McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Appendix for Traffic Impact Study

Proposed Coffee Shop with Drive-Through Window

399 Union Street (Route 135)
Ashland, MA

Prepared by
McMahon Associates, Inc.
350 Myles Standish Boulevard, Suite 103
Taunton, MA 02780
508-823-2245

Prepared for
Salvatore Capital

July 2022

APPENDIX A
Traffic Count Data

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Summer Street
E/W: Union Street/W. Union Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571A
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	12	5	0	0	32	0	63	27	0	139
06:15 AM	13	6	0	3	51	0	116	34	0	223
06:30 AM	11	1	0	2	49	0	146	33	0	242
06:45 AM	32	5	0	3	70	0	163	44	0	317
Total	68	17	0	8	202	0	488	138	0	921
07:00 AM	30	2	0	7	68	0	158	45	0	310
07:15 AM	25	6	1	6	91	0	137	43	0	309
07:30 AM	45	3	0	10	110	0	143	64	0	375
07:45 AM	61	10	0	4	122	0	142	68	0	407
Total	161	21	1	27	391	0	580	220	0	1401
08:00 AM	36	7	1	3	101	0	156	80	0	384
08:15 AM	37	13	1	9	78	0	136	72	0	346
08:30 AM	42	7	0	5	80	0	161	50	0	345
08:45 AM	39	19	0	8	84	0	120	49	0	319
Total	154	46	2	25	343	0	573	251	0	1394
Grand Total	383	84	3	60	936	0	1641	609	0	3716
Apprch %	81.5	17.9	0.6	6	94	0	72.9	27.1	0	
Total %	10.3	2.3	0.1	1.6	25.2	0	44.2	16.4	0	
Cars & Peds	364	77	3	55	901	0	1608	581	0	3589
% Cars & Peds	95	91.7	100	91.7	96.3	0	98	95.4	0	96.6
Trucks & Buses	19	7	0	5	35	0	33	28	0	127
% Trucks & Buses	5	8.3	0	8.3	3.7	0	2	4.6	0	3.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	45	3	0	48	**10**	110	0	120	143	64	0	207	375
07:45 AM	**61**	10	0	**71**	4	**122**	0	**126**	142	68	0	210	**407**
08:00 AM	36	7	**1**	44	3	101	0	104	**156**	**80**	0	**236**	384
08:15 AM	37	**13**	1	51	9	78	0	87	136	72	0	208	346
Total Volume	179	33	2	214	26	411	0	437	577	284	0	861	1512
% App. Total	83.6	15.4	0.9		5.9	94.1	0		67	33	0		
PHF	.734	.635	.500	.754	.650	.842	.000	.867	.925	.888	.000	.912	.929
Cars & Peds	168	31	2	201	21	392	0	413	558	265	0	823	1437
% Cars & Peds	93.9	93.9	100	93.9	80.8	95.4	0	94.5	96.7	93.3	0	95.6	95.0
Trucks & Buses	11	2	0	13	5	19	0	24	19	19	0	38	75
% Trucks & Buses	6.1	6.1	0	6.1	19.2	4.6	0	5.5	3.3	6.7	0	4.4	5.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
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N: Summer Street
E/W: Union Street/W. Union Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571A
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	12	3	0	0	31	0	63	27	0	136
06:15 AM	13	6	0	3	47	0	116	32	0	217
06:30 AM	10	1	0	2	48	0	144	33	0	238
06:45 AM	31	5	0	3	67	0	161	42	0	309
Total	66	15	0	8	193	0	484	134	0	900
07:00 AM	27	2	0	7	66	0	155	44	0	301
07:15 AM	24	4	1	6	91	0	136	41	0	303
07:30 AM	45	3	0	8	105	0	140	63	0	364
07:45 AM	52	10	0	4	113	0	139	58	0	376
Total	148	19	1	25	375	0	570	206	0	1344
08:00 AM	35	7	1	2	99	0	149	74	0	367
08:15 AM	36	11	1	7	75	0	130	70	0	330
08:30 AM	40	6	0	5	77	0	158	49	0	335
08:45 AM	39	19	0	8	82	0	117	48	0	313
Total	150	43	2	22	333	0	554	241	0	1345
Grand Total	364	77	3	55	901	0	1608	581	0	3589
Apprch %	82	17.3	0.7	5.8	94.2	0	73.5	26.5	0	
Total %	10.1	2.1	0.1	1.5	25.1	0	44.8	16.2	0	

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	45	3	0	48	**8**	105	0	113	140	63	0	203	364
07:45 AM	**52**	10	0	**62**	4	**113**	0	**117**	139	58	0	197	**376**
08:00 AM	35	7	**1**	43	2	99	0	101	**149**	**74**	0	**223**	367
08:15 AM	36	**11**	1	48	7	75	0	82	130	70	0	200	330
Total Volume	168	31	2	201	21	392	0	413	558	265	0	823	1437
% App. Total	83.6	15.4	1		5.1	94.9	0		67.8	32.2	0		
PHF	.808	.705	.500	.810	.656	.867	.000	.882	.936	.895	.000	.923	.955

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File Name : 05571A
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Groups Printed- Trucks & Buses

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	2	0	0	1	0	0	0	0	3
06:15 AM	0	0	0	0	4	0	0	2	0	6
06:30 AM	1	0	0	0	1	0	2	0	0	4
06:45 AM	1	0	0	0	3	0	2	2	0	8
Total	2	2	0	0	9	0	4	4	0	21
07:00 AM	3	0	0	0	2	0	3	1	0	9
07:15 AM	1	2	0	0	0	0	1	2	0	6
07:30 AM	0	0	0	2	5	0	3	1	0	11
07:45 AM	9	0	0	0	9	0	3	10	0	31
Total	13	2	0	2	16	0	10	14	0	57
08:00 AM	1	0	0	1	2	0	7	6	0	17
08:15 AM	1	2	0	2	3	0	6	2	0	16
08:30 AM	2	1	0	0	3	0	3	1	0	10
08:45 AM	0	0	0	0	2	0	3	1	0	6
Total	4	3	0	3	10	0	19	10	0	49
Grand Total	19	7	0	5	35	0	33	28	0	127
Apprch %	73.1	26.9	0	12.5	87.5	0	54.1	45.9	0	
Total %	15	5.5	0	3.9	27.6	0	26	22	0	

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	**2**	5	0	7	3	1	0	4	11
07:45 AM	**9**	0	0	**9**	0	**9**	0	**9**	3	**10**	0	**13**	**31**
08:00 AM	1	0	0	1	1	2	0	3	**7**	6	0	13	17
08:15 AM	1	**2**	0	3	2	3	0	5	6	2	0	8	16
Total Volume	11	2	0	13	5	19	0	24	19	19	0	38	75
% App. Total	84.6	15.4	0		20.8	79.2	0		50	50	0		
PHF	.306	.250	.000	.361	.625	.528	.000	.667	.679	.475	.000	.731	.605

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Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Bikes by Direction

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 06:00 AM													
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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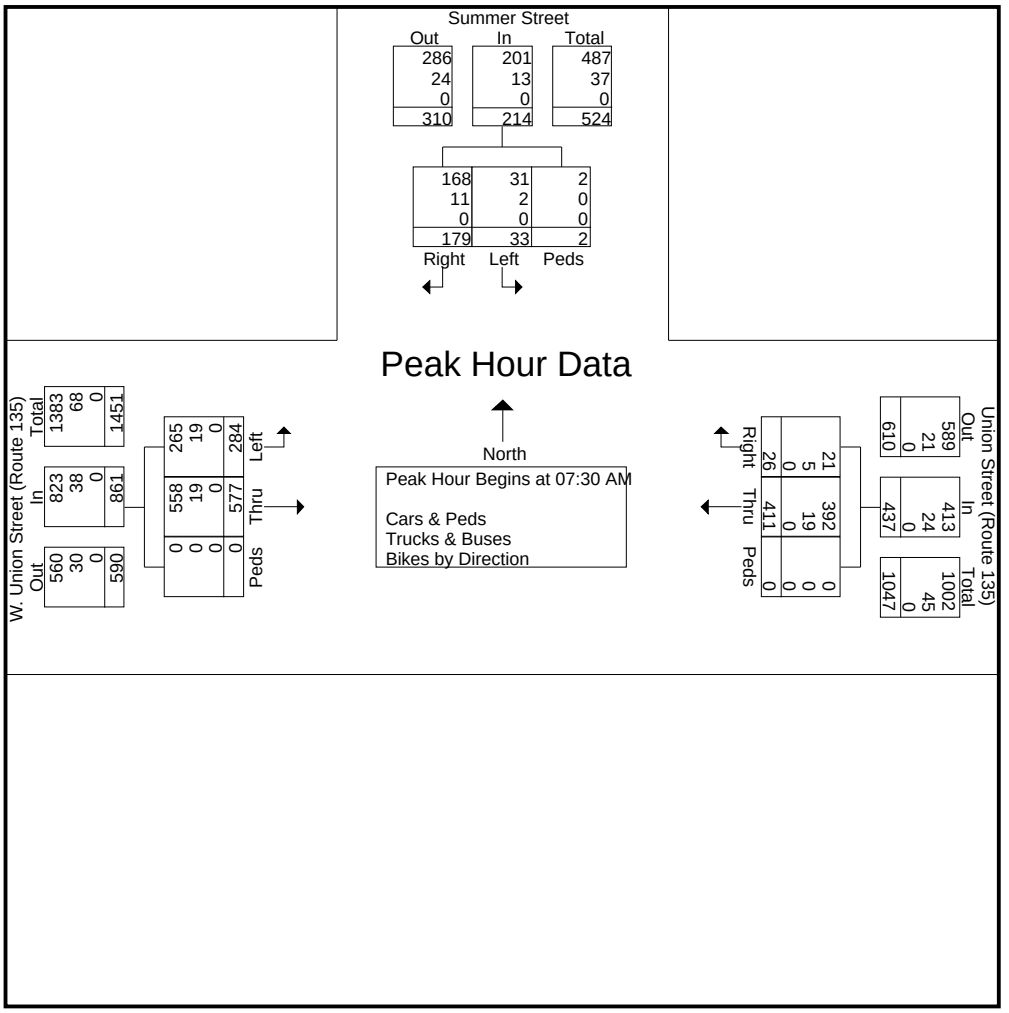
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	45	3	0	48	**10**	110	0	120	143	64	0	207	375
07:45 AM	**61**	10	0	**71**	4	**122**	0	**126**	142	68	0	210	**407**
08:00 AM	36	7	**1**	44	3	101	0	104	**156**	**80**	0	**236**	384
08:15 AM	37	**13**	1	51	9	78	0	87	136	72	0	208	346
Total Volume	179	33	2	214	26	411	0	437	577	284	0	861	1512
% App. Total	83.6	15.4	0.9		5.9	94.1	0		67	33	0		
PHF	.734	.635	.500	.754	.650	.842	.000	.867	.925	.888	.000	.912	.929
Cars & Peds	168	31	2	201	21	392	0	413	558	265	0	823	1437
% Cars & Peds	93.9	93.9	100	93.9	80.8	95.4	0	94.5	96.7	93.3	0	95.6	95.0
Trucks & Buses	11	2	0	13	5	19	0	24	19	19	0	38	75
% Trucks & Buses	6.1	6.1	0	6.1	19.2	4.6	0	5.5	3.3	6.7	0	4.4	5.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



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Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	54	13	0	7	138	1	109	40	0	362
04:15 PM	50	14	0	11	167	0	111	41	0	394
04:30 PM	56	10	0	7	130	0	122	46	1	372
04:45 PM	56	18	0	10	138	0	123	38	0	383
Total	216	55	0	35	573	1	465	165	1	1511
05:00 PM	74	20	1	12	162	0	117	41	1	428
05:15 PM	91	14	1	6	164	0	128	37	1	442
05:30 PM	54	13	1	10	150	1	121	40	1	391
05:45 PM	65	16	2	12	127	0	108	34	0	364
Total	284	63	5	40	603	1	474	152	3	1625
Grand Total	500	118	5	75	1176	2	939	317	4	3136
Apprch %	80.3	18.9	0.8	6	93.9	0.2	74.5	25.2	0.3	
Total %	15.9	3.8	0.2	2.4	37.5	0.1	29.9	10.1	0.1	
Cars & Peds	496	117	5	75	1163	2	929	312	4	3103
% Cars & Peds	99.2	99.2	100	100	98.9	100	98.9	98.4	100	98.9
Trucks & Buses	4	1	0	0	13	0	10	5	0	33
% Trucks & Buses	0.8	0.8	0	0	1.1	0	1.1	1.6	0	1.1
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	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	56	18	0	74	10	138	0	148	123	38	0	161	383
05:00 PM	74	**20**	**1**	95	**12**	162	0	**174**	117	**41**	**1**	159	428
05:15 PM	**91**	14	1	**106**	6	**164**	0	170	**128**	37	1	**166**	**442**
05:30 PM	54	13	1	68	10	150	**1**	161	121	40	1	162	391
Total Volume	275	65	3	343	38	614	1	653	489	156	3	648	1644
% App. Total	80.2	19	0.9		5.8	94	0.2		75.5	24.1	0.5		
PHF	.755	.813	.750	.809	.792	.936	.250	.938	.955	.951	.750	.976	.930
Cars & Peds	274	65	3	342	38	611	1	650	487	155	3	645	1637
% Cars & Peds	99.6	100	100	99.7	100	99.5	100	99.5	99.6	99.4	100	99.5	99.6
Trucks & Buses	1	0	0	1	0	3	0	3	2	1	0	3	7
% Trucks & Buses	0.4	0	0	0.3	0	0.5	0	0.5	0.4	0.6	0	0.5	0.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

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Groups Printed- Cars & Peds

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	53	12	0	7	134	1	106	39	0	352
04:15 PM	48	14	0	11	165	0	109	39	0	386
04:30 PM	56	10	0	7	128	0	121	45	1	368
04:45 PM	56	18	0	10	137	0	123	38	0	382
Total	213	54	0	35	564	1	459	161	1	1488
05:00 PM	73	20	1	12	161	0	117	41	1	426
05:15 PM	91	14	1	6	163	0	128	37	1	441
05:30 PM	54	13	1	10	150	1	119	39	1	388
05:45 PM	65	16	2	12	125	0	106	34	0	360
Total	283	63	5	40	599	1	470	151	3	1615
Grand Total	496	117	5	75	1163	2	929	312	4	3103
Apprch %	80.3	18.9	0.8	6	93.8	0.2	74.6	25.1	0.3	
Total %	16	3.8	0.2	2.4	37.5	0.1	29.9	10.1	0.1	

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	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	56	18	0	74	10	137	0	147	123	38	0	161	382
05:00 PM	73	**20**	**1**	94	**12**	161	0	**173**	117	**41**	**1**	159	426
05:15 PM	**91**	14	1	**106**	6	**163**	0	169	**128**	37	1	**166**	**441**
05:30 PM	54	13	1	68	10	150	**1**	161	119	39	1	159	388
Total Volume	274	65	3	342	38	611	1	650	487	155	3	645	1637
% App. Total	80.1	19	0.9		5.8	94	0.2		75.5	24	0.5		
PHF	.753	.813	.750	.807	.792	.937	.250	.939	.951	.945	.750	.971	.928

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Groups Printed- Trucks & Buses

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	1	1	0	0	4	0	3	1	0	10
04:15 PM	2	0	0	0	2	0	2	2	0	8
04:30 PM	0	0	0	0	2	0	1	1	0	4
04:45 PM	0	0	0	0	1	0	0	0	0	1
Total	3	1	0	0	9	0	6	4	0	23
05:00 PM	1	0	0	0	1	0	0	0	0	2
05:15 PM	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	2	1	0	3
05:45 PM	0	0	0	0	2	0	2	0	0	4
Total	1	0	0	0	4	0	4	1	0	10
Grand Total	4	1	0	0	13	0	10	5	0	33
Apprch %	80	20	0	0	100	0	66.7	33.3	0	
Total %	12.1	3	0	0	39.4	0	30.3	15.2	0	

