

Appendix

- Traffic Volume Data
- Seasonal and Background Growth
- Speed Data
- Sight Line Analysis
- Trip Generation Data
- Trip Distribution Calculations
- Capacity Analyses

□ Traffic Volume Data

MDM TRANSPORTATION CONSULTANTS, INC.

E/W: Washington Street
246 Washington Street
Sherborn, MA

28 Lord Road, Suite 280
Marlborough, MA
www.mdmtrans.com

Site Code: 00000812
Station ID:
812 Washington St (Volume)
Latitude: 0' 0.0000 Undefined

Start Time	16-Dec-14 Tue	Westbound		Hour Totals		Eastbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		16	66			2	77				
12:15		12	79			0	68				
12:30		7	67			0	75				
12:45		3	74	38	286	1	66	3	286	41	572
01:00		3	80			1	67				
01:15		3	96			2	59				
01:30		1	79			1	56				
01:45		2	69	9	324	0	70	4	252	13	576
02:00		1	86			4	71				
02:15		0	82			3	79				
02:30		0	112			1	80				
02:45		1	127	2	407	0	63	8	293	10	700
03:00		1	114			0	66				
03:15		0	148			2	55				
03:30		1	156			3	82				
03:45		1	181	3	599	8	55	13	258	16	857
04:00		1	164			6	68				
04:15		0	160			12	68				
04:30		1	185			13	72				
04:45		6	177	8	686	16	68	47	276	55	962
05:00		5	170			30	80				
05:15		9	195			54	74				
05:30		5	185			80	88				
05:45		10	166	29	716	114	73	278	315	307	1031
06:00		12	163			185	56				
06:15		27	170			243	45				
06:30		23	158			301	50				
06:45		44	158	106	649	227	33	956	184	1062	833
07:00		45	109			217	49				
07:15		46	89			233	33				
07:30		70	63			221	29				
07:45		49	85	210	346	231	24	902	135	1112	481
08:00		63	58			183	18				
08:15		69	72			231	18				
08:30		72	64			178	22				
08:45		66	67	270	261	163	26	755	84	1025	345
09:00		50	52			155	17				
09:15		54	47			127	15				
09:30		40	37			106	12				
09:45		36	60	180	196	98	9	486	53	666	249
10:00		50	40			98	12				
10:15		49	36			83	19				
10:30		55	35			89	12				
10:45		41	33	195	144	68	8	338	51	533	195
11:00		47	28			74	3				
11:15		48	20			78	3				
11:30		58	20			75	5				
11:45		70	15	223	83	71	5	298	16	521	99
Total		1273	4697			4088	2203			5361	6900
Percent		21.3%	78.7%			65.0%	35.0%			43.7%	56.3%

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812 Washington St (Volume)

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Start Time	17-Dec-14 Wed	Westbound		Hour Totals		Eastbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		16	67			2	83				
12:15		17	101			1	84				
12:30		11	69			1	73				
12:45		6	88	50	325	1	69	5	309	55	634
01:00		6	69			0	54				
01:15		3	86			2	83				
01:30		0	79			0	69				
01:45		2	91	11	325	1	71	3	277	14	602
02:00		0	86			6	79				
02:15		2	102			4	70				
02:30		0	119			1	79				
02:45		0	113	2	420	0	89	11	317	13	737
03:00		1	131			0	67				
03:15		0	158			2	78				
03:30		1	155			5	63				
03:45		2	177	4	621	3	94	10	302	14	923
04:00		0	161			11	56				
04:15		1	155			4	79				
04:30		1	156			19	64				
04:45		5	177	7	649	22	81	56	280	63	929
05:00		1	146			27	68				
05:15		5	174			45	93				
05:30		7	171			74	78				
05:45		7	183	20	674	108	64	254	303	274	977
06:00		8	169			162	75				
06:15		26	155			249	68				
06:30		29	155			279	63				
06:45		39	136	102	615	222	47	912	253	1014	868
07:00		55	137			214	29				
07:15		51	102			208	55				
07:30		51	97			230	23				
07:45		76	76	233	412	220	26	872	133	1105	545
08:00		48	72			193	35				
08:15		66	69			189	22				
08:30		63	63			157	22				
08:45		50	62	227	266	163	17	702	96	929	362
09:00		50	54			151	16				
09:15		54	57			129	16				
09:30		47	69			121	19				
09:45		47	45	198	225	109	21	510	72	708	297
10:00		43	48			87	9				
10:15		57	35			94	13				
10:30		50	27			88	12				
10:45		44	30	194	140	80	7	349	41	543	181
11:00		61	25			75	8				
11:15		60	25			86	7				
11:30		58	15			74	2				
11:45		68	9	247	74	62	5	297	22	544	96
Total		1295	4746			3981	2405			5276	7151
Percent		21.4%	78.6%			62.3%	37.7%			42.5%	57.5%

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Station ID:
812 Washington St (Volume)

