	Full	400	0.0	0.0
Approach	662	1.1		0.430		6.3	NA	4.4	111.8				
Intersection	1235	1.1		0.430		6.4	NA	4.4	111.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

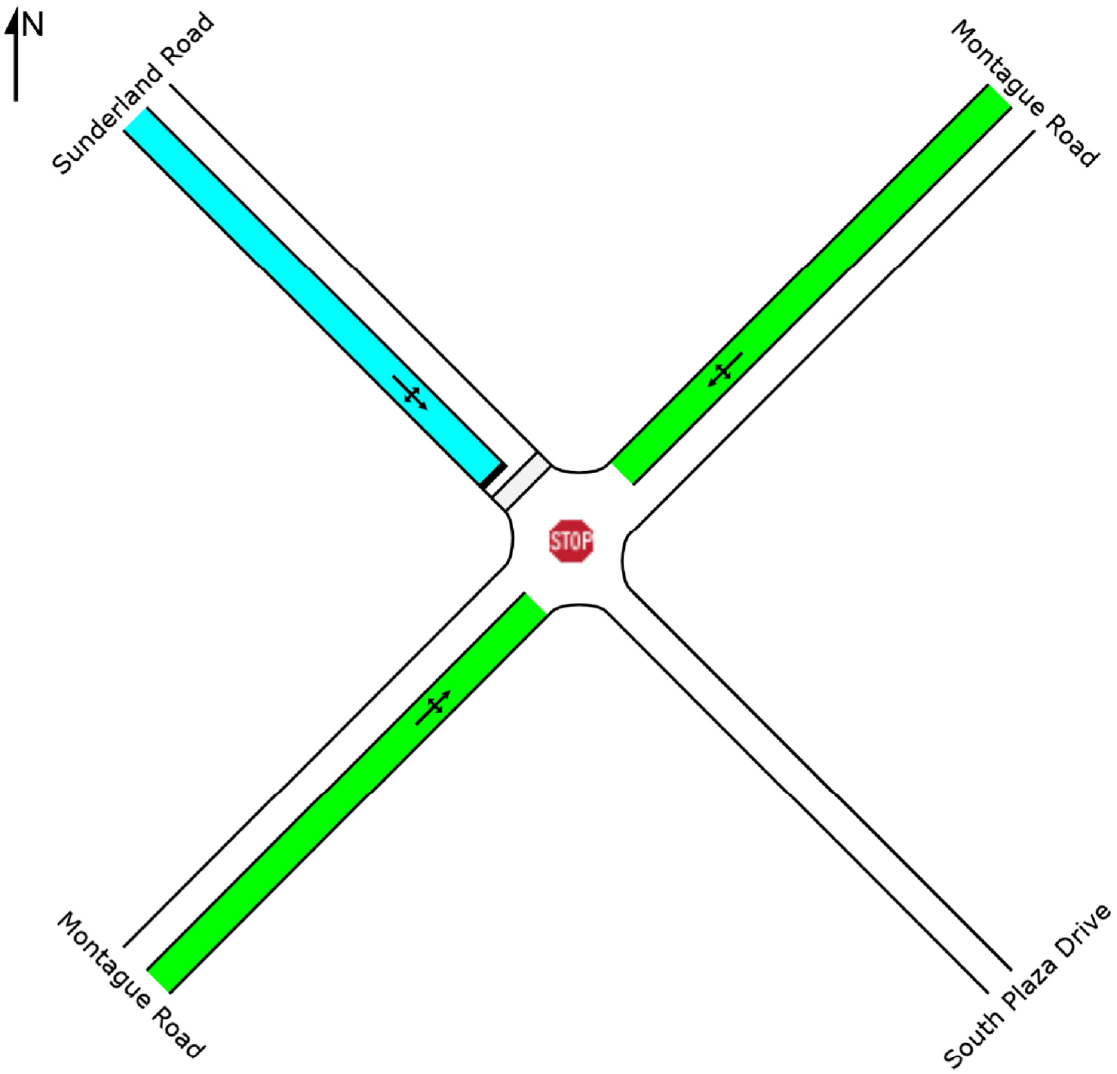
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	B	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

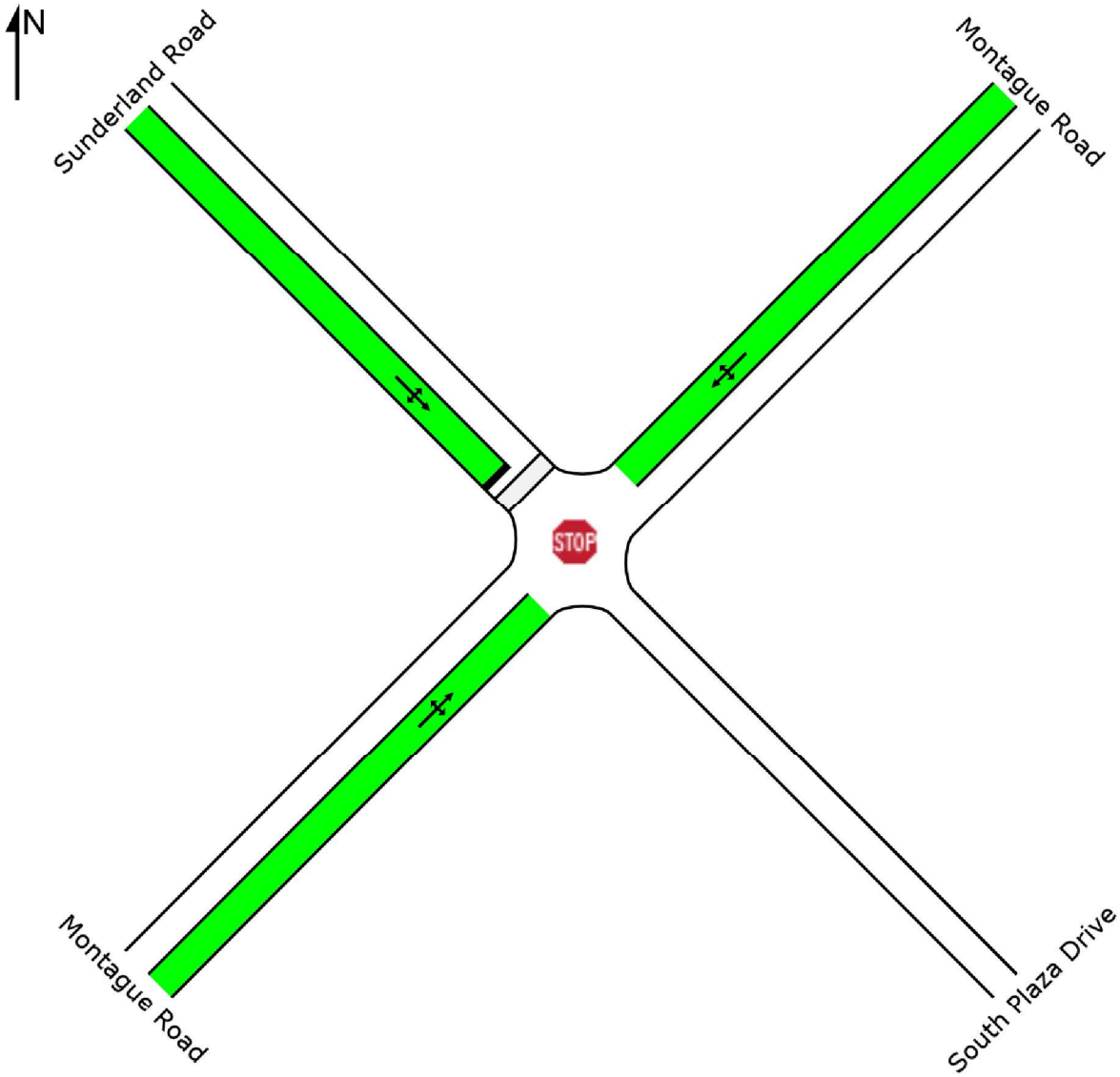
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	1	26	45	45



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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Alternative 4

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	48	4.7	183	0.262	100	35.5	LOS D	1.9	49.1	Short	100	0.0	NA
Lane 2	143	3.8	474	0.303	100	25.6	LOS C	4.9	126.3	Full	1600	0.0	0.0
Lane 3	24	0.0	1138	0.021	100	1.0	LOS A	0.2	4.4	Short	100	0.0	NA
Approach	215	3.6		0.303		25.1	LOS C	4.9	126.3				
East: Pine Street													
Lane 1	443	1.2	685	0.647	100	18.9	LOS B	14.6	368.2	Full	1600	0.0	0.0
Approach	443	1.2		0.647		18.9	LOS B	14.6	368.2				
North: North Pleasant Street													
Lane 1	169	2.4	172[1]	0.985	100	101.6	LOS F	10.5	266.4	Short	100	0.0	NA
Lane 2	465	3.2	358[1]	1.296	100	176.8	LOS F	42.9	1099.1	Full	150	0.0	100.0
Lane 3	178	1.8	1107	0.161	100	1.0	LOS A	1.4	36.0	Short	100	0.0	NA
Approach	812	2.7		1.296		122.5	LOS F	42.9	1099.1				
West: Meadow Street													
Lane 1	317	3.5	821	0.386	100	23.2	LOS C	10.5	269.2	Full	1600	0.0	0.0
Approach	317	3.5		0.386		23.2	LOS C	10.5	269.2				
Intersection	1788	2.6		1.296		67.5	LOS E	42.9	1099.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

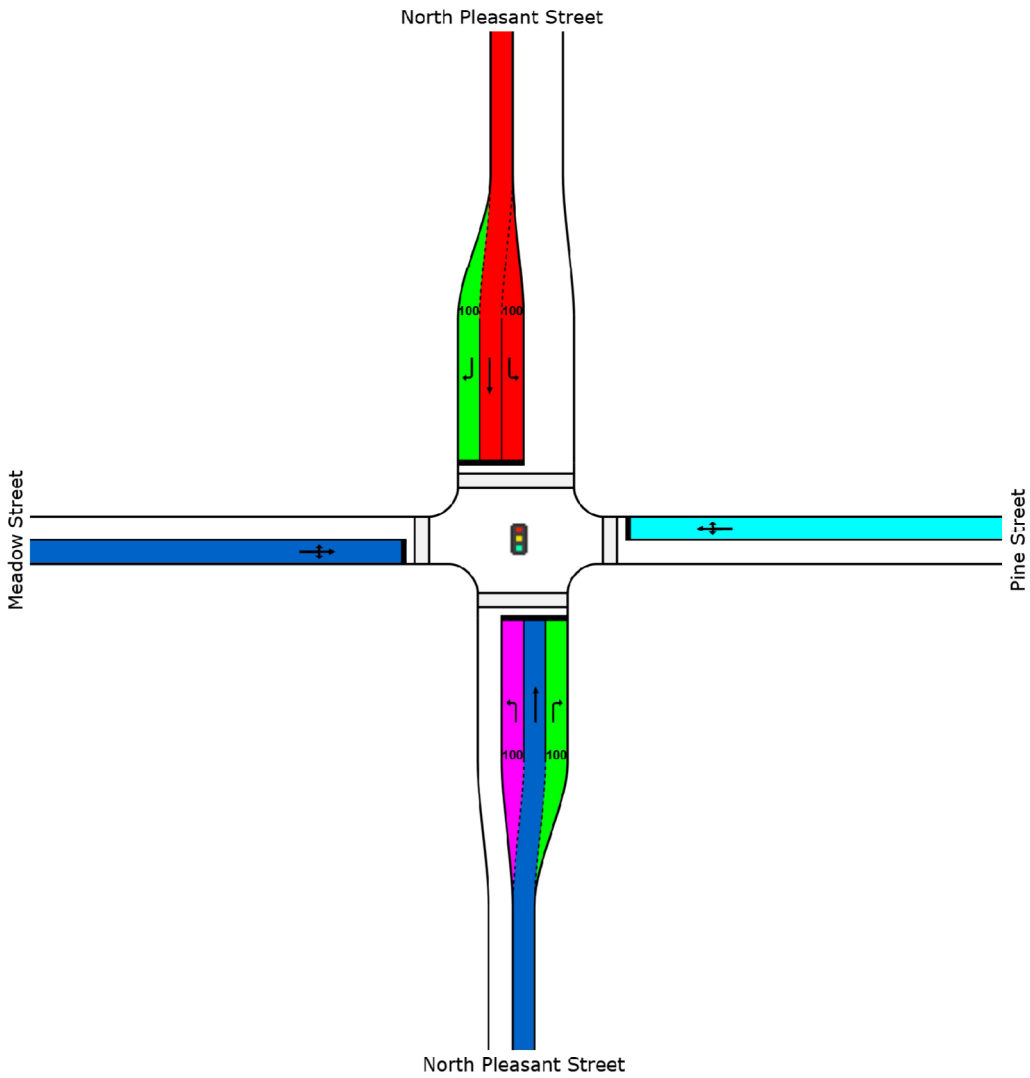
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	B	F	C	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

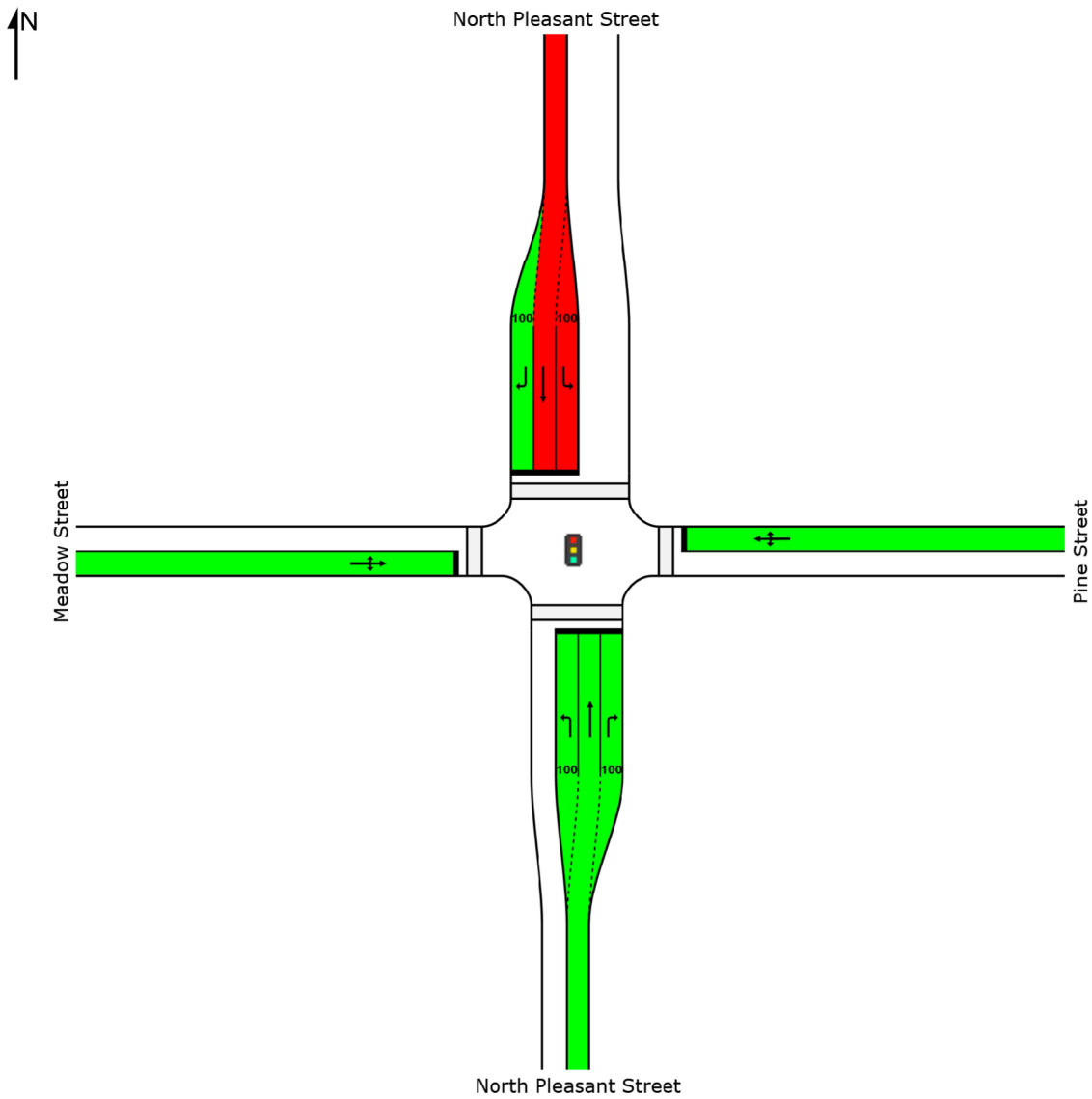
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	77	226	673	165	673



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	444	1.8	1719	0.258	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	444	1.8		0.258		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	383	0.7	386	0.993	100	77.3	LOS F	19.8	496.5	Full	1600	0.0	0.0
Approach	383	0.7		0.993		77.3	LOS F	19.8	496.5				
North: Sunderland Road													
Lane 1	402	2.7	1824	0.220	100	1.8	LOS A	0.1	2.3	Full	1600	0.0	0.0
Approach	402	2.7		0.220		1.8	NA	0.1	2.3				
Intersection	1228	1.8		0.993		24.7	NA	19.8	496.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

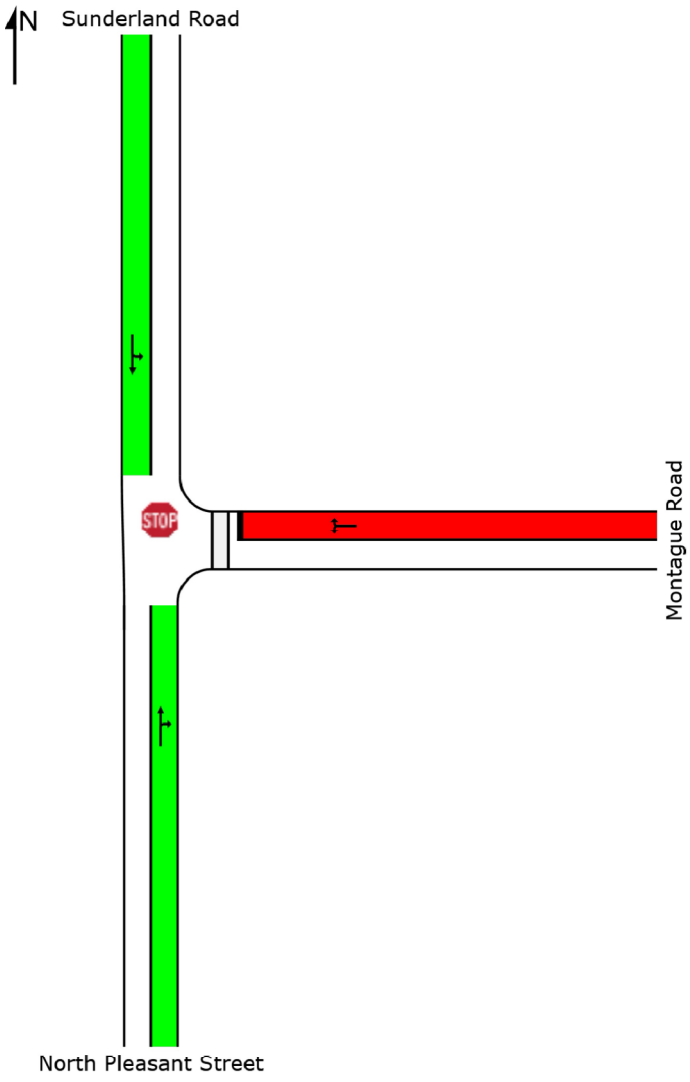
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

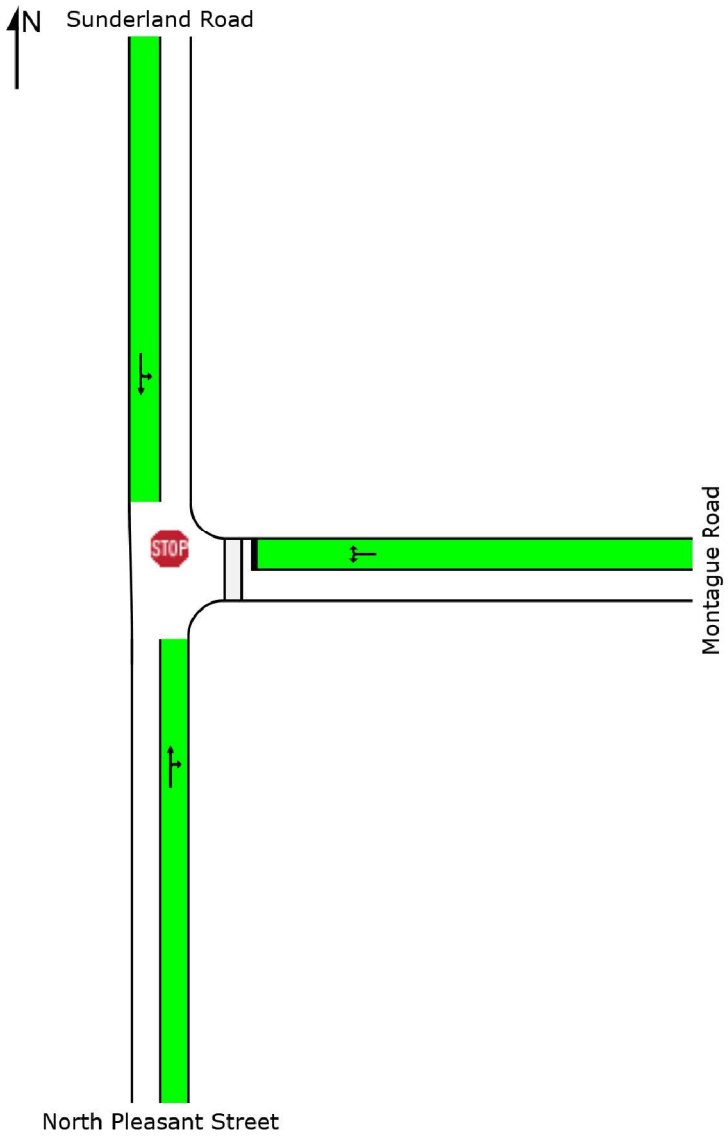
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	200	1	200



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	214	0.0	178[1]	1.206	100	165.4	LOS F	18.1	452.2	Short	100	0.0	NA
Lane 2	379	3.1	363[1]	1.044	100	89.3	LOS F	24.6	631.2	Full	1600	0.0	0.0
Lane 3	133	1.7	1157	0.115	100	0.7	LOS A	0.9	21.9	Short	100	0.0	NA
Approach	726	1.9		1.206		95.5	LOS F	24.6	631.2				
East: Pine Street													
Lane 1	560	2.8	647	0.866	100	34.1	LOS C	25.2	643.0	Full	1600	0.0	0.0
Approach	560	2.8		0.866		34.1	LOS C	25.2	643.0				
North: North Pleasant Street													
Lane 1	123	4.6	183	0.672	100	45.1	LOS D	5.6	145.0	Short	100	0.0	NA
Lane 2	392	1.3	404[1]	0.971	100	66.5	LOS E	21.8	549.7	Full	150	0.0	100.0
Lane 3	75	5.1	919	0.082	100	2.7	LOS A	0.9	23.0	Short	100	0.0	NA
Approach	590	2.5		0.971		53.9	LOS D	21.8	549.7				
West: Meadow Street													
Lane 1	518	1.3	829	0.625	100	22.7	LOS C	18.6	469.9	Full	1600	0.0	0.0
Approach	518	1.3		0.625		22.7	LOS C	18.6	469.9				
Intersection	2395	2.1		1.206		55.1	LOS E	25.2	643.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

PM PEAK

LANE LEVEL OF SERVICE

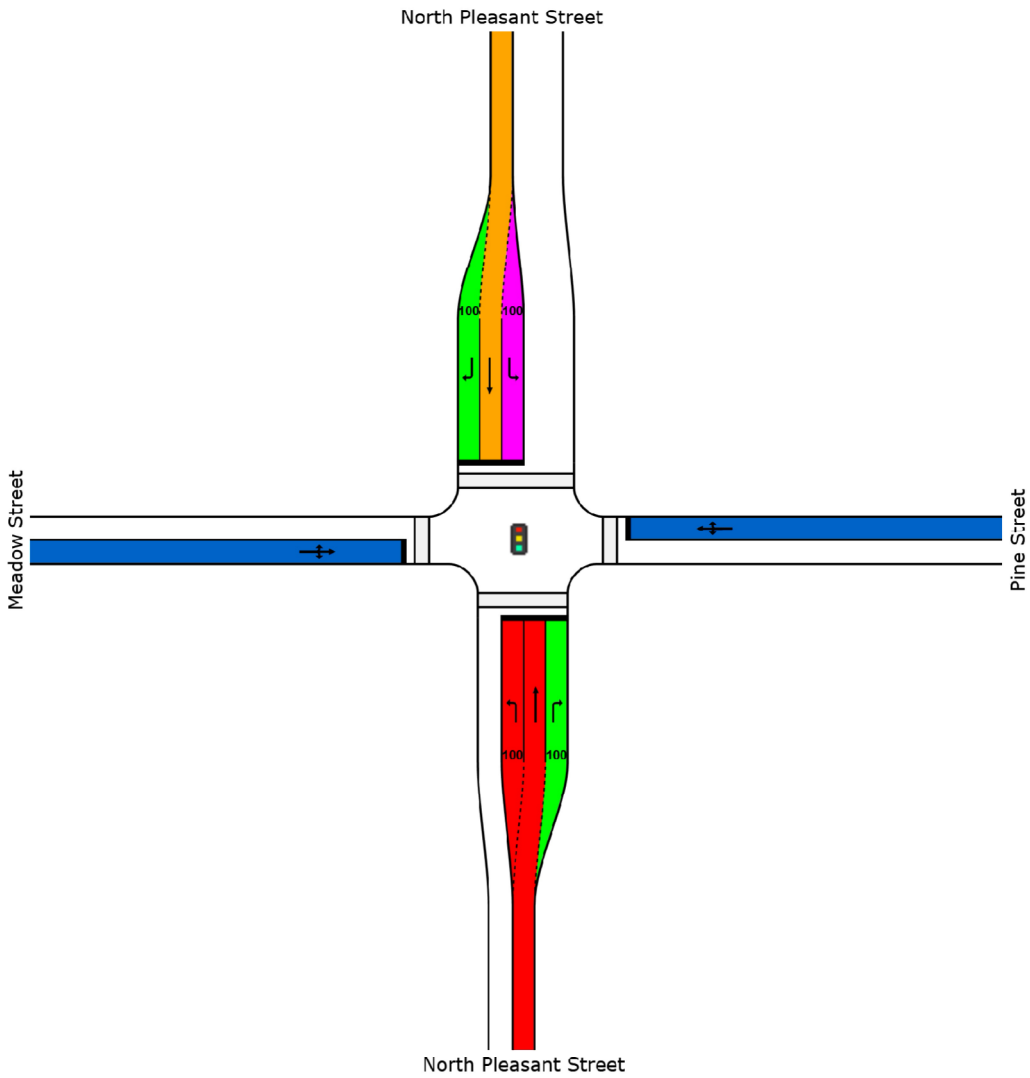
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	C	D	C	E



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

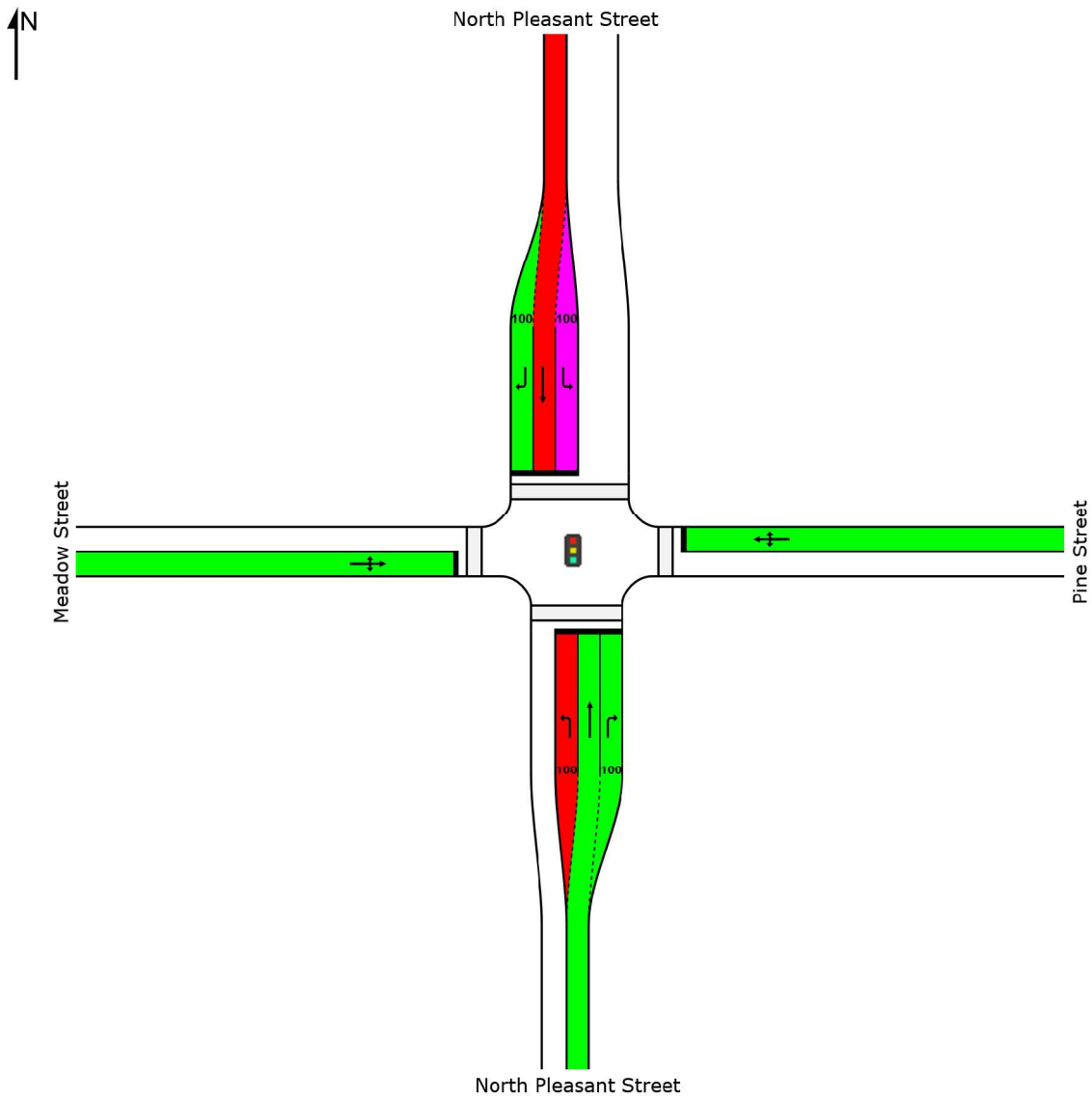
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	387	394	337	288	394



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	758	1.5	1689	0.449	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	758	1.5		0.449		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	303	0.8	345	0.879	100	57.9	LOS F	11.1	279.3	Full	1600	0.0	0.0
Approach	303	0.8		0.879		57.9	LOS F	11.1	279.3				
North: Sunderland Road													
Lane 1	311	1.7	1812	0.172	100	1.6	LOS A	0.1	3.0	Full	1600	0.0	0.0
Approach	311	1.7		0.172		1.6	NA	0.1	3.0				
Intersection	1372	1.4		0.879		13.2	NA	11.1	279.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

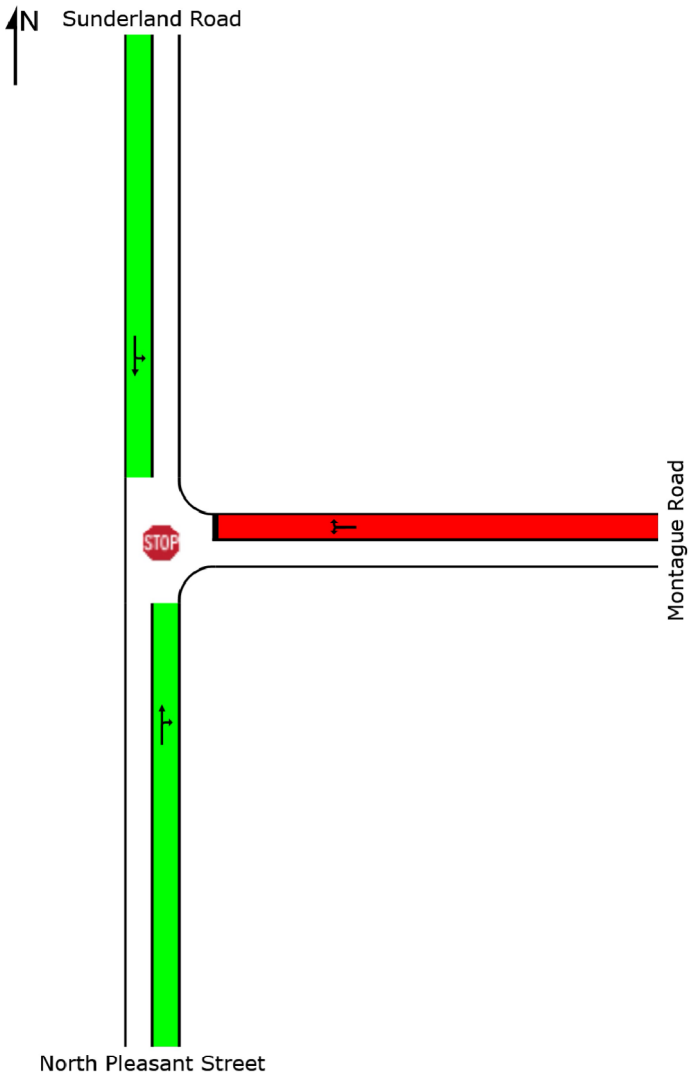
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

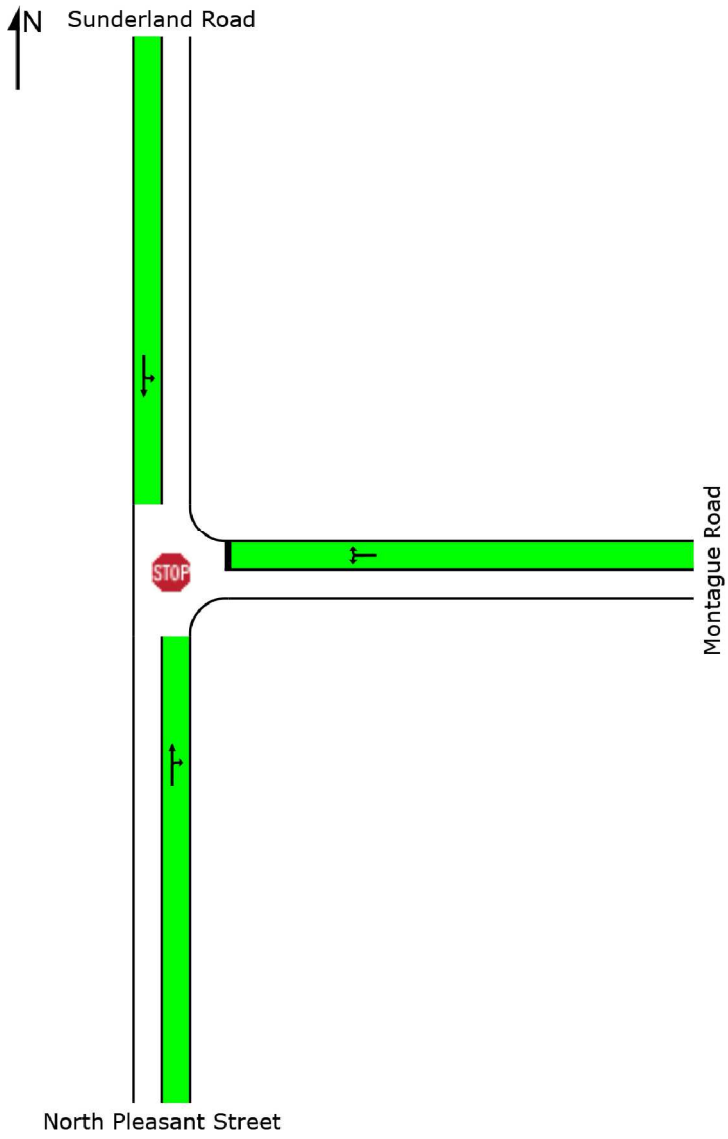
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	112	1	112



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	104	1.3	189	0.550	100	38.9	LOS D	4.5	112.6	Short	100	0.0	NA
Lane 2	271	3.4	403[1]	0.674	100	31.5	LOS C	10.9	280.7	Full	1600	0.0	0.0
Lane 3	30	2.7	1119	0.026	100	1.0	LOS A	0.2	5.5	Short	100	0.0	NA
Approach	405	2.8		0.674		31.1	LOS C	10.9	280.7				
East: Pine Street													
Lane 1	529	2.9	684	0.773	100	24.6	LOS C	20.0	511.0	Full	1600	0.0	0.0
Approach	529	2.9		0.773		24.6	LOS C	20.0	511.0				
North: North Pleasant Street													
Lane 1	175	0.5	178[1]	0.984	100	100.0	LOS F	10.8	270.5	Short	100	0.0	NA
Lane 2	241	0.4	365[1]	0.661	100	30.8	LOS C	9.5	239.0	Full	150	0.0	59.4[8]
Lane 3	194	0.9	1034	0.188	100	2.0	LOS A	2.1	53.5	Short	100	0.0	NA
Approach	611	0.6		0.984		41.5	LOS D	10.8	270.5				
West: Meadow Street													
Lane 1	423	1.3	830	0.509	100	17.7	LOS B	13.4	337.7	Full	1600	0.0	0.0
Approach	423	1.3		0.509		17.7	LOS B	13.4	337.7				
Intersection	1968	1.8		0.984		29.7	LOS C	20.0	511.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

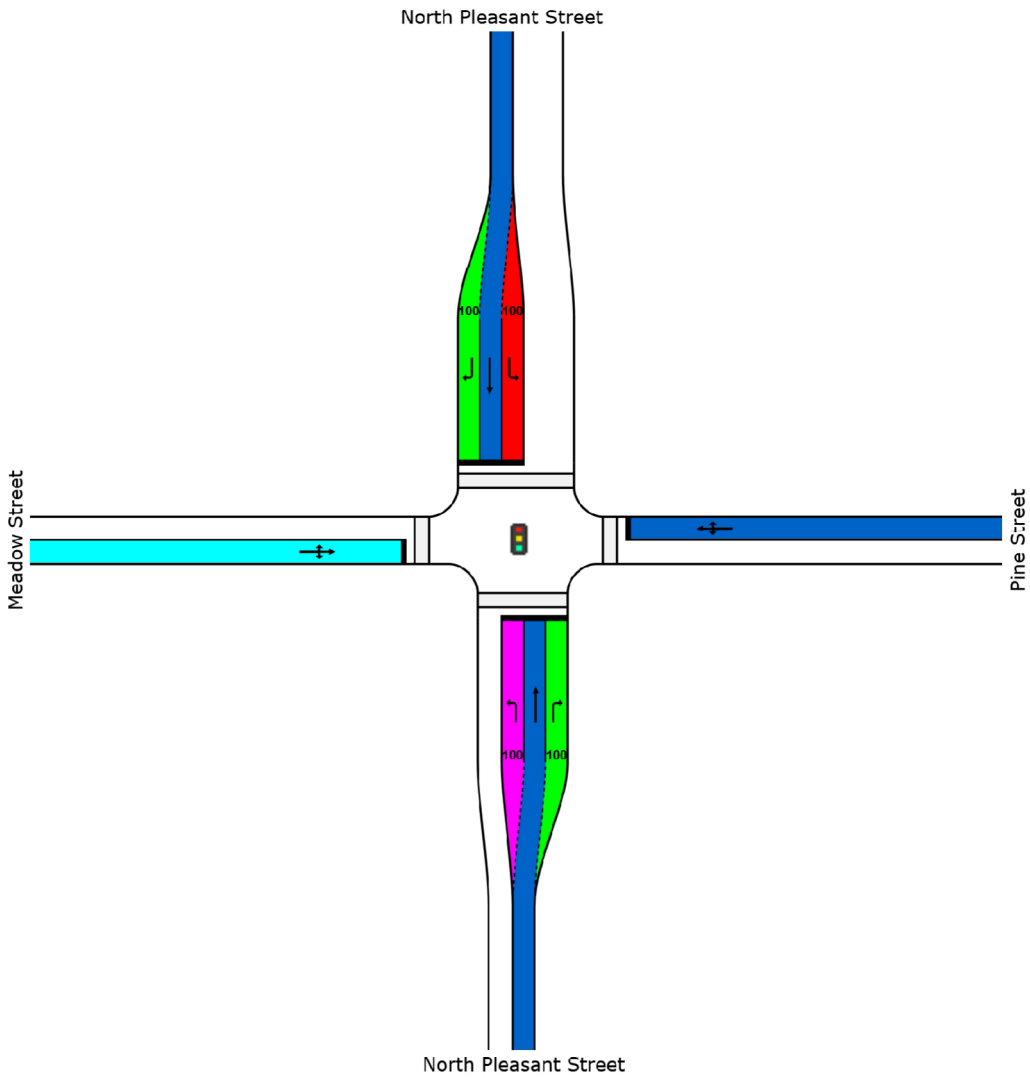
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	D	B	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

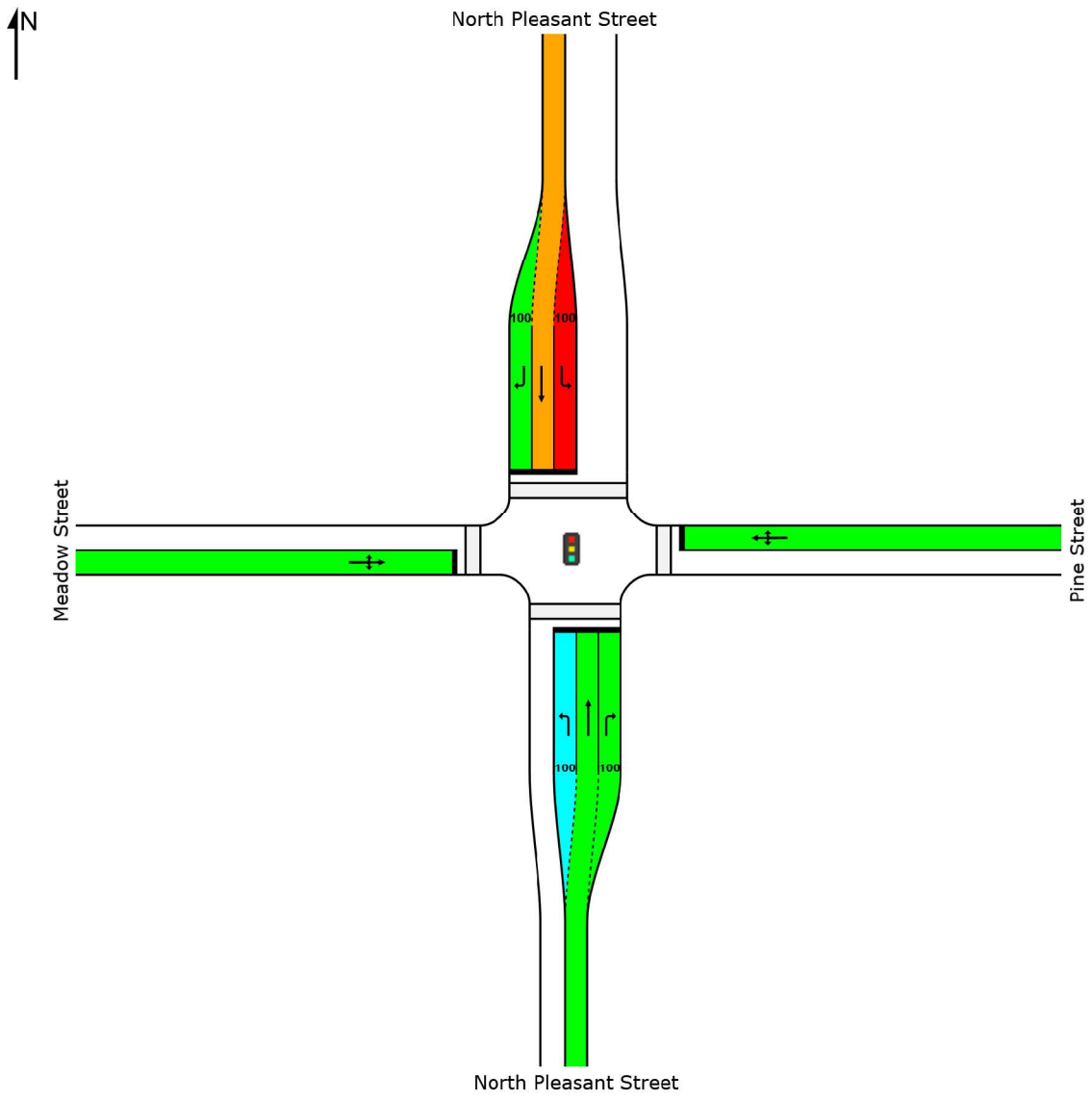
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	172	313	166	207	313



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	746	2.8	1670	0.447	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	746	2.8		0.447		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	362	0.5	370	0.979	100	75.7	LOS F	17.8	446.9	Full	1600	0.0	0.0
Approach	362	0.5		0.979		75.7	LOS F	17.8	446.9				
North: Sunderland Road													
Lane 1	252	0.5	1854	0.136	100	1.2	LOS A	0.1	1.4	Full	1600	0.0	0.0
Approach	252	0.5		0.136		1.2	NA	0.1	1.4				
Intersection	1360	1.8		0.979		20.4	NA	17.8	446.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

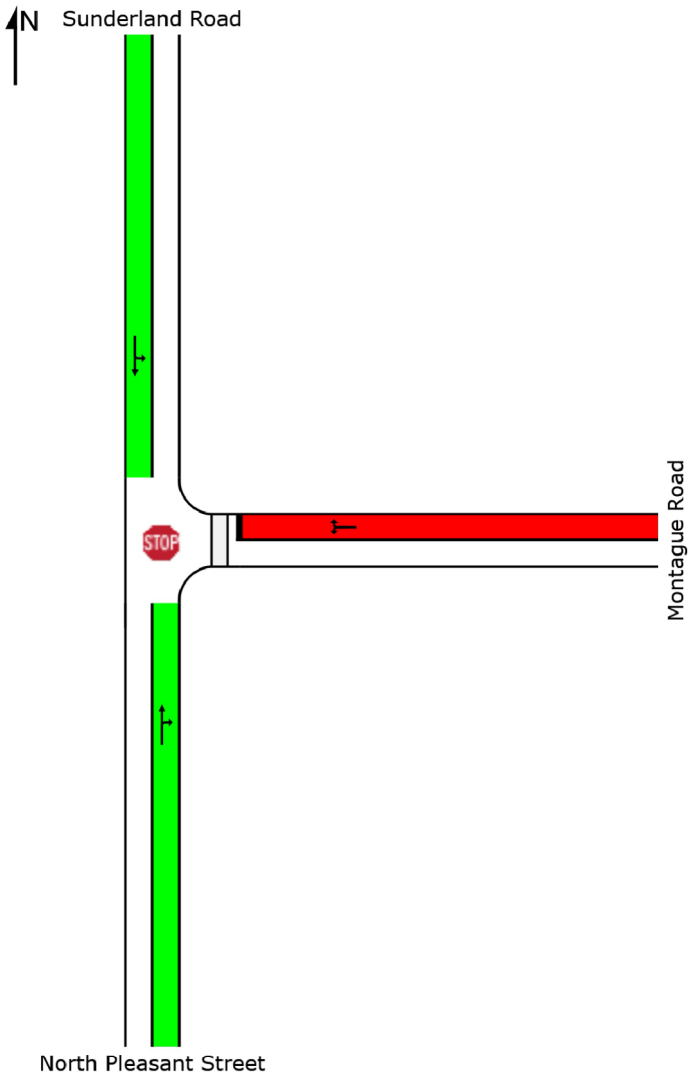
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

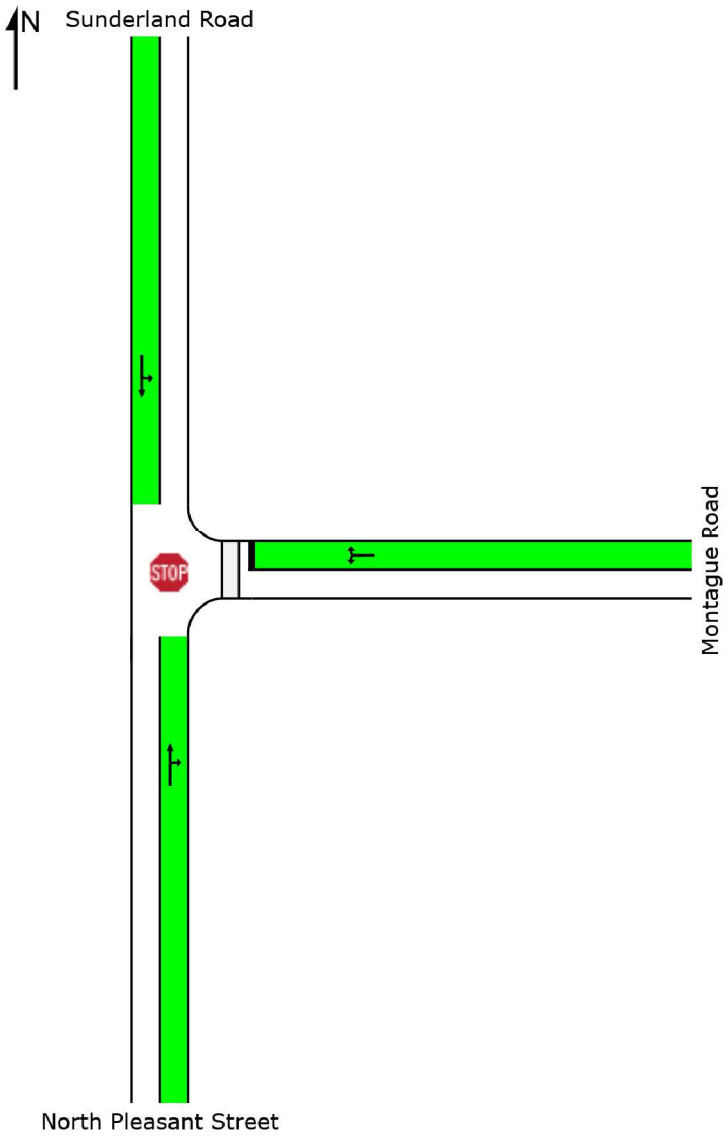
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	180	1	180



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 5

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	215	3.6	1174	0.183	100	4.7	LOS A	1.0	24.8	Full	1600	0.0	0.0
Approach	215	3.6		0.183		4.7	LOS A	1.0	24.8				
East: Pine Street													
Lane 1[d]	231	0.5	1330	0.173	100	4.1	LOS A	1.0	24.3	Full	1600	0.0	0.0
Lane 2	213	1.9	1378	0.154	100	3.9	LOS A	0.8	21.6	Short	50	0.0	NA
Approach	443	1.2		0.173		4.0	LOS A	1.0	24.3				
North: North Pleasant Street													
Lane 1[d]	812	2.7	1332	0.610	100	9.9	LOS A	6.3	162.2	Full	400	0.0	0.0
Approach	812	2.7		0.610		9.9	LOS A	6.3	162.2				
West: Meadow Street													
Lane 1[d]	317	3.5	865	0.366	100	8.4	LOS A	2.0	51.4	Full	1600	0.0	0.0
Approach	317	3.5		0.366		8.4	LOS A	2.0	51.4				
Intersection	1788	2.6		0.610		7.5	LOS A	6.3	162.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

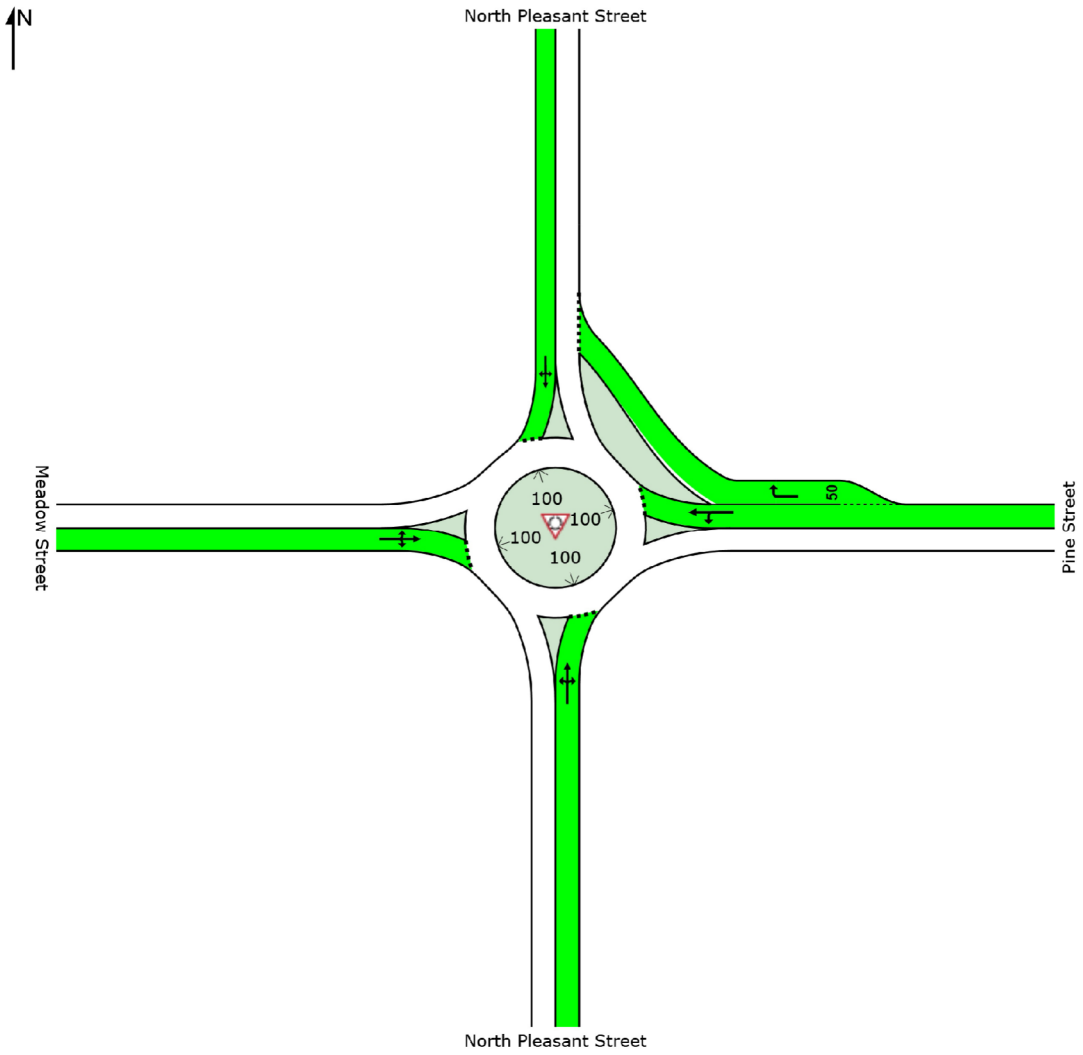
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

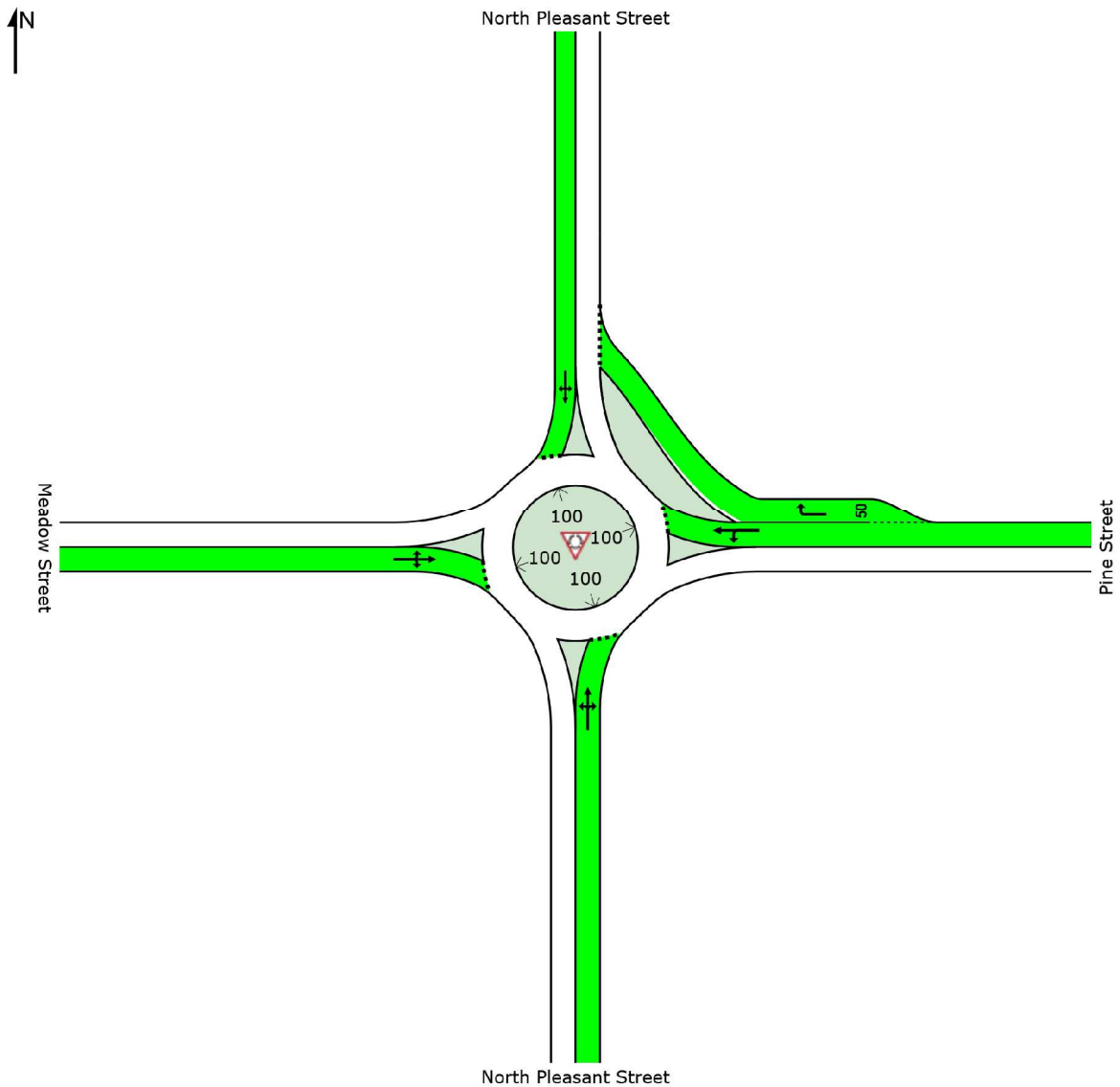
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	10	10	65	21	65



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	355	0.6	1021	0.348	100	7.1	LOS A	1.9	47.0	Full	1600	0.0	0.0
Approach	355	0.6		0.348		7.1	LOS A	1.9	47.0				
NorthWest: Sunderland Road													
Lane 1[d]	393	2.8	880	0.447	100	9.6	LOS A	2.7	69.1	Full	1600	0.0	0.0
Approach	393	2.8		0.447		9.6	LOS A	2.7	69.1				
SouthWest: Montague Road													
Lane 1[d]	416	1.8	1302	0.320	100	5.7	LOS A	1.9	47.6	Full	400	0.0	0.0
Approach	416	1.8		0.320		5.7	LOS A	1.9	47.6				
Intersection	1165	1.8		0.447		7.4	LOS A	2.7	69.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

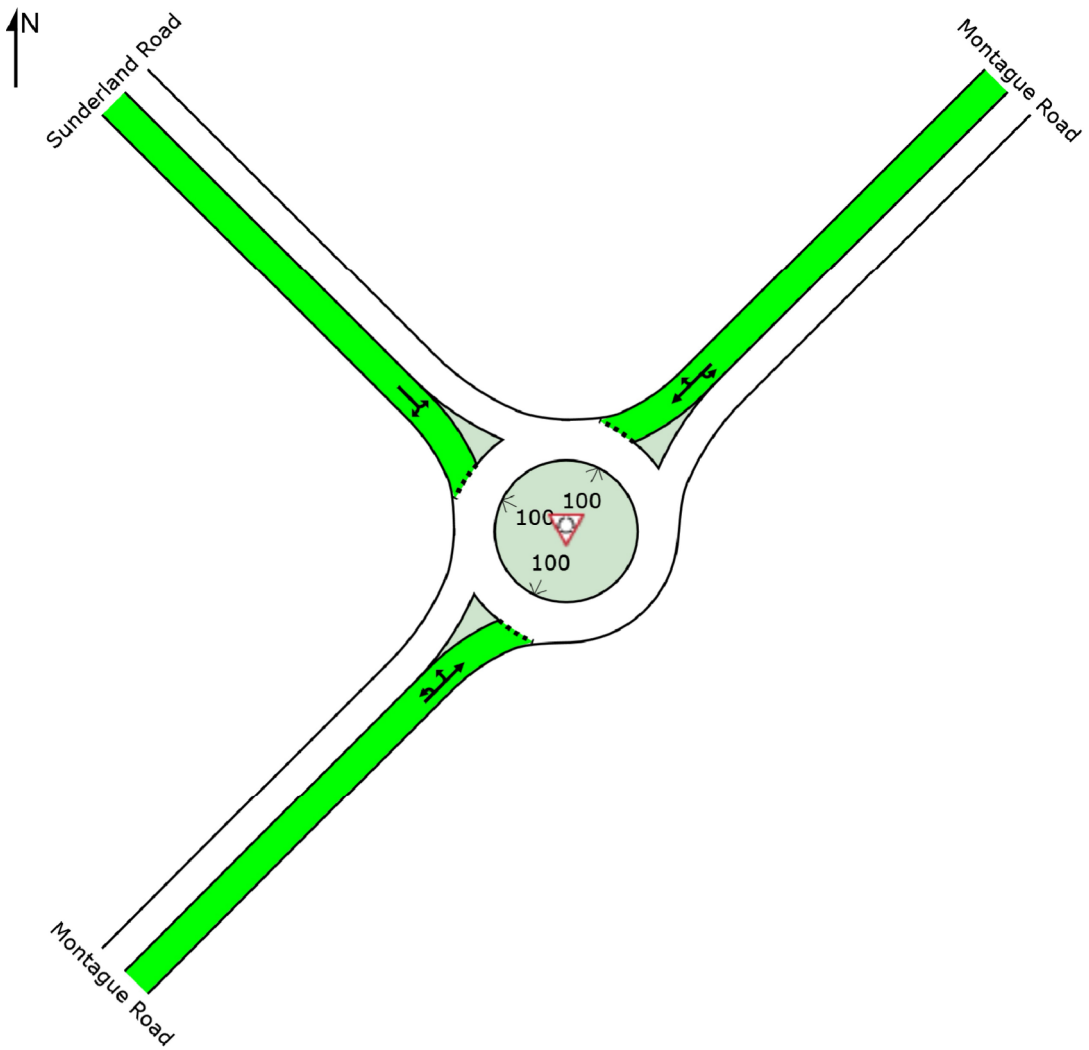
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

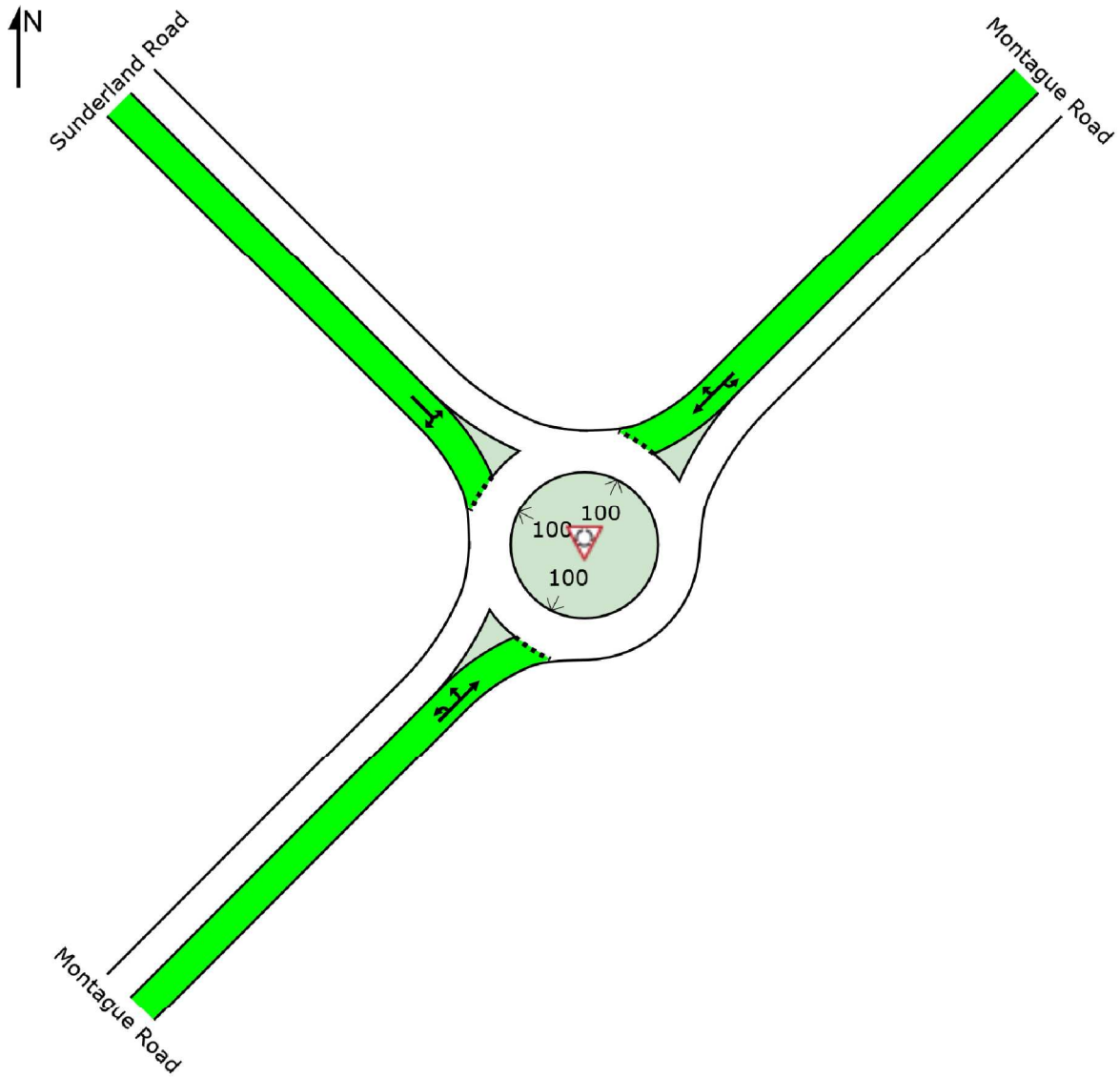
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	19	28	19	28



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	726	1.9	1112	0.653	100	12.4	LOS B	8.4	212.9	Full	1600	0.0	0.0
Approach	726	1.9		0.653		12.4	LOS B	8.4	212.9				
East: Pine Street													
Lane 1[d]	356	0.7	808	0.440	100	10.1	LOS B	2.8	71.1	Full	1600	0.0	0.0
Lane 2	205	6.5	941	0.217	100	6.0	LOS A	1.1	27.9	Short	50	0.0	NA
Approach	560	2.8		0.440		8.6	LOS A	2.8	71.1				
North: North Pleasant Street													
Lane 1[d]	590	2.5	1007	0.586	100	11.4	LOS B	5.8	146.8	Full	400	0.0	0.0
Approach	590	2.5		0.586		11.4	LOS B	5.8	146.8				
West: Meadow Street													
Lane 1[d]	518	1.3	898	0.577	100	12.2	LOS B	5.1	129.5	Full	1600	0.0	0.0
Approach	518	1.3		0.577		12.2	LOS B	5.1	129.5				
Intersection	2395	2.1		0.653		11.2	LOS B	8.4	212.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

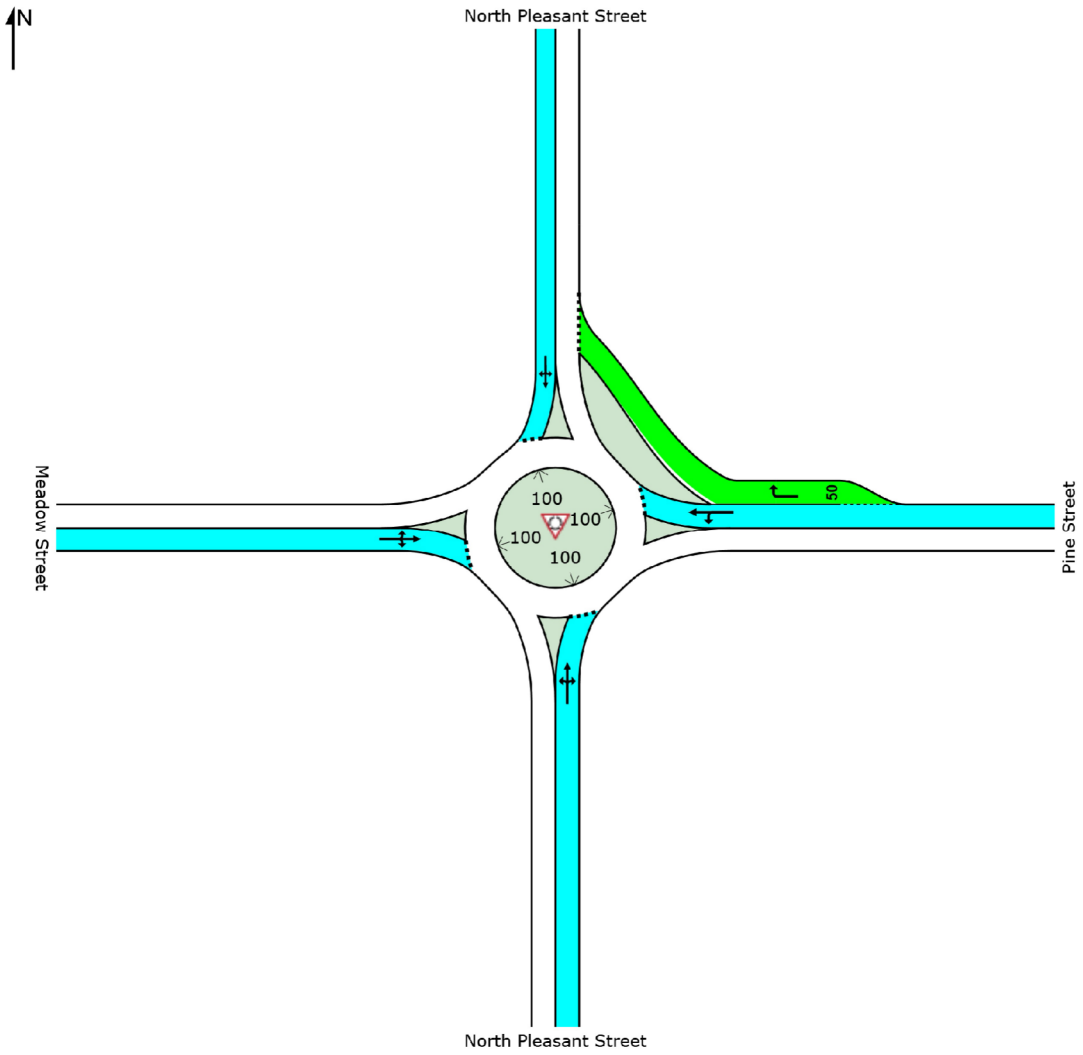
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

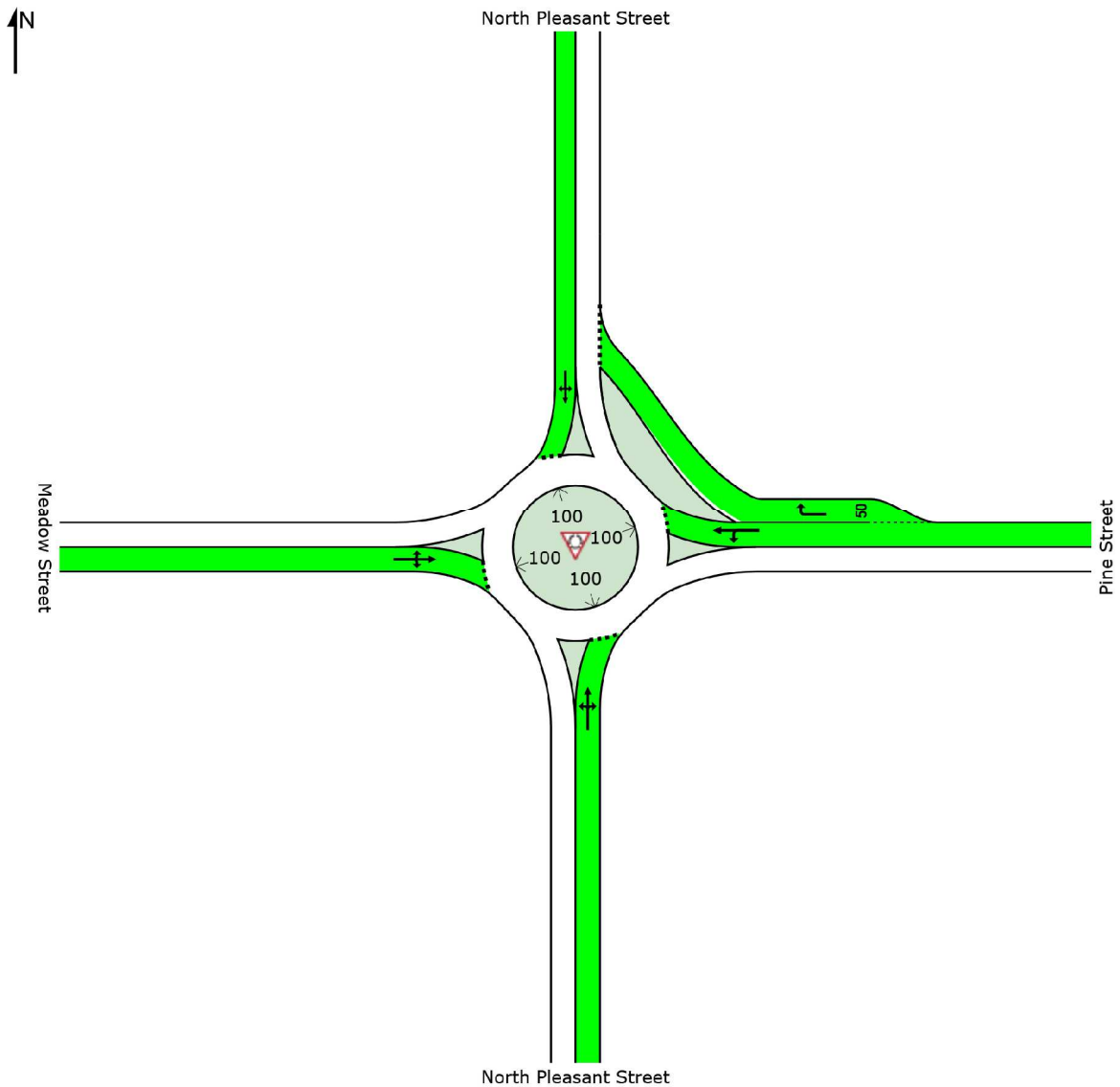
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	86	29	59	52	86



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	248	0.8	949	0.261	100	6.4	LOS A	1.3	31.6	Full	1600	0.0	0.0
Approach	248	0.8		0.261		6.4	LOS A	1.3	31.6				
NorthWest: Sunderland Road													
Lane 1[d]	309	1.6	1000	0.309	100	6.8	LOS A	1.6	39.8	Full	1600	0.0	0.0
Approach	309	1.6		0.309		6.8	LOS A	1.6	39.8				
SouthWest: Montague Road													
Lane 1[d]	720	1.5	1322	0.544	100	8.6	LOS A	4.7	118.6	Full	400	0.0	0.0
Approach	720	1.5		0.544		8.6	LOS A	4.7	118.6				
Intersection	1277	1.4		0.544		7.8	LOS A	4.7	118.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

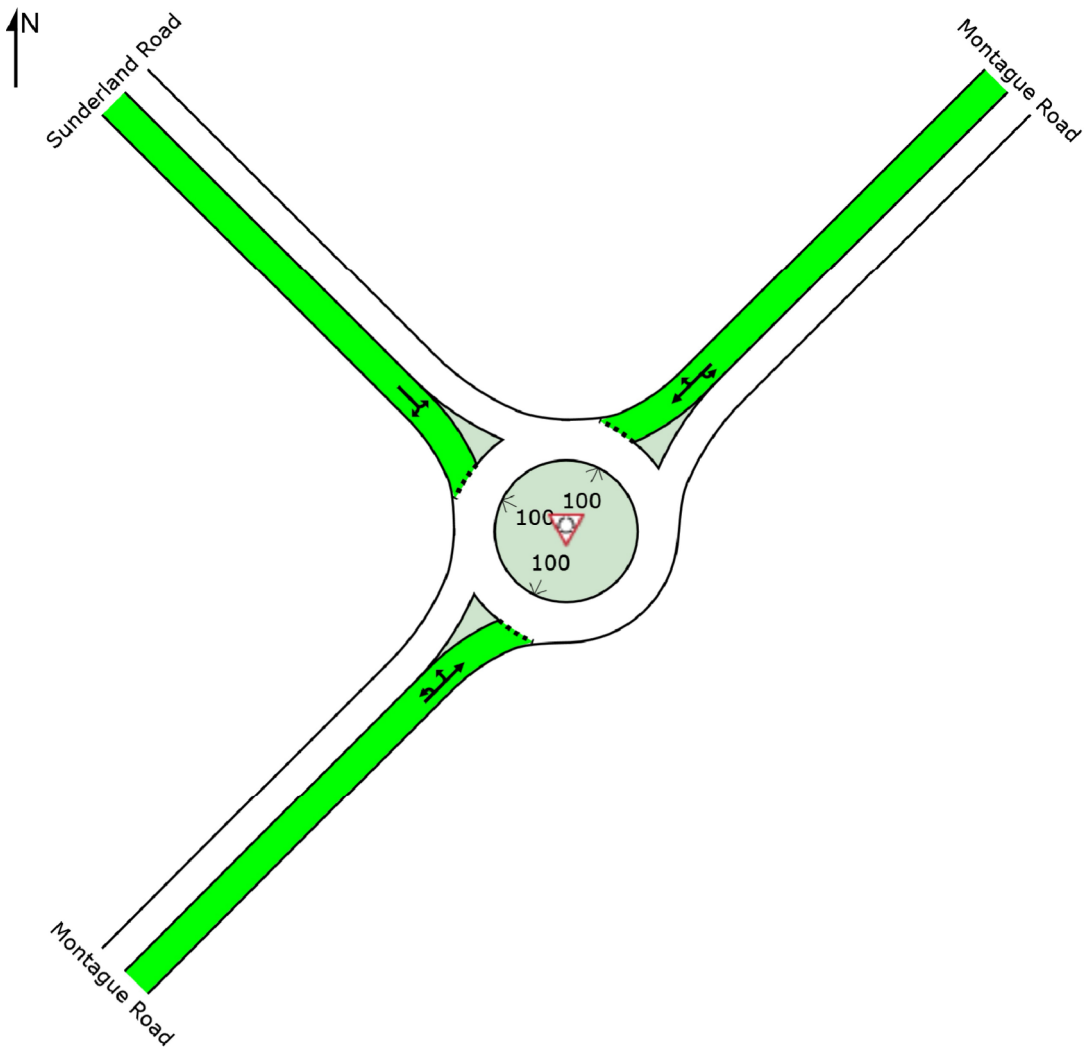
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