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	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	1	**1**	0	**2**	0	**4**	0	**4**	**3**	1	0	**4**	**10**
04:15 PM	**2**	0	0	2	0	2	0	2	2	**2**	0	4	8
04:30 PM	0	0	0	0	0	2	0	2	1	1	0	2	4
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	3	1	0	4	0	9	0	9	6	4	0	10	23
% App. Total	75	25	0		0	100	0		60	40	0		
PHF	.375	.250	.000	.500	.000	.563	.000	.563	.500	.500	.000	.625	.575

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Summer Street
E/W: Union Street/W. Union Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571AA
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Bikes by Direction

	Summer Street From North			Union Street (Route 135) From East			W. Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

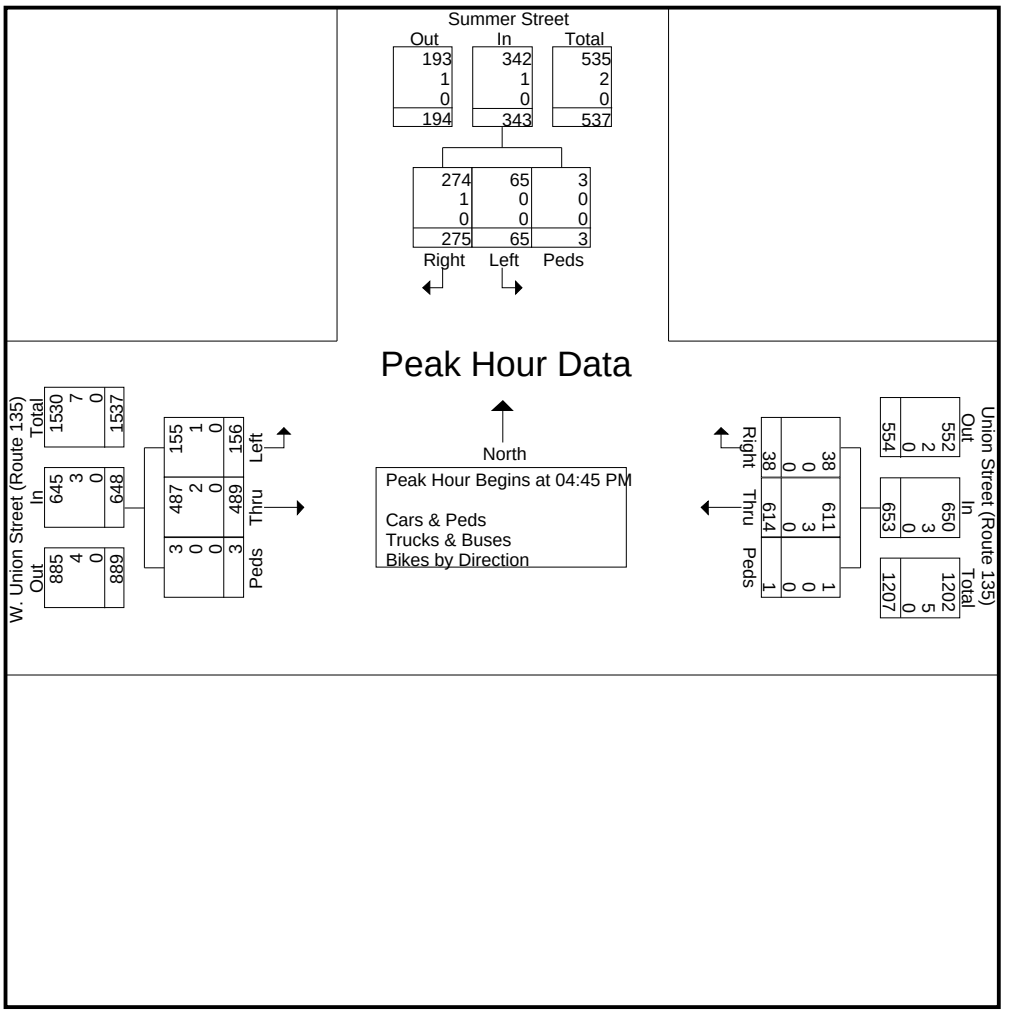
	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Summer Street
E/W: Union Street/W. Union Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571AA
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Summer Street From North				Union Street (Route 135) From East				W. Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	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	56	18	0	74	10	138	0	148	123	38	0	161	383
05:00 PM	74	**20**	**1**	95	**12**	162	0	**174**	117	**41**	**1**	159	428
05:15 PM	**91**	14	1	**106**	6	**164**	0	170	**128**	37	1	**166**	**442**
05:30 PM	54	13	1	68	10	150	**1**	161	121	40	1	162	391
Total Volume	275	65	3	343	38	614	1	653	489	156	3	648	1644
% App. Total	80.2	19	0.9		5.8	94	0.2		75.5	24.1	0.5		
PHF	.755	.813	.750	.809	.792	.936	.250	.938	.955	.951	.750	.976	.930
Cars & Peds	274	65	3	342	38	611	1	650	487	155	3	645	1637
% Cars & Peds	99.6	100	100	99.7	100	99.5	100	99.5	99.6	99.4	100	99.5	99.6
Trucks & Buses	1	0	0	1	0	3	0	3	2	1	0	3	7
% Trucks & Buses	0.4	0	0	0.3	0	0.5	0	0.5	0.4	0.6	0	0.5	0.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571B
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	16	0	0	0	1	0	4	23	0	44
06:15 AM	12	3	0	2	7	0	11	26	0	61
06:30 AM	5	0	0	2	7	0	13	22	0	49
06:45 AM	21	1	0	3	16	0	14	33	0	88
Total	54	4	0	7	31	0	42	104	0	242
07:00 AM	13	2	0	1	19	0	21	31	0	87
07:15 AM	21	0	0	0	10	0	23	26	0	80
07:30 AM	26	1	0	3	22	0	33	41	0	126
07:45 AM	42	1	0	0	29	0	31	41	0	144
Total	102	4	0	4	80	0	108	139	0	437
08:00 AM	25	1	0	1	18	0	43	40	0	128
08:15 AM	28	0	0	1	22	0	48	33	0	132
08:30 AM	19	0	0	3	30	0	32	23	0	107
08:45 AM	28	3	0	2	30	0	28	29	0	120
Total	100	4	0	7	100	0	151	125	0	487
Grand Total	256	12	0	18	211	0	301	368	0	1166
Apprch %	95.5	4.5	0	7.9	92.1	0	45	55	0	
Total %	22	1	0	1.5	18.1	0	25.8	31.6	0	
Cars & Peds	238	12	0	18	203	0	287	349	0	1107
% Cars & Peds	93	100	0	100	96.2	0	95.3	94.8	0	94.9
Trucks & Buses	18	0	0	0	8	0	14	19	0	59
% Trucks & Buses	7	0	0	0	3.8	0	4.7	5.2	0	5.1
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	26	**1**	0	27	**3**	22	0	25	33	**41**	0	74	126
07:45 AM	**42**	1	0	**43**	0	**29**	0	**29**	31	41	0	72	**144**
08:00 AM	25	1	0	26	1	18	0	19	43	40	0	**83**	128
08:15 AM	28	0	0	28	1	22	0	23	**48**	33	0	81	132
Total Volume	121	3	0	124	5	91	0	96	155	155	0	310	530
% App. Total	97.6	2.4	0		5.2	94.8	0		50	50	0		
PHF	.720	.750	.000	.721	.417	.784	.000	.828	.807	.945	.000	.934	.920
Cars & Peds	112	3	0	115	5	87	0	92	145	141	0	286	493
% Cars & Peds	92.6	100	0	92.7	100	95.6	0	95.8	93.5	91.0	0	92.3	93.0
Trucks & Buses	9	0	0	9	0	4	0	4	10	14	0	24	37
% Trucks & Buses	7.4	0	0	7.3	0	4.4	0	4.2	6.5	9.0	0	7.7	7.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571B
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Cars & Peds

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	14	0	0	0	1	0	4	23	0	42
06:15 AM	12	3	0	2	7	0	10	25	0	59
06:30 AM	5	0	0	2	6	0	13	22	0	48
06:45 AM	21	1	0	3	15	0	13	32	0	85
Total	52	4	0	7	29	0	40	102	0	234
07:00 AM	12	2	0	1	17	0	20	31	0	83
07:15 AM	18	0	0	0	10	0	23	24	0	75
07:30 AM	26	1	0	3	22	0	32	39	0	123
07:45 AM	36	1	0	0	26	0	25	37	0	125
Total	92	4	0	4	75	0	100	131	0	406
08:00 AM	24	1	0	1	18	0	41	35	0	120
08:15 AM	26	0	0	1	21	0	47	30	0	125
08:30 AM	16	0	0	3	30	0	31	23	0	103
08:45 AM	28	3	0	2	30	0	28	28	0	119
Total	94	4	0	7	99	0	147	116	0	467
Grand Total	238	12	0	18	203	0	287	349	0	1107
Apprch %	95.2	4.8	0	8.1	91.9	0	45.1	54.9	0	
Total %	21.5	1.1	0	1.6	18.3	0	25.9	31.5	0	

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	26	**1**	0	27	**3**	22	0	25	32	**39**	0	71	123
07:45 AM	**36**	1	0	**37**	0	**26**	0	**26**	25	37	0	62	**125**
08:00 AM	24	1	0	25	1	18	0	19	41	35	0	76	120
08:15 AM	26	0	0	26	1	21	0	22	**47**	30	0	**77**	125
Total Volume	112	3	0	115	5	87	0	92	145	141	0	286	493
% App. Total	97.4	2.6	0		5.4	94.6	0		50.7	49.3	0		
PHF	.778	.750	.000	.777	.417	.837	.000	.885	.771	.904	.000	.929	.986

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571B
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Trucks & Buses

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	2	0	0	0	0	0	0	0	0	2
06:15 AM	0	0	0	0	0	0	1	1	0	2
06:30 AM	0	0	0	0	1	0	0	0	0	1
06:45 AM	0	0	0	0	1	0	1	1	0	3
Total	2	0	0	0	2	0	2	2	0	8
07:00 AM	1	0	0	0	2	0	1	0	0	4
07:15 AM	3	0	0	0	0	0	0	2	0	5
07:30 AM	0	0	0	0	0	0	1	2	0	3
07:45 AM	6	0	0	0	3	0	6	4	0	19
Total	10	0	0	0	5	0	8	8	0	31
08:00 AM	1	0	0	0	0	0	2	5	0	8
08:15 AM	2	0	0	0	1	0	1	3	0	7
08:30 AM	3	0	0	0	0	0	1	0	0	4
08:45 AM	0	0	0	0	0	0	0	1	0	1
Total	6	0	0	0	1	0	4	9	0	20
Grand Total	18	0	0	0	8	0	14	19	0	59
Apprch %	100	0	0	0	100	0	42.4	57.6	0	
Total %	30.5	0	0	0	13.6	0	23.7	32.2	0	

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	**6**	0	0	**6**	0	**3**	0	**3**	**6**	4	0	**10**	**19**
08:00 AM	1	0	0	1	0	0	0	0	2	**5**	0	7	8
08:15 AM	2	0	0	2	0	1	0	1	1	3	0	4	7
08:30 AM	3	0	0	3	0	0	0	0	1	0	0	1	4
Total Volume	12	0	0	12	0	4	0	4	10	12	0	22	38
% App. Total	100	0	0		0	100	0		45.5	54.5	0		
PHF	.500	.000	.000	.500	.000	.333	.000	.333	.417	.600	.000	.550	.500

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571B
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Bikes by Direction

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

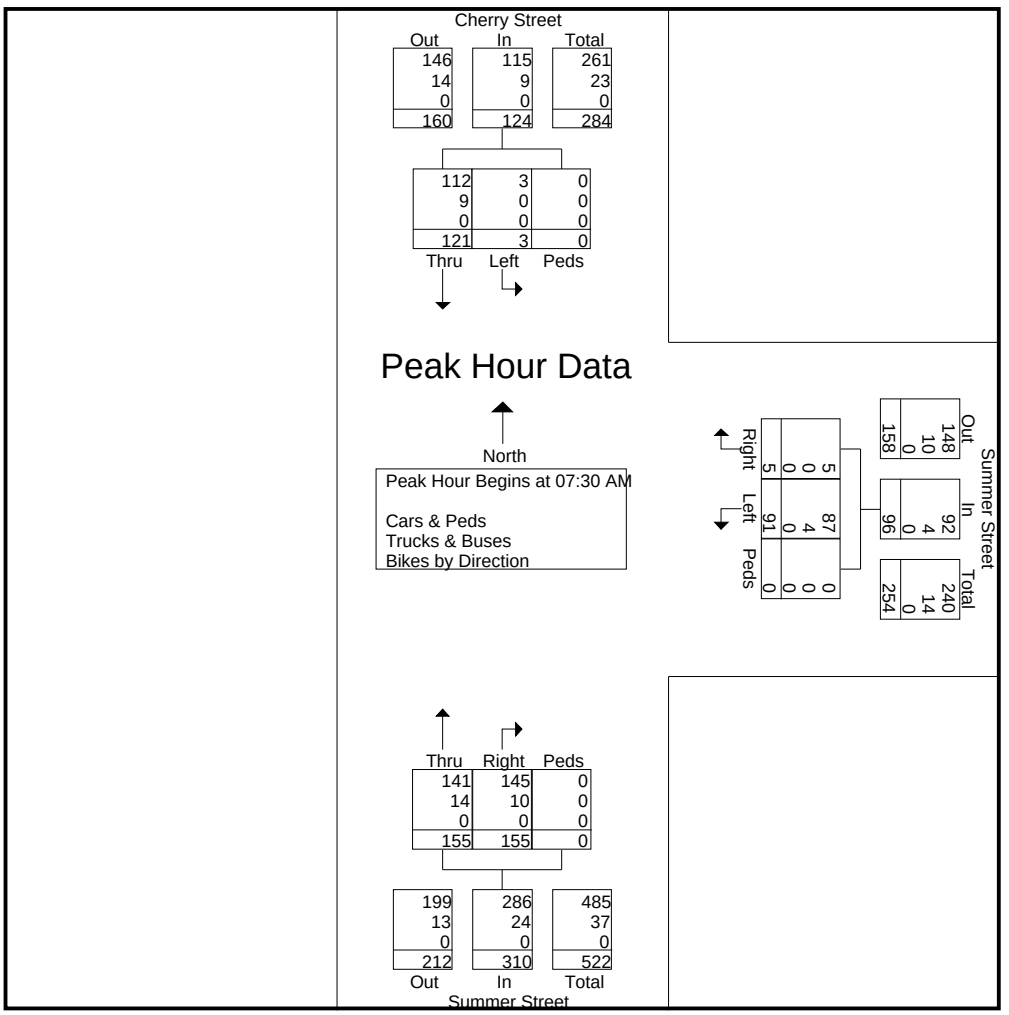
	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 06:00 AM													
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571B
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	26	**1**	0	27	**3**	22	0	25	33	**41**	0	74	126
07:45 AM	**42**	1	0	**43**	0	**29**	0	**29**	31	41	0	72	**144**
08:00 AM	25	1	0	26	1	18	0	19	43	40	0	**83**	128
08:15 AM	28	0	0	28	1	22	0	23	**48**	33	0	81	132
Total Volume	121	3	0	124	5	91	0	96	155	155	0	310	530
% App. Total	97.6	2.4	0		5.2	94.8	0		50	50	0		
PHF	.720	.750	.000	.721	.417	.784	.000	.828	.807	.945	.000	.934	.920
Cars & Peds	112	3	0	115	5	87	0	92	145	141	0	286	493
% Cars & Peds	92.6	100	0	92.7	100	95.6	0	95.8	93.5	91.0	0	92.3	93.0
Trucks & Buses	9	0	0	9	0	4	0	4	10	14	0	24	37
% Trucks & Buses	7.4	0	0	7.3	0	4.4	0	4.2	6.5	9.0	0	7.7	7.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571BB
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	27	2	0	4	40	0	24	23	0	120
04:15 PM	32	1	0	11	32	0	20	32	0	128
04:30 PM	31	4	0	3	35	0	21	32	0	126
04:45 PM	34	4	0	4	40	0	16	32	0	130
Total	124	11	0	22	147	0	81	119	0	504
05:00 PM	52	1	0	3	42	0	25	28	0	151
05:15 PM	48	4	0	1	57	0	22	21	0	153
05:30 PM	30	4	0	5	37	0	24	26	0	126
05:45 PM	36	4	0	8	45	0	22	24	0	139
Total	166	13	0	17	181	0	93	99	0	569
Grand Total	290	24	0	39	328	0	174	218	0	1073
Apprch %	92.4	7.6	0	10.6	89.4	0	44.4	55.6	0	
Total %	27	2.2	0	3.6	30.6	0	16.2	20.3	0	
Cars & Peds	287	24	0	39	326	0	171	216	0	1063
% Cars & Peds	99	100	0	100	99.4	0	98.3	99.1	0	99.1
Trucks & Buses	3	0	0	0	2	0	3	2	0	10
% Trucks & Buses	1	0	0	0	0.6	0	1.7	0.9	0	0.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	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 05:00 PM													
05:00 PM	**52**	1	0	**53**	3	42	0	45	**25**	**28**	0	**53**	151
05:15 PM	48	**4**	0	52	1	**57**	0	**58**	22	21	0	43	**153**
05:30 PM	30	4	0	34	5	37	0	42	24	26	0	50	126
05:45 PM	36	4	0	40	**8**	45	0	53	22	24	0	46	139
Total Volume	166	13	0	179	17	181	0	198	93	99	0	192	569
% App. Total	92.7	7.3	0		8.6	91.4	0		48.4	51.6	0		
PHF	.798	.813	.000	.844	.531	.794	.000	.853	.930	.884	.000	.906	.930
Cars & Peds	165	13	0	178	17	181	0	198	92	99	0	191	567
% Cars & Peds	99.4	100	0	99.4	100	100	0	100	98.9	100	0	99.5	99.6
Trucks & Buses	1	0	0	1	0	0	0	0	1	0	0	1	2
% Trucks & Buses	0.6	0	0	0.6	0	0	0	0	1.1	0	0	0.5	0.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571BB
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	26	2	0	4	39	0	23	23	0	117
04:15 PM	31	1	0	11	31	0	19	31	0	124
04:30 PM	31	4	0	3	35	0	21	31	0	125
04:45 PM	34	4	0	4	40	0	16	32	0	130
Total	122	11	0	22	145	0	79	117	0	496
05:00 PM	51	1	0	3	42	0	25	28	0	150
05:15 PM	48	4	0	1	57	0	22	21	0	153
05:30 PM	30	4	0	5	37	0	23	26	0	125
05:45 PM	36	4	0	8	45	0	22	24	0	139
Total	165	13	0	17	181	0	92	99	0	567
Grand Total	287	24	0	39	326	0	171	216	0	1063
Apprch %	92.3	7.7	0	10.7	89.3	0	44.2	55.8	0	
Total %	27	2.3	0	3.7	30.7	0	16.1	20.3	0	