Latitude: 0' 0.0000 Undefined

Start Time	18-Dec-14 Thu	Westbound		Hour Totals		Eastbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		15	68			3	71				
12:15		11	59			0	62				
12:30		7	70			2	66				
12:45		7	84	40	281	2	56	7	255	47	536
01:00		8	79			1	74				
01:15		5	82			4	75				
01:30		2	64			1	64				
01:45		4	83	19	308	1	61	7	274	26	582
02:00		0	79			6	70				
02:15		1	80			3	83				
02:30		1	99			0	72				
02:45		2	124	4	382	1	65	10	290	14	672
03:00		2	128			3	70				
03:15		2	138			1	79				
03:30		1	168			6	67				
03:45		0	162	5	596	4	58	14	274	19	870
04:00		0	151			10	68				
04:15		1	170			7	63				
04:30		2	165			14	85				
04:45		4	161	7	647	22	82	53	298	60	945
05:00		3	166			31	61				
05:15		6	177			42	70				
05:30		7	167			82	82				
05:45		10	168	26	678	91	72	246	285	272	963
06:00		9	107			162	67				
06:15		17	135			246	79				
06:30		29	155			286	67				
06:45		26	120	81	517	247	37	941	250	1022	767
07:00		53	103			217	43				
07:15		58	99			207	46				
07:30		62	81			224	30				
07:45		77	72	250	355	197	26	845	145	1095	500
08:00		51	63			189	25				
08:15		73	76			169	16				
08:30		56	76			192	18				
08:45		62	67	242	282	170	20	720	79	962	361
09:00		53	78			131	26				
09:15		46	65			121	19				
09:30		43	64			120	18				
09:45		51	40	193	247	98	19	470	82	663	329
10:00		46	52			89	21				
10:15		49	31			84	19				
10:30		60	55			104	15				
10:45		52	36	207	174	85	14	362	69	569	243
11:00		47	26			70	6				
11:15		58	14			78	7				
11:30		55	21			83	6				
11:45		74	0	234	61	89	0	320	19	554	80
Total		1308	4528			3995	2320			5303	6848
Percent		22.4%	77.6%			63.3%	36.7%			43.6%	56.4%
Grand Total		3876	13971			12064	6928			15940	20899
Percent		21.7%	78.3%			63.5%	36.5%			43.3%	56.7%
ADT		ADT 12,280	AADT 12,280								

□ Seasonal and Background Growth

December
Adjustment
to Year

STATION 307 - WESTBOROUGH - RTE.9 - EAST OF NORTHBOROUGH T.L.

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
06	44,301	44,854	50,326	51,170	51,729	52,438	48,052	50,270	50,998	50,194	50,043	50,032	49,534
	7%	5%	-2%	-4%	-3%	-1%	10%	4%	-4%	1%	-1%	-6%	0%
07	47,505	47,283	49,268	49,136	50,000	52,000	53,000	52,322	49,031	50,571	49,662	47,007	49,732
	-4%	-2%	-3%	1%	1%	-4%	-8%	-7%	-1%	-3%	-4%	-1%	-3%
08	45,614	46,112	47,829	49,816	50,518	49,936	48,629	48,759	48,531	49,009	47,490	46,696	48,245
	-3%	1%	-3%	-2%	-2%	0%	-2%	-3%	-2%	-1%	0%	2%	-1%
09	44,103	46,434	46,455	49,049	49,474	49,934	47,638	47,056	47,762	48,663	47,379	47,564	47,626
	-1%	0%	2%	0%	0%	1%	-1%	1%	1%	1%	2%	2%	1%
11	43,244	46,150	48,016	48,943	49,781	50,525	46,812	48,234	48,825	49,198	49,151	49,888	48,231
	7%	2%	1%	-1%	1%	-1%	3%	4%	0%	2%	2%	-5%	1%
12	46,381	46,883	48,608	48,662	50,126	49,961	48,380	49,941	48,882	50,056	50,015	47,600	48,791
												Growth	-0.40%
													Sub Average
													1.01

STATION 3180 - MILFORD - RTE.1495 - AT MEDWAY T.L.

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
06	72,492	71,145	76,347	78,305	80,480	85,728	84,957	89,595	83,740	80,518	79,468	76,386	79,930
	-2%	-1%	-4%	-2%	6%	3%	4%	2%	-1%	2%	-2%	-5%	0%
07	70,749	70,432	73,596	76,751	85,024	88,000	88,401	91,080	83,309	82,221	77,941	72,362	79,989
	-2%	-3%	3%	-1%	-7%	-8%	-4%	-5%	-5%	-3%	-5%	-2%	-4%
08	69,200	68,456	76,000	75,934	79,352	81,166	84,701	86,189	78,778	79,645	73,861	70,747	77,002
	-5%	1%	-8%	1%	-1%	-1%	-1%	1%	6%	0%	2%	3%	0%
09	65,444	69,136	69,739	76,913	78,876	80,700	84,000	86,829	83,273	79,419	75,486	73,169	76,915
	3%	-1%	5%	1%	-1%	7%	4%	4%	0%	4%	3%	3%	3%
10	67,428	68,595	73,544	77,906	77,940	86,167	87,728	90,295	83,483	82,244	77,516	75,273	79,010
	-3%	2%	1%	-1%	3%	1%	-1%	-4%	1%	-2%	3%	2%	0%
11	65,217	69,804	73,992	77,115	80,458	87,344	86,859	87,108	84,288	80,223	79,773	76,729	79,076
	8%	2%	1%	1%	2%	0%	-1%	4%	-1%	3%	0%	-2%	1%
12	70,333	71,280	74,372	78,117	81,707	87,015	85,909	90,589	83,100	82,647	79,570	74,989	79,969
												Growth	0.03%
													Sub Average
													1.06

STATION 6125 - BELLINGHAM - RTE.1495 - AT FRANKLIN T.L.

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
06	74,825	72,901	78,382	80,386	82,080	86,982	86,481	90,748	84,958	81,767	80,901	77,982	81,533
	-4%	-1%	-4%	-3%	3%	2%	1%	1%	0%	2%	-2%	-7%	-1%
07	72,153	71,826	75,186	78,376	84,242	88,793	87,242	91,996	85,043	83,370	79,615	72,604	80,871
	-1%	-1%	-3%	-1%	-4%	-6%	-3%	-4%	-5%	-2%	-5%	-1%	-3%
08	71,744	70,760	73,000	77,938	81,066	83,867	84,721	88,163	80,551	81,608	75,924	71,971	78,443
	-6%	1%	-1%	-4%	-7%	0%	6%	2%	6%	-1%	1%	4%	0%
09	67,317	71,174	71,926	74,852	75,774	84,000	89,606	89,969	85,237	81,173	76,814	74,493	78,528
	3%	0%	5%	10%	11%	6%	-1%	3%	0%	4%	3%	0%	4%
10	69,081	70,859	75,603	82,248	83,876	89,208	88,854	92,455	85,654	84,020	79,116	74,625	81,300
	-4%	1%	1%	-4%	-2%	0%	0%	-4%	0%	-1%	2%	6%	-1%
11	66,166	71,765	76,067	78,721	82,611	88,965	88,970	88,945	85,358	83,307	80,382	78,732	80,832
	9%	2%	0%	2%	2%	1%	1%	4%	0%	2%	2%	0%	2%
12	71,975	73,106	76,326	80,040	84,068	89,578	90,207	92,864	85,332	84,818	81,773	78,544	82,386
												Growth	0.20%
													Sub Average
													1.07