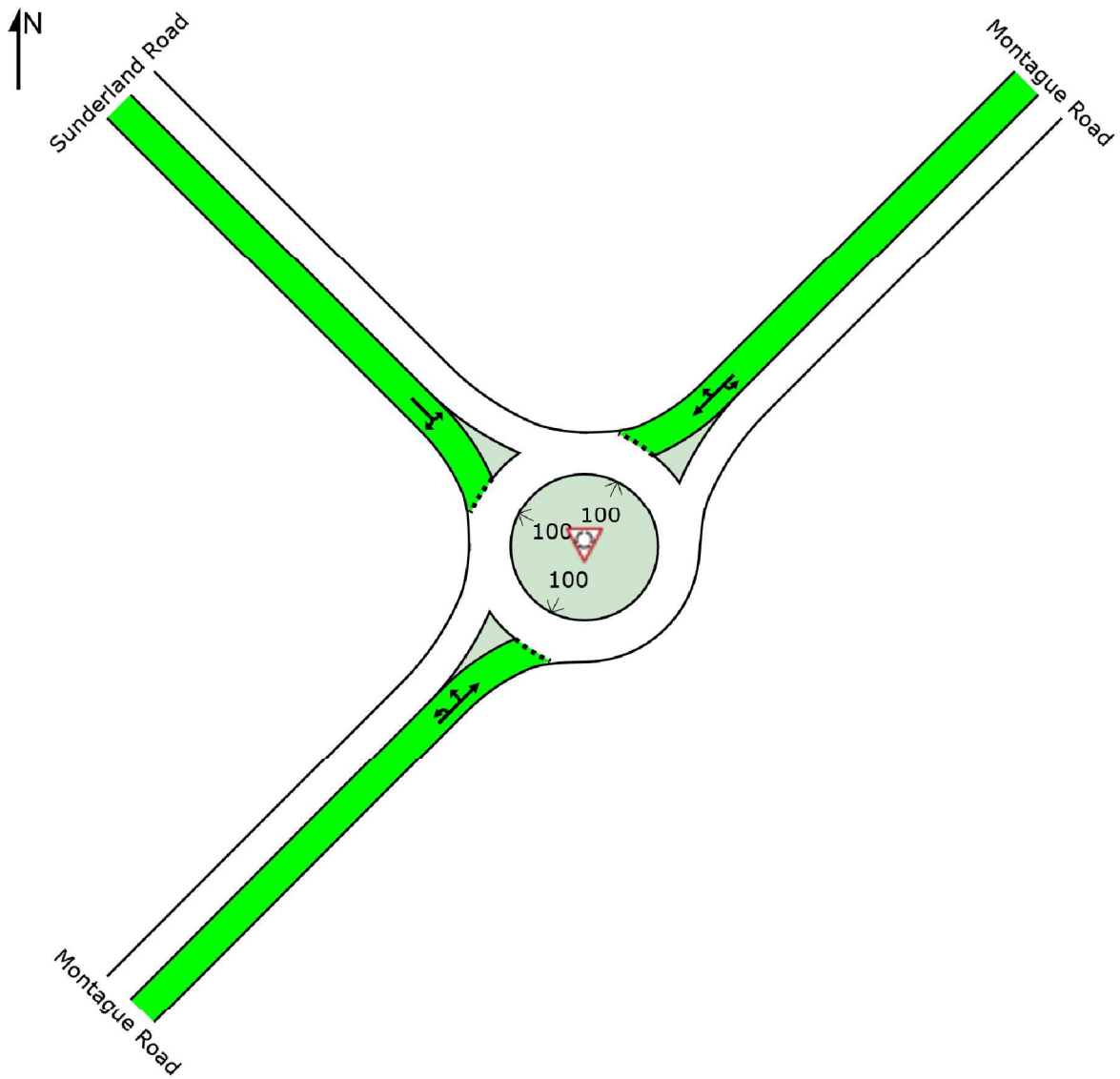
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	13	16	48	48



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	405	2.8	1079	0.375	100	7.2	LOS A	2.2	56.7	Full	1600	0.0	0.0
Approach	405	2.8		0.375		7.2	LOS A	2.2	56.7				
East: Pine Street													
Lane 1[d]	258	2.1	1003	0.257	100	6.1	LOS A	1.4	34.6	Full	1600	0.0	0.0
Lane 2	271	3.7	1094	0.247	100	5.6	LOS A	1.3	34.2	Short	50	0.0	NA
Approach	529	2.9		0.257		5.9	LOS A	1.4	34.6				
North: North Pleasant Street													
Lane 1[d]	611	0.6	1250	0.489	100	8.0	LOS A	3.6	89.4	Full	400	0.0	0.0
Approach	611	0.6		0.489		8.0	LOS A	3.6	89.4				
West: Meadow Street													
Lane 1[d]	423	1.3	1127	0.375	100	7.0	LOS A	2.3	57.9	Full	1600	0.0	0.0
Approach	423	1.3		0.375		7.0	LOS A	2.3	57.9				
Intersection	1968	1.8		0.489		7.1	LOS A	3.6	89.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

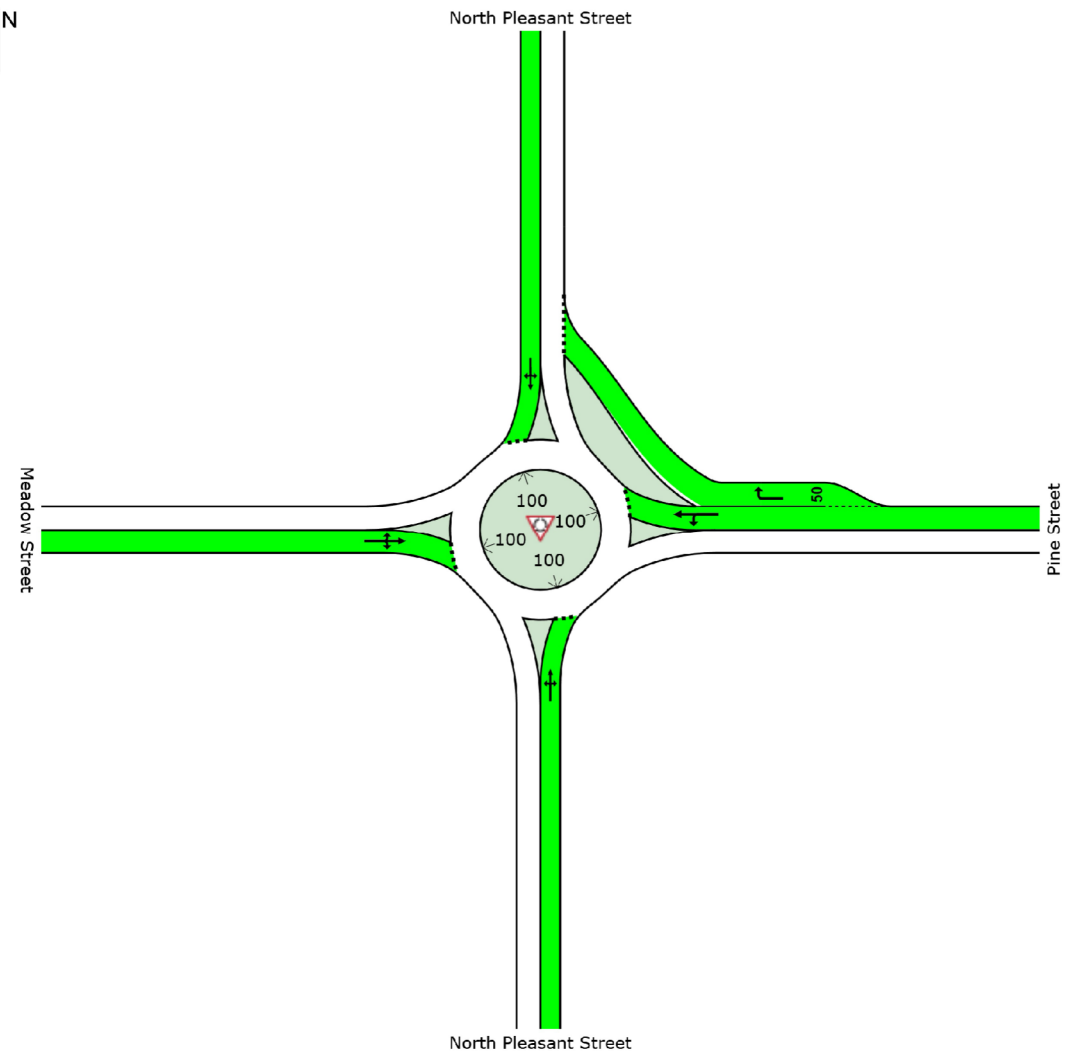
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

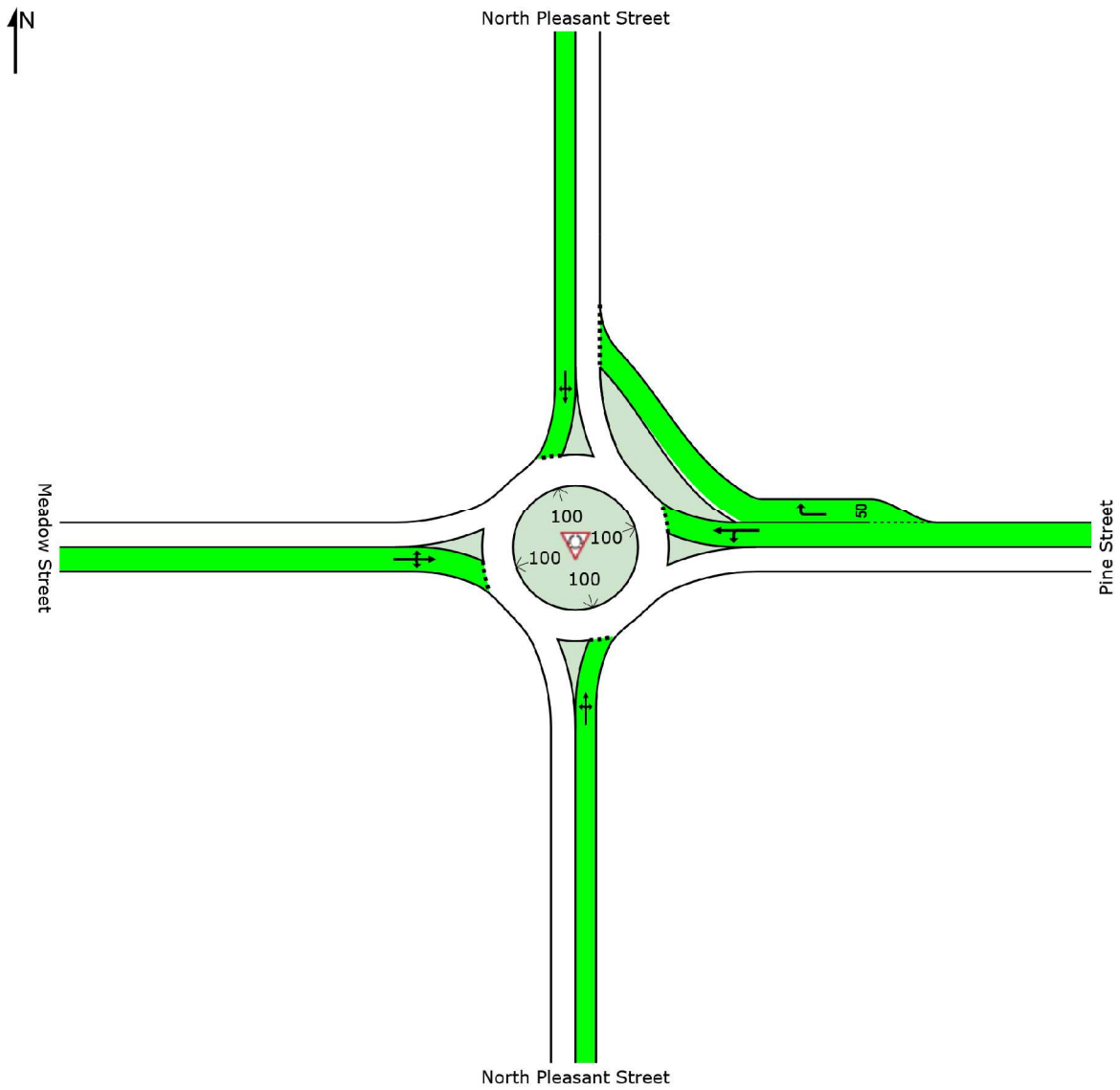
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	23	14	36	23	36



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	257	0.5	1017	0.253	100	6.0	LOS A	1.2	31.2	Full	1600	0.0	0.0
Approach	257	0.5		0.253		6.0	LOS A	1.2	31.2				
NorthWest: Sunderland Road													
Lane 1[d]	228	0.5	999	0.228	100	5.8	LOS A	1.1	27.3	Full	1600	0.0	0.0
Approach	228	0.5		0.228		5.8	LOS A	1.1	27.3				
SouthWest: Montague Road													
Lane 1[d]	601	2.1	1319	0.456	100	7.3	LOS A	3.3	84.1	Full	400	0.0	0.0
Approach	601	2.1		0.456		7.3	LOS A	3.3	84.1				
Intersection	1086	1.4		0.456		6.7	LOS A	3.3	84.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

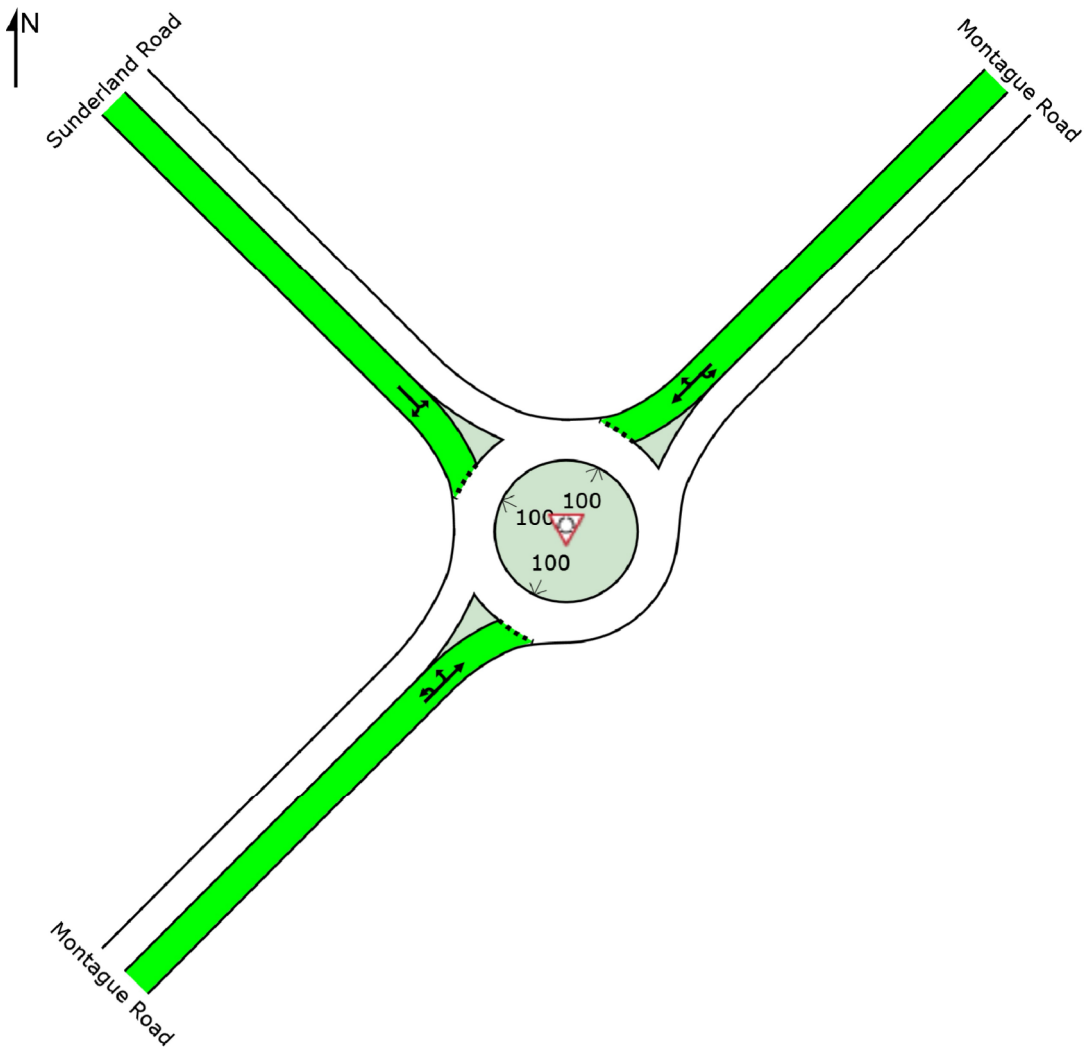
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

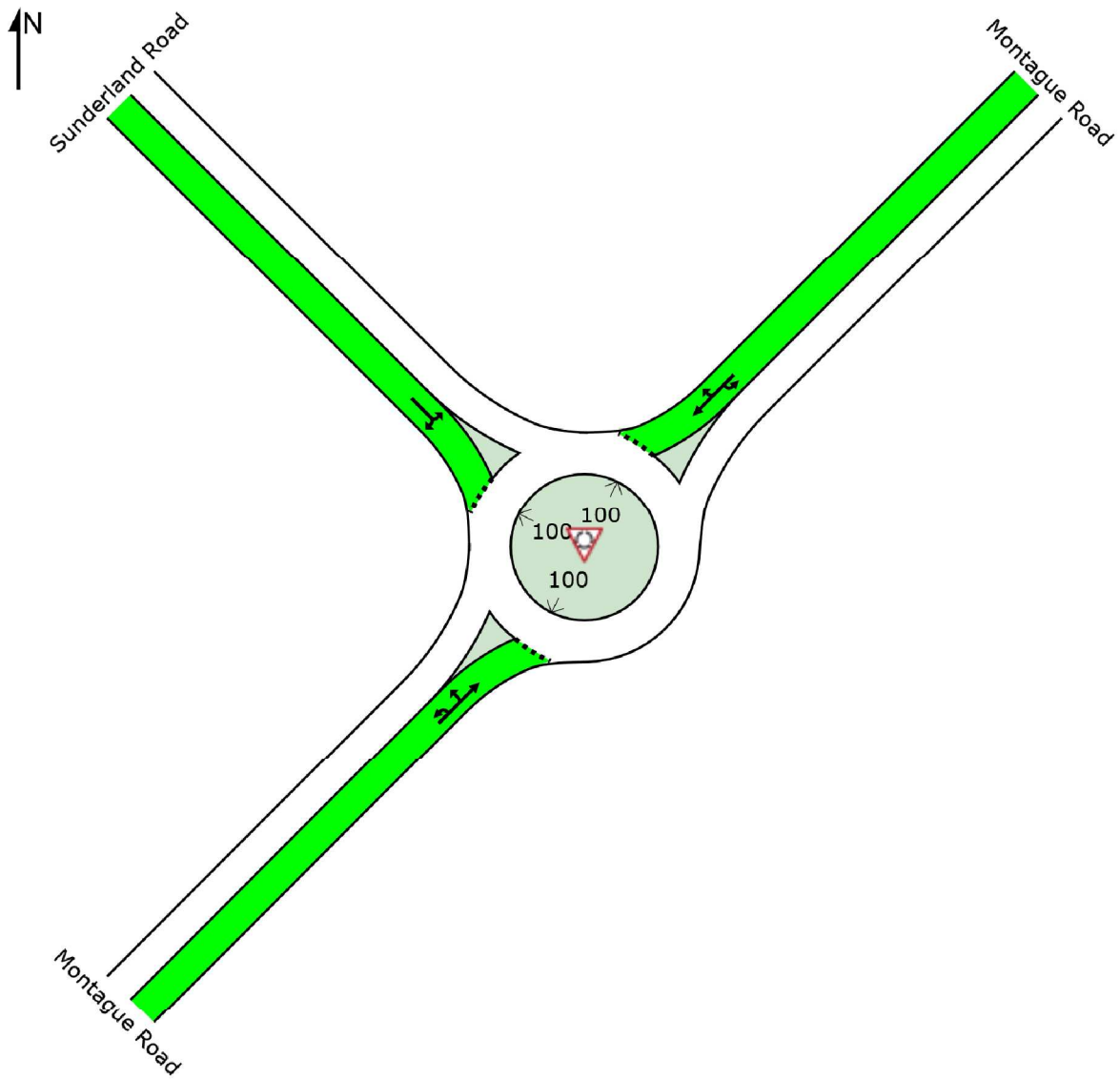
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	13	11	34	34



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 6

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	215	3.6	1174	0.183	100	4.7	LOS A	1.0	24.8	Full	1600	0.0	0.0
Approach	215	3.6		0.183		4.7	LOS A	1.0	24.8				
East: Pine Street													
Lane 1[d]	231	0.5	1330	0.173	100	4.1	LOS A	1.0	24.3	Full	1600	0.0	0.0
Lane 2	213	1.9	1378	0.154	100	3.9	LOS A	0.8	21.6	Short	50	0.0	NA
Approach	443	1.2		0.173		4.0	LOS A	1.0	24.3				
North: North Pleasant Street													
Lane 1[d]	812	2.7	1332	0.610	100	9.9	LOS A	6.3	162.2	Full	400	0.0	0.0
Approach	812	2.7		0.610		9.9	LOS A	6.3	162.2				
West: Meadow Street													
Lane 1[d]	317	3.5	865	0.366	100	8.4	LOS A	2.0	51.4	Full	1600	0.0	0.0
Approach	317	3.5		0.366		8.4	LOS A	2.0	51.4				
Intersection	1788	2.6		0.610		7.5	LOS A	6.3	162.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

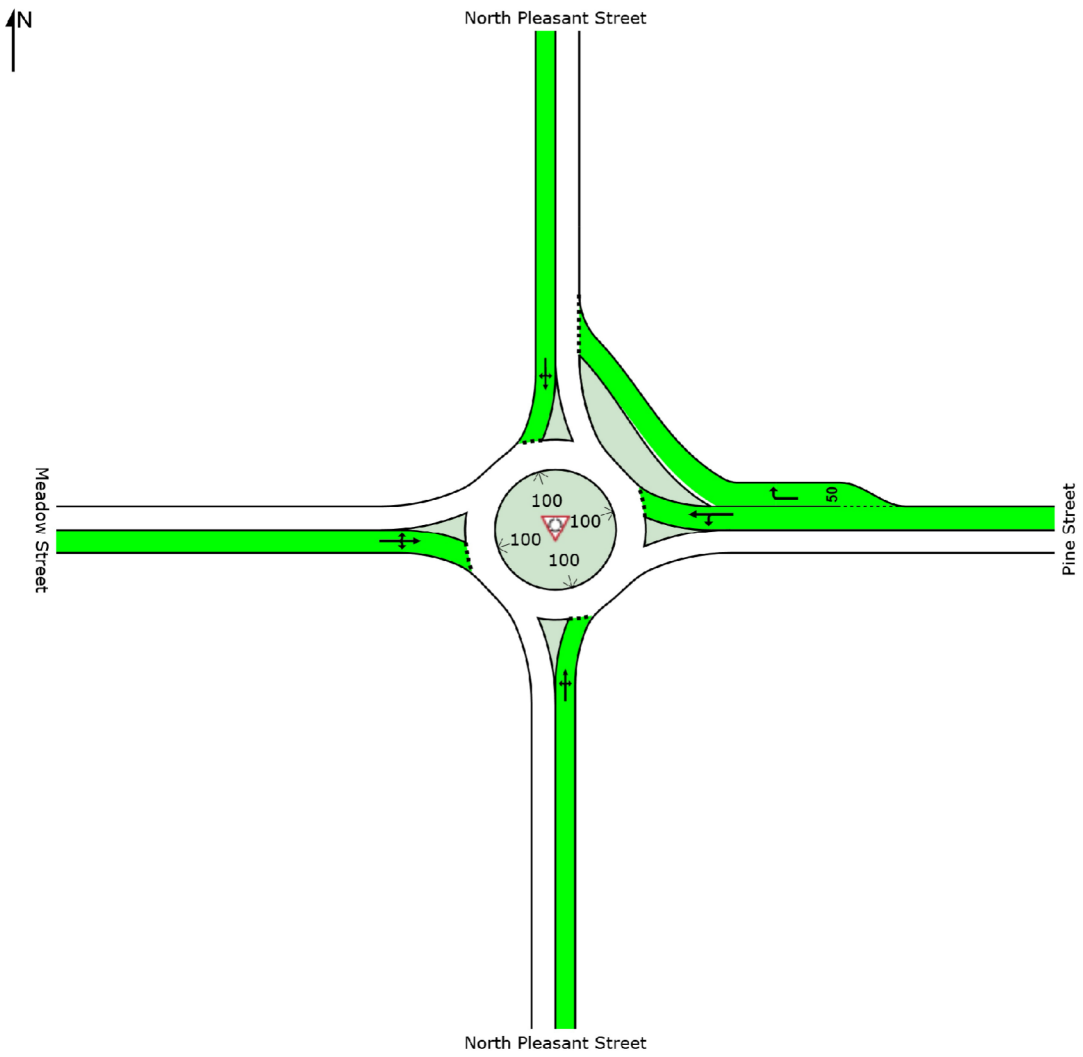
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

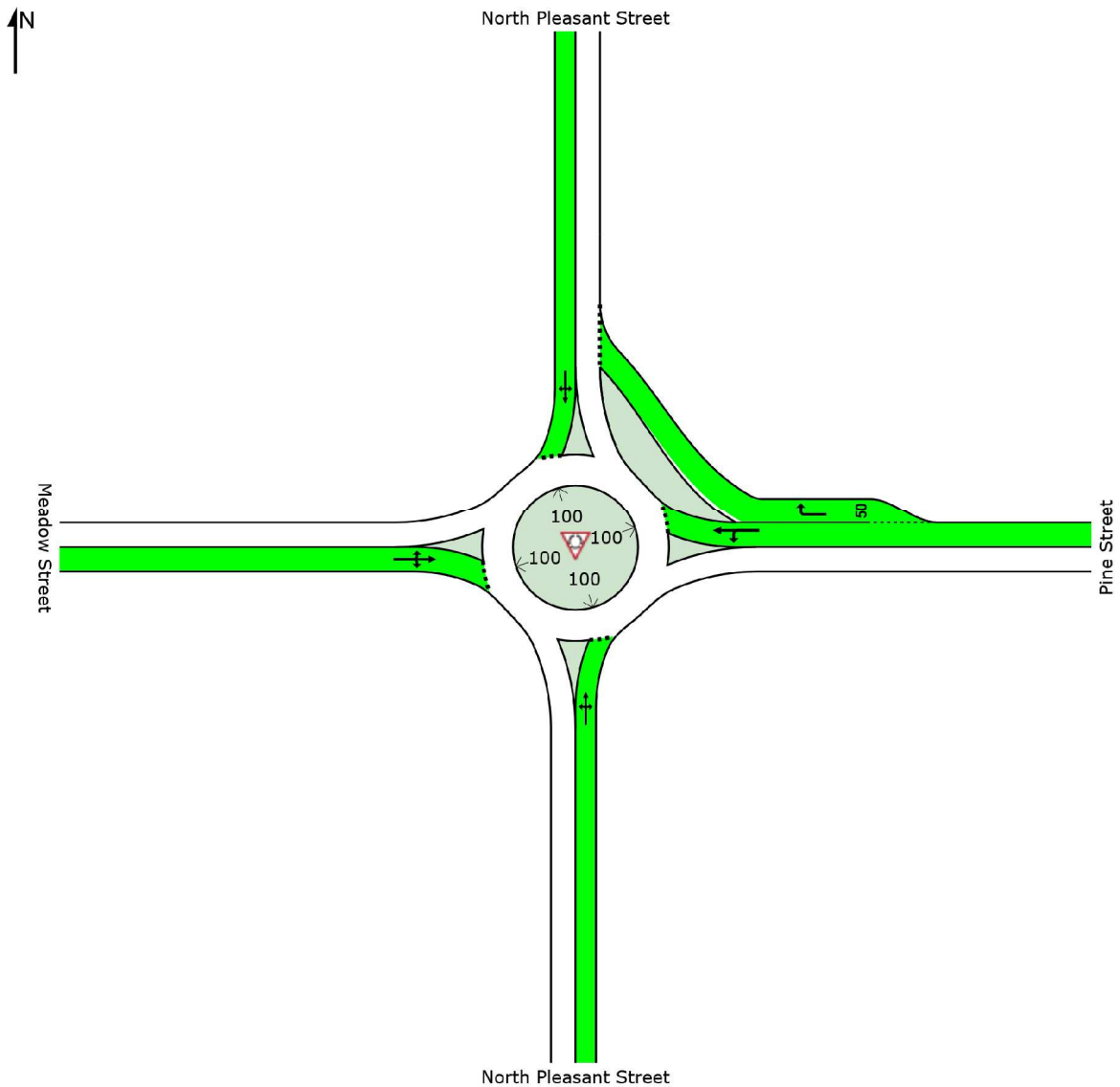
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	10	10	65	21	65



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	105	1.9	939	0.112	100	4.9	LOS A	0.5	12.0	Full	20	0.0	0.0
Approach	105	1.9		0.112		4.9	LOS A	0.5	12.0				
NorthEast: Montague Road													
Lane 1[d]	370	0.5	1009	0.367	100	7.5	LOS A	2.0	50.2	Full	1600	0.0	0.0
Approach	370	0.5		0.367		7.5	LOS A	2.0	50.2				
NorthWest: Sunderland Road													
Lane 1[d]	394	2.8	858	0.460	100	10.0	LOS B	2.9	74.7	Full	1600	0.0	0.0
Approach	394	2.8		0.460		10.0	LOS B	2.9	74.7				
SouthWest: Montague Road													
Lane 1[d]	353	1.8	1308	0.270	100	5.1	LOS A	1.5	37.7	Full	400	0.0	0.0
Approach	353	1.8		0.270		5.1	LOS A	1.5	37.7				
Intersection	1222	1.7		0.460		7.4	LOS A	2.9	74.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

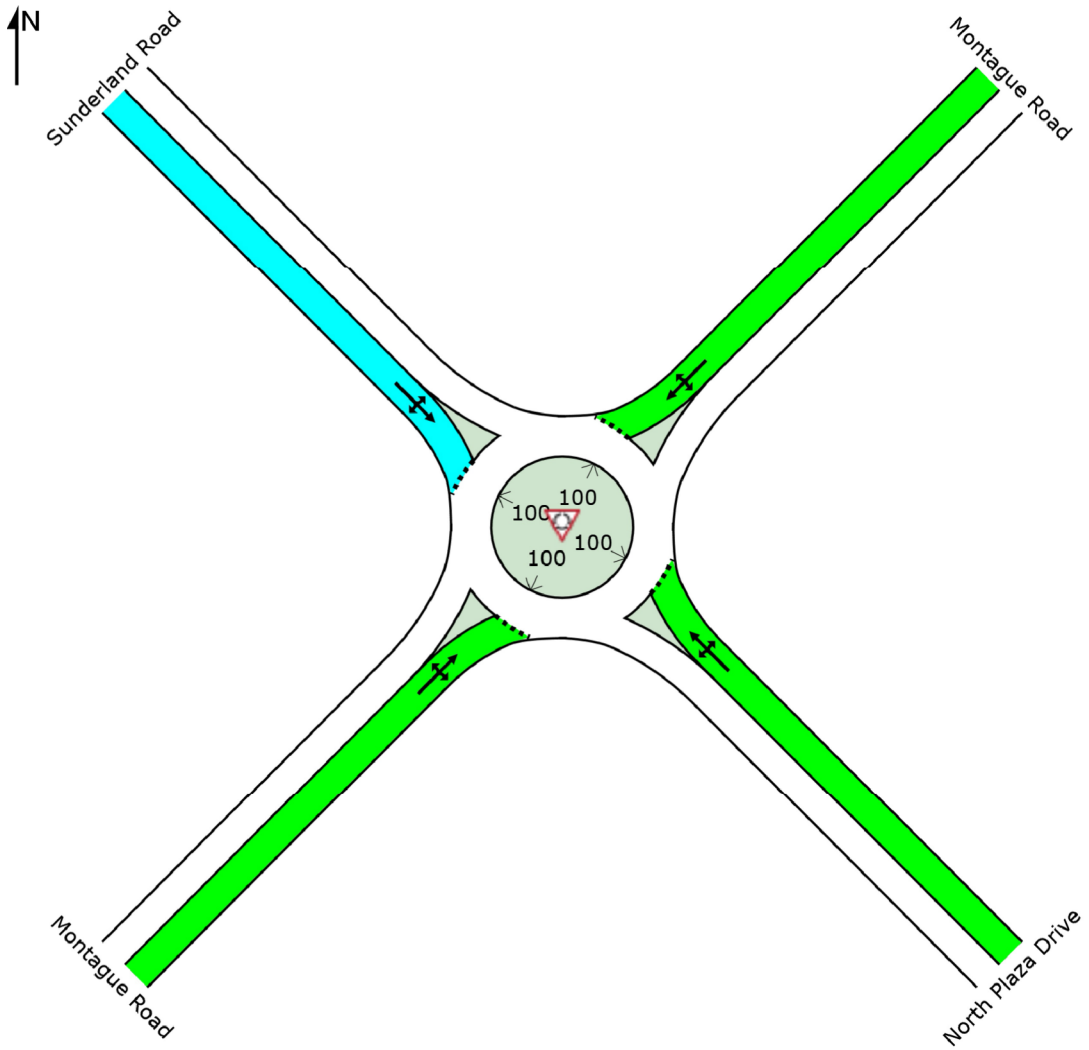
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

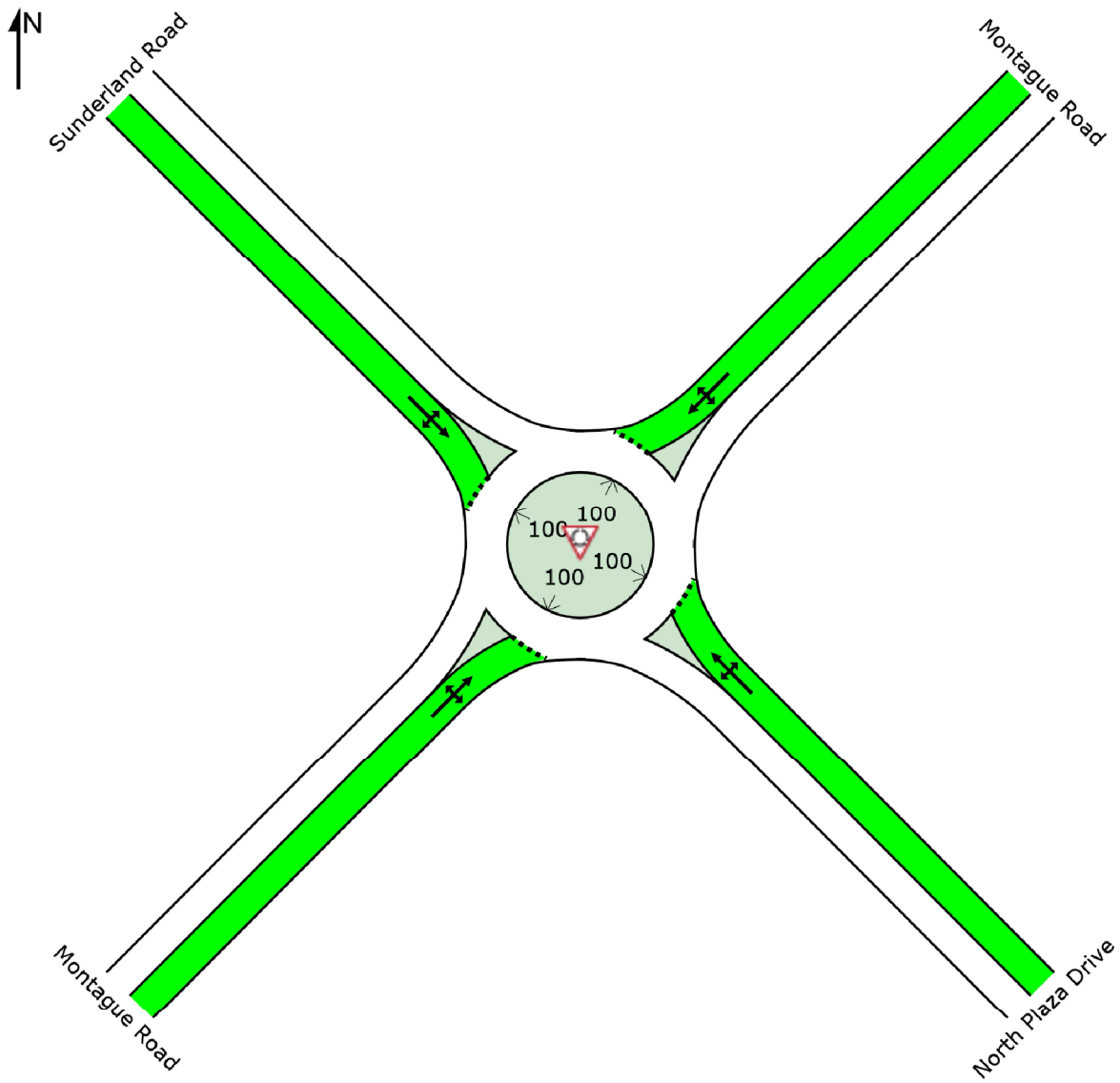
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	5	20	30	15	30



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	726	1.9	1112	0.653	100	12.4	LOS B	8.4	212.9	Full	1600	0.0	0.0
Approach	726	1.9		0.653		12.4	LOS B	8.4	212.9				
East: Pine Street													
Lane 1[d]	356	0.7	808	0.440	100	10.1	LOS B	2.8	71.1	Full	1600	0.0	0.0
Lane 2	205	6.5	941	0.217	100	6.0	LOS A	1.1	27.9	Short	50	0.0	NA
Approach	560	2.8		0.440		8.6	LOS A	2.8	71.1				
North: North Pleasant Street													
Lane 1[d]	590	2.5	1007	0.586	100	11.4	LOS B	5.8	146.8	Full	400	0.0	0.0
Approach	590	2.5		0.586		11.4	LOS B	5.8	146.8				
West: Meadow Street													
Lane 1[d]	518	1.3	898	0.577	100	12.2	LOS B	5.1	129.5	Full	1600	0.0	0.0
Approach	518	1.3		0.577		12.2	LOS B	5.1	129.5				
Intersection	2395	2.1		0.653		11.2	LOS B	8.4	212.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

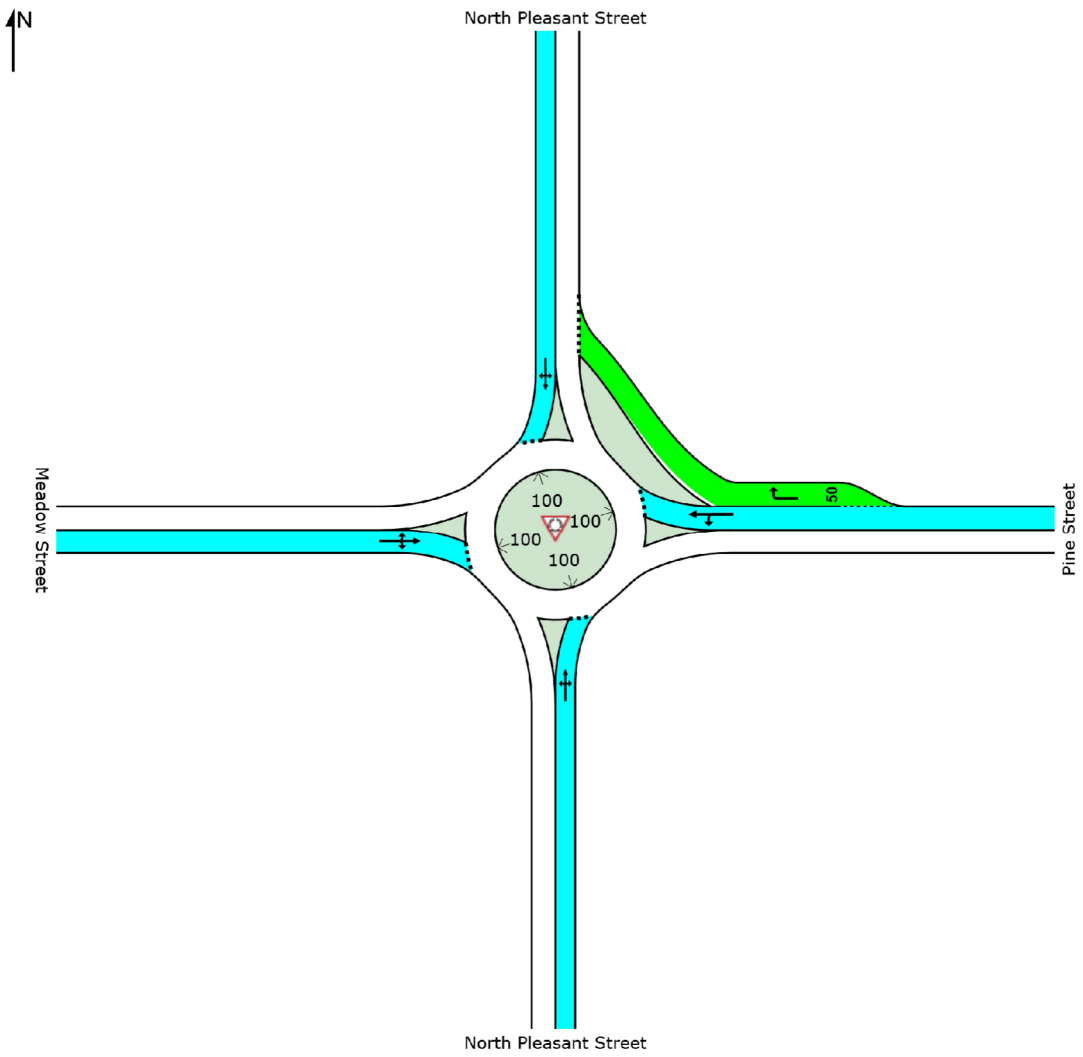
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

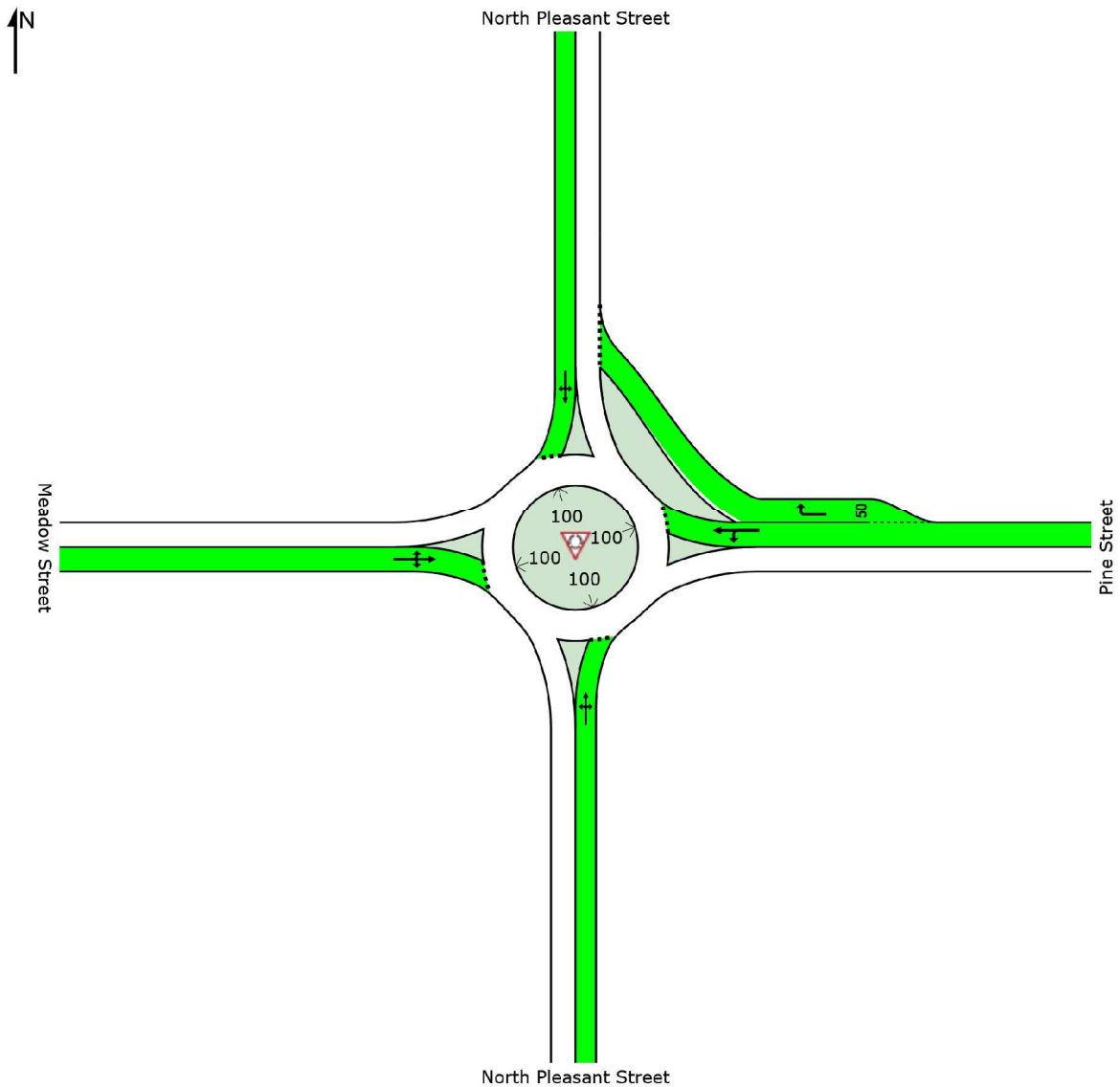
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	86	29	59	52	86



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	111	0.9	670	0.165	100	7.3	LOS A	0.7	16.8	Full	20	0.0	0.1
Approach	111	0.9		0.165		7.3	LOS A	0.7	16.8				
NorthEast: Montague Road													
Lane 1[d]	256	0.5	932	0.275	100	6.7	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	256	0.5		0.275		6.7	LOS A	1.3	33.4				
NorthWest: Sunderland Road													
Lane 1[d]	633	1.6	988	0.640	100	13.1	LOS B	7.8	197.8	Full	1600	0.0	0.0
Approach	633	1.6		0.640		13.1	LOS B	7.8	197.8				
SouthWest: Montague Road													
Lane 1[d]	704	1.5	1317	0.534	100	8.5	LOS A	4.5	113.5	Full	400	0.0	0.0
Approach	704	1.5		0.534		8.5	LOS A	4.5	113.5				
Intersection	1704	1.3		0.640		9.8	LOS A	7.8	197.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

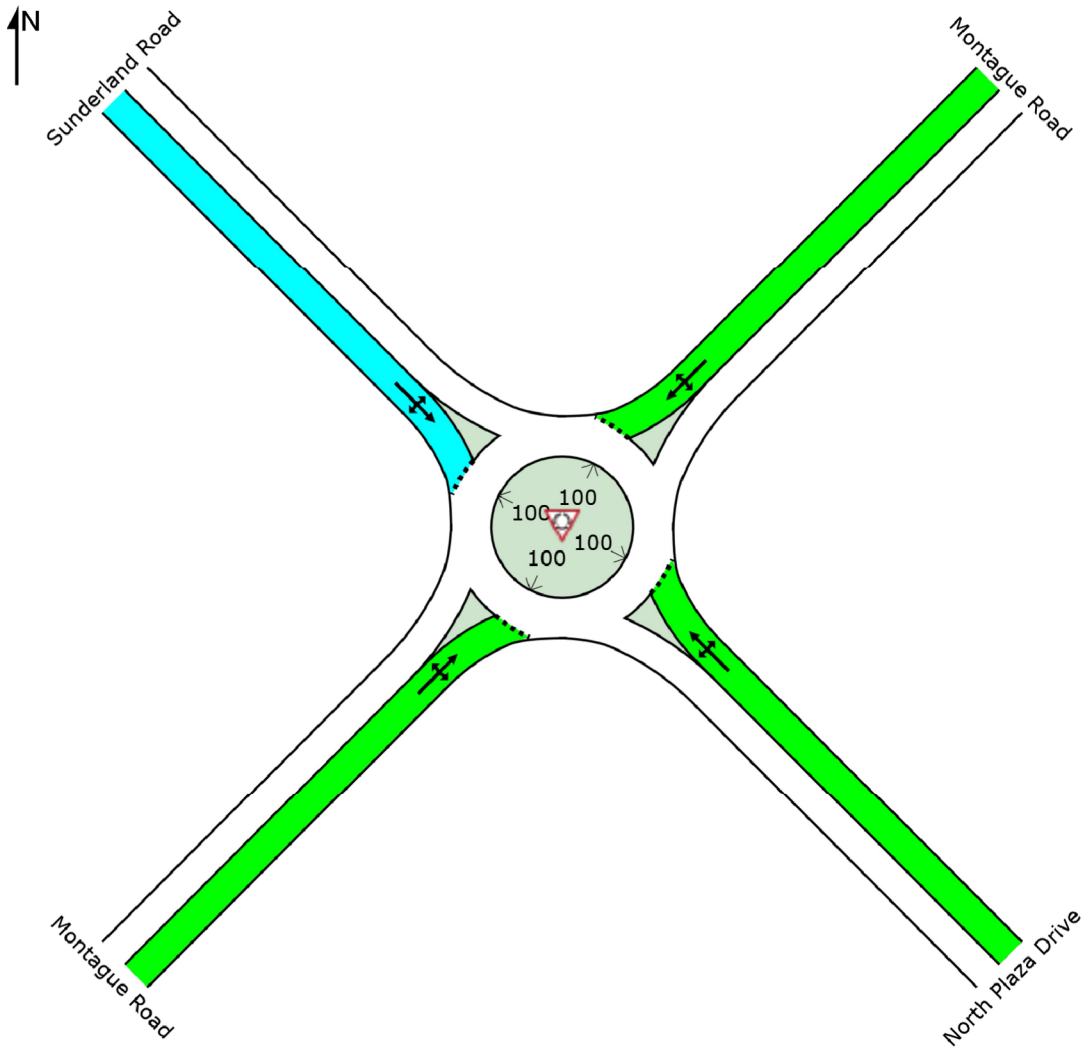
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

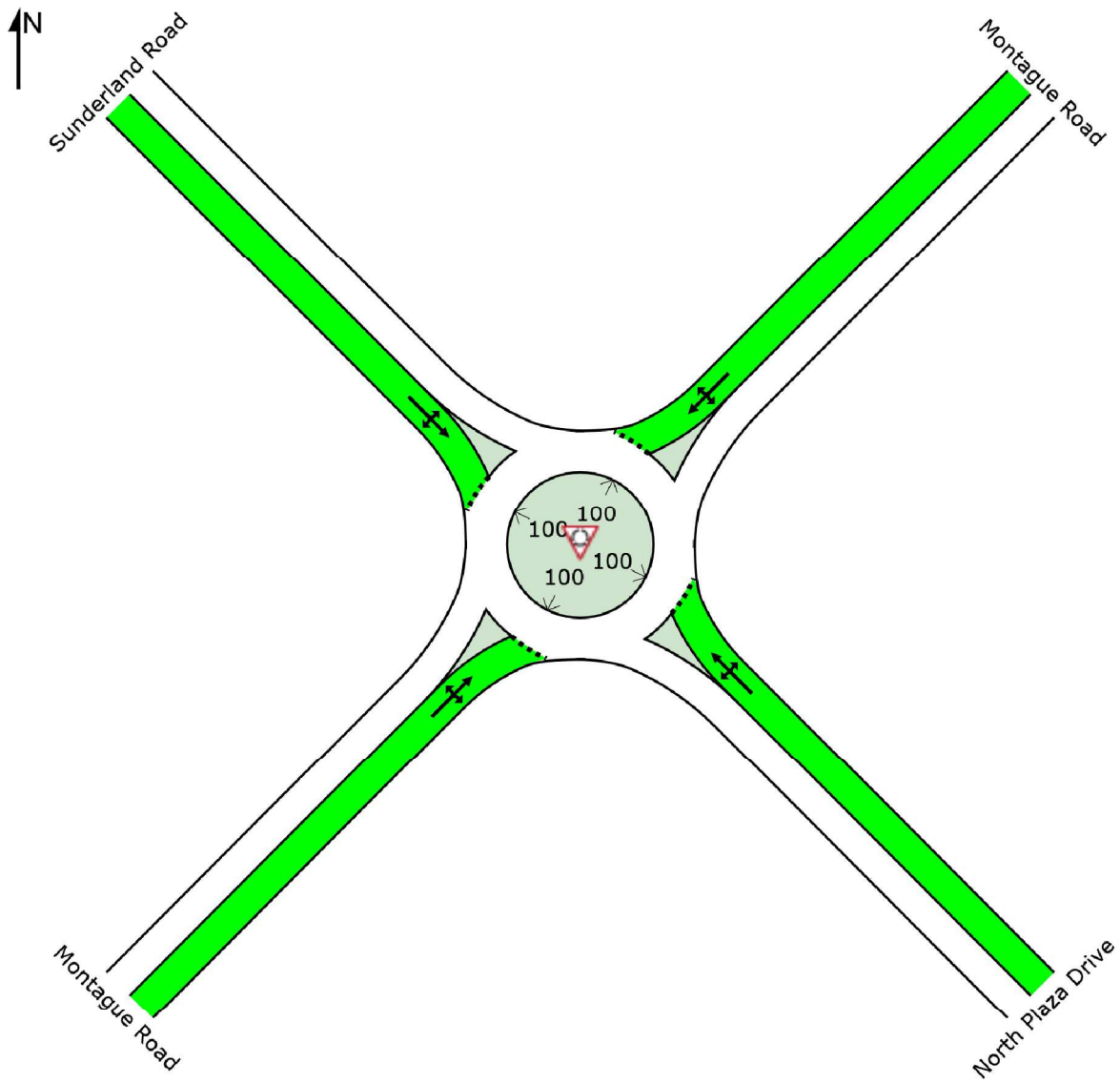
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	7	13	80	46	80



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	405	2.8	1079	0.375	100	7.2	LOS A	2.2	56.7	Full	1600	0.0	0.0
Approach	405	2.8		0.375		7.2	LOS A	2.2	56.7				
East: Pine Street													
Lane 1[d]	258	2.1	1003	0.257	100	6.1	LOS A	1.4	34.6	Full	1600	0.0	0.0
Lane 2	271	3.7	1094	0.247	100	5.6	LOS A	1.3	34.2	Short	50	0.0	NA
Approach	529	2.9		0.257		5.9	LOS A	1.4	34.6				
North: North Pleasant Street													
Lane 1[d]	611	0.6	1250	0.489	100	8.0	LOS A	3.6	89.4	Full	400	0.0	0.0
Approach	611	0.6		0.489		8.0	LOS A	3.6	89.4				
West: Meadow Street													
Lane 1[d]	423	1.3	1127	0.375	100	7.0	LOS A	2.3	57.9	Full	1600	0.0	0.0
Approach	423	1.3		0.375		7.0	LOS A	2.3	57.9				
Intersection	1968	1.8		0.489		7.1	LOS A	3.6	89.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

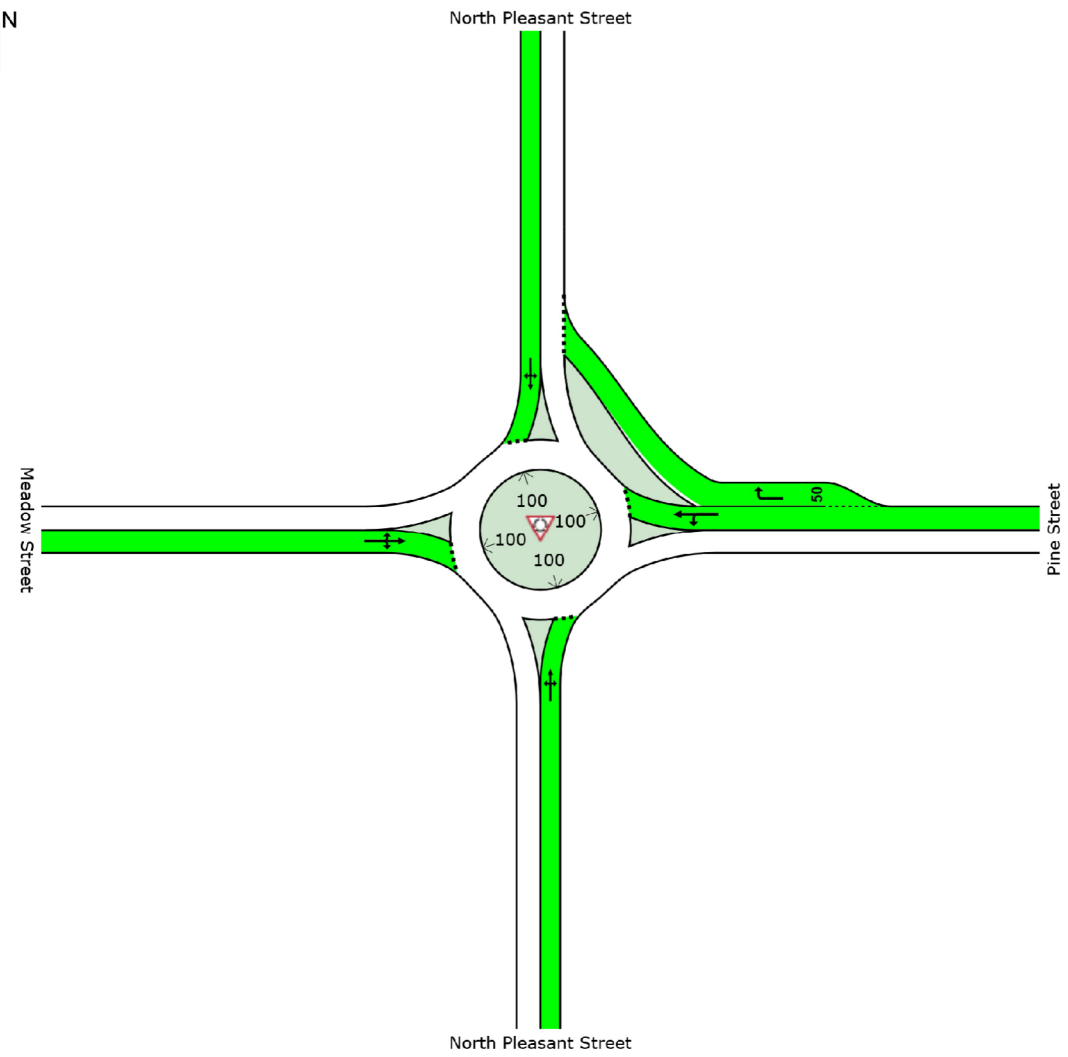
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

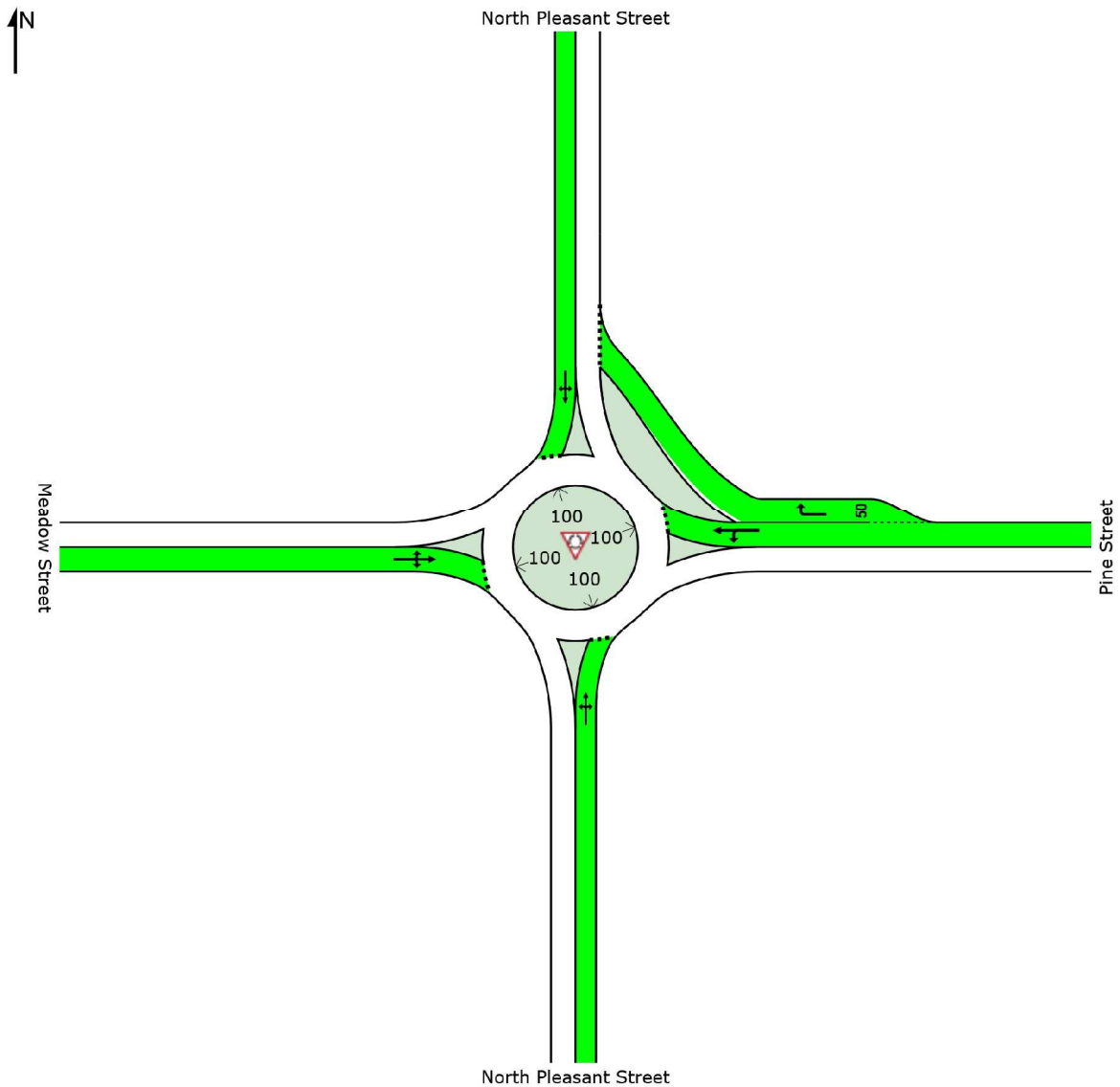
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	23	14	36	23	36



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	104	0.8	765	0.136	100	6.1	LOS A	0.6	14.0	Full	20	0.0	0.0
Approach	104	0.8		0.136		6.1	LOS A	0.6	14.0				
NorthEast: Montague Road													
Lane 1[d]	274	0.6	998	0.275	100	6.3	LOS A	1.4	34.3	Full	1600	0.0	0.0
Approach	274	0.6		0.275		6.3	LOS A	1.4	34.3				
NorthWest: Sunderland Road													
Lane 1[d]	250	1.6	964	0.259	100	6.3	LOS A	1.2	31.5	Full	1600	0.0	0.0
Approach	250	1.6		0.259		6.3	LOS A	1.2	31.5				
SouthWest: Montague Road													
Lane 1[d]	571	1.1	1341	0.426	100	6.8	LOS A	3.0	75.9	Full	400	0.0	0.0
Approach	571	1.1		0.426		6.8	LOS A	3.0	75.9				
Intersection	1199	1.1		0.426		6.5	LOS A	3.0	75.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

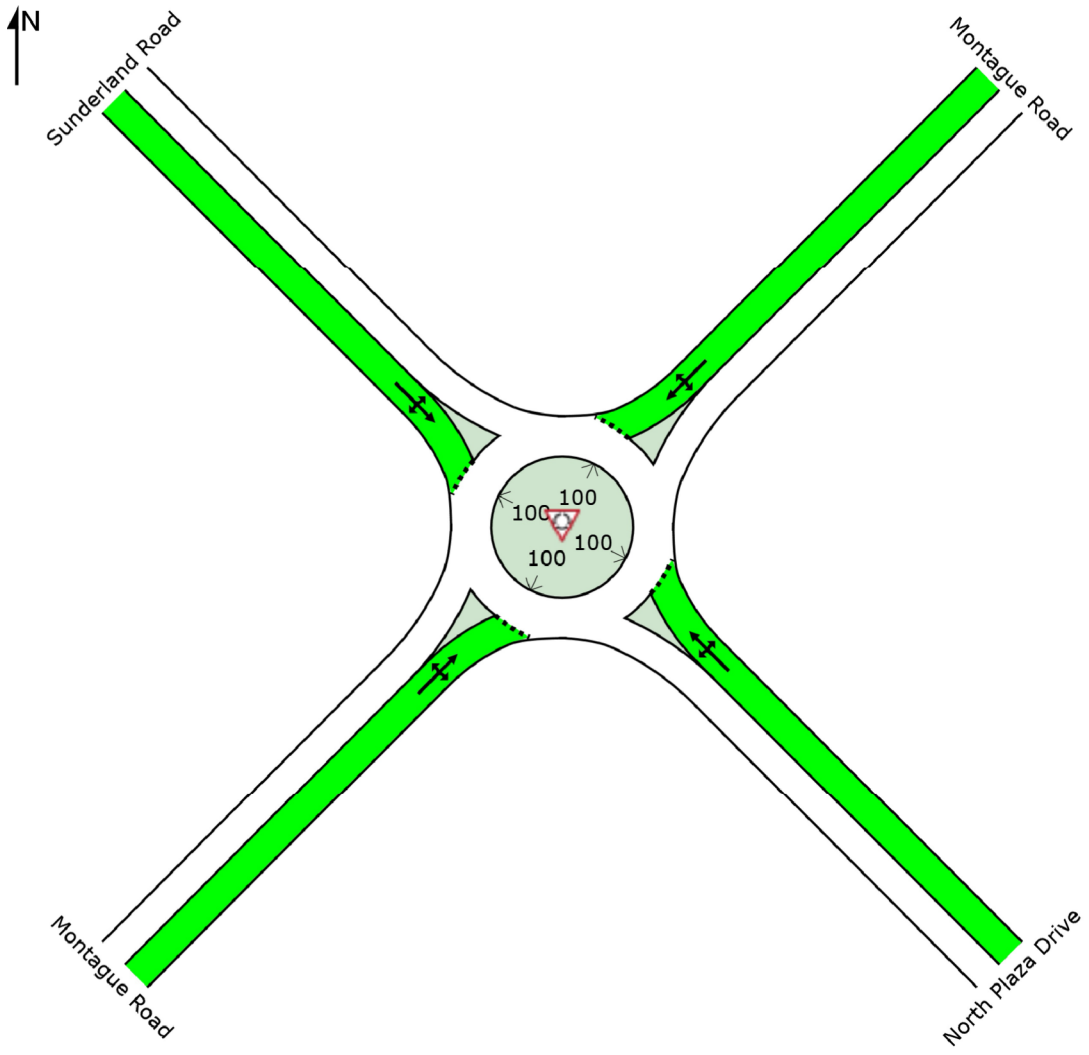
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

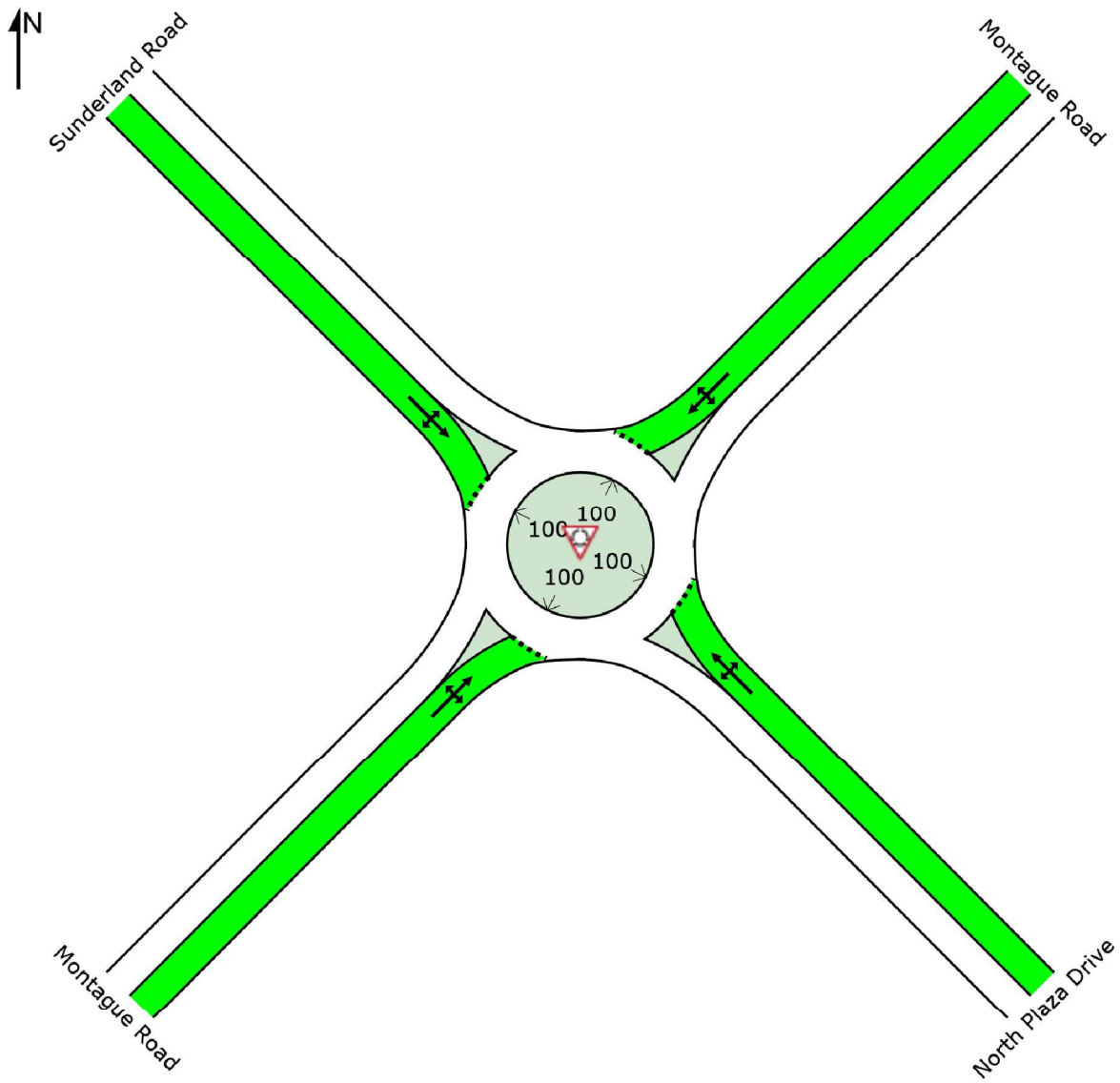
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	6	14	13	31	31



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 7

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	215	3.6	1174	0.183	100	4.7	LOS A	1.0	24.8	Full	1600	0.0	0.0
Approach	215	3.6		0.183		4.7	LOS A	1.0	24.8				
East: Pine Street													
Lane 1[d]	231	0.5	1330	0.173	100	4.1	LOS A	1.0	24.3	Full	1600	0.0	0.0
Lane 2	213	1.9	1378	0.154	100	3.9	LOS A	0.8	21.6	Short	50	0.0	NA
Approach	443	1.2		0.173		4.0	LOS A	1.0	24.3				
North: North Pleasant Street													
Lane 1[d]	812	2.7	1332	0.610	100	9.9	LOS A	6.3	162.2	Full	400	0.0	0.0
Approach	812	2.7		0.610		9.9	LOS A	6.3	162.2				
West: Meadow Street													
Lane 1[d]	317	3.5	865	0.366	100	8.4	LOS A	2.0	51.4	Full	1600	0.0	0.0
Approach	317	3.5		0.366		8.4	LOS A	2.0	51.4				
Intersection	1788	2.6		0.610		7.5	LOS A	6.3	162.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

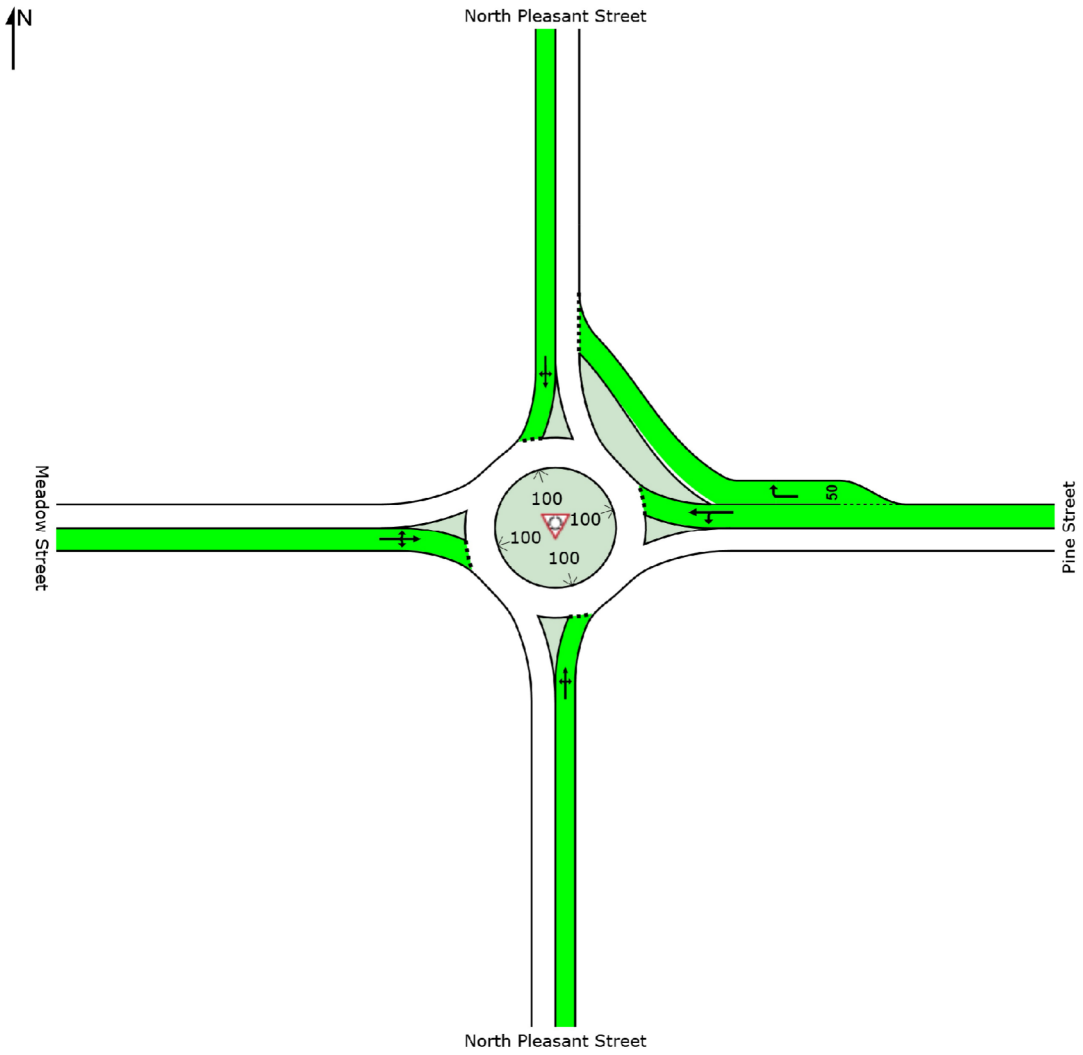
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

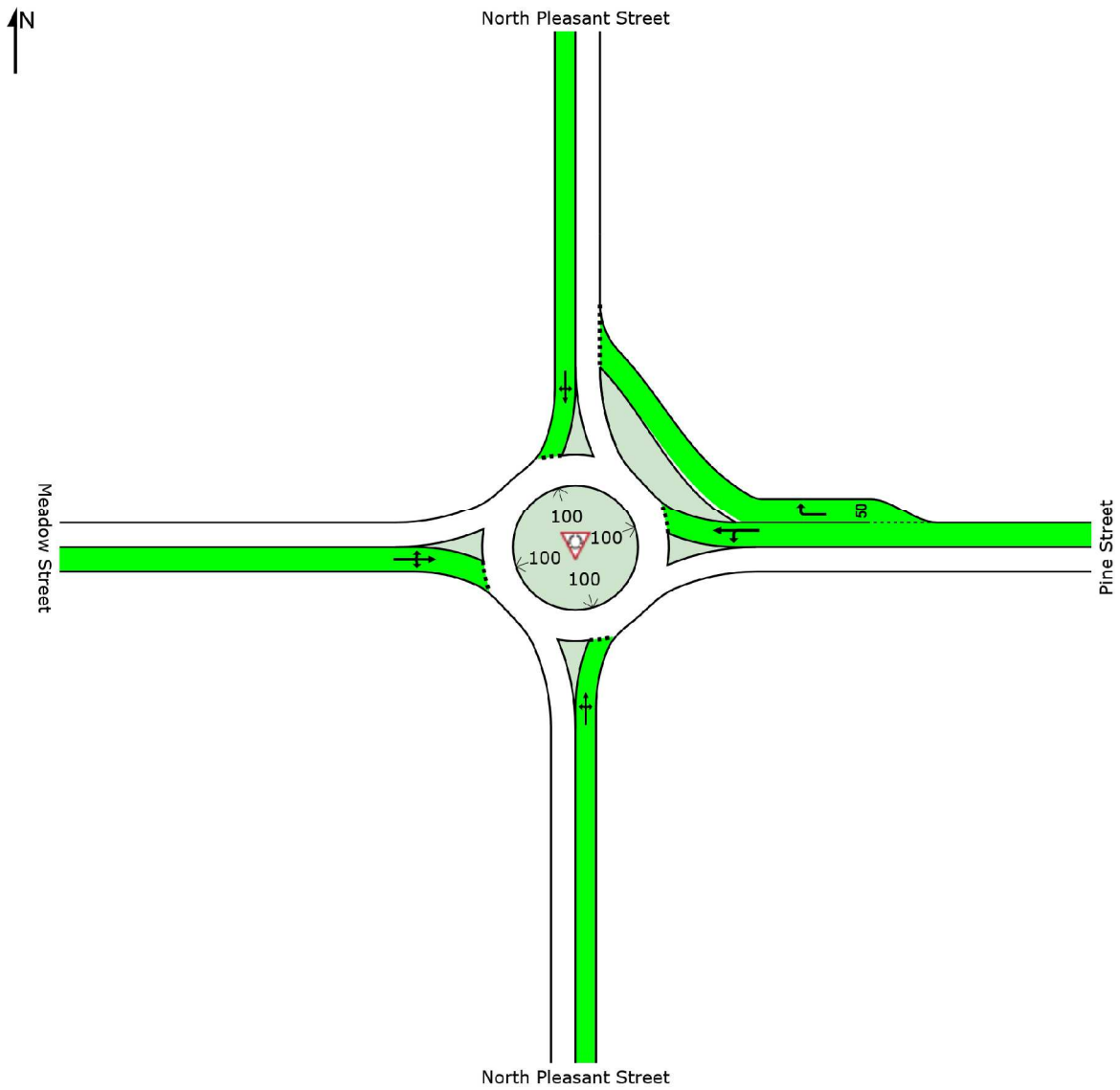
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	10	10	65	21	65