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	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 05:00 PM													
05:00 PM	**51**	1	0	**52**	3	42	0	45	**25**	**28**	0	**53**	150
05:15 PM	48	**4**	0	52	1	**57**	0	**58**	22	21	0	43	**153**
05:30 PM	30	4	0	34	5	37	0	42	23	26	0	49	125
05:45 PM	36	4	0	40	**8**	45	0	53	22	24	0	46	139
Total Volume	165	13	0	178	17	181	0	198	92	99	0	191	567
% App. Total	92.7	7.3	0		8.6	91.4	0		48.2	51.8	0		
PHF	.809	.813	.000	.856	.531	.794	.000	.853	.920	.884	.000	.901	.926

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Cherry Street/Summer Street
E: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571BB
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Trucks & Buses

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	1	0	0	0	1	0	1	0	0	3
04:15 PM	1	0	0	0	1	0	1	1	0	4
04:30 PM	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	2	0	2	2	0	8
05:00 PM	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	1	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	1	0	0	2
Grand Total	3	0	0	0	2	0	3	2	0	10
Apprch %	100	0	0	0	100	0	60	40	0	
Total %	30	0	0	0	20	0	30	20	0	

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	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	**1**	0	0	**1**	0	**1**	0	**1**	**1**	0	0	1	3
04:15 PM	1	0	0	1	0	1	0	1	1	**1**	0	**2**	**4**
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	2	0	2	0	2	2	2	0	4	8
% App. Total	100	0	0		0	100	0		50	50	0		
PHF	.500	.000	.000	.500	.000	.500	.000	.500	.500	.500	.000	.500	.500

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

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File Name : 05571BB
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Bikes by Direction

	Cherry Street From North			Summer Street From East			Summer Street From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	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	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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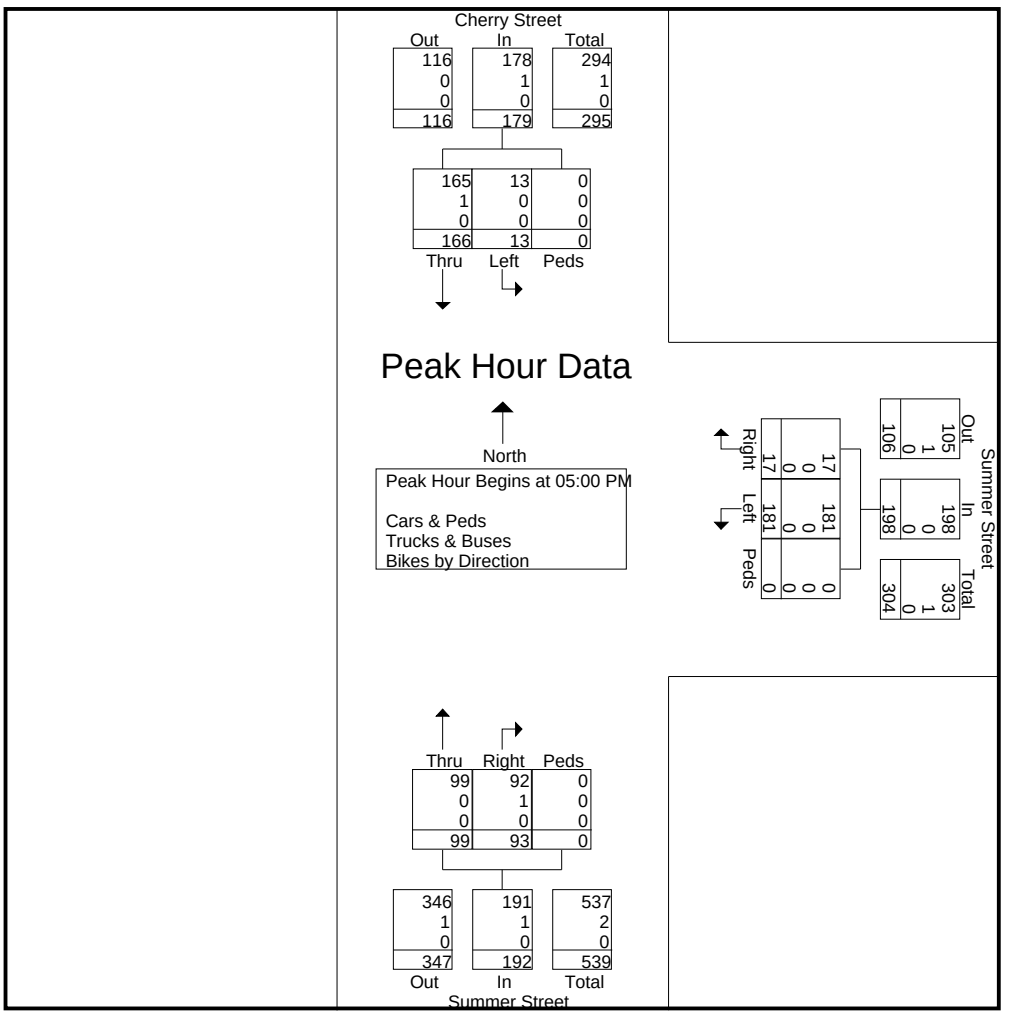
File Name : 05571BB
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Cherry Street From North				Summer Street From East				Summer Street From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	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 05:00 PM													
05:00 PM	**52**	1	0	**53**	3	42	0	45	**25**	**28**	0	**53**	151
05:15 PM	48	**4**	0	52	1	**57**	0	**58**	22	21	0	43	**153**
05:30 PM	30	4	0	34	5	37	0	42	24	26	0	50	126
05:45 PM	36	4	0	40	**8**	45	0	53	22	24	0	46	139
Total Volume	166	13	0	179	17	181	0	198	93	99	0	192	569
% App. Total	92.7	7.3	0		8.6	91.4	0		48.4	51.6	0		
PHF	.798	.813	.000	.844	.531	.794	.000	.853	.930	.884	.000	.906	.930
Cars & Peds	165	13	0	178	17	181	0	198	92	99	0	191	567
% Cars & Peds	99.4	100	0	99.4	100	100	0	100	98.9	100	0	99.5	99.6
Trucks & Buses	1	0	0	1	0	0	0	0	1	0	0	1	2
% Trucks & Buses	0.6	0	0	0.6	0	0	0	0	1.1	0	0	0.5	0.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Walgreens Westerly Dr./Plaza Dr.
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571C
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Cars & Peds

	Walgreens Westerly Driveway From North				Union Street (Route 135) From East				Ashland Square (CVS Plaza Driveway) From South				Union Street (Route 135) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	2	0	1	0	1	0	1	0	0	0	5
06:15 AM	0	0	0	0	0	0	2	0	3	0	2	0	6	0	0	0	13
06:30 AM	0	0	0	0	0	0	4	0	2	0	1	0	2	0	0	0	9
06:45 AM	0	0	0	0	0	0	3	0	1	0	1	0	2	0	0	0	7
Total	0	0	0	0	0	0	11	0	7	0	5	0	11	0	0	0	34
07:00 AM	0	0	0	0	0	0	4	0	4	0	2	0	5	0	0	0	15
07:15 AM	0	0	0	0	0	0	3	0	4	0	2	0	4	0	0	0	13
07:30 AM	0	0	0	0	0	0	2	0	4	0	1	0	3	0	0	0	10
07:45 AM	0	0	0	0	0	0	10	0	8	0	7	0	13	0	0	0	38
Total	0	0	0	0	0	0	19	0	20	0	12	0	25	0	0	0	76
08:00 AM	0	0	0	0	0	0	8	0	5	0	4	0	7	0	0	0	24
08:15 AM	0	0	0	0	0	0	8	0	8	0	4	0	13	0	0	0	33
08:30 AM	1	0	0	0	0	0	7	0	13	0	8	0	9	0	0	0	38
08:45 AM	0	0	0	0	0	0	9	0	11	0	9	0	16	0	0	0	45
Total	1	0	0	0	0	0	32	0	37	0	25	0	45	0	0	0	140
Grand Total	1	0	0	0	0	0	62	0	64	0	42	0	81	0	0	0	250
Apprch %	100	0	0	0	0	0	100	0	60.4	0	39.6	0	100	0	0	0	
Total %	0.4	0	0	0	0	0	24.8	0	25.6	0	16.8	0	32.4	0	0	0	

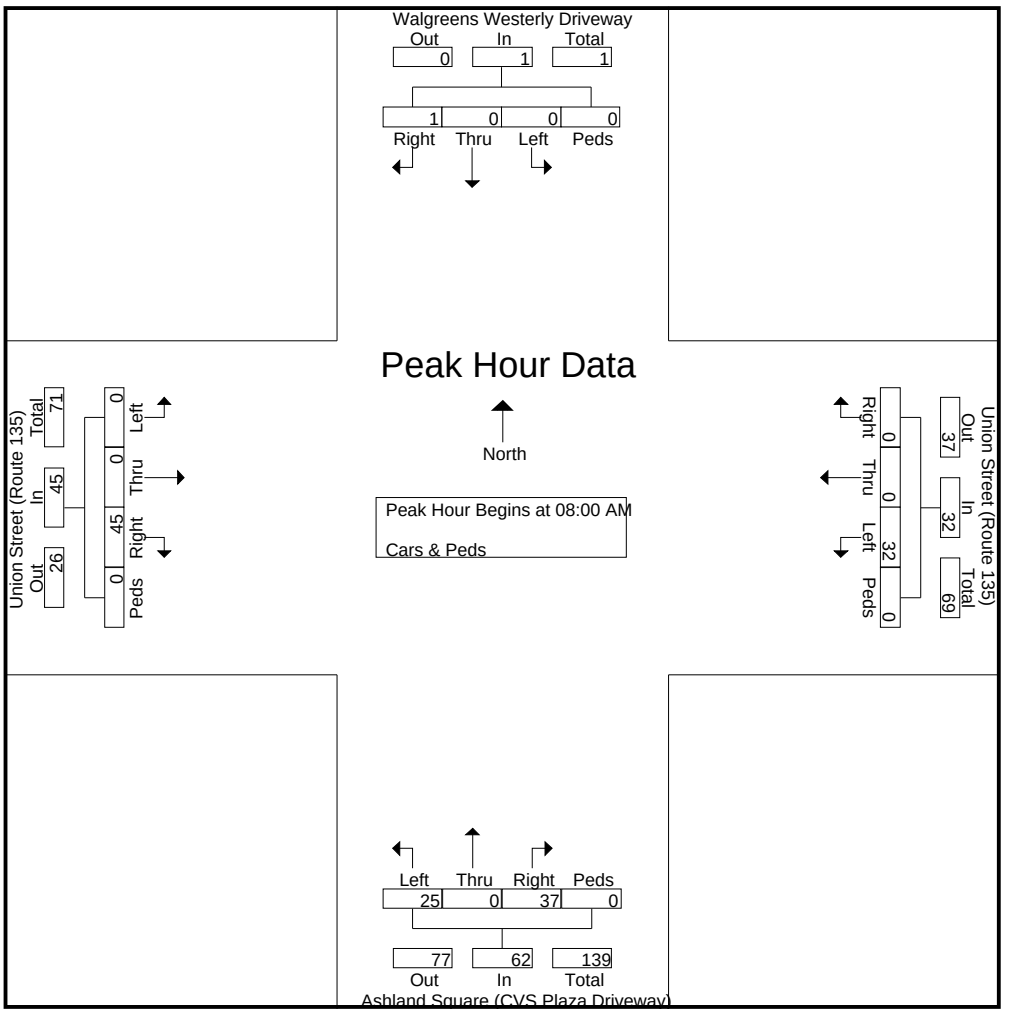
	Walgreens Westerly Driveway From North					Union Street (Route 135) From East					Ashland Square (CVS Plaza Driveway) From South					Union Street (Route 135) From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	8	0	8	5	0	4	0	9	7	0	0	0	7	24
08:15 AM	0	0	0	0	0	0	0	8	0	8	8	0	4	0	12	13	0	0	0	13	33
08:30 AM	**1**	0	0	0	**1**	0	0	7	0	7	**13**	0	8	0	**21**	9	0	0	0	9	38
08:45 AM	0	0	0	0	0	0	0	**9**	0	**9**	11	0	**9**	0	20	**16**	0	0	0	**16**	**45**
Total Volume	1	0	0	0	1	0	0	32	0	32	37	0	25	0	62	45	0	0	0	45	140
% App. Total	100	0	0	0		0	0	100	0		59.7	0	40.3	0		100	0	0	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.889	.000	.889	.712	.000	.694	.000	.738	.703	.000	.000	.000	.703	.778

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Walgreens Westerly Dr./Plaza Dr.
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571C
Site Code : Y2252211
Start Date : 6/1/2022

	Walgreens Westerly Driveway From North					Union Street (Route 135) From East					Ashland Square (CVS Plaza Driveway) From South					Union Street (Route 135) 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 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	8	0	8	5	0	4	0	9	7	0	0	0	7	24
08:15 AM	0	0	0	0	0	0	0	8	0	8	8	0	4	0	12	13	0	0	0	13	33
08:30 AM	**1**	0	0	0	**1**	0	0	7	0	7	**13**	0	8	0	**21**	9	0	0	0	9	38
08:45 AM	0	0	0	0	0	0	0	**9**	0	**9**	11	0	**9**	0	20	**16**	0	0	0	**16**	**45**
Total Volume	1	0	0	0	1	0	0	32	0	32	37	0	25	0	62	45	0	0	0	45	140
% App. Total	100	0	0	0		0	0	100	0		59.7	0	40.3	0		100	0	0	0		
PHF	.250	.000	.000	.000	.250	.000	.000	.889	.000	.889	.712	.000	.694	.000	.738	.703	.000	.000	.000	.703	.778



Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

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E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571CC
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds

	Walgreens Westerly Driveway From North				Union Street (Route 135) From East				Ashland Square (CVS Plaza Driveway) From South				Union Street (Route 135) 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	3	0	2	0	0	0	19	0	20	0	23	0	16	0	1	0	84
04:15 PM	3	0	0	0	0	0	16	0	24	0	14	0	26	0	1	0	84
04:30 PM	4	0	1	0	0	0	11	0	21	0	8	0	12	0	0	0	57
04:45 PM	1	0	3	0	0	0	21	0	26	0	17	0	21	0	0	0	89
Total	11	0	6	0	0	0	67	0	91	0	62	0	75	0	2	0	314
05:00 PM	2	0	0	0	0	0	8	0	17	0	23	0	19	0	0	0	69
05:15 PM	3	0	0	0	2	0	18	0	22	0	17	0	26	0	0	0	88
05:30 PM	2	0	1	0	0	0	11	0	16	0	13	0	17	0	0	0	60
05:45 PM	1	0	1	0	0	0	11	0	17	0	15	0	18	0	0	0	63
Total	8	0	2	0	2	0	48	0	72	0	68	0	80	0	0	0	280
Grand Total	19	0	8	0	2	0	115	0	163	0	130	0	155	0	2	0	594
Apprch %	70.4	0	29.6	0	1.7	0	98.3	0	55.6	0	44.4	0	98.7	0	1.3	0	
Total %	3.2	0	1.3	0	0.3	0	19.4	0	27.4	0	21.9	0	26.1	0	0.3	0	

	Walgreens Westerly Driveway From North					Union Street (Route 135) From East					Ashland Square (CVS Plaza Driveway) From South					Union Street (Route 135) From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			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	3	0	2	0	**5**	0	0	19	0	19	20	0	**23**	0	**43**	16	0	**1**	0	17	84
04:15 PM	3	0	0	0	3	0	0	16	0	16	24	0	14	0	38	**26**	0	1	0	**27**	84
04:30 PM	**4**	0	1	0	5	0	0	11	0	11	21	0	8	0	29	12	0	0	0	12	57
04:45 PM	1	0	**3**	0	4	0	0	**21**	0	**21**	**26**	0	17	0	43	21	0	0	0	21	**89**
Total Volume	11	0	6	0	17	0	0	67	0	67	91	0	62	0	153	75	0	2	0	77	314
% App. Total	64.7	0	35.3	0		0	0	100	0		59.5	0	40.5	0		97.4	0	2.6	0		
PHF	.688	.000	.500	.000	.850	.000	.000	.798	.000	.798	.875	.000	.674	.000	.890	.721	.000	.500	.000	.713	.882

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

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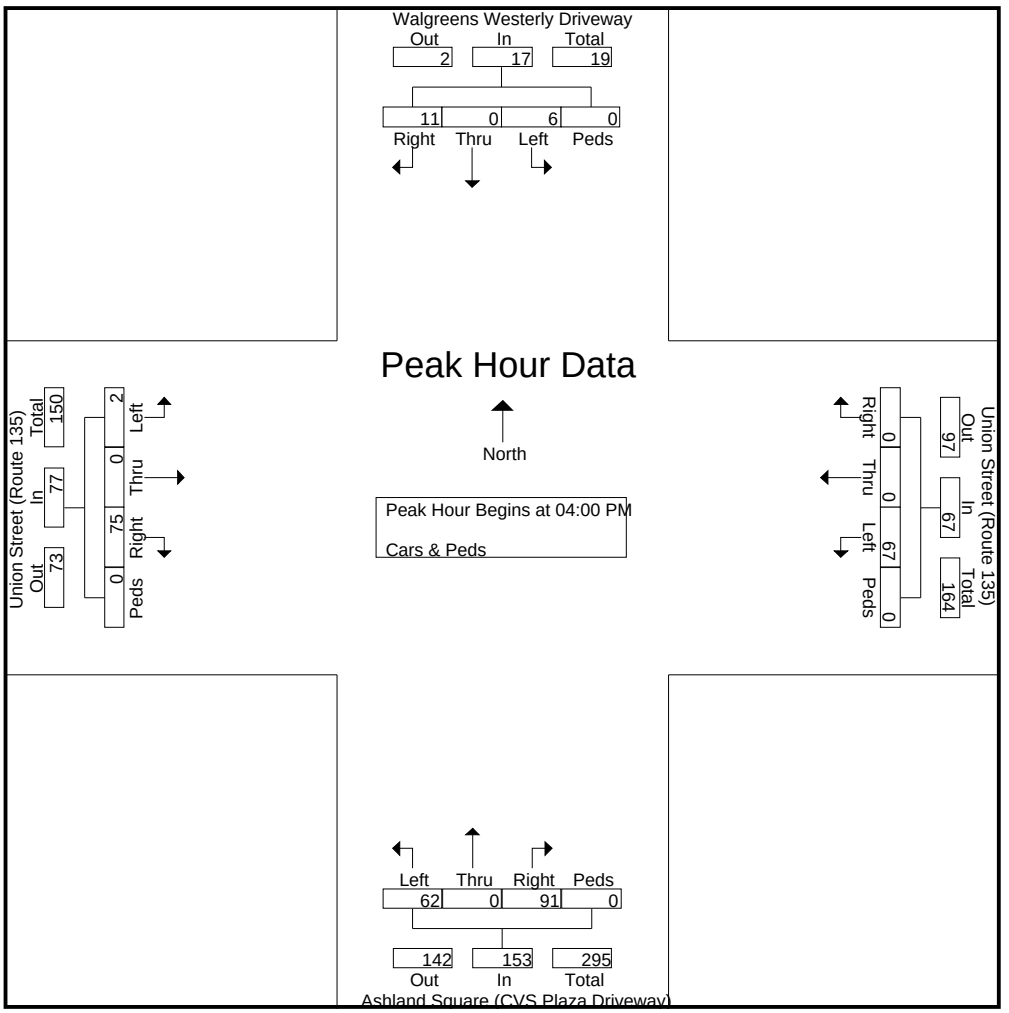
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571CC
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Walgreens Westerly Driveway From North					Union Street (Route 135) From East					Ashland Square (CVS Plaza Driveway) From South					Union Street (Route 135) 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	3	0	2	0	**5**	0	0	19	0	19	20	0	**23**	0	**43**	16	0	**1**	0	17	84
04:15 PM	3	0	0	0	3	0	0	16	0	16	24	0	14	0	38	**26**	0	1	0	**27**	84
04:30 PM	**4**	0	1	0	5	0	0	11	0	11	21	0	8	0	29	12	0	0	0	12	57
04:45 PM	1	0	**3**	0	4	0	0	**21**	0	**21**	**26**	0	17	0	43	21	0	0	0	21	**89**
Total Volume	11	0	6	0	17	0	0	67	0	67	91	0	62	0	153	75	0	2	0	77	314
% App. Total	64.7	0	35.3	0		0	0	100	0		59.5	0	40.5	0		97.4	0	2.6	0		
PHF	.688	.000	.500	.000	.850	.000	.000	.798	.000	.798	.875	.000	.674	.000	.890	.721	.000	.500	.000	.713	.882



Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Walgreens Easterly Driveway
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571D
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds

	Walgreens Easterly Driveway From North			Union Street (Route 135) From East			Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	1	0	1
08:30 AM	0	1	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	3	0	0	0	0	0	3
Total	0	1	0	3	0	0	0	1	0	5
Grand Total	0	1	0	3	0	0	0	1	0	5
Apprch %	0	100	0	100	0	0	0	100	0	
Total %	0	20	0	60	0	0	0	20	0	

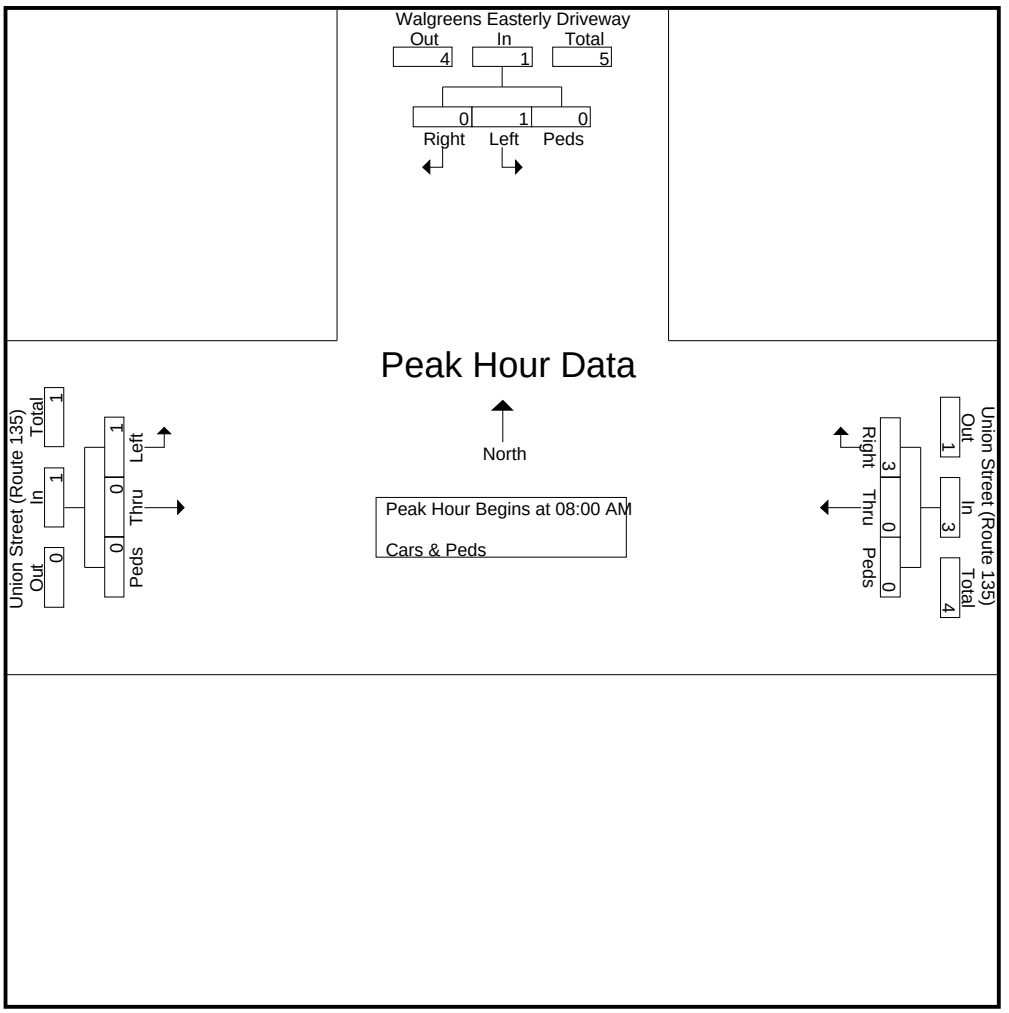
	Walgreens Easterly Driveway From North				Union Street (Route 135) From East				Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	1
08:30 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	**3**	0	0	**3**	0	0	0	0	**3**
Total Volume	0	1	0	1	3	0	0	3	0	1	0	1	5
% App. Total	0	100	0		100	0	0		0	100	0		
PHF	.000	.250	.000	.250	.250	.000	.000	.250	.000	.250	.000	.250	.417

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Walgreens Easterly Driveway
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571D
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Walgreens Easterly Driveway From North				Union Street (Route 135) From East				Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	1
08:30 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	**3**	0	0	**3**	0	0	0	0	**3**
Total Volume	0	1	0	1	3	0	0	3	0	1	0	1	5
% App. Total	0	100	0		100	0	0		0	100	0		
PHF	.000	.250	.000	.250	.250	.000	.000	.250	.000	.250	.000	.250	.417



Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Walgreens Easterly Driveway
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571DD
Site Code : Y2252211
Start Date : 6/1/2022

Groups Printed- Cars & Peds

	Walgreens Easterly Driveway From North			Union Street (Route 135) From East			Union Street (Route 135) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	5	0	0	0	0	0	5
04:15 PM	0	0	0	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	3	0	0	0	4	0	7
Total	0	0	0	10	0	0	0	4	0	14
05:00 PM	0	1	0	1	0	0	0	0	0	2
05:15 PM	0	0	0	3	0	0	0	1	0	4
05:30 PM	0	0	0	3	0	0	0	0	0	3
05:45 PM	1	0	0	2	0	0	0	2	0	5
Total	1	1	0	9	0	0	0	3	0	14
Grand Total	1	1	0	19	0	0	0	7	0	28
Apprch %	50	50	0	100	0	0	0	100	0	
Total %	3.6	3.6	0	67.9	0	0	0	25	0	

	Walgreens Easterly Driveway From North				Union Street (Route 135) From East				Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	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	0	0	0	0	**3**	0	0	**3**	0	**4**	0	**4**	**7**
05:00 PM	0	**1**	0	**1**	1	0	0	1	0	0	0	0	2
05:15 PM	0	0	0	0	3	0	0	3	0	1	0	1	4
05:30 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
Total Volume	0	1	0	1	10	0	0	10	0	5	0	5	16
% App. Total	0	100	0		100	0	0		0	100	0		
PHF	.000	.250	.000	.250	.833	.000	.000	.833	.000	.313	.000	.313	.571

Transportation Data Corporation
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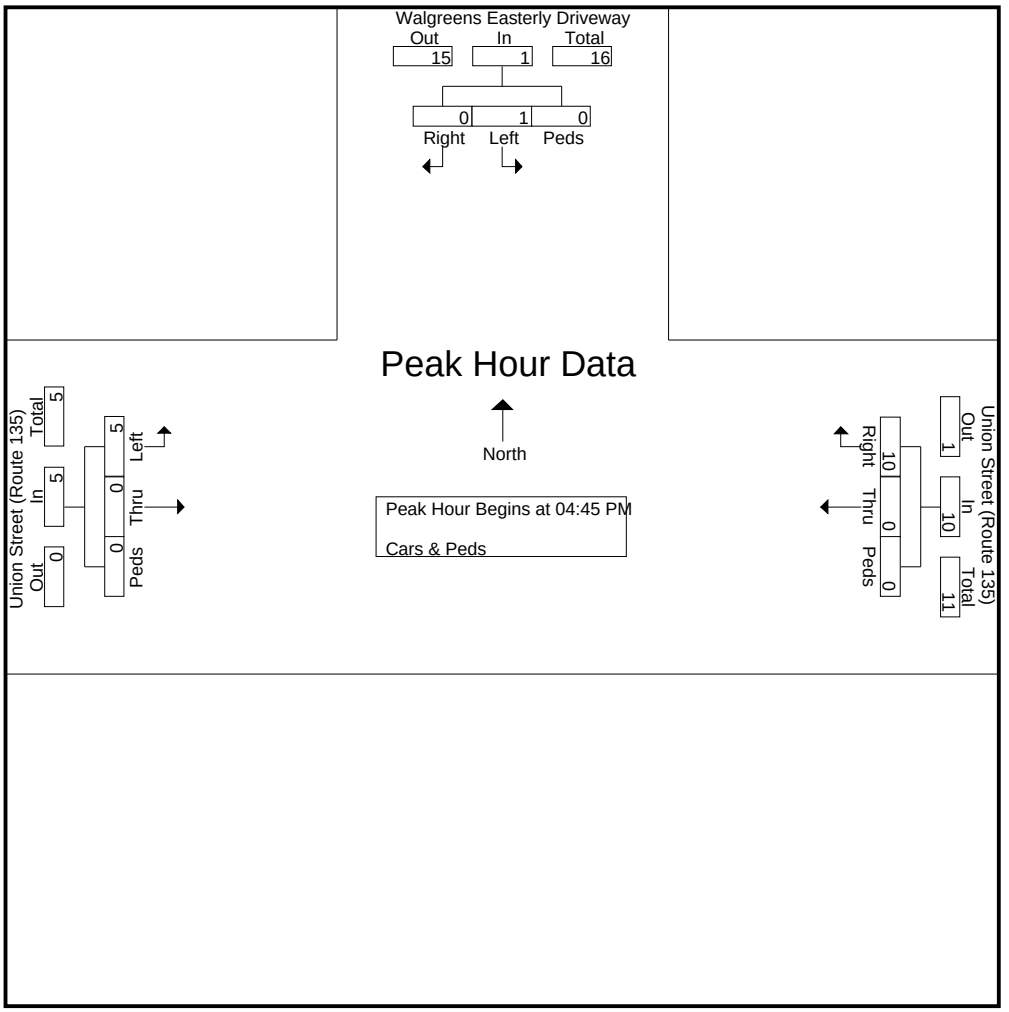
tel (781) 587-0086 cell (781) 439-4999