Average Adjustment Factor 1.05

Average Yearly Growth Calculated -0.06%

Yearly Growth Factor Used ITALY-ESTIMATED DATA
MADT

□ Speed Data

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Site Code: 00000812
Station ID:
812 Washington St (Speed)

Latitude: 0' 0.0000 Undefined

Eastbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	85th Percent
Start Time	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	38
12/16/14	15	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	47
01:00	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	4	49
02:00	0	0	0	0	0	0	1	2	4	1	0	0	0	0	0	8	47
03:00	0	0	0	0	0	1	2	7	2	1	0	0	0	0	0	13	48
04:00	0	0	0	0	0	0	11	21	13	2	0	0	0	0	0	47	45
05:00	0	0	0	0	0	14	101	119	41	3	0	0	0	0	0	278	42
06:00	0	1	19	28	164	526	456	215	28	2	0	0	0	0	0	956	42
07:00	0	0	28	151	456	236	261	236	21	4	0	0	0	0	0	902	44
08:00	4	2	13	103	305	305	175	223	53	10	0	0	0	0	0	755	44
09:00	2	0	4	39	175	117	117	148	29	4	0	0	0	0	0	486	44
10:00	0	0	3	31	117	118	117	117	26	9	1	0	0	0	0	338	44
11:00	2	0	4	29	118	104	104	111	31	2	0	0	0	0	0	298	44
12 PM	1	0	5	23	104	101	101	109	16	10	0	0	0	0	0	286	44
13:00	0	0	1	17	101	110	110	96	29	6	1	0	0	0	0	252	44
14:00	0	0	13	43	23	43	110	85	30	2	0	0	0	0	0	293	44
15:00	1	1	2	15:00	4	42	127	87	15	7	1	0	0	0	0	258	44
16:00	2	0	3	42	49	135	77	60	28	1	0	0	0	0	0	276	43
17:00	1	0	3	26	26	42	42	56	15	2	0	0	0	0	0	315	44
18:00	1	1	0	22	22	33	33	34	12	3	0	0	0	0	0	184	44
19:00	0	0	0	4	4	20	20	22	6	0	0	0	0	0	0	135	44
20:00	0	0	0	0	0	3	3	24	2	0	2	0	0	0	0	84	44
21:00	0	0	0	0	0	3	17	24	2	3	0	0	0	0	0	53	45
22:00	0	0	0	0	0	2	6	6	1	0	0	0	0	0	0	51	44
23:00	1	0	0	0	0	2	6	6	1	0	0	0	0	0	0	16	43
Total	15	5	19	101	2691	791	2691	2138	454	72	5	0	0	0	0	6291	

Statistics	10 MPH Pace Speed :		36-45 MPH
	85th Percentile :	95th Percentile :	44 MPH
Number of Vehicles > 40 MPH :		2669	47 MPH
Percent of Vehicles > 40 MPH :		42.4%	
Mean Speed(Average) :		40 MPH	

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Eastbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	85th
Start	Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Percent
12/17/14	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	5
01:00	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3
02:00	0	0	0	0	0	1	4	4	2	0	0	0	0	0	0	11
03:00	0	0	0	0	0	0	2	6	2	0	0	0	0	0	0	10
04:00	0	0	0	0	1	1	14	34	6	0	0	0	0	0	0	56
05:00	0	0	0	0	3	30	106	88	24	3	0	0	0	0	0	254
06:00	3	0	0	2	53	297	438	109	10	0	0	0	0	0	0	912
07:00	2	0	0	6	33	207	427	164	32	1	0	0	0	0	0	872
08:00	3	3	3	10	22	112	301	206	45	0	0	0	0	0	0	702
09:00	0	0	0	4	4	58	182	220	39	2	0	1	0	0	0	510
10:00	0	0	1	4	3	41	121	131	44	4	0	0	0	0	0	349
11:00	0	0	0	0	1	18	115	112	47	3	1	0	0	0	0	297
12 PM	0	0	0	1	4	26	107	131	36	4	0	0	0	0	0	309
13:00	1	0	0	0	3	22	112	118	17	3	1	0	0	0	0	277
14:00	1	0	0	0	8	34	126	105	40	3	0	0	0	0	0	317
15:00	0	0	2	2	5	33	124	103	31	3	0	0	0	0	0	302
16:00	3	0	2	0	6	37	117	97	17	1	0	0	0	0	0	280
17:00	2	0	0	1	10	64	108	87	25	6	0	0	0	0	0	303
18:00	0	0	0	0	1	52	108	78	14	0	0	0	0	0	0	253
19:00	0	0	0	0	8	19	47	42	15	2	0	0	0	0	0	133
20:00	1	0	1	0	0	8	34	44	7	1	0	0	0	0	0	96
21:00	2	0	0	0	3	5	26	26	9	0	1	0	0	0	0	72
22:00	0	0	0	0	1	5	13	16	5	1	0	0	0	0	0	41
23:00	0	0	0	0	0	2	4	9	7	0	0	0	0	0	0	22
Total	18	7	31	169	1073	2639	1933	475	37	3	1	0	0	0	0	6386

Statistics	10 MPH Pace Speed :		36-45 MPH
	85th Percentile :	95th Percentile :	
	43 MPH		
	47 MPH		
Number of Vehicles > 40 MPH :		2449	
Percent of Vehicles > 40 MPH :		38.3%	
Mean Speed(Average) :		39 MPH	

MDM TRANSPORTATION CONSULTANTS, INC.