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	406	0.6	1849	0.219	100	1.9	LOS A	0.2	4.1	Full	1600	0.0	0.0
Approach	406	0.6		0.219		1.9	NA	0.2	4.1				
NorthWest: Sunderland Road													
Lane 1	394	2.8	617	0.639	100	20.6	LOS C	9.1	233.1	Full	1600	0.0	0.0
Approach	394	2.8		0.639		20.6	LOS C	9.1	233.1				
SouthWest: Montague Road													
Lane 1	475	1.3	1395	0.340	100	6.0	LOS A	2.3	58.6	Full	400	0.0	0.0
Approach	475	1.3		0.340		6.0	NA	2.3	58.6				
Intersection	1275	1.5		0.639		9.2	NA	9.1	233.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

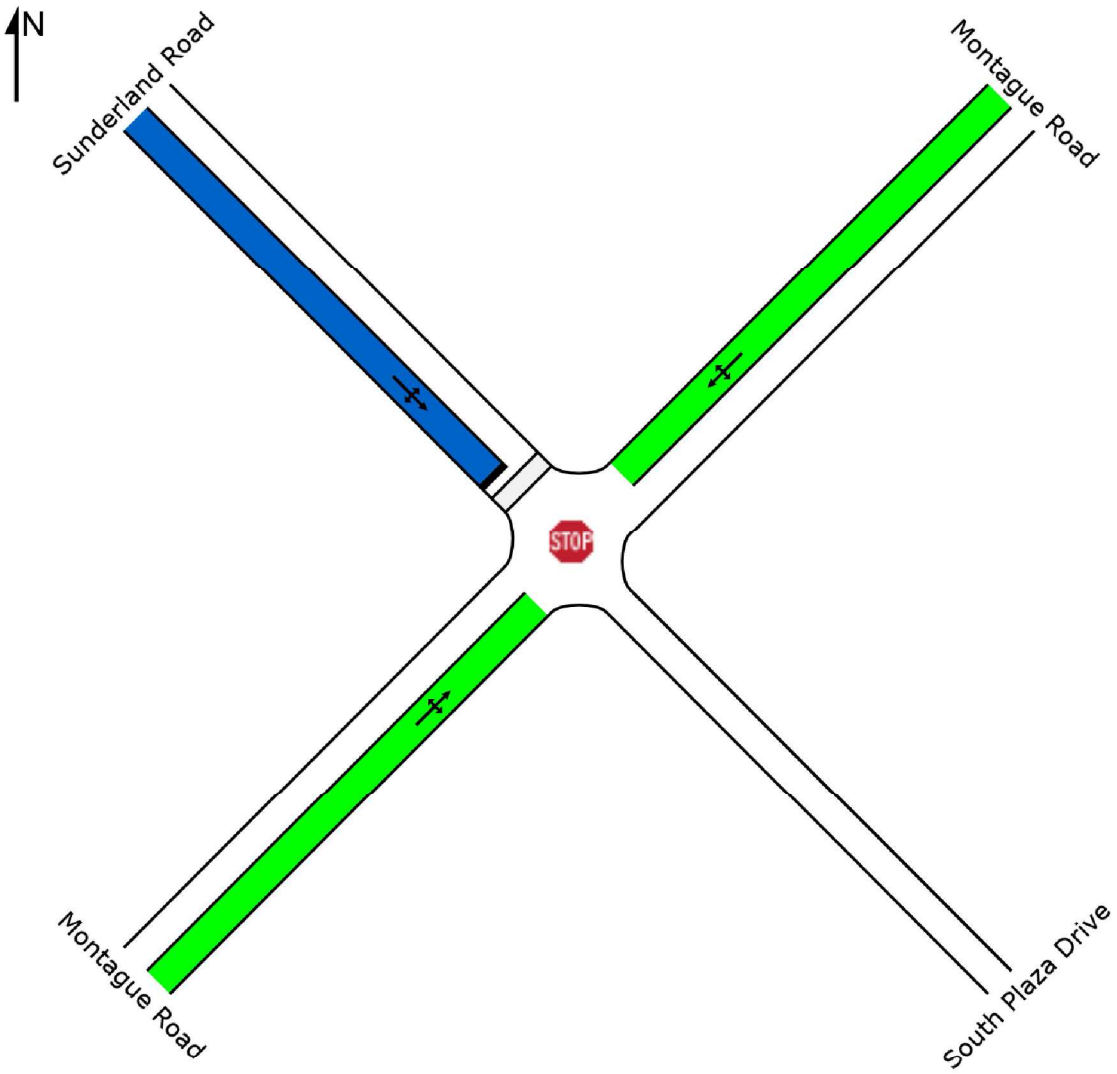
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	C	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

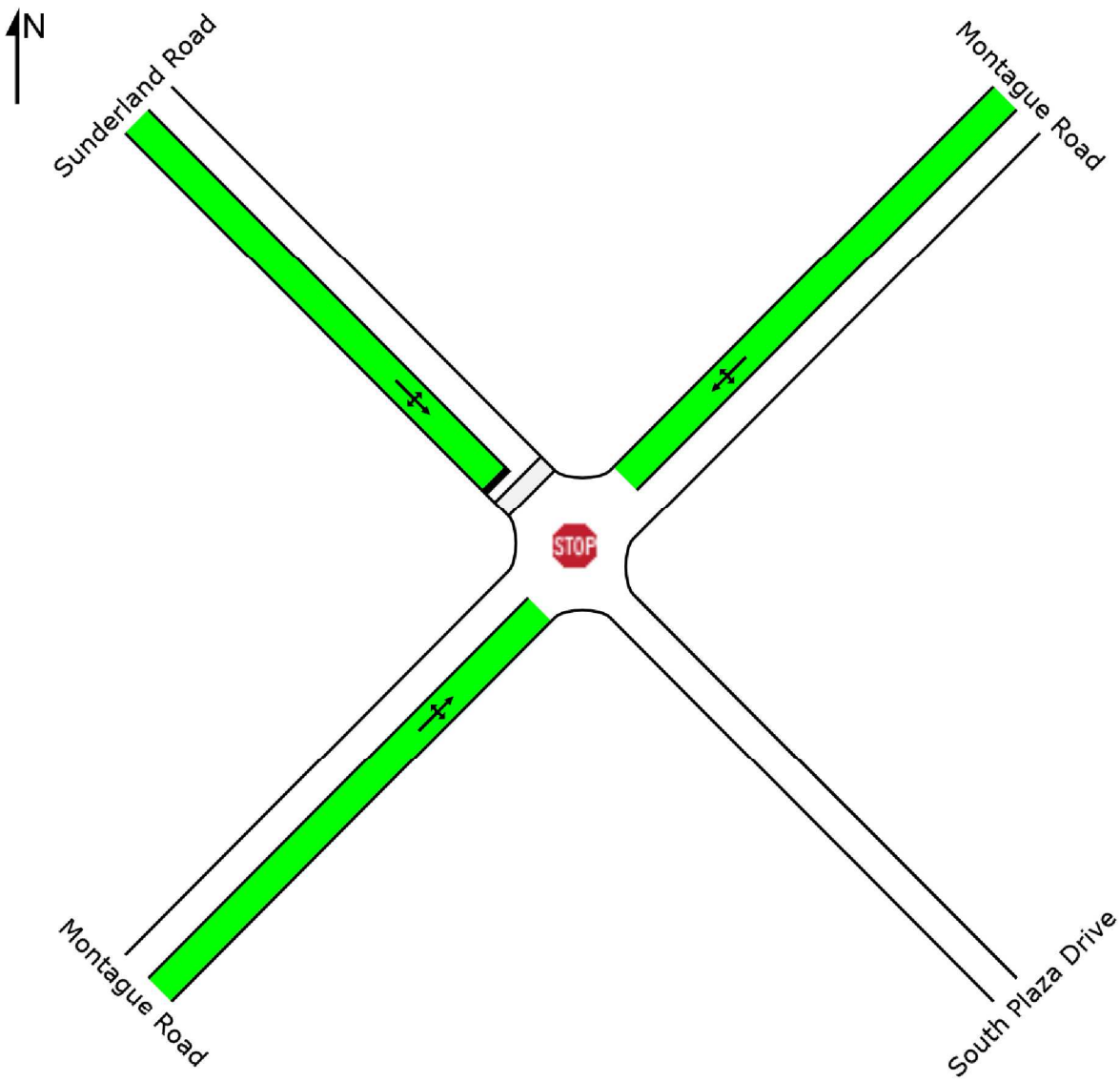
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	2	94	24	94



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	726	1.9	1112	0.653	100	12.4	LOS B	8.4	212.9	Full	1600	0.0	0.0
Approach	726	1.9		0.653		12.4	LOS B	8.4	212.9				
East: Pine Street													
Lane 1[d]	463	2.0	798	0.580	100	13.5	LOS B	4.8	121.0	Full	1600	0.0	0.0
Lane 2	98	6.5	842	0.116	20[6]	5.4	LOS A	0.5	13.6	Short	50	0.0	NA
Approach	560	2.8		0.580		12.1	LOS B	4.8	121.0				
North: North Pleasant Street													
Lane 1[d]	590	2.5	1007	0.586	100	11.4	LOS B	5.8	146.8	Full	400	0.0	0.0
Approach	590	2.5		0.586		11.4	LOS B	5.8	146.8				
West: Meadow Street													
Lane 1[d]	518	1.3	898	0.577	100	12.2	LOS B	5.1	129.5	Full	1600	0.0	0.0
Approach	518	1.3		0.577		12.2	LOS B	5.1	129.5				
Intersection	2395	2.1		0.653		12.0	LOS B	8.4	212.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

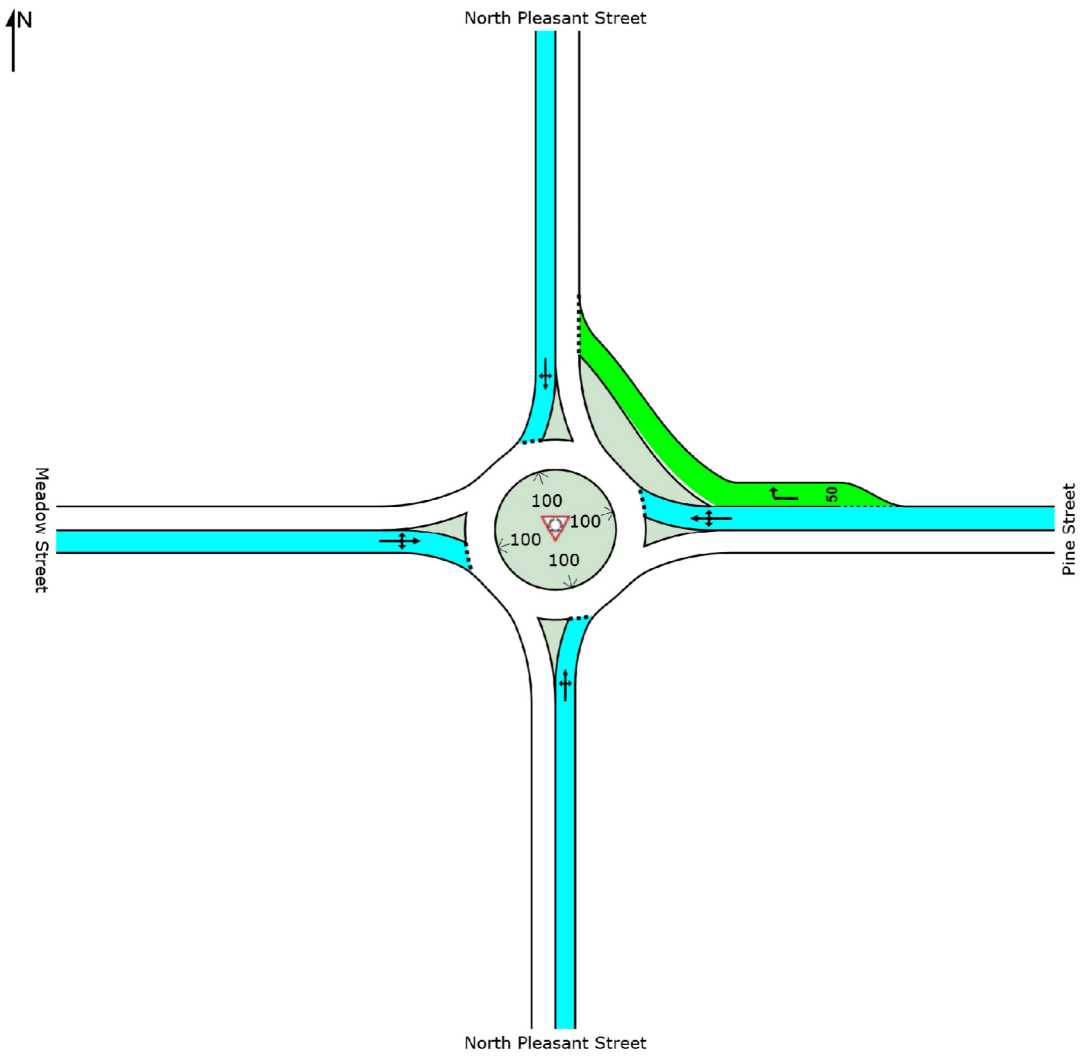
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	B	B	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

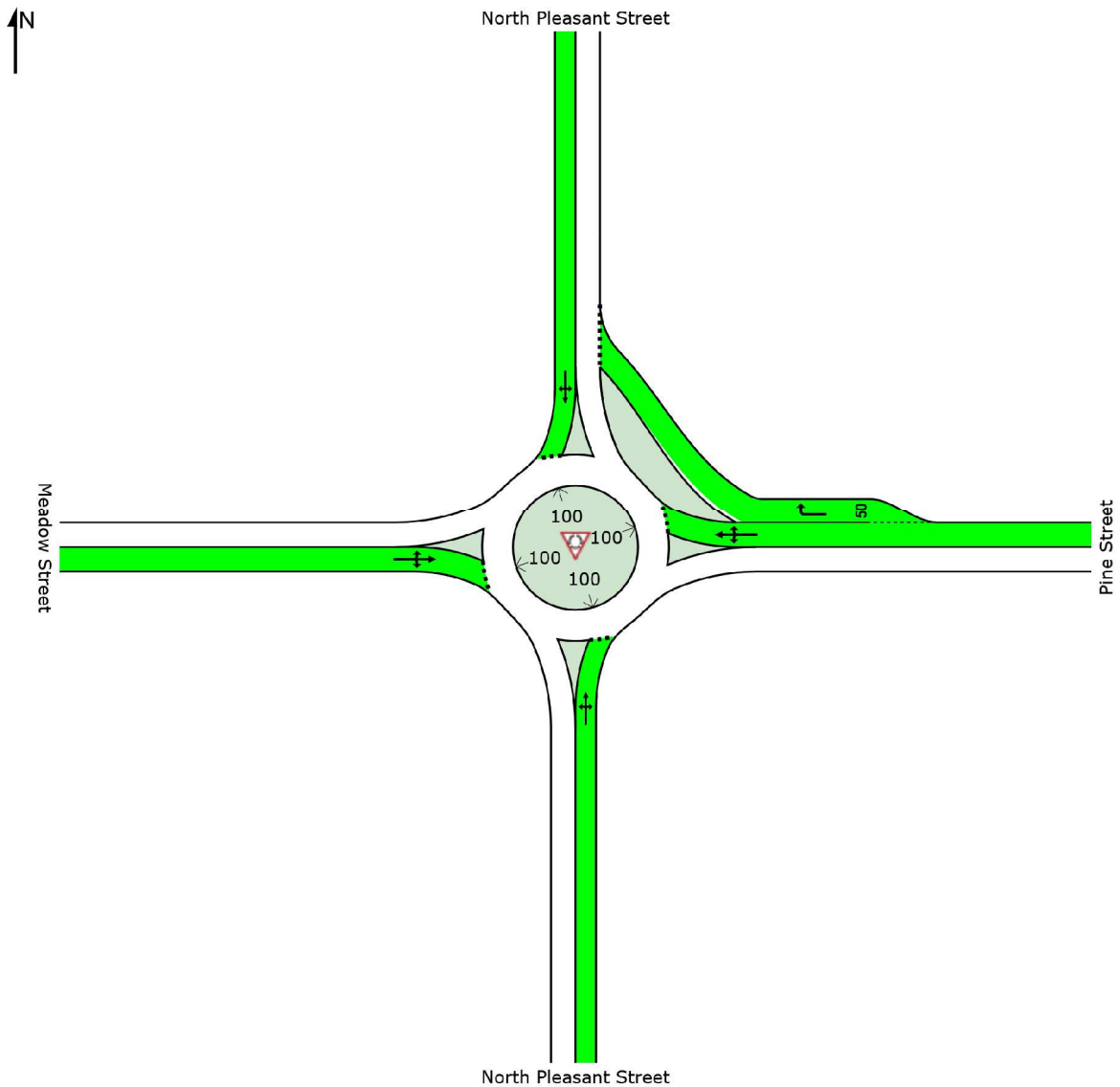
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	86	49	59	52	86



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	300	0.6	1772	0.169	100	2.0	LOS A	0.3	6.7	Full	1600	0.0	0.0
Approach	300	0.6		0.169		2.0	NA	0.3	6.7				
NorthWest: Sunderland Road													
Lane 1	633	1.6	720	0.880	100	35.0	LOS E	34.4	871.0	Full	1600	0.0	0.0
Approach	633	1.6		0.880		35.0	LOS E	34.4	871.0				
SouthWest: Montague Road													
Lane 1	879	1.2	1549	0.568	100	8.1	LOS A	12.3	310.6	Full	400	0.0	0.0
Approach	879	1.2		0.568		8.1	NA	12.3	310.6				
Intersection	1813	1.2		0.880		16.5	NA	34.4	871.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

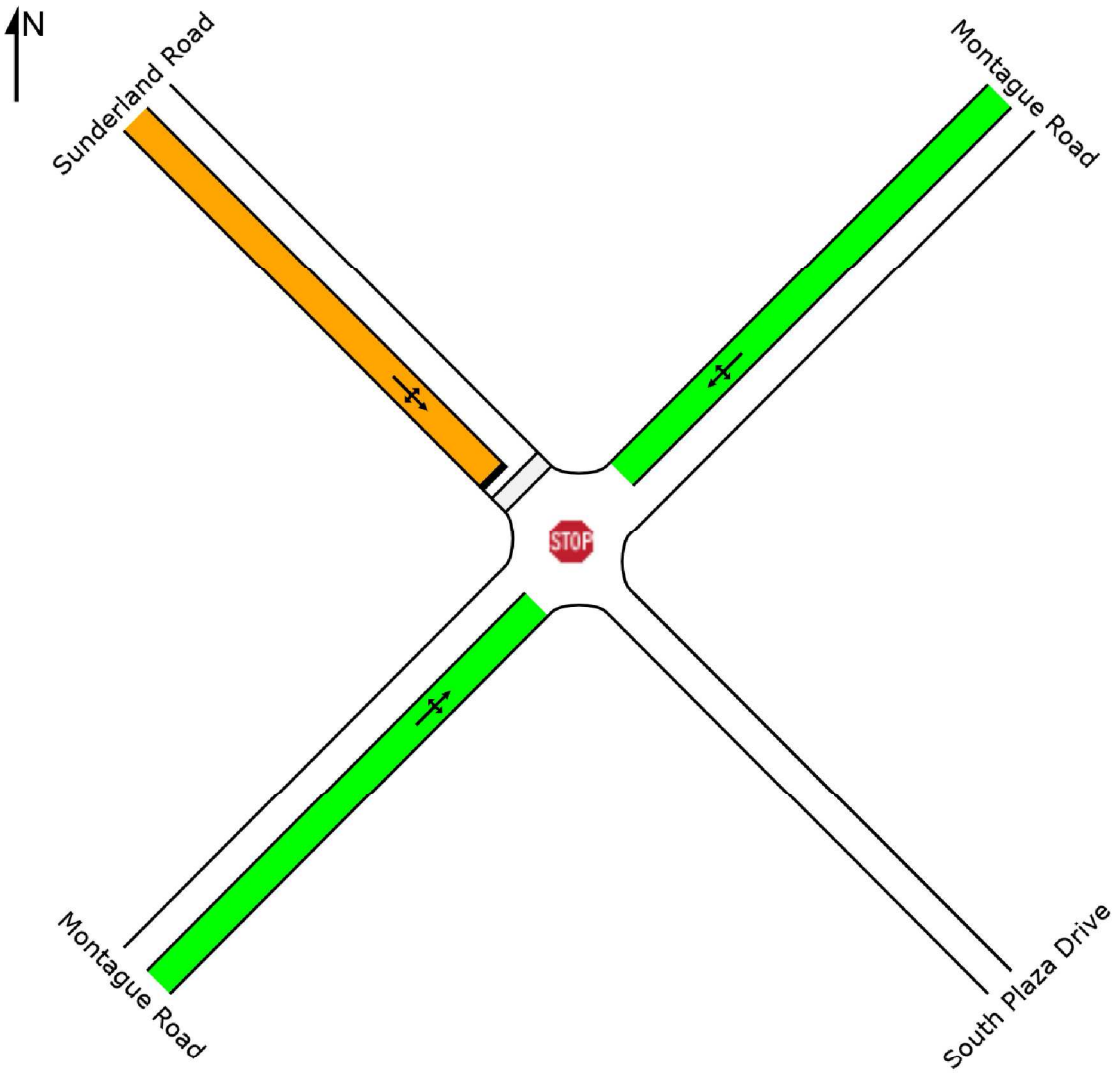
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	E	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

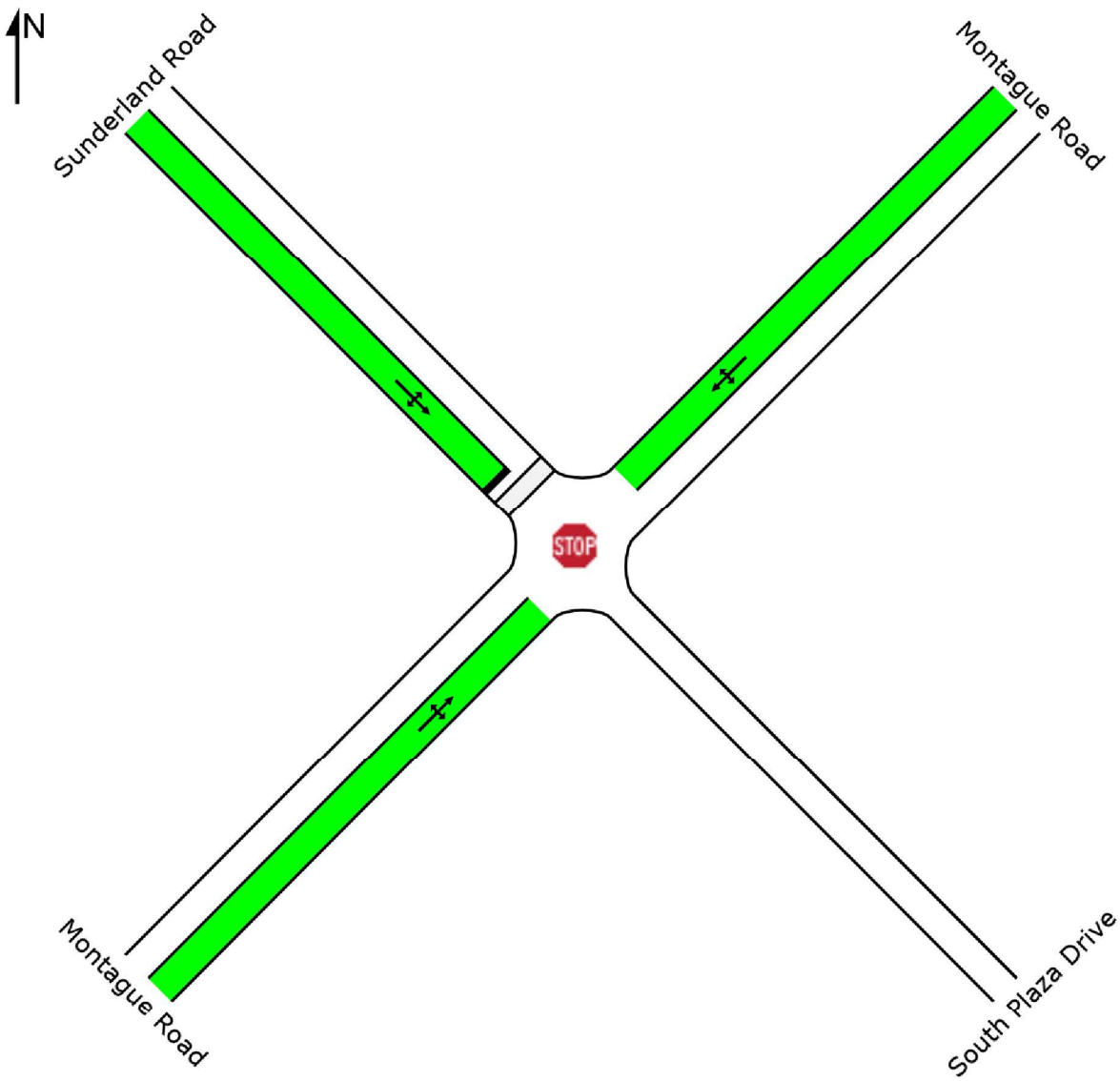
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	3	350	125	350



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	405	2.8	1079	0.375	100	7.2	LOS A	2.2	56.7	Full	1600	0.0	0.0
Approach	405	2.8		0.375		7.2	LOS A	2.2	56.7				
East: Pine Street													
Lane 1[d]	258	2.1	1003	0.257	100	6.1	LOS A	1.4	34.6	Full	1600	0.0	0.0
Lane 2	271	3.7	1094	0.247	100	5.6	LOS A	1.3	34.2	Short	50	0.0	NA
Approach	529	2.9		0.257		5.9	LOS A	1.4	34.6				
North: North Pleasant Street													
Lane 1[d]	611	0.6	1250	0.489	100	8.0	LOS A	3.6	89.4	Full	400	0.0	0.0
Approach	611	0.6		0.489		8.0	LOS A	3.6	89.4				
West: Meadow Street													
Lane 1[d]	423	1.3	1127	0.375	100	7.0	LOS A	2.3	57.9	Full	1600	0.0	0.0
Approach	423	1.3		0.375		7.0	LOS A	2.3	57.9				
Intersection	1968	1.8		0.489		7.1	LOS A	3.6	89.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

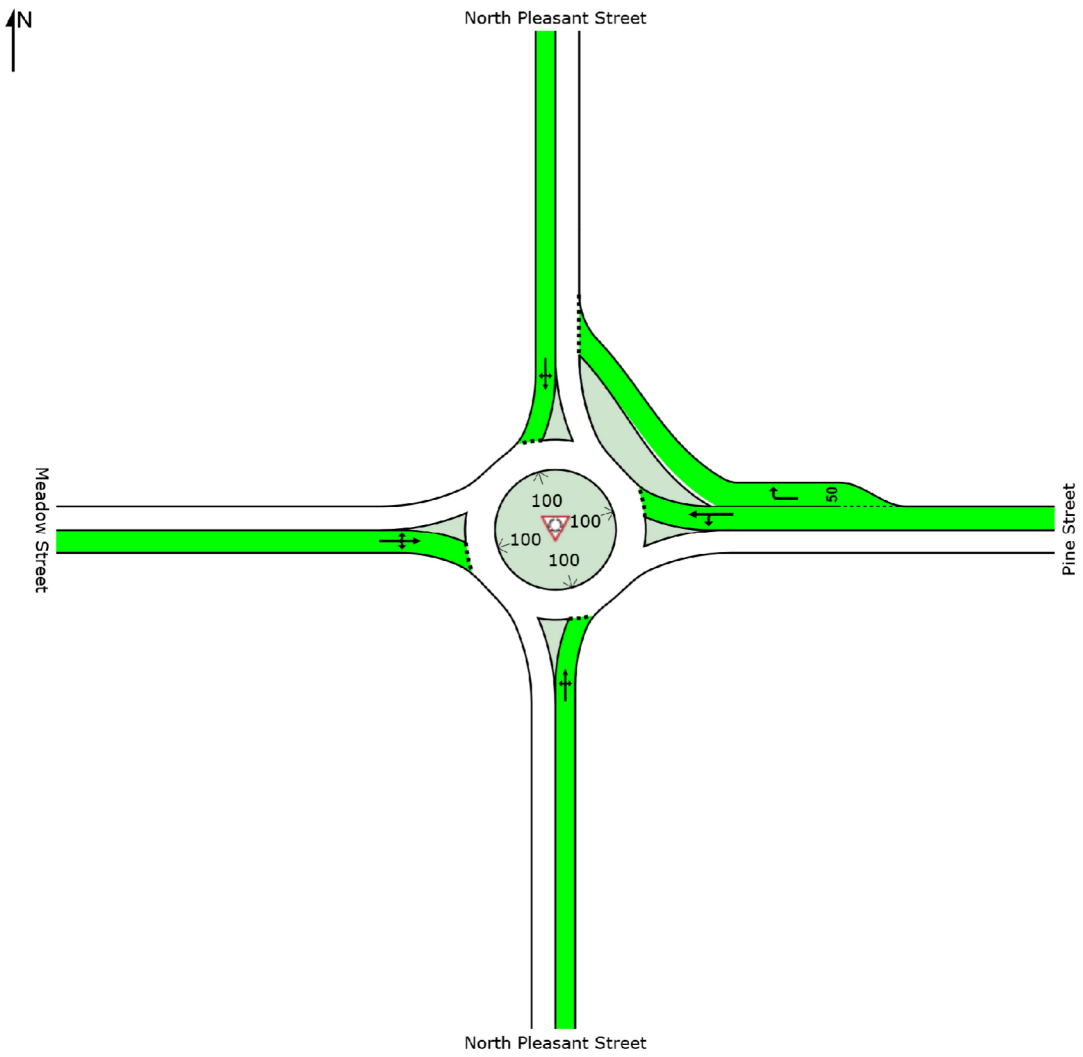
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

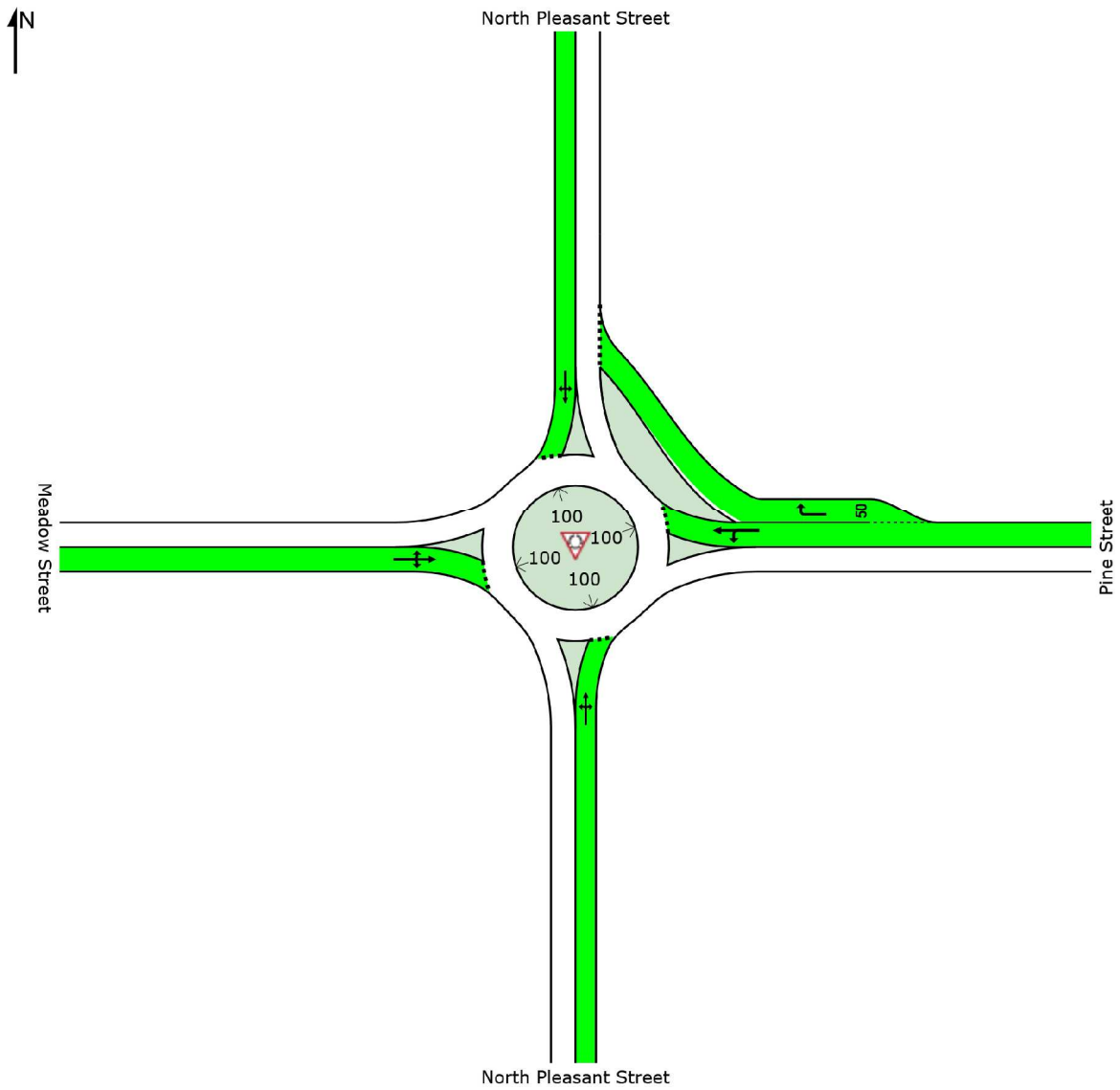
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	23	14	36	23	36



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	323	0.6	1840	0.176	100	1.6	LOS A	0.1	3.2	Full	1600	0.0	0.0
Approach	323	0.6		0.176		1.6	NA	0.1	3.2				
NorthWest: Sunderland Road													
Lane 1	250	1.6	685	0.365	100	13.2	LOS B	2.5	63.4	Full	1600	0.0	0.0
Approach	250	1.6		0.365		13.2	LOS B	2.5	63.4				
SouthWest: Montague Road													
Lane 1	662	1.1	1539	0.430	100	6.3	LOS A	4.4	111.8	Full	400	0.0	0.0
Approach	662	1.1		0.430		6.3	NA	4.4	111.8				
Intersection	1235	1.1		0.430		6.4	NA	4.4	111.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

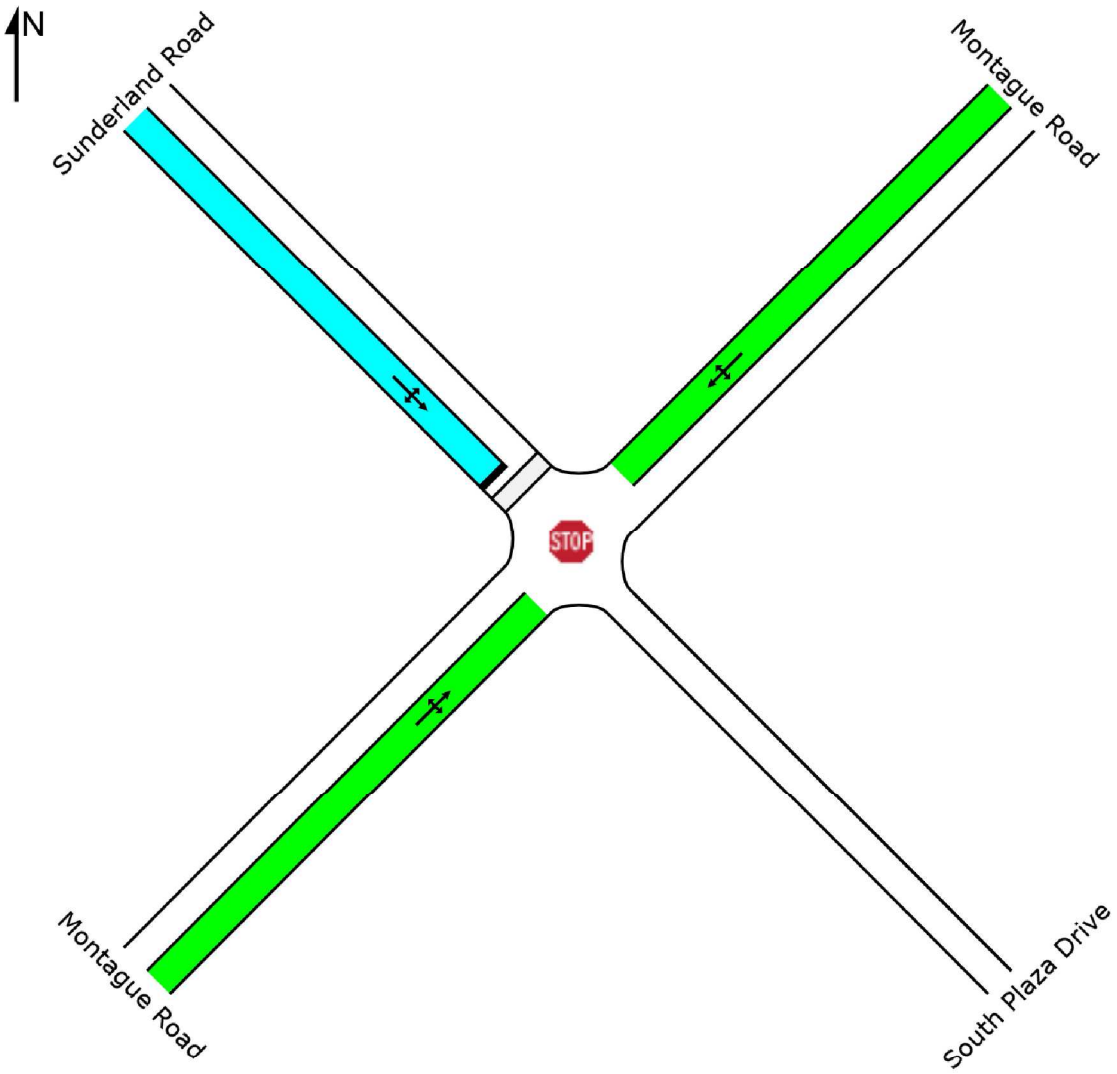
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	B	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

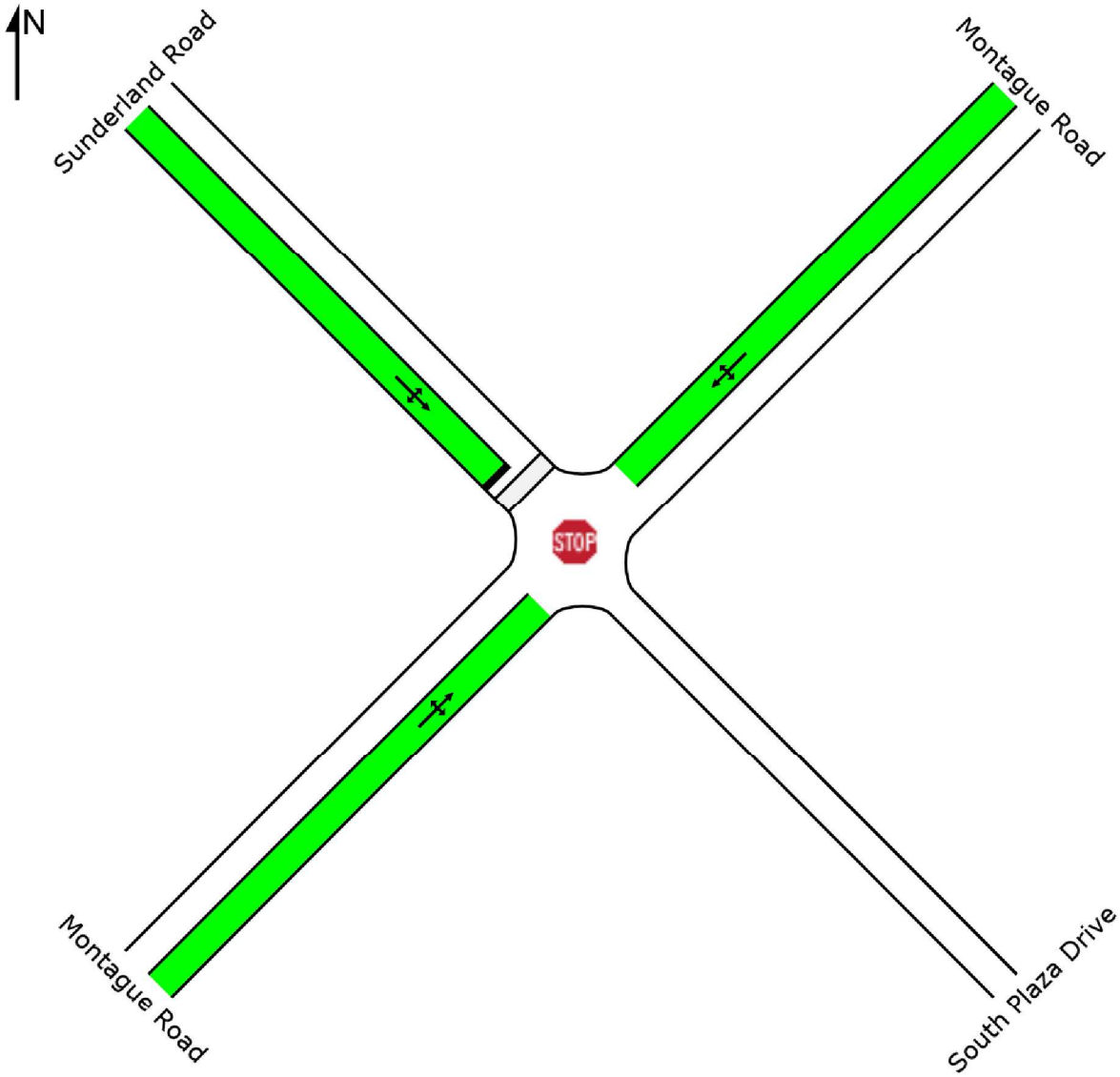
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	1	26	45	45



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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Alternative 8

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	215	3.6	1174	0.183	100	4.7	LOS A	1.0	24.8	Full	1600	0.0	0.0
Approach	215	3.6		0.183		4.7	LOS A	1.0	24.8				
East: Pine Street													
Lane 1[d]	231	0.5	1330	0.173	100	4.1	LOS A	1.0	24.3	Full	1600	0.0	0.0
Lane 2	213	1.9	1378	0.154	100	3.9	LOS A	0.8	21.6	Short	50	0.0	NA
Approach	443	1.2		0.173		4.0	LOS A	1.0	24.3				
North: North Pleasant Street													
Lane 1[d]	812	2.7	1332	0.610	100	9.9	LOS A	6.3	162.1	Full	150	0.0	7.3
Approach	812	2.7		0.610		9.9	LOS A	6.3	162.1				
West: Meadow Street													
Lane 1[d]	317	3.5	865	0.366	100	8.4	LOS A	2.0	51.4	Full	1600	0.0	0.0
Approach	317	3.5		0.366		8.4	LOS A	2.0	51.4				
Intersection	1788	2.6		0.610		7.5	LOS A	6.3	162.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

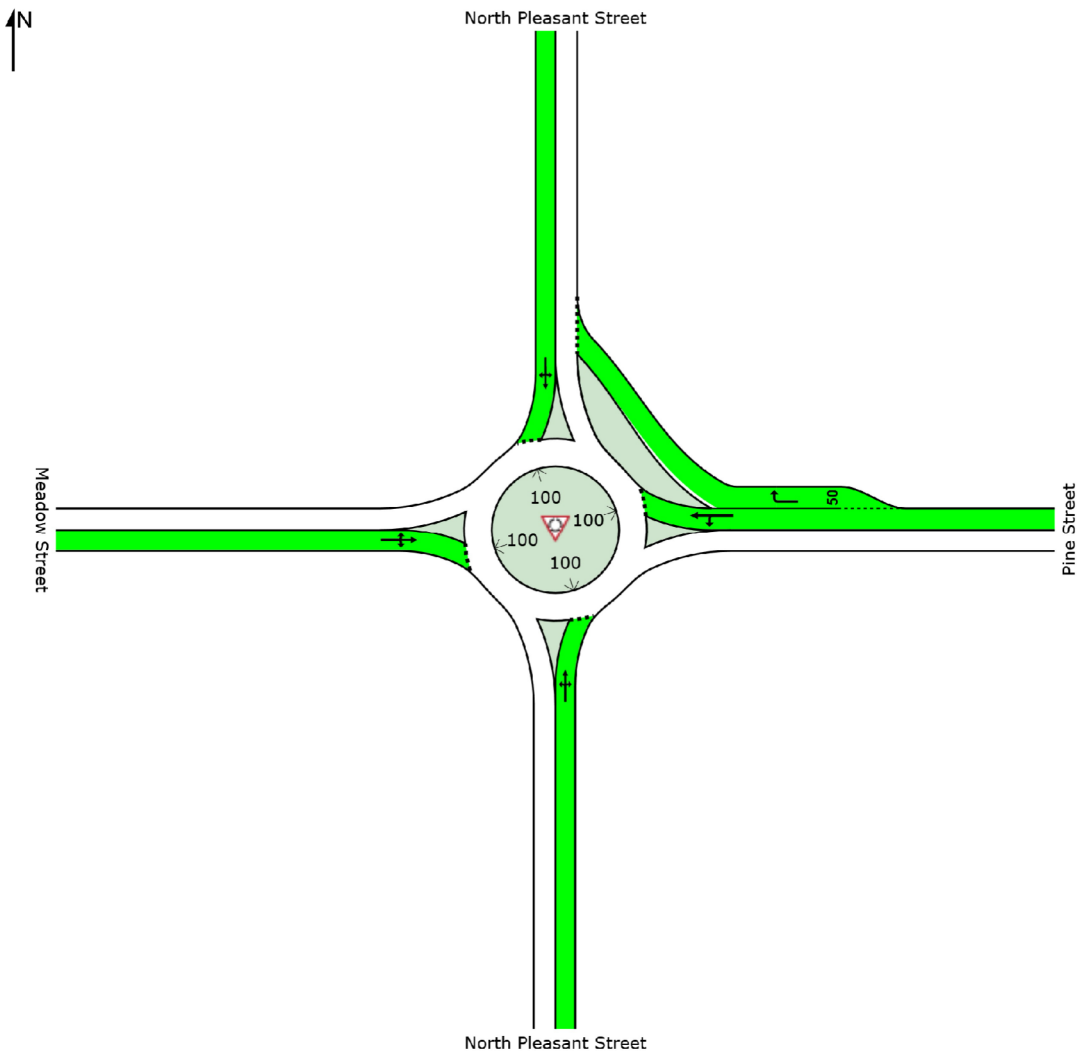
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

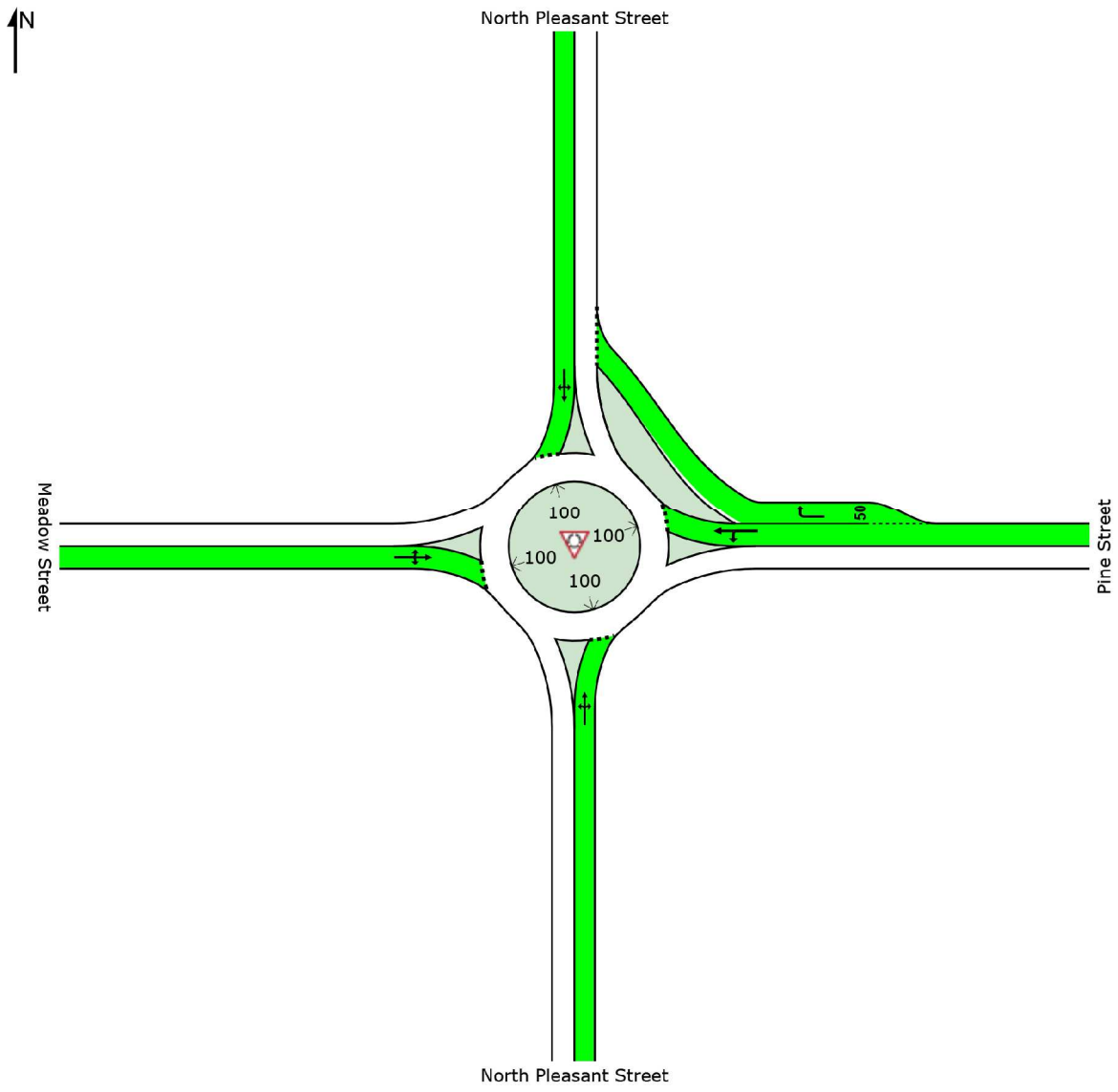
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	10	10	65	21	65



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	444	1.8	1719	0.258	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	444	1.8		0.258		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	383	0.7	386	0.993	100	77.3	LOS F	19.8	496.5	Full	1600	0.0	0.0
Approach	383	0.7		0.993		77.3	LOS F	19.8	496.5				
North: Sunderland Road													
Lane 1	402	2.7	1824	0.220	100	1.8	LOS A	0.1	2.3	Full	1600	0.0	0.0
Approach	402	2.7		0.220		1.8	NA	0.1	2.3				
Intersection	1228	1.8		0.993		24.7	NA	19.8	496.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

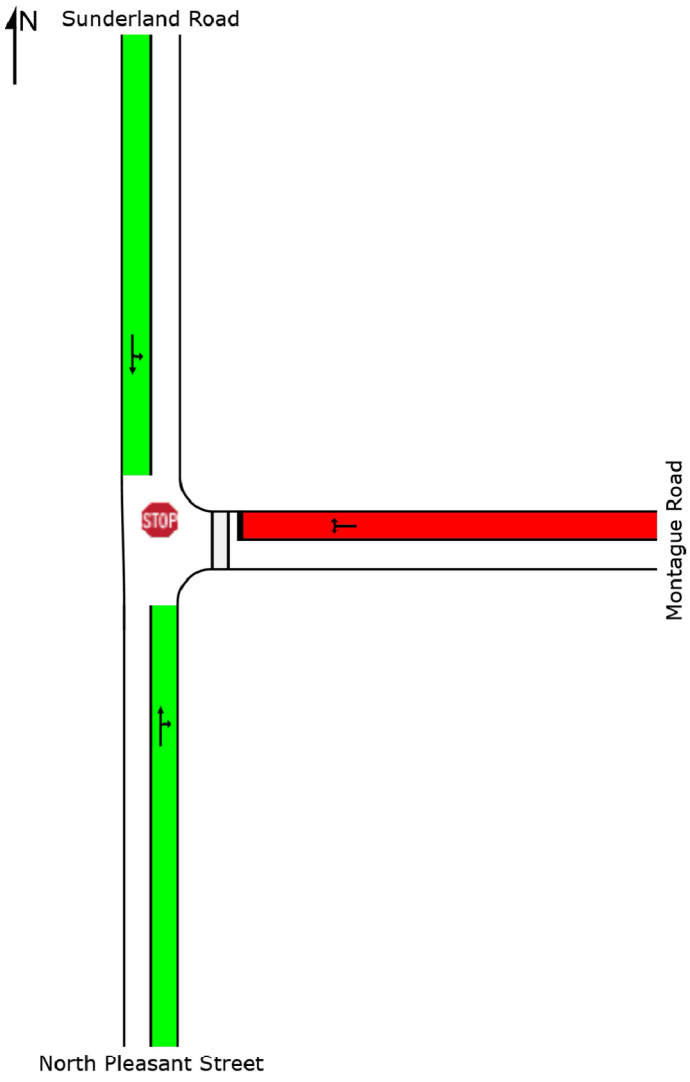
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

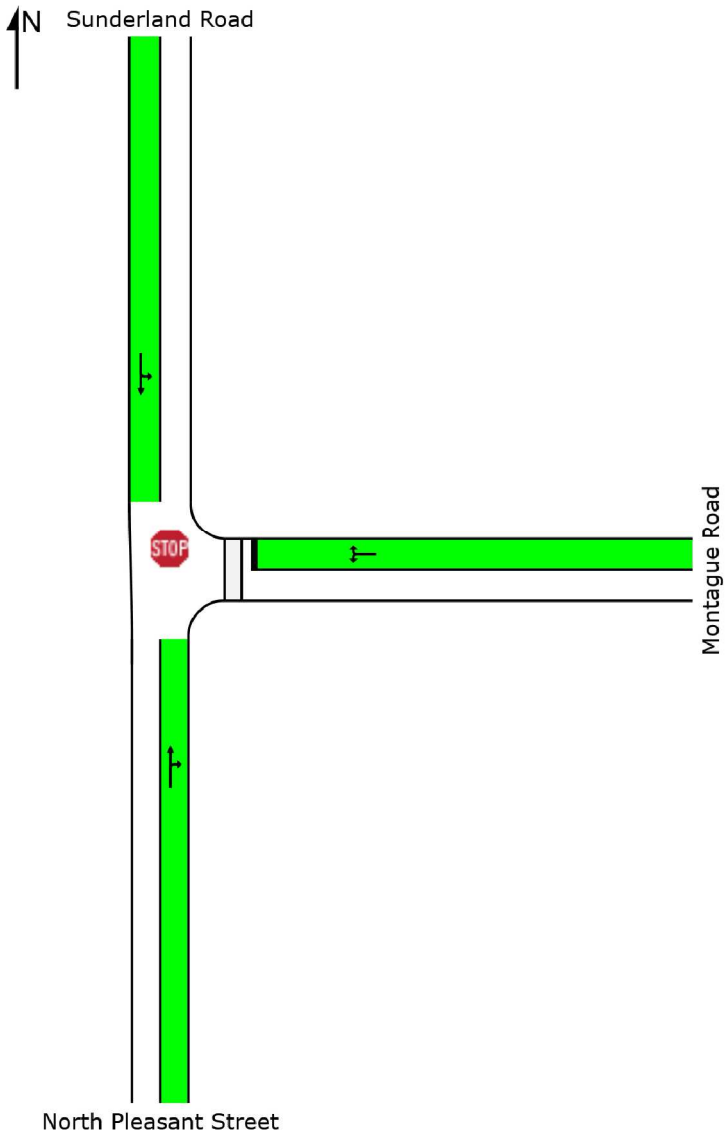
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	200	1	200



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	726	1.9	1112	0.653	100	12.4	LOS B	8.4	212.9	Full	1600	0.0	0.0
Approach	726	1.9		0.653		12.4	LOS B	8.4	212.9				
East: Pine Street													
Lane 1[d]	356	0.7	808	0.440	100	10.1	LOS B	2.8	71.1	Full	1600	0.0	0.0
Lane 2	205	6.5	941	0.217	100	6.0	LOS A	1.1	27.9	Short	50	0.0	NA
Approach	560	2.8		0.440		8.6	LOS A	2.8	71.1				
North: North Pleasant Street													
Lane 1[d]	590	2.5	1007	0.586	100	11.4	LOS B	5.8	146.8	Full	150	0.0	4.4
Approach	590	2.5		0.586		11.4	LOS B	5.8	146.8				
West: Meadow Street													
Lane 1[d]	518	1.3	898	0.577	100	12.2	LOS B	5.1	129.5	Full	1600	0.0	0.0
Approach	518	1.3		0.577		12.2	LOS B	5.1	129.5				
Intersection	2395	2.1		0.653		11.2	LOS B	8.4	212.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

PM PEAK

LANE LEVEL OF SERVICE

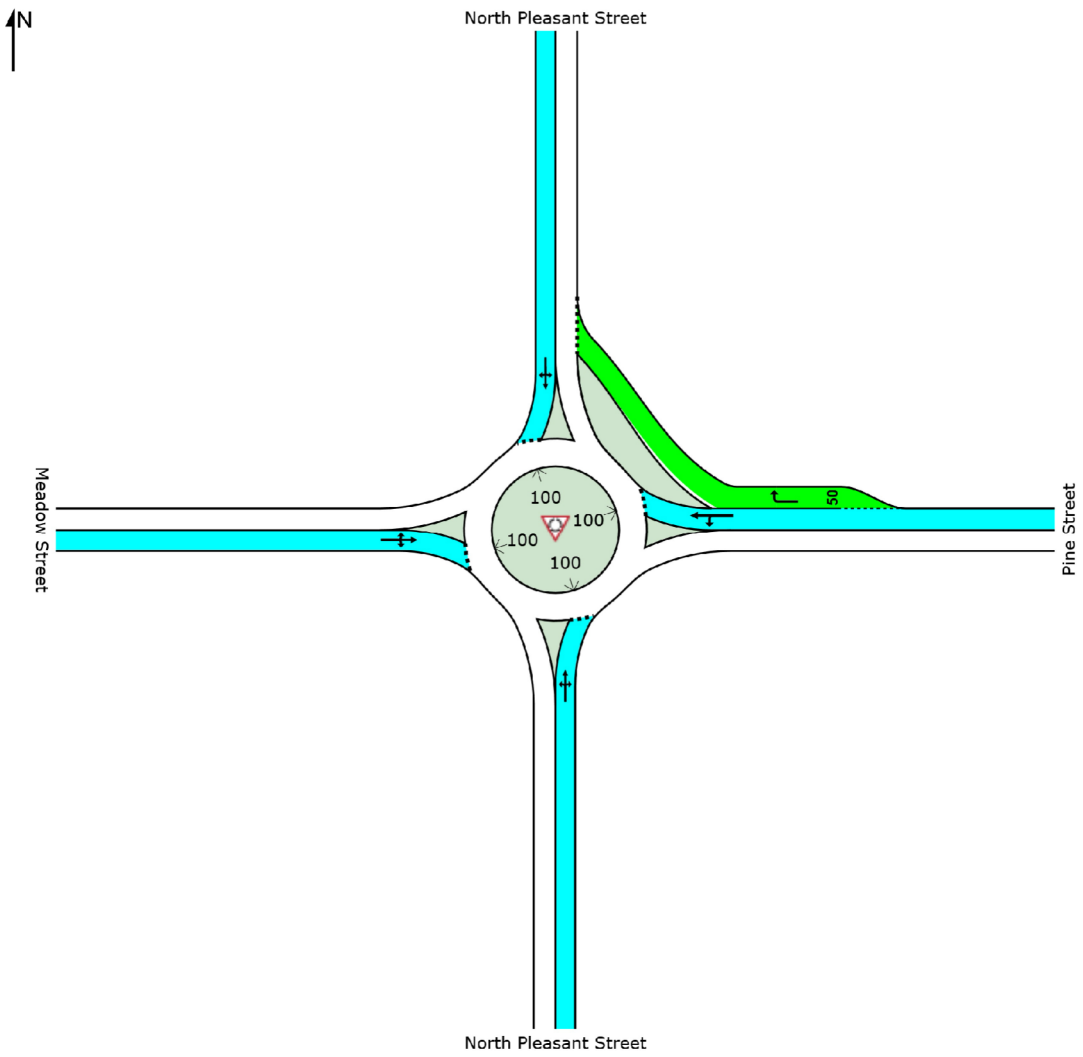
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

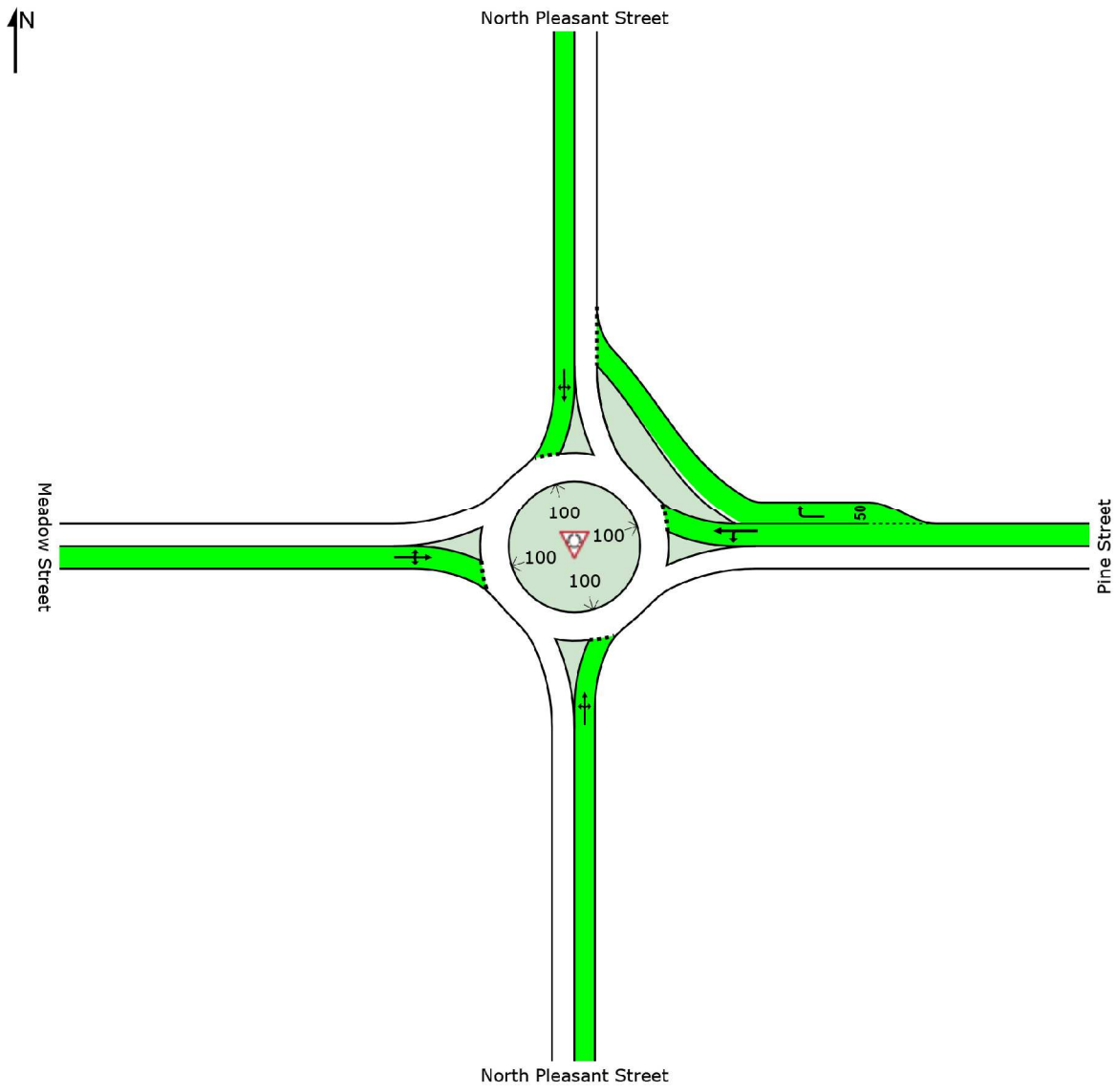
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	86	29	59	52	86



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	758	1.5	1689	0.449	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	758	1.5		0.449		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	303	0.8	345	0.879	100	57.9	LOS F	11.1	279.3	Full	1600	0.0	0.0
Approach	303	0.8		0.879		57.9	LOS F	11.1	279.3				
North: Sunderland Road													
Lane 1	311	1.7	1812	0.172	100	1.6	LOS A	0.1	3.0	Full	1600	0.0	0.0
Approach	311	1.7		0.172		1.6	NA	0.1	3.0				
Intersection	1372	1.4		0.879		13.2	NA	11.1	279.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

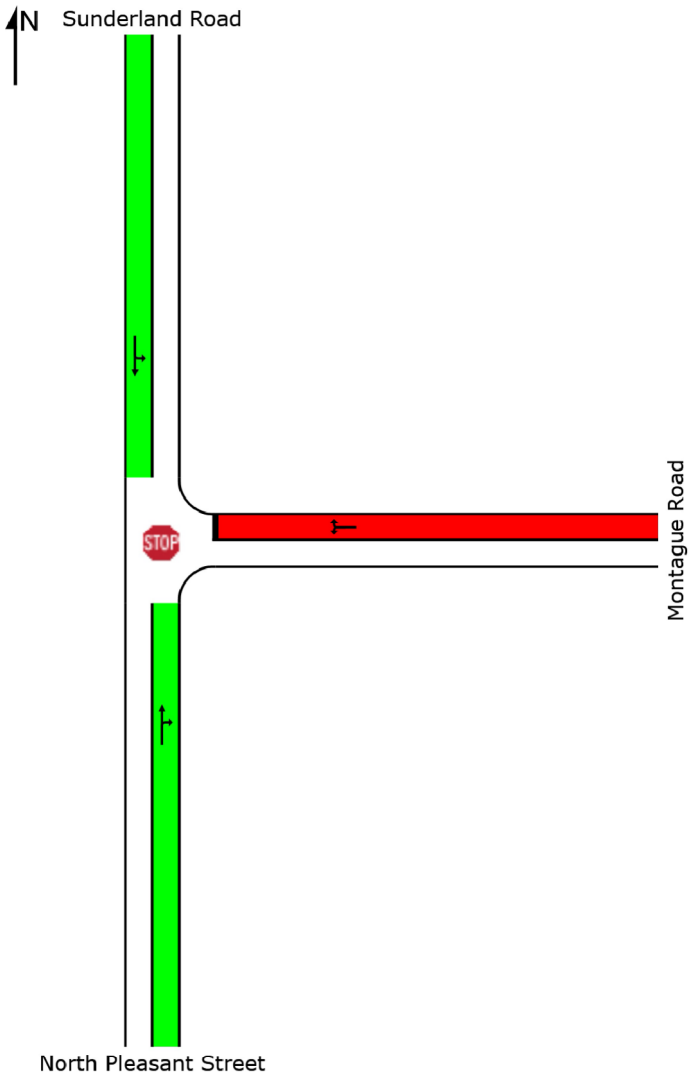
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

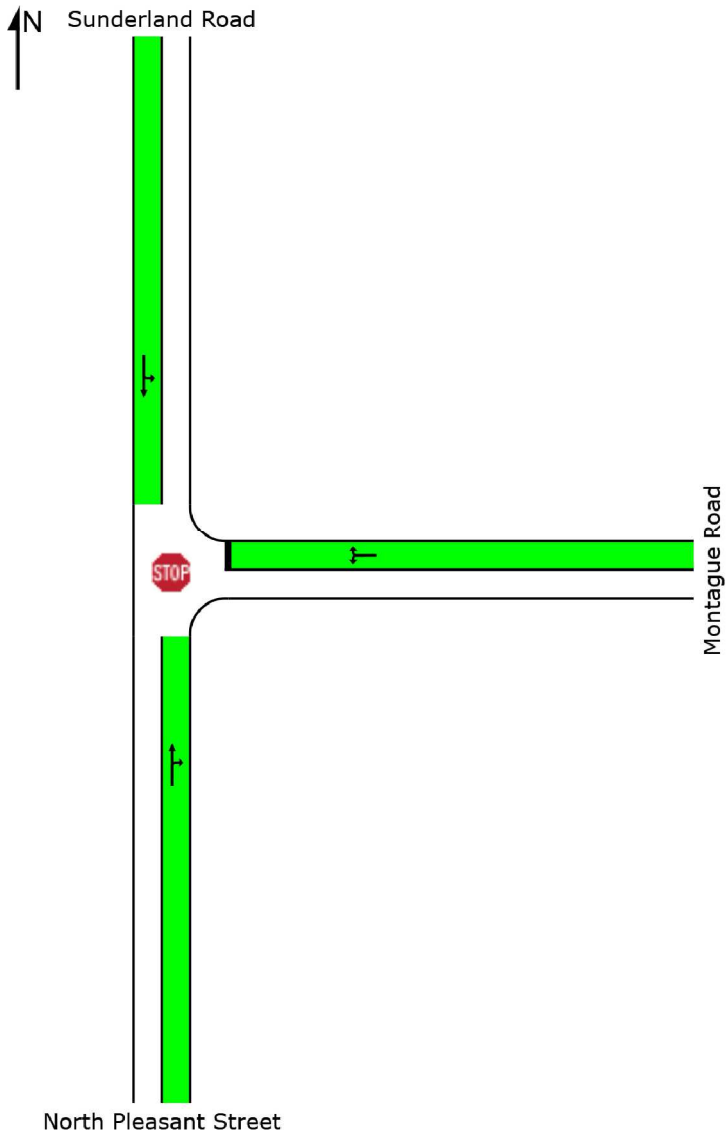
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	112	1	112



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	405	2.8	1079	0.375	100	7.2	LOS A	2.2	56.7	Full	1600	0.0	0.0
Approach	405	2.8		0.375		7.2	LOS A	2.2	56.7				
East: Pine Street													
Lane 1[d]	258	2.1	1003	0.257	100	6.1	LOS A	1.4	34.6	Full	1600	0.0	0.0
Lane 2	271	3.7	1094	0.247	100	5.6	LOS A	1.3	34.2	Short	50	0.0	NA
Approach	529	2.9		0.257		5.9	LOS A	1.4	34.6				
North: North Pleasant Street													
Lane 1[d]	611	0.6	1250	0.489	100	8.0	LOS A	3.6	89.4	Full	150	0.0	0.0
Approach	611	0.6		0.489		8.0	LOS A	3.6	89.4				
West: Meadow Street													
Lane 1[d]	423	1.3	1127	0.375	100	7.0	LOS A	2.3	57.9	Full	1600	0.0	0.0
Approach	423	1.3		0.375		7.0	LOS A	2.3	57.9				
Intersection	1968	1.8		0.489		7.1	LOS A	3.6	89.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SATURDAY PEAK

LANE LEVEL OF SERVICE

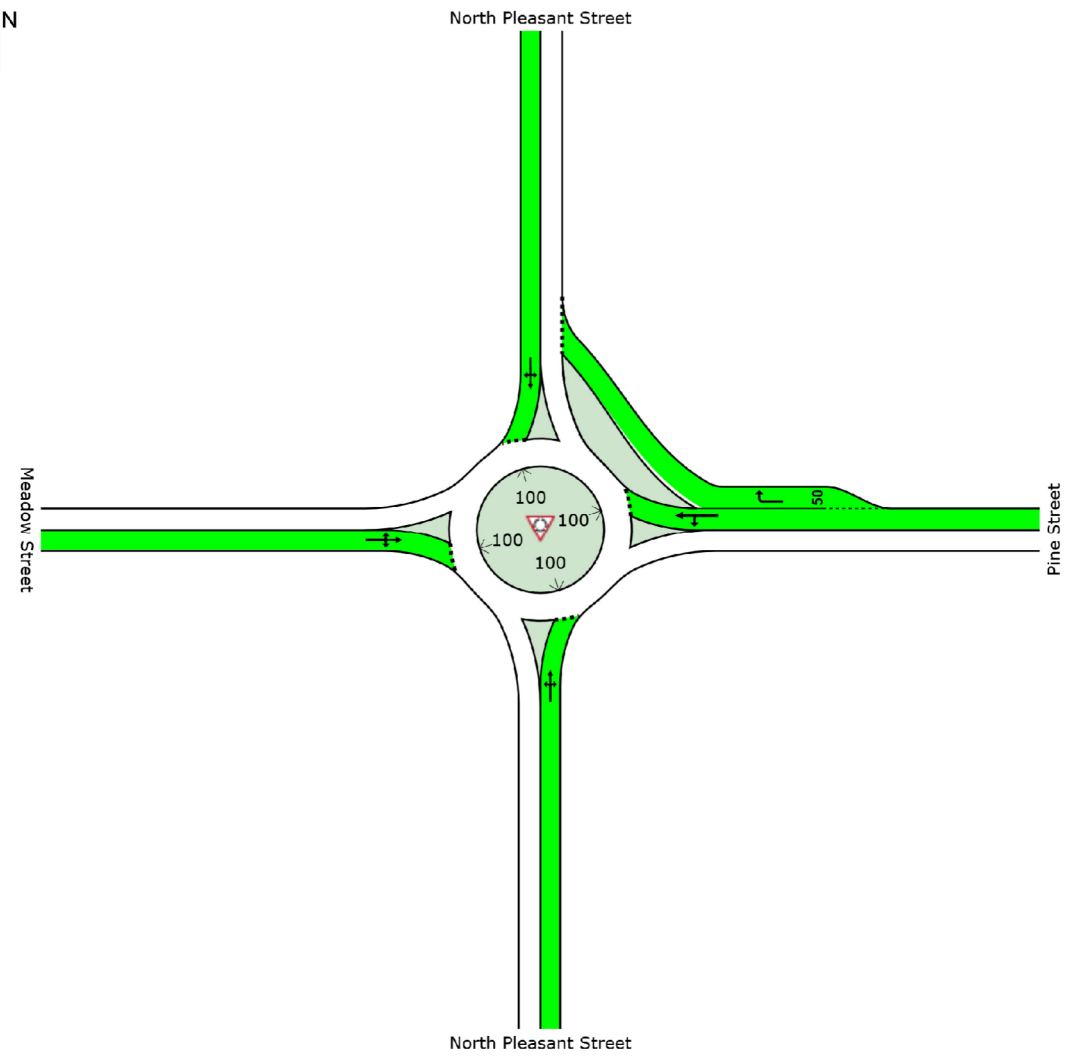
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

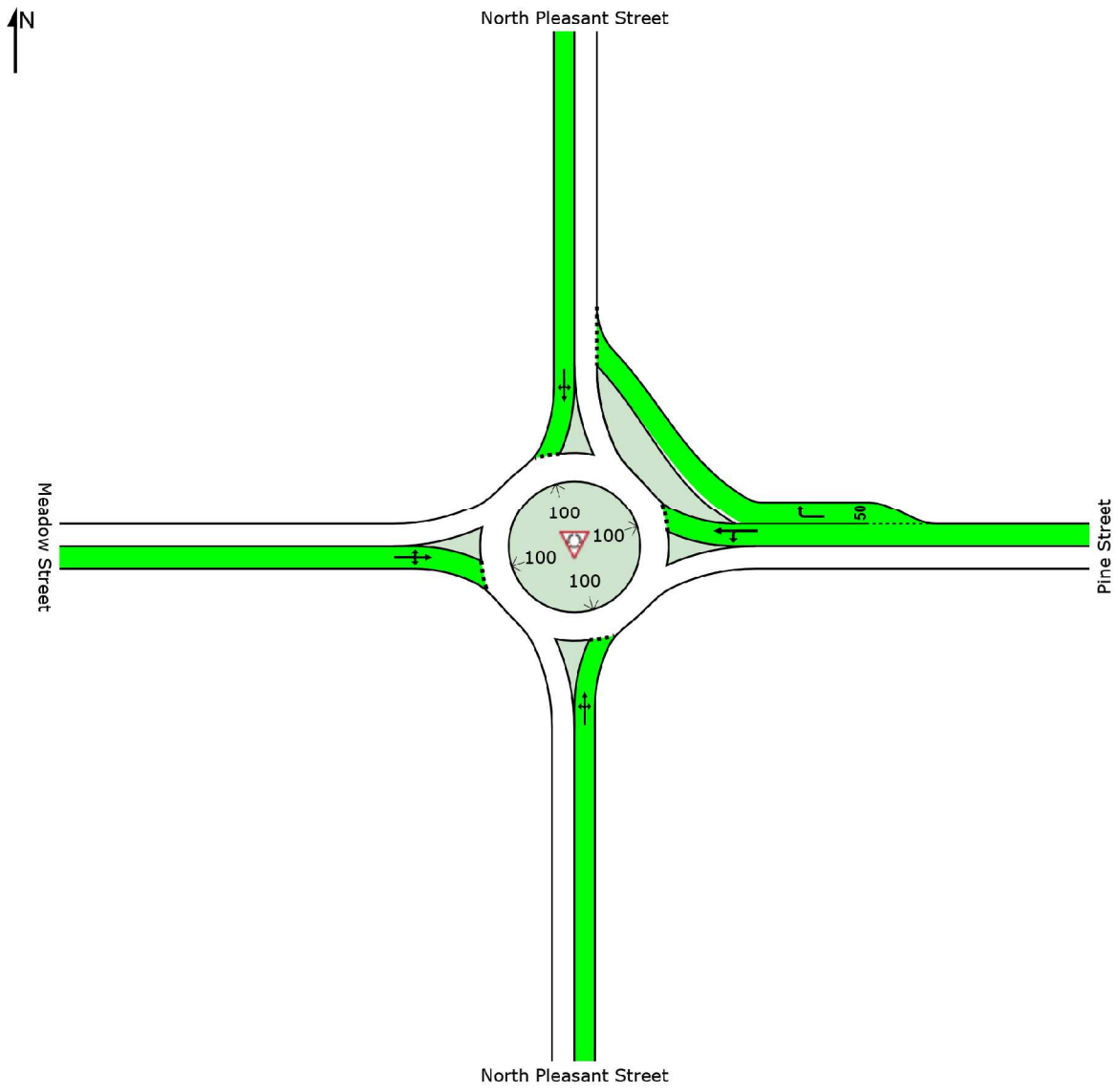
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	23	14	36	23	36



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	746	2.8	1670	0.447	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	746	2.8		0.447		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	362	0.5	370	0.979	100	75.7	LOS F	17.8	446.9	Full	1600	0.0	0.0
Approach	362	0.5		0.979		75.7	LOS F	17.8	446.9				
North: Sunderland Road													
Lane 1	252	0.5	1854	0.136	100	1.2	LOS A	0.1	1.4	Full	1600	0.0	0.0
Approach	252	0.5		0.136		1.2	NA	0.1	1.4				
Intersection	1360	1.8		0.979		20.4	NA	17.8	446.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