N: Walgreens Easterly Driveway
E/W: Union Street (Route 135)
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571DD
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Walgreens Easterly Driveway From North				Union Street (Route 135) From East				Union Street (Route 135) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	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	0	0	0	0	**3**	0	0	**3**	0	**4**	0	**4**	**7**
05:00 PM	0	**1**	0	**1**	1	0	0	1	0	0	0	0	2
05:15 PM	0	0	0	0	3	0	0	3	0	1	0	1	4
05:30 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
Total Volume	0	1	0	1	10	0	0	10	0	5	0	5	16
% App. Total	0	100	0		100	0	0		0	100	0		
PHF	.000	.250	.000	.250	.833	.000	.000	.833	.000	.313	.000	.313	.571



Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

S: Walgreens Driveway
E/W: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571E
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds

	Summer Street From East			Walgreens Driveway From South			Summer Street From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
08:00 AM	0	1	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	2	1	0	1	0	0	4
08:30 AM	0	0	0	0	0	0	1	0	0	1
08:45 AM	0	2	0	1	2	0	3	0	0	8
Total	0	3	0	3	3	0	5	0	0	14
Grand Total	0	4	0	3	3	0	5	0	0	15
Apprch %	0	100	0	50	50	0	100	0	0	
Total %	0	26.7	0	20	20	0	33.3	0	0	

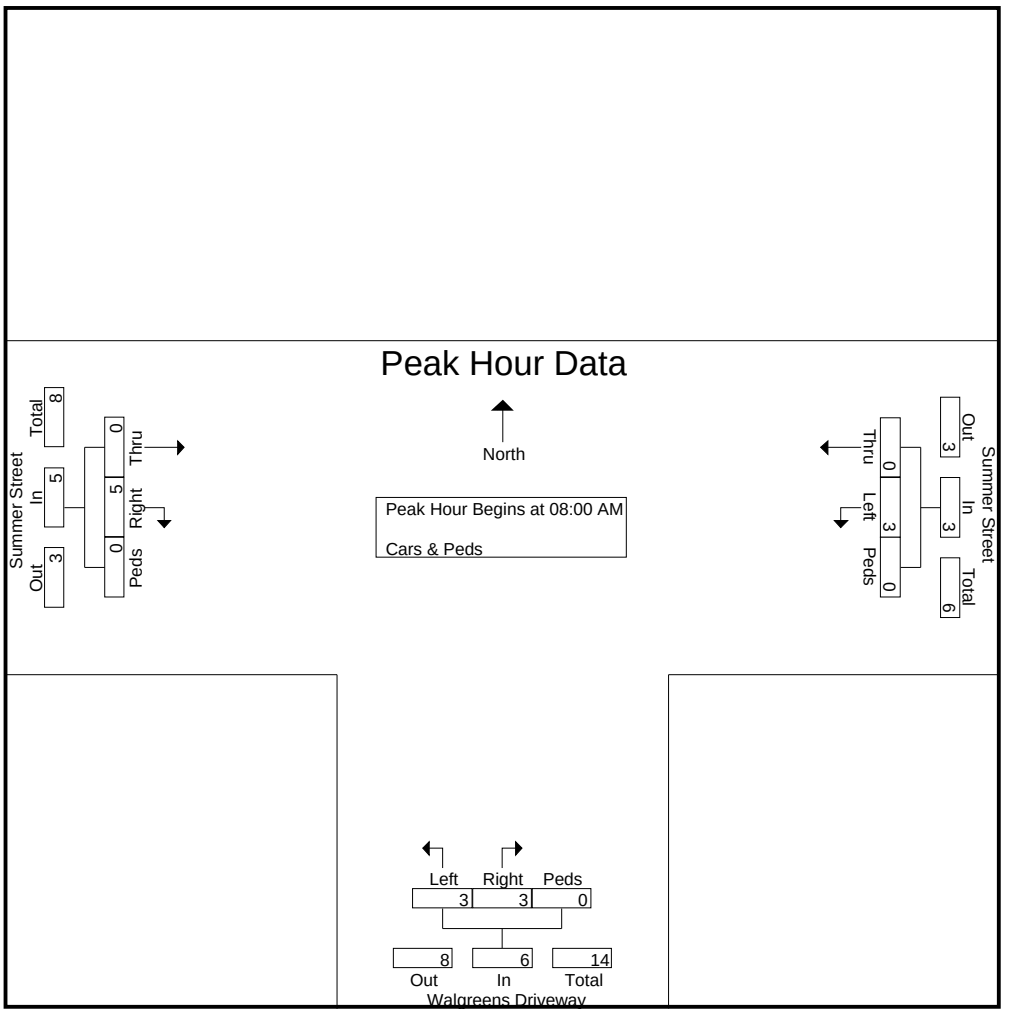
	Summer Street From East				Walgreens Driveway From South				Summer Street From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	**2**	1	0	**3**	1	0	0	1	4
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
08:45 AM	0	**2**	0	**2**	1	**2**	0	3	**3**	0	0	**3**	**8**
Total Volume	0	3	0	3	3	3	0	6	5	0	0	5	14
% App. Total	0	100	0		50	50	0		100	0	0		
PHF	.000	.375	.000	.375	.375	.375	.000	.500	.417	.000	.000	.417	.438

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

S: Walgreens Driveway
E/W: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571E
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Summer Street From East				Walgreens Driveway From South				Summer Street From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	**2**	1	0	**3**	1	0	0	1	4
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
08:45 AM	0	**2**	0	**2**	1	**2**	0	3	**3**	0	0	**3**	**8**
Total Volume	0	3	0	3	3	3	0	6	5	0	0	5	14
% App. Total	0	100	0		50	50	0		100	0	0		
PHF	.000	.375	.000	.375	.375	.375	.000	.500	.417	.000	.000	.417	.438



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S: Walgreens Driveway
E/W: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571EE
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

Groups Printed- Cars & Peds

	Summer Street From East			Walgreens Driveway From South			Summer Street From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
04:00 PM	0	4	0	5	3	0	6	0	0	18
04:15 PM	0	1	0	3	4	0	2	0	0	10
04:30 PM	0	1	0	2	2	0	3	0	0	8
04:45 PM	0	3	0	2	2	0	4	0	0	11
Total	0	9	0	12	11	0	15	0	0	47
05:00 PM	0	0	0	6	3	0	4	0	0	13
05:15 PM	0	0	0	2	2	0	2	0	0	6
05:30 PM	0	1	0	1	1	0	5	0	0	8
05:45 PM	0	1	0	2	4	0	2	0	0	9
Total	0	2	0	11	10	0	13	0	0	36
Grand Total	0	11	0	23	21	0	28	0	0	83
Apprch %	0	100	0	52.3	47.7	0	100	0	0	
Total %	0	13.3	0	27.7	25.3	0	33.7	0	0	

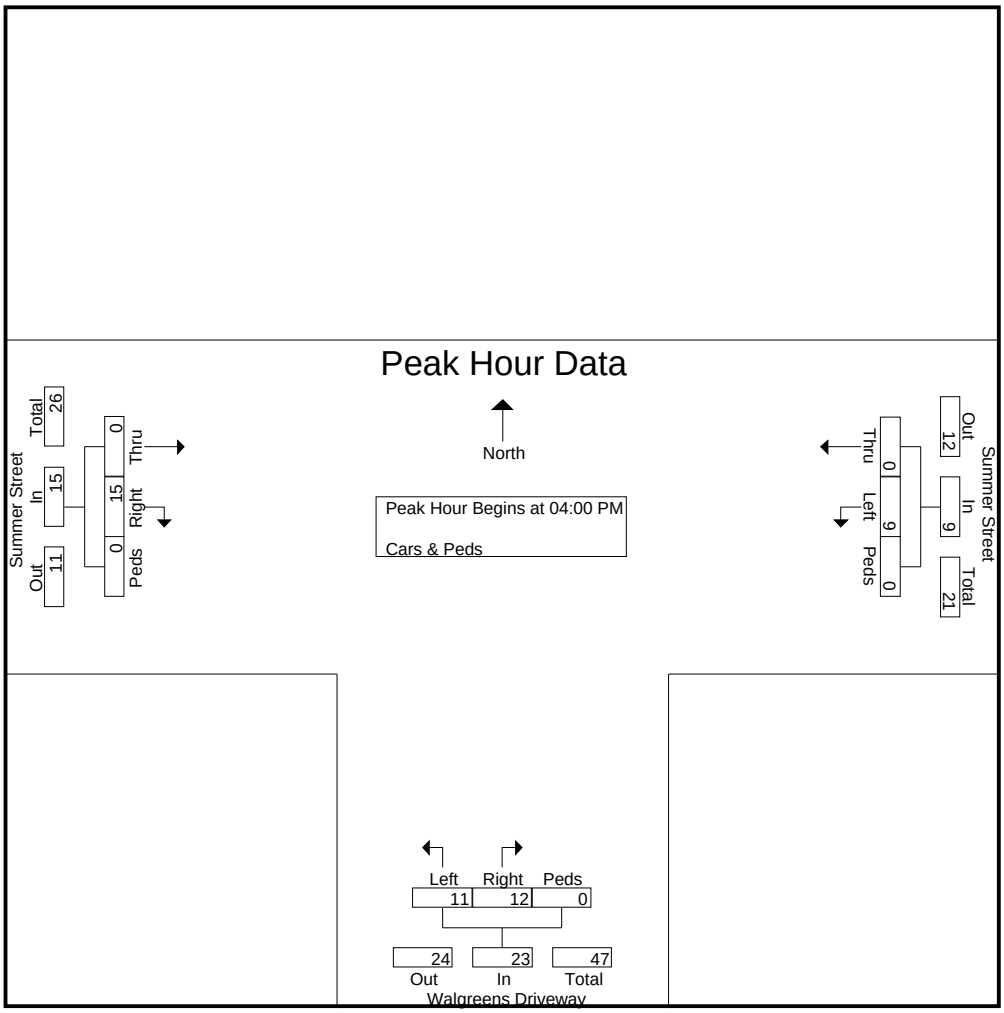
	Summer Street From East				Walgreens Driveway From South				Summer Street From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	**4**	0	**4**	**5**	3	0	**8**	**6**	0	0	**6**	**18**
04:15 PM	0	1	0	1	3	**4**	0	7	2	0	0	2	10
04:30 PM	0	1	0	1	2	2	0	4	3	0	0	3	8
04:45 PM	0	3	0	3	2	2	0	4	4	0	0	4	11
Total Volume	0	9	0	9	12	11	0	23	15	0	0	15	47
% App. Total	0	100	0		52.2	47.8	0		100	0	0		
PHF	.000	.563	.000	.563	.600	.688	.000	.719	.625	.000	.000	.625	.653

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

S: Walgreens Driveway
E/W: Summer Street
City, State: Ashland, MA
Client: McM/L. Young

File Name : 05571EE
Site Code : Y2252211
Start Date : 6/1/2022
Page No : 1

	Summer Street From East				Walgreens Driveway From South				Summer Street From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	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	**4**	0	**4**	**5**	3	0	**8**	**6**	0	0	**6**	**18**
04:15 PM	0	1	0	1	3	**4**	0	7	2	0	0	2	10
04:30 PM	0	1	0	1	2	2	0	4	3	0	0	3	8
04:45 PM	0	3	0	3	2	2	0	4	4	0	0	4	11
Total Volume	0	9	0	9	12	11	0	23	15	0	0	15	47
% App. Total	0	100	0		52.2	47.8	0		100	0	0		
PHF	.000	.563	.000	.563	.600	.688	.000	.719	.625	.000	.000	.625	.653



APPENDIX B
Crash Summary

CRASH SUMMARY

Proposed Coffee Shop with Drive-Through Window
399 Union Street (Route 135), Ashland, MA

	West Union Street/Union Street (Route 135) at Summer Street	Summer Street at Cherry Street	Summer Street at North Site Driveway	Union Street (Route 135) at West Site Driveway	Union Street (Route 135) at East Site Driveway	Union Street (Route 135) at Ashland Square Plaza Driveway
Year						
2015	1	0	0	0	1	0
2016	1	0	0	0	0	1
2017	0	0	0	0	1	1
2018	0	1	0	0	1	1
2019	2	2	0	0	1	2
Type						
Angle	2	1	0	0	0	2
Rear-end	1	0	0	0	3	1
Sideswipe	1	0	0	0	0	1
Head-on	0	0	0	0	0	0
Pedestrian	0	0	0	0	0	1
Single Vehicle	0	2	0	0	1	0
Severity						
Property Damage	4	3	0	0	3	4
Personal Injury	0	0	0	0	1	1
Fatality	0	0	0	0	0	0
Weather						
Clear	3	2	0	0	3	3
Cloudy	0	0	0	0	0	0
Rain	0	1	0	0	0	2
Snow	1	0	0	0	0	0
Sleet	0	0	0	0	1	0
Other	0	0	0	0	0	0
Road Surface						
Dry	3	2	0	0	3	3
Wet	0	1	0	0	0	2
Ice	0	0	0	0	1	0
Snow	1	0	0	0	0	0
Time						
7:00 AM to 9:00 AM	1	0	0	0	0	0
9:00 AM to 4:00 PM	0	1	0	0	2	3
4:00 PM to 6:00 PM	2	1	0	0	2	0
6:00 PM to 7:00 AM	1	1	0	0	0	2
Total	**4**	**3**	**0**	**0**	**4**	**5**
Crash Rate	0.13	0.28	0.00	0.00	0.19	0.22
State Average	0.78	0.57	0.57	0.57	0.57	0.57
District 3 Average	0.89	0.61	0.61	0.61	0.61	0.61

Source: MassDOT

APPENDIX C
Traffic Projection Model

TRAFFIC PROJECTION MODEL

Proposed Coffee Shop
Weekday Morning Peak Hour
Ashland, MA

Intersection	Dir.	Turn	2022 Counted Volumes	2022 Existing Volumes	Background Growth 1.00% per year	0 Memorial Drive Development	81 West Union Street Development	2029 No Build Volumes	New PERCENT ENTER	New Trips ENTER	New PERCENT EXIT	New Trips EXIT	New Trips TOTAL	Pass-By Trips	2029 Build Volumes
Union Street (Route 135) at Summer Street	EB	L	284	284	20	4	1	308	25%	14			14	11	333
		T	577	577	42	7	3	626	20%	11			11	-11	626
	WB	T	411	411	30	4	16	445			25%	13	13	4	462
		R	26	26	2			28							28
	SB	L	33	33	2			35							35
		R	179	179	13	2	8	194			20%	11	11	-4	201
Summer Street at Cherry Street	WB	L	91	91	6	1	4	98			20%	11	11		109
		R	5	5	0			5			10%	5	5	5	15
	NB	T	155	155	11	2	1	168						-5	163
		R	155	155	11	2		168	25%	14			14	16	198
	SB	L	3	3	0			3	10%	6			6	4	13
		T	121	121	8	2	4	131						-4	127
Summer Street at North Site Driveway	EB	T	157	157	11	2		170						-5	165
		R	1	1				1	35%	20			20	25	46
	WB	L	2	2				2	30%	17			17	5	24
		T	95	95	6	1	4	102						-5	97
	NB	L	1	1				1			30%	16	16	10	27
		R	2	2				2			30%	16	16	15	33
Union Street (Route 135) at West Site Driveway	EB	T	610	610	44	7	3	661	20%	11			11	-11	661
	WB	T	437	437	32	4	16	473						-10	463
	SB	R	0	0				0			25%	13	13	14	27
Union Street (Route 135) at Ashland Square Plaza	EB	T	574	574	44	7	3	625	20%	11			11	-11	625
		R	36	36				36							36
	WB	L	28	28				28							28
		T	421	421	32	4	16	457						-10	447
	NB	L	16	16				16							16
		R	25	25				25							25
Union Street (Route 135) at East Site Driveway	EB	L	1	1				1	20%	11			11	10	22
		T	598	598	44	7	3	649						-21	628
	WB	T	449	449	32	4	16	485						-16	469
		R	0	0				0	15%	9			9	16	25
	SB	L	0	0				0			15%	8	8	11	19
		R	0	0				0						6	6