E/W: Washington Street
246 Washington Street
Sherborn, MA

28 Lord Road, Suite 280
Marlborough, MA
www.mdmtrans.com

Site Code: 00000812
Station ID:
812 Washington St (Speed)

Latitude: 0' 0.0000 Undefined

Eastbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	85th
Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total	Percent
12/18/14	0	0	0	0	0	1	3	0	0	0	0	0	0	0	7	43
01:00	0	0	0	0	1	1	4	1	0	0	0	0	0	0	7	44
02:00	0	0	0	0	0	4	5	1	0	0	0	0	0	0	10	44
03:00	0	0	0	0	1	3	7	2	1	1	0	0	0	0	14	47
04:00	0	0	0	0	1	10	31	9	2	2	0	0	0	0	53	46
05:00	0	0	0	0	14	91	102	33	6	6	0	0	0	0	246	45
06:00	0	2	2	39	332	406	139	20	1	1	0	0	0	0	941	40
07:00	0	0	4	28	165	393	213	38	4	4	0	0	0	0	845	43
08:00	10	14	17	19	77	263	263	50	7	7	0	0	0	0	720	44
09:00	0	0	0	2	19	161	235	50	3	3	0	0	0	0	470	44
10:00	0	0	0	2	28	130	143	51	8	8	0	0	0	0	362	45
11:00	0	0	0	3	31	89	144	49	4	4	0	0	0	0	320	45
12 PM	2	0	1	1	20	105	91	29	5	5	0	0	0	0	255	44
13:00	0	0	2	9	19	76	110	47	10	10	0	0	0	0	274	46
14:00	0	0	0	2	25	99	106	52	5	5	1	0	0	0	290	46
15:00	0	0	1	2	19	88	113	42	9	9	0	0	0	0	274	46
16:00	0	0	0	5	51	122	100	17	3	3	0	0	0	0	298	46
17:00	1	0	0	13	50	122	84	13	2	2	0	0	0	0	285	43
18:00	0	1	4	24	61	97	51	11	1	1	0	0	0	0	250	42
19:00	2	0	0	2	14	50	59	17	1	1	0	0	0	0	145	44
20:00	0	0	2	3	12	33	24	5	0	0	0	0	0	0	79	43
21:00	0	0	0	1	8	28	32	12	0	0	1	0	0	0	82	45
22:00	0	0	0	1	4	28	32	4	0	0	0	0	0	0	69	44
23:00	0	0	0	0	0	8	6	6	1	1	1	0	0	0	22	48
Total	15	17	33	156	955	2408	2097	559	73	3	0	0	0	0	6318	

Statistics	10 MPH Pace Speed :		36-45 MPH
	85th Percentile :	95th Percentile :	
	44 MPH	47 MPH	
	Number of Vehicles > 40 MPH :	2734	
	Percent of Vehicles > 40 MPH :	43.3%	
	Mean Speed(Average) :	40 MPH	

Stats	Mean Speed(Average) :		39 MPH
	85th Percentile :	95th Percentile :	
	44 MPH	47 MPH	
	Number of Vehicles > 40 MPH :	7852	
	Percent of Vehicles > 40 MPH :	41.3%	

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Westbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	85th Percent
Start Time	15	0	0	0	0	1	12	16	20	24	28	32	36	40	44	48	
12/16/14	0	0	0	0	0	1	12	16	20	24	28	32	36	40	44	38	48
01:00	0	0	0	0	0	1	5	1	1	1	0	0	0	0	0	9	48
02:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	48
03:00	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3	43
04:00	0	0	0	0	0	2	4	2	0	0	0	0	0	0	0	8	42
05:00	0	0	1	0	0	4	7	9	7	1	0	0	0	0	0	29	47
06:00	0	1	0	1	1	12	41	37	23	2	0	0	0	0	0	106	44
07:00	0	0	0	0	1	19	78	88	23	1	0	0	0	0	0	210	44
08:00	0	0	0	0	5	11	112	119	17	6	0	0	0	0	0	270	44
09:00	0	0	1	0	8	14	73	71	13	0	0	0	0	0	0	180	44
10:00	0	1	0	0	0	15	79	81	17	2	0	0	0	0	0	195	44
11:00	0	0	0	0	1	22	101	84	14	1	0	0	0	0	0	223	43
12 PM	0	0	0	0	6	11	118	125	24	2	0	0	0	0	0	286	44
13:00	0	0	1	0	0	18	119	154	28	2	1	1	0	0	0	324	44
14:00	0	0	0	0	4	38	194	141	22	3	0	0	0	0	0	407	43
15:00	1	0	2	5	0	101	275	188	21	5	0	1	0	0	0	599	43
16:00	0	0	0	18	0	124	357	168	18	1	0	0	0	0	0	686	42
17:00	1	0	2	7	0	164	392	140	10	0	0	0	0	0	0	716	41
18:00	3	5	6	21	0	107	335	159	12	1	0	0	0	0	0	649	42
19:00	0	0	0	1	0	42	166	117	17	3	0	0	0	0	0	346	43
20:00	0	0	0	0	0	26	134	90	7	2	1	0	0	0	0	261	43
21:00	0	0	0	3	0	16	84	74	16	2	1	0	0	0	0	196	44
22:00	0	0	1	5	4	4	44	70	16	4	0	0	0	0	0	144	44
23:00	1	0	0	0	0	8	27	35	10	1	1	0	0	0	0	83	44
Total	6	7	19	87	760	2758	1972	311	43	4	3	0	0	0	0	5970	