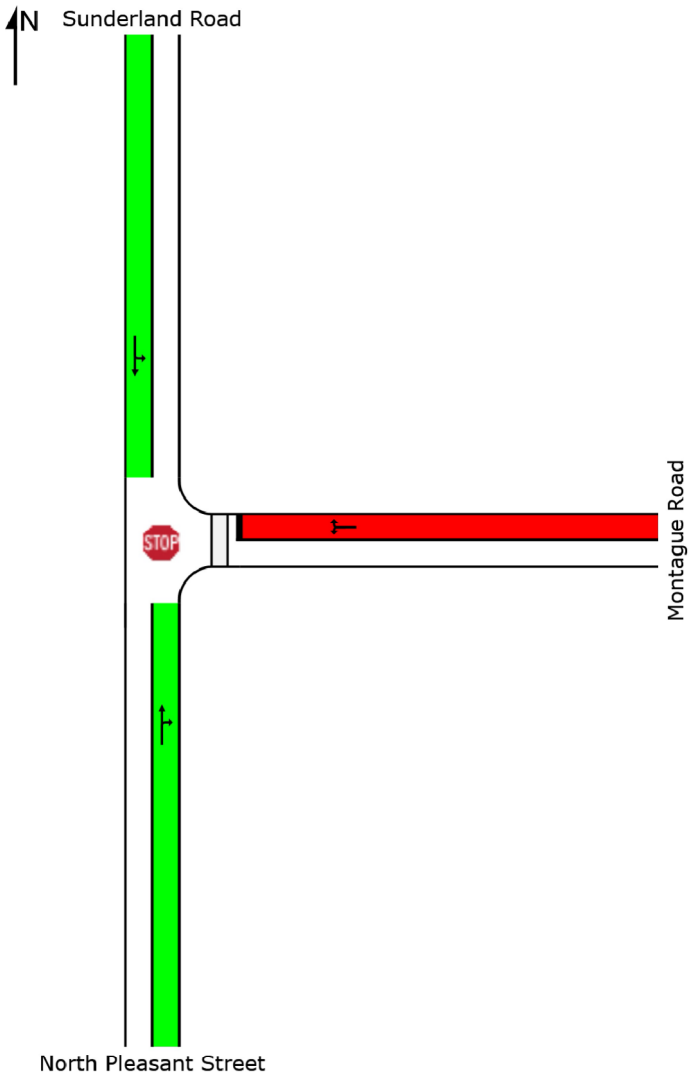
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

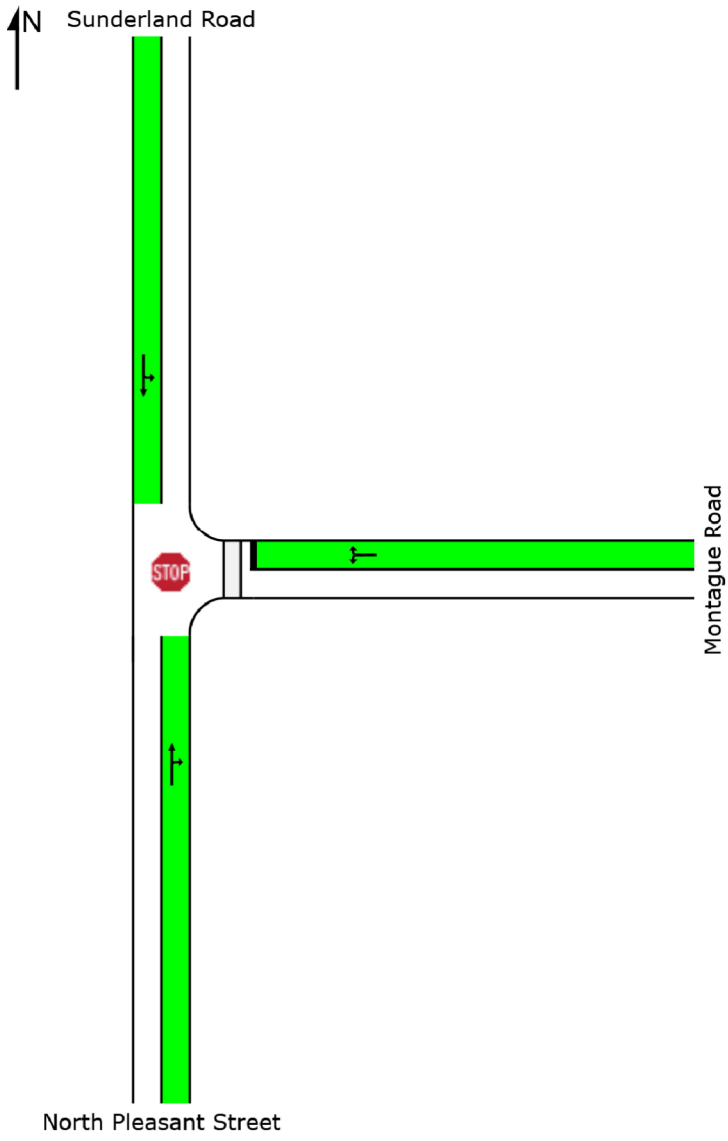
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	180	1	180



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Appendix H-d

Sidra Analysis: 2038 Build

Alternative 1

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	59	4.7	183	0.323	100	35.9	LOS D	2.4	61.4	Short	100	0.0	NA
Lane 2	175	3.8	474	0.369	100	26.2	LOS C	6.1	158.2	Full	1600	0.0	0.0
Lane 3	29	0.0	945	0.030	100	1.7	LOS A	0.3	6.7	Short	100	0.0	NA
Approach	263	3.6		0.369		25.7	LOS C	6.1	158.2				
East: Pine Street													
Lane 1	540	1.2	660	0.819	100	27.3	LOS C	22.0	555.0	Full	1600	0.0	0.0
Approach	540	1.2		0.819		27.3	LOS C	22.0	555.0				
North: North Pleasant Street													
Lane 1	206	2.4	172[1]	1.200	100	164.5	LOS F	17.3	441.6	Short	100	0.0	NA
Lane 2	566	3.2	358[1]	1.582	100	294.9	LOS F	66.6	1707.7	Full	400	0.0	100.0
Lane 3	218	1.8	984	0.221	100	3.1	LOS A	2.9	74.5	Short	100	0.0	NA
Approach	991	2.7		1.582		203.6	LOS F	66.6	1707.7				
West: Meadow Street													
Lane 1	126	3.3	311	0.404	100	15.5	LOS B	3.2	81.4	Short	100	0.0	NA
Lane 2	260	3.7	870	0.299	100	10.2	LOS B	5.2	134.3	Full	1600	0.0	0.0
Approach	386	3.5		0.404		11.9	LOS B	5.2	134.3				
Intersection	2180	2.6		1.582		104.5	LOS F	66.6	1707.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

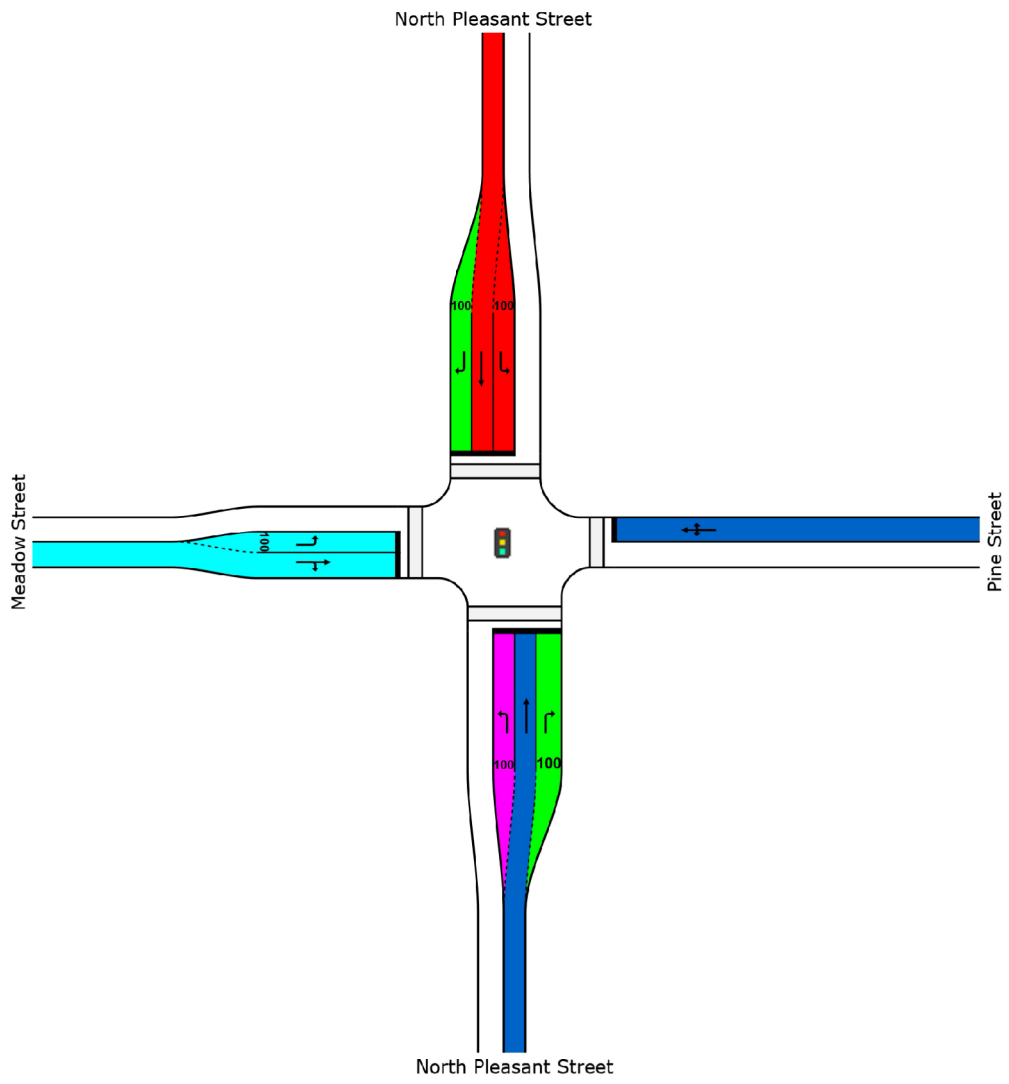
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	F	B	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

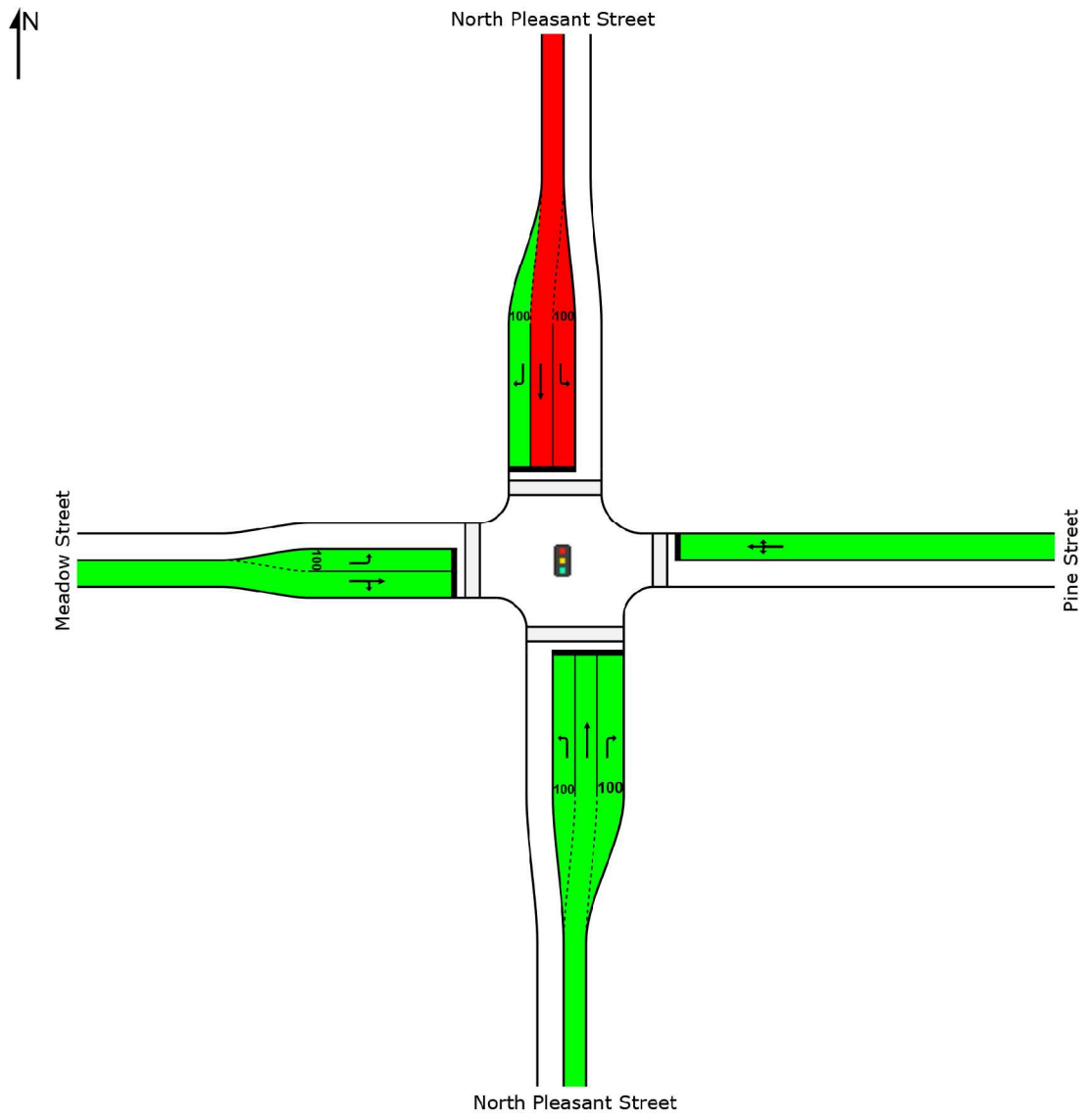
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	97	340	1046	82	1046



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	455	0.6	957	0.476	100	9.5	LOS A	3.2	79.7	Full	1600	0.0	0.0
Approach	455	0.6		0.476		9.5	LOS A	3.2	79.7				
NorthWest: Sunderland Road													
Lane 1[d]	481	2.8	785	0.612	100	14.6	LOS B	5.6	143.4	Full	1600	0.0	0.0
Approach	481	2.8		0.612		14.6	LOS B	5.6	143.4				
SouthWest: Montague Road													
Lane 1[d]	508	1.8	1274	0.399	100	6.7	LOS A	2.6	65.3	Full	400	0.0	0.0
Approach	508	1.8		0.399		6.7	LOS A	2.6	65.3				
Intersection	1444	1.8		0.612		10.2	LOS B	5.6	143.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

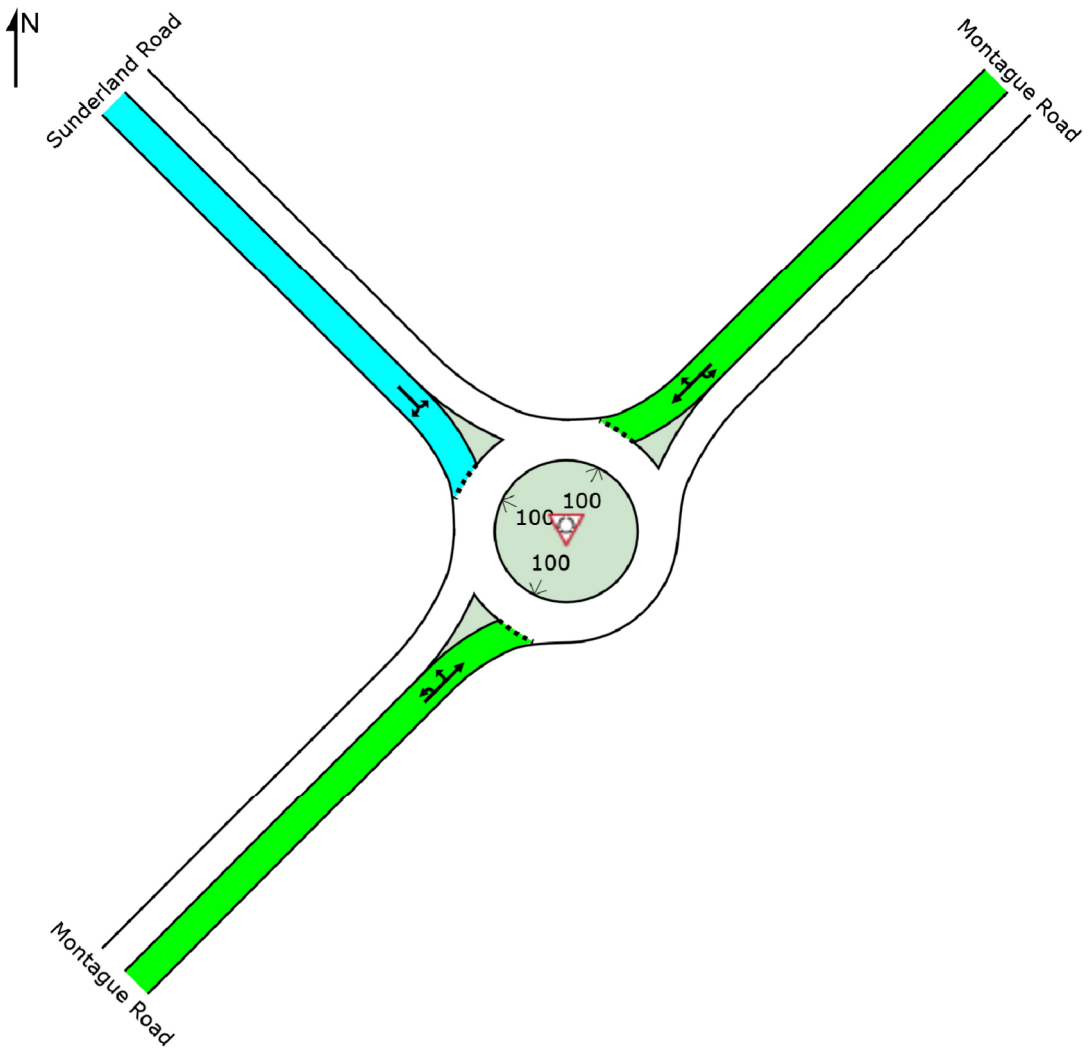
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	B	A	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

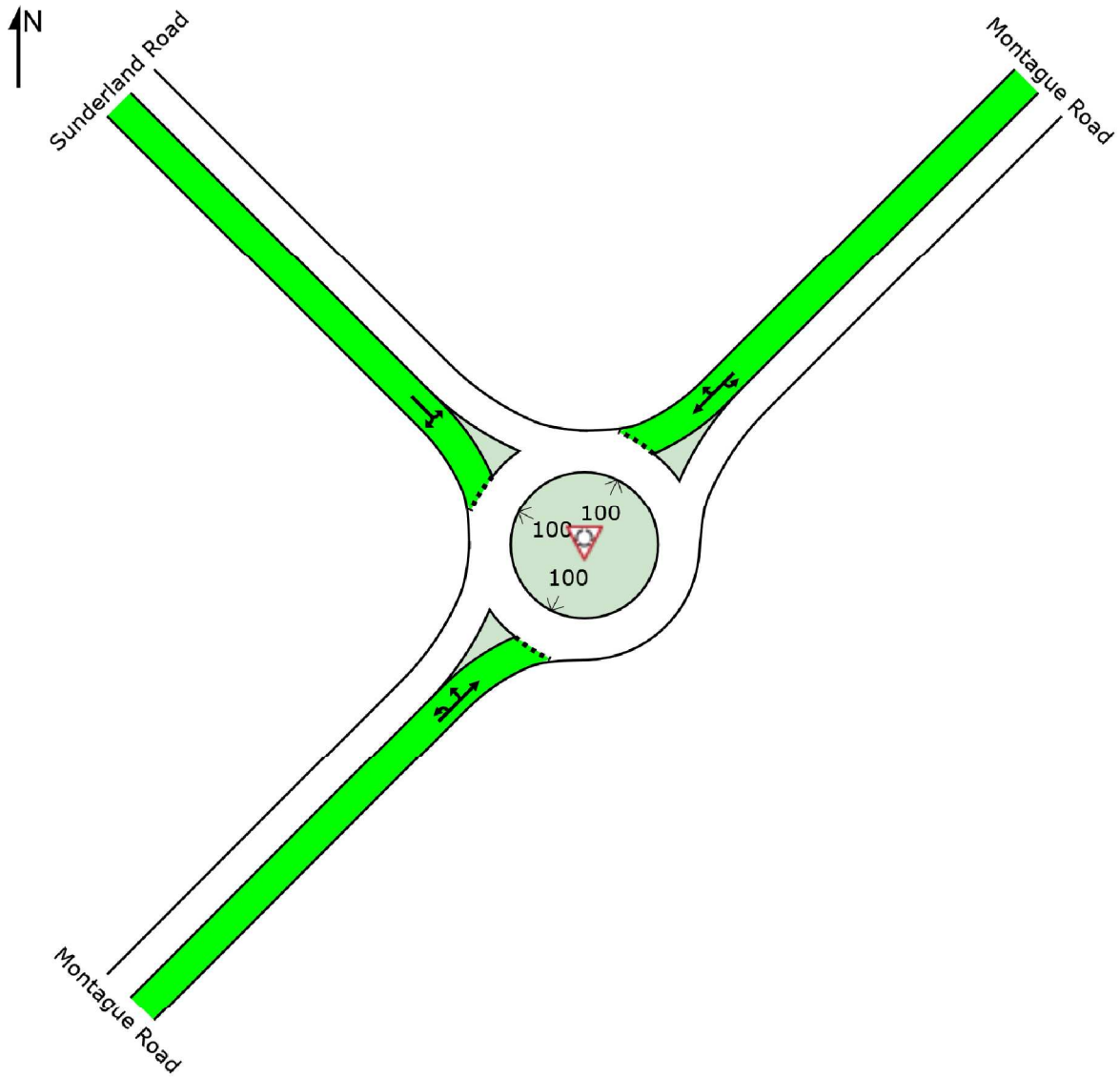
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	32	58	26	58



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	261	0.0	178[1]	1.472	100	266.0	LOS F	28.7	716.7	Short	100	0.0	NA
Lane 2	462	3.1	356[1]	1.299	100	177.8	LOS F	42.8	1096.4	Full	1600	0.0	0.0
Lane 3	163	1.7	952	0.171	100	1.5	LOS A	1.6	40.2	Short	100	0.0	NA
Approach	886	1.9		1.472		171.4	LOS F	42.8	1096.4				
East: Pine Street													
Lane 1	683	2.8	579	1.181	100	106.6	LOS F	43.7	1116.5	Full	1600	0.0	0.0
Approach	683	2.8		1.181		106.6	LOS F	43.7	1116.5				
North: North Pleasant Street													
Lane 1	151	4.6	183	0.822	100	61.6	LOS E	7.6	197.7	Short	100	0.0	NA
Lane 2	478	1.3	401[1]	1.194	100	135.8	LOS F	38.8	980.7	Full	400	0.0	89.2
Lane 3	91	5.1	893	0.102	100	3.0	LOS A	1.1	29.7	Short	100	0.0	NA
Approach	720	2.5		1.194		103.5	LOS F	38.8	980.7				
West: Meadow Street													
Lane 1	258	0.0	316	0.816	100	35.9	LOS D	8.5	212.2	Short	100	0.0	NA
Lane 2	374	2.3	887	0.422	100	10.3	LOS B	7.9	201.0	Full	1600	0.0	0.0
Approach	632	1.3		0.816		20.8	LOS C	8.5	212.2				
Intersection	2922	2.1		1.472		106.9	LOS F	43.7	1116.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

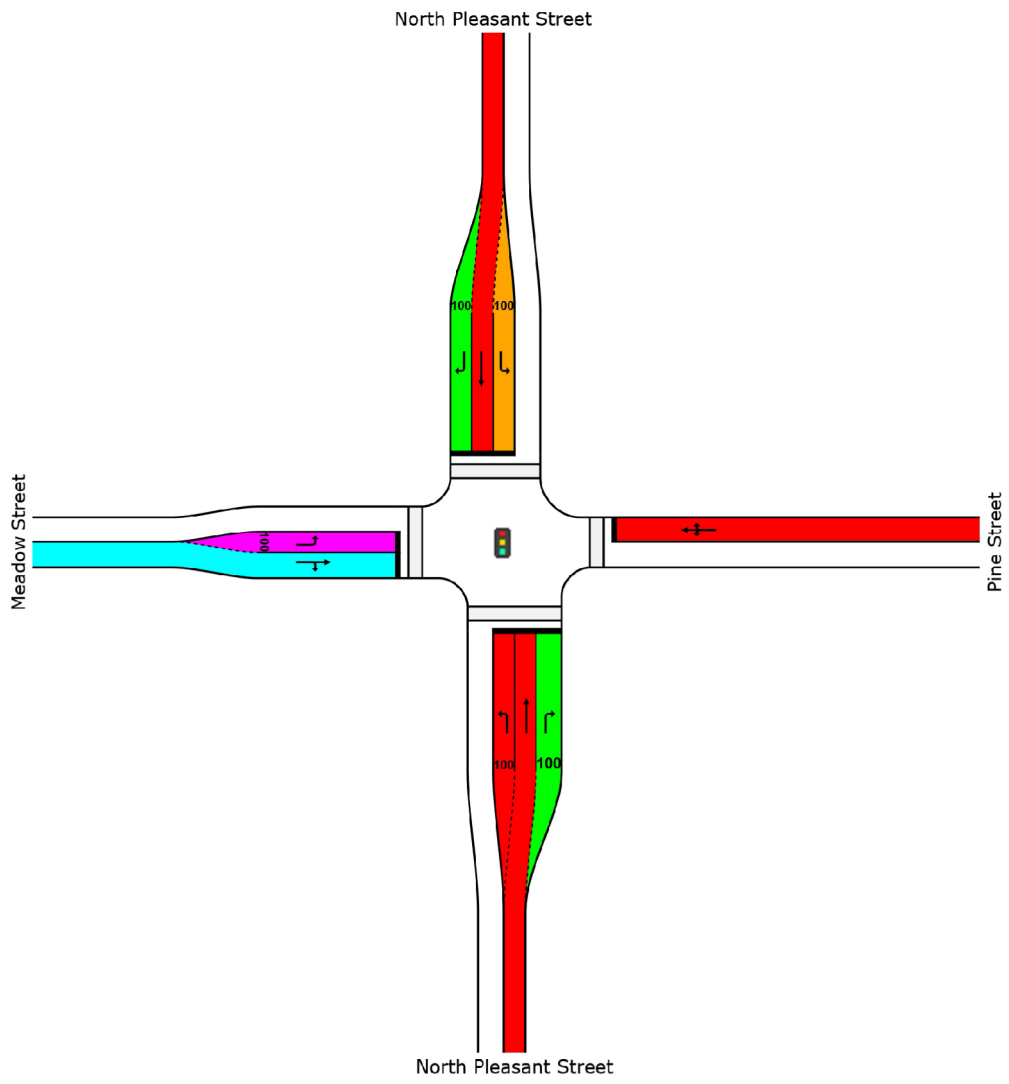
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	F	F	C	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

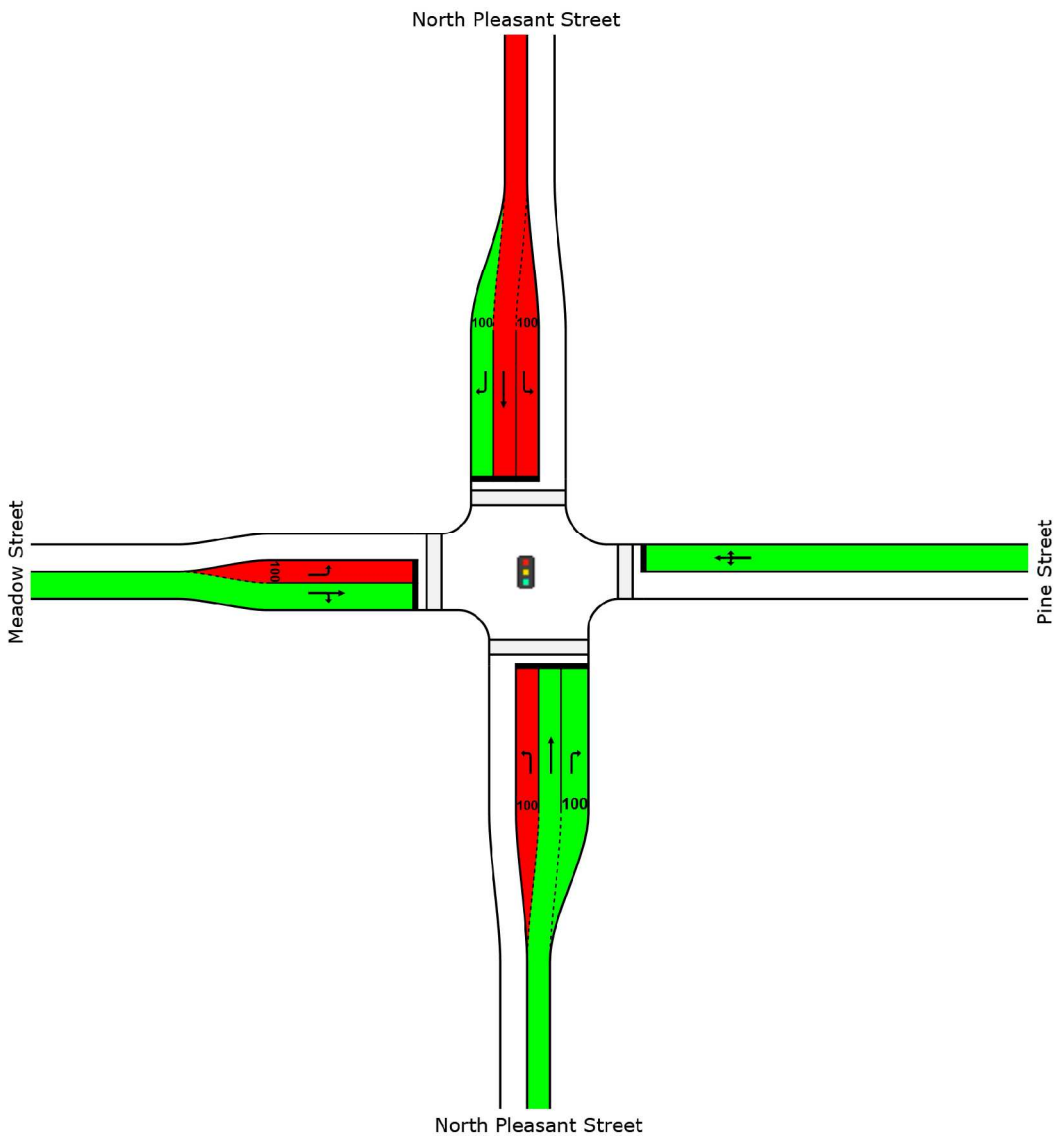
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	672	684	601	130	684



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	302	0.8	875	0.345	100	8.0	LOS A	1.7	43.3	Full	1600	0.0	0.0
Approach	302	0.8		0.345		8.0	LOS A	1.7	43.3				
NorthWest: Sunderland Road													
Lane 1[d]	377	1.6	935	0.403	100	8.4	LOS A	2.2	54.8	Full	1600	0.0	0.0
Approach	377	1.6		0.403		8.4	LOS A	2.2	54.8				
SouthWest: Montague Road													
Lane 1[d]	878	1.5	1315	0.668	100	11.4	LOS B	7.6	191.2	Full	400	0.0	0.0
Approach	878	1.5		0.668		11.4	LOS B	7.6	191.2				
Intersection	1557	1.4		0.668		10.0	LOS B	7.6	191.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

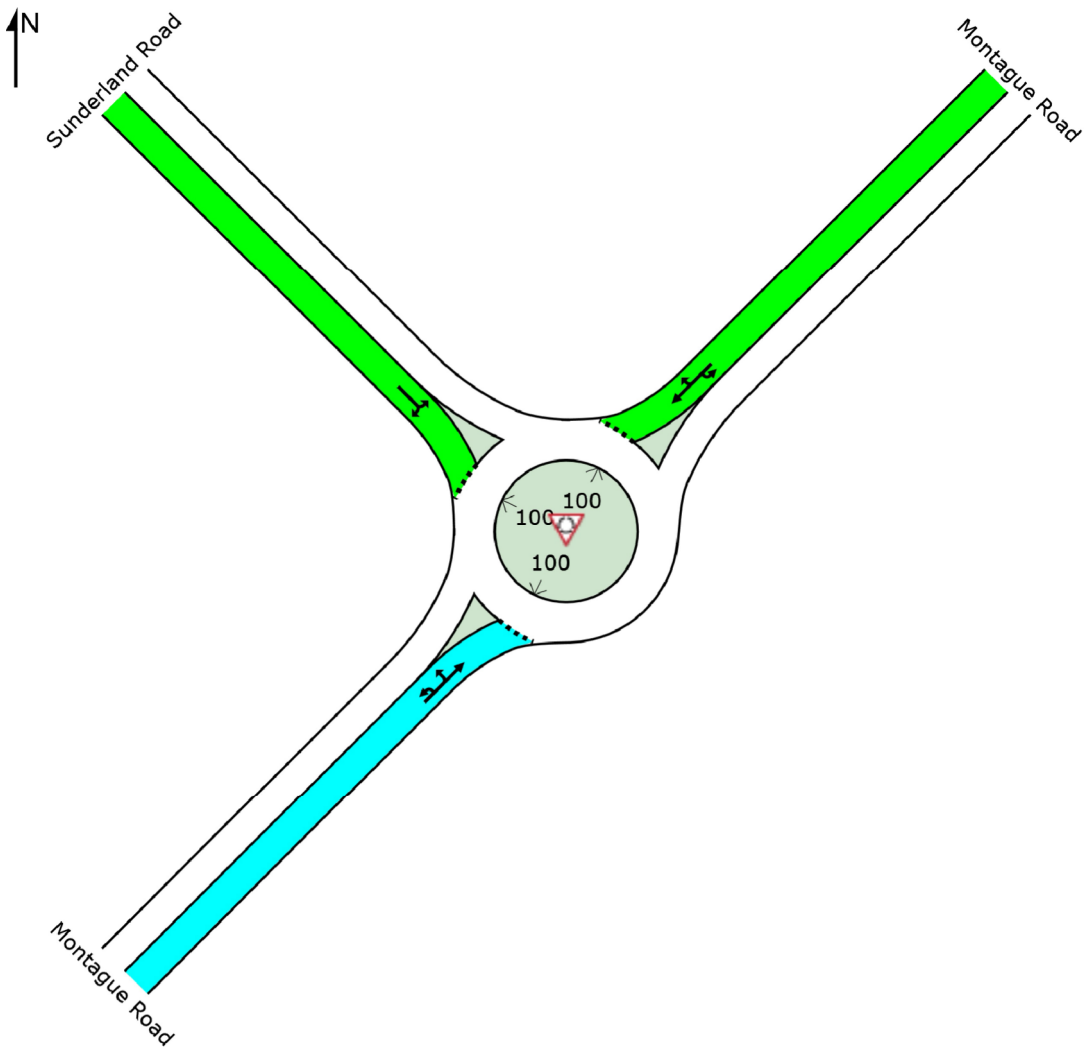
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

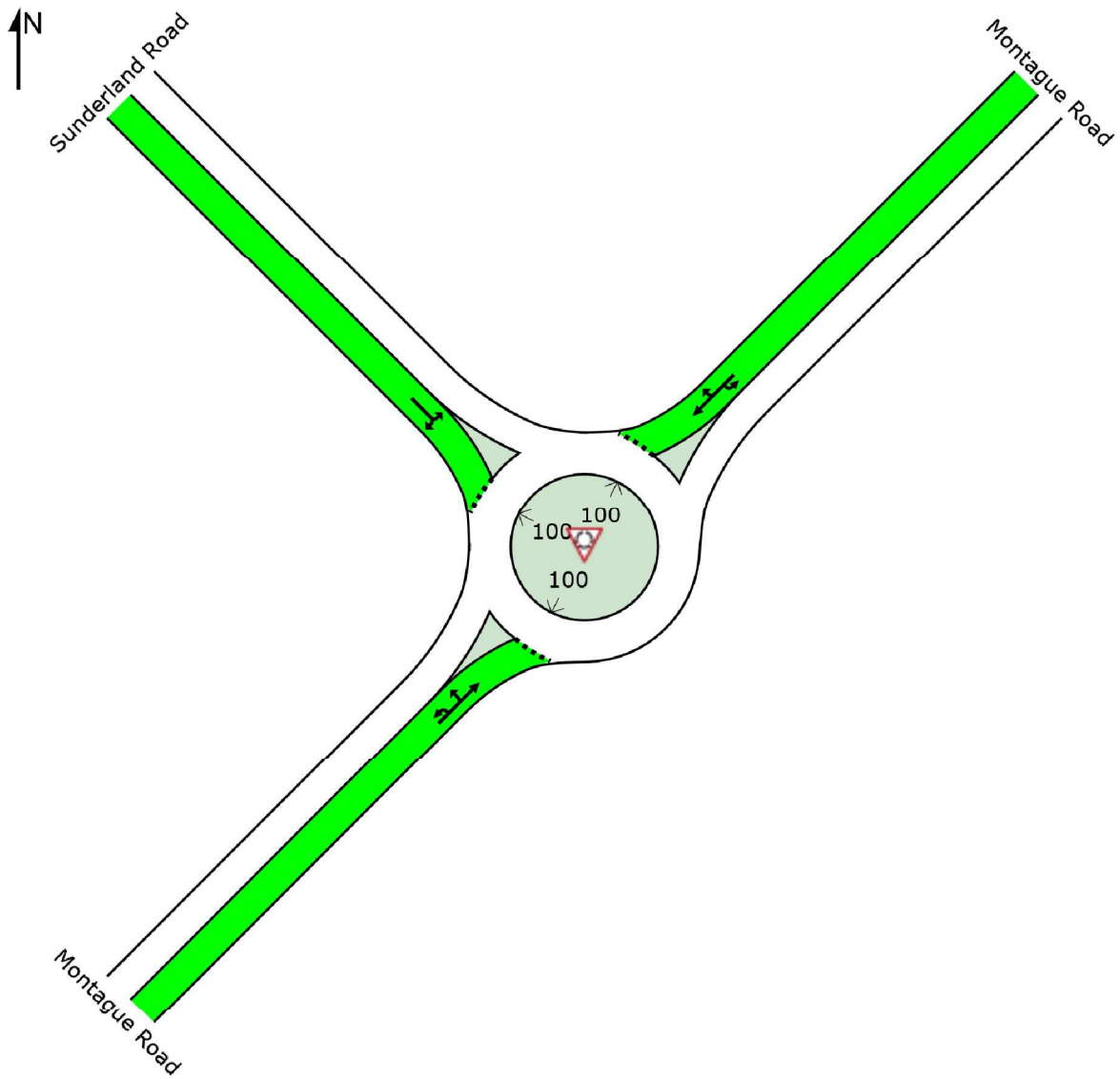
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	17	22	77	77



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	128	1.3	189	0.675	100	45.1	LOS D	5.8	146.6	Short	100	0.0	NA
Lane 2	331	3.4	387[1]	0.855	100	45.0	LOS D	15.6	399.5	Full	1600	0.0	0.0
Lane 3	37	2.7	904	0.040	100	1.7	LOS A	0.3	8.8	Short	100	0.0	NA
Approach	495	2.8		0.855		41.8	LOS D	15.6	399.5				
East: Pine Street													
Lane 1	646	2.9	667	0.968	100	49.4	LOS D	34.0	868.7	Full	1600	0.0	0.0
Approach	646	2.9		0.968		49.4	LOS D	34.0	868.7				
North: North Pleasant Street													
Lane 1	214	0.5	178[1]	1.201	100	163.6	LOS F	18.0	451.2	Short	100	0.0	NA
Lane 2	294	0.4	304[1]	0.967	100	70.2	LOS E	15.8	397.0	Full	400	0.0	15.9[8]
Lane 3	238	0.9	973	0.244	100	3.2	LOS A	3.3	83.3	Short	100	0.0	NA
Approach	746	0.6		1.201		75.7	LOS E	18.0	451.2				
West: Meadow Street													
Lane 1	233	1.6	226	1.032	100	86.1	LOS F	11.3	287.3	Short	100	0.0	NA
Lane 2	282	1.0	894	0.316	100	8.6	LOS A	5.7	144.0	Full	1600	0.0	0.0
Approach	516	1.3		1.032		43.6	LOS D	11.3	287.3				
Intersection	2402	1.8		1.201		54.7	LOS D	34.0	868.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

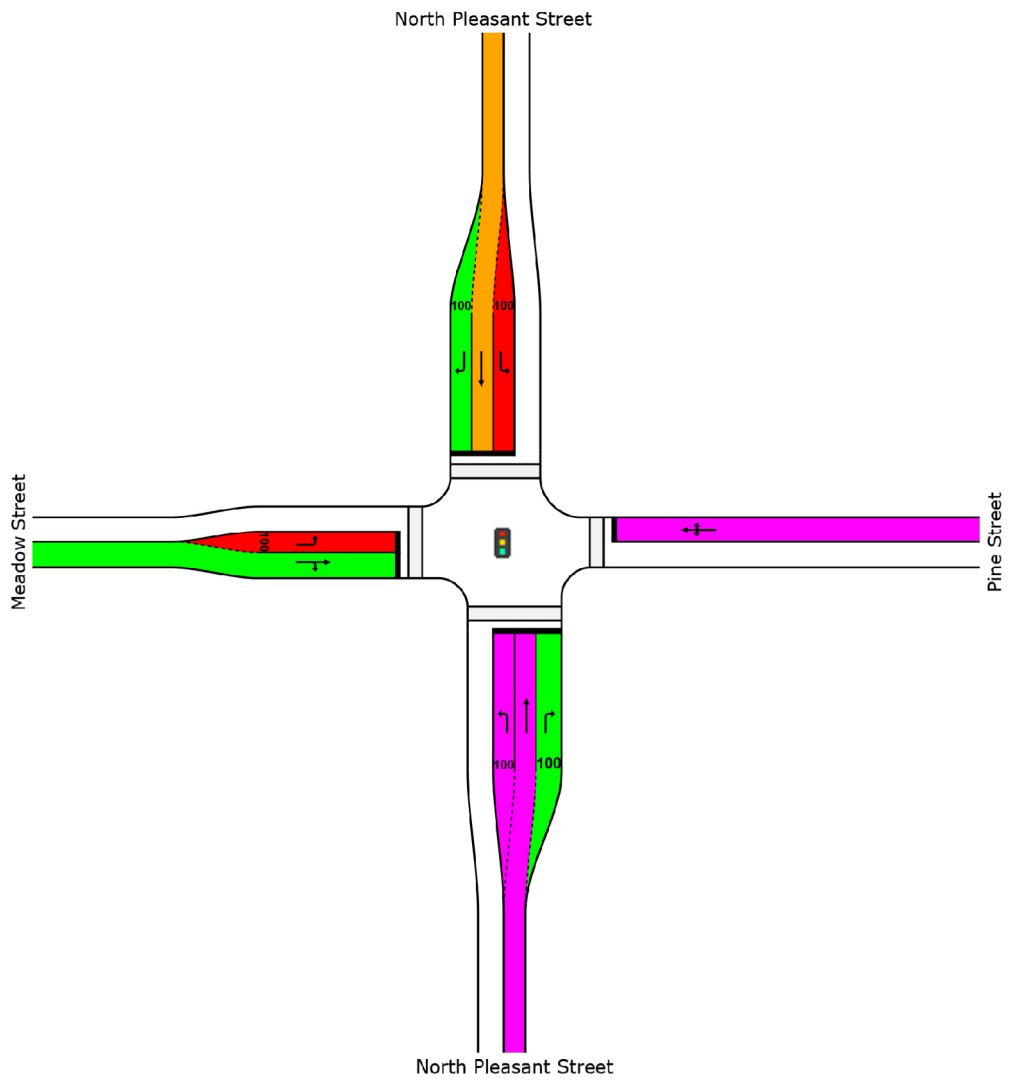
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	D	D	E	D	D



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

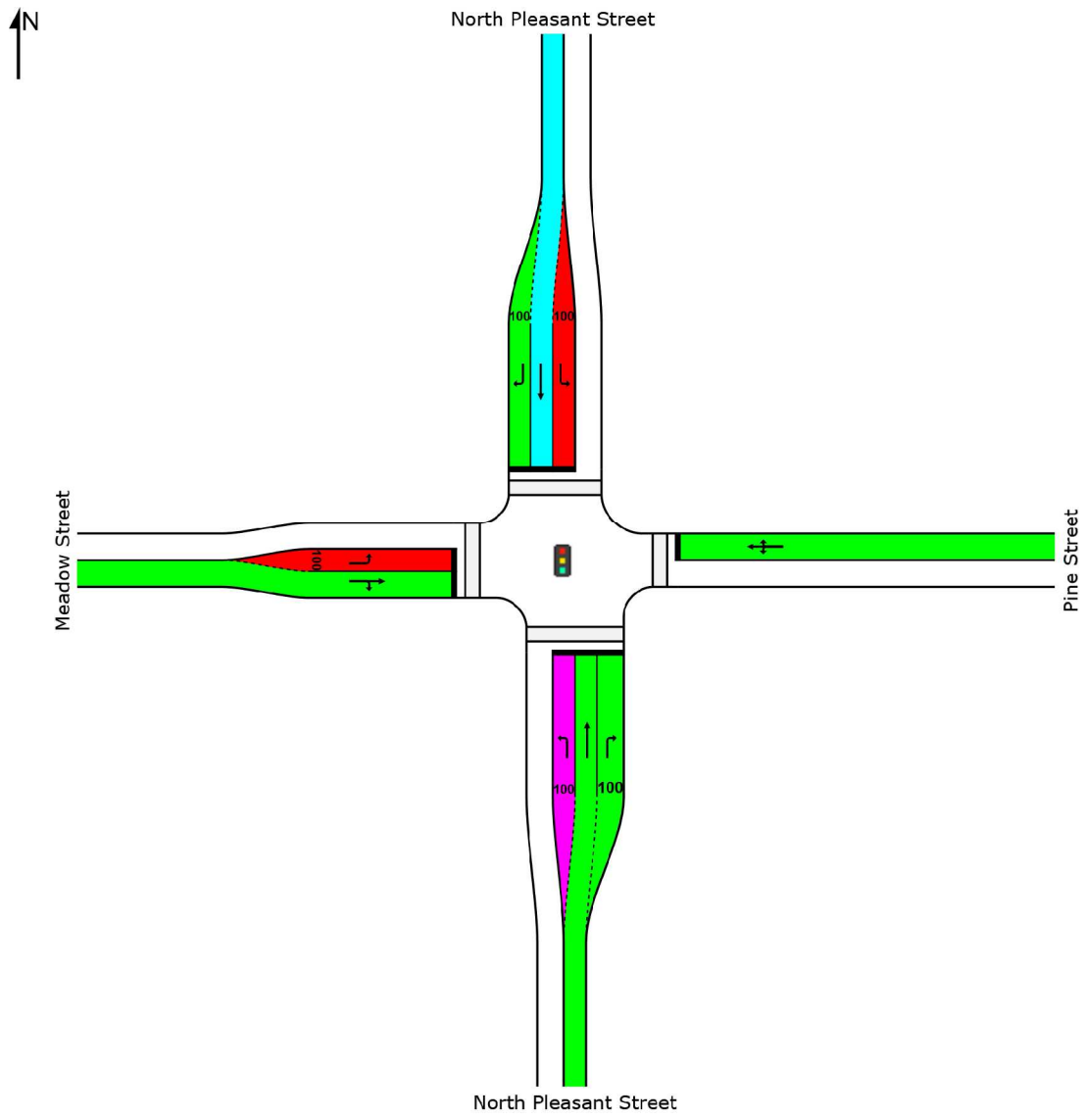
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	245	532	276	176	532



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	314	0.5	953	0.329	100	7.3	LOS A	1.7	42.3	Full	1600	0.0	0.0
Approach	314	0.5		0.329		7.3	LOS A	1.7	42.3				
NorthWest: Sunderland Road													
Lane 1[d]	279	0.5	931	0.299	100	7.0	LOS A	1.5	37.1	Full	1600	0.0	0.0
Approach	279	0.5		0.299		7.0	LOS A	1.5	37.1				
SouthWest: Montague Road													
Lane 1[d]	734	2.1	1312	0.559	100	9.0	LOS A	4.9	124.3	Full	400	0.0	0.0
Approach	734	2.1		0.559		9.0	LOS A	4.9	124.3				
Intersection	1326	1.4		0.559		8.2	LOS A	4.9	124.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

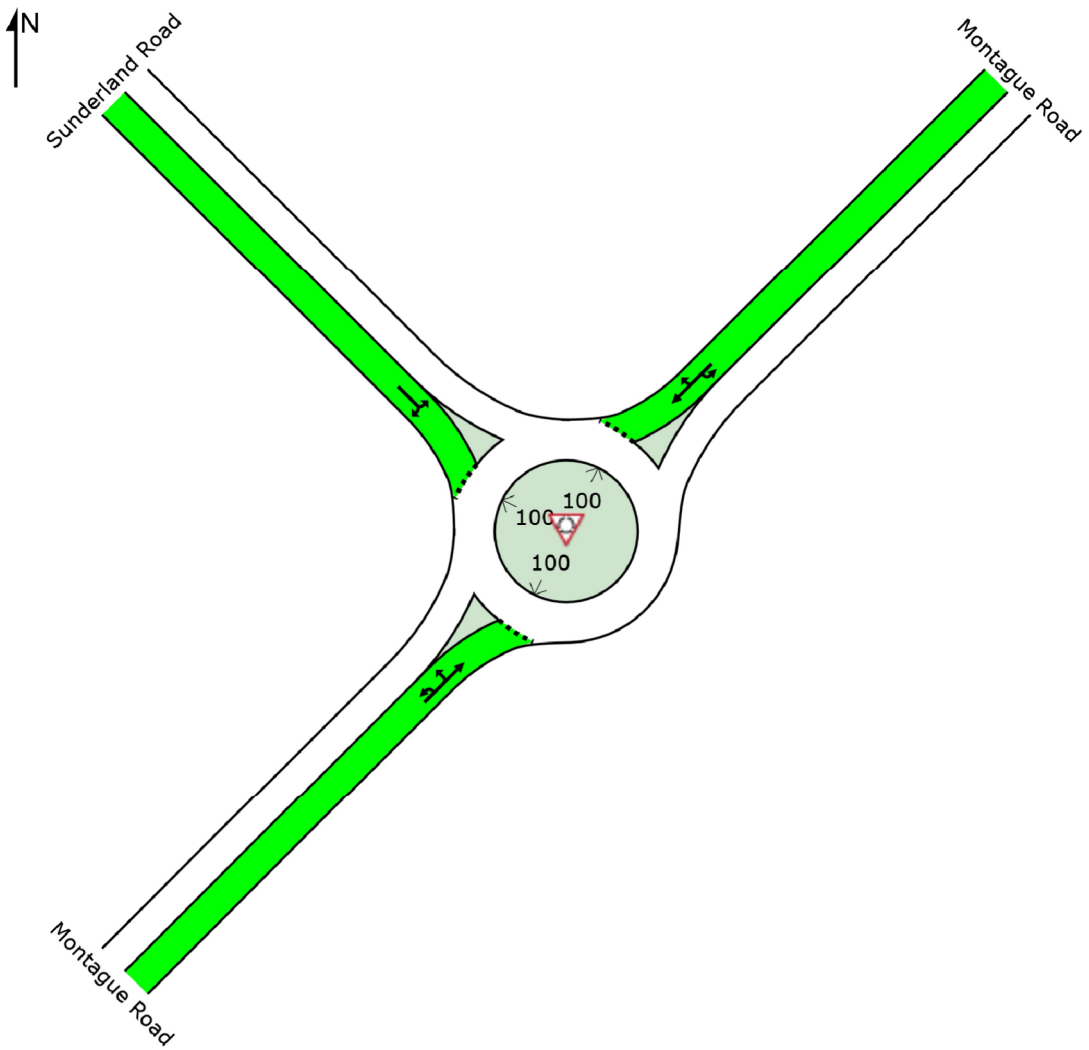
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

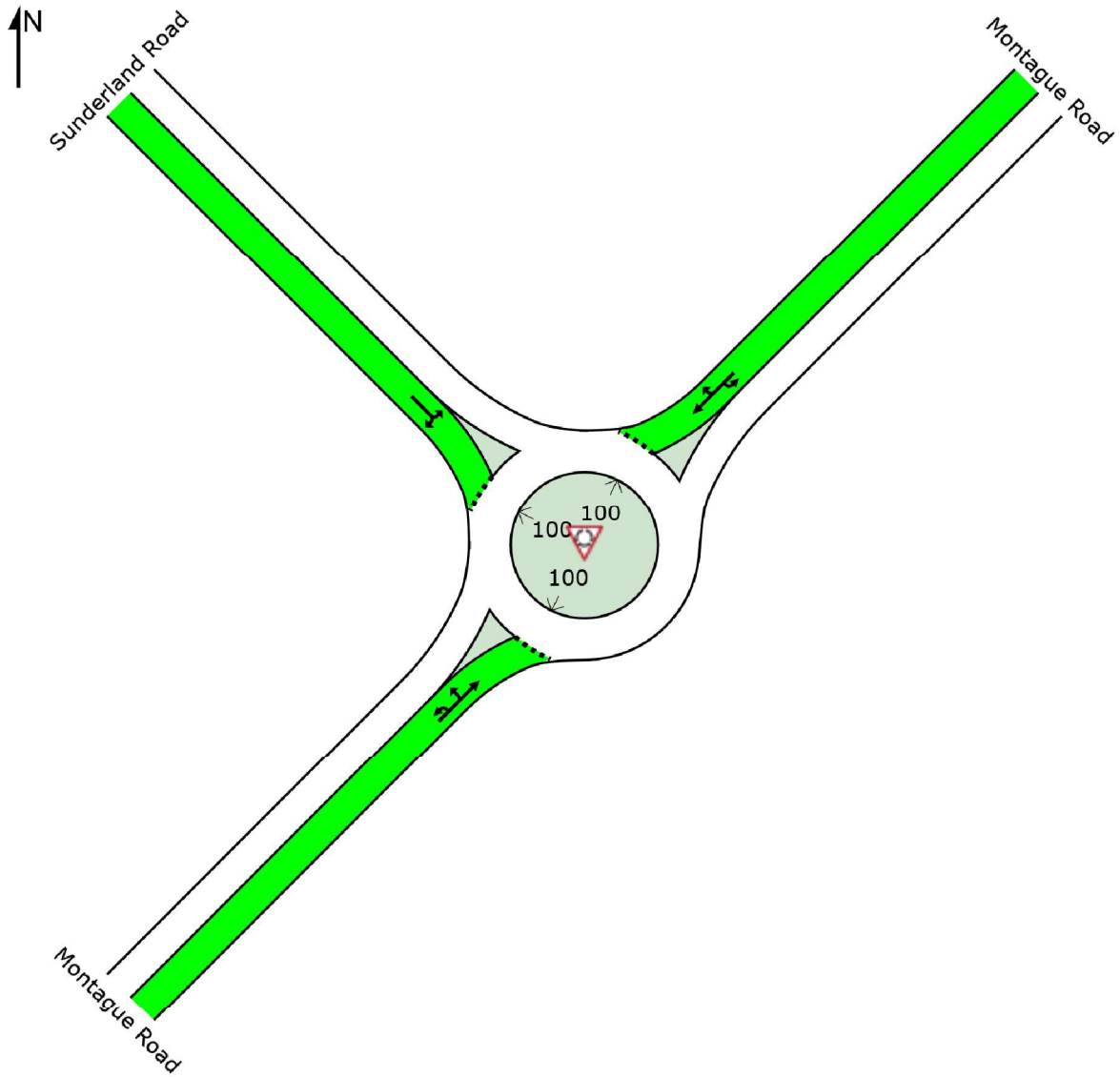
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	17	15	50	50



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 2

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	59	4.7	183	0.323	100	35.9	LOS D	2.4	61.4	Short	100	0.0	NA
Lane 2	175	3.8	474	0.369	100	26.2	LOS C	6.1	158.2	Full	1600	0.0	0.0
Lane 3	29	0.0	945	0.030	100	1.7	LOS A	0.3	6.7	Short	100	0.0	NA
Approach	263	3.6		0.369		25.7	LOS C	6.1	158.2				
East: Pine Street													
Lane 1	540	1.2	660	0.819	100	27.3	LOS C	22.0	555.0	Full	1600	0.0	0.0
Approach	540	1.2		0.819		27.3	LOS C	22.0	555.0				
North: North Pleasant Street													
Lane 1	206	2.4	172[1]	1.200	100	164.5	LOS F	17.3	441.6	Short	100	0.0	NA
Lane 2	566	3.2	358[1]	1.582	100	294.9	LOS F	66.6	1707.7	Full	400	0.0	100.0
Lane 3	218	1.8	984	0.221	100	3.1	LOS A	2.9	74.5	Short	100	0.0	NA
Approach	991	2.7		1.582		203.6	LOS F	66.6	1707.7				
West: Meadow Street													
Lane 1	126	3.3	311	0.404	100	15.5	LOS B	3.2	81.4	Short	100	0.0	NA
Lane 2	260	3.7	870	0.299	100	10.2	LOS B	5.2	134.3	Full	1600	0.0	0.0
Approach	386	3.5		0.404		11.9	LOS B	5.2	134.3				
Intersection	2180	2.6		1.582		104.5	LOS F	66.6	1707.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

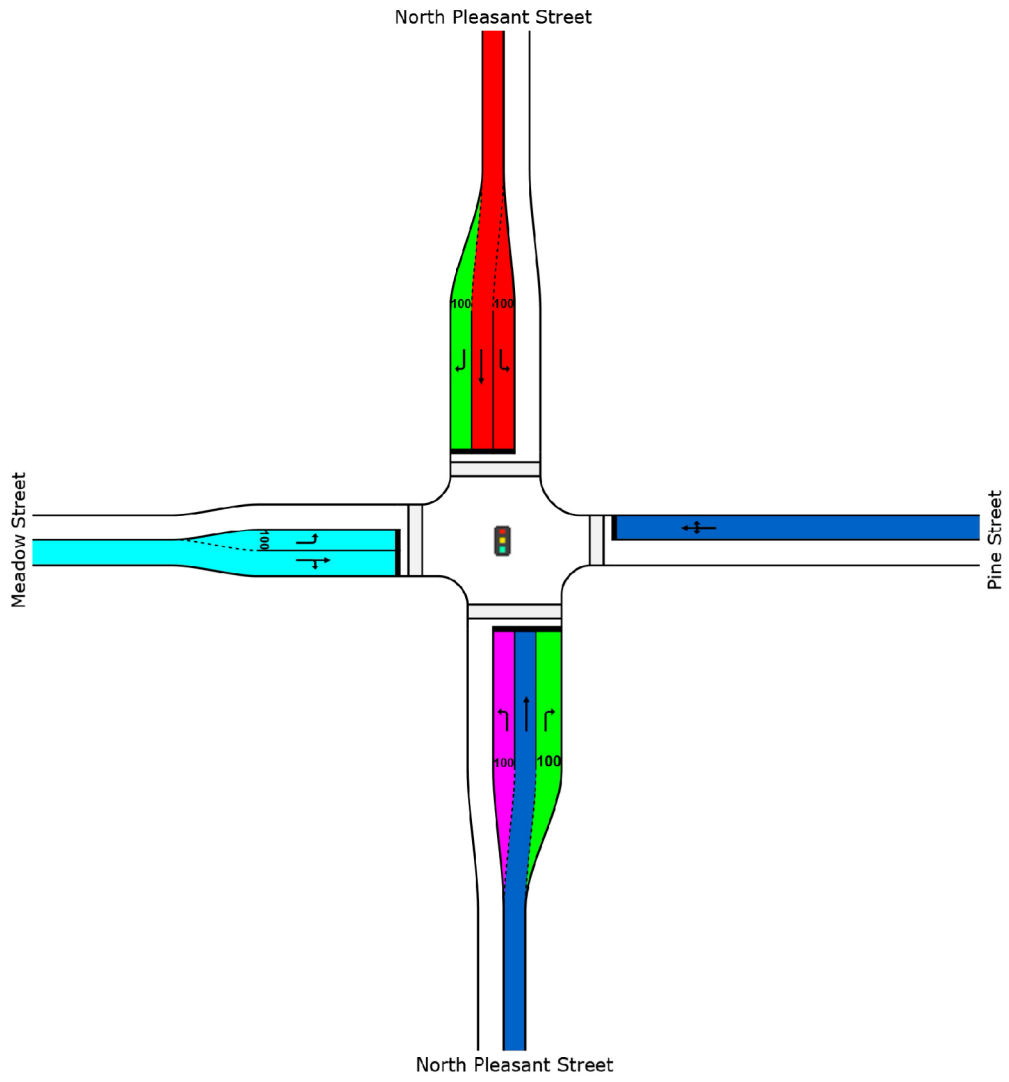
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	F	B	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

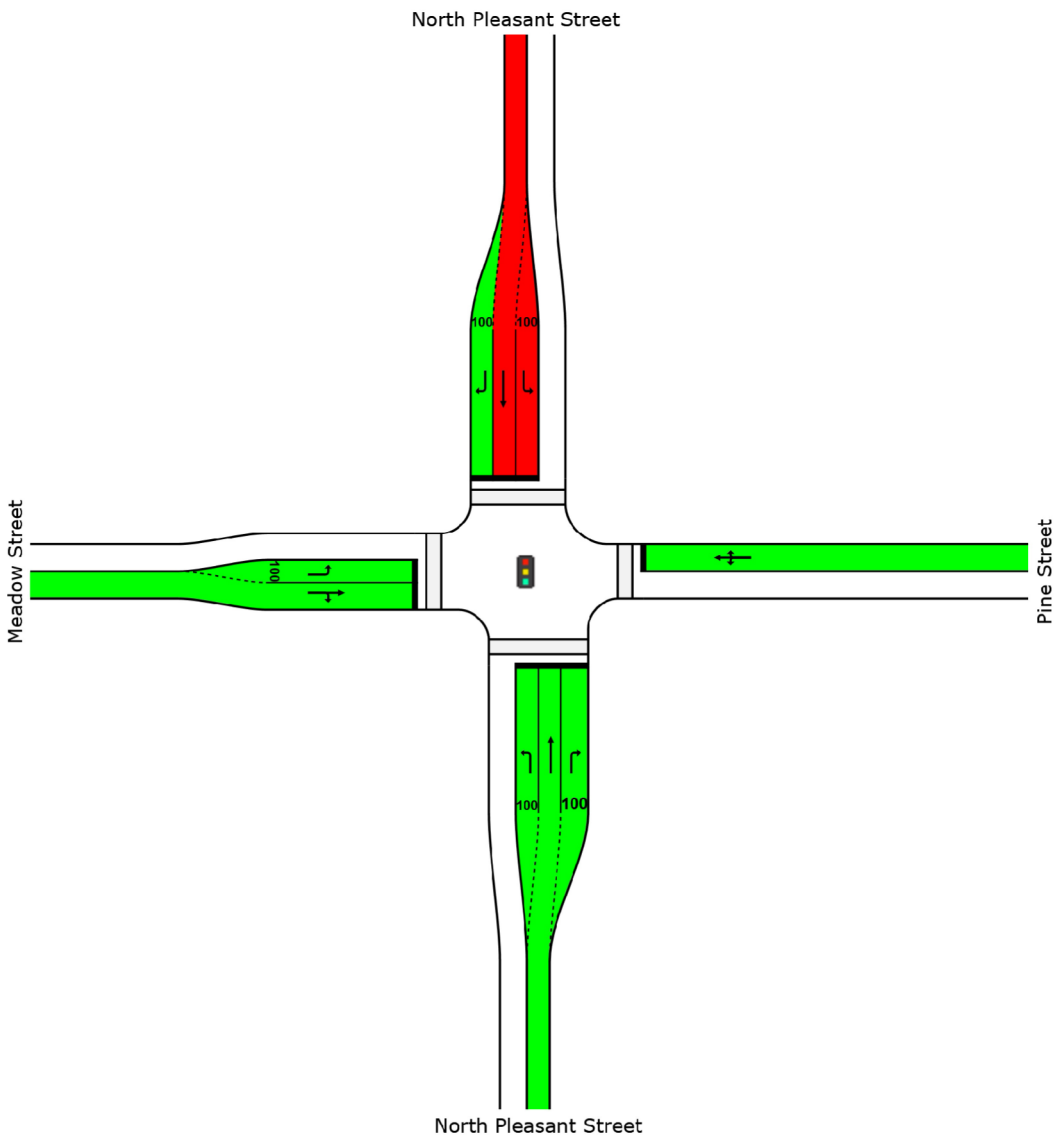
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	97	340	1046	82	1046



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	129	1.9	867	0.148	100	5.6	LOS A	0.6	16.0	Full	20	0.0	0.0
Approach	129	1.9		0.148		5.6	LOS A	0.6	16.0				
NorthEast: Montague Road													
Lane 1[d]	452	0.5	943	0.479	100	9.7	LOS A	3.3	82.1	Full	1600	0.0	0.0
Approach	452	0.5		0.479		9.7	LOS A	3.3	82.1				
NorthWest: Sunderland Road													
Lane 1[d]	481	2.8	777	0.619	100	14.9	LOS B	5.7	145.7	Full	1600	0.0	0.0
Approach	481	2.8		0.619		14.9	LOS B	5.7	145.7				
SouthWest: Montague Road													
Lane 1[d]	429	1.8	1298	0.331	100	5.8	LOS A	2.0	49.9	Full	400	0.0	0.0
Approach	429	1.8		0.331		5.8	LOS A	2.0	49.9				
Intersection	1490	1.7		0.619		9.9	LOS A	5.7	145.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

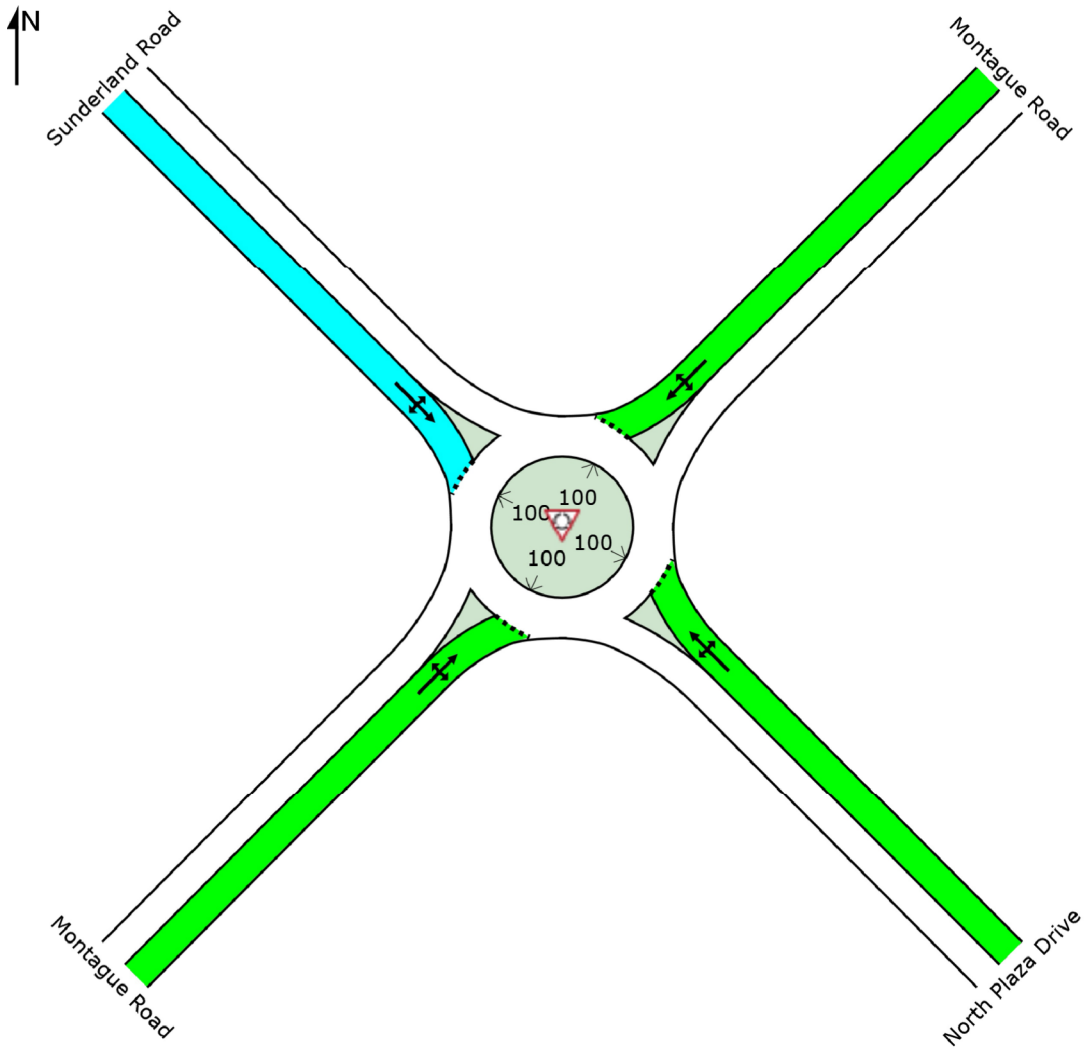
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

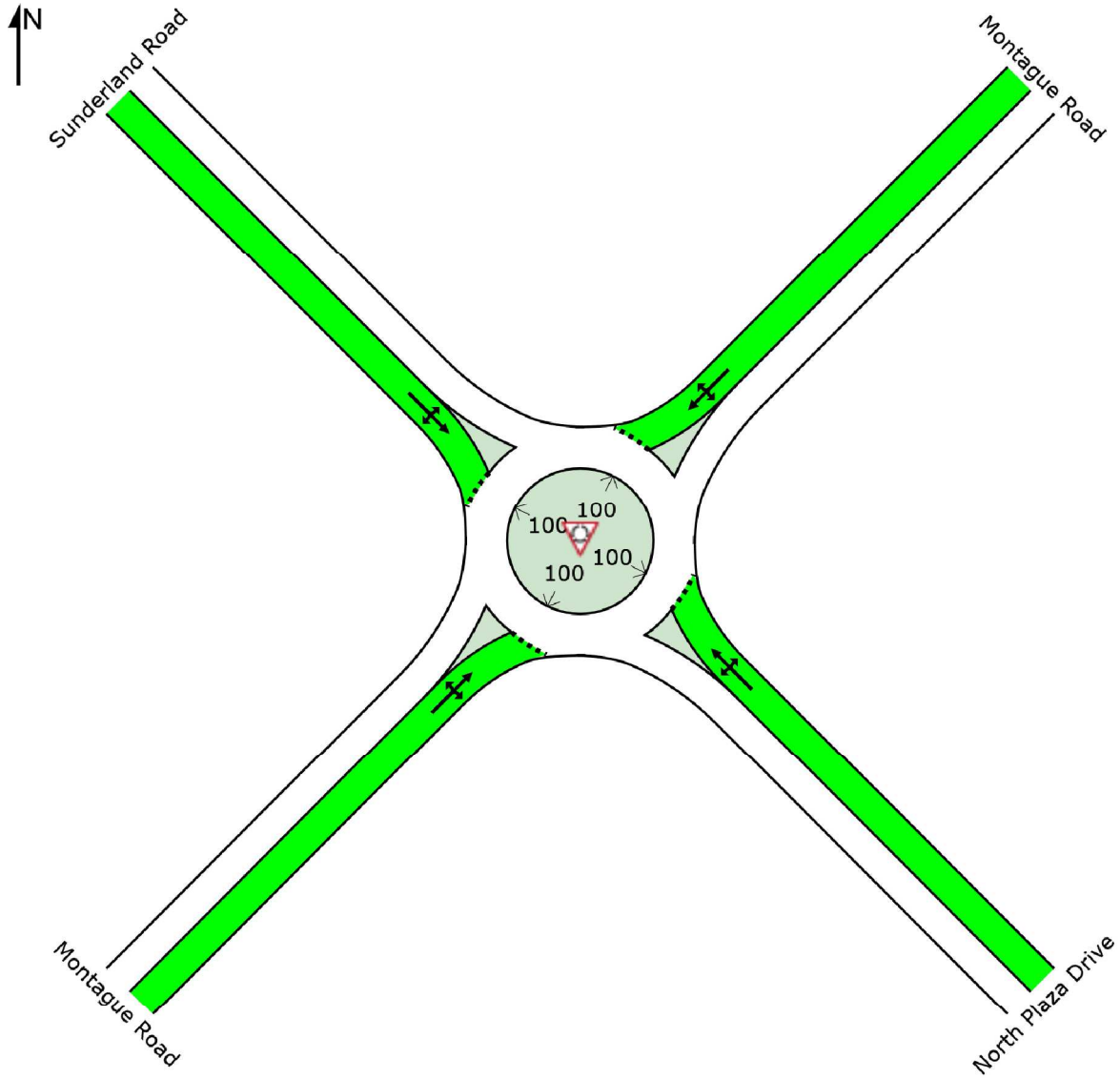
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	6	33	59	20	59



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	261	0.0	178[1]	1.472	100	266.0	LOS F	28.7	716.7	Short	100	0.0	NA
Lane 2	462	3.1	356[1]	1.299	100	177.8	LOS F	42.8	1096.4	Full	1600	0.0	0.0
Lane 3	163	1.7	952	0.171	100	1.5	LOS A	1.6	40.2	Short	100	0.0	NA
Approach	886	1.9		1.472		171.4	LOS F	42.8	1096.4				
East: Pine Street													
Lane 1	683	2.8	579	1.181	100	106.6	LOS F	43.7	1116.5	Full	1600	0.0	0.0
Approach	683	2.8		1.181		106.6	LOS F	43.7	1116.5				
North: North Pleasant Street													
Lane 1	151	4.6	183	0.822	100	61.6	LOS E	7.6	197.7	Short	100	0.0	NA
Lane 2	478	1.3	401[1]	1.194	100	135.8	LOS F	38.8	980.7	Full	400	0.0	89.2
Lane 3	91	5.1	893	0.102	100	3.0	LOS A	1.1	29.7	Short	100	0.0	NA
Approach	720	2.5		1.194		103.5	LOS F	38.8	980.7				
West: Meadow Street													
Lane 1	258	0.0	316	0.816	100	35.9	LOS D	8.5	212.2	Short	100	0.0	NA
Lane 2	374	2.3	887	0.422	100	10.3	LOS B	7.9	201.0	Full	1600	0.0	0.0
Approach	632	1.3		0.816		20.8	LOS C	8.5	212.2				
Intersection	2922	2.1		1.472		106.9	LOS F	43.7	1116.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

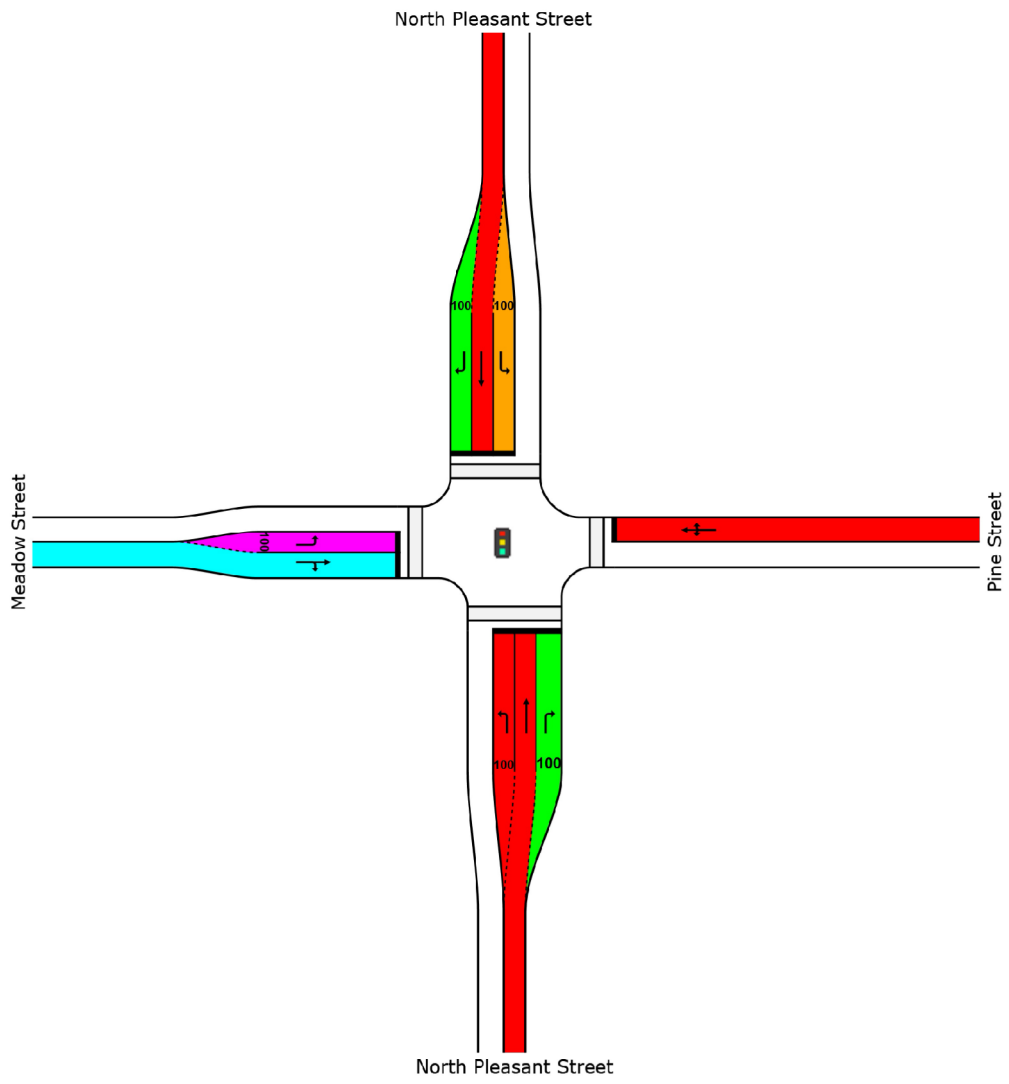
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	F	F	C	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