Peak Hour: 7:30 AM - 8:30 PM

TRAFFIC PROJECTION MODEL

Proposed Coffee Shop
Weekday Afternoon Peak Hour
Ashland, MA

Intersection	Dir.	Turn	2022 Counted Volumes	2022 Existing Volumes	Background Growth 1.00% per year	0 Memorial Drive Development	81 West Union Street Development	2029 No Build Volumes	New PERCENT ENTER	New Trips ENTER	New PERCENT EXIT	New Trips EXIT	New Trips TOTAL	Pass-By Trips	2029 Build Volumes
Union Street (Route 135) at Summer Street	EB	L	156	156	11	4	10	171	25%	6			6	3	180
		T	489	489	35	6	18	530	20%	4			4	-3	531
	WB	T	614	614	44	8	13	666			25%	6	6	2	674
		R	38	38	3			41							41
	SB	L	65	65	5			70							70
		R	275	275	20	5	7	300			20%	4	4	-2	302
Summer Street at Cherry Street	WB	L	176	176	13	2	3	191			20%	4	4		195
		R	13	13	1			14			10%	2	2		16
	NB	T	107	107	8	2	5	117							117
		R	87	87	6	2	5	95	25%	6			6	3	104
	SB	L	13	13	1			14	10%	2			2	2	18
		T	164	164	12	3	4	179						-2	177
Summer Street at North Site Driveway	EB	T	85	85	7	2	5	94						-3	91
		R	15	15				15	35%	8			8	8	31
	WB	L	4	4				4	30%	7			7	2	13
		T	181	181	14	2	3	197						-2	195
	NB	L	8	8				8			30%	6	6	2	16
		R	11	11				11			30%	7	7	8	26
Union Street (Route 135) at West Site Driveway	EB	T	554	554	40	6	18	600	20%	4			4	-3	601
	WB	T	644	644	47	8	13	699						-6	693
	SB	R	8	8				8			25%	6	6	8	22
Union Street (Route 135) at Ashland Square Plaza	EB	T	471	471	40	6	18	517	20%	4			4	-3	518
		R	83	83				83							83
	WB	L	58	58				58							58
		T	574	574	47	8	13	629						-6	623
	NB	L	70	70				70							70
		R	81	81				81							81
Union Street (Route 135) at East Site Driveway	EB	L	5	5				5	20%	4			4	6	15
		T	547	547	40	6	18	593						-9	584
	WB	T	632	632	47	8	13	687						-12	675
		R	10	10				10	15%	3			3	12	25
	SB	L	1	1				1			15%	3	3	4	8
		R	0	0				0						6	6

Peak Hour: 4:45 PM - 5:45 PM

APPENDIX D
Highway Capacity Manual Methodologies

CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.(1) By definition, capacity represents "the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions." The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". Such measures include "speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety."

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

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(1) *Transportation Research Board, Highway Capacity Manual, 6th Edition, published by the Transportation Research Board, Washington, DC, 2016.*

Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

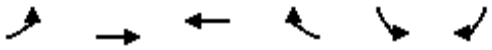
At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

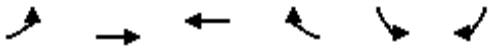
Level of Service	Control Delay Per Vehicle (seconds)
A	$\leq$ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

APPENDIX E

2022 Existing Capacity/Level-of-Service Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	284	577	411	26	33	179	
Future Volume (vph)	284	577	411	26	33	179	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	175			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Satd. Flow (prot)	1687	1845	1778	0	1703	1524	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1683	1845	1778	0	1703	1524	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			2			224	
Link Speed (mph)		35	30		30		
Link Distance (ft)		510	151		124		
Travel Time (s)		9.9	3.4		2.8		
Confl. Peds. (#/hr)	2			2			
Peak Hour Factor	0.91	0.91	0.87	0.87	0.80	0.80	
Heavy Vehicles (%)	7%	3%	5%	19%	6%	6%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	312	634	502	0	41	224	
Turn Type	Prot	NA	NA		Prot	pt+ov	
Protected Phases	5	2	6		4	4 5	9
Permitted Phases							
Detector Phase	5	2	6		4	4 5	
Switch Phase							
Minimum Initial (s)	6.0	6.0	10.0		6.0		5.0
Minimum Split (s)	11.0	11.0	15.0		11.0		24.0
Total Split (s)	35.0	74.0	39.0		29.0		24.0
Total Split (%)	27.6%	58.3%	30.7%		22.8%		19%
Yellow Time (s)	4.0	4.0	4.0		4.0		2.0
All-Red Time (s)	1.0	1.0	1.0		1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	Min	Min		None		None
Act Effct Green (s)	19.4	59.6	35.0		7.2	31.0	
Actuated g/C Ratio	0.24	0.74	0.43		0.09	0.39	
v/c Ratio	0.77	0.46	0.65		0.27	0.31	
Control Delay	43.1	7.2	26.6		43.7	3.1	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.1	7.2	26.6		43.7	3.1	
LOS	D	A	C		D	A	
Approach Delay		19.0	26.6		9.4		
Approach LOS		B	C		A		
Queue Length 50th (ft)	131	70	165		18	0	
Queue Length 95th (ft)	307	357	#531		57	18	
Internal Link Dist (ft)		430	71		44		
Turn Bay Length (ft)	175						

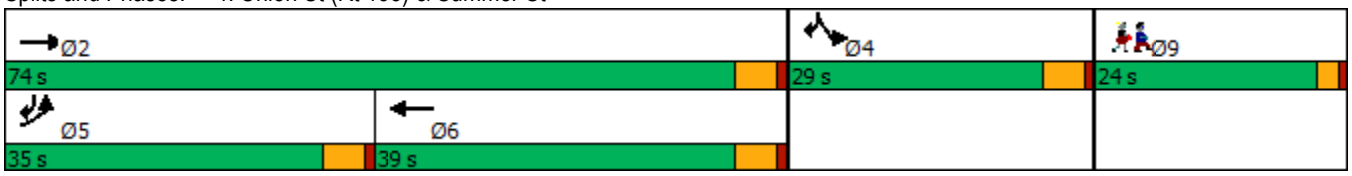


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	649	1627	777		524	944	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.48	0.39	0.65		0.08	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 127			
Actuated Cycle Length: 80.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Union St (Rt 135) & Summer St



Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	157	1	2	95	1	2
Future Vol, veh/h	157	1	2	95	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	84	84	80	80
Heavy Vehicles, %	6	0	0	4	0	0
Mvmt Flow	191	1	2	113	1	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	192	0	309	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	117	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1394	-	687	855
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	913	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1394	-	686	855
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	911	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	790	-	-	1394	-
HCM Lane V/C Ratio	0.005	-	-	0.002	-
HCM Control Delay (s)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	610	437	0	0	0
Future Vol, veh/h	0	610	437	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	87	87	92	92
Heavy Vehicles, %	0	4	6	0	0	0
Mvmt Flow	0	649	502	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	502
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	573
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	573
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	0
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	574	36	28	421	16	25
Future Vol, veh/h	574	36	28	421	16	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	87	87	80	80
Heavy Vehicles, %	4	0	0	6	0	0
Mvmt Flow	611	38	32	484	20	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	649	0	1178	630
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	548	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	947	-	213	485
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	947	-	206	485
Mov Cap-2 Maneuver	-	-	-	-	206	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	317	-	-	947	-
HCM Lane V/C Ratio	0.162	-	-	0.034	-
HCM Control Delay (s)	18.5	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	598	449	0	0	0
Future Vol, veh/h	1	598	449	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	87	87	92	92
Heavy Vehicles, %	0	4	5	0	2	2
Mvmt Flow	1	643	516	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	516	0	-	0	1161	516
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	645	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1060	-	-	-	216	559
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1060	-	-	-	216	559
Mov Cap-2 Maneuver	-	-	-	-	216	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	522	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1060	-	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-	-
HCM Control Delay (s)	8.4	0	-	-	0	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

HCS7 Two-Way Stop-Control Report

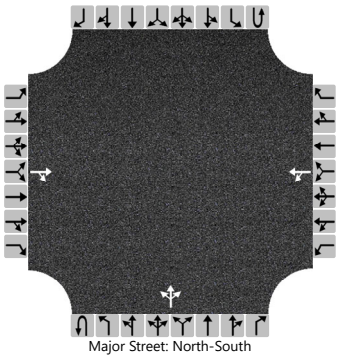
General Information

Analyst	EKB/LCY
Agency/Co.	McMahon
Date Performed	6/7/2022
Analysis Year	2022
Time Analyzed	Weekday AM
Intersection Orientation	North-South
Project Description	Ashland Starbucks

Site Information

Intersection	Summer St at Cherry St
Jurisdiction	Ashland
East/West Street	Cherry St/Summer St
North/South Street	Summer St
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

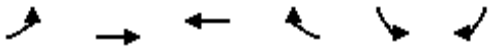
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			3	121		91	5			155	0	155				
Percent Heavy Vehicles (%)			0	7		4	0			9						
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)			7.1	6.5		7.1	6.2			4.1						
Critical Headway (sec)			7.10	6.57		7.14	6.20			4.19						
Base Follow-Up Headway (sec)			4.0	3.3		3.5	4.0			2.2						
Follow-Up Headway (sec)			4.00	3.36		3.54	4.00			2.28						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				135		104				168						
Capacity, c (veh/h)				1026		429				1578						
v/c Ratio				0.13		0.24				0.11						
95% Queue Length, Q_{95} (veh)				0.5		1.0				0.4						
Control Delay (s/veh)				9.0		16.1				7.6						
Level of Service (LOS)				A		C				A						
Approach Delay (s/veh)	9.0				16.1				4.2							
Approach LOS	A				C											



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	156	489	614	38	65	275	
Future Volume (vph)	156	489	614	38	65	275	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	175			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Satd. Flow (prot)	1787	1881	1867	0	1805	1599	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1881	1867	0	1805	1599	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			2			340	
Link Speed (mph)		35	30		30		
Link Distance (ft)		510	151		124		
Travel Time (s)		9.9	3.4		2.8		
Peak Hour Factor	0.98	0.98	0.94	0.94	0.81	0.81	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	159	499	693	0	80	340	
Turn Type	Prot	NA	NA		Prot	pt+ov	
Protected Phases	5	2	6		4	4 5	9
Permitted Phases							
Detector Phase	5	2	6		4	4 5	
Switch Phase							
Minimum Initial (s)	6.0	6.0	10.0		6.0		5.0
Minimum Split (s)	11.0	11.0	15.0		11.0		24.0
Total Split (s)	45.0	94.0	49.0		29.0		24.0
Total Split (%)	30.6%	63.9%	33.3%		19.7%		16%
Yellow Time (s)	4.0	4.0	4.0		4.0		2.0
All-Red Time (s)	1.0	1.0	1.0		1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	Min	Min		None		None
Act Effct Green (s)	12.1	62.6	45.3		8.5	25.1	
Actuated g/C Ratio	0.14	0.74	0.53		0.10	0.30	
v/c Ratio	0.62	0.36	0.70		0.44	0.48	
Control Delay	47.2	6.7	23.0		47.1	4.5	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	47.2	6.7	23.0		47.1	4.5	
LOS	D	A	C		D	A	
Approach Delay		16.5	23.0		12.6		
Approach LOS		B	C		B		
Queue Length 50th (ft)	74	57	218		37	0	
Queue Length 95th (ft)	180	274	#761		95	25	
Internal Link Dist (ft)		430	71		44		
Turn Bay Length (ft)	175						
Base Capacity (vph)	866	1793	996		525	1166	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.18	0.28	0.70		0.15	0.29	

Intersection Summary			
Area Type:	Other		
Cycle Length: 147			
Actuated Cycle Length: 84.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 60.8%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Union St (Rt 135) & Summer St

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	15	4	181	8	11
Future Vol, veh/h	85	15	4	181	8	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	83	83	80	80
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	96	17	5	218	10	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	113	0	333	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1489	-	666	955
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1489	-	663	955
Mov Cap-2 Maneuver	-	-	-	-	663	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	812	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	806	-	-	1489	-
HCM Lane V/C Ratio	0.029	-	-	0.003	-
HCM Control Delay (s)	9.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	554	644	0	0	8
Future Vol, veh/h	0	554	644	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	93	93	80	80
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	565	692	0	0	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	692
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	447
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	447
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	447
HCM Lane V/C Ratio	-	-	0.022
HCM Control Delay (s)	-	-	13.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	471	83	58	574	70	81
Future Vol, veh/h	471	83	58	574	70	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	93	93	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	481	85	62	617	80	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	566	0	1265	524
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	741	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1016	-	189	557
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	475	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1016	-	177	557
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	446	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	36.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	279	-	-	1016	-
HCM Lane V/C Ratio	0.615	-	-	0.061	-
HCM Control Delay (s)	36.5	-	-	8.8	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q(veh)	3.7	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	547	632	10	1	0
Future Vol, veh/h	5	547	632	10	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	80	80
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	5	588	680	11	1	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	691	0	-	0	1284	686
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	598	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	913	-	-	-	184	451
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	913	-	-	-	183	451
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	553	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	24.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	913	-	-	-	183	-
HCM Lane V/C Ratio	0.006	-	-	-	0.007	-
HCM Control Delay (s)	9	0	-	-	24.8	0
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	-	0	-

HCS7 Two-Way Stop-Control Report

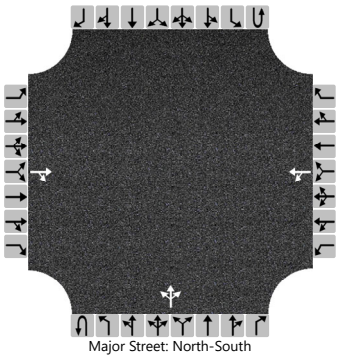
General Information

Analyst	EKB/LCY
Agency/Co.	McMahon
Date Performed	6/7/2022
Analysis Year	2022
Time Analyzed	Weekday PM
Intersection Orientation	North-South
Project Description	Ashland Starbucks

Site Information

Intersection	Summer St at Cherry St
Jurisdiction	Ashland
East/West Street	Cherry St/Summer St
North/South Street	Summer St
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			13	164		176	13			107	0	87				
Percent Heavy Vehicles (%)			0	1		0	0			0						
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

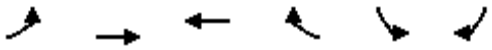
Base Critical Headway (sec)			7.1	6.5		7.1	6.2			4.1						
Critical Headway (sec)			7.10	6.51		7.10	6.20			4.10						
Base Follow-Up Headway (sec)			4.0	3.3		3.5	4.0			2.2						
Follow-Up Headway (sec)			4.00	3.31		3.50	4.00			2.20						

Delay, Queue Length, and Level of Service

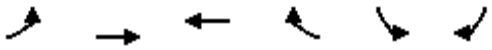
Flow Rate, v (veh/h)				192		205				116						
Capacity, c (veh/h)				1007		527				1636						
v/c Ratio				0.19		0.39				0.07						
95% Queue Length, Q_{95} (veh)				0.7		1.9				0.2						
Control Delay (s/veh)				9.4		16.2				7.4						
Level of Service (LOS)				A		C				A						
Approach Delay (s/veh)	9.4				16.2				4.3							
Approach LOS	A				C											