Statistics	10 MPH Pace Speed :	36-45 MPH
	85th Percentile :	43 MPH
	95th Percentile :	46 MPH
	Number of Vehicles > 40 MPH :	2333
Percent of Vehicles > 40 MPH :		39.1%
Mean Speed(Average) :		39 MPH

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Latitude: 0' 0.0000 Undefined

Westbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	85th Percent
Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85		
12/17/14	0	0	0	0	2	19	24	5	0	0	0	0	0	0	0	50	44
01:00	0	0	0	0	0	8	1	2	0	0	0	0	0	0	0	11	45
02:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	44
03:00	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4	48
04:00	0	0	0	0	0	5	1	1	0	0	0	0	0	0	0	7	44
05:00	0	0	0	2	1	9	8	0	0	0	0	0	0	0	0	20	43
06:00	1	0	1	6	25	40	23	6	4	0	0	0	0	0	0	102	42
07:00	0	0	0	7	38	94	78	11	21	4	1	0	0	0	0	233	43
08:00	0	0	0	1	24	90	88	21	2	1	0	0	0	0	0	227	44
09:00	0	0	0	1	14	82	70	26	5	0	0	0	0	0	0	198	45
10:00	0	0	3	7	23	76	72	13	0	0	0	0	0	0	0	194	43
11:00	0	0	2	0	35	81	93	30	6	0	0	0	0	0	0	247	44
12 PM	0	0	1	2	22	158	123	18	1	0	0	0	0	0	0	325	43
13:00	1	0	0	3	40	149	108	21	3	0	0	0	0	0	0	325	43
14:00	3	0	2	3	34	196	154	26	2	0	0	0	0	0	0	420	43
15:00	0	0	1	9	54	285	240	30	2	0	0	0	0	0	0	621	43
16:00	0	2	5	15	94	356	157	17	3	0	0	0	0	0	0	649	42
17:00	2	0	2	26	136	375	119	11	2	1	0	0	0	0	0	674	41
18:00	0	0	2	13	128	305	142	24	1	0	0	0	0	0	0	615	42
19:00	0	0	0	0	69	198	133	11	1	0	0	0	0	0	0	412	43
20:00	1	0	0	3	25	114	110	13	0	0	0	0	0	0	0	266	43
21:00	2	0	0	0	18	115	83	7	0	0	0	0	0	0	0	225	43
22:00	0	0	0	1	6	75	46	10	2	0	0	0	0	0	0	140	44
23:00	0	0	0	0	2	26	33	10	1	1	1	0	0	0	0	74	45
Total	10	2	19	100	790	2858	1908	315	35	3	1	0	0	0	0	6041	

Statistics	10 MPH Pace Speed :	36-45 MPH
	85th Percentile :	43 MPH
	95th Percentile :	45 MPH
	Number of Vehicles > 40 MPH :	2262
	Percent of Vehicles > 40 MPH :	37.4%
	Mean Speed(Average) :	39 MPH

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Westbound		1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	85th Percent
Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85		
12/18/14	0	0	0	0	0	3	15	14	7	0	1	0	0	0	0	40	46
01:00	0	0	0	0	2	2	11	5	1	0	0	0	0	0	0	19	43
02:00	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4	42
03:00	0	0	0	0	1	1	2	1	0	0	1	0	0	0	0	5	56
04:00	0	0	0	0	0	0	3	2	0	2	0	0	0	0	0	7	52
05:00	0	1	0	0	2	2	9	10	3	1	0	0	0	0	0	26	45
06:00	0	1	2	5	19	19	28	19	6	1	0	0	0	0	0	81	43
07:00	0	0	0	1	28	118	118	84	18	1	0	0	0	0	0	250	43
08:00	0	1	3	8	32	92	92	87	18	1	0	0	0	0	0	242	44
09:00	0	0	0	1	13	71	71	89	17	2	0	0	0	0	0	193	44
10:00	0	0	0	3	10	79	79	93	19	3	0	0	0	0	0	207	44
11:00	0	0	1	1	16	77	77	103	32	4	0	0	0	0	0	234	45
12 PM	2	0	0	4	8	88	88	148	28	2	1	0	0	0	0	281	44
13:00	0	0	1	1	16	102	102	133	51	4	0	0	0	0	0	308	45
14:00	0	0	0	5	28	148	148	158	41	2	0	0	0	0	0	382	44
15:00	0	0	0	9	43	216	216	268	54	6	0	0	0	0	0	596	44
16:00	0	0	2	22	100	323	323	175	23	2	0	0	0	0	0	647	42
17:00	9	3	5	16	163	357	357	111	13	1	0	0	0	0	0	678	41
18:00	57	34	10	12	86	209	209	103	6	0	0	0	0	0	0	517	41
19:00	0	0	2	5	29	177	177	119	23	0	0	0	0	0	0	355	43
20:00	0	7	20	14	19	124	124	85	11	2	0	0	0	0	0	282	43
21:00	0	0	0	1	19	117	117	94	15	1	0	0	0	0	0	247	43
22:00	0	0	1	0	10	81	81	65	16	1	0	0	0	0	0	174	44
23:00	0	0	0	0	4	29	29	32	10	3	0	0	0	0	0	78	45
Total	68	47	47	108	651	2479	2479	1999	412	39	3	0	0	0	0	5853	

Statistics	10 MPH Pace Speed :	36-45 MPH
	85th Percentile :	43 MPH
	95th Percentile :	46 MPH
	Number of Vehicles > 40 MPH :	2453
	Percent of Vehicles > 40 MPH :	41.9%
	Mean Speed(Average) :	39 MPH

Stats	Mean Speed(Average) :	39 MPH
	85th Percentile :	43 MPH
	95th Percentile :	46 MPH
	Number of Vehicles > 40 MPH :	7048
	Percent of Vehicles > 40 MPH :	39.5%

□ Sight Line Analysis

Stopping Sight Distance

Posted Speed Limit

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	40	147	153.6	300.6
Direction 2	WB	40	147	153.6	300.6