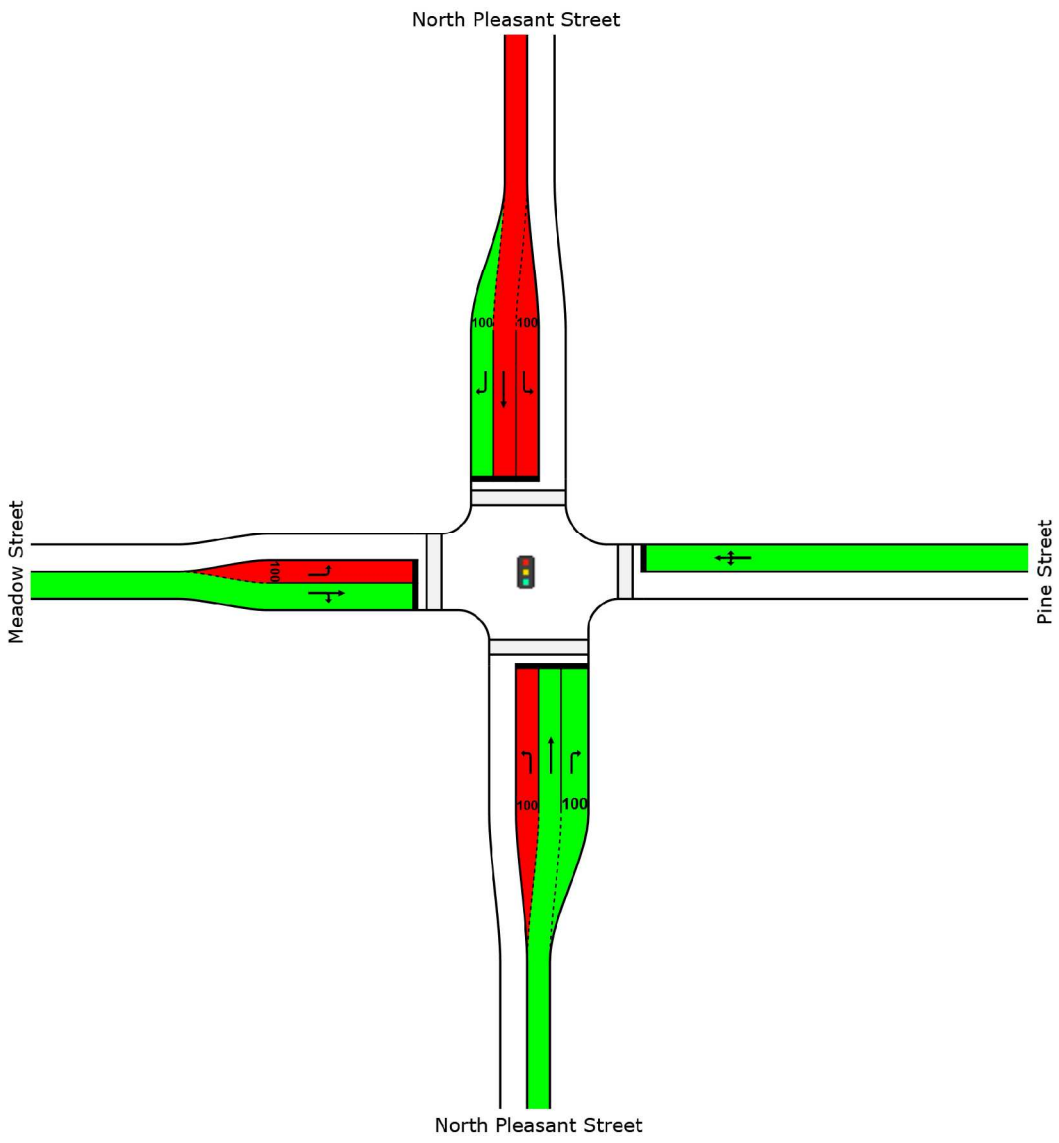
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	672	684	601	130	684



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	135	0.9	572	0.236	100	9.4	LOS A	1.0	24.0	Full	20	0.0	10.7
Approach	135	0.9		0.236		9.4	LOS A	1.0	24.0				
NorthEast: Montague Road													
Lane 1[d]	312	0.5	856	0.365	100	8.4	LOS A	1.8	46.0	Full	1600	0.0	0.0
Approach	312	0.5		0.365		8.4	LOS A	1.8	46.0				
NorthWest: Sunderland Road													
Lane 1[d]	773	1.6	922	0.838	100	24.6	LOS C	19.3	487.4	Full	1600	0.0	0.0
Approach	773	1.6		0.838		24.6	LOS C	19.3	487.4				
SouthWest: Montague Road													
Lane 1[d]	859	1.5	1307	0.657	100	11.2	LOS B	7.2	181.2	Full	400	0.0	0.0
Approach	859	1.5		0.657		11.2	LOS B	7.2	181.2				
Intersection	2080	1.3		0.838		15.6	LOS C	19.3	487.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

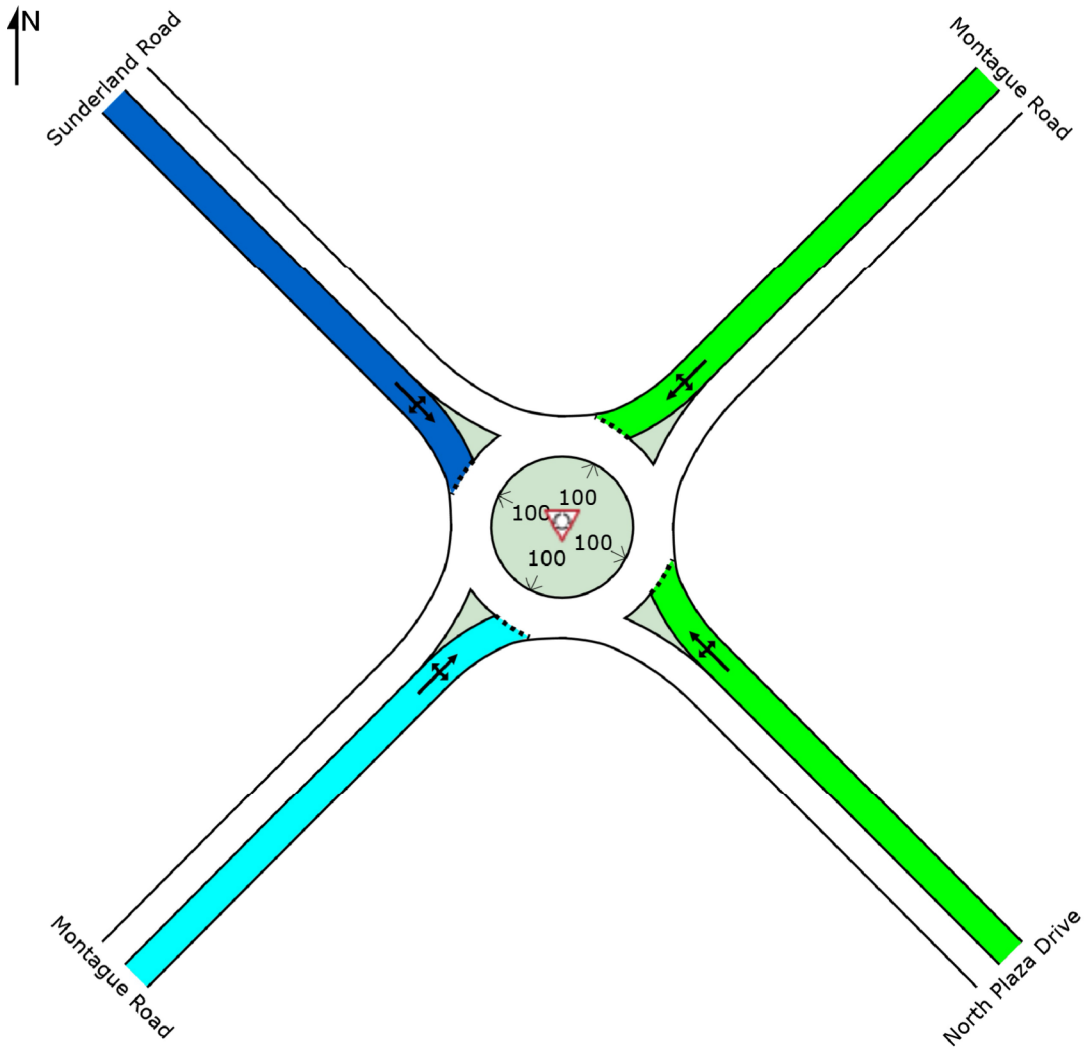
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	C	B	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

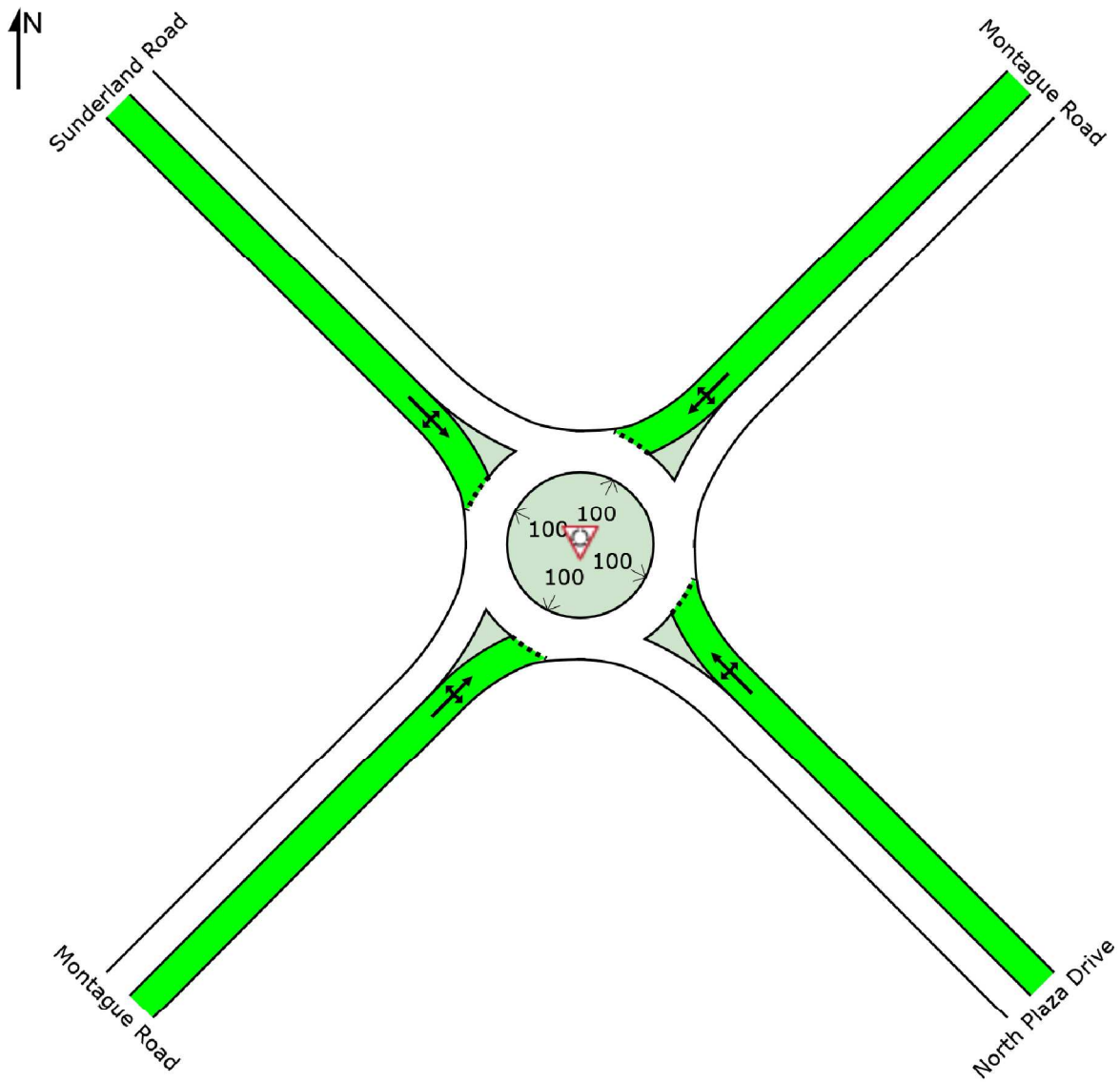
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	10	19	196	73	196



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	128	1.3	189	0.675	100	45.1	LOS D	5.8	146.6	Short	100	0.0	NA
Lane 2	331	3.4	387[1]	0.855	100	45.0	LOS D	15.6	399.5	Full	1600	0.0	0.0
Lane 3	37	2.7	904	0.040	100	1.7	LOS A	0.3	8.8	Short	100	0.0	NA
Approach	495	2.8		0.855		41.8	LOS D	15.6	399.5				
East: Pine Street													
Lane 1	646	2.9	667	0.968	100	49.4	LOS D	34.0	868.7	Full	1600	0.0	0.0
Approach	646	2.9		0.968		49.4	LOS D	34.0	868.7				
North: North Pleasant Street													
Lane 1	214	0.5	178[1]	1.201	100	163.6	LOS F	18.0	451.2	Short	100	0.0	NA
Lane 2	294	0.4	304[1]	0.967	100	70.2	LOS E	15.8	397.0	Full	400	0.0	15.9[8]
Lane 3	238	0.9	973	0.244	100	3.2	LOS A	3.3	83.3	Short	100	0.0	NA
Approach	746	0.6		1.201		75.7	LOS E	18.0	451.2				
West: Meadow Street													
Lane 1	233	1.6	226	1.032	100	86.1	LOS F	11.3	287.3	Short	100	0.0	NA
Lane 2	282	1.0	894	0.316	100	8.6	LOS A	5.7	144.0	Full	1600	0.0	0.0
Approach	516	1.3		1.032		43.6	LOS D	11.3	287.3				
Intersection	2402	1.8		1.201		54.7	LOS D	34.0	868.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

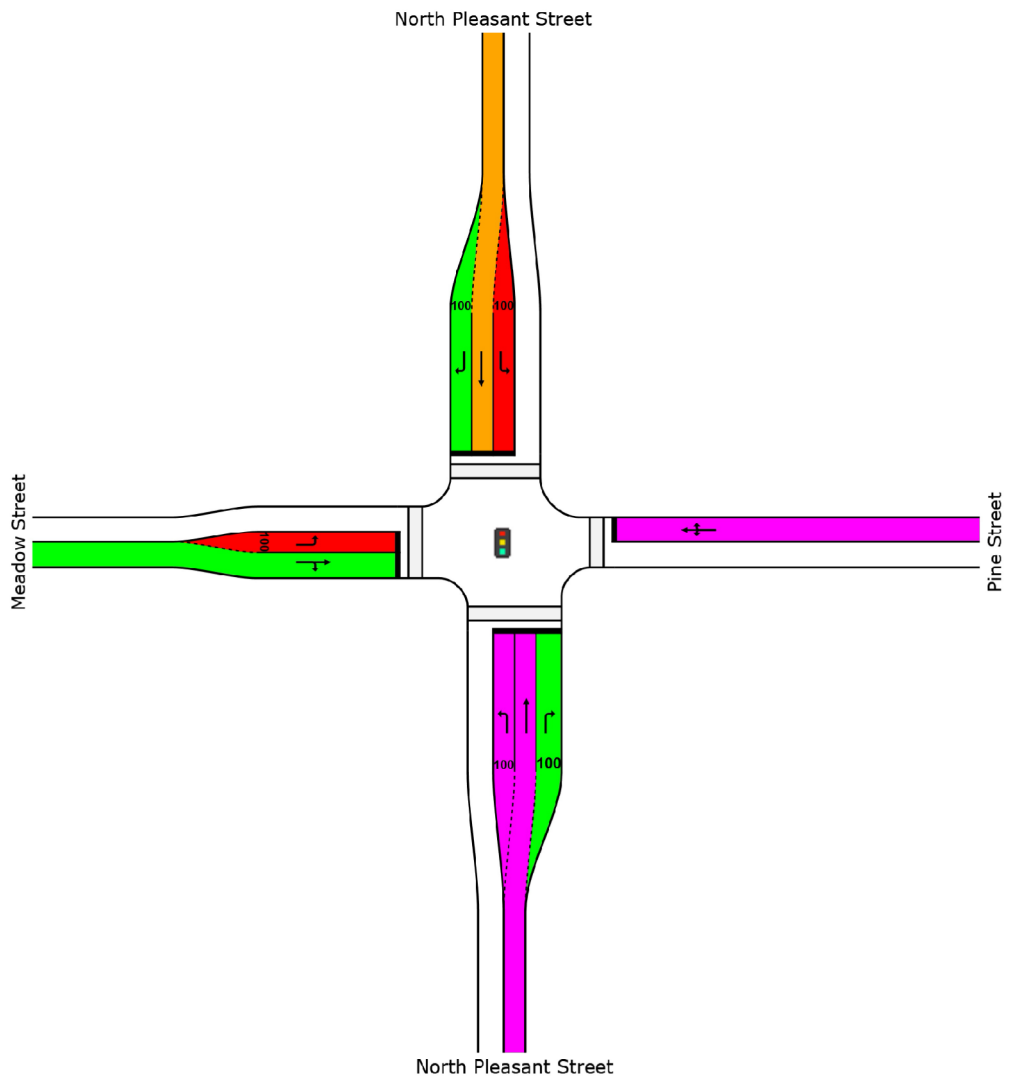
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	D	D	E	D	D



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

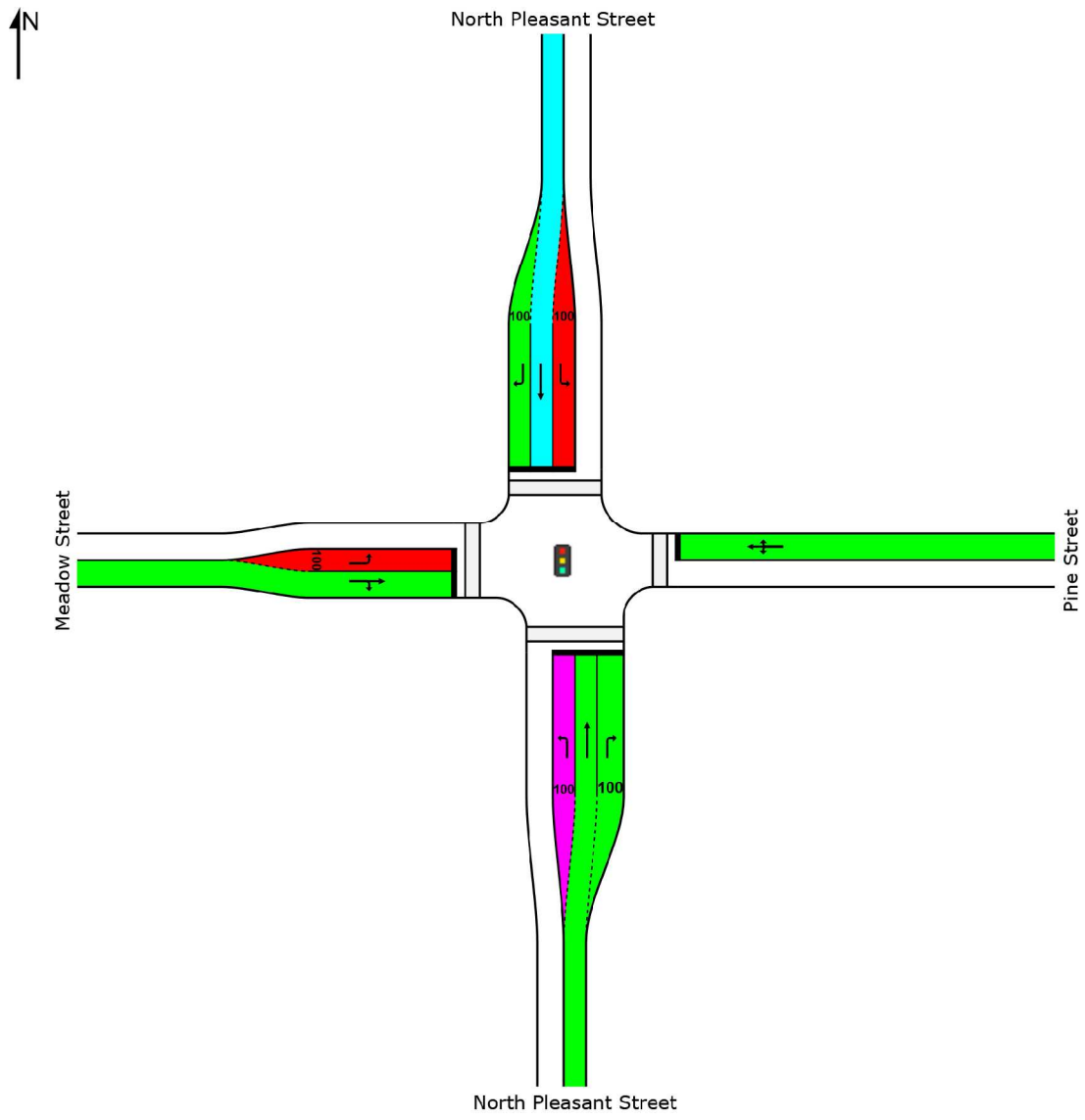
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	245	532	276	176	532



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	127	0.8	673	0.188	100	7.5	LOS A	0.8	19.5	Full	20	0.0	4.2
Approach	127	0.8		0.188		7.5	LOS A	0.8	19.5				
NorthEast: Montague Road													
Lane 1[d]	334	0.6	931	0.359	100	7.8	LOS A	1.9	46.9	Full	1600	0.0	0.0
Approach	334	0.6		0.359		7.8	LOS A	1.9	46.9				
NorthWest: Sunderland Road													
Lane 1[d]	305	1.6	895	0.341	100	7.8	LOS A	1.7	42.9	Full	1600	0.0	0.0
Approach	305	1.6		0.341		7.8	LOS A	1.7	42.9				
SouthWest: Montague Road													
Lane 1[d]	698	1.1	1338	0.521	100	8.2	LOS A	4.4	110.1	Full	400	0.0	0.0
Approach	698	1.1		0.521		8.2	LOS A	4.4	110.1				
Intersection	1464	1.1		0.521		8.0	LOS A	4.4	110.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

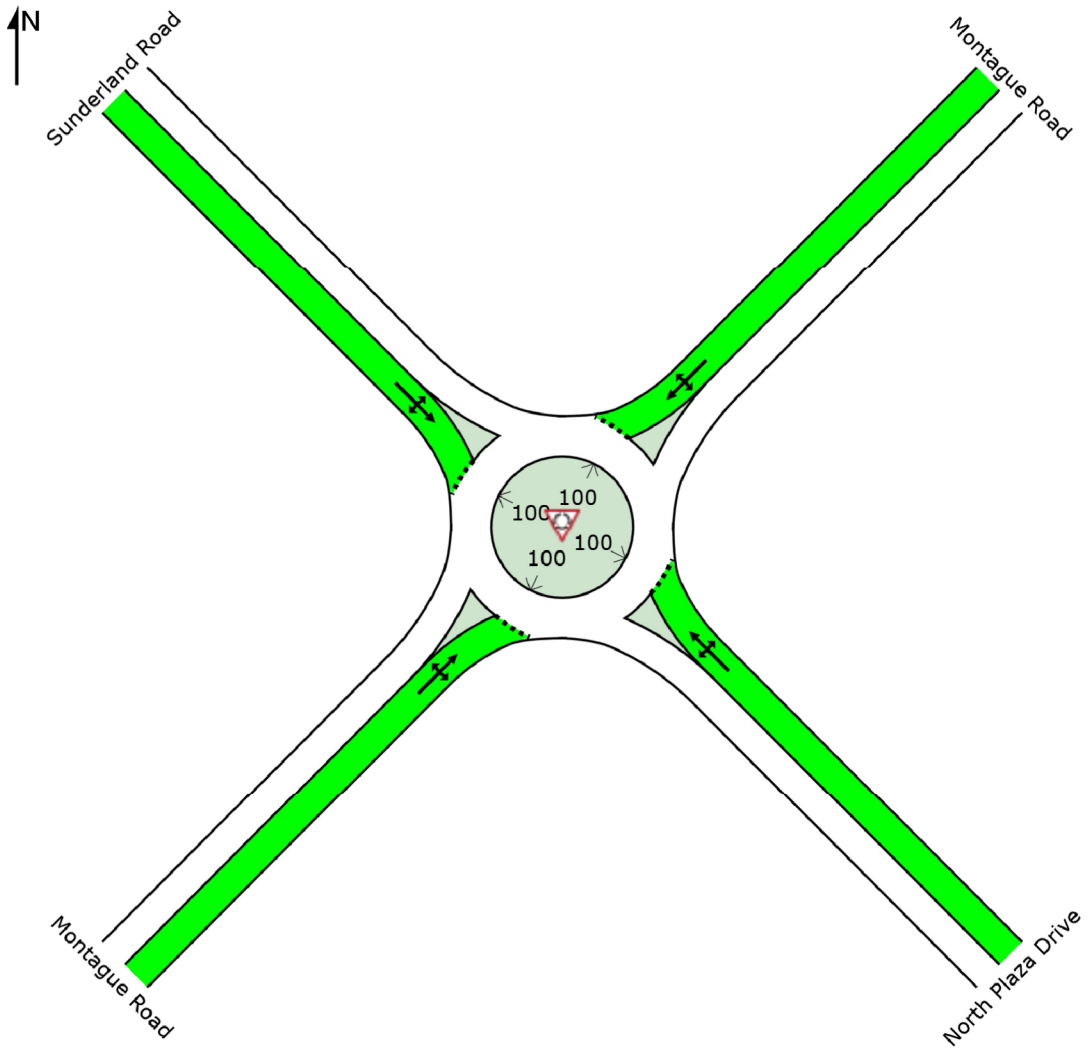
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

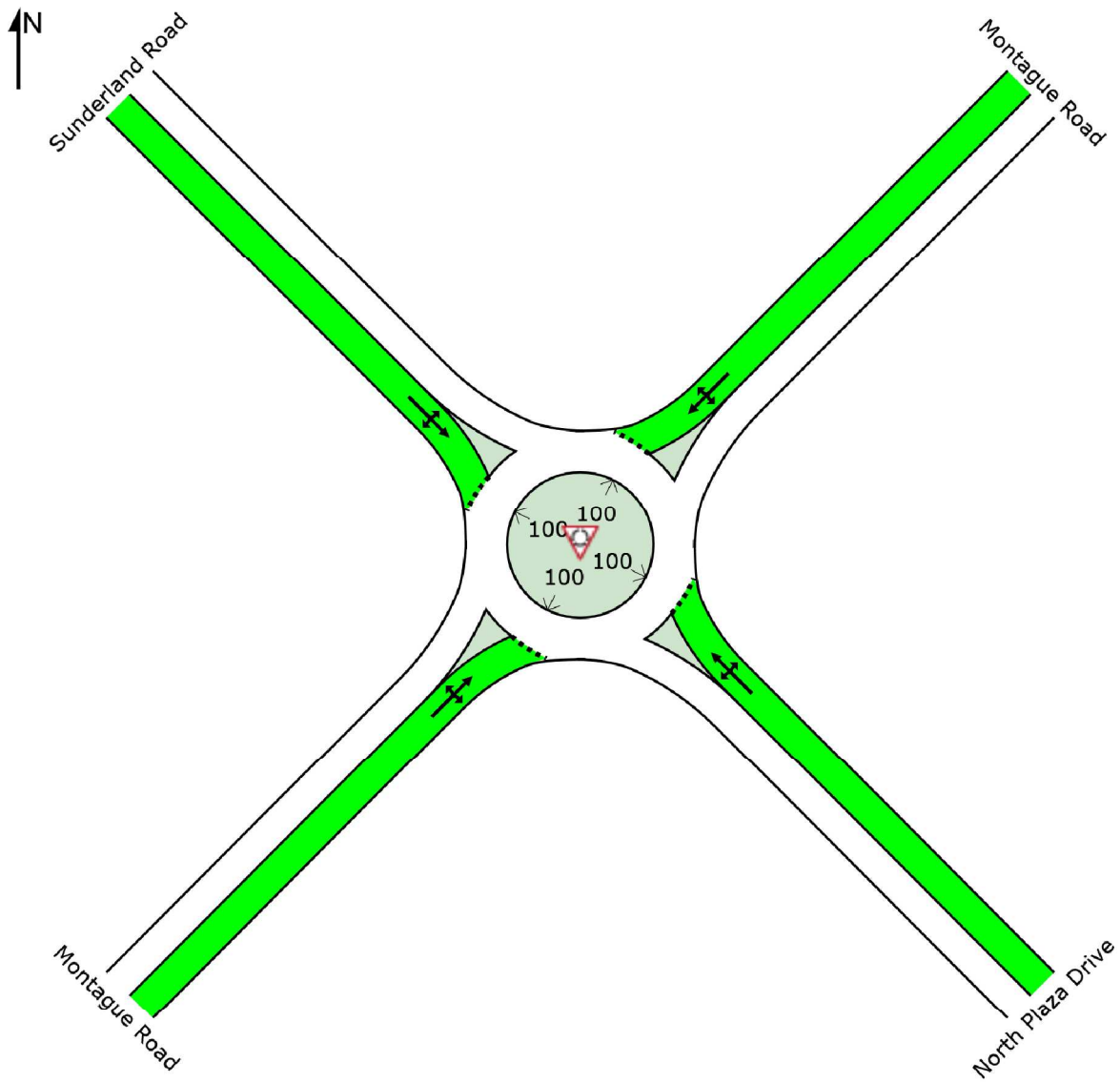
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	8	19	17	44	44



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 3

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	59	4.7	183	0.323	100	35.9	LOS D	2.4	61.4	Short	100	0.0	NA
Lane 2	175	3.8	474	0.369	100	26.2	LOS C	6.1	158.2	Full	1600	0.0	0.0
Lane 3	29	0.0	945	0.030	100	1.7	LOS A	0.3	6.7	Short	100	0.0	NA
Approach	263	3.6		0.369		25.7	LOS C	6.1	158.2				
East: Pine Street													
Lane 1	540	1.2	660	0.819	100	27.3	LOS C	22.0	555.0	Full	1600	0.0	0.0
Approach	540	1.2		0.819		27.3	LOS C	22.0	555.0				
North: North Pleasant Street													
Lane 1	206	2.4	172[1]	1.200	100	164.5	LOS F	17.3	441.6	Short	100	0.0	NA
Lane 2	566	3.2	358[1]	1.582	100	294.9	LOS F	66.6	1707.7	Full	400	0.0	100.0
Lane 3	218	1.8	984	0.221	100	3.1	LOS A	2.9	74.5	Short	100	0.0	NA
Approach	991	2.7		1.582		203.6	LOS F	66.6	1707.7				
West: Meadow Street													
Lane 1	126	3.3	311	0.404	100	15.5	LOS B	3.2	81.4	Short	100	0.0	NA
Lane 2	260	3.7	870	0.299	100	10.2	LOS B	5.2	134.3	Full	1600	0.0	0.0
Approach	386	3.5		0.404		11.9	LOS B	5.2	134.3				
Intersection	2180	2.6		1.582		104.5	LOS F	66.6	1707.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

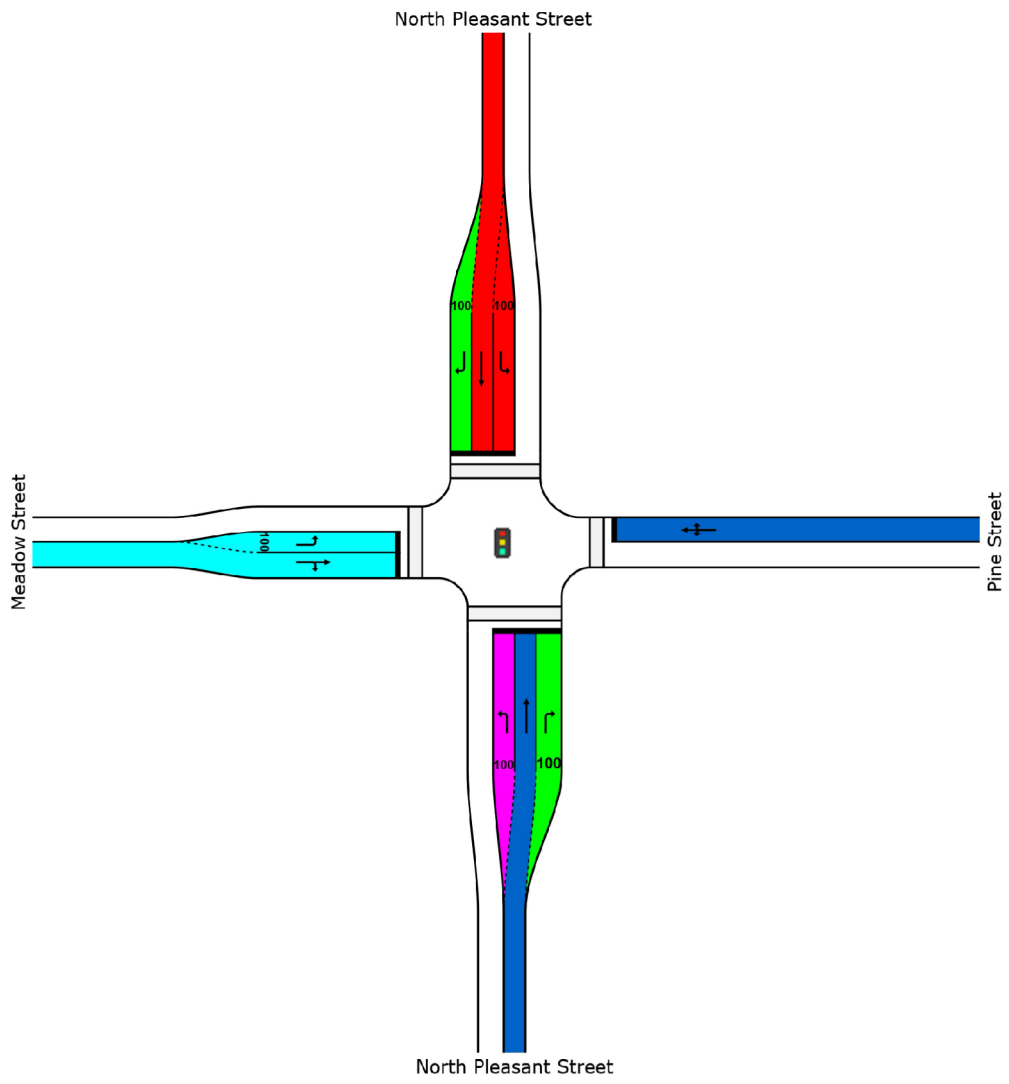
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	F	B	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

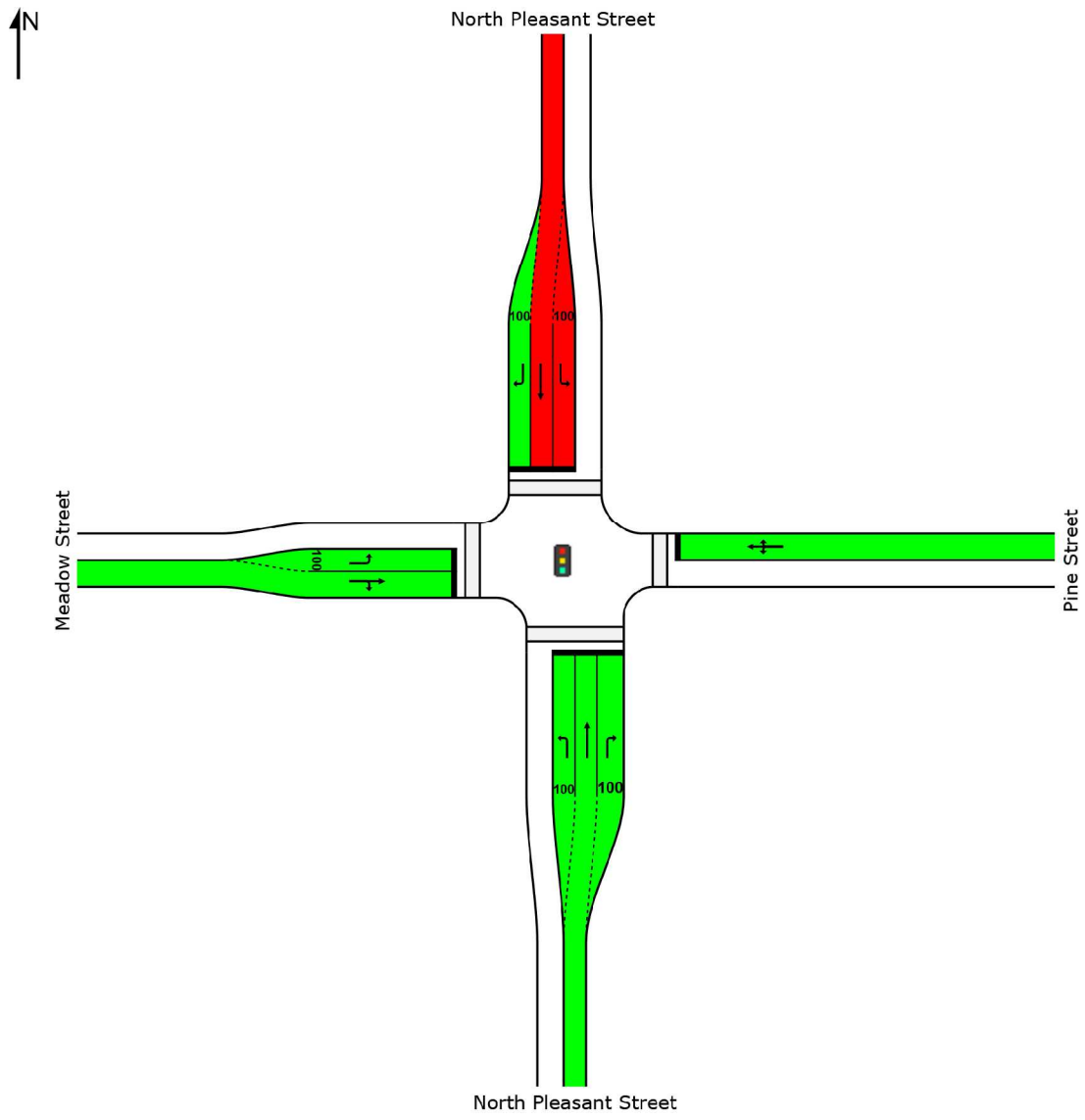
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	97	340	1046	82	1046



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	495	0.6	1845	0.268	100	2.4	LOS A	0.2	5.5	Full	1600	0.0	0.0
Approach	495	0.6		0.268		2.4	NA	0.2	5.5				
NorthWest: Sunderland Road													
Lane 1	481	2.8	551	0.873	100	41.1	LOS E	19.6	502.0	Full	1600	0.0	0.0
Approach	481	2.8		0.873		41.1	LOS E	19.6	502.0				
SouthWest: Montague Road													
Lane 1	580	1.3	1335	0.434	100	7.4	LOS A	5.0	127.6	Full	400	0.0	0.0
Approach	580	1.3		0.434		7.4	NA	5.0	127.6				
Intersection	1556	1.5		0.873		16.2	NA	19.6	502.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

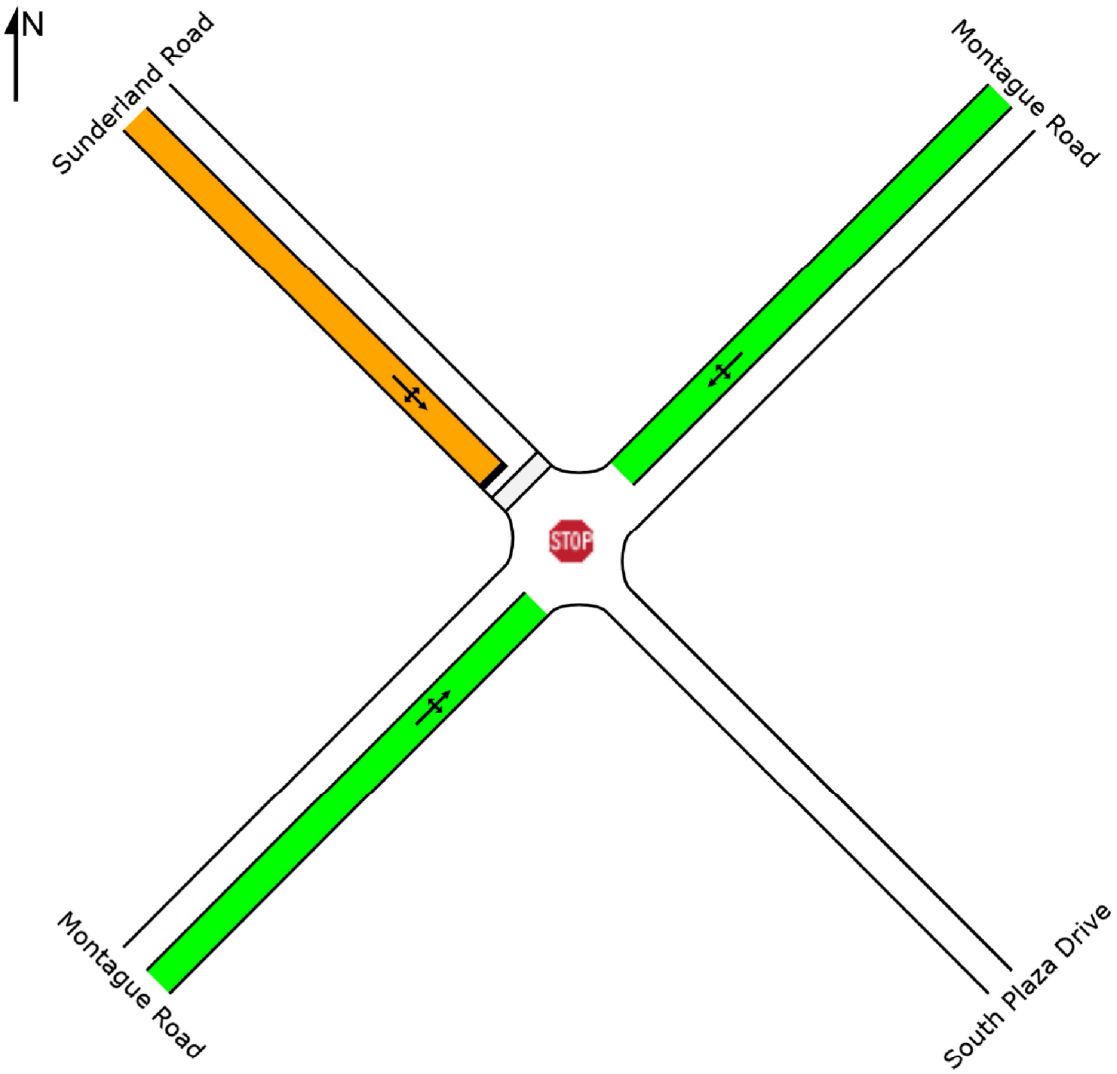
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	E	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

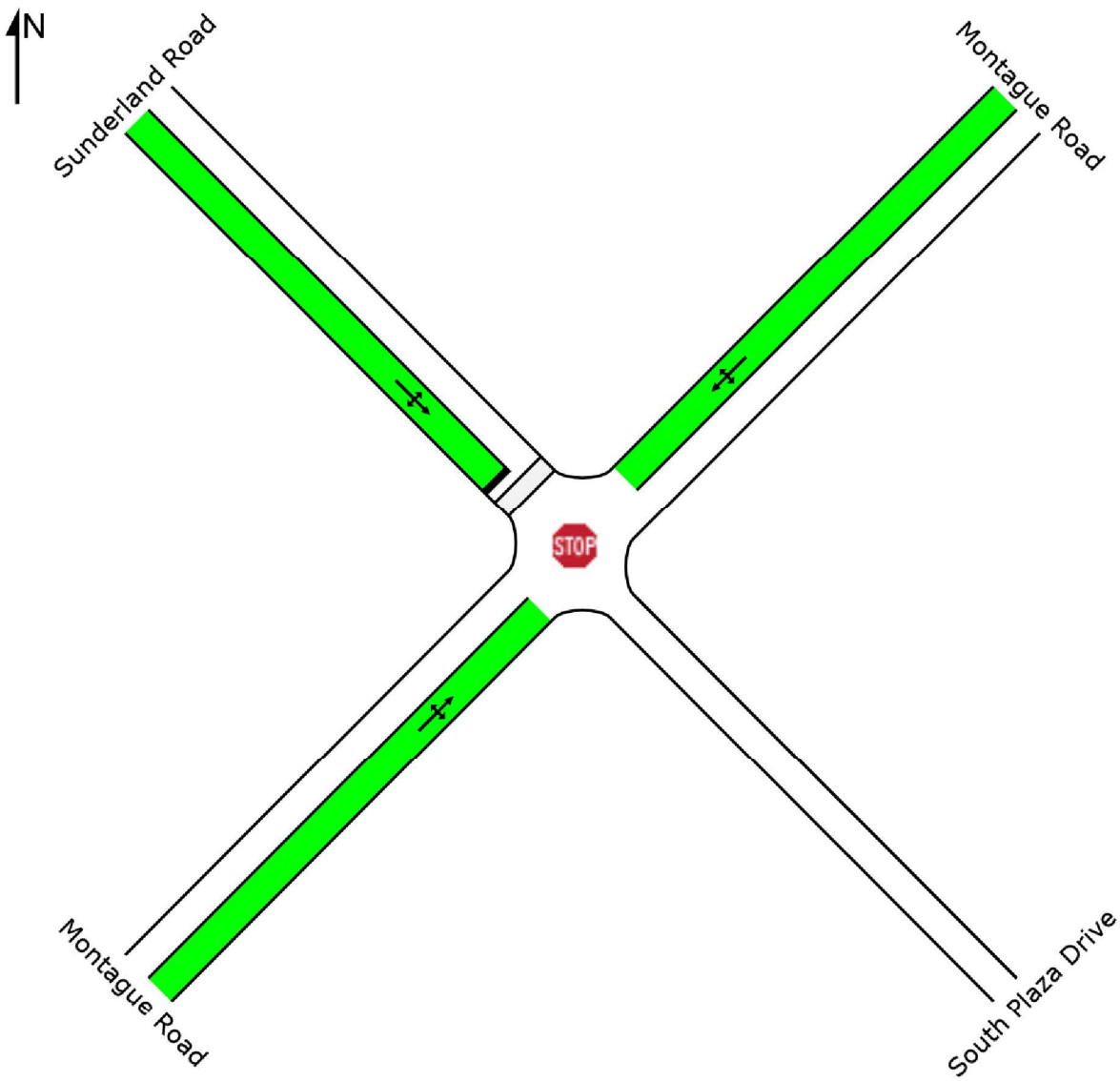
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	2	202	51	202



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	261	0.0	323	0.809	100	31.4	LOS C	8.5	212.1	Short	100	0.0	NA
Lane 2	462	3.1	356[1]	1.299	100	177.8	LOS F	42.8	1096.4	Full	1600	0.0	0.0
Lane 3	163	1.7	952	0.171	100	1.5	LOS A	1.6	40.2	Short	100	0.0	NA
Approach	886	1.9		1.299		102.3	LOS F	42.8	1096.4				
East: Pine Street													
Lane 1	683	2.8	579	1.181	100	106.6	LOS F	43.7	1116.5	Full	1600	0.0	0.0
Approach	683	2.8		1.181		106.6	LOS F	43.7	1116.5				
North: North Pleasant Street													
Lane 1	151	4.6	183	0.822	100	61.6	LOS E	7.6	197.7	Short	100	0.0	NA
Lane 2	478	1.3	400[1]	1.196	100	136.4	LOS F	38.9	982.7	Full	400	0.0	89.5
Lane 3	91	5.1	913	0.100	100	2.5	LOS A	1.1	27.3	Short	100	0.0	NA
Approach	720	2.5		1.196		103.8	LOS F	38.9	982.7				
West: Meadow Street													
Lane 1	258	0.0	316	0.816	100	35.9	LOS D	8.5	212.2	Short	100	0.0	NA
Lane 2	374	2.3	887	0.422	100	10.3	LOS B	7.9	201.0	Full	1600	0.0	0.0
Approach	632	1.3		0.816		20.8	LOS C	8.5	212.2				
Intersection	2922	2.1		1.299		86.0	LOS F	43.7	1116.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

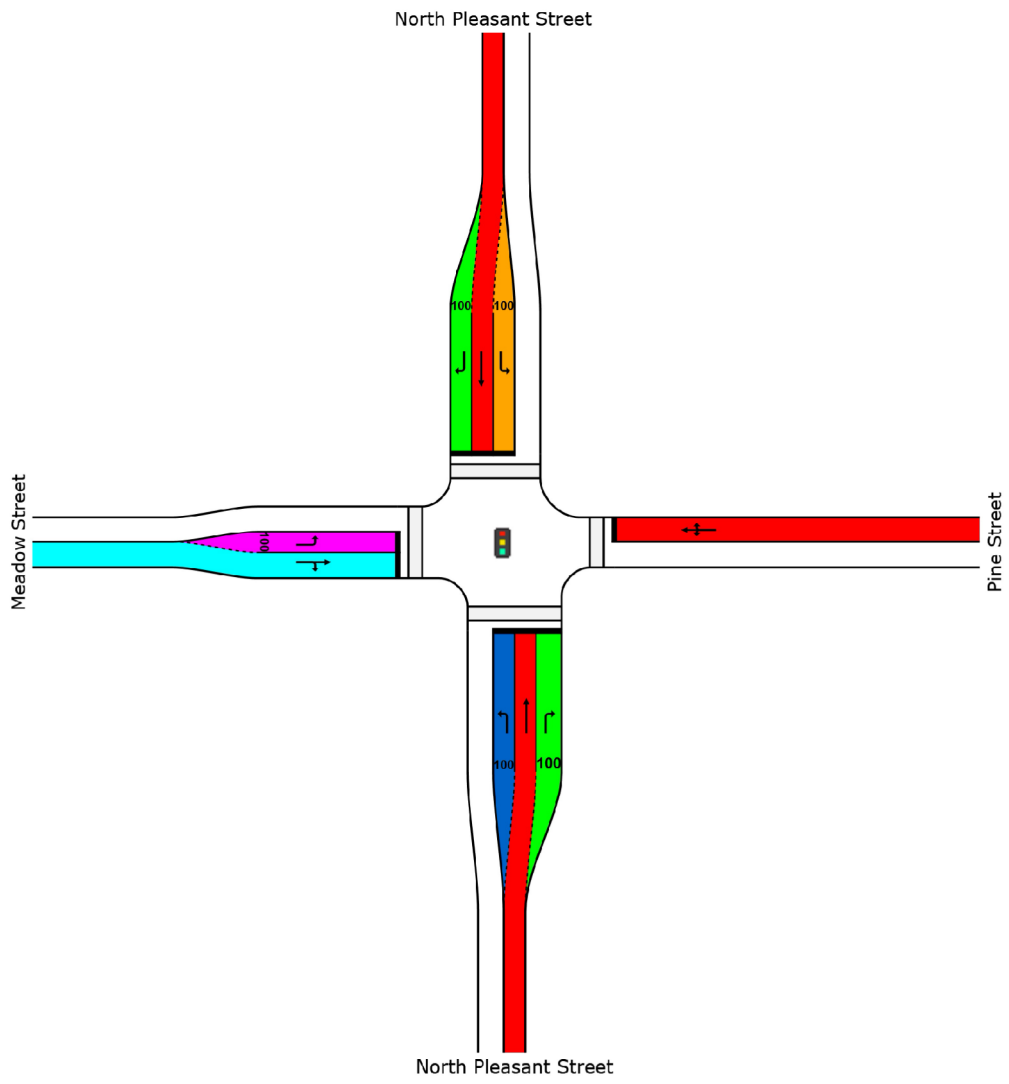
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	F	F	C	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

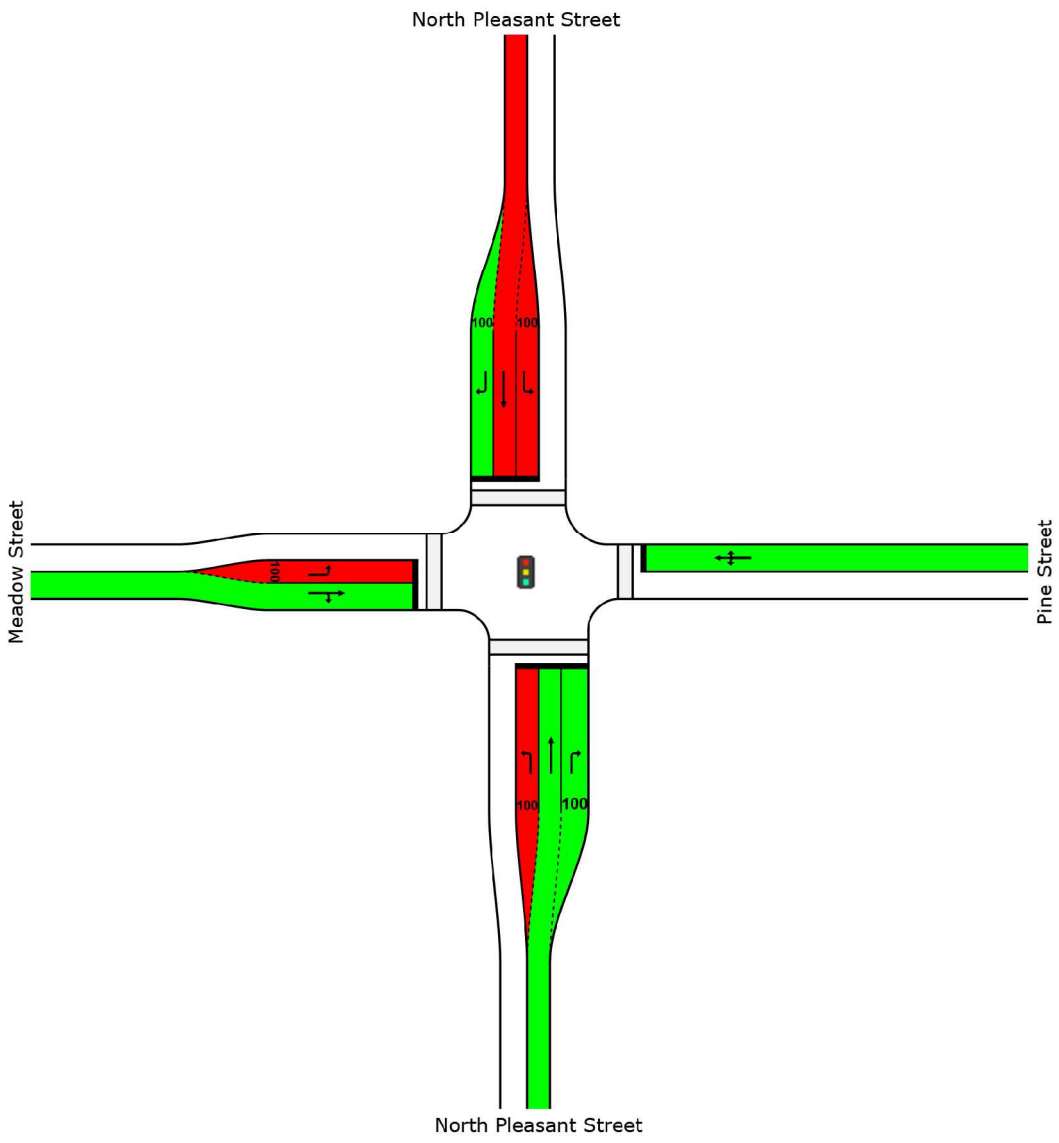
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	672	684	602	130	684



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	366	0.6	1749	0.210	100	2.4	LOS A	0.4	9.8	Full	1600	0.0	0.0
Approach	366	0.6		0.210		2.4	NA	0.4	9.8				
NorthWest: Sunderland Road													
Lane 1	773	1.6	649	1.191	100	122.9	LOS F	76.2	1928.1	Full	1600	0.0	10.8
Approach	773	1.6		1.191		122.9	LOS F	76.2	1928.1				
SouthWest: Montague Road													
Lane 1	1075	1.2	1513	0.710	100	11.6	LOS B	25.0	629.9	Full	400	0.0	20.6
Approach	1075	1.2		0.710		11.6	NA	25.0	629.9				
Intersection	2214	1.2		1.191		49.0	NA	76.2	1928.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

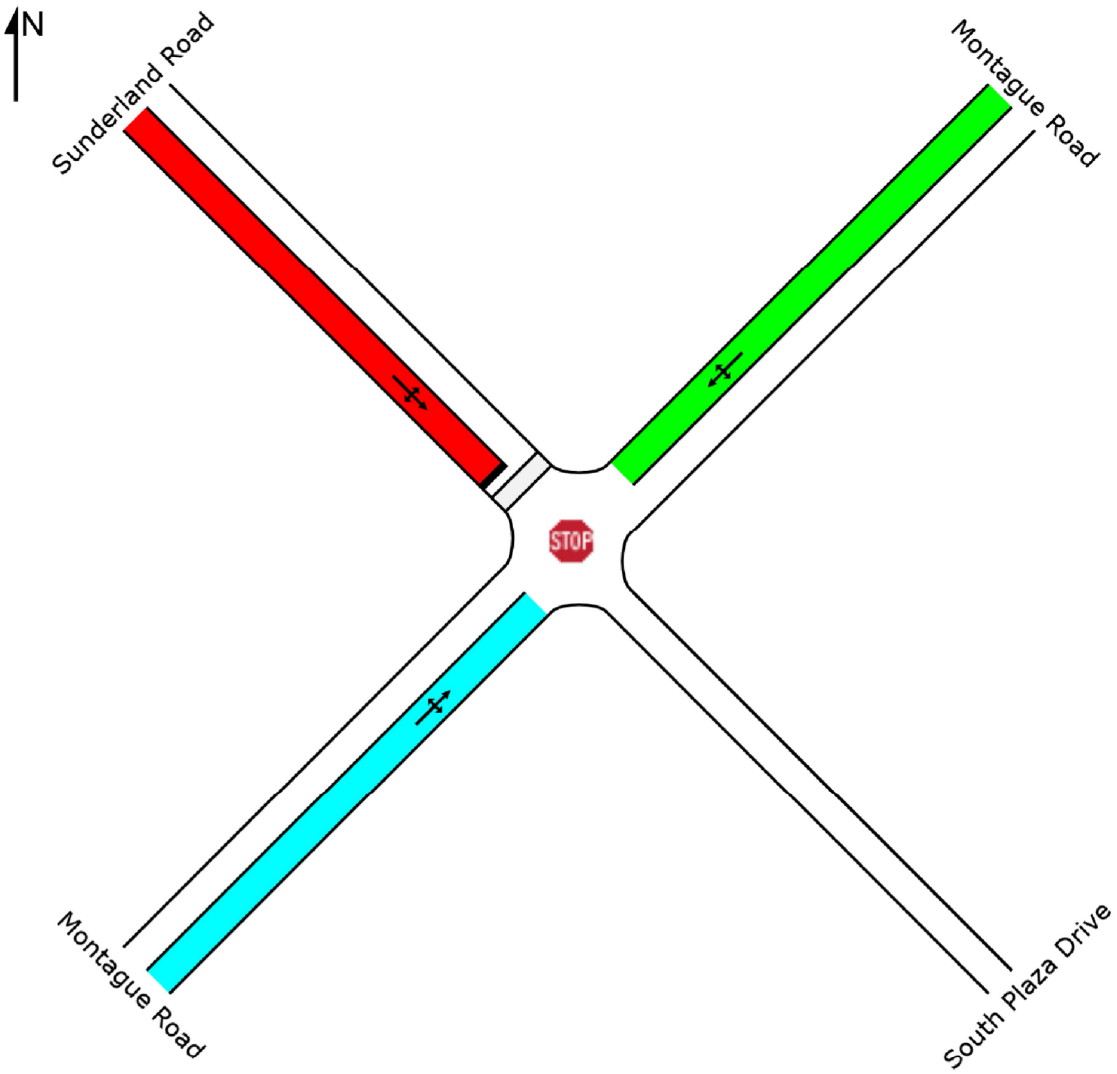
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

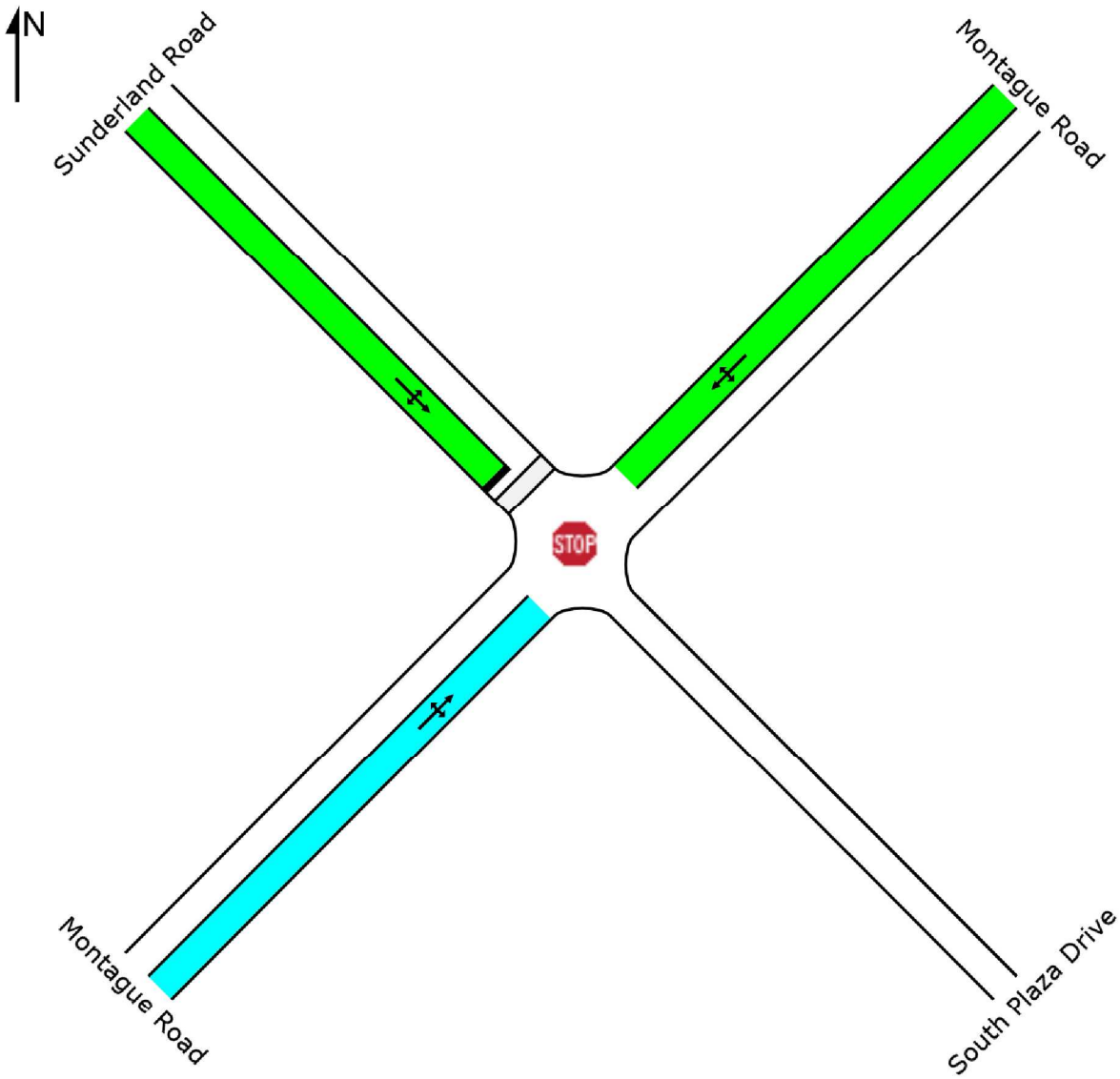
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	4	776	253	776



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	128	1.3	189	0.675	100	45.1	LOS D	5.8	146.6	Short	100	0.0	NA
Lane 2	331	3.4	387[1]	0.855	100	45.0	LOS D	15.6	399.5	Full	1600	0.0	0.0
Lane 3	37	2.7	904	0.040	100	1.7	LOS A	0.3	8.8	Short	100	0.0	NA
Approach	495	2.8		0.855		41.8	LOS D	15.6	399.5				
East: Pine Street													
Lane 1	646	2.9	667	0.968	100	49.4	LOS D	34.0	868.7	Full	1600	0.0	0.0
Approach	646	2.9		0.968		49.4	LOS D	34.0	868.7				
North: North Pleasant Street													
Lane 1	214	0.5	178[1]	1.201	100	163.6	LOS F	18.0	451.2	Short	100	0.0	NA
Lane 2	294	0.4	304[1]	0.967	100	70.2	LOS E	15.8	397.0	Full	400	0.0	15.9[8]
Lane 3	238	0.9	973	0.244	100	3.2	LOS A	3.3	83.3	Short	100	0.0	NA
Approach	746	0.6		1.201		75.7	LOS E	18.0	451.2				
West: Meadow Street													
Lane 1	233	1.6	226	1.032	100	86.1	LOS F	11.3	287.3	Short	100	0.0	NA
Lane 2	282	1.0	894	0.316	100	8.6	LOS A	5.7	144.0	Full	1600	0.0	0.0
Approach	516	1.3		1.032		43.6	LOS D	11.3	287.3				
Intersection	2402	1.8		1.201		54.7	LOS D	34.0	868.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

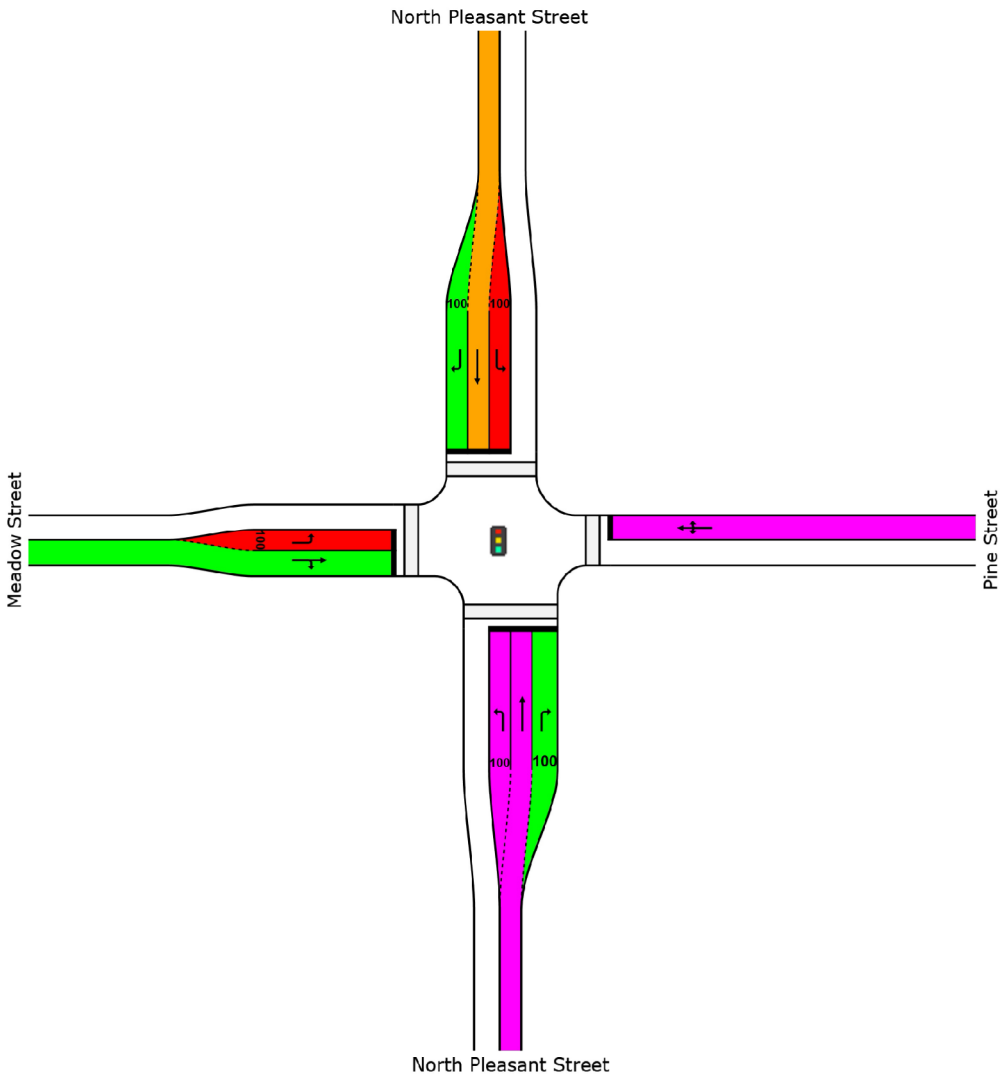
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	D	D	E	D	D



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

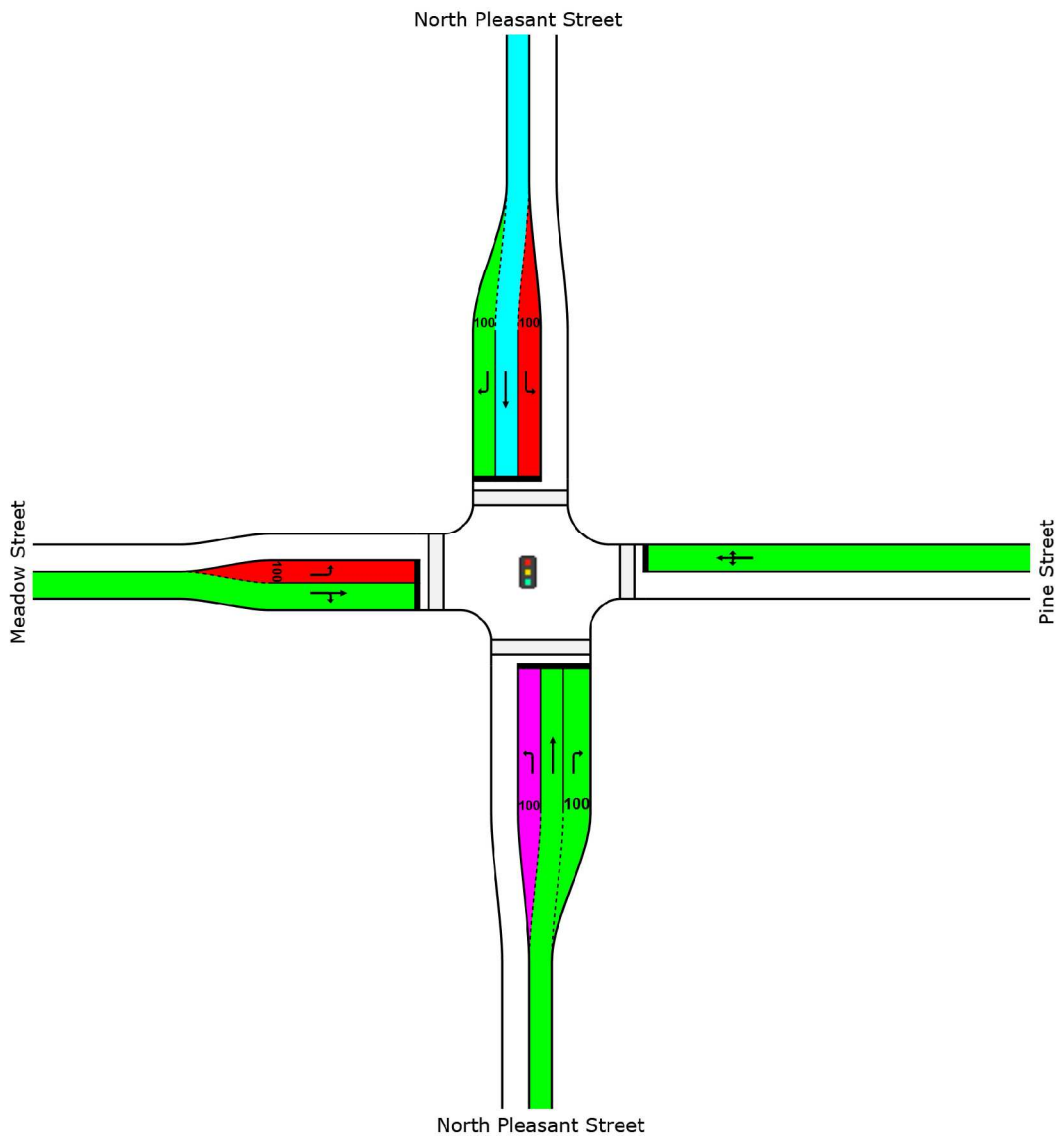
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	245	532	276	176	532



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	394	0.6	1833	0.215	100	1.9	LOS A	0.2	4.4	Full	1600	0.0	0.0
Approach	394	0.6		0.215		1.9	NA	0.2	4.4				
NorthWest: Sunderland Road													
Lane 1	305	1.6	624	0.488	100	16.2	LOS C	4.7	119.3	Full	1600	0.0	0.0
Approach	305	1.6		0.488		16.2	LOS C	4.7	119.3				
SouthWest: Montague Road													
Lane 1	808	1.1	1497	0.540	100	8.0	LOS A	9.5	238.4	Full	400	0.0	0.0
Approach	808	1.1		0.540		8.0	NA	9.5	238.4				
Intersection	1507	1.1		0.540		8.1	NA	9.5	238.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

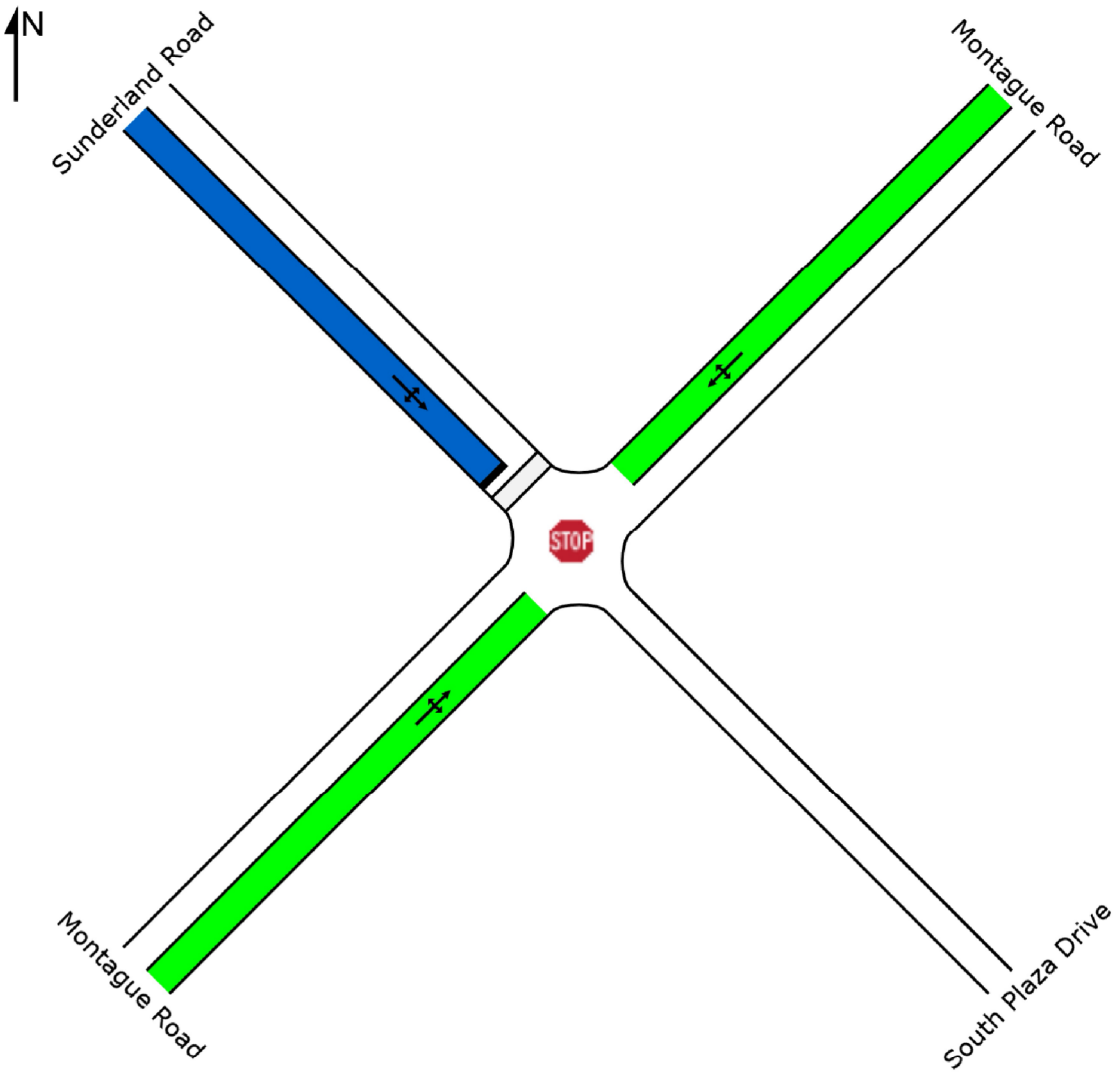
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	C	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

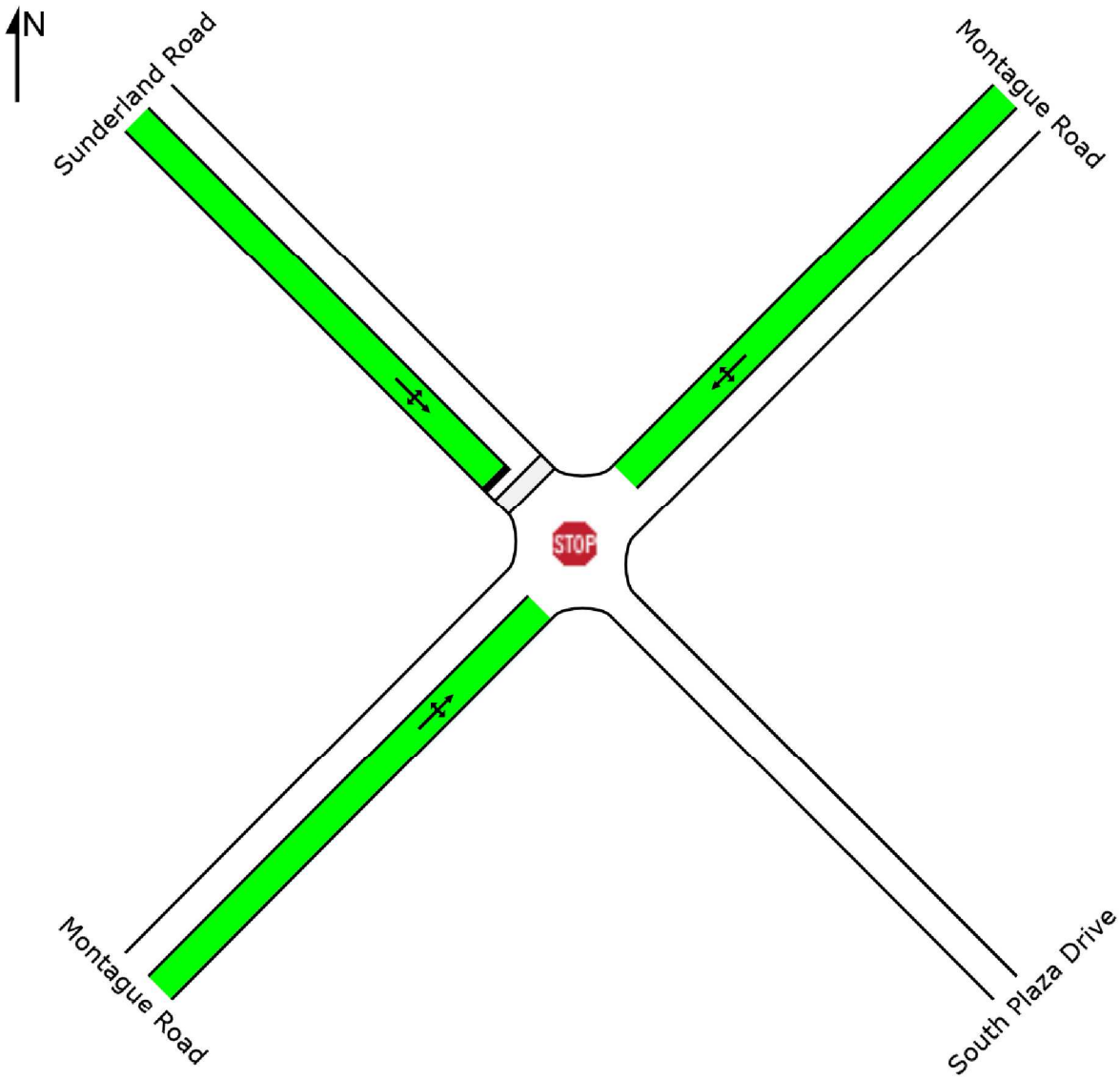
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	2	48	96	96