APPENDIX F

2029 No Build Capacity/Level-of-Service Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	308	626	445	28	35	194	
Future Volume (vph)	308	626	445	28	35	194	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	175			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Satd. Flow (prot)	1687	1845	1779	0	1703	1524	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1684	1845	1779	0	1703	1524	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			2			243	
Link Speed (mph)		35	30		30		
Link Distance (ft)		510	151		124		
Travel Time (s)		9.9	3.4		2.8		
Confl. Peds. (#/hr)	2			2			
Peak Hour Factor	0.91	0.91	0.87	0.87	0.80	0.80	
Heavy Vehicles (%)	7%	3%	5%	19%	6%	6%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	338	688	543	0	44	243	
Turn Type	Prot	NA	NA		Prot	pt+ov	
Protected Phases	5	2	6		4	4 5	9
Permitted Phases							
Detector Phase	5	2	6		4	4 5	
Switch Phase							
Minimum Initial (s)	6.0	6.0	10.0		6.0		5.0
Minimum Split (s)	11.0	11.0	15.0		11.0		24.0
Total Split (s)	35.0	74.0	39.0		29.0		24.0
Total Split (%)	27.6%	58.3%	30.7%		22.8%		19%
Yellow Time (s)	4.0	4.0	4.0		4.0		2.0
All-Red Time (s)	1.0	1.0	1.0		1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	Min	Min		None		None
Act Effct Green (s)	21.3	61.4	35.0		7.3	33.0	
Actuated g/C Ratio	0.26	0.74	0.42		0.09	0.40	
v/c Ratio	0.78	0.50	0.72		0.30	0.32	
Control Delay	43.1	7.7	29.7		44.9	3.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.1	7.7	29.7		44.9	3.0	
LOS	D	A	C		D	A	
Approach Delay		19.4	29.7		9.4		
Approach LOS		B	C		A		
Queue Length 50th (ft)	146	81	198		20	0	
Queue Length 95th (ft)	#355	409	#598		60	19	
Internal Link Dist (ft)		430	71		44		
Turn Bay Length (ft)	175						

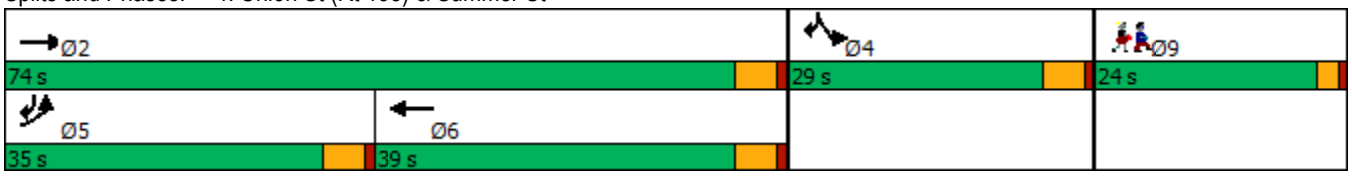


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	631	1589	756		510	935	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.54	0.43	0.72		0.09	0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 127			
Actuated Cycle Length: 82.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Union St (Rt 135) & Summer St



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	170	1	2	102	1	2
Future Vol, veh/h	170	1	2	102	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	84	84	80	80
Heavy Vehicles, %	6	0	0	4	0	0
Mvmt Flow	207	1	2	121	1	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	208	0	333	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	125	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1375	-	666	837
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1375	-	665	837
Mov Cap-2 Maneuver	-	-	-	-	665	-
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	771	-	-	1375	-
HCM Lane V/C Ratio	0.005	-	-	0.002	-
HCM Control Delay (s)	9.7	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	661	473	0	0	0
Future Vol, veh/h	0	661	473	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	87	87	92	92
Heavy Vehicles, %	0	4	6	0	0	0
Mvmt Flow	0	703	544	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	544
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	543
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	543
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	-	0
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	625	36	28	457	16	25
Future Vol, veh/h	625	36	28	457	16	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	87	87	80	80
Heavy Vehicles, %	4	0	0	6	0	0
Mvmt Flow	665	38	32	525	20	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	703	0	1273	684
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	589	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	904	-	187	452
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	904	-	180	452
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	284	-	-	904	-
HCM Lane V/C Ratio	0.18	-	-	0.036	-
HCM Control Delay (s)	20.4	-	-	9.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	649	485	0	0	0
Future Vol, veh/h	1	649	485	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	87	87	92	92
Heavy Vehicles, %	0	4	5	0	2	2
Mvmt Flow	1	698	557	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	557	0	-	0	1257	557
Stage 1	-	-	-	-	557	-
Stage 2	-	-	-	-	700	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1024	-	-	-	189	530
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1024	-	-	-	189	530
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	493	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1024	-	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-	-
HCM Control Delay (s)	8.5	0	-	-	0	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

HCS7 Two-Way Stop-Control Report

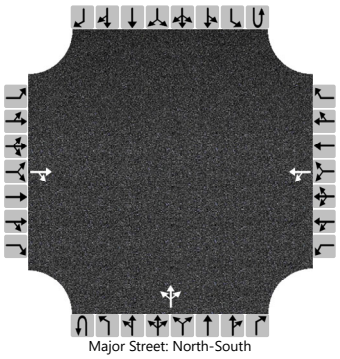
General Information

Analyst	EKB/LCY
Agency/Co.	McMahon
Date Performed	6/7/2022
Analysis Year	2029
Time Analyzed	Weekday AM
Intersection Orientation	North-South
Project Description	Ashland Starbucks

Site Information

Intersection	Summer St at Cherry St
Jurisdiction	Ashland
East/West Street	Cherry St/Summer St
North/South Street	Summer St
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

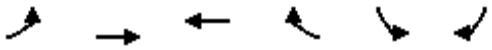
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			3	131		98	5			168	0	168				
Percent Heavy Vehicles (%)			0	7		4	0			9						
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)			7.1	6.5		7.1	6.2			4.1						
Critical Headway (sec)			7.10	6.57		7.14	6.20			4.19						
Base Follow-Up Headway (sec)			4.0	3.3		3.5	4.0			2.2						
Follow-Up Headway (sec)			4.00	3.36		3.54	4.00			2.28						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				146		112				183						
Capacity, c (veh/h)				1024		398				1578						
v/c Ratio				0.14		0.28				0.12						
95% Queue Length, Q_{95} (veh)				0.5		1.2				0.4						
Control Delay (s/veh)				9.1		17.6				7.6						
Level of Service (LOS)				A		C				A						
Approach Delay (s/veh)		9.1				17.6				4.3						
Approach LOS		A				C										



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	171	530	666	41	70	300	
Future Volume (vph)	171	530	666	41	70	300	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	175			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Satd. Flow (prot)	1787	1881	1867	0	1805	1599	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1881	1867	0	1805	1599	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			2			370	
Link Speed (mph)		35	30		30		
Link Distance (ft)		510	151		124		
Travel Time (s)		9.9	3.4		2.8		
Peak Hour Factor	0.98	0.98	0.94	0.94	0.81	0.81	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	174	541	753	0	86	370	
Turn Type	Prot	NA	NA		Prot	pt+ov	
Protected Phases	5	2	6		4	4 5	9
Permitted Phases							
Detector Phase	5	2	6		4	4 5	
Switch Phase							
Minimum Initial (s)	6.0	6.0	10.0		6.0		5.0
Minimum Split (s)	11.0	11.0	15.0		11.0		24.0
Total Split (s)	45.0	94.0	49.0		29.0		24.0
Total Split (%)	30.6%	63.9%	33.3%		19.7%		16%
Yellow Time (s)	4.0	4.0	4.0		4.0		2.0
All-Red Time (s)	1.0	1.0	1.0		1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	Min	Min		None		None
Act Effct Green (s)	13.0	63.5	45.3		8.8	26.2	
Actuated g/C Ratio	0.15	0.74	0.53		0.10	0.30	
v/c Ratio	0.65	0.39	0.77		0.46	0.50	
Control Delay	47.8	7.1	26.1		48.0	4.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	47.8	7.1	26.1		48.0	4.4	
LOS	D	A	C		D	A	
Approach Delay		17.0	26.1		12.6		
Approach LOS		B	C		B		
Queue Length 50th (ft)	82	65	258		41	0	
Queue Length 95th (ft)	196	308	#886		102	25	
Internal Link Dist (ft)		430	71		44		
Turn Bay Length (ft)	175						
Base Capacity (vph)	855	1787	984		518	1168	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.20	0.30	0.77		0.17	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 147			
Actuated Cycle Length: 86.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 19.5		Intersection LOS: B	
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Union St (Rt 135) & Summer St

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	15	4	197	8	11
Future Vol, veh/h	94	15	4	197	8	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	83	83	80	80
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	106	17	5	237	10	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	123	0	362	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1477	-	641	943
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	799	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1477	-	638	943
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	785	-	-	1477	-
HCM Lane V/C Ratio	0.03	-	-	0.003	-
HCM Control Delay (s)	9.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	600	699	0	0	8
Future Vol, veh/h	0	600	699	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	93	93	80	80
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	612	752	0	0	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	752
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	413
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	413
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	413
HCM Lane V/C Ratio	-	-	0.024
HCM Control Delay (s)	-	-	13.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	517	83	58	629	70	81
Future Vol, veh/h	517	83	58	629	70	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	93	93	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	528	85	62	676	80	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	613	0	1371	571
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	800	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	976	-	163	524
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	446	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	976	-	153	524
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	417	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	47.2
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	247	-	-	976	-
HCM Lane V/C Ratio	0.695	-	-	0.064	-
HCM Control Delay (s)	47.2	-	-	8.9	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q(veh)	4.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	593	687	10	1	0
Future Vol, veh/h	5	593	687	10	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	80	80
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	5	638	739	11	1	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	750	0	-	0	1393	745
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	648	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	868	-	-	-	158	417
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	524	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	868	-	-	-	157	417
Mov Cap-2 Maneuver	-	-	-	-	157	-
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	524	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	28.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	868	-	-	-	157	-
HCM Lane V/C Ratio	0.006	-	-	-	0.008	-
HCM Control Delay (s)	9.2	0	-	-	28.1	0
HCM Lane LOS	A	A	-	-	D	A
HCM 95th %tile Q(veh)	0	-	-	-	0	-

HCS7 Two-Way Stop-Control Report

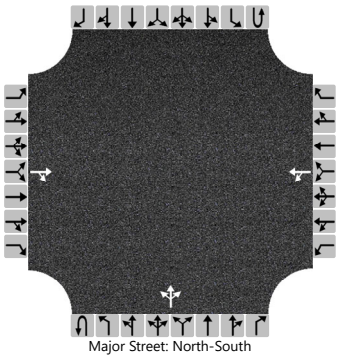
General Information

Analyst	EKB/LCY
Agency/Co.	McMahon
Date Performed	6/7/2029
Analysis Year	2022
Time Analyzed	Weekday PM
Intersection Orientation	North-South
Project Description	Ashland Starbucks

Site Information

Intersection	Summer St at Cherry St
Jurisdiction	Ashland
East/West Street	Cherry St/Summer St
North/South Street	Summer St
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			14	179		191	14			117	0	95				
Percent Heavy Vehicles (%)			0	1		0	0			0						
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

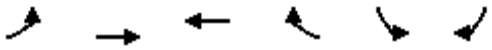
Base Critical Headway (sec)			7.1	6.5		7.1	6.2			4.1						
Critical Headway (sec)			7.10	6.51		7.10	6.20			4.10						
Base Follow-Up Headway (sec)			4.0	3.3		3.5	4.0			2.2						
Follow-Up Headway (sec)			4.00	3.31		3.50	4.00			2.20						

Delay, Queue Length, and Level of Service

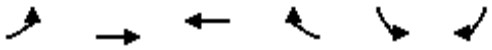
Flow Rate, v (veh/h)				210		223				127						
Capacity, c (veh/h)				1001		493				1636						
v/c Ratio				0.21		0.45				0.08						
95% Queue Length, Q_{95} (veh)				0.8		2.4				0.3						
Control Delay (s/veh)				9.6		18.3				7.4						
Level of Service (LOS)				A		C				A						
Approach Delay (s/veh)	9.6				18.3				4.4							
Approach LOS	A				C											

APPENDIX G

2029 Build Capacity/Level-of-Service Analysis



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	333	626	462	28	35	201	
Future Volume (vph)	333	626	462	28	35	201	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	175			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Satd. Flow (prot)	1687	1845	1779	0	1703	1524	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1684	1845	1779	0	1703	1524	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			2			251	
Link Speed (mph)		35	30		30		
Link Distance (ft)		510	151		124		
Travel Time (s)		9.9	3.4		2.8		
Confl. Peds. (#/hr)	2			2			
Peak Hour Factor	0.91	0.91	0.87	0.87	0.80	0.80	
Heavy Vehicles (%)	7%	3%	5%	19%	6%	6%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	366	688	563	0	44	251	
Turn Type	Prot	NA	NA		Prot	pt+ov	
Protected Phases	5	2	6		4	4 5	9
Permitted Phases							
Detector Phase	5	2	6		4	4 5	
Switch Phase							
Minimum Initial (s)	6.0	6.0	10.0		6.0		5.0
Minimum Split (s)	11.0	11.0	15.0		11.0		24.0
Total Split (s)	35.0	74.0	39.0		29.0		24.0
Total Split (%)	27.6%	58.3%	30.7%		22.8%		19%
Yellow Time (s)	4.0	4.0	4.0		4.0		2.0
All-Red Time (s)	1.0	1.0	1.0		1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	Min	Min		None		None
Act Effct Green (s)	24.2	64.1	34.8		7.2	35.8	
Actuated g/C Ratio	0.28	0.75	0.41		0.08	0.42	
v/c Ratio	0.77	0.50	0.77		0.31	0.32	
Control Delay	41.2	7.6	33.4		46.3	2.9	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	41.2	7.6	33.4		46.3	2.9	
LOS	D	A	C		D	A	
Approach Delay		19.3	33.4		9.4		
Approach LOS		B	C		A		
Queue Length 50th (ft)	161	81	229		21	0	
Queue Length 95th (ft)	#404	409	#631		60	19	
Internal Link Dist (ft)		430	71		44		
Turn Bay Length (ft)	175						

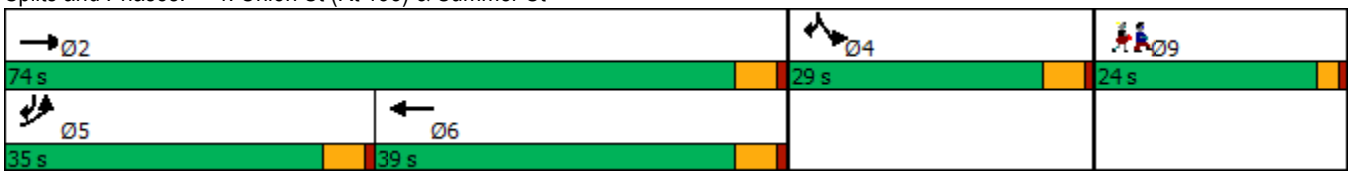


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	608	1530	728		491	914	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.60	0.45	0.77		0.09	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 127			
Actuated Cycle Length: 85.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 21.9		Intersection LOS: C	
Intersection Capacity Utilization 62.0%		ICU Level of Service B	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Union St (Rt 135) & Summer St



Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	165	46	24	97	27	33
Future Vol, veh/h	165	46	24	97	27	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	84	84	80	80
Heavy Vehicles, %	6	0	0	4	0	0
Mvmt Flow	201	56	29	115	34	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	257	0	402	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	173	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1320	-	608	815
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	862	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1320	-	594	815
Mov Cap-2 Maneuver	-	-	-	-	594	-
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	842	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1320	-
HCM Lane V/C Ratio	0.107	-	-	0.022	-
HCM Control Delay (s)	10.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	661	463	0	0	27
Future Vol, veh/h	0	661	463	0	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	87	87	92	92
Heavy Vehicles, %	0	4	6	0	0	0
Mvmt Flow	0	703	532	0	0	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	532
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	551
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	551
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	551
HCM Lane V/C Ratio	-	-	0.053
HCM Control Delay (s)	-	-	11.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	625	36	28	447	16	25
Future Vol, veh/h	625	36	28	447	16	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	87	87	80	80
Heavy Vehicles, %	4	0	0	6	0	0
Mvmt Flow	665	38	32	514	20	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	703	0	1262	684
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	578	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	904	-	189	452
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	565	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	904	-	182	452
Mov Cap-2 Maneuver	-	-	-	-	182	-
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	545	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	20.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	286	-	-	904	-
HCM Lane V/C Ratio	0.179	-	-	0.036	-
HCM Control Delay (s)	20.3	-	-	9.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	628	469	25	19	6
Future Vol, veh/h	22	628	469	25	19	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	87	87	92	92
Heavy Vehicles, %	0	4	5	0	0	0
Mvmt Flow	24	675	539	29	21	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	568	0	-	0	1277	554
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	723	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1014	-	-	-	185	536
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1014	-	-	-	178	536
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1014	-	-	-	212
HCM Lane V/C Ratio	0.023	-	-	-	0.128
HCM Control Delay (s)	8.6	0	-	-	24.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

HCS7 Two-Way Stop-Control Report

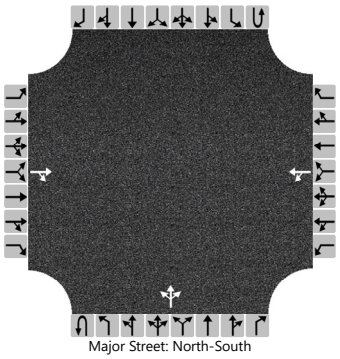
General Information

Analyst	EKB/LCY
Agency/Co.	McMahon
Date Performed	6/7/2022
Analysis Year	2029
Time Analyzed	Weekday AM
Intersection Orientation	North-South
Project Description	Ashland Starbucks

Site Information

Intersection	Summer St at Cherry St
Jurisdiction	Ashland
East/West Street	Cherry St/Summer St
North/South Street	Summer St
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

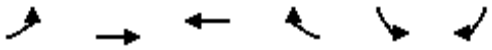
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			13	127		109	15			163	0	198				
Percent Heavy Vehicles (%)			0	7		4	0			9						
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

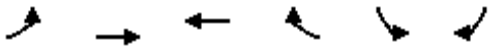
Base Critical Headway (sec)			7.1	6.5		7.1	6.2			4.1						
Critical Headway (sec)			7.10	6.57		7.14	6.20			4.19						
Base Follow-Up Headway (sec)			4.0	3.3		3.5	4.0			2.2						
Follow-Up Headway (sec)			4.00	3.36		3.54	4.00			2.28						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				152		135				177						
Capacity, c (veh/h)				894		392				1578						
v/c Ratio				0.17		0.34				0.11						
95% Queue Length, Q_{95} (veh)				0.6		1.6				0.4						
Control Delay (s/veh)				9.8		19.0				7.6						
Level of Service (LOS)				A		C				A						
Approach Delay (s/veh)	9.8				19.0				4.0							
Approach LOS	A				C											



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	180	531	674	41	70	302	
Future Volume (vph)	180	531	674	41	70	302	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	175			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Satd. Flow (prot)	1787	1881	1867	0	1805	1599	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1787	1881	1867	0	1805	1599	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			2			373	
Link Speed (mph)		35	30		30		
Link Distance (ft)		510	151		124		
Travel Time (s)		9.9	3.4		2.8		
Peak Hour Factor	0.98	0.98	0.94	0.94	0.81	0.81	
Heavy Vehicles (%)	1%	1%	1%	0%	0%	1%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	184	542	761	0	86	373	
Turn Type	Prot	NA	NA		Prot	pt+ov	
Protected Phases	5	2	6		4	4 5	9
Permitted Phases							
Detector Phase	5	2	6		4	4 5	
Switch Phase							
Minimum Initial (s)	6.0	6.0	10.0		6.0		5.0
Minimum Split (s)	11.0	11.0	15.0		11.0		24.0
Total Split (s)	45.0	94.0	49.0		29.0		24.0
Total Split (%)	30.6%	63.9%	33.3%		19.7%		16%
Yellow Time (s)	4.0	4.0	4.0		4.0		2.0
All-Red Time (s)	1.0	1.0	1.0		1.0		1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0	5.0		5.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	None	Min	Min		None		None
Act Effct Green (s)	13.5	64.0	45.4		8.9	26.8	
Actuated g/C Ratio	0.16	0.74	0.52		0.10	0.31	
v/c Ratio	0.66	0.39	0.78		0.47	0.50	
Control Delay	48.0	7.0	27.0		48.4	4.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	48.0	7.0	27.0		48.4	4.3	
LOS	D	A	C		D	A	
Approach Delay		17.4	27.0		12.6		
Approach LOS		B	C		B		
Queue Length 50th (ft)	87	66	268		41	0	
Queue Length 95th (ft)	206	309	#910		103	24	
Internal Link Dist (ft)		430	71		44		
Turn Bay Length (ft)	175						
Base Capacity (vph)	849	1785	977		514	1164	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.22	0.30	0.78		0.17	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 147			
Actuated Cycle Length: 86.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 20.0		Intersection LOS: C	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Union St (Rt 135) & Summer St

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	31	13	195	16	26
Future Vol, veh/h	91	31	13	195	16	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	83	83	80	80
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	102	35	16	235	20	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	137	0	387	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	267	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1459	-	620	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	782	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1459	-	612	937
Mov Cap-2 Maneuver	-	-	-	-	612	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	772	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	779	-	-	1459	-
HCM Lane V/C Ratio	0.067	-	-	0.011	-
HCM Control Delay (s)	10	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Traffic Vol, veh/h	0	601	693	0	0	22
Future Vol, veh/h	0	601	693	0	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	93	93	80	80
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	613	745	0	0	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	745
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	417
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	417
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	417
HCM Lane V/C Ratio	-	-	0.066
HCM Control Delay (s)	-	-	14.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	518	83	58	623	70	81
Future Vol, veh/h	518	83	58	623	70	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	93	93	88	88
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	529	85	62	670	80	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1366	572
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	794	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	975	-	164	523
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	449	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	975	-	154	523
Mov Cap-2 Maneuver	-	-	-	-	154	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	46.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	248	-	-	975	-
HCM Lane V/C Ratio	0.692	-	-	0.064	-
HCM Control Delay (s)	46.8	-	-	8.9	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q(veh)	4.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	584	675	25	8	6
Future Vol, veh/h	15	584	675	25	8	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	80	80
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	16	628	726	27	10	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	753	0	-	0	1400	740
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	660	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	866	-	-	-	156	420
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	866	-	-	-	152	420
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	23.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	866	-	-	-	209
HCM Lane V/C Ratio	0.019	-	-	-	0.084
HCM Control Delay (s)	9.2	0	-	-	23.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

HCS7 Two-Way Stop-Control Report

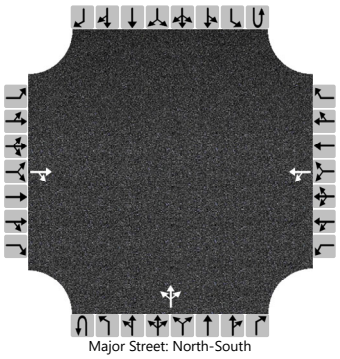
General Information

Analyst	EKB/LCY
Agency/Co.	McMahon
Date Performed	6/7/2022
Analysis Year	2029
Time Analyzed	Weekday PM
Intersection Orientation	North-South
Project Description	Ashland Starbucks

Site Information

Intersection	Summer St at Cherry St
Jurisdiction	Ashland
East/West Street	Cherry St/Summer St
North/South Street	Summer St
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			18	177		195	16			117	0	104				
Percent Heavy Vehicles (%)			0	1		0	0			0						
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)			7.1	6.5		7.1	6.2			4.1						
Critical Headway (sec)			7.10	6.51		7.10	6.20			4.10						
Base Follow-Up Headway (sec)			4.0	3.3		3.5	4.0			2.2						
Follow-Up Headway (sec)			4.00	3.31		3.50	4.00			2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				212		229				127						
Capacity, c (veh/h)				976		488				1636						
v/c Ratio				0.22		0.47				0.08						
95% Queue Length, Q_{95} (veh)				0.8		2.6				0.3						
Control Delay (s/veh)				9.7		18.9				7.4						
Level of Service (LOS)				A		C				A						
Approach Delay (s/veh)	9.7				18.9				4.2							
Approach LOS	A				C											

APPENDIX H

Capacity/Level-of-Service Analysis Summary

CAPACITY ANALYSIS SUMMARY

Weekday Morning Peak Hour
Proposed Coffee Shop with Drive-Through Window
399 Union Street (Route 135), Ashland, MA

			2022 Existing			2029 No Build			2029 Build		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Union Street (Route 135) at	EB	L	D	43.1	0.77	D	43.1	0.78	D	41.2	0.77
Summer Street		T	A	7.2	0.46	A	7.7	0.50	A	7.6	0.50
	WB	TR	C	26.6	0.65	C	29.7	0.72	C	33.4	0.77
	SB	L	D	43.7	0.27	D	44.9	0.30	D	46.3	0.31
		R	A	3.1	0.31	A	3.0	0.32	A	2.9	0.32
	Overall		*B*	*19.8*	*0.57*	*C*	*20.9*	*0.60*	*C*	*21.9*	*0.62*
Summer Street at	WB	LR	C	16.1	0.24	C	17.6	0.28	C	19.0	0.34
Cherry Street	NB	TR	A	4.2	0.11	A	4.3	0.12	A	4.0	0.11
	SB	LT	A	9.0	0.13	A	9.1	0.14	A	9.8	0.17
Summer Street at	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
North Site Driveway	WB	LT	A	0.2	0.00	A	0.1	0.00	A	1.5	0.02
	NB	LR	A	9.6	0.01	A	9.7	0.01	B	10.8	0.11
Union Street (Route 135) at	EB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
West Site Driveway	WB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	R	A	0.0	0.00	A	0.0	0.00	B	11.9	0.05
Union Street (Route 135) at	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Ashland Square Plaza Driveway	WB	L	A	8.9	0.03	A	9.1	0.04	A	9.1	0.04
		T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	LR	C	18.5	0.16	C	20.4	0.18	C	20.3	0.18
Union Street (Route 135) at	EB	LT	A	0.0	0.00	A	0.0	0.00	A	0.3	0.02
East Site Driveway	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	A	0.0	0.00	A	0.0	0.00	C	24.5	0.13

1 Level-of-Service
2 Average vehicle delay in seconds
3 Volume to capacity ratio
n/a Not Applicable

QUEUE SUMMARY

Weekday Morning Peak Hour
Proposed Coffee Shop with Drive-Through Window
399 Union Street (Route 135), Ashland, MA

			2022 Existing		2029 No Build		2029 Build	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
Union Street (Route 135) at	EB	L	131	307	146	355	161	404
Summer Street		T	70	357	81	409	81	409
	WB	TR	165	531	198	598	229	631
	SB	L	18	57	20	60	21	60
		R	0	18	0	19	0	19
Summer Street at	WB	LR	n/a	25	n/a	30	n/a	40
Cherry Street	NB	TR	n/a	10	n/a	10	n/a	10
	SB	LT	n/a	13	n/a	13	n/a	15
Union Street (Route 135) at	EB	TR	n/a	0	n/a	0	n/a	0
North Site Driveway	WB	LT	n/a	0	n/a	0	n/a	3
	NB	LR	n/a	0	n/a	0	n/a	10
Union Street (Route 135) at	EB	T	n/a	0	n/a	0	n/a	0
West Site Driveway	WB	T	n/a	0	n/a	0	n/a	0
	SB	R	n/a	0	n/a	0	n/a	5
Union Street (Route 135) at	EB	TR	n/a	0	n/a	0	n/a	0
Ashland Square Plaza Driveway	WB	L	n/a	3	n/a	3	n/a	3
		T	n/a	0	n/a	0	n/a	0
	NB	LR	n/a	15	n/a	15	n/a	15
Union Street (Route 135) at	EB	LT	n/a	0	n/a	0	n/a	3
East Site Driveway	WB	TR	n/a	0	n/a	0	n/a	0
	SB	LR	n/a	0	n/a	0	n/a	10

1 50th Percentile Queue Length, in feet
2 95th Percentile Queue Length, in feet
n/a Not Applicable

CAPACITY ANALYSIS SUMMARY

Weekday Afternoon Peak Hour
Proposed Coffee Shop with Drive-Through Window
399 Union Street (Route 135), Ashland, MA

			2022 Existing			2029 No Build			2029 Build		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Union Street (Route 135) at	EB	L	D	47.2	0.62	D	47.8	0.65	D	48.0	0.66
Summer Street		T	A	6.7	0.36	A	7.1	0.39	A	7.0	0.39
	WB	TR	C	23.0	0.70	C	26.1	0.77	C	27.0	0.78
	SB	L	D	47.1	0.44	D	48.0	0.46	D	48.4	0.47
		R	A	4.5	0.48	A	4.4	0.50	A	4.3	0.50
	Overall		*B*	*18.1*	*0.61*	*B*	*19.5*	*0.65*	*C*	*20.0*	*0.65*
Summer Street at	WB	LR	C	16.2	0.39	C	18.3	0.45	C	18.9	0.47
Cherry Street	NB	TR	A	4.3	0.07	A	4.4	0.08	A	4.2	0.08
	SB	LT	A	9.4	0.19	A	9.6	0.21	A	9.7	0.22
Summer Street at	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
North Site Driveway	WB	LT	A	0.2	0.00	A	0.1	0.00	A	0.5	0.01
	NB	LR	A	9.6	0.03	A	9.7	0.03	B	10.0	0.07
Union Street (Route 135) at	EB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
West Site Driveway	WB	T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	R	B	13.2	0.02	B	13.9	0.02	B	14.2	0.07
Union Street (Route 135) at	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Ashland Square Plaza Driveway	WB	L	A	8.8	0.06	A	8.9	0.06	A	8.9	0.06
		T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	LR	E	36.5	0.62	E	47.2	0.70	E	46.8	0.69
Union Street (Route 135) at	EB	LT	A	0.1	0.01	A	0.1	0.01	A	0.2	0.02
East Site Driveway	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	C	24.8	0.01	D	28.1	0.01	C	23.8	0.08

1 Level-of-Service
2 Average vehicle delay in seconds
3 Volume to capacity ratio
n/a Not Applicable

QUEUE SUMMARY

Weekday Afternoon Peak Hour
Proposed Coffee Shop with Drive-Through Window
399 Union Street (Route 135), Ashland, MA

			2022 Existing		2029 No Build		2029 Build	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
Union Street (Route 135) at	EB	L	74	180	82	196	87	206
Summer Street		T	57	274	65	308	66	309
	WB	TR	218	761	258	886	268	910
	SB	L	37	95	41	102	41	103
		R	0	25	0	25	0	24
Summer Street at	WB	LR	n/a	48	n/a	60	n/a	65
Cherry Street	NB	TR	n/a	5	n/a	8	n/a	8
	SB	LT	n/a	18	n/a	20	n/a	20
Union Street (Route 135) at	EB	TR	n/a	0	n/a	0	n/a	0
North Site Driveway	WB	LT	n/a	0	n/a	0	n/a	0
	NB	LR	n/a	3	n/a	3	n/a	5
Union Street (Route 135) at	EB	T	n/a	0	n/a	0	n/a	0
West Site Driveway	WB	T	n/a	0	n/a	0	n/a	0
	SB	R	n/a	3	n/a	3	n/a	5
Union Street (Route 135) at	EB	TR	n/a	0	n/a	0	n/a	0
Ashland Square Plaza Driveway	WB	L	n/a	5	n/a	5	n/a	5
		T	n/a	0	n/a	0	n/a	0
	NB	LR	n/a	93	n/a	115	n/a	115
Union Street (Route 135) at	EB	LT	n/a	0	n/a	0	n/a	3
East Site Driveway	WB	TR	n/a	0	n/a	0	n/a	0
	SB	LR	n/a	0	n/a	0	n/a	8

1 50th Percentile Queue Length, in feet
2 95th Percentile Queue Length, in feet
n/a Not Applicable