INPUTS

Direction 1

Direction 2

Travel Direction

EB

WB

Speed

40

40

t

2.5

2.5

a

11.2

11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = $1.47 \times t \times V$

Brake Distance = $1.075 \times V^2 / a$

Where:

t = reaction time (sec)

V = travel speed (mph)

a = deceleration rate (ft/sec²)

Stopping Sight Distance

Average Observed Travel Speeds

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	39	143.325	146.0	289.3
Direction 2	WB	39	143.325	146.0	289.3

INPUTS

Direction 1

Direction 2

Travel Direction

EB

WB

Speed

39

39

t

2.5

2.5

a

11.2

11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = $1.47 \times t \times V$

Brake Distance = $1.075 \times V^2 / a$

Where:

t = reaction time (sec)

V = travel speed (mph)

a = deceleration rate (ft/sec²)

Stopping Sight Distance

85th Percentile Observed Travel Speeds

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	44	161.7	185.8	347.5
Direction 2	WB	43	158.025	177.5	335.5

INPUTS

Direction 1

Direction 2

Travel Direction
Speed
t
a

EB
44
2.5
11.2

WB
43
2.5
11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = $1.47 \times t \times V$

Brake Distance = $1.075 \times V^2 / a$

Where:

t = reaction time (sec)

V = travel speed (mph)

a = deceleration rate (ft/sec²)

□ Trip Generation Data

Institute of Transportation Engineers (ITE) 9th Edition Land Use Code (LUC) 210 - Single-Family Detached Housing

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 3

AVERAGE WEEKDAY DAILY

$T = 9.52^* (X)$
 $T = 9.52^* \quad 3$
 $T = 28.56$
 $T = 28$ vehicle trips
with 50% (14 vpd) entering and 50% (14 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.75^* (X)$
 $T = 0.75^* \quad 3$
 $T = 2.25$
 $T = 2$ vehicle trips
with 25% (1 vph) entering and 75% (1 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 1.00^* (X)$
 $T = 1.00^* \quad 3$
 $T = 3.00$
 $T = 3$ vehicle trips
with 63% (2 vph) entering and 37% (1 vph) exiting.

SATURDAY DAILY

$T = 9.91^* (X)$
 $T = 9.91^* \quad 3$
 $T = 29.73$
 $T = 30$ vehicle trips
with 50% (15 vph) entering and 50% (15 vph) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.93^* (X)$
 $T = 0.93^* \quad 3$
 $T = 2.79$
 $T = 3$ vehicle trips
with 54% (2 vph) entering and 46% (1 vph) exiting.

Institute of Transportation Engineers (ITE) 9th Edition Land Use Code (LUC) 230 - Residential Condominium/Townhouse
--

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 36

AVERAGE WEEKDAY DAILY

$T = 5.81 * (X)$
 $T = 5.81 * 36$
 $T = 209.16$
 $T = 210$ vehicle trips
with 50% (105 vpd) entering and 50% (105 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.44 * (X)$
 $T = 0.44 * 36$
 $T = 15.84$
 $T = 16$ vehicle trips
with 17% (3 vpd) entering and 83% (13 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.52 * (X)$
 $T = 0.52 * 36$
 $T = 18.72$
 $T = 19$ vehicle trips
with 67% (13 vpd) entering and 33% (6 vpd) exiting.

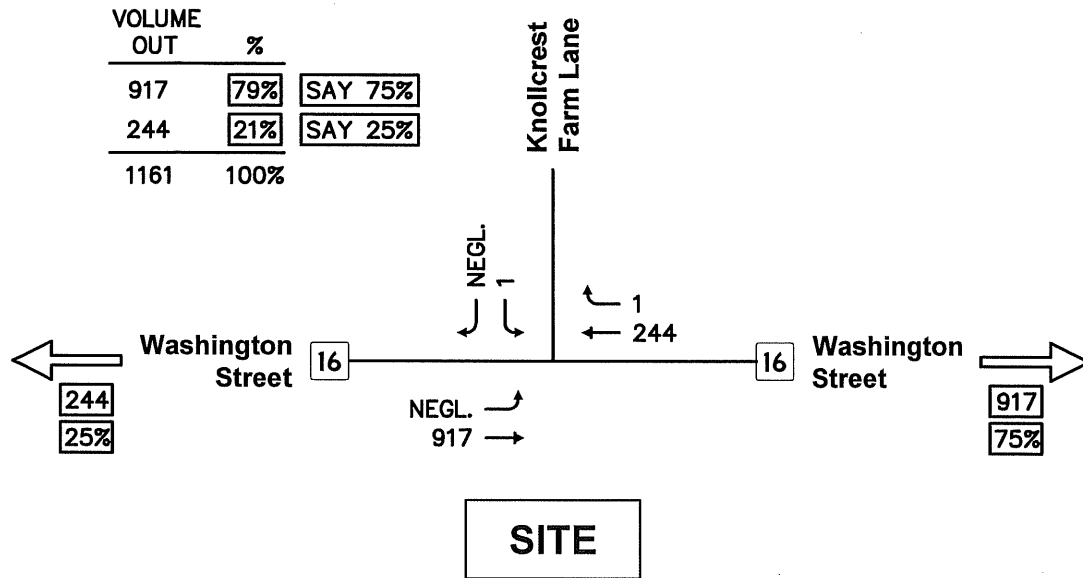
SATURDAY DAILY

$T = 5.67 * (X)$
 $T = 5.67 * 36$
 $T = 204.12$
 $T = 204$ vehicle trips
with 50% (102 vpd) entering and 50% (102 vpd) exiting.