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 4

AM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	59	4.7	183	0.323	100	35.9	LOS D	2.4	61.4	Short	100	0.0	NA
Lane 2	175	3.8	474	0.369	100	26.2	LOS C	6.1	158.2	Full	1600	0.0	0.0
Lane 3	29	0.0	1124	0.026	100	1.1	LOS A	0.2	5.6	Short	100	0.0	NA
Approach	263	3.6		0.369		25.6	LOS C	6.1	158.2				
East: Pine Street													
Lane 1	540	1.2	685	0.789	100	25.2	LOS C	21.1	532.3	Full	1600	0.0	0.0
Approach	540	1.2		0.789		25.2	LOS C	21.1	532.3				
North: North Pleasant Street													
Lane 1	206	2.4	172[1]	1.200	100	164.4	LOS F	17.3	441.6	Short	100	0.0	NA
Lane 2	566	3.2	356[1]	1.591	100	298.6	LOS F	66.9	1716.5	Full	150	0.0	100.0
Lane 3	218	1.8	1065	0.204	100	1.4	LOS A	2.1	52.6	Short	100	0.0	NA
Approach	991	2.7		1.591		205.3	LOS F	66.9	1716.5				
West: Meadow Street													
Lane 1	386	3.5	821	0.470	100	23.3	LOS C	13.1	338.0	Full	1600	0.0	0.0
Approach	386	3.5		0.470		23.3	LOS C	13.1	338.0				
Intersection	2180	2.6		1.591		106.7	LOS F	66.9	1716.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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AM PEAK

LANE LEVEL OF SERVICE

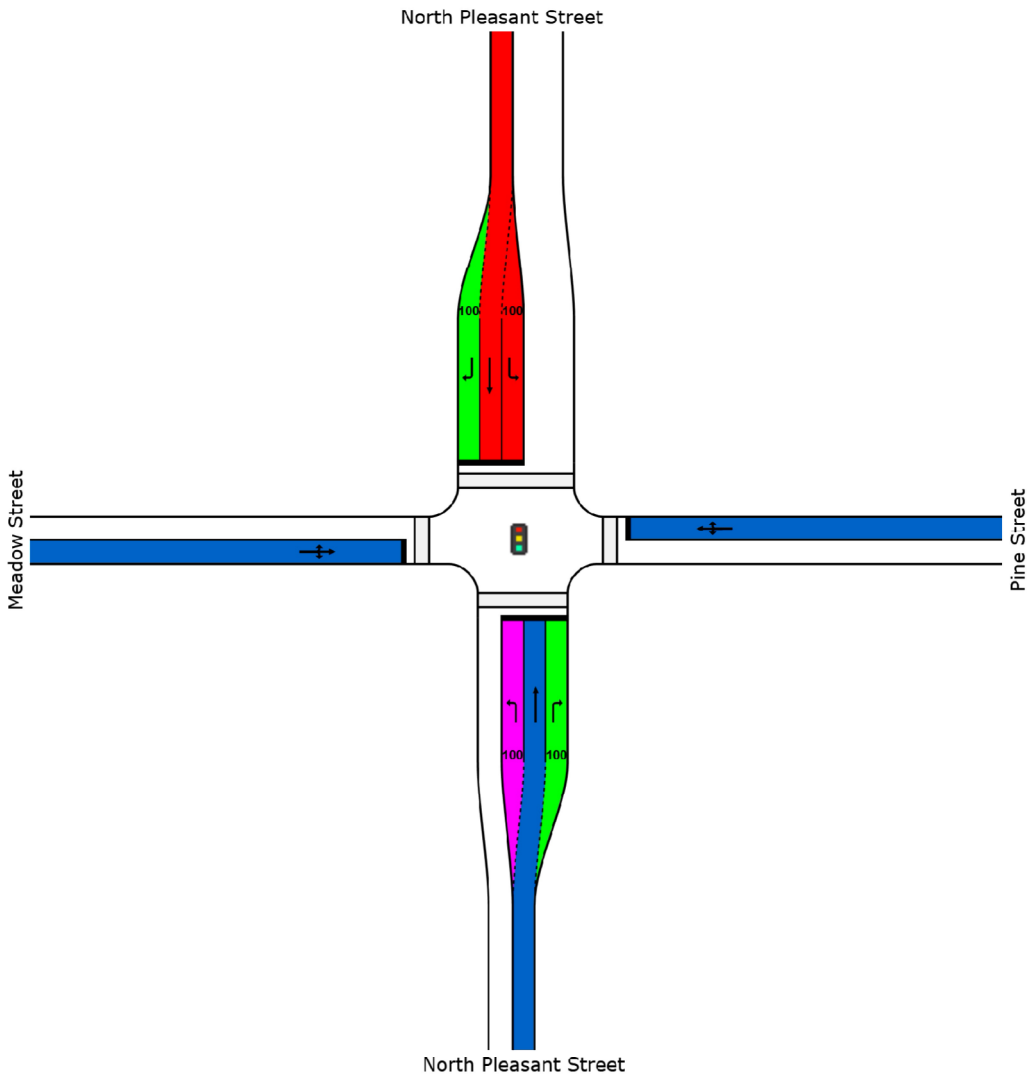
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	C	C	F	C	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

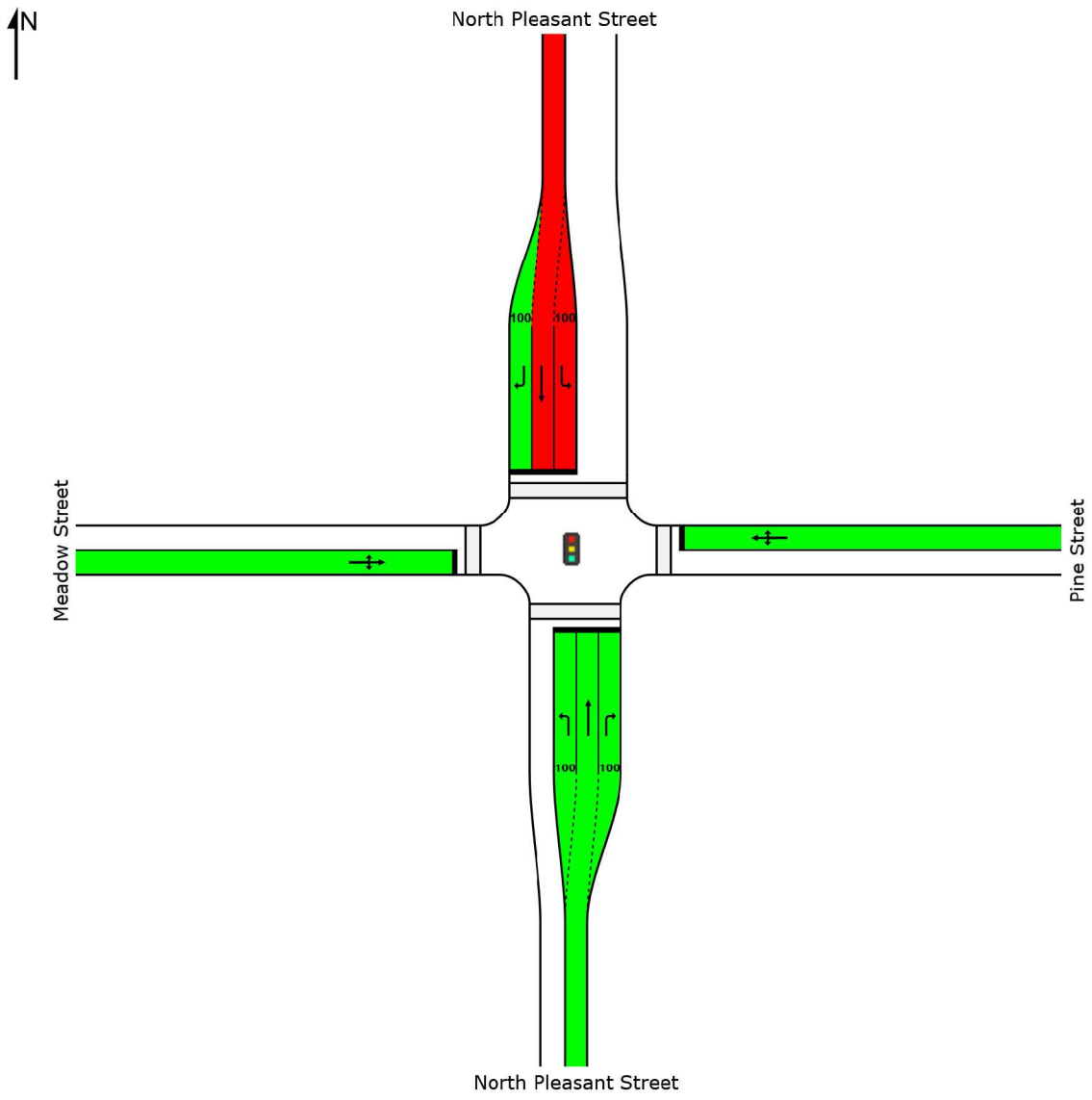
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	97	326	1052	207	1052



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	541	1.8	1719	0.315	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	541	1.8		0.315		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	468	0.7	308	1.519	100	280.3	LOS F	61.7	1549.8	Full	1600	0.0	4.1
Approach	468	0.7		1.519		280.3	LOS F	61.7	1549.8				
North: Sunderland Road													
Lane 1	493	2.7	1813	0.272	100	2.3	LOS A	0.2	4.1	Full	1600	0.0	0.0
Approach	493	2.7		0.272		2.3	NA	0.2	4.1				
Intersection	1502	1.7		1.519		88.2	NA	61.7	1549.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

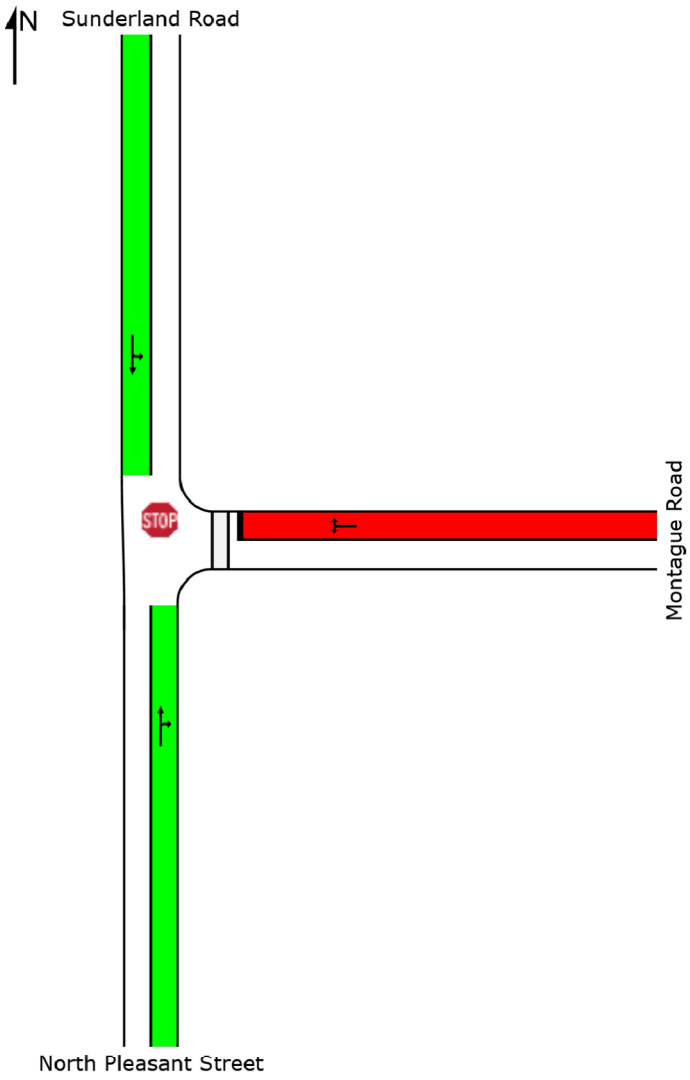
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

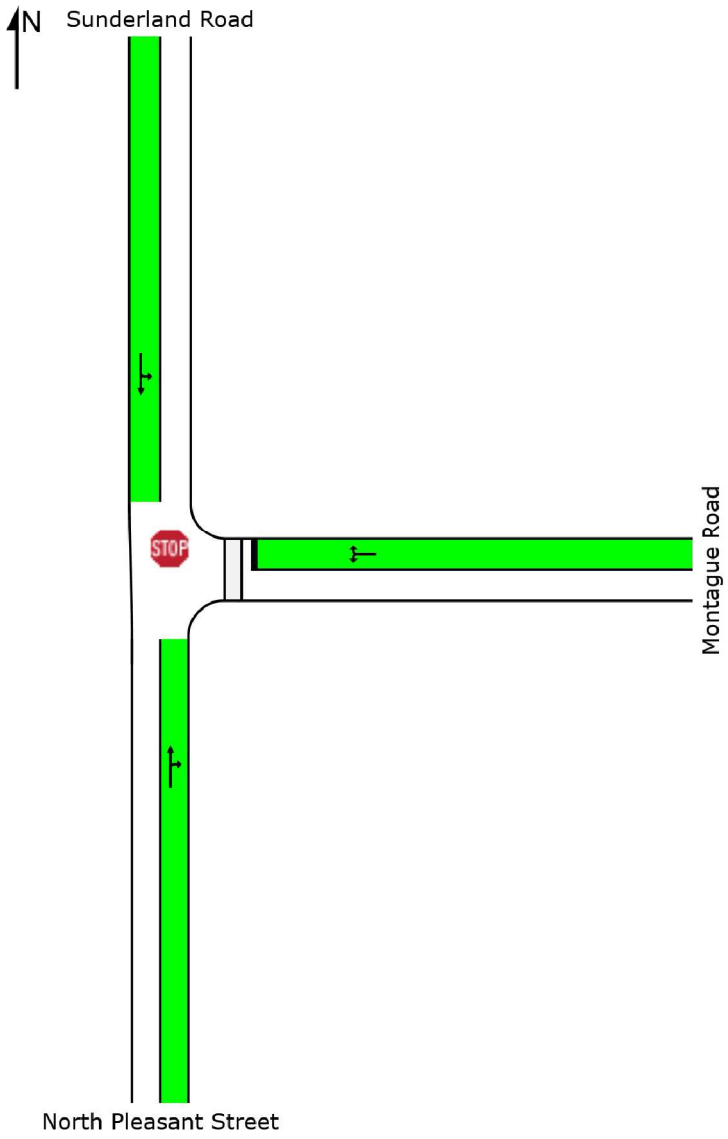
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	624	2	624



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	261	0.0	178[1]	1.472	100	266.0	LOS F	28.7	716.7	Short	100	0.0	NA
Lane 2	462	3.1	363[1]	1.273	100	167.6	LOS F	41.6	1065.1	Full	1600	0.0	0.0
Lane 3	163	1.7	1136	0.143	100	1.0	LOS A	1.3	31.8	Short	100	0.0	NA
Approach	886	1.9		1.472		166.0	LOS F	41.6	1065.1				
East: Pine Street													
Lane 1	683	2.8	647	1.057	100	60.9	LOS F	34.2	875.1	Full	1600	0.0	0.0
Approach	683	2.8		1.057		60.9	LOS E	34.2	875.1				
North: North Pleasant Street													
Lane 1	151	4.6	183	0.822	100	61.6	LOS E	7.6	197.7	Short	100	0.0	NA
Lane 2	478	1.3	401[1]	1.192	100	135.0	LOS F	38.7	977.7	Full	150	0.0	100.0
Lane 3	91	5.1	886	0.103	100	3.3	LOS A	1.2	30.9	Short	100	0.0	NA
Approach	720	2.5		1.192		103.0	LOS F	38.7	977.7				
West: Meadow Street													
Lane 1	581	1.2	829	0.701	100	28.0	LOS C	22.8	576.5	Full	1600	0.0	0.0
Approach	581	1.2		0.701		28.0	LOS C	22.8	576.5				
Intersection	2871	2.1		1.472		97.3	LOS F	41.6	1065.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

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PM PEAK

LANE LEVEL OF SERVICE

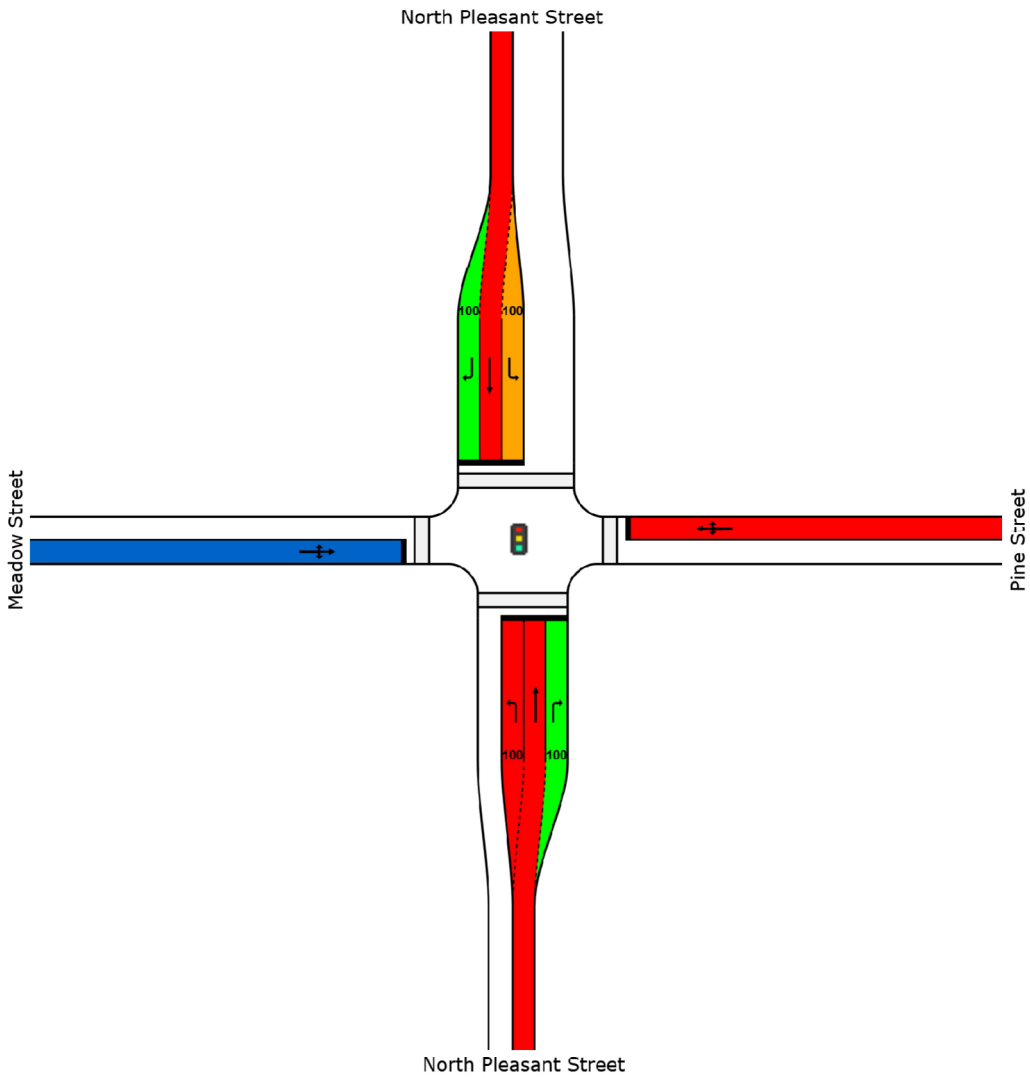
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	F	E	F	C	F



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

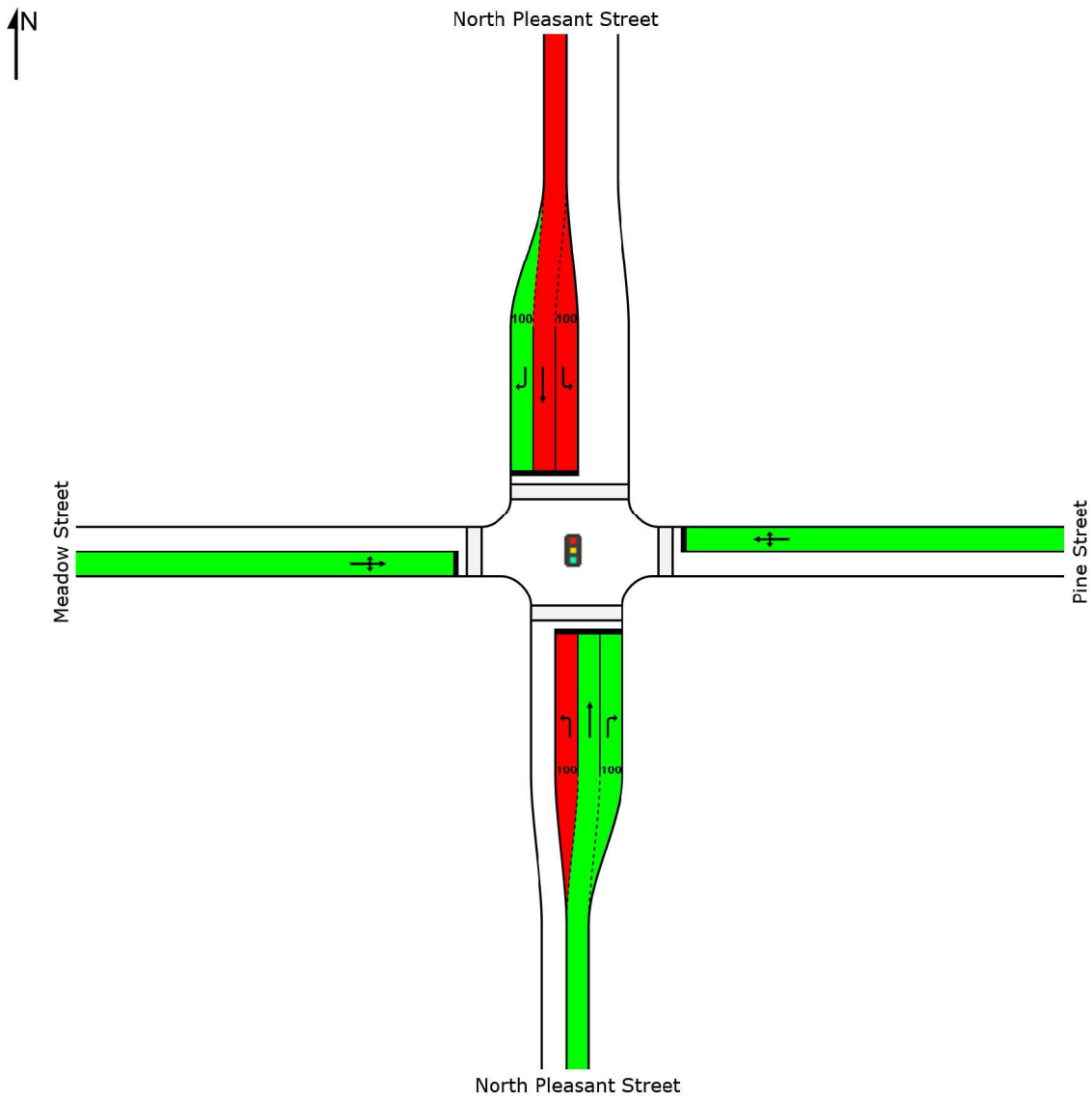
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	653	536	599	353	653



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	924	1.5	1689	0.547	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	924	1.5		0.547		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	370	0.8	269	1.376	100	227.2	LOS F	42.1	1058.8	Full	1600	0.0	0.0
Approach	370	0.8		1.376		227.2	LOS F	42.1	1058.8				
North: Sunderland Road													
Lane 1	379	1.7	1798	0.211	100	2.0	LOS A	0.2	4.5	Full	1600	0.0	0.0
Approach	379	1.7		0.211		2.0	NA	0.2	4.5				
Intersection	1673	1.4		1.376		50.7	NA	42.1	1058.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

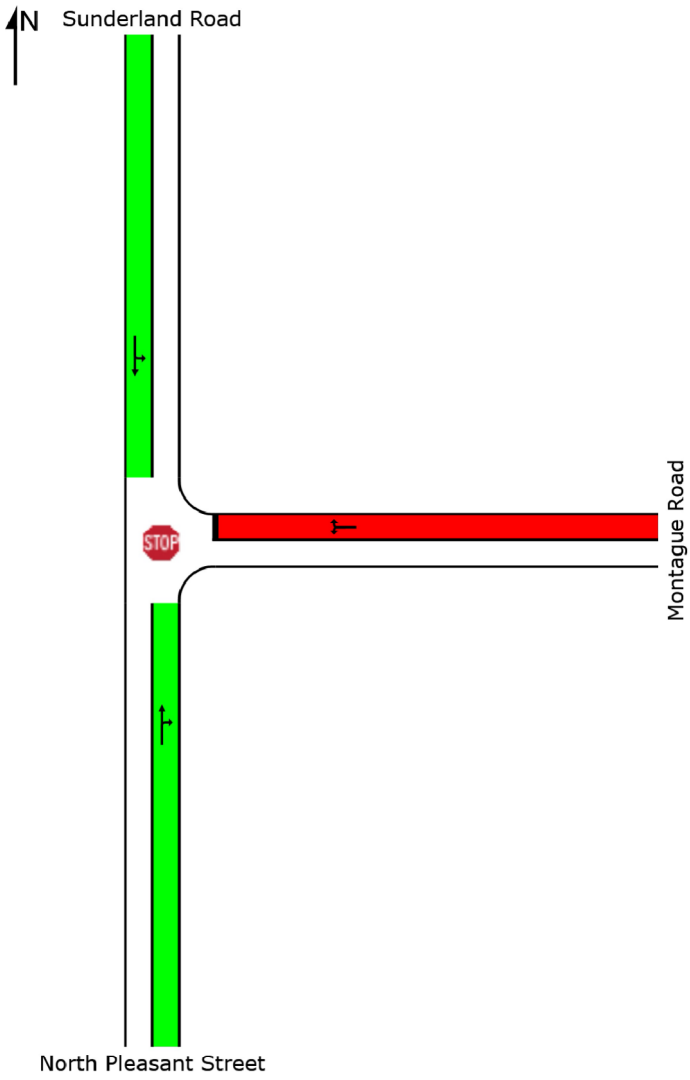
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

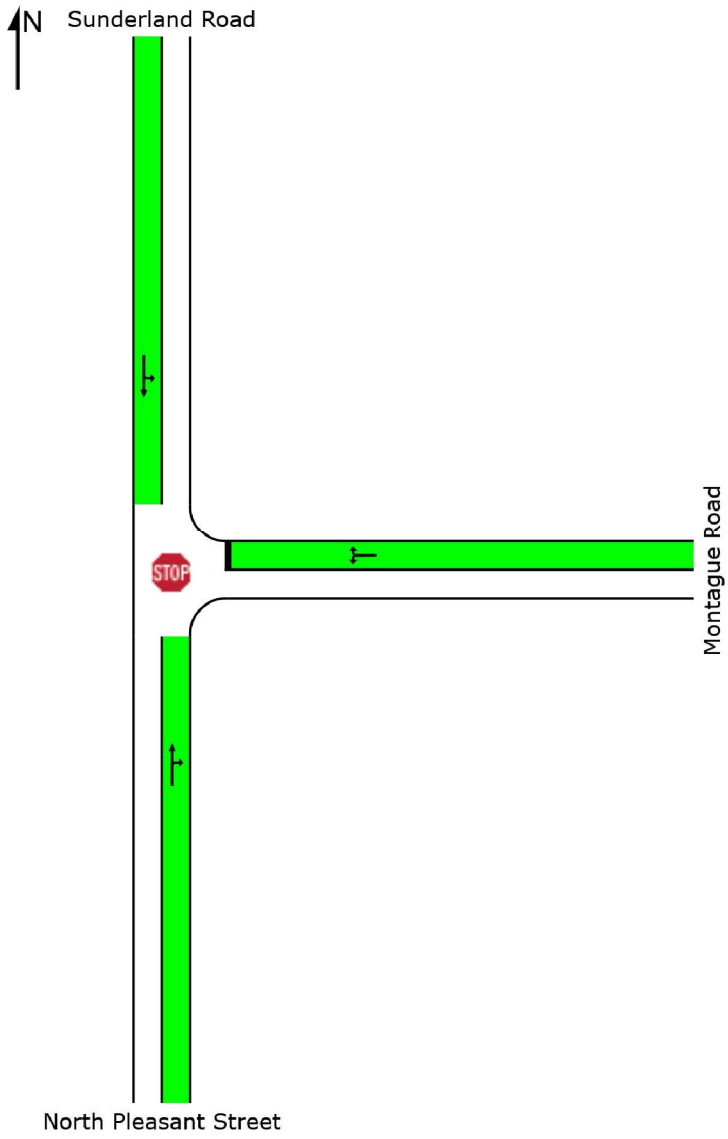
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	426	2	426



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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SATURDAY PEAK

LANE SUMMARY

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	128	1.3	189	0.675	100	45.1	LOS D	5.8	146.6	Short	100	0.0	NA
Lane 2	331	3.4	387[1]	0.855	100	45.0	LOS D	15.6	399.5	Full	1600	0.0	0.0
Lane 3	37	2.7	510	0.072	100	19.4	LOS B	1.0	26.6	Short	100	0.0	NA
Approach	495	2.8		0.855		43.1	LOS D	15.6	399.5				
East: Pine Street													
Lane 1	646	2.9	684	0.944	100	43.8	LOS D	32.3	826.2	Full	1600	0.0	0.0
Approach	646	2.9		0.944		43.8	LOS D	32.3	826.2				
North: North Pleasant Street													
Lane 1	214	0.5	178[1]	1.201	100	163.6	LOS F	18.0	451.2	Short	100	0.0	NA
Lane 2	294	0.4	304[1]	0.965	100	69.6	LOS E	15.8	395.7	Full	150	0.0	100.0[8]
Lane 3	238	0.9	975	0.244	100	3.2	LOS A	3.3	83.2	Short	100	0.0	NA
Approach	746	0.6		1.201		75.4	LOS E	18.0	451.2				
West: Meadow Street													
Lane 1	516	1.3	830	0.622	100	20.9	LOS C	18.1	456.6	Full	1600	0.0	0.0
Approach	516	1.3		0.622		20.9	LOS C	18.1	456.6				
Intersection	2402	1.8		1.201		48.6	LOS D	32.3	826.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
8 Probability of Blockage has been set on the basis of a queue that overflows from a short lane.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

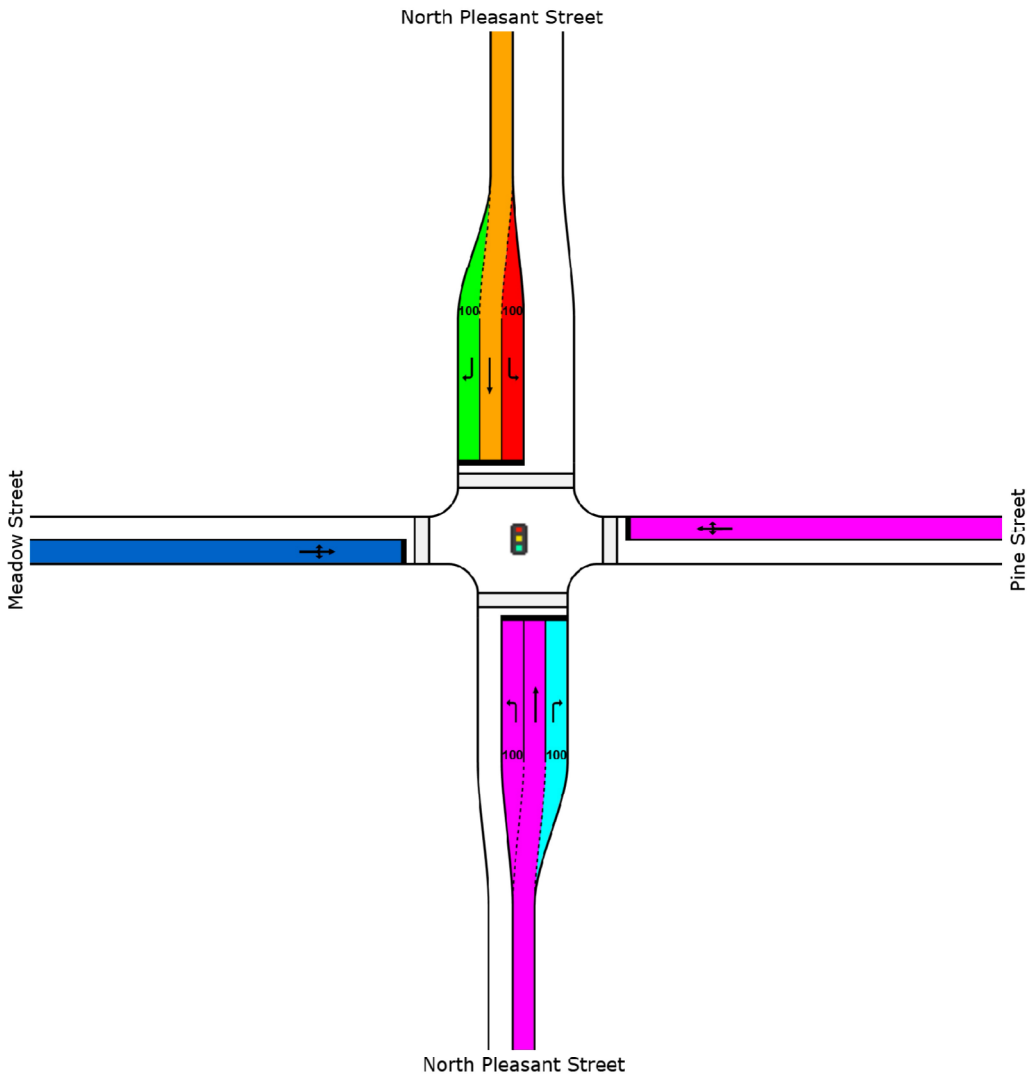
Lane Level of Service

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
LOS	D	D	E	C	D



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

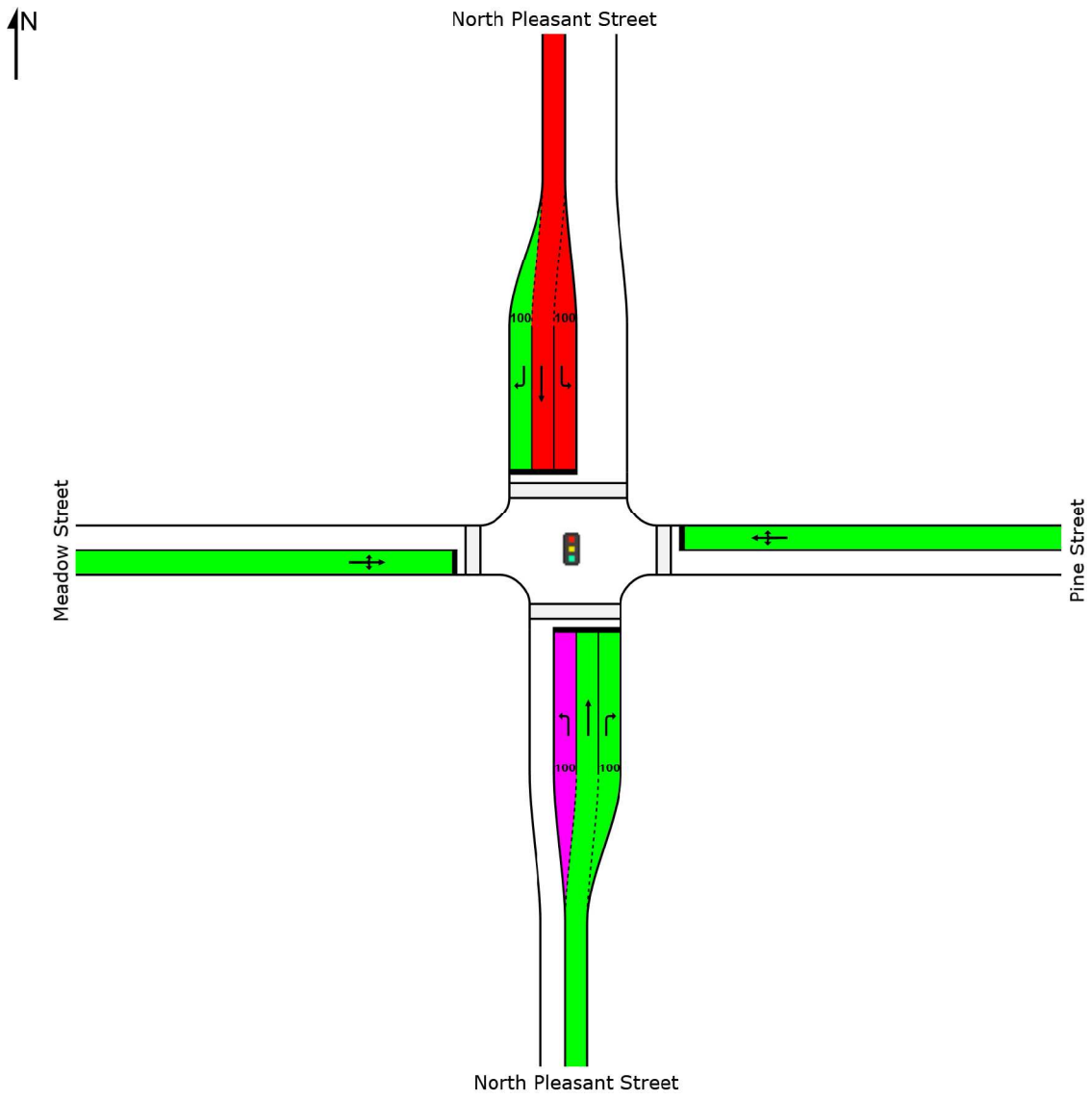
Average Back of Queue Distance per lane (feet)

Site: 101 [Pleasant/Meadow/Pine]

New Site
Signals - Pretimed Isolated Cycle Time = 85 seconds (User-Given Phase Times)

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	245	506	276	280	506



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	911	2.8	1669	0.546	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	911	2.8		0.546		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	441	0.5	292	1.510	100	278.8	LOS F	57.7	1448.8	Full	1600	0.0	2.1
Approach	441	0.5		1.510		278.8	LOS F	57.7	1448.8				
North: Sunderland Road													
Lane 1	309	0.5	1841	0.168	100	1.5	LOS A	0.1	2.4	Full	1600	0.0	0.0
Approach	309	0.5		0.168		1.5	NA	0.1	2.4				
Intersection	1661	1.8		1.510		74.4	NA	57.7	1448.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

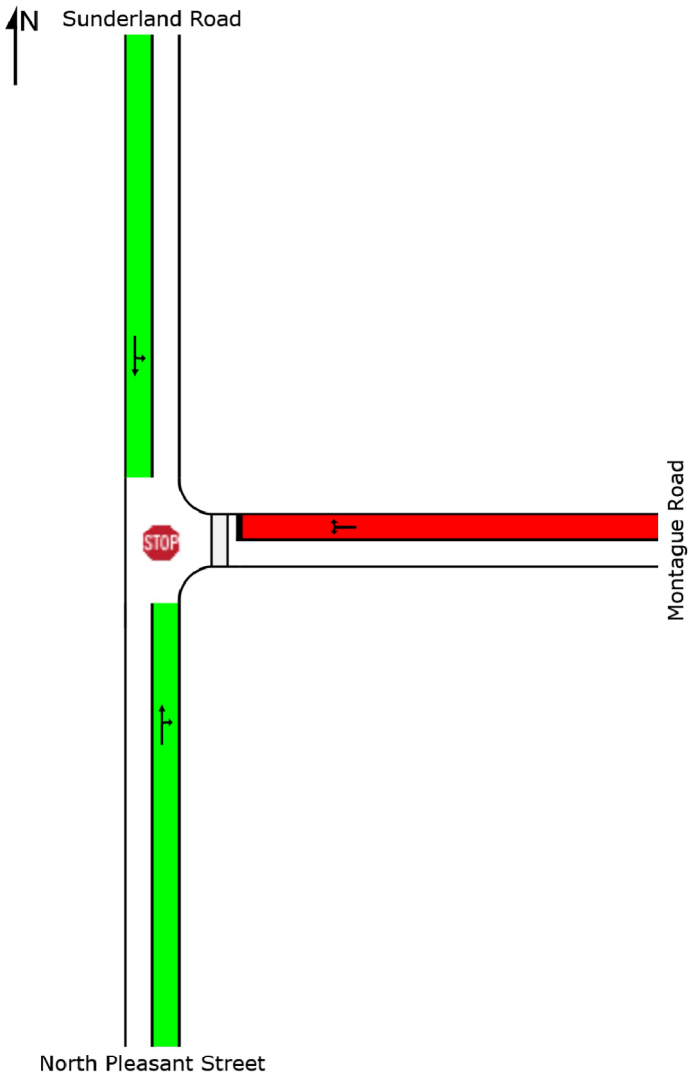
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

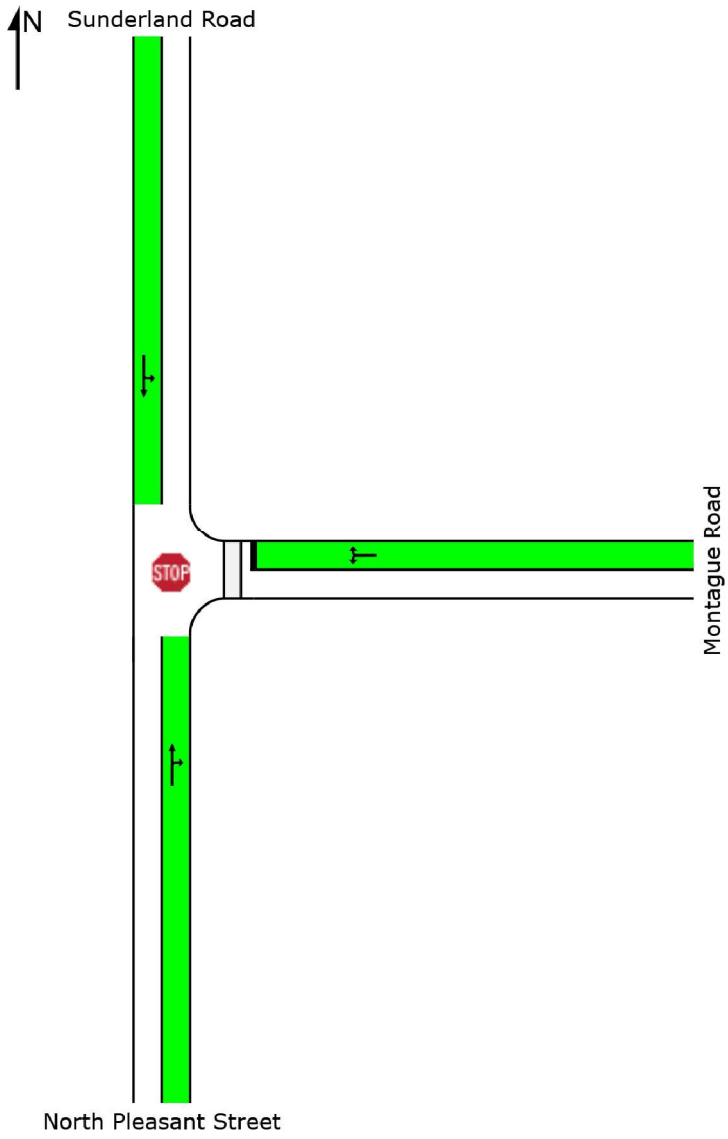
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	583	1	583



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 5

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	263	3.6	1079	0.244	100	5.6	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	263	3.6		0.244		5.6	LOS A	1.3	33.4				
East: Pine Street													
Lane 1[d]	281	0.5	1246	0.226	100	4.9	LOS A	1.3	32.2	Full	1600	0.0	0.0
Lane 2	260	1.9	1305	0.199	100	4.4	LOS A	1.1	28.3	Short	50	0.0	NA
Approach	540	1.2		0.226		4.7	LOS A	1.3	32.2				
North: North Pleasant Street													
Lane 1[d]	991	2.7	1254	0.790	100	16.6	LOS C	18.9	482.0	Full	400	0.0	10.8
Approach	991	2.7		0.790		16.6	LOS C	18.9	482.0				
West: Meadow Street													
Lane 1[d]	386	3.5	742	0.520	100	12.6	LOS B	3.6	93.4	Full	1600	0.0	0.0
Approach	386	3.5		0.520		12.6	LOS B	3.6	93.4				
Intersection	2180	2.6		0.790		11.6	LOS B	18.9	482.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

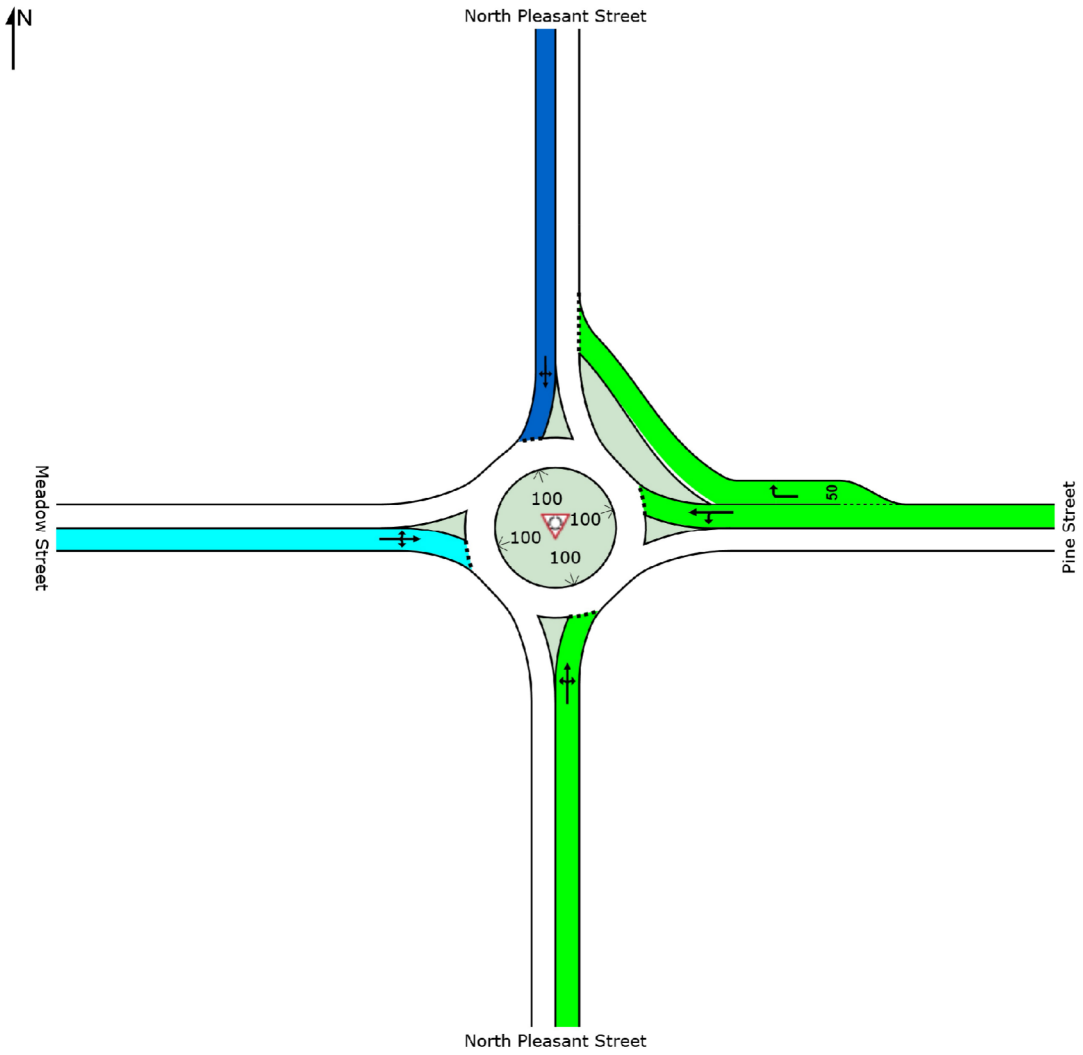
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	C	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

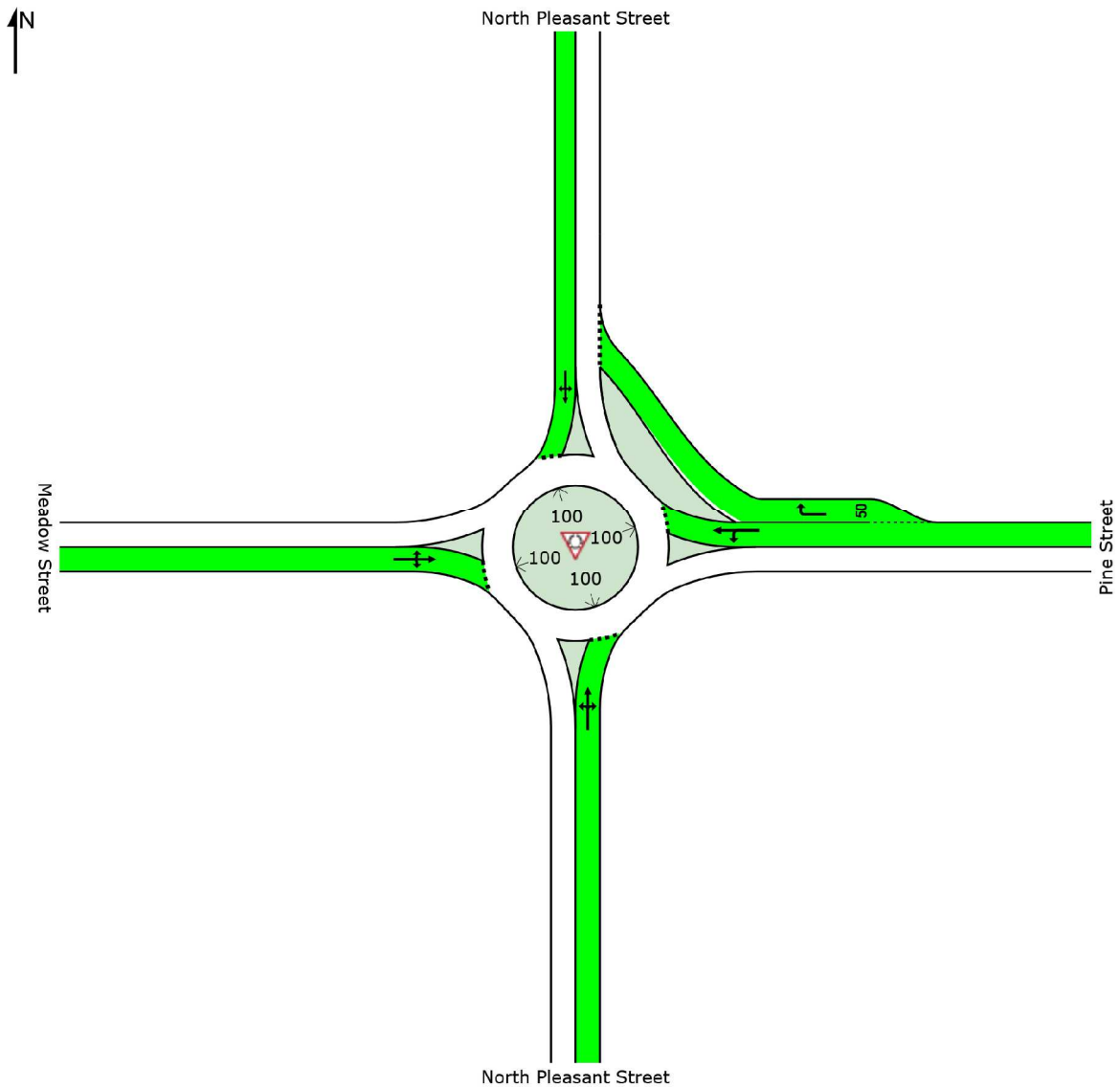
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	13	13	194	38	194



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	434	0.6	957	0.453	100	9.1	LOS A	2.8	69.2	Full	1600	0.0	0.0
Approach	434	0.6		0.453		9.1	LOS A	2.8	69.2				
NorthWest: Sunderland Road													
Lane 1[d]	481	2.8	802	0.599	100	14.0	LOS B	5.4	138.3	Full	1600	0.0	0.0
Approach	481	2.8		0.599		14.0	LOS B	5.4	138.3				
SouthWest: Montague Road													
Lane 1[d]	508	1.8	1290	0.393	100	6.6	LOS A	2.5	64.6	Full	400	0.0	0.0
Approach	508	1.8		0.393		6.6	LOS A	2.5	64.6				
Intersection	1422	1.8		0.599		9.8	LOS A	5.4	138.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

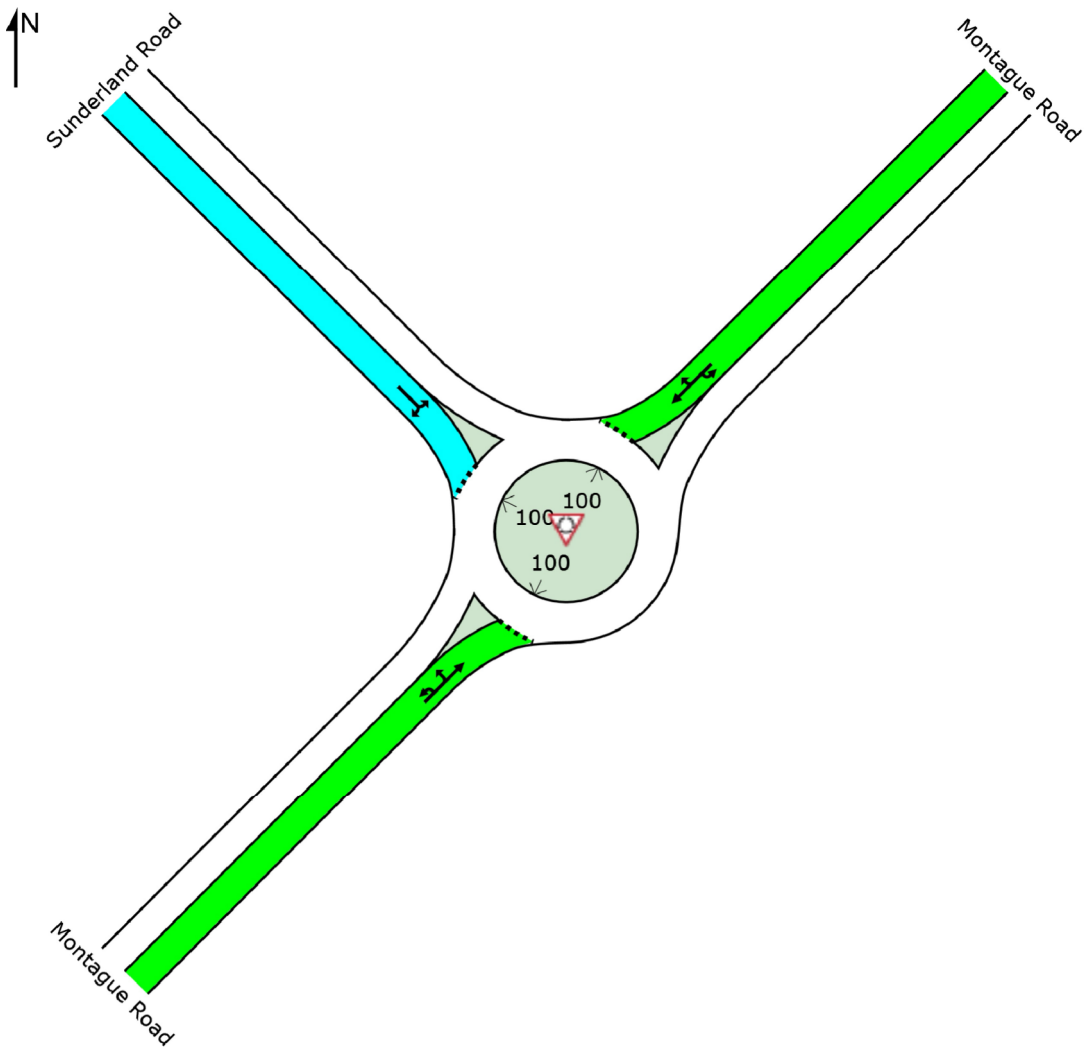
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

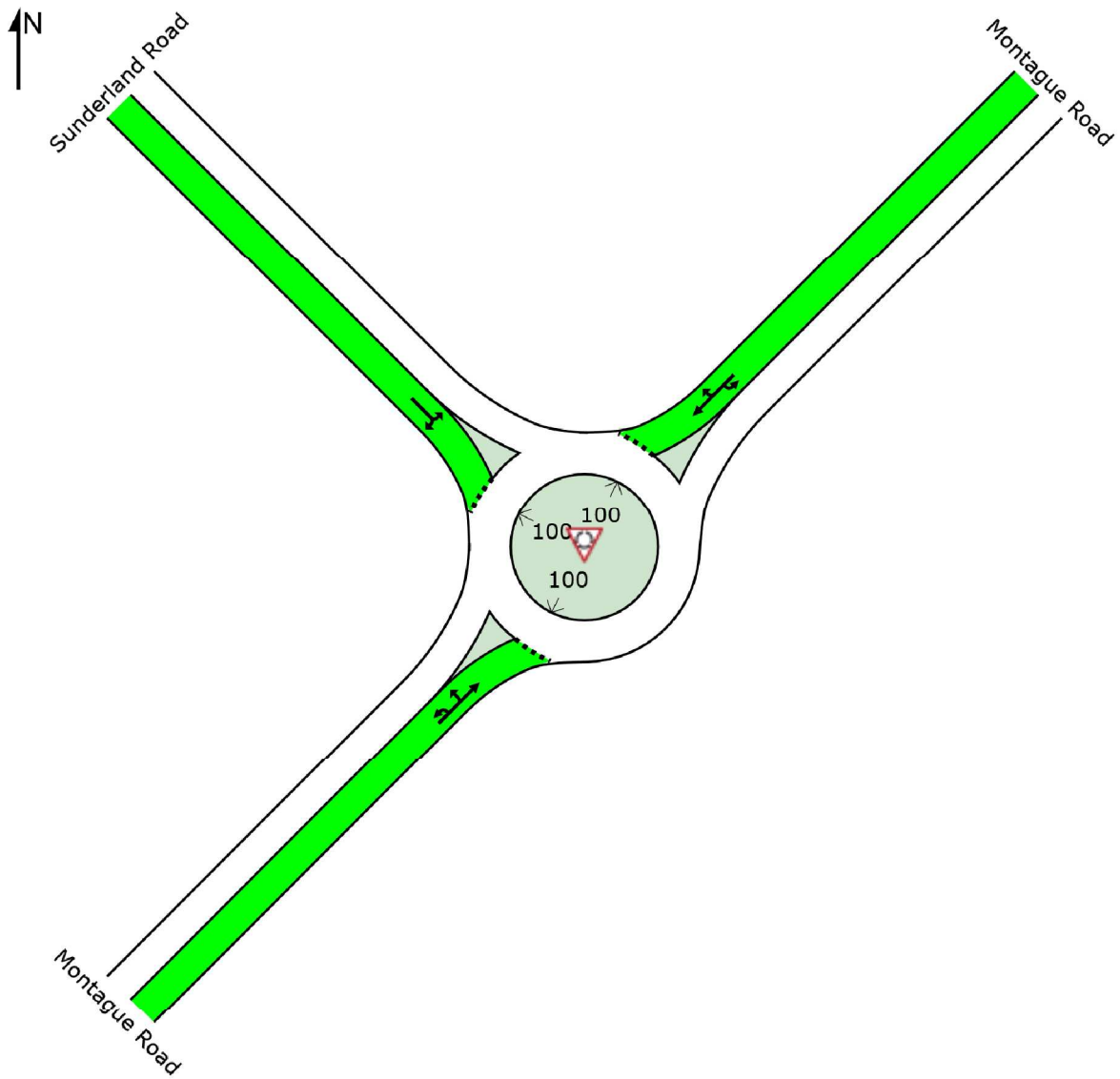
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	28	56	26	56



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	886	1.9	1004	0.883	100	27.7	LOS D	21.7	551.4	Full	1600	0.0	0.0
Approach	886	1.9		0.883		27.7	LOS D	21.7	551.4				
East: Pine Street													
Lane 1[d]	434	0.7	679	0.640	100	17.4	LOS C	5.3	132.4	Full	1600	0.0	0.0
Lane 2	249	6.5	827	0.301	100	7.7	LOS A	1.5	38.8	Short	50	0.0	NA
Approach	683	2.8		0.640		13.9	LOS B	5.3	132.4				
North: North Pleasant Street													
Lane 1[d]	720	2.5	891	0.808	100	22.7	LOS C	12.9	329.4	Full	400	0.0	0.0
Approach	720	2.5		0.808		22.7	LOS C	12.9	329.4				
West: Meadow Street													
Lane 1[d]	632	1.3	773	0.818	100	26.0	LOS D	11.5	289.8	Full	1600	0.0	0.0
Approach	632	1.3		0.818		26.0	LOS D	11.5	289.8				
Intersection	2922	2.1		0.883		22.9	LOS C	21.7	551.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

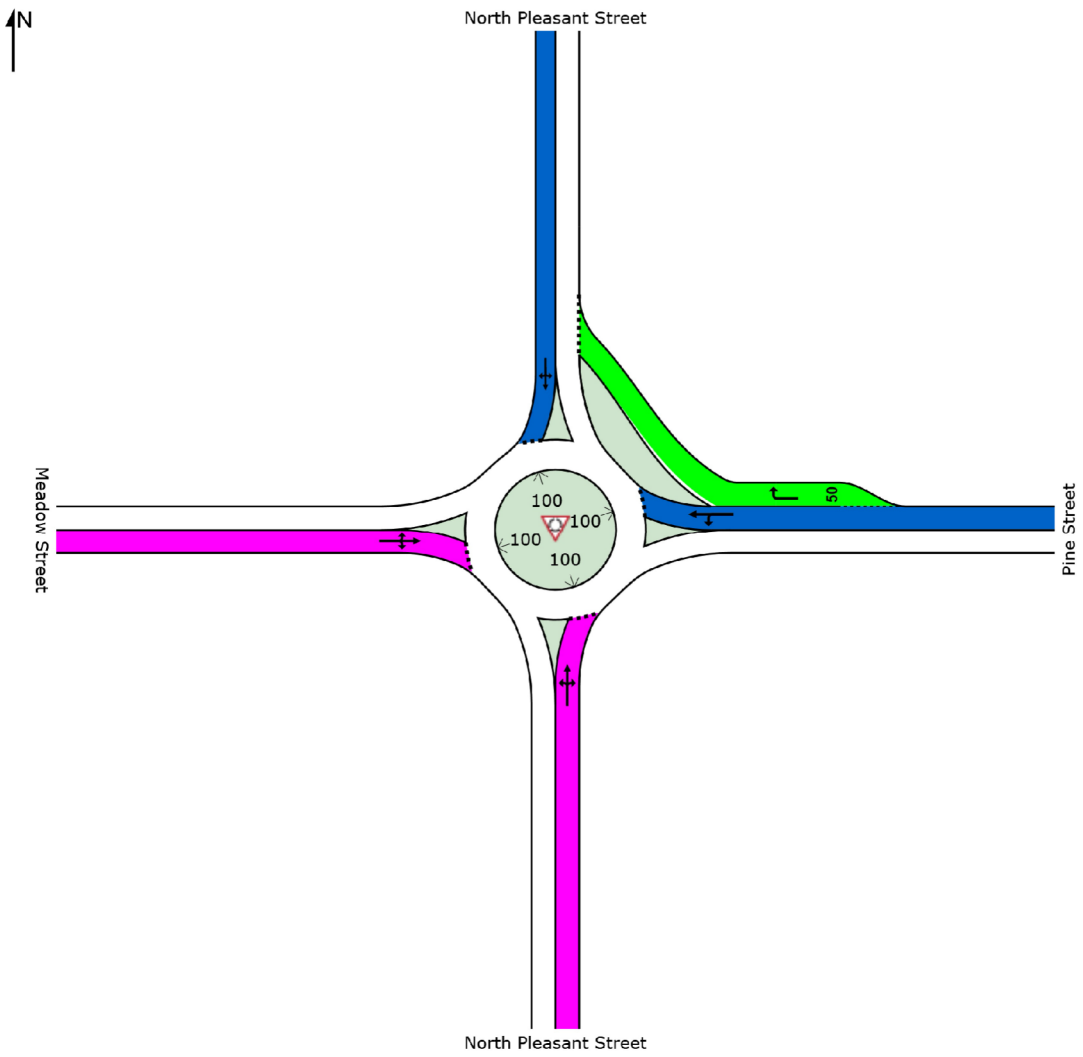
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	D	B	C	D	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

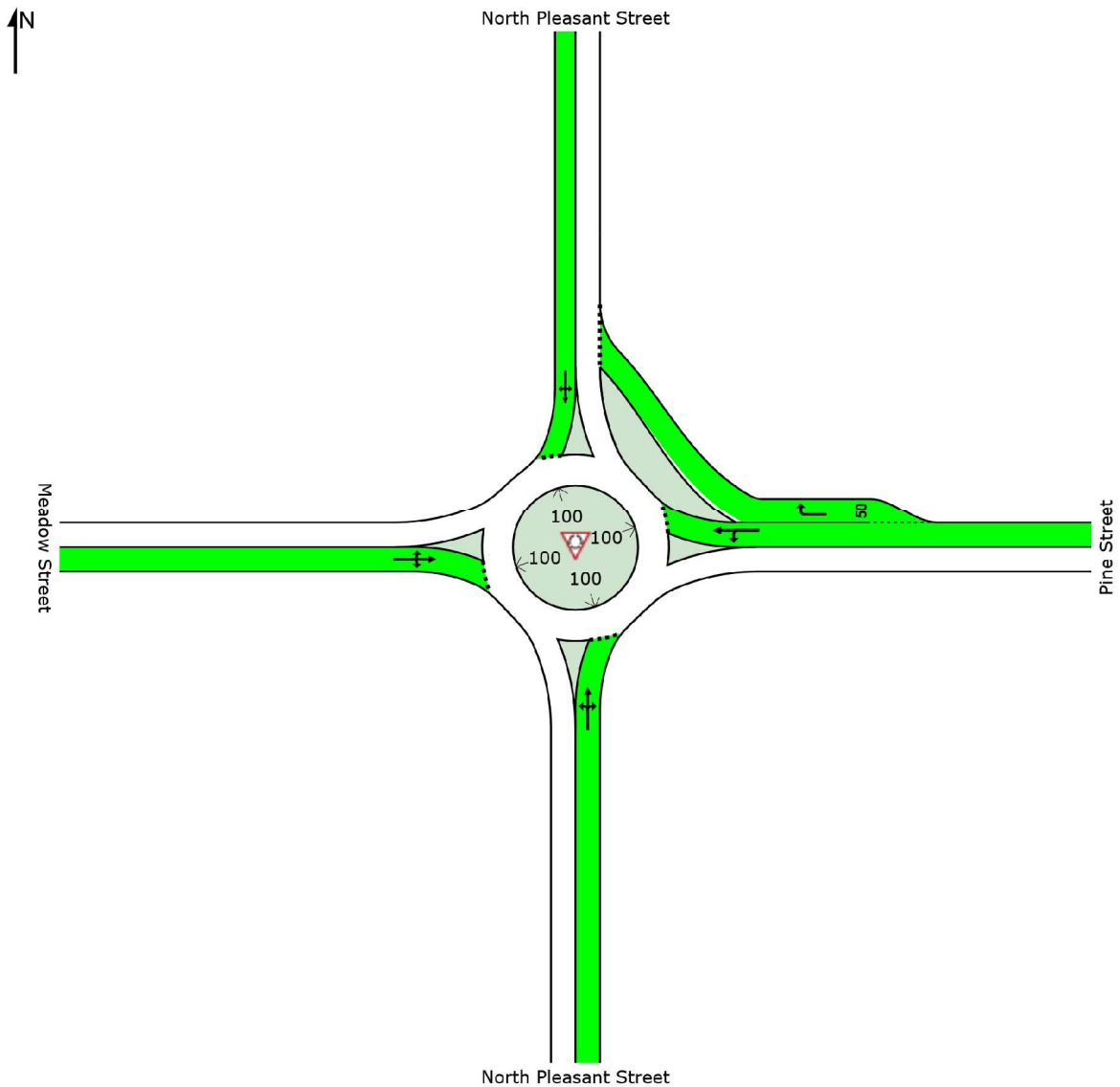
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	222	53	133	117	222



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	303	0.8	875	0.346	100	8.0	LOS A	1.7	43.5	Full	1600	0.0	0.0
Approach	303	0.8		0.346		8.0	LOS A	1.7	43.5				
NorthWest: Sunderland Road													
Lane 1[d]	377	1.6	934	0.404	100	8.5	LOS A	2.2	54.9	Full	1600	0.0	0.0
Approach	377	1.6		0.404		8.5	LOS A	2.2	54.9				
SouthWest: Montague Road													
Lane 1[d]	878	1.5	1313	0.669	100	11.4	LOS B	7.6	191.3	Full	400	0.0	0.0
Approach	878	1.5		0.669		11.4	LOS B	7.6	191.3				
Intersection	1558	1.4		0.669		10.0	LOS B	7.6	191.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

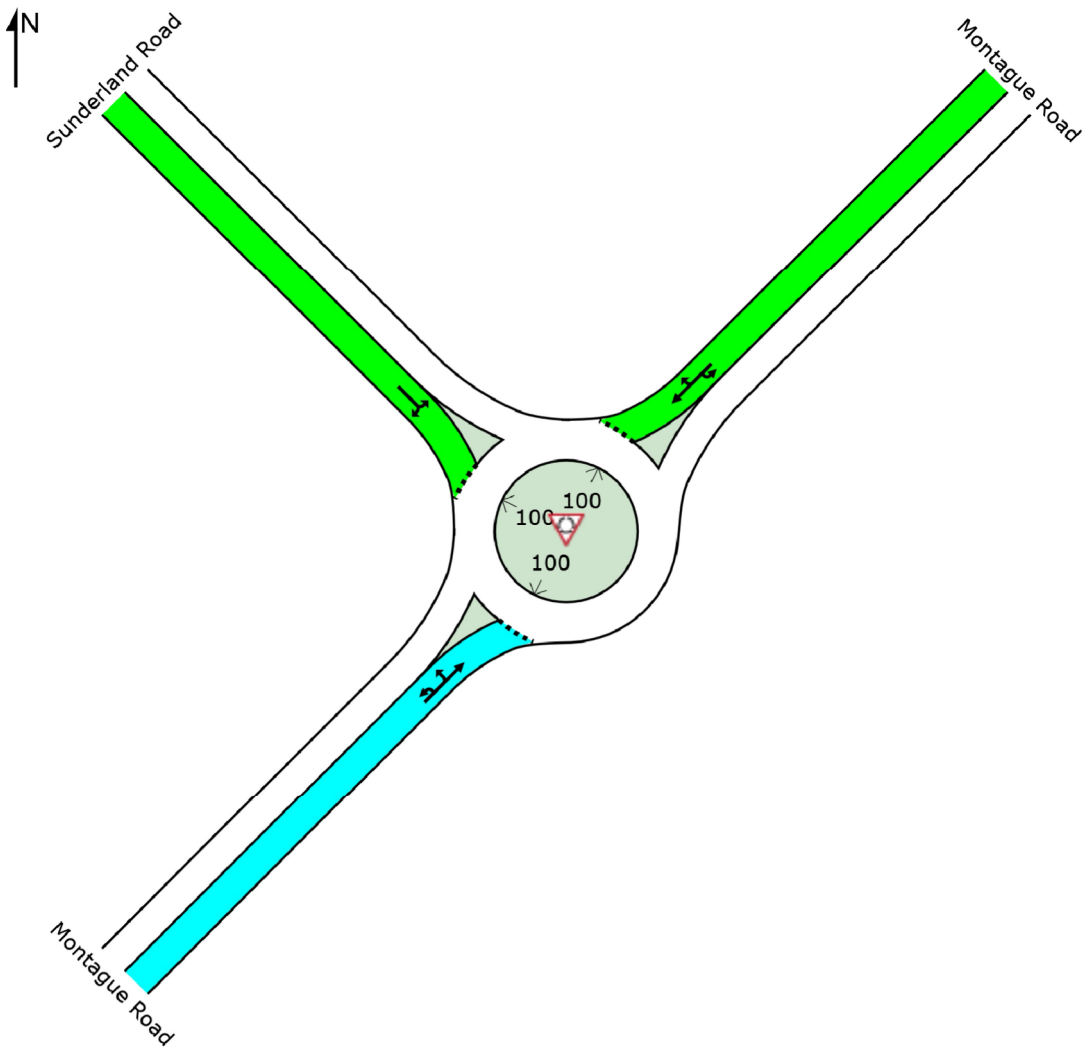
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

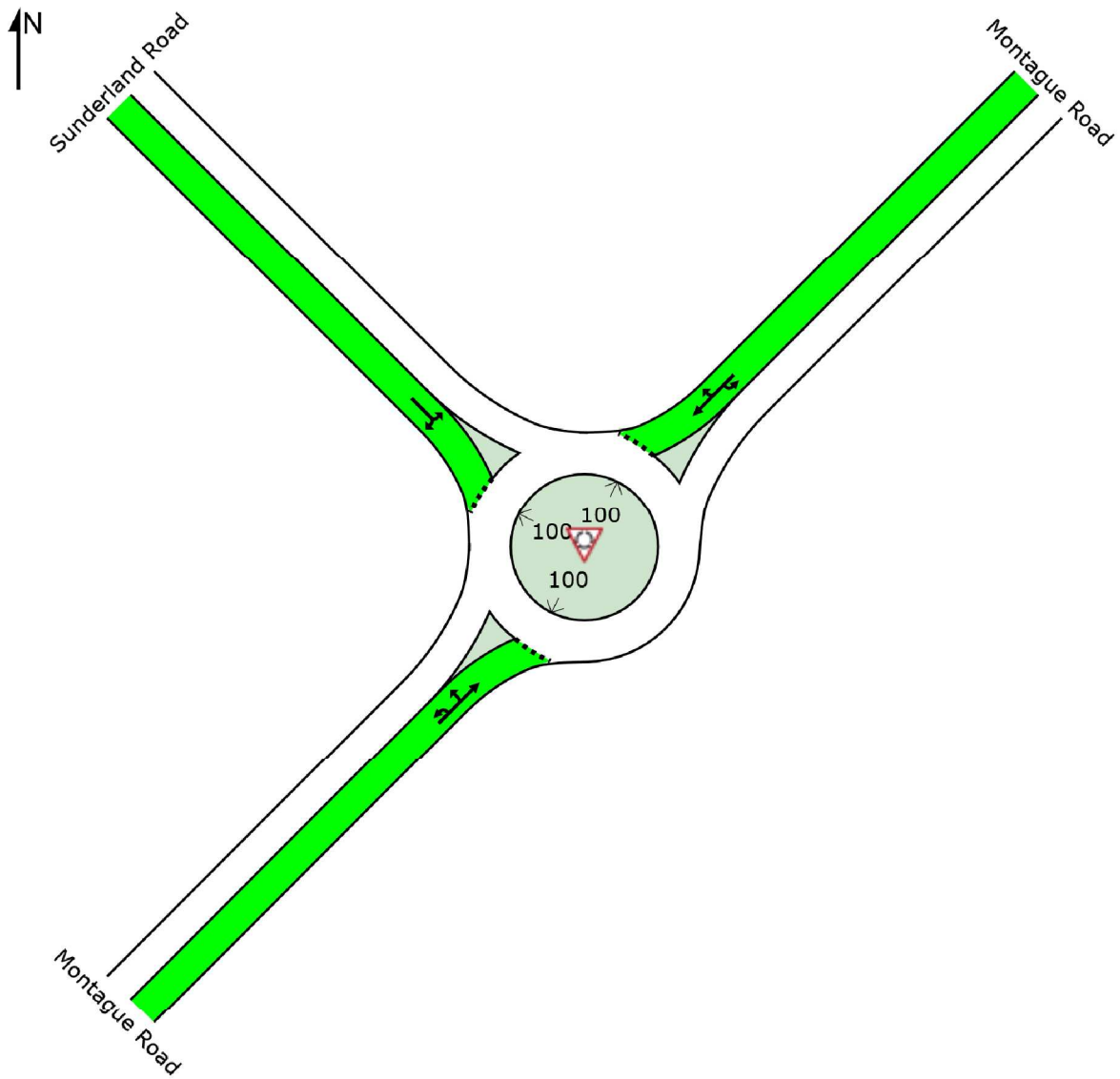
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	17	22	77	77



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	495	2.8	969	0.511	100	10.1	LOS B	4.1	103.9	Full	1600	0.0	0.0
Approach	495	2.8		0.511		10.1	LOS B	4.1	103.9				
East: Pine Street													
Lane 1[d]	315	2.1	885	0.356	100	8.1	LOS A	1.9	49.0	Full	1600	0.0	0.0
Lane 2	331	3.7	989	0.334	100	7.1	LOS A	1.8	47.1	Short	50	0.0	NA
Approach	646	2.9		0.356		7.6	LOS A	1.9	49.0				
North: North Pleasant Street													
Lane 1[d]	746	0.6	1154	0.646	100	11.8	LOS B	8.4	211.1	Full	400	0.0	0.0
Approach	746	0.6		0.646		11.8	LOS B	8.4	211.1				
West: Meadow Street													
Lane 1[d]	516	1.3	1019	0.506	100	9.6	LOS A	4.1	103.6	Full	1600	0.0	0.0
Approach	516	1.3		0.506		9.6	LOS A	4.1	103.6				
Intersection	2402	1.8		0.646		9.9	LOS A	8.4	211.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SATURDAY PEAK

LANE LEVEL OF SERVICE

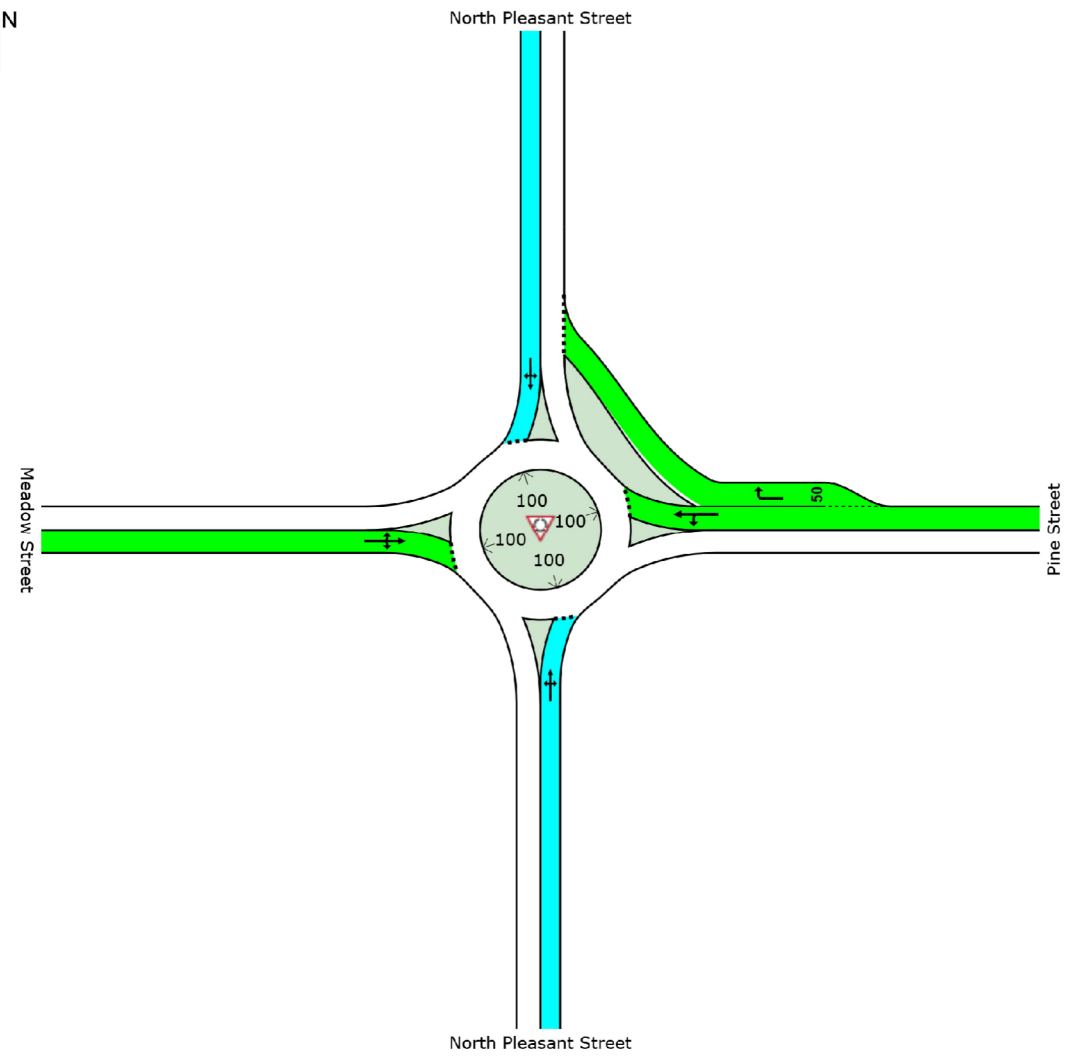
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

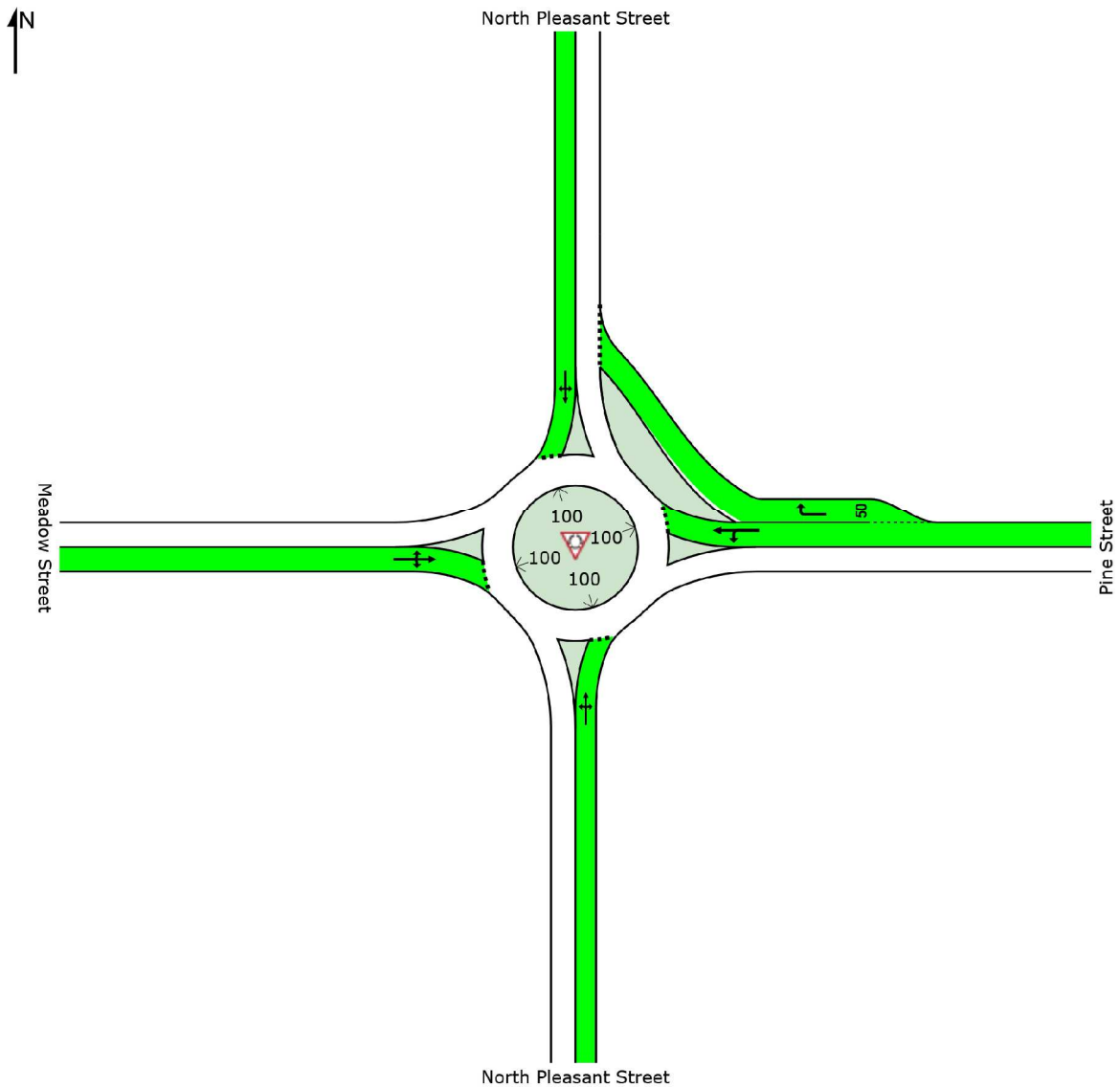
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	42	20	85	42	85



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1[d]	314	0.5	953	0.329	100	7.3	LOS A	1.7	42.3	Full	1600	0.0	0.0
Approach	314	0.5		0.329		7.3	LOS A	1.7	42.3				
NorthWest: Sunderland Road													
Lane 1[d]	279	0.5	931	0.299	100	7.0	LOS A	1.5	37.1	Full	1600	0.0	0.0
Approach	279	0.5		0.299		7.0	LOS A	1.5	37.1				
SouthWest: Montague Road													
Lane 1[d]	734	2.1	1312	0.559	100	9.0	LOS A	4.9	124.3	Full	400	0.0	0.0
Approach	734	2.1		0.559		9.0	LOS A	4.9	124.3				
Intersection	1326	1.4		0.559		8.2	LOS A	4.9	124.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

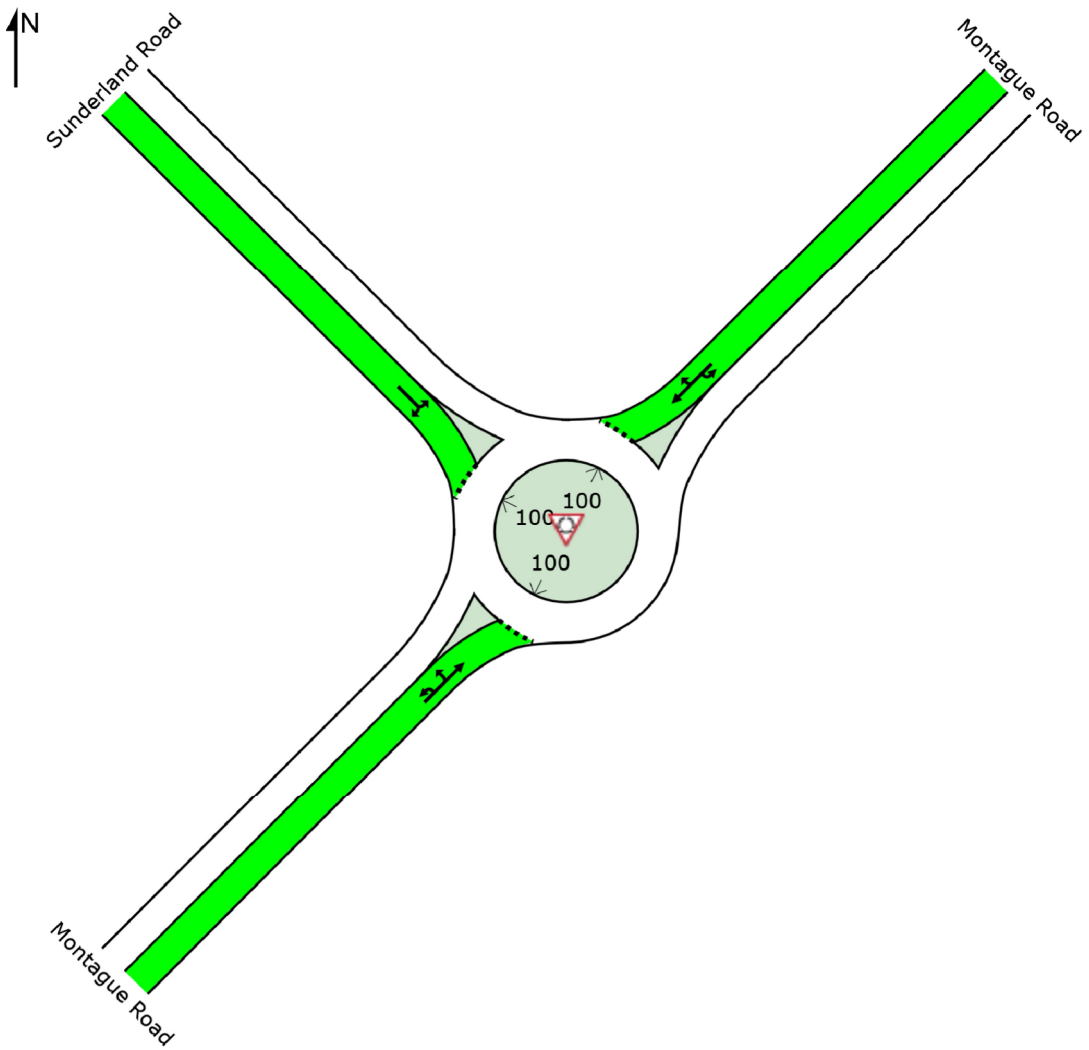
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

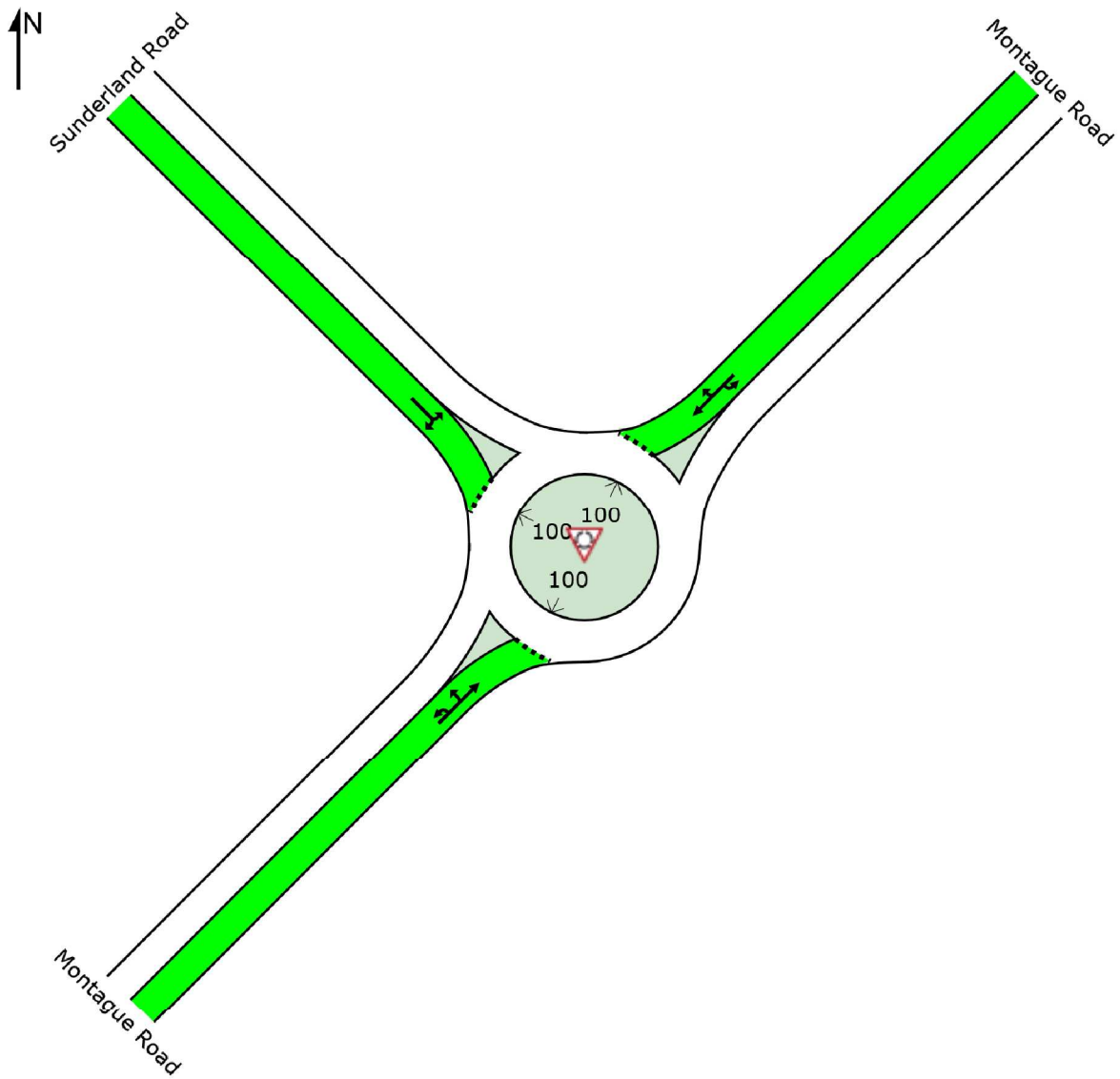
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	17	15	50	50



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 6

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	263	3.6	1079	0.244	100	5.6	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	263	3.6		0.244		5.6	LOS A	1.3	33.4				
East: Pine Street													
Lane 1[d]	281	0.5	1246	0.226	100	4.9	LOS A	1.3	32.2	Full	1600	0.0	0.0
Lane 2	260	1.9	1305	0.199	100	4.4	LOS A	1.1	28.3	Short	50	0.0	NA
Approach	540	1.2		0.226		4.7	LOS A	1.3	32.2				
North: North Pleasant Street													
Lane 1[d]	991	2.7	1254	0.790	100	16.6	LOS C	18.9	482.0	Full	400	0.0	10.8
Approach	991	2.7		0.790		16.6	LOS C	18.9	482.0				
West: Meadow Street													
Lane 1[d]	386	3.5	742	0.520	100	12.6	LOS B	3.6	93.4	Full	1600	0.0	0.0
Approach	386	3.5		0.520		12.6	LOS B	3.6	93.4				
Intersection	2180	2.6		0.790		11.6	LOS B	18.9	482.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

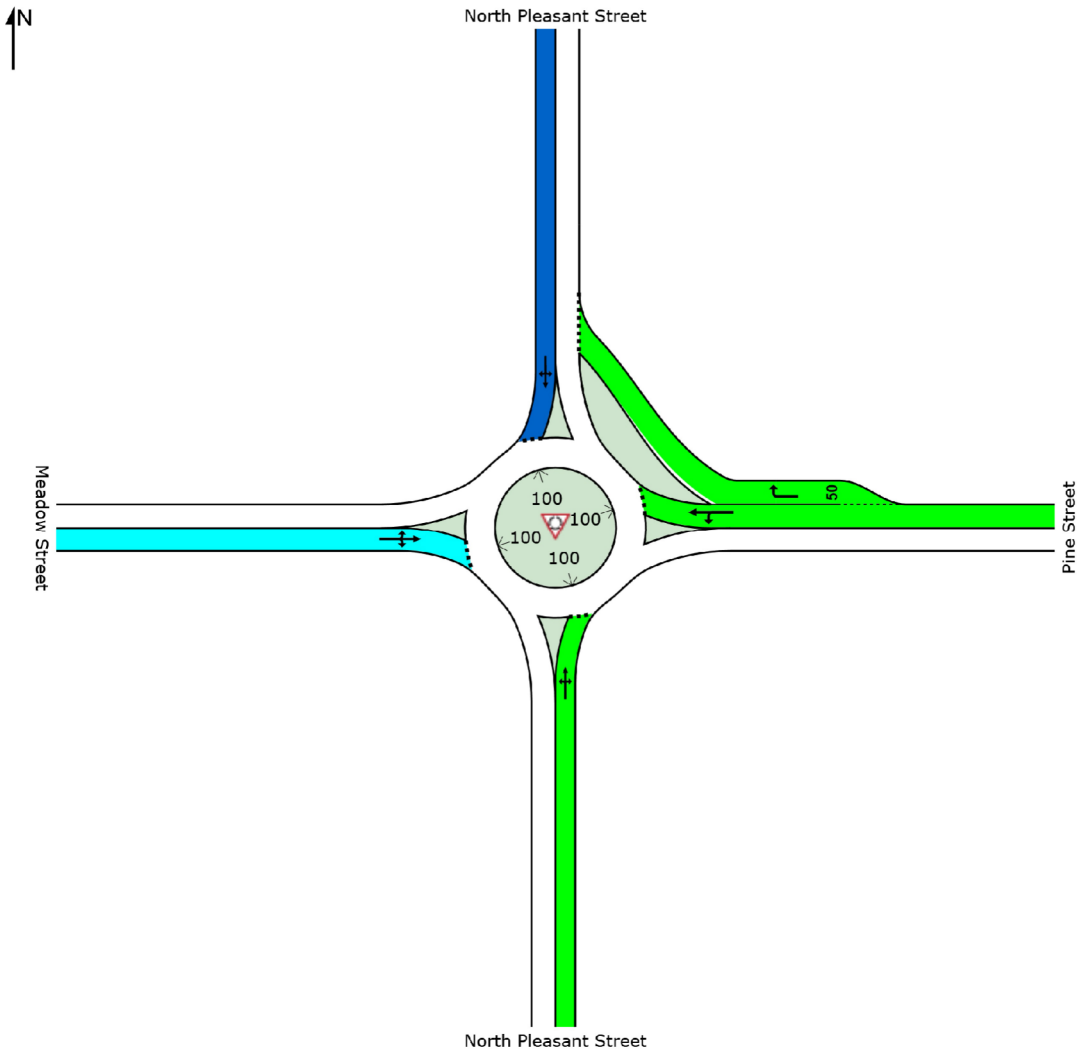
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	C	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

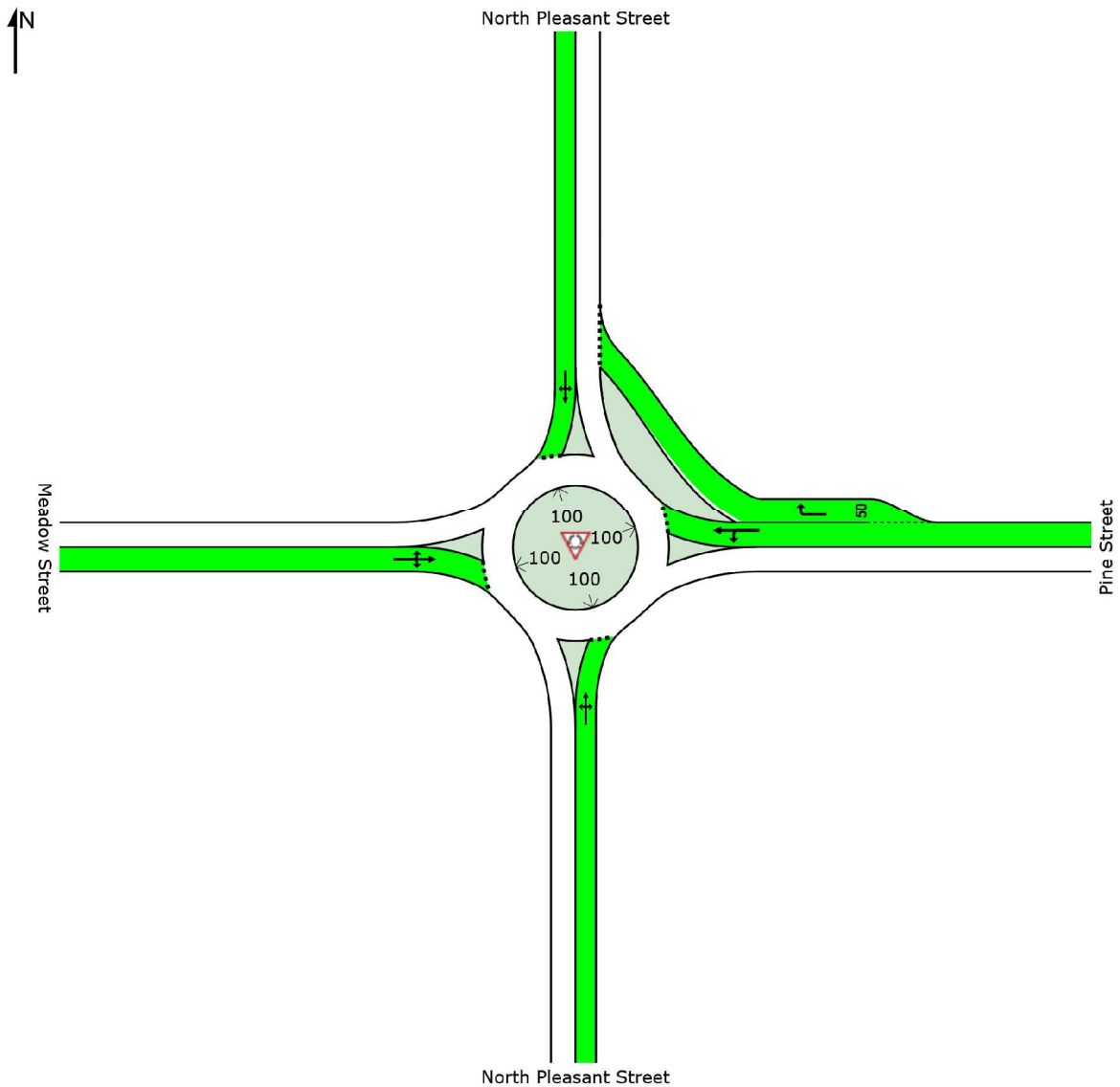
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	13	13	194	38	194



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	129	1.9	867	0.148	100	5.6	LOS A	0.6	16.0	Full	20	0.0	0.0
Approach	129	1.9		0.148		5.6	LOS A	0.6	16.0				
NorthEast: Montague Road													
Lane 1[d]	452	0.5	943	0.479	100	9.7	LOS A	3.3	82.1	Full	1600	0.0	0.0
Approach	452	0.5		0.479		9.7	LOS A	3.3	82.1				
NorthWest: Sunderland Road													
Lane 1[d]	481	2.8	777	0.619	100	14.9	LOS B	5.7	145.7	Full	1600	0.0	0.0
Approach	481	2.8		0.619		14.9	LOS B	5.7	145.7				
SouthWest: Montague Road													
Lane 1[d]	429	1.8	1298	0.331	100	5.8	LOS A	2.0	49.9	Full	400	0.0	0.0
Approach	429	1.8		0.331		5.8	LOS A	2.0	49.9				
Intersection	1490	1.7		0.619		9.9	LOS A	5.7	145.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

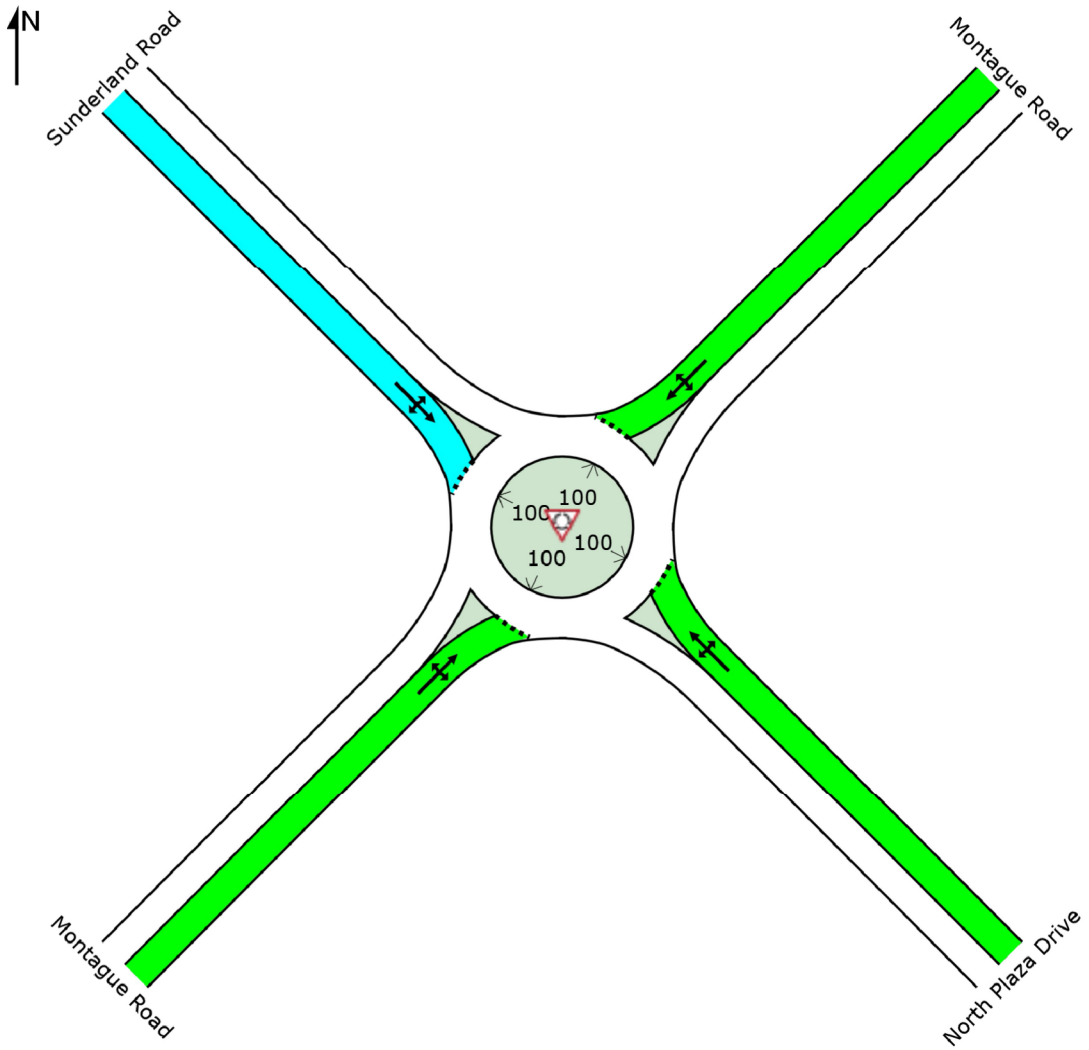
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

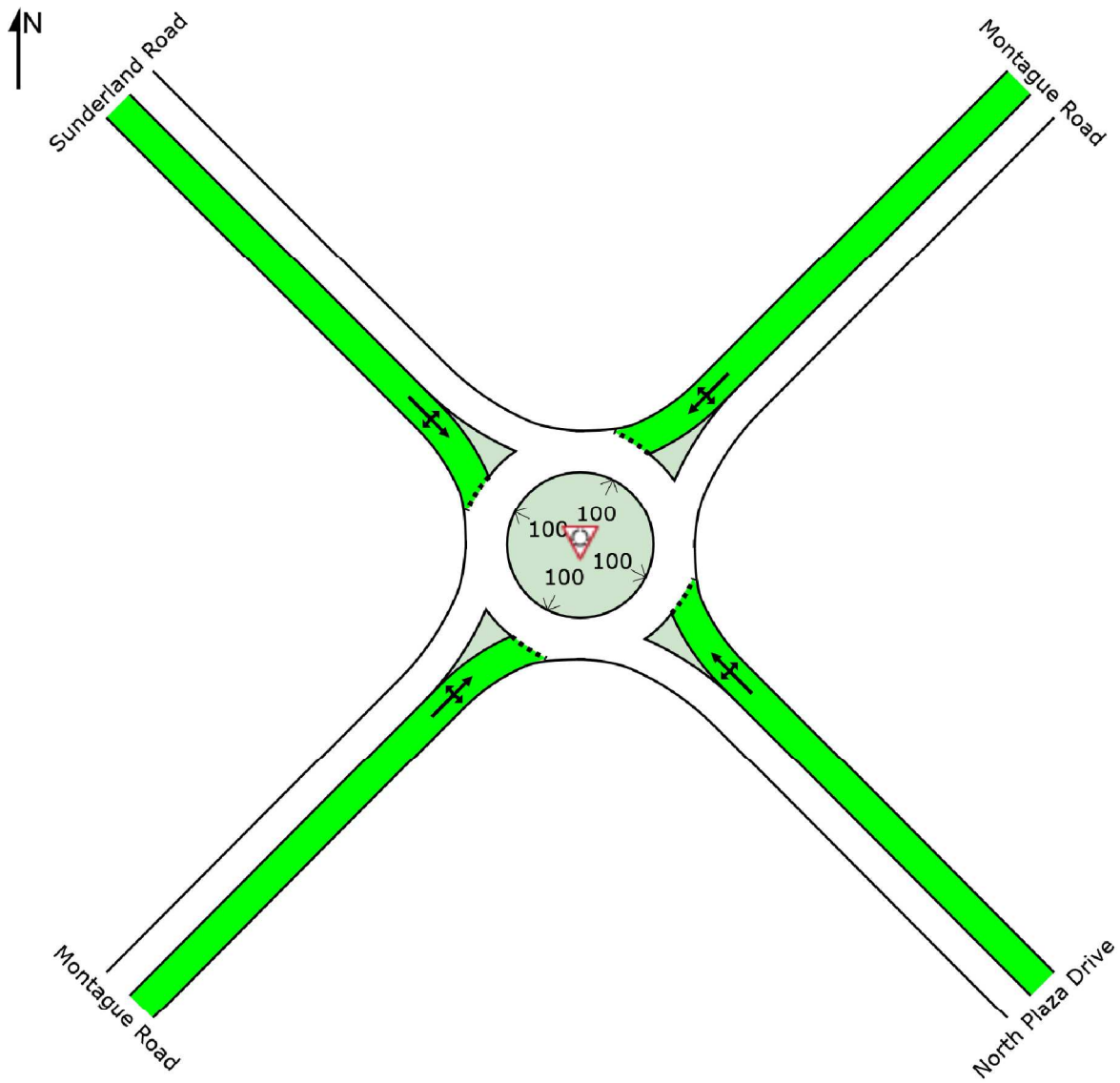
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	6	33	59	20	59



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	886	1.9	1004	0.883	100	27.7	LOS D	21.7	551.4	Full	1600	0.0	0.0
Approach	886	1.9		0.883		27.7	LOS D	21.7	551.4				
East: Pine Street													
Lane 1[d]	434	0.7	679	0.640	100	17.4	LOS C	5.3	132.4	Full	1600	0.0	0.0
Lane 2	249	6.5	827	0.301	100	7.7	LOS A	1.5	38.8	Short	50	0.0	NA
Approach	683	2.8		0.640		13.9	LOS B	5.3	132.4				
North: North Pleasant Street													
Lane 1[d]	720	2.5	891	0.808	100	22.7	LOS C	12.9	329.4	Full	400	0.0	0.0
Approach	720	2.5		0.808		22.7	LOS C	12.9	329.4				
West: Meadow Street													
Lane 1[d]	632	1.3	773	0.818	100	26.0	LOS D	11.5	289.8	Full	1600	0.0	0.0
Approach	632	1.3		0.818		26.0	LOS D	11.5	289.8				
Intersection	2922	2.1		0.883		22.9	LOS C	21.7	551.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

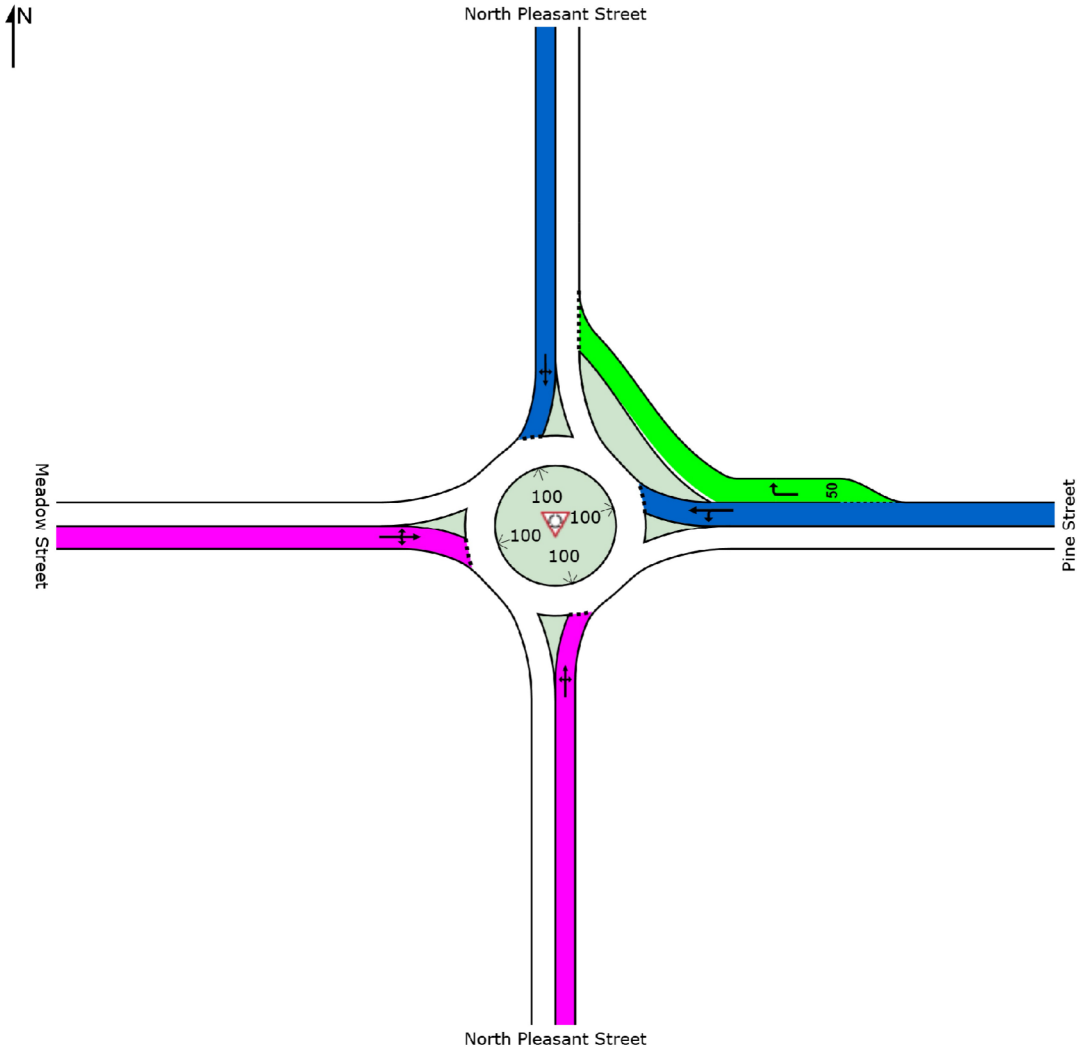
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	D	B	C	D	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

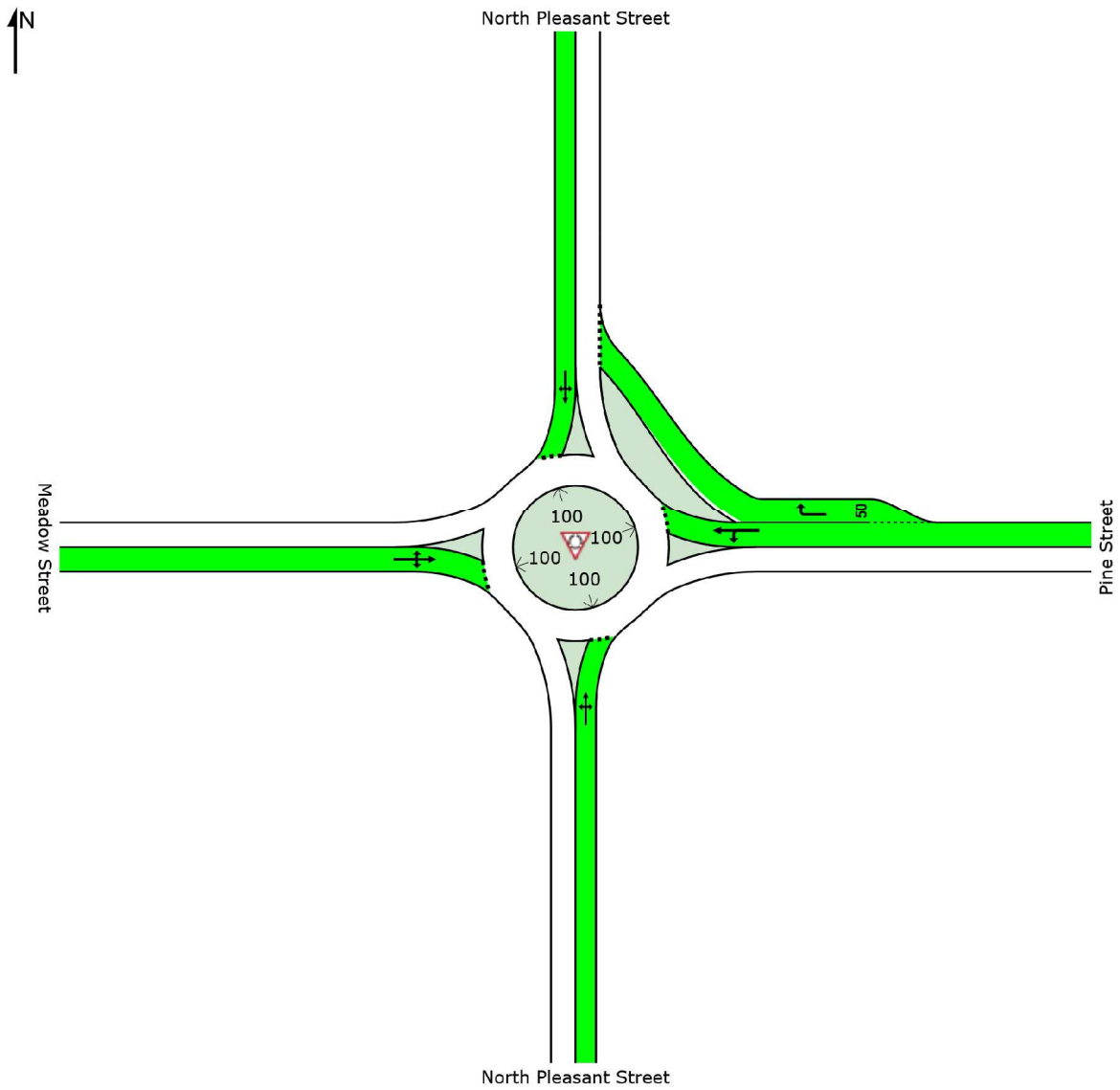
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	222	53	133	117	222



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	135	0.9	572	0.236	100	9.4	LOS A	1.0	24.0	Full	20	0.0	10.7
Approach	135	0.9		0.236		9.4	LOS A	1.0	24.0				
NorthEast: Montague Road													
Lane 1[d]	312	0.5	856	0.365	100	8.4	LOS A	1.8	46.0	Full	1600	0.0	0.0
Approach	312	0.5		0.365		8.4	LOS A	1.8	46.0				
NorthWest: Sunderland Road													
Lane 1[d]	773	1.6	922	0.838	100	24.6	LOS C	19.3	487.4	Full	1600	0.0	0.0
Approach	773	1.6		0.838		24.6	LOS C	19.3	487.4				
SouthWest: Montague Road													
Lane 1[d]	859	1.5	1307	0.657	100	11.2	LOS B	7.2	181.2	Full	400	0.0	0.0
Approach	859	1.5		0.657		11.2	LOS B	7.2	181.2				
Intersection	2080	1.3		0.838		15.6	LOS C	19.3	487.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

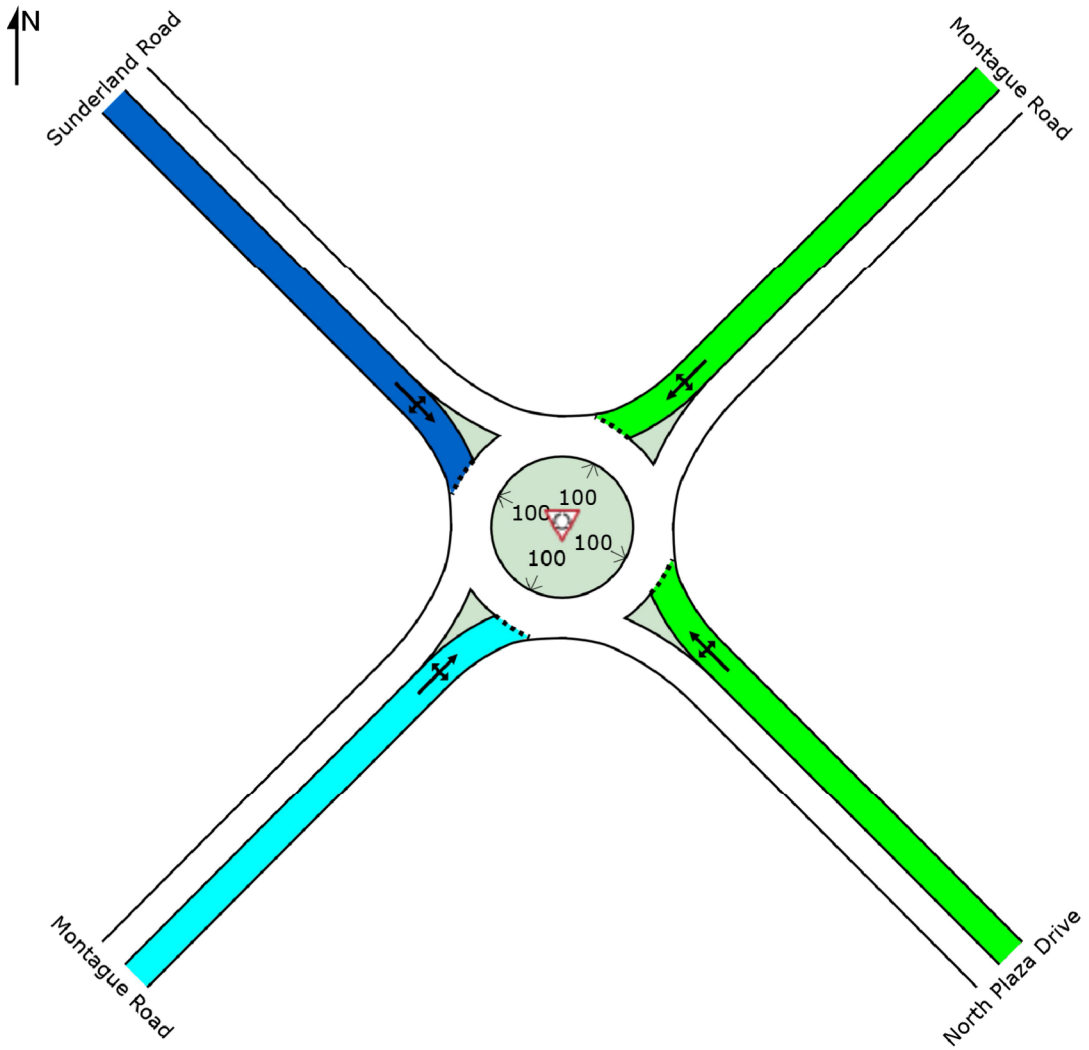
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	C	B	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

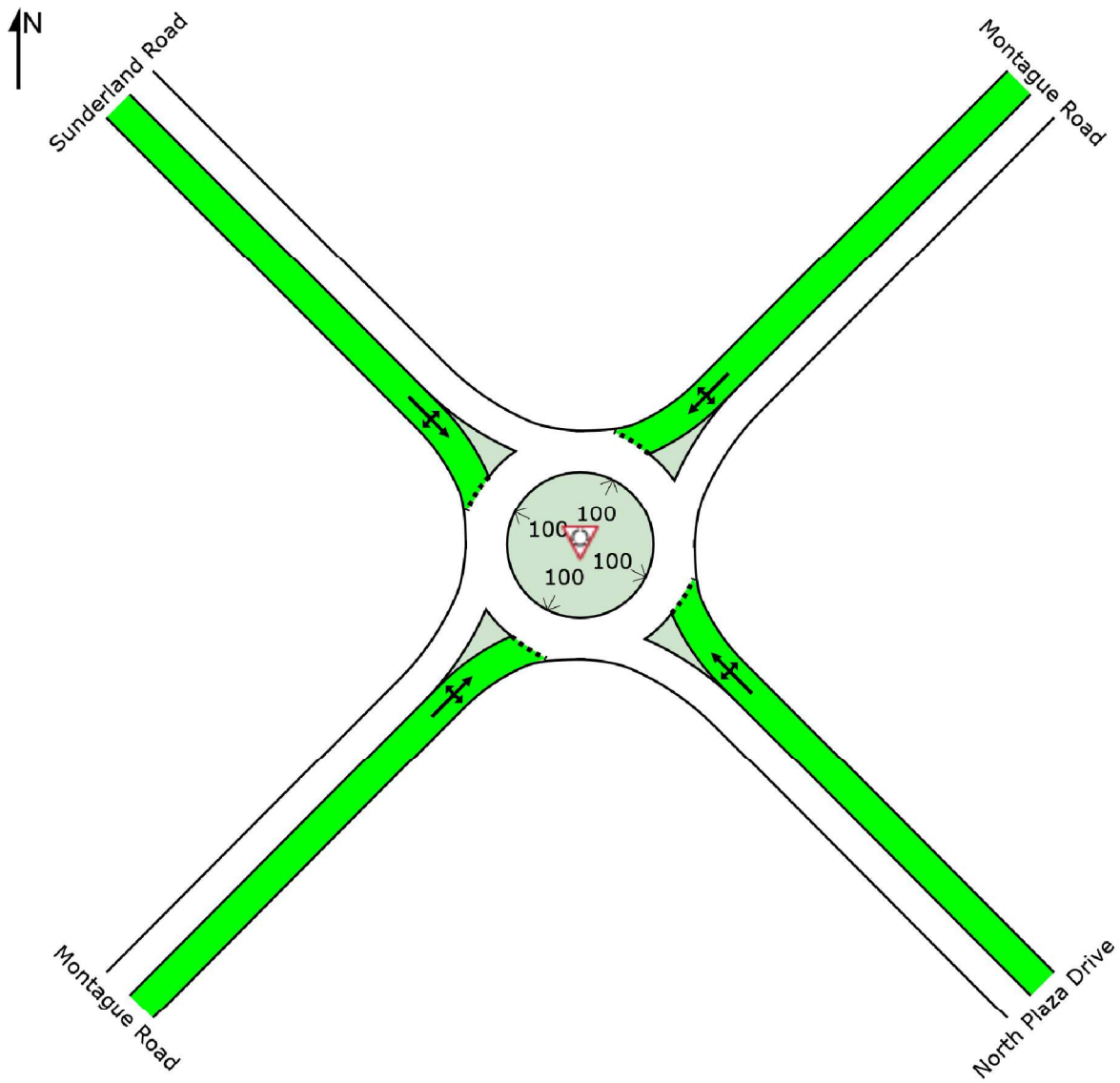
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	10	19	196	73	196



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	495	2.8	969	0.511	100	10.1	LOS B	4.1	103.9	Full	1600	0.0	0.0
Approach	495	2.8		0.511		10.1	LOS B	4.1	103.9				
East: Pine Street													
Lane 1[d]	315	2.1	885	0.356	100	8.1	LOS A	1.9	49.0	Full	1600	0.0	0.0
Lane 2	331	3.7	989	0.334	100	7.1	LOS A	1.8	47.1	Short	50	0.0	NA
Approach	646	2.9		0.356		7.6	LOS A	1.9	49.0				
North: North Pleasant Street													
Lane 1[d]	746	0.6	1154	0.646	100	11.8	LOS B	8.4	211.1	Full	400	0.0	0.0
Approach	746	0.6		0.646		11.8	LOS B	8.4	211.1				
West: Meadow Street													
Lane 1[d]	516	1.3	1019	0.506	100	9.6	LOS A	4.1	103.6	Full	1600	0.0	0.0
Approach	516	1.3		0.506		9.6	LOS A	4.1	103.6				
Intersection	2402	1.8		0.646		9.9	LOS A	8.4	211.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SATURDAY PEAK

LANE LEVEL OF SERVICE

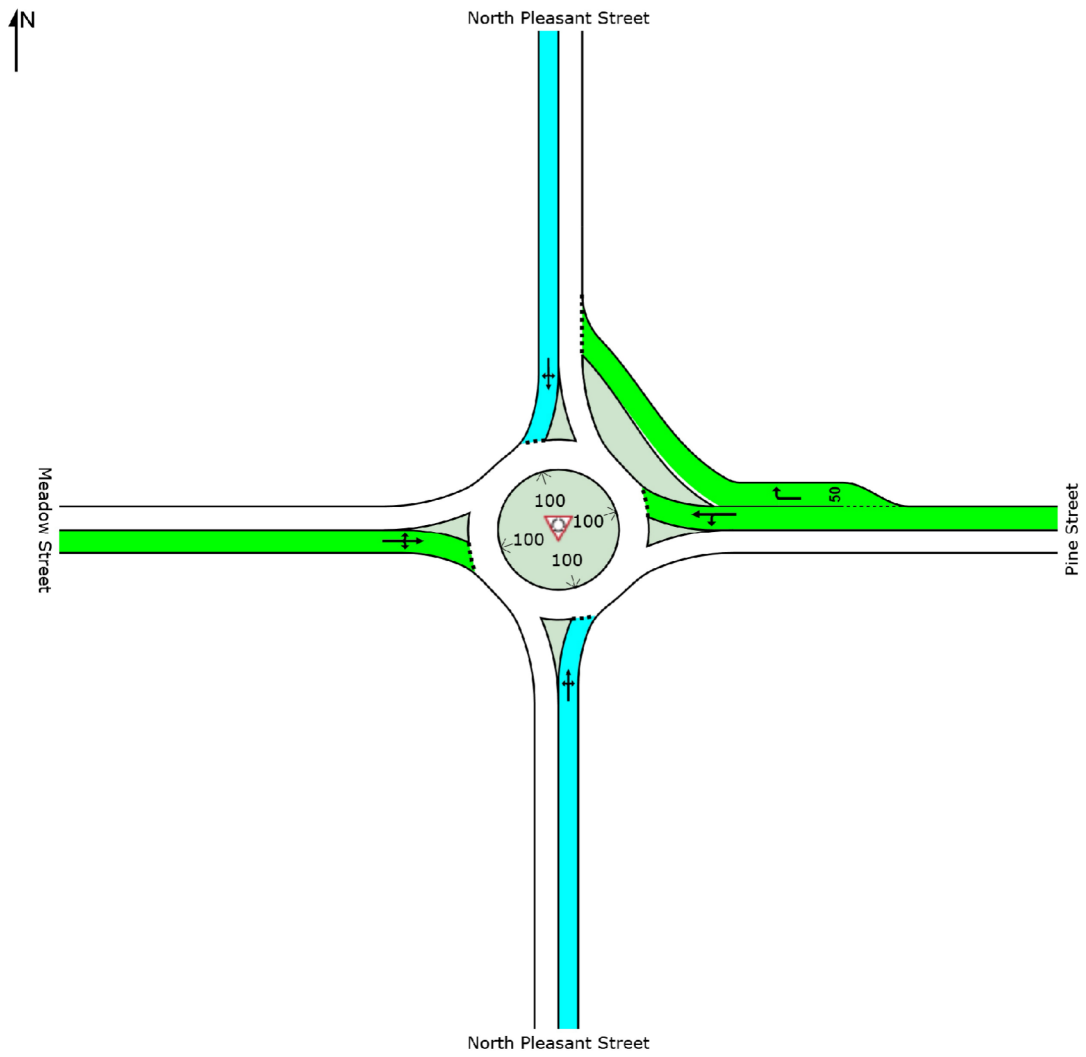
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

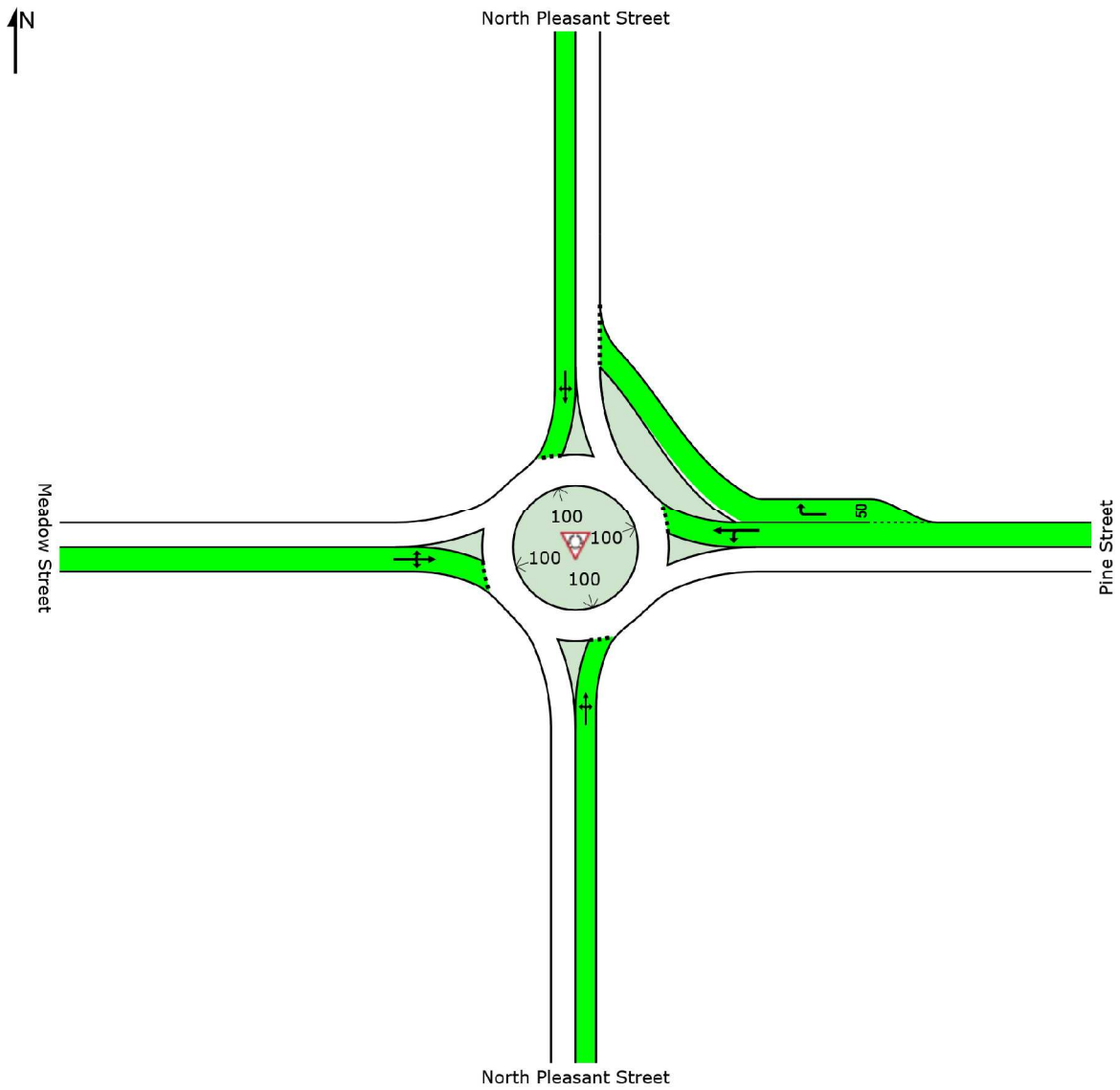
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	42	20	85	42	85



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102 [Sunderland/Montague]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
SouthEast: North Plaza Drive													
Lane 1[d]	127	0.8	673	0.188	100	7.5	LOS A	0.8	19.5	Full	20	0.0	4.2
Approach	127	0.8		0.188		7.5	LOS A	0.8	19.5				
NorthEast: Montague Road													
Lane 1[d]	334	0.6	931	0.359	100	7.8	LOS A	1.9	46.9	Full	1600	0.0	0.0
Approach	334	0.6		0.359		7.8	LOS A	1.9	46.9				
NorthWest: Sunderland Road													
Lane 1[d]	305	1.6	895	0.341	100	7.8	LOS A	1.7	42.9	Full	1600	0.0	0.0
Approach	305	1.6		0.341		7.8	LOS A	1.7	42.9				
SouthWest: Montague Road													
Lane 1[d]	698	1.1	1338	0.521	100	8.2	LOS A	4.4	110.1	Full	400	0.0	0.0
Approach	698	1.1		0.521		8.2	LOS A	4.4	110.1				
Intersection	1464	1.1		0.521		8.0	LOS A	4.4	110.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

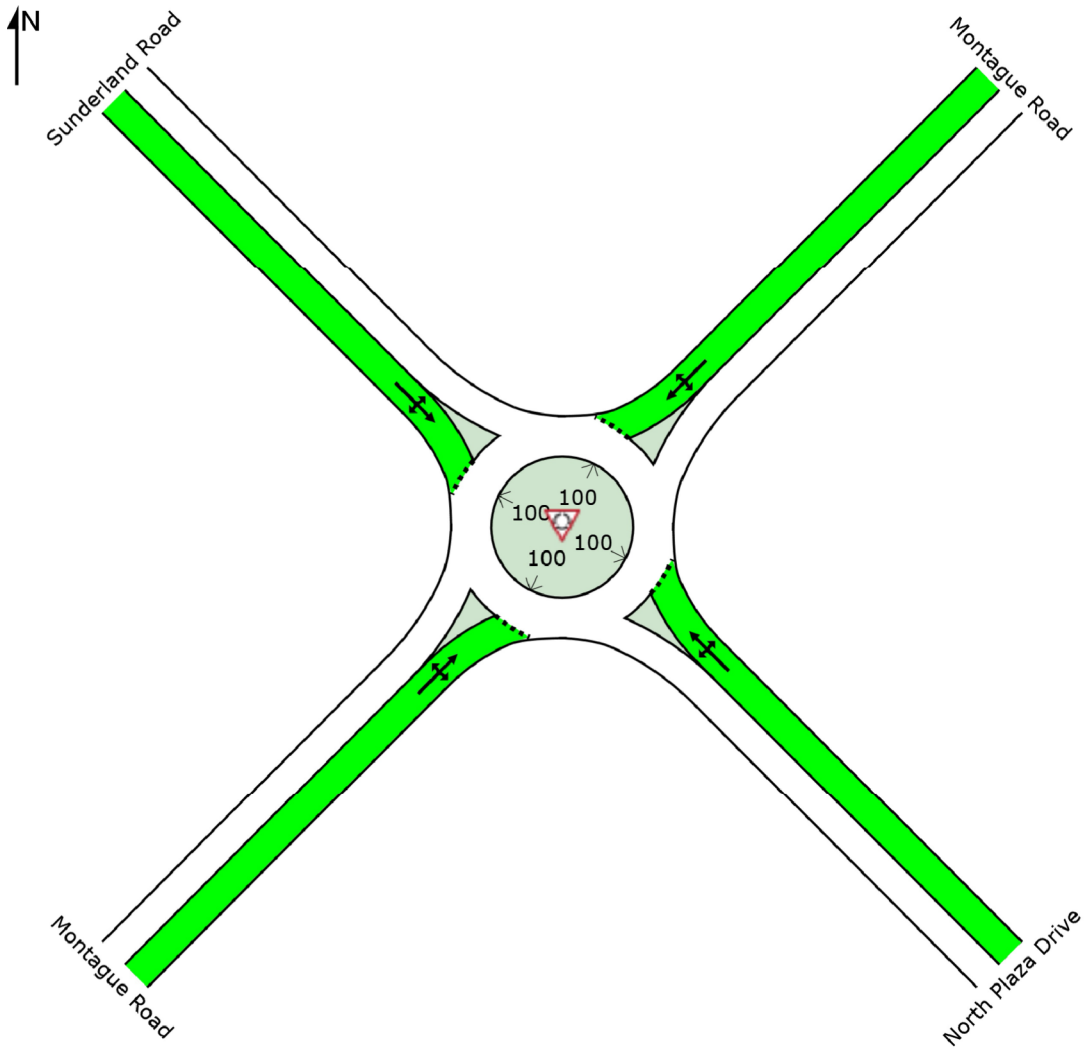
Lane Level of Service

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
LOS	A	A	A	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

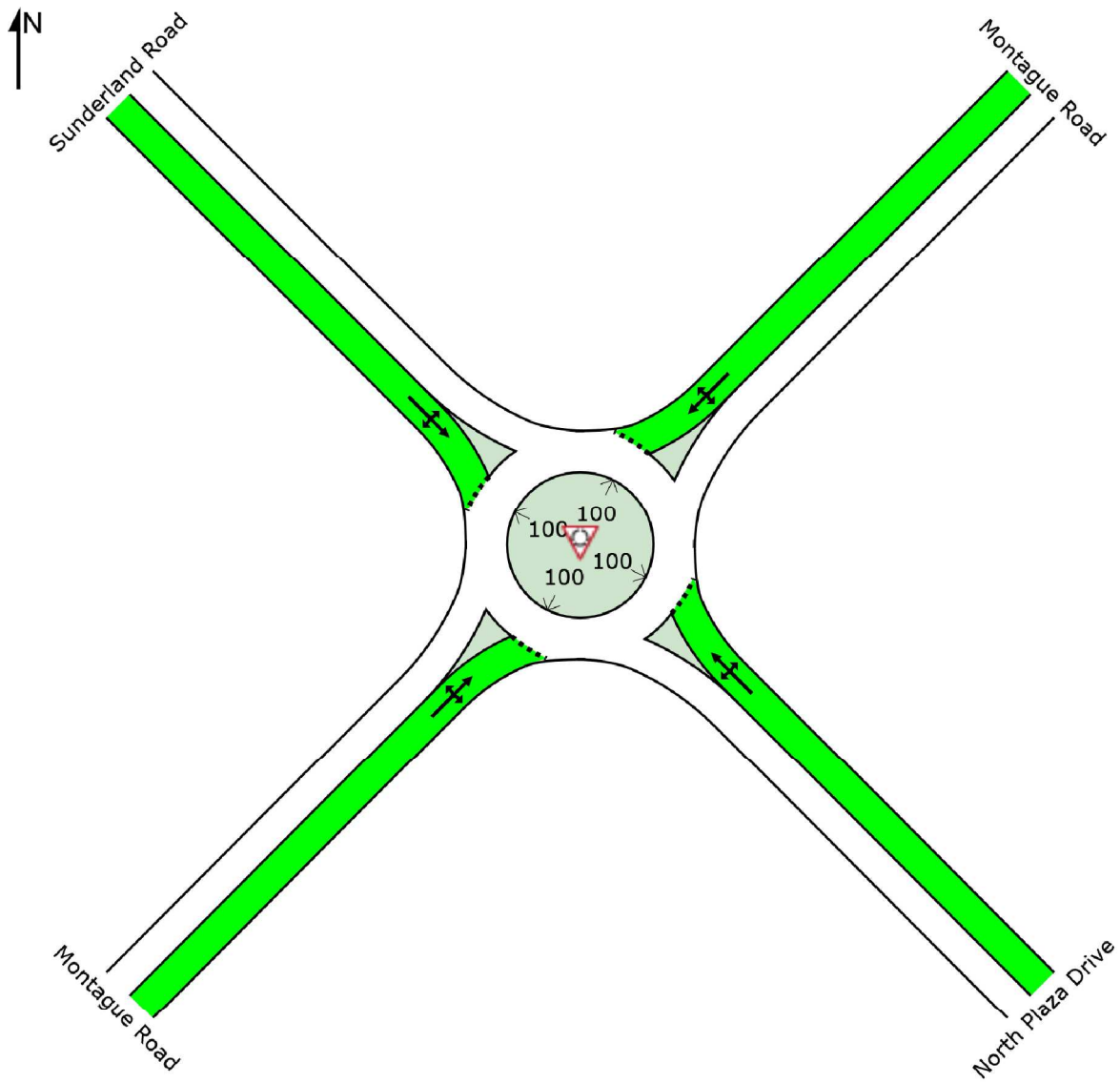
Average Back of Queue Distance per lane (feet)

Site: 102 [Sunderland/Montague]

New Site
Roundabout

All Movement Classes

	Southeast	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	8	19	17	44	44



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

Alternative 7

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	263	3.6	1079	0.244	100	5.6	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	263	3.6		0.244		5.6	LOS A	1.3	33.4				
East: Pine Street													
Lane 1[d]	281	0.5	1246	0.226	100	4.9	LOS A	1.3	32.2	Full	1600	0.0	0.0
Lane 2	260	1.9	1305	0.199	100	4.4	LOS A	1.1	28.3	Short	50	0.0	NA
Approach	540	1.2		0.226		4.7	LOS A	1.3	32.2				
North: North Pleasant Street													
Lane 1[d]	991	2.7	1254	0.790	100	16.6	LOS C	18.9	482.0	Full	400	0.0	10.8
Approach	991	2.7		0.790		16.6	LOS C	18.9	482.0				
West: Meadow Street													
Lane 1[d]	386	3.5	742	0.520	100	12.6	LOS B	3.6	93.4	Full	1600	0.0	0.0
Approach	386	3.5		0.520		12.6	LOS B	3.6	93.4				
Intersection	2180	2.6		0.790		11.6	LOS B	18.9	482.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

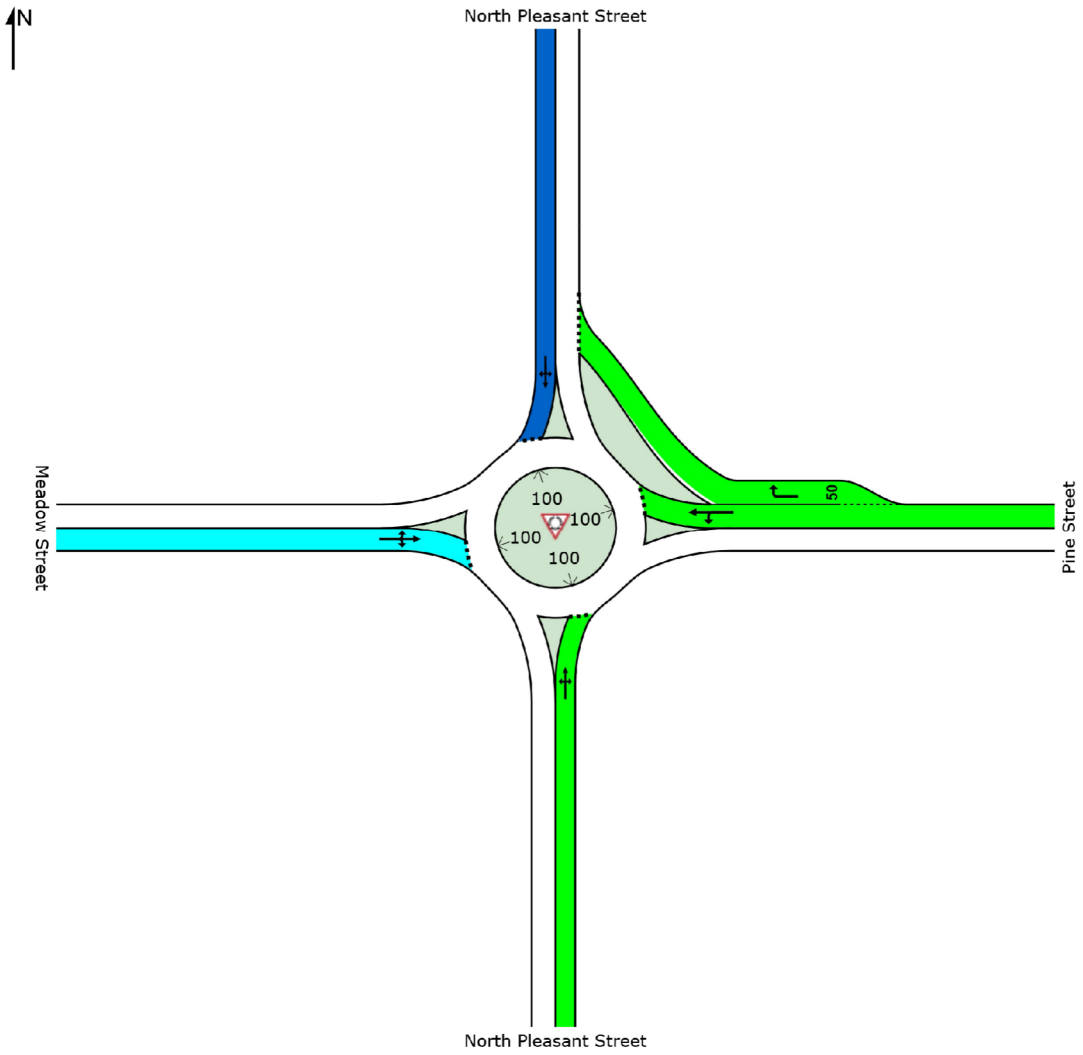
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	C	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

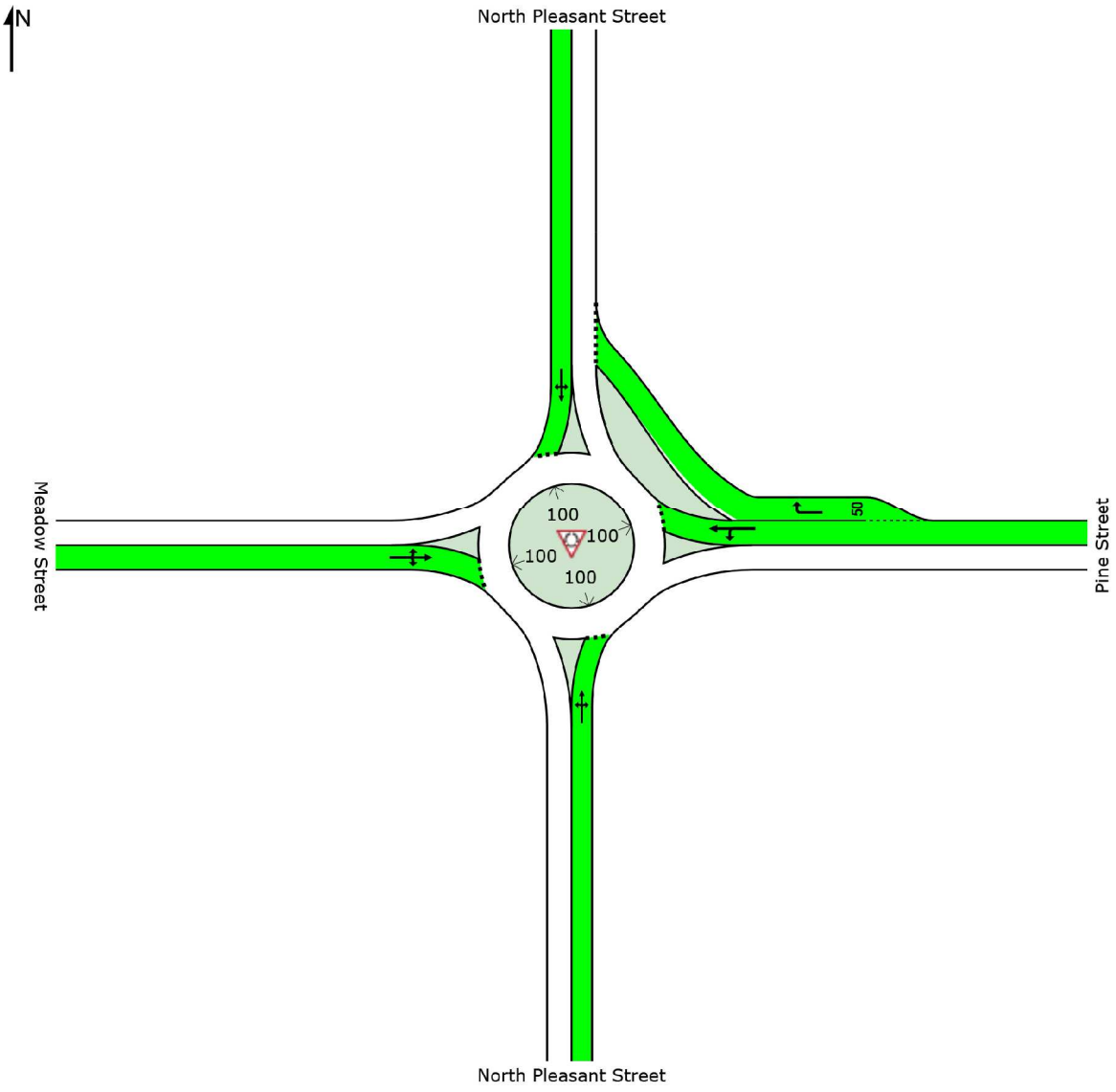
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	13	13	194	38	194



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	495	0.6	1845	0.268	100	2.4	LOS A	0.2	5.5	Full	1600	0.0	0.0
Approach	495	0.6		0.268		2.4	NA	0.2	5.5				
NorthWest: Sunderland Road													
Lane 1	481	2.8	551	0.873	100	41.1	LOS E	19.6	502.0	Full	1600	0.0	0.0
Approach	481	2.8		0.873		41.1	LOS E	19.6	502.0				
SouthWest: Montague Road													
Lane 1	580	1.3	1335	0.434	100	7.4	LOS A	5.0	127.6	Full	400	0.0	0.0
Approach	580	1.3		0.434		7.4	NA	5.0	127.6				
Intersection	1556	1.5		0.873		16.2	NA	19.6	502.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

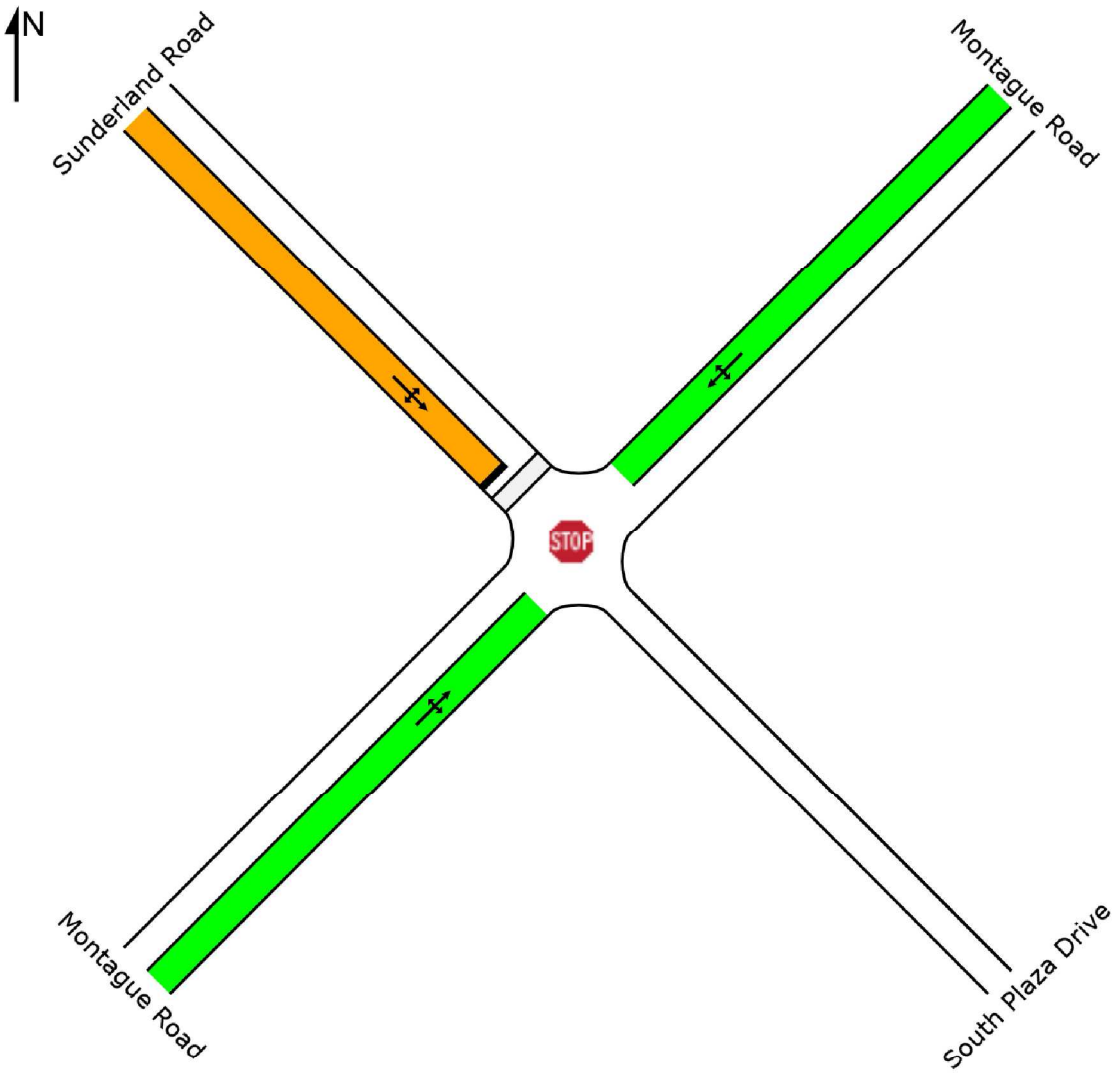
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	E	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

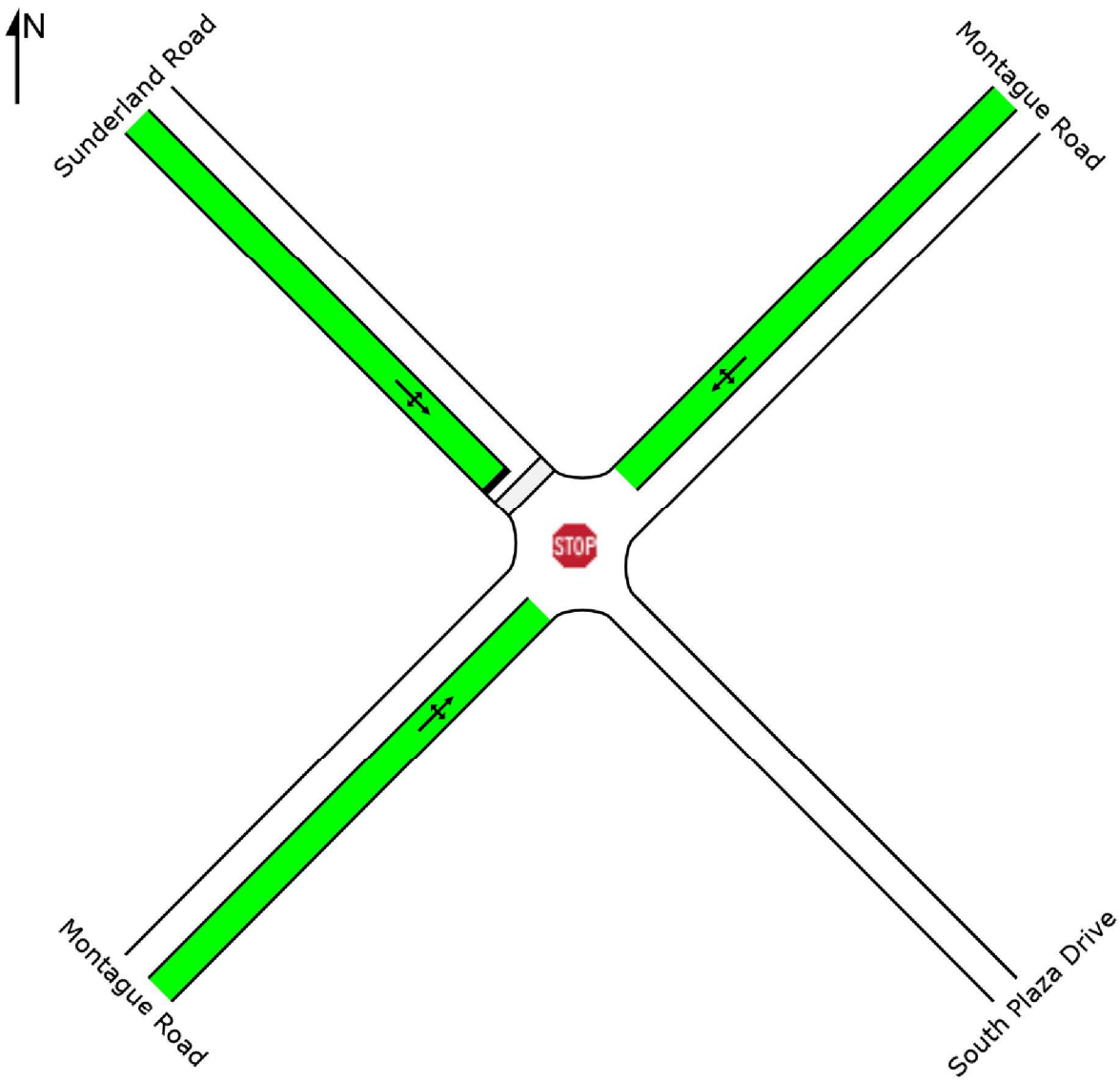
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	2	202	51	202