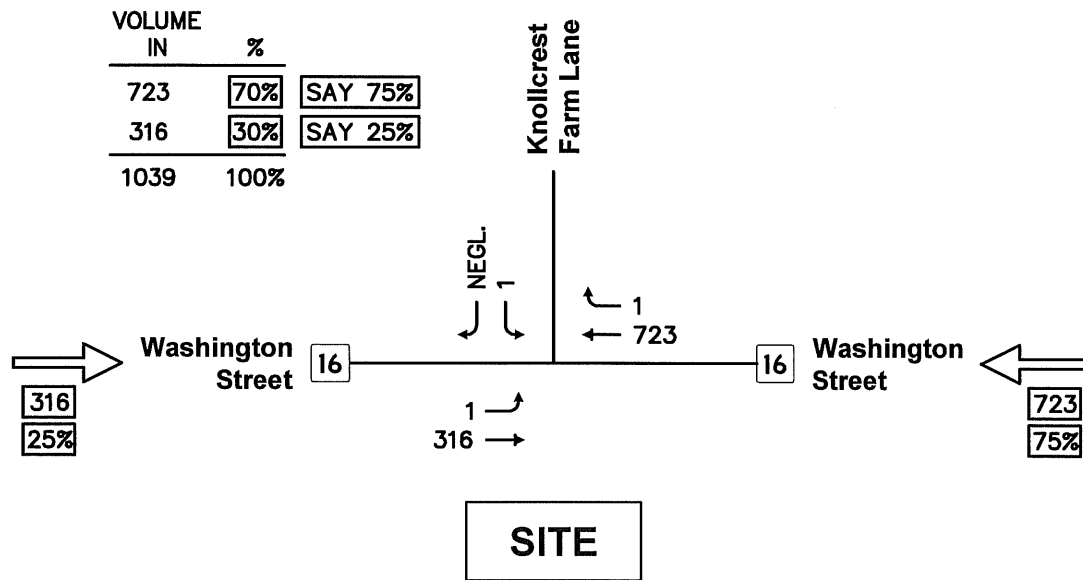
SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.47 * (X)$
 $T = 0.47 * 36$
 $T = 16.92$
 $T = 17$ vehicle trips
with 54% (9 vpd) entering and 46% (8 vpd) exiting.

□ Trip Distribution Calculations



Weekday Morning Peak Hour



Weekday Evening Peak Hour

North

Scale: Not to Scale

MDM TRANSPORTATION CONSULTANTS, INC.
 Planners & Engineers

Attachment

**Trip Distribution Calculation
 (Existing Patterns)**

Journey-to-Work Distribution
US Census Journey-to-Work Data

Residence Town Name	Workplace Town Name	All Workers	% of Total Rounded
Sherborn town Middlesex Co. MA	Boston city Suffolk Co. MA	391	21%
Sherborn town Middlesex Co. MA	Sherborn town Middlesex Co. MA	304	16%
Sherborn town Middlesex Co. MA	Framingham town Middlesex Co. MA	154	8%
Sherborn town Middlesex Co. MA	Cambridge city Middlesex Co. MA	85	5%
Sherborn town Middlesex Co. MA	Newton city Middlesex Co. MA	77	4%
Sherborn town Middlesex Co. MA	Natick town Middlesex Co. MA	74	4%
Sherborn town Middlesex Co. MA	Marlbor. city Middlesex Co. MA	57	3%
Sherborn town Middlesex Co. MA	Wellesley town Norfolk Co. MA	56	3%
Sherborn town Middlesex Co. MA	Waltham city Middlesex Co. MA	44	2%
Sherborn town Middlesex Co. MA	Needham town Norfolk Co. MA	44	2%
Sherborn town Middlesex Co. MA	Ashland town Middlesex Co. MA	34	2%
Sherborn town Middlesex Co. MA	Dedham town Norfolk Co. MA	29	2%
Sherborn town Middlesex Co. MA	West Bridgewater town Plymouth Co. MA	27	1%
Sherborn town Middlesex Co. MA	Medfield town Norfolk Co. MA	23	1%
Sherborn town Middlesex Co. MA	Millis town Norfolk Co. MA	19	1%
Sherborn town Middlesex Co. MA	Lexington town Middlesex Co. MA	18	1%
Sherborn town Middlesex Co. MA	Woburn city Middlesex Co. MA	18	1%
Sherborn town Middlesex Co. MA	Walpole town Norfolk Co. MA	18	1%
Sherborn town Middlesex Co. MA	Canton town Norfolk Co. MA	17	1%
Sherborn town Middlesex Co. MA	Warren town Worcester Co. MA	17	1%
Sherborn town Middlesex Co. MA	Holliston town Middlesex Co. MA	15	1%
Sherborn town Middlesex Co. MA	Norwood town Norfolk Co. MA	14	1%
Sherborn town Middlesex Co. MA	Grafton town Worcester Co. MA	14	1%
Sherborn town Middlesex Co. MA	Milford town Worcester Co. MA	14	1%
Sherborn town Middlesex Co. MA	Shrewsbury town Worcester Co. MA	14	1%
Sherborn town Middlesex Co. MA	Bedford town Middlesex Co. MA	13	1%
	Sub-Total	1,590	86%
	Other	268	14%
	Total	3,448	186%