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	886	1.9	1004	0.883	100	27.7	LOS D	21.7	551.4	Full	1600	0.0	0.0
Approach	886	1.9		0.883		27.7	LOS D	21.7	551.4				
East: Pine Street													
Lane 1[d]	562	2.0	670	0.839	100	31.2	LOS D	10.9	276.3	Full	1600	0.0	0.0
Lane 2	122	6.5	724	0.168	20[6]	6.8	LOS A	0.7	19.4	Short	50	0.0	NA
Approach	683	2.8		0.839		26.8	LOS D	10.9	276.3				
North: North Pleasant Street													
Lane 1[d]	720	2.5	891	0.808	100	22.7	LOS C	12.9	329.4	Full	400	0.0	0.0
Approach	720	2.5		0.808		22.7	LOS C	12.9	329.4				
West: Meadow Street													
Lane 1[d]	632	1.3	773	0.818	100	26.0	LOS D	11.5	289.8	Full	1600	0.0	0.0
Approach	632	1.3		0.818		26.0	LOS D	11.5	289.8				
Intersection	2922	2.1		0.883		25.9	LOS D	21.7	551.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

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PM PEAK

LANE LEVEL OF SERVICE

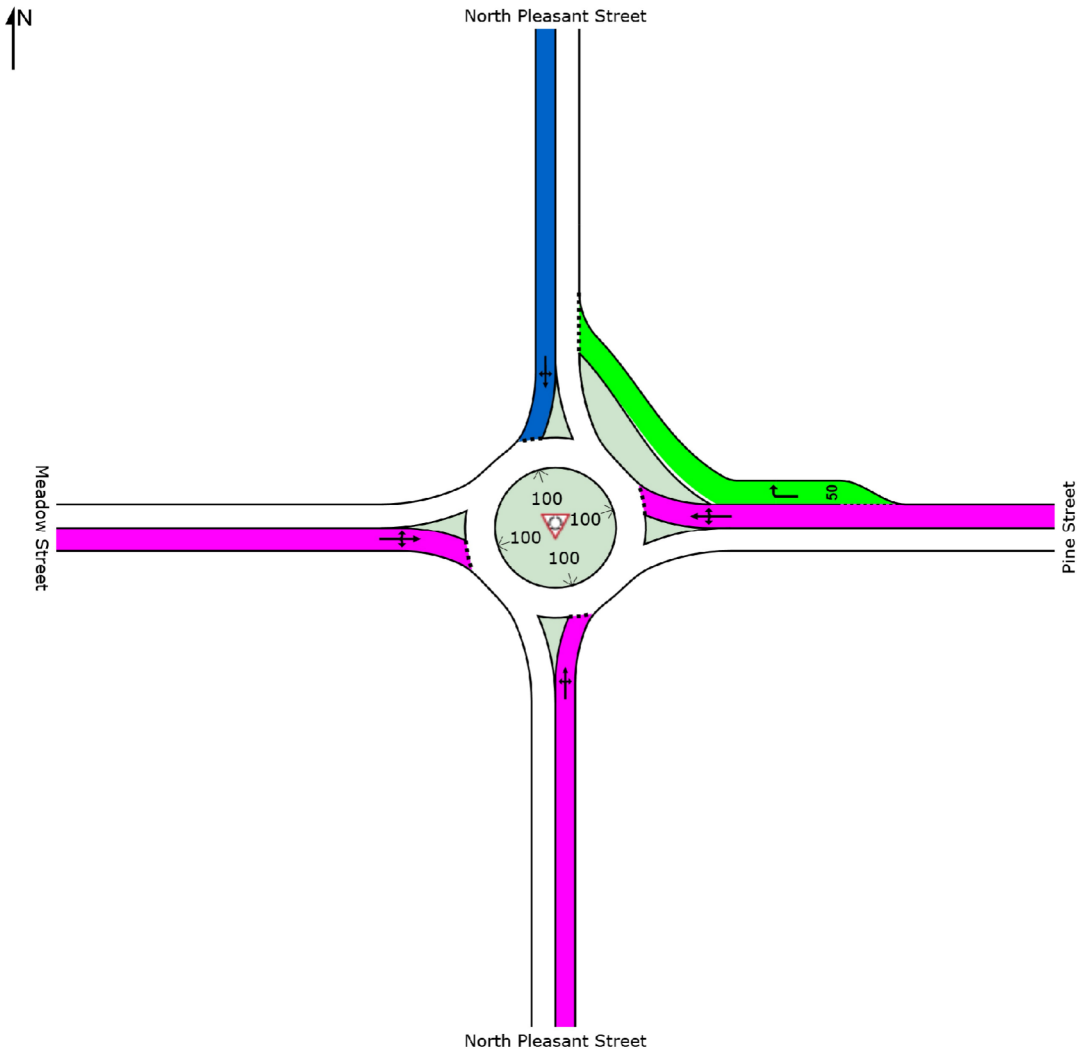
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	D	D	C	D	D



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

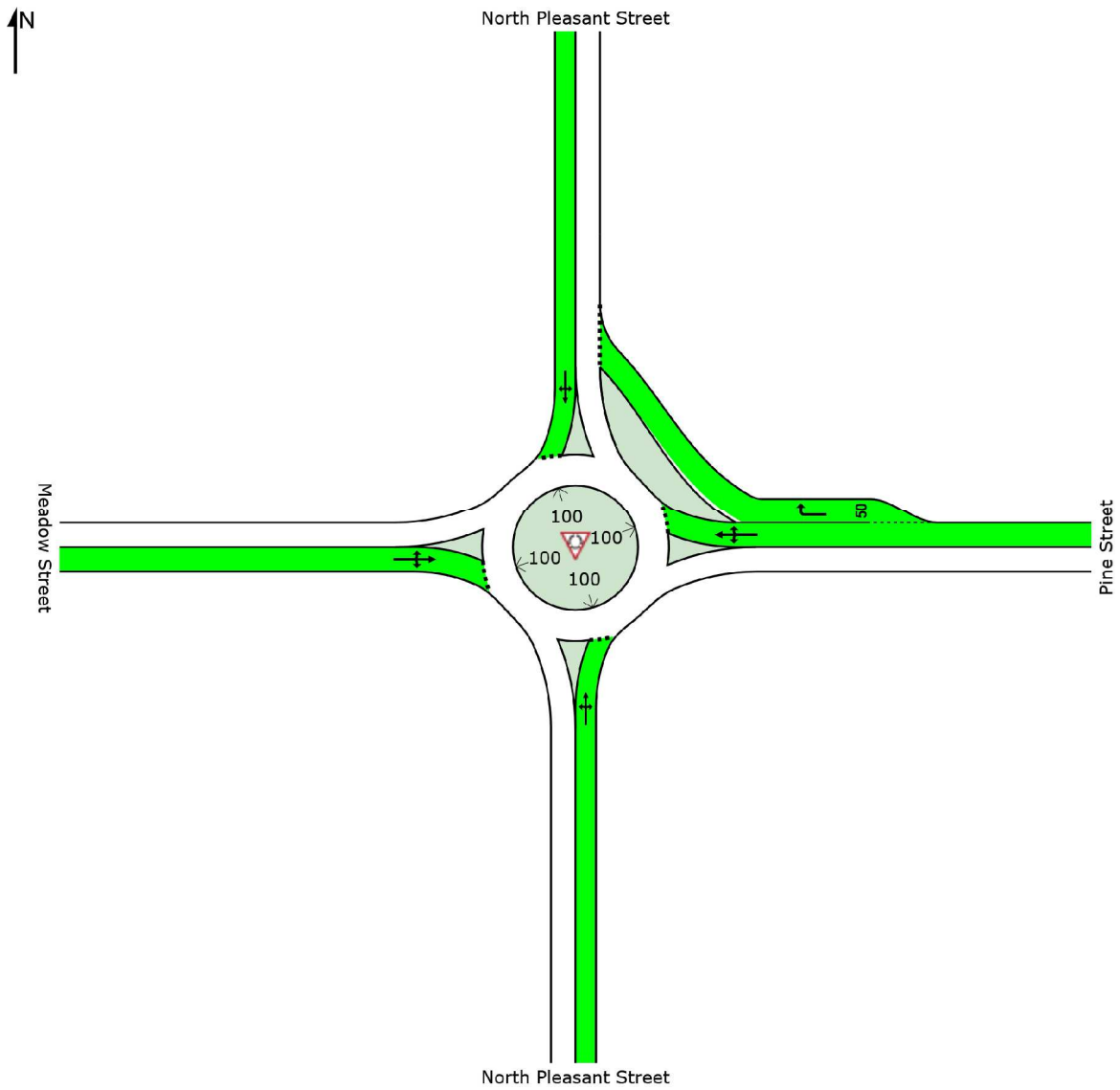
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	222	111	133	117	222



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	366	0.6	1749	0.210	100	2.4	LOS A	0.4	9.8	Full	1600	0.0	0.0
Approach	366	0.6		0.210		2.4	NA	0.4	9.8				
NorthWest: Sunderland Road													
Lane 1	773	1.6	649	1.191	100	122.9	LOS F	76.2	1928.1	Full	1600	0.0	10.8
Approach	773	1.6		1.191		122.9	LOS F	76.2	1928.1				
SouthWest: Montague Road													
Lane 1	1075	1.2	1513	0.710	100	11.6	LOS B	25.0	629.9	Full	400	0.0	20.6
Approach	1075	1.2		0.710		11.6	NA	25.0	629.9				
Intersection	2214	1.2		1.191		49.0	NA	76.2	1928.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

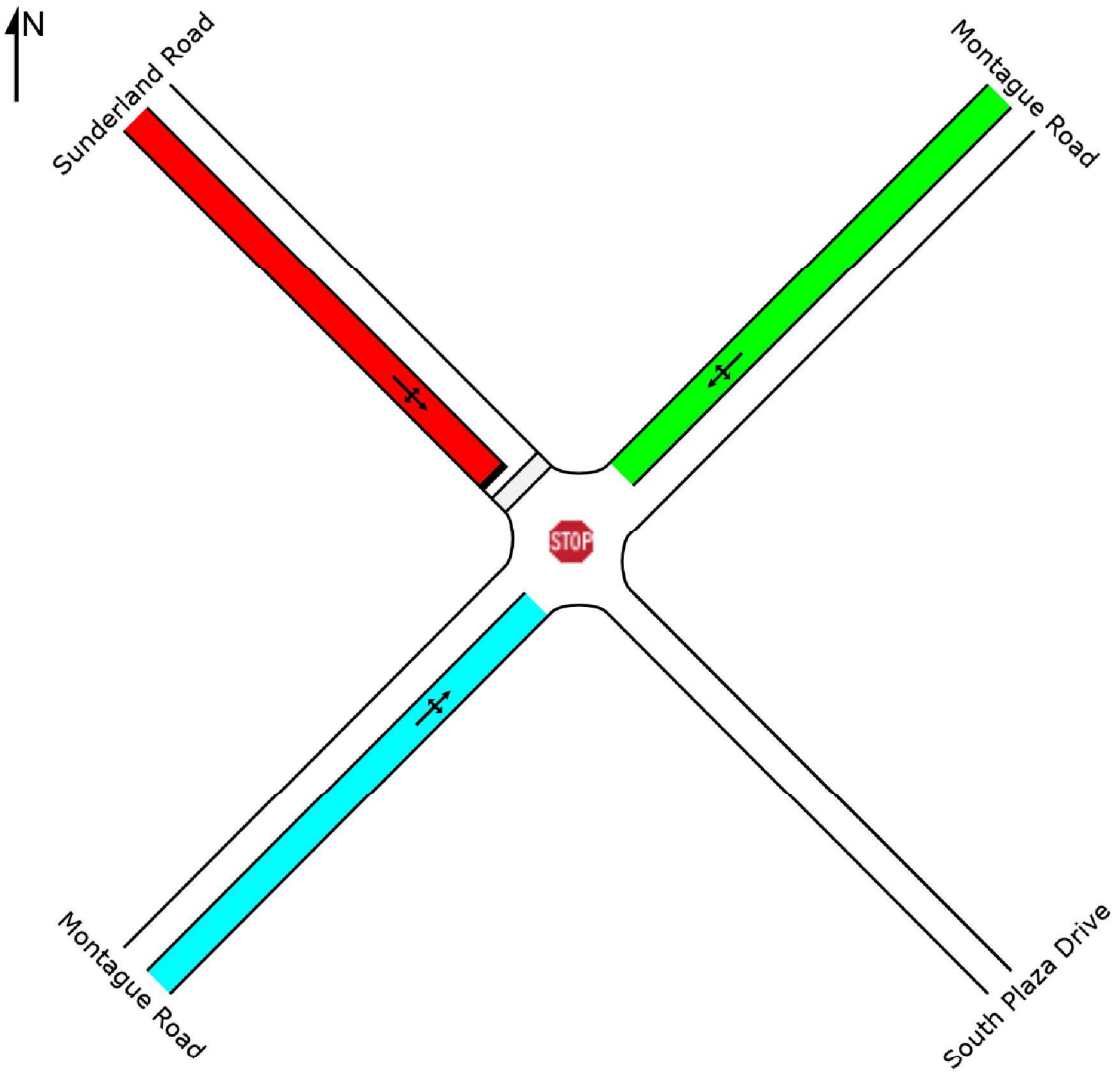
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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PM PEAK

QUEUE DISTANCE (AVER)

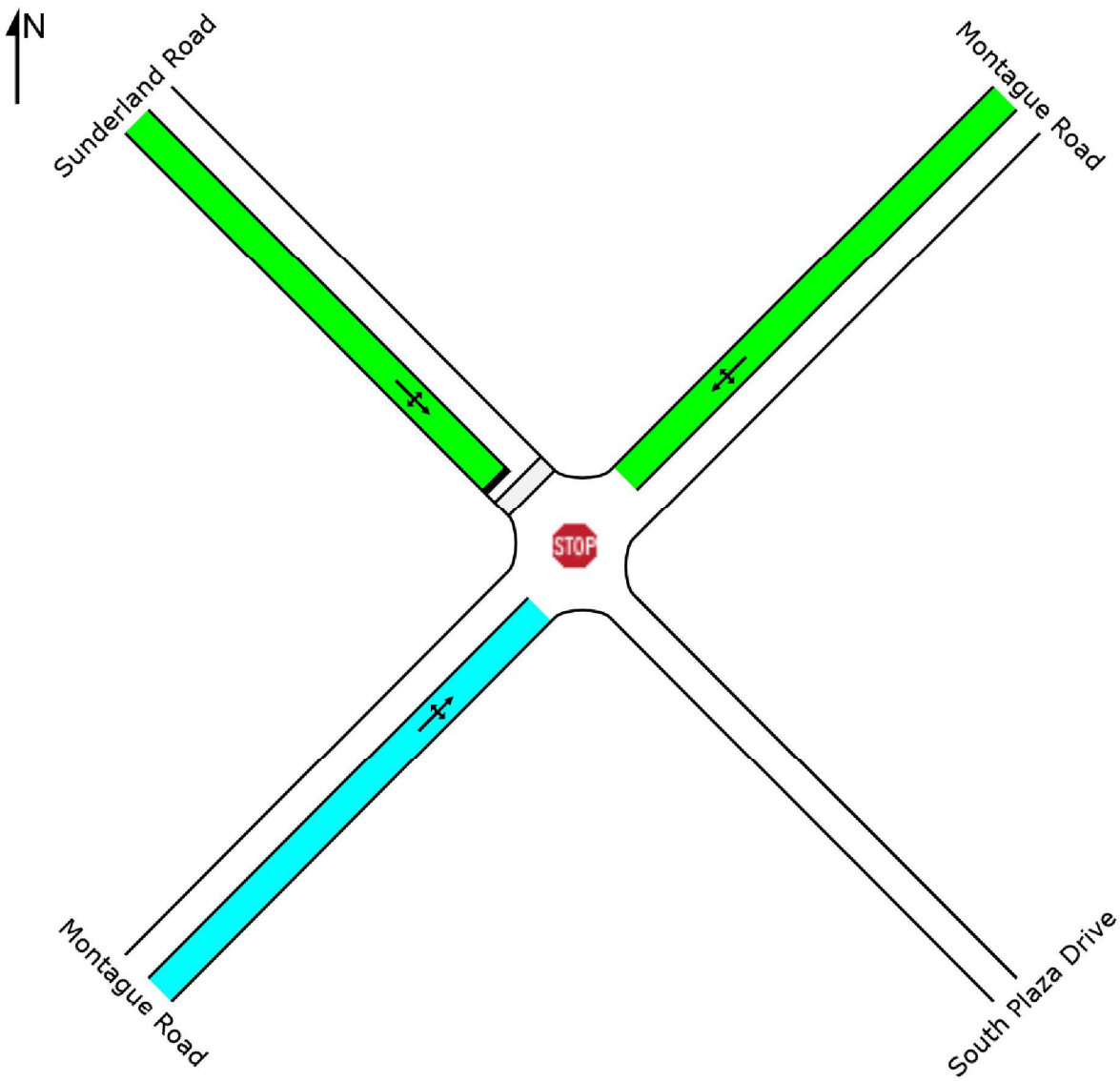
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	4	776	253	776



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	495	2.8	969	0.511	100	10.1	LOS B	4.1	103.9	Full	1600	0.0	0.0
Approach	495	2.8		0.511		10.1	LOS B	4.1	103.9				
East: Pine Street													
Lane 1[d]	315	2.1	885	0.356	100	8.1	LOS A	1.9	49.0	Full	1600	0.0	0.0
Lane 2	331	3.7	989	0.334	100	7.1	LOS A	1.8	47.1	Short	50	0.0	NA
Approach	646	2.9		0.356		7.6	LOS A	1.9	49.0				
North: North Pleasant Street													
Lane 1[d]	746	0.6	1154	0.646	100	11.8	LOS B	8.4	211.1	Full	400	0.0	0.0
Approach	746	0.6		0.646		11.8	LOS B	8.4	211.1				
West: Meadow Street													
Lane 1[d]	516	1.3	1019	0.506	100	9.6	LOS A	4.1	103.6	Full	1600	0.0	0.0
Approach	516	1.3		0.506		9.6	LOS A	4.1	103.6				
Intersection	2402	1.8		0.646		9.9	LOS A	8.4	211.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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SATURDAY PEAK

LANE LEVEL OF SERVICE

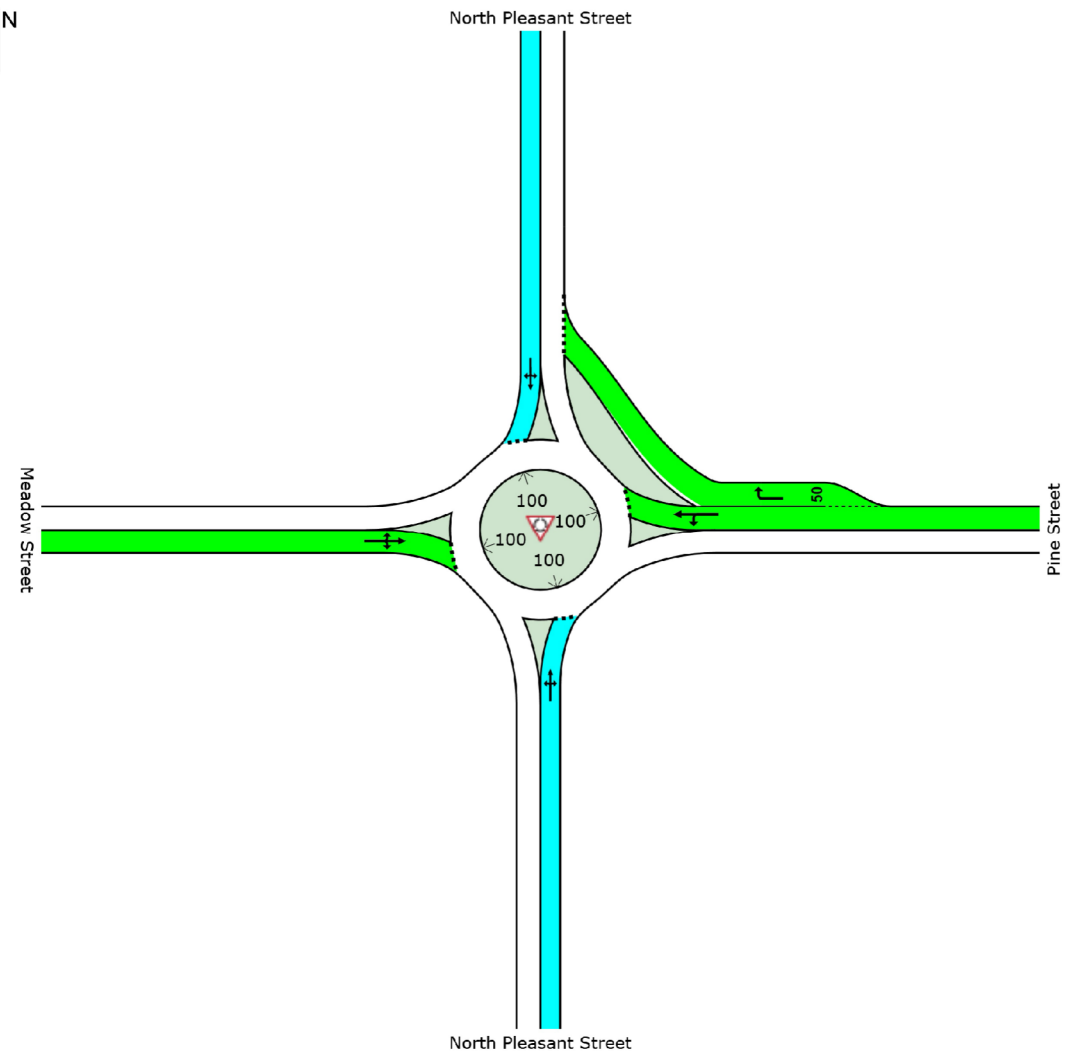
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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SATURDAY PEAK

QUEUE DISTANCE (AVER)

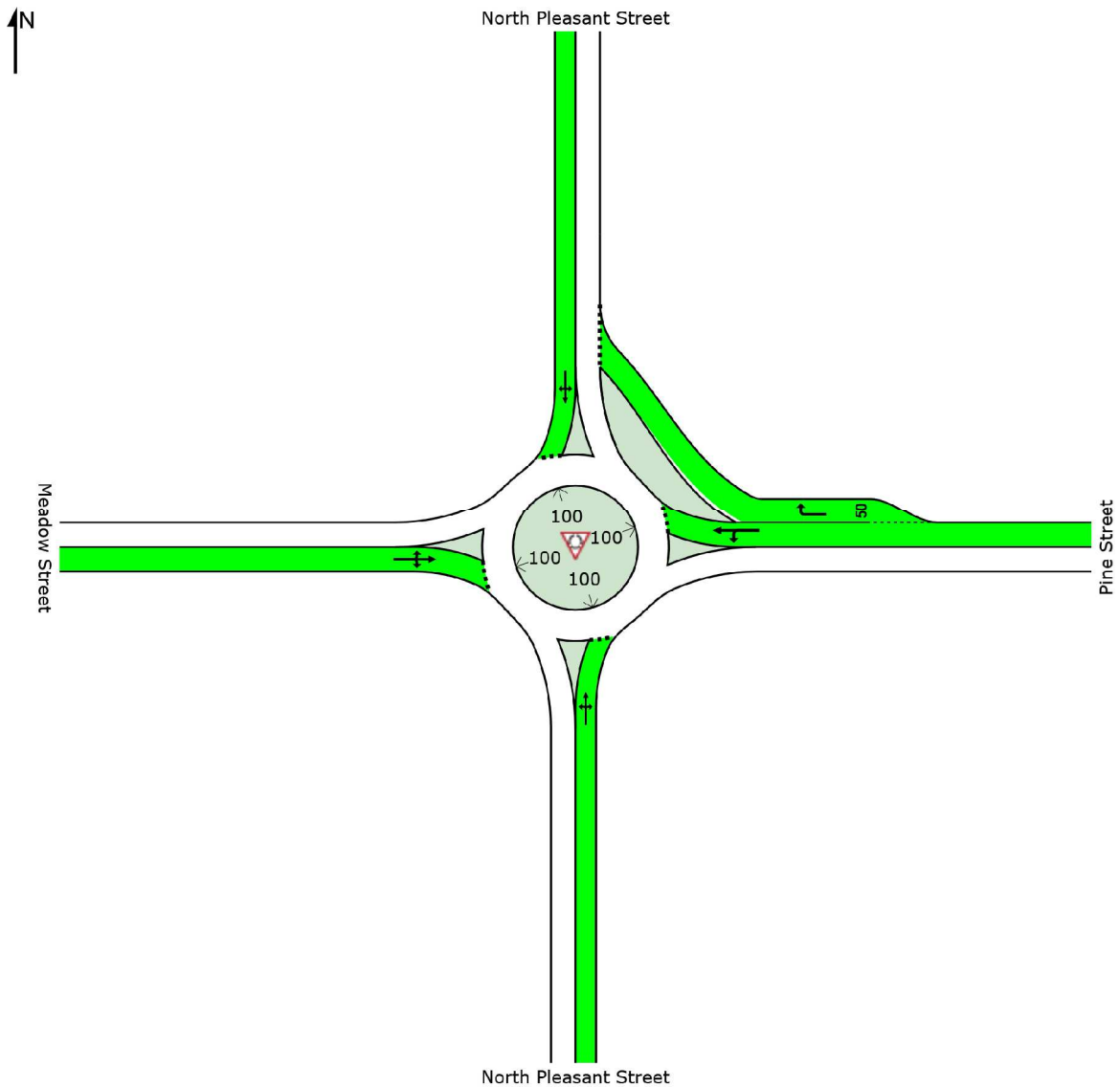
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	42	20	85	42	85



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
NorthEast: Montague Road													
Lane 1	394	0.6	1833	0.215	100	1.9	LOS A	0.2	4.4	Full	1600	0.0	0.0
Approach	394	0.6		0.215		1.9	NA	0.2	4.4				
NorthWest: Sunderland Road													
Lane 1	305	1.6	624	0.488	100	16.2	LOS C	4.7	119.3	Full	1600	0.0	0.0
Approach	305	1.6		0.488		16.2	LOS C	4.7	119.3				
SouthWest: Montague Road													
Lane 1	808	1.1	1497	0.540	100	8.0	LOS A	9.5	238.4	Full	400	0.0	0.0
Approach	808	1.1		0.540		8.0	NA	9.5	238.4				
Intersection	1507	1.1		0.540		8.1	NA	9.5	238.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

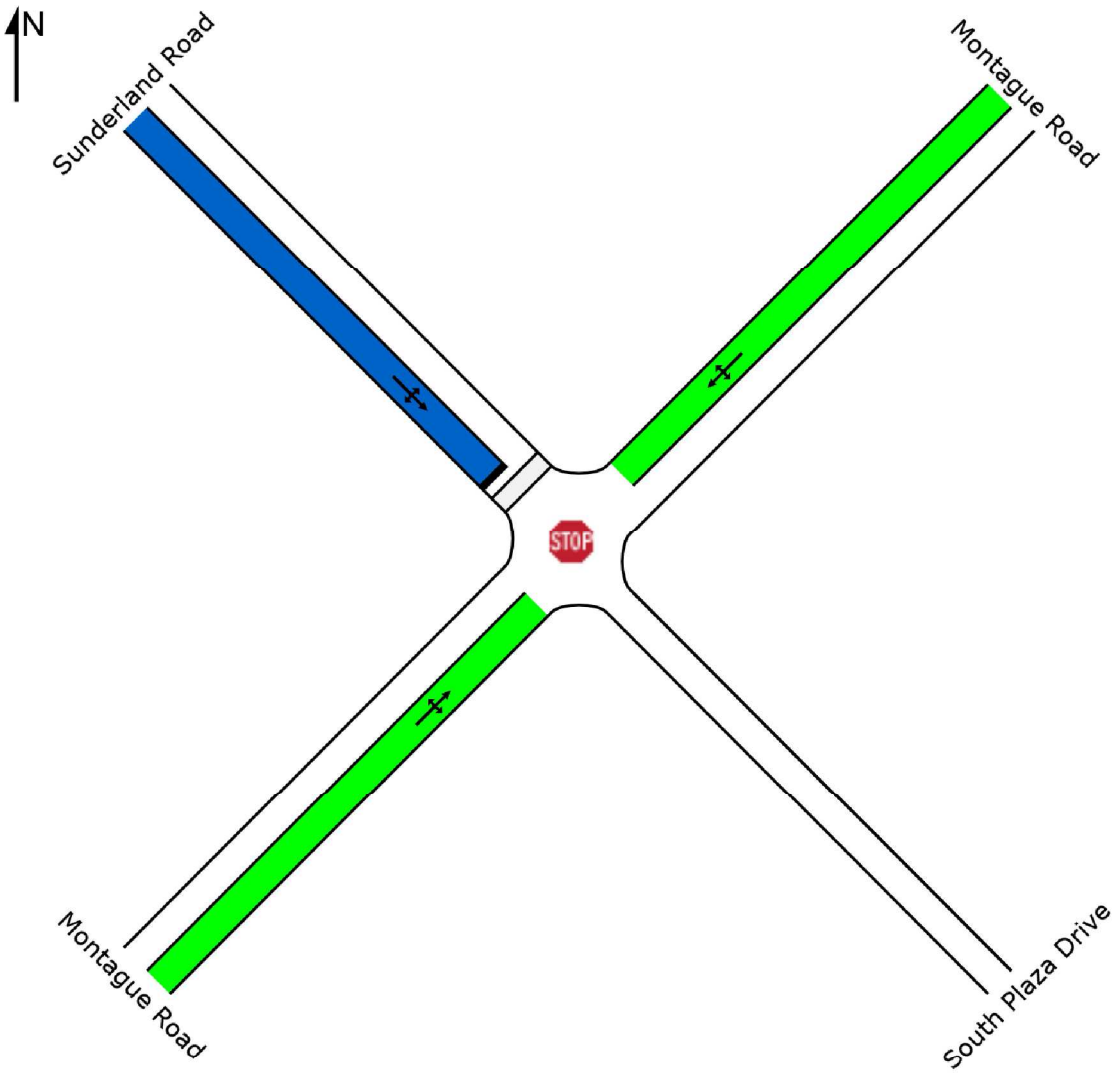
Lane Level of Service

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
LOS	NA	C	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

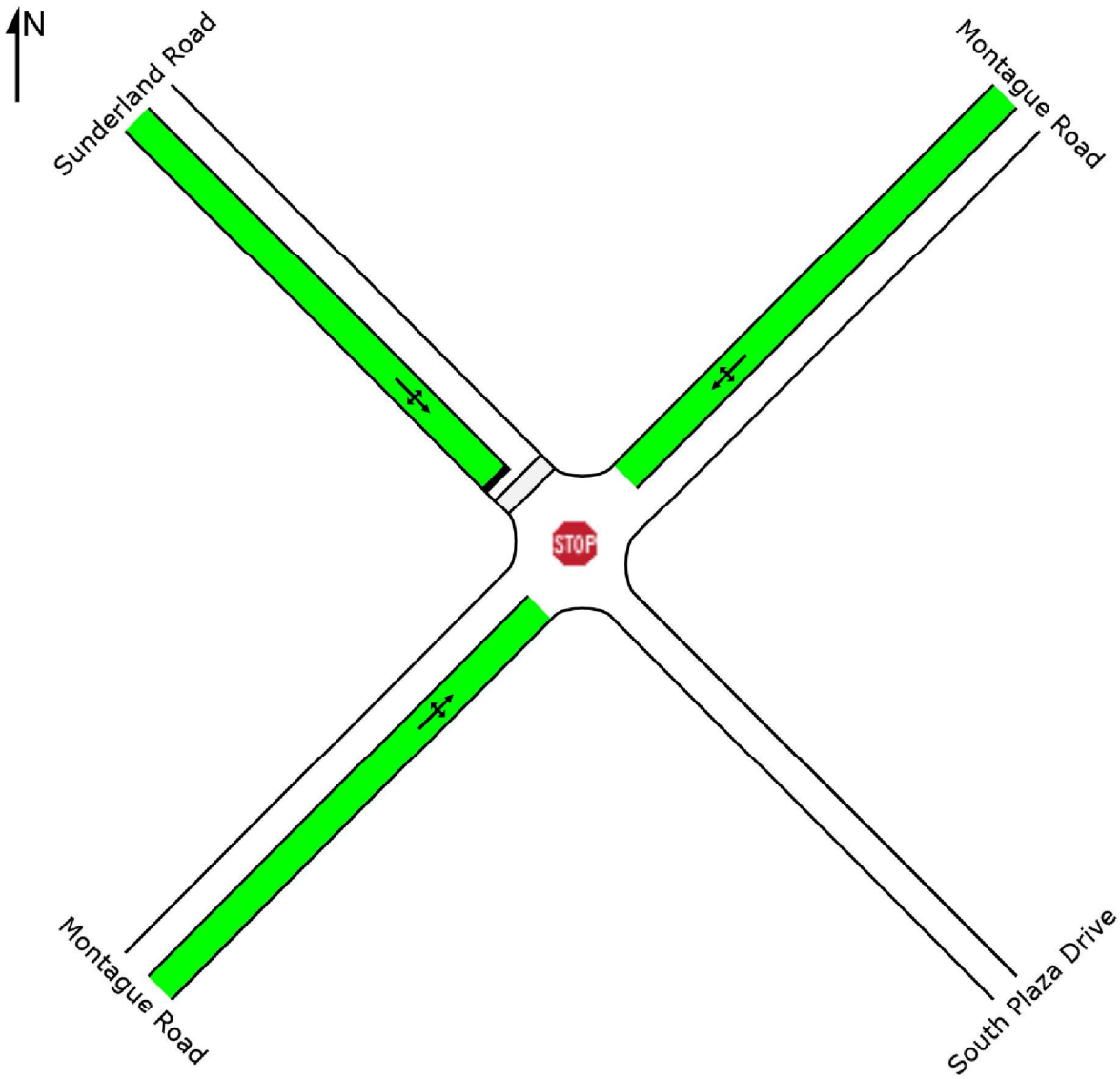
Average Back of Queue Distance per lane (feet)

Site: 102v [Sunderland/Montague - Conversion]

New Site
Stop (Two-Way)

All Movement Classes

	Northeast	Northwest	Southwest	Intersection
Queue Distance (Aver)	2	48	96	96



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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Alternative 8

AM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	263	3.6	1079	0.244	100	5.6	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	263	3.6		0.244		5.6	LOS A	1.3	33.4				
East: Pine Street													
Lane 1[d]	281	0.5	1246	0.226	100	4.9	LOS A	1.3	32.2	Full	1600	0.0	0.0
Lane 2	260	1.9	1305	0.199	100	4.4	LOS A	1.1	28.3	Short	50	0.0	NA
Approach	540	1.2		0.226		4.7	LOS A	1.3	32.2				
North: North Pleasant Street													
Lane 1[d]	991	2.7	1254	0.790	100	16.6	LOS C	18.9	481.7	Full	150	0.0	100.0
Approach	991	2.7		0.790		16.6	LOS C	18.9	481.7				
West: Meadow Street													
Lane 1[d]	386	3.5	743	0.520	100	12.6	LOS B	3.6	93.4	Full	1600	0.0	0.0
Approach	386	3.5		0.520		12.6	LOS B	3.6	93.4				
Intersection	2180	2.6		0.790		11.6	LOS B	18.9	481.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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AM PEAK

LANE LEVEL OF SERVICE

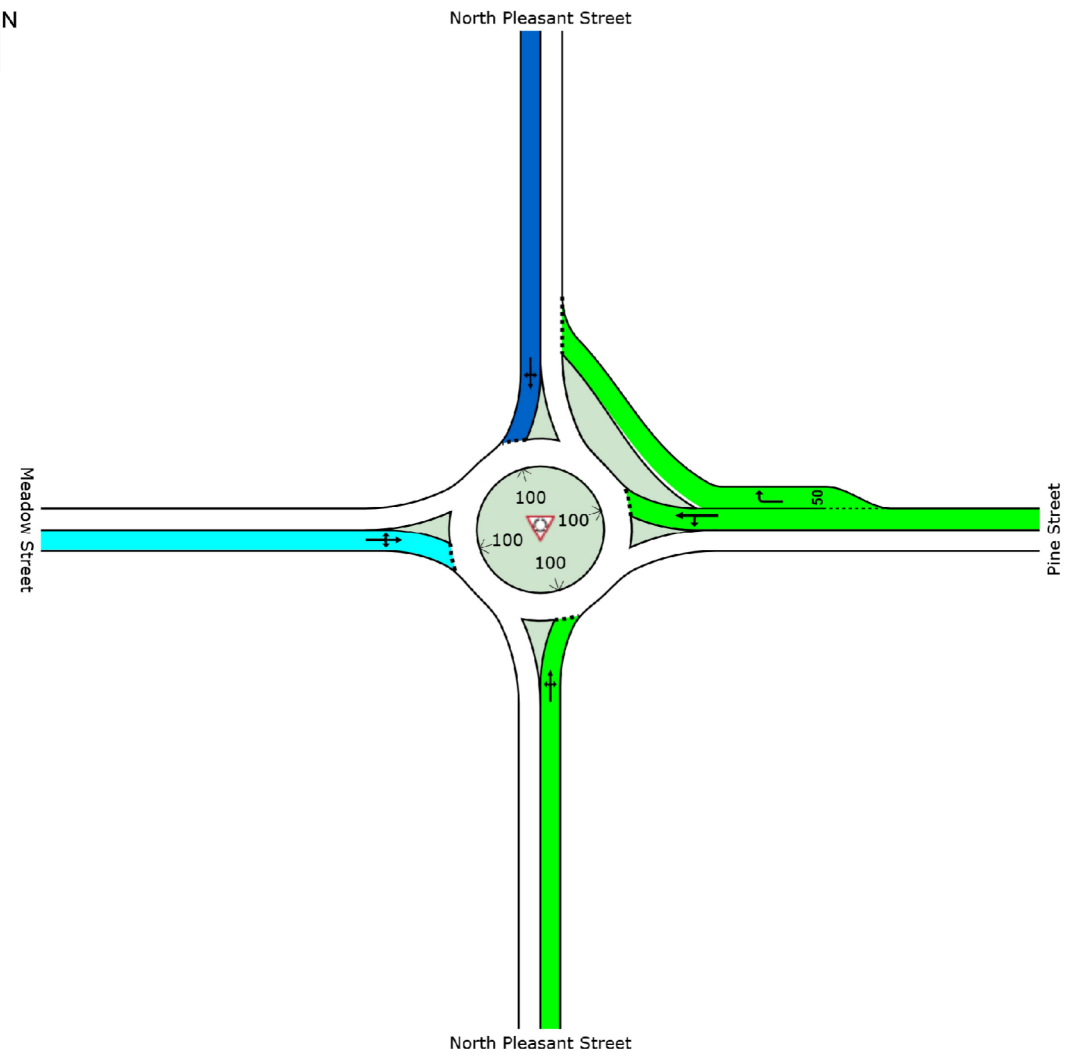
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	A	A	C	B	B



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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AM PEAK

QUEUE DISTANCE (AVER)

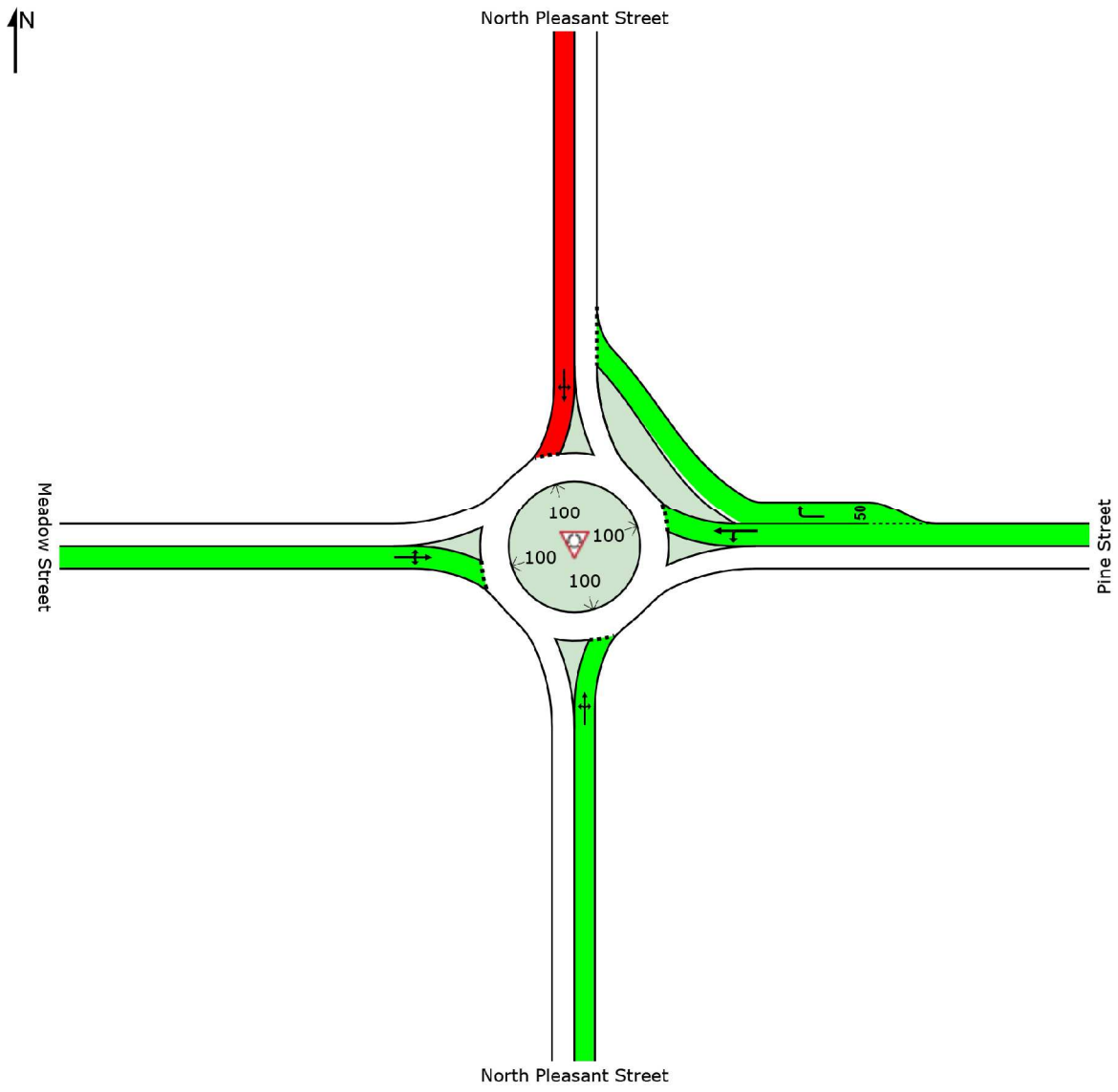
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	13	13	194	38	194



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

AM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	541	1.8	1719	0.315	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	541	1.8		0.315		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	468	0.7	308	1.519	100	280.3	LOS F	61.7	1549.8	Full	1600	0.0	4.1
Approach	468	0.7		1.519		280.3	LOS F	61.7	1549.8				
North: Sunderland Road													
Lane 1	493	2.7	1813	0.272	100	2.3	LOS A	0.2	4.1	Full	1600	0.0	0.0
Approach	493	2.7		0.272		2.3	NA	0.2	4.1				
Intersection	1502	1.7		1.519		88.2	NA	61.7	1549.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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AM PEAK

LANE LEVEL OF SERVICE

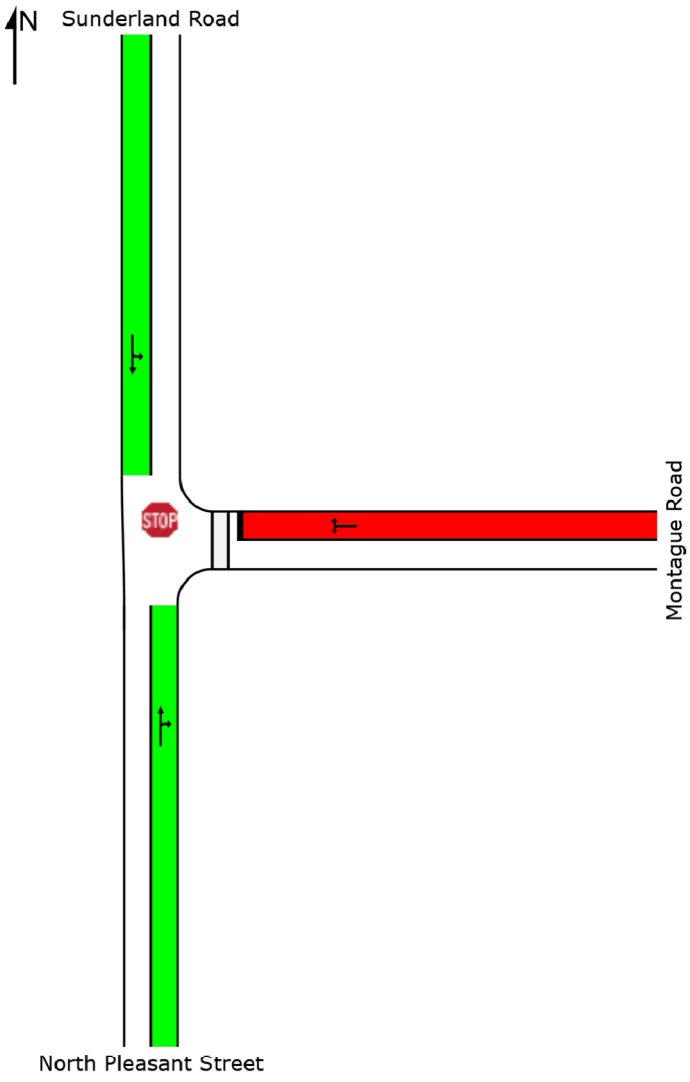
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

AM PEAK

QUEUE DISTANCE (AVER)

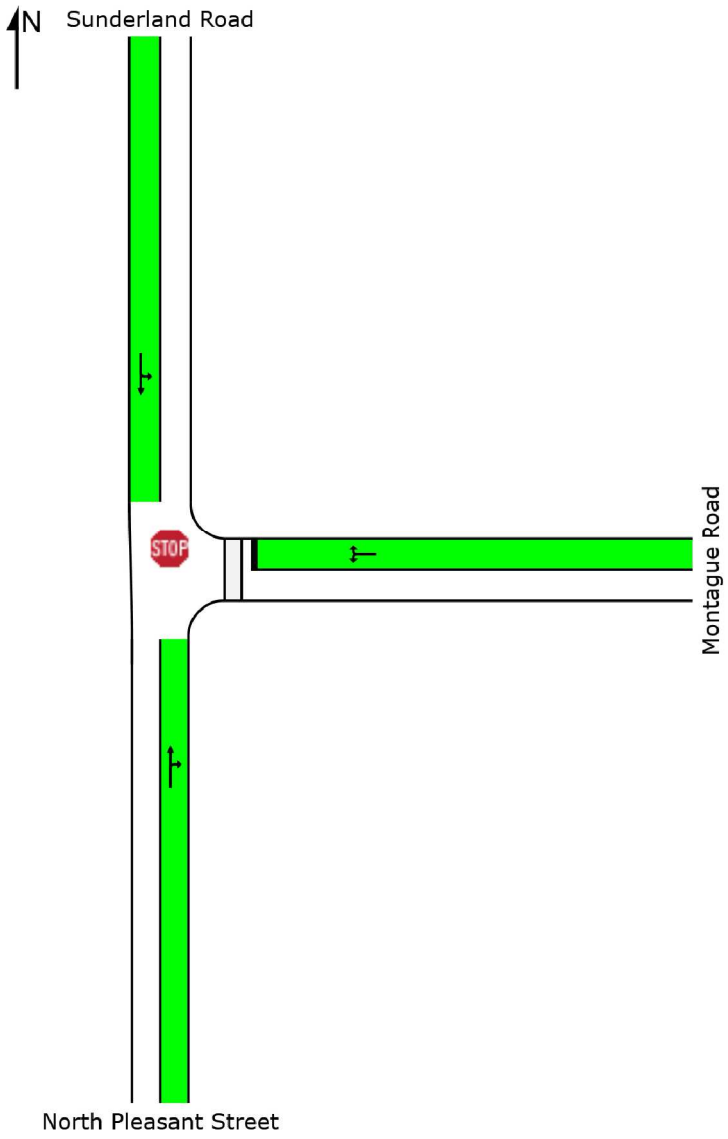
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	624	2	624



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	886	1.9	1004	0.883	100	27.7	LOS D	21.7	551.4	Full	1600	0.0	0.0
Approach	886	1.9		0.883		27.7	LOS D	21.7	551.4				
East: Pine Street													
Lane 1[d]	434	0.7	679	0.640	100	17.4	LOS C	5.3	132.4	Full	1600	0.0	0.0
Lane 2	249	6.5	827	0.301	100	7.7	LOS A	1.5	38.8	Short	50	0.0	NA
Approach	683	2.8		0.640		13.9	LOS B	5.3	132.4				
North: North Pleasant Street													
Lane 1[d]	720	2.5	891	0.808	100	22.7	LOS C	12.9	329.4	Full	150	0.0	38.5
Approach	720	2.5		0.808		22.7	LOS C	12.9	329.4				
West: Meadow Street													
Lane 1[d]	581	1.2	774	0.751	100	21.0	LOS C	8.7	220.7	Full	1600	0.0	0.0
Approach	581	1.2		0.751		21.0	LOS C	8.7	220.7				
Intersection	2871	2.1		0.883		21.8	LOS C	21.7	551.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

PM PEAK

LANE LEVEL OF SERVICE

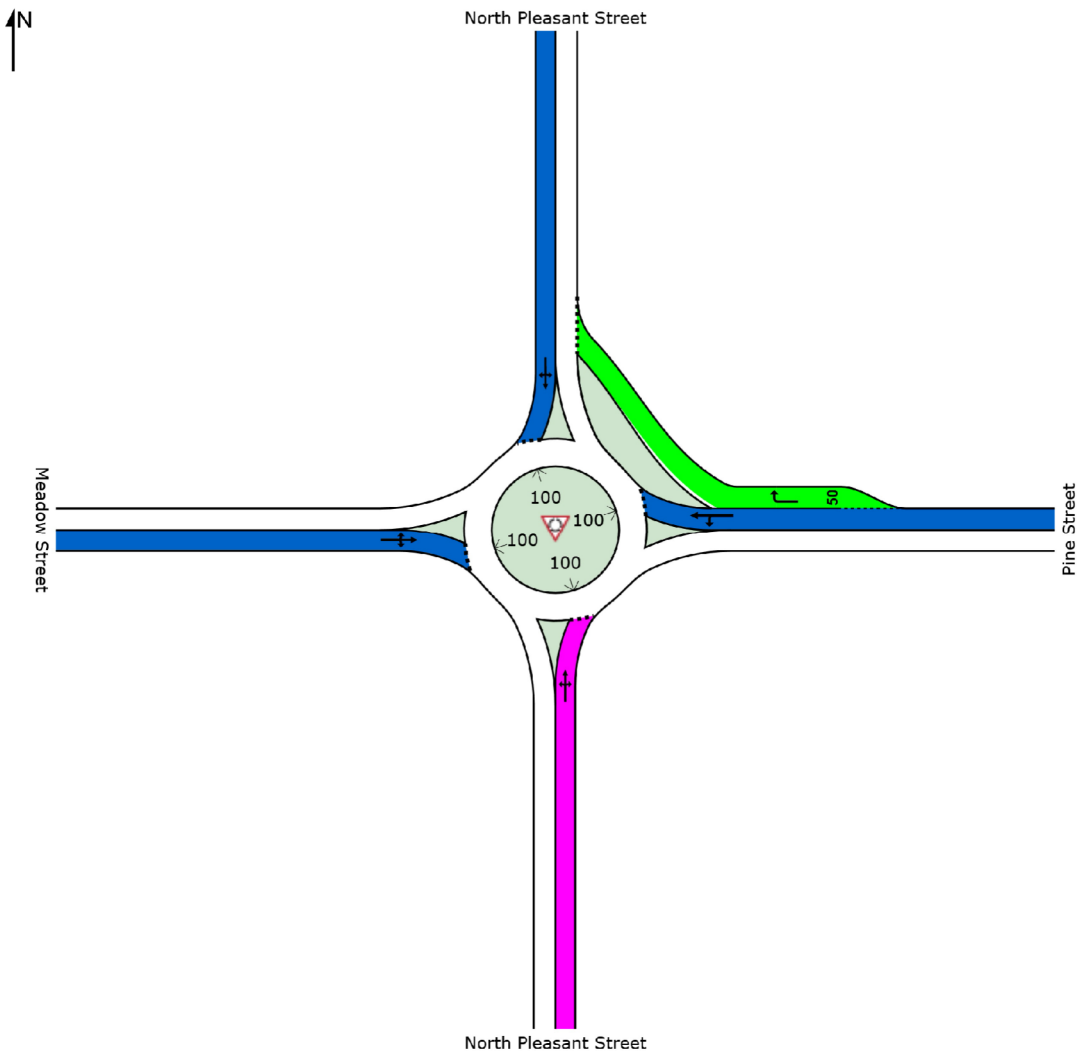
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	D	B	C	C	C



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

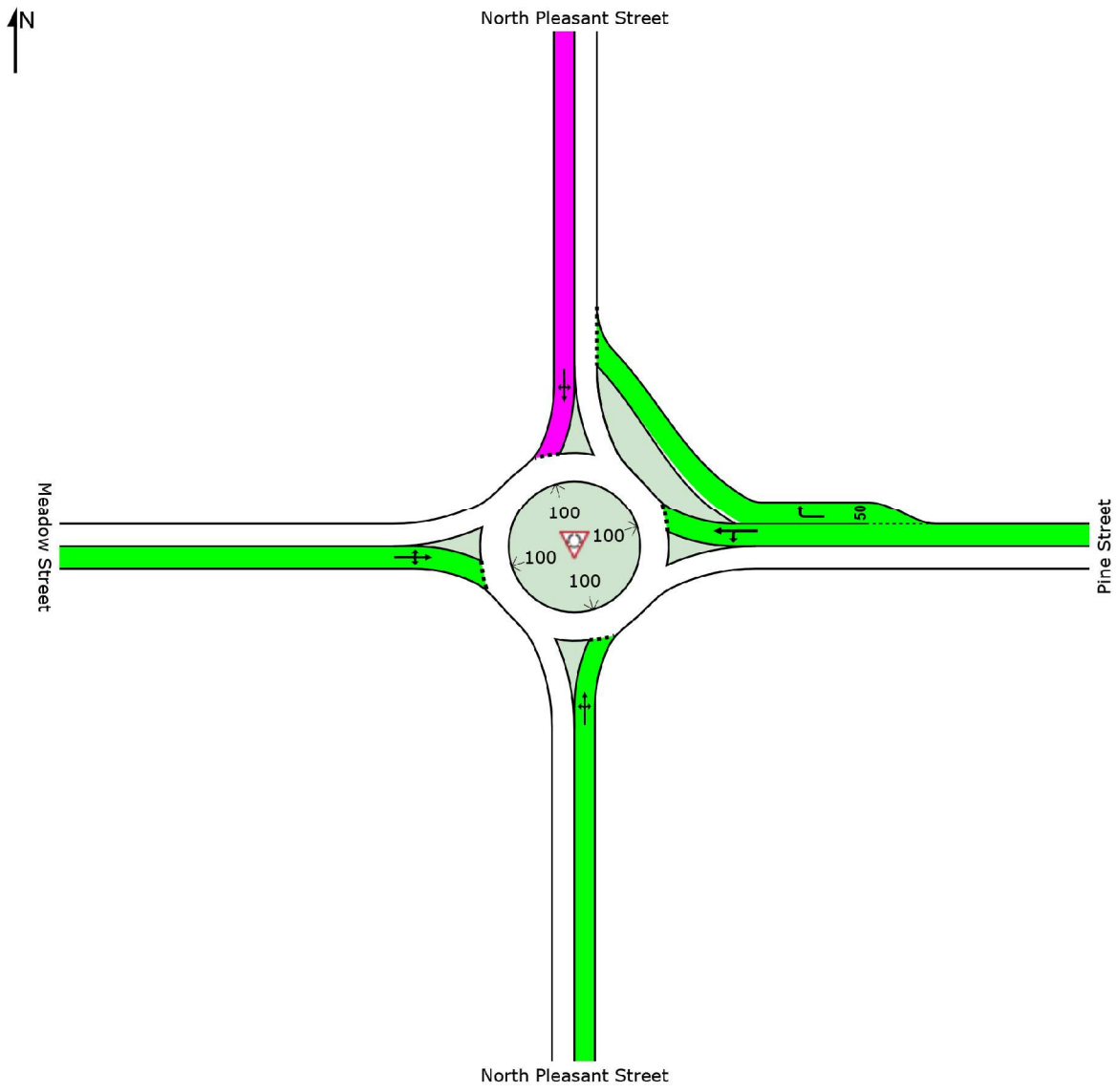
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	222	53	133	89	222



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

PM PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	924	1.5	1689	0.547	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	924	1.5		0.547		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	370	0.8	269	1.376	100	227.2	LOS F	42.1	1058.8	Full	1600	0.0	0.0
Approach	370	0.8		1.376		227.2	LOS F	42.1	1058.8				
North: Sunderland Road													
Lane 1	379	1.7	1798	0.211	100	2.0	LOS A	0.2	4.5	Full	1600	0.0	0.0
Approach	379	1.7		0.211		2.0	NA	0.2	4.5				
Intersection	1673	1.4		1.376		50.7	NA	42.1	1058.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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PM PEAK

LANE LEVEL OF SERVICE

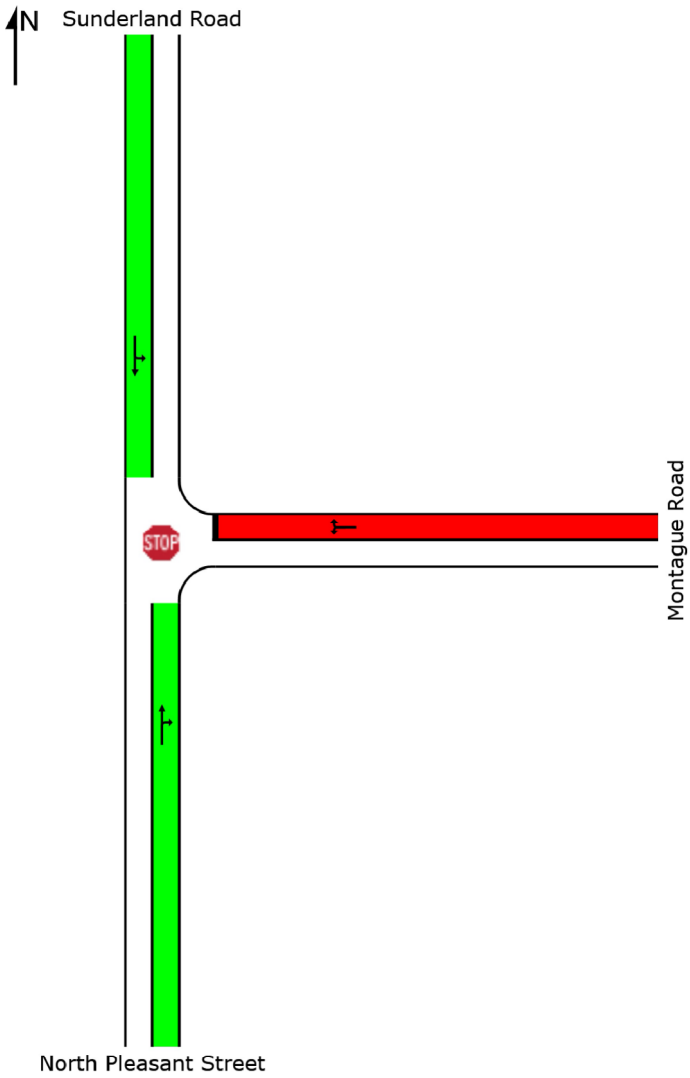
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

PM PEAK

QUEUE DISTANCE (AVER)

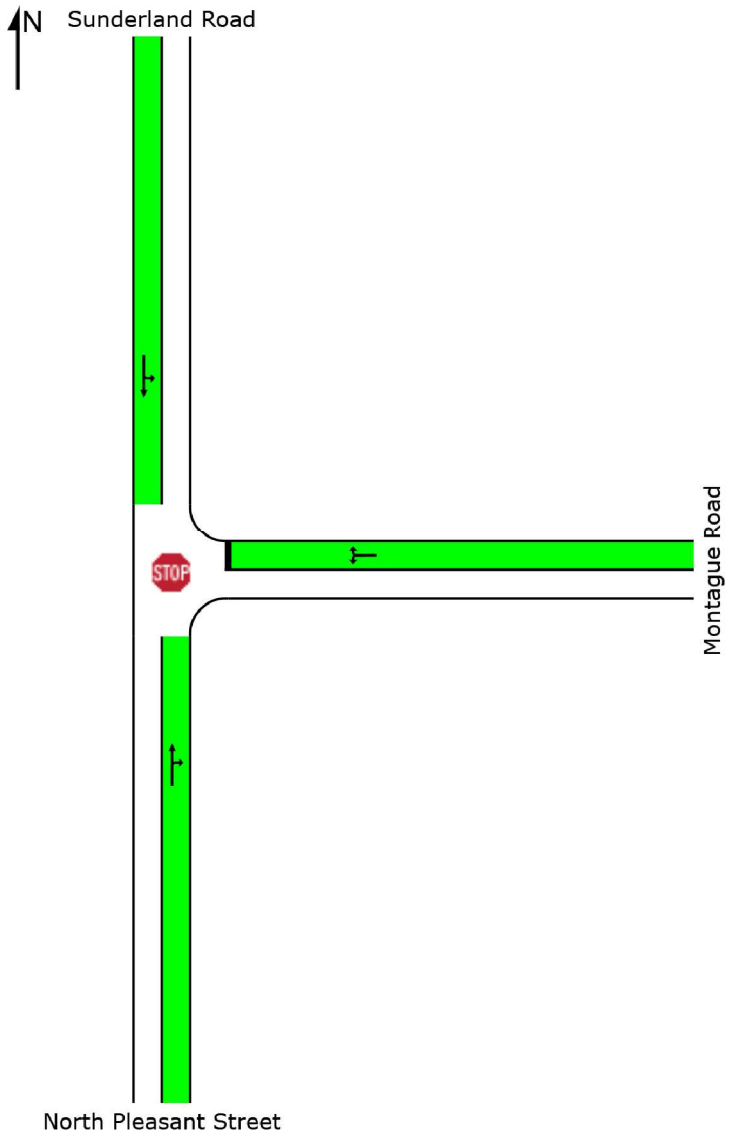
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	426	2	426



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1[d]	495	2.8	969	0.511	100	10.1	LOS B	4.1	103.9	Full	1600	0.0	0.0
Approach	495	2.8		0.511		10.1	LOS B	4.1	103.9				
East: Pine Street													
Lane 1[d]	315	2.1	885	0.356	100	8.1	LOS A	1.9	49.0	Full	1600	0.0	0.0
Lane 2	331	3.7	989	0.334	100	7.1	LOS A	1.8	47.1	Short	50	0.0	NA
Approach	646	2.9		0.356		7.6	LOS A	1.9	49.0				
North: North Pleasant Street													
Lane 1[d]	746	0.6	1154	0.646	100	11.8	LOS B	8.4	211.1	Full	150	0.0	16.2
Approach	746	0.6		0.646		11.8	LOS B	8.4	211.1				
West: Meadow Street													
Lane 1[d]	516	1.3	1019	0.506	100	9.6	LOS A	4.1	103.6	Full	1600	0.0	0.0
Approach	516	1.3		0.506		9.6	LOS A	4.1	103.6				
Intersection	2402	1.8		0.646		9.9	LOS A	8.4	211.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SATURDAY PEAK

LANE LEVEL OF SERVICE

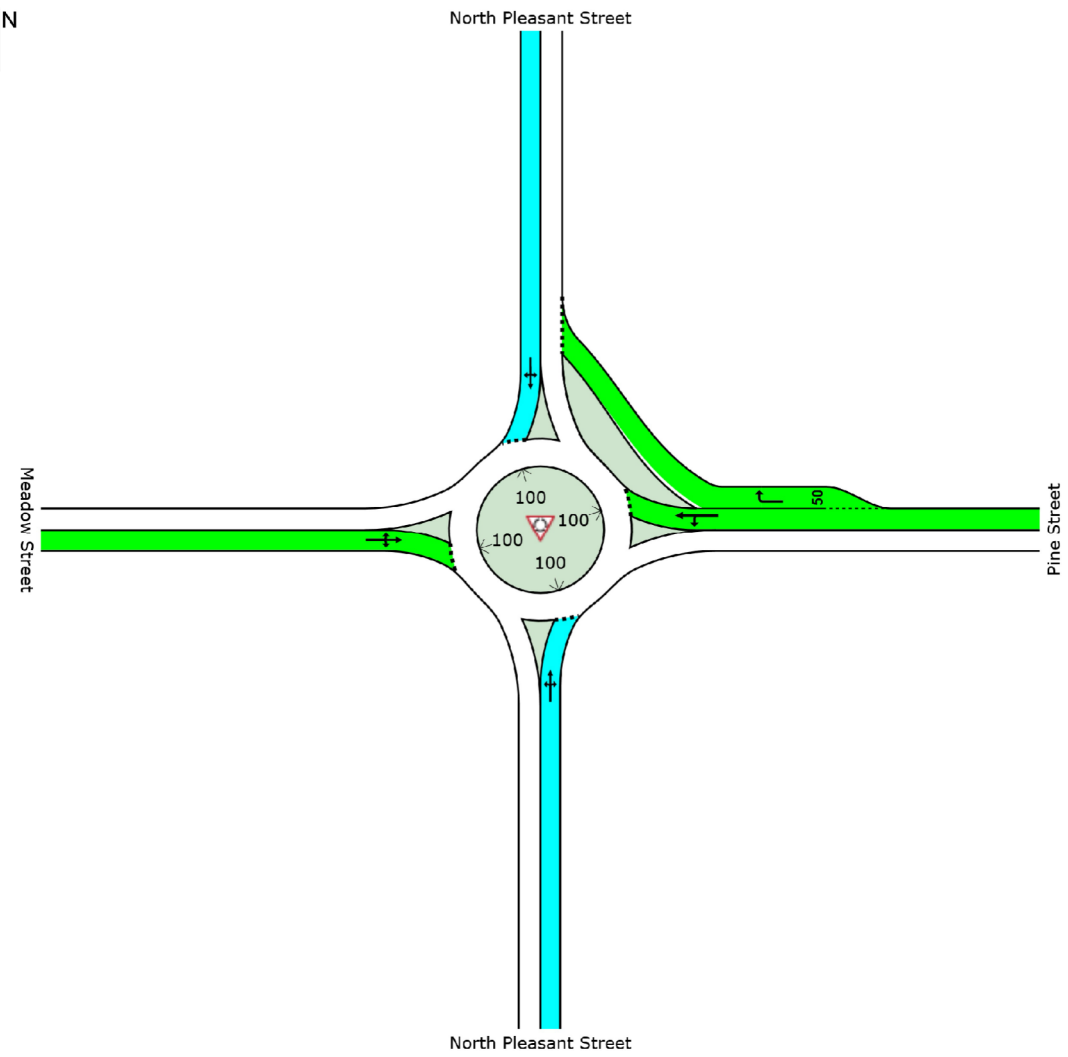
Lane Level of Service

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
LOS	B	A	B	A	A



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Roundabout Level of Service Method: Same as Sign Control
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

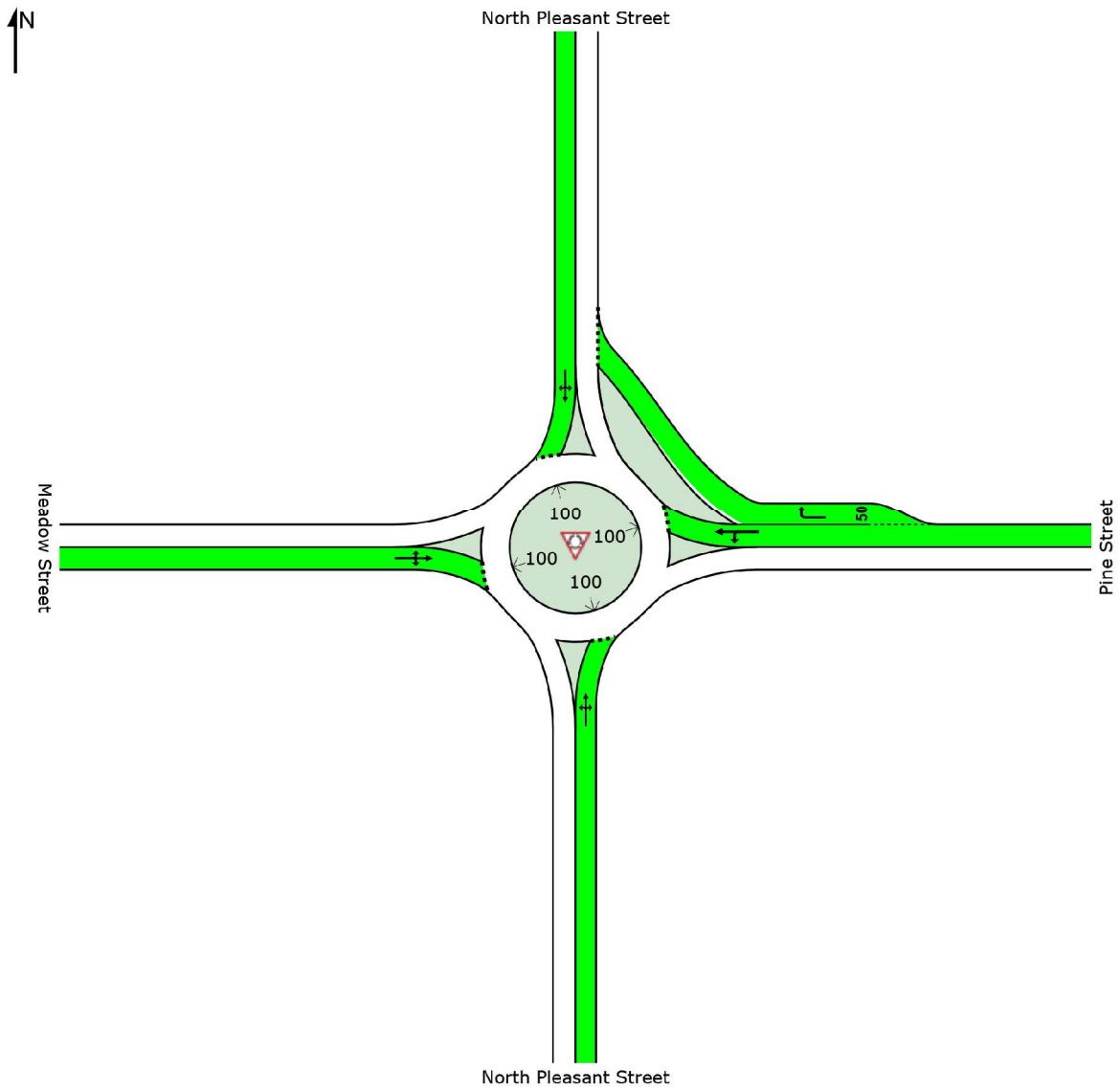
Average Back of Queue Distance per lane (feet)

Site: 101v [Pleasant/Meadow/Pine - Conversion]

New Site
Roundabout

All Movement Classes

	South	East	North	West	Intersection
Queue Distance (Aver)	42	20	85	42	85



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

SATURDAY PEAK

LANE SUMMARY

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: North Pleasant Street													
Lane 1	911	2.8	1669	0.546	100	0.0	LOS A	0.0	0.0	Full	150	0.0	0.0
Approach	911	2.8		0.546		0.0	NA	0.0	0.0				
East: Montague Road													
Lane 1	441	0.5	292	1.510	100	278.8	LOS F	57.7	1448.8	Full	1600	0.0	2.1
Approach	441	0.5		1.510		278.8	LOS F	57.7	1448.8				
North: Sunderland Road													
Lane 1	309	0.5	1841	0.168	100	1.5	LOS A	0.1	2.4	Full	1600	0.0	0.0
Approach	309	0.5		0.168		1.5	NA	0.1	2.4				
Intersection	1661	1.8		1.510		74.4	NA	57.7	1448.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SATURDAY PEAK

LANE LEVEL OF SERVICE

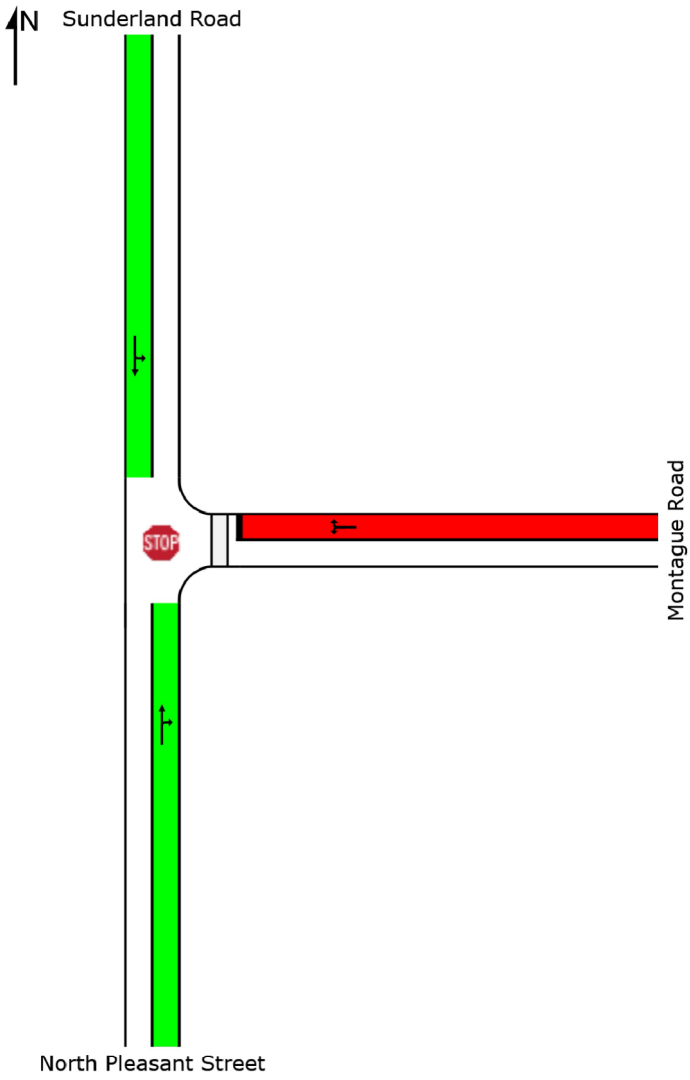
Lane Level of Service

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
LOS	NA	F	NA	NA



Colour code based on Level of Service

LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SATURDAY PEAK

QUEUE DISTANCE (AVER)

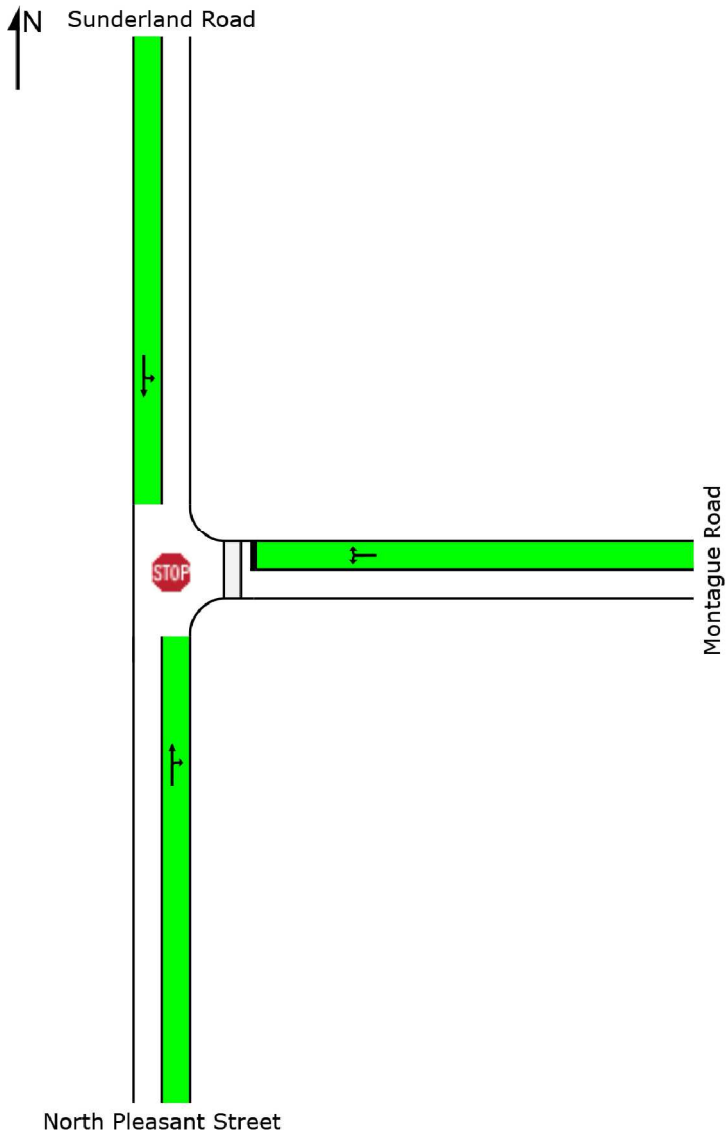
Average Back of Queue Distance per lane (feet)

Site: 101 [Montague/Sunderland]

New Site
Stop (Two-Way)

All Movement Classes

	South	East	North	Intersection
Queue Distance (Aver)	0	583	1	583



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]