Workplace	To/From Routes			Total
	Washington St (Route 16) (To/ From East)	Washington St (Route 16) (To South/East)	Washington St (Route 16) (To South/East)	
Boston, MA	100%	21.0%	0.0%	21.0%
Sherborn, MA	100%	16.0%	0.0%	16.0%
Framingham, MA	50%	4.0%	50%	8.0%
Cambridge, MA	100%	5.0%	0.0%	5.0%
Newton, MA	100%	4.0%	0.0%	4.0%
Natick, MA	100%	4.0%	0.0%	4.0%
Marlboro, MA		0.0%	100%	3.0%
Wellesley, MA	100%	3.0%	0.0%	3.0%
Waltham, MA	100%	2.0%	0.0%	2.0%
Needham, MA	100%	2.0%	0.0%	2.0%
Ashland, MA		0.0%	100%	2.0%
Dedham, MA	100%	2.0%	0.0%	2.0%
West Bridgewater, MA		0.0%	100%	1.0%
Medfield, MA	100%	1.0%	0.0%	1.0%
Millis, MA	50%	0.5%	50%	1.0%
Lexington, MA	100%	1.0%	0.0%	1.0%
Woburn, MA	100%	1.0%	0.0%	1.0%
Walpole, MA	100%	1.0%	0.0%	1.0%
Canton, MA	100%	1.0%	0.0%	1.0%
Warren, MA		0.0%	100%	1.0%
Holliston, MA		0.0%	100%	1.0%
Norwood, MA	100%	1.0%	0.0%	1.0%
Grafton, MA		0.0%	100%	1.0%
Milford, MA		0.0%	100%	1.0%
Shrewsbury, MA		0.0%	100%	1.0%
Bedford, MA	100%	1.0%	0.0%	1.0%
Sub-Total		70.5%		86.0%
Other		9.9%		14.0%
Total	SAY	80.4%		100.0%
		80%	20%	100%

□ Capacity Analyses

LEVEL OF SERVICE METHODOLOGY

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the 2010 Highway Capacity Manual (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements and (for signalized intersections) for the entire intersection. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements, and greater than 80 seconds for signalized movements).

Signalized Intersection Performance Measures

The six LOS designations for signalized intersections may be described as follows:

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

The LOS for signalized intersections are calculated using the operational analysis methodology of the 2010 *Highway Capacity Manual*.¹ This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. LOS designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. **Table A1** summarizes the relationship between LOS and control delay. The tabulated control delay criterion may be applied in assigning LOS designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table A1
LEVEL-OF-SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS¹

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

¹Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.

¹*Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.

Unsignalized Intersection Performance Measures

The six LOS designations for unsignalized intersections may be described as follows:

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

The LOS designations of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.² LOS is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for LOS at unsignalized intersections are also given in the *Highway Capacity Manual 2010*. **Table A2** summarizes the relationship between LOS and average control delay.

Table A2
LEVEL-OF-SERVICE CRITERIA FOR
UNSIGNALIZED INTERSECTIONS¹

Average Control Delay (seconds per vehicle)	Level of Service	
	$v/c \leq 1$	$v/c > 1$
≤ 10.0	A	F
10.1 to 15.0	B	F
15.1 to 25.0	C	F
25.1 to 35.0	D	F
35.1 to 50.0	E	F
>50.0	F	F

¹Source: *Highway Capacity Manual 2010*, Transportation Research Board; Washington, DC; 2010.

² *ibid*

HCM 2010 TWSC
1: Washington Street & Knollcrest Farm Lane

Baseline Conditions
Weekday Morning Peak Hour

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	917	244	1	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	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	0	955	254	1	1	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	255	0	1210
Stage 1	-	-	255
Stage 2	-	-	955
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1322	-	204
Stage 1	-	-	792
Stage 2	-	-	377
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1322	-	204
Mov Cap-2 Maneuver	-	-	204
Stage 1	-	-	792
Stage 2	-	-	377

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1322	-	-	-	204
HCM Lane V/C Ratio	-	-	-	-	0.005
HCM Control Delay (s)	0	-	-	-	22.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 TWSC
1: Washington Street & Knollcrest Farm Lane

Baseline Conditions
Weekday Evening Peak Hour

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	1	316	723	1	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	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	1	336	769	1	1	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	770	0	1108
Stage 1	-	-	770
Stage 2	-	-	338
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	854	-	234
Stage 1	-	-	460
Stage 2	-	-	727
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	854	-	234
Mov Cap-2 Maneuver	-	-	234
Stage 1	-	-	460
Stage 2	-	-	726

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	854	-	-	-	234
HCM Lane V/C Ratio	0.001	-	-	-	0.005
HCM Control Delay (s)	9.2	0	-	-	20.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	917	1	2	244	1	3	0	10	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	0	955	1	2	254	1	3	0	10	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	255	0	0	956	0	0	1215	1215	956	1220	1215	255
Stage 1	-	-	-	-	-	-	956	956	-	259	259	-
Stage 2	-	-	-	-	-	-	259	259	-	961	956	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1322	-	-	727	-	-	160	183	316	158	183	789
Stage 1	-	-	-	-	-	-	313	339	-	750	697	-
Stage 2	-	-	-	-	-	-	750	697	-	311	339	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1322	-	-	727	-	-	160	182	316	152	182	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	160	182	-	152	182	-
Stage 1	-	-	-	-	-	-	313	339	-	750	695	-
Stage 2	-	-	-	-	-	-	748	695	-	301	339	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	19.7	28.8
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	258	1322	-	-	727	-	-	152
HCM Lane V/C Ratio	0.052	-	-	-	0.003	-	-	0.007
HCM Control Delay (s)	19.7	0	-	-	10	0	-	28.8
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	316	3	10	723	1	1	0	5	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	336	3	11	769	1	1	0	5	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	770	0	0	339	0	0	1131	1131	338	1134	1132	770
Stage 1	-	-	-	-	-	-	340	340	-	791	791	-
Stage 2	-	-	-	-	-	-	791	791	-	343	341	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	854	-	-	1231	-	-	182	205	709	181	205	404
Stage 1	-	-	-	-	-	-	679	643	-	386	404	-
Stage 2	-	-	-	-	-	-	386	404	-	676	642	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	854	-	-	1231	-	-	180	202	709	177	202	404
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	202	-	177	202	-
Stage 1	-	-	-	-	-	-	678	642	-	386	398	-
Stage 2	-	-	-	-	-	-	380	398	-	670	641	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	12.7	25.5
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	476	854	-	-	1231	-	-	177
HCM Lane V/C Ratio	0.013	0.001	-	-	0.009	-	-	0.006
HCM Control Delay (s)	12.7	9.2	0	-	8	0	-	25.5
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0