

APPENDIX C
2030 NO-BUILD LEVELS OF SERVICE

**TABLES C-1 THROUGH C-3
2030 NO-BUILD LEVELS OF SERVICE**

TABLE C-1- 2030 No-Build Unsignalized Intersections

Exit	Approach	Dir.	Mvmt.	AM			PM		
				Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
33	NB	Exit ramp	NB L	490	F	686	81	F	146
33	NB	Exit ramp	NB R	54	F	237	15	C	66
33	SB	Route 4	WB L	2	A	7	2	A	4
34	NB	Exit ramp	NB L	61	F	49	131	F	45
		Exit ramp	NB R	14	B	36	32	D	93
		Route 110	WB L	1	A	3	4	A	15
34	SB	Exit ramp	SB L	37	E	56	670	F	290
		Exit ramp	SB R	25	D	128	37	E	186
		Route 110	EB L	1	A	4	8	A	40
37	NB	Exit ramp	NB L/T	87	F	132	699	F	367
		Exit ramp	NB R	50	E	269	13	B	39
		Woburn St.	EB L	36	E	88	25	C	46
		Christman Ave.	SB L	8	A	8	5	A	19
37	SB	Exit ramp	SB L	743	F	792	*	F	*
		Exit ramp	SB R	11	B	25	12	B	27
		Woburn St.	WB L	6	A	20	8	A	54
41	SB	Route 28	NB R	13	B	27	17	C	49
		Route 28	NB L	19	C	50	43	E	114
43	NB	Exit ramp	NB L	658	F	261	363	F	150
		Exit ramp	NB R	32	D	171	22	C	127
		Mass. Ave.	EB L	11	B	15	10	B	28
43	SB	Exit ramp	SB L/R	*	F	*	*	F	*
		Loring St.	WB L	15	B	46	11	B	19
48	SB	Industrial Way	EB L	4	A	2	4	A	3
		Exit ramp	NB L	14	B	17	13	B	3
49	NB	Exit ramp	NB L	192	F	117	461	F	260
		Exit ramp	NB R	21	C	127	466	F	1442
		Route 113	EB L	12	B	2	12	B	26
49	SB	Exit ramp	SB L	29	D	67	85	F	163
		Exit ramp	SB R	11	B	9	13	B	19
		Route 113	EB L	8	A	2	1	A	4

TABLE C-1- 2030 No-Build Unsignalized Intersections

Exit	Approach	Dir. Mvmt.	AM			PM		
			Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
52 NB	Exit ramp	NB L	147	F	292	39	E	106
	Exit ramp	NB R	15	B	31	21	C	118
	Route 110	WB L	2	A	4	1	A	2
52 SB	Exit ramp	SB L	48	E	46	27	D	23
	Exit ramp	SB R	14	B	36	13	B	36
	Route 110	EB L	4	A	17	2	A	5
53 NB	Exit ramp	NB L	10	B	17	12	B	32
	Exit ramp	NB R	9	A	6	9	A	4
53 SB	Exit ramp	SB L/R	12	B	19	15	B	60
	Broad St.	WB L	2	A	3	1	A	2
54 NB	Hunt Rd. S.	NB L/R	13	B	6	15	B	18
	Route 150	WB L	0	A	1	0	A	0
54 NB	Exit ramp	SB L	13	B	9	17	B	12
	Exit ramp	SB R	10	B	25	12	B	43
	Route 150	EB L	2	A	4	7	A	15
54 SB	Exit ramp	SB L	23	C	25	22	C	16
	Exit ramp	SB R	11	B	15	12	B	27
	Route 150	WB L	2	A	4	2	A	5

*Incalculable.

TABLE C-2- 2030 No-Build Signalized Intersections

Exit	Approach	Dir.	Mvmt.	AM			PM		
				Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
32 NB	Exit ramp NB		L	15	B	29	20	B	73
	Exit ramp NB		R	92	F	#346	18	B	23
	Exit ramp NB		ALL	79	E	-	19	B	-
	Boston Rd. EB		L	24	C		6	A	100
	Boston Rd. EB		T	24	C	m#357	6	A	100
	Boston Rd. EB		ALL	24	C	-	6	A	-
	Boston Rd. WB		T	6	A	61	8	A	276
	Boston Rd. WB		R	6	A		8	A	276
	Boston Rd. WB		ALL	6	A	-	8	A	-
INTERSECTION				31	C	-	9	A	-
32 SB	Exit ramp SB		L	17	B	132	18	B	82
	Exit ramp SB		R	13	B	19	19	B	109
	Exit ramp SB		ALL	16	B	-	19	B	-
	Boston Rd. EB		T	7	A	116	6	A	172
	Boston Rd. WB		L/T	64	E	#751	10	B	#468
INTERSECTION				38	D	-	12	B	-
38 NB	Exit ramp SB		L	29	C	#169	78	E	#253
	Exit ramp SB		T	28	C	93	47	D	110
	Exit ramp SB		R	26	C	63	56	E	193
	Exit ramp SB		ALL	28	D	-	65	E	-
	Route 38 EB		L	21	C	m#118	53	D	#346
	Route 38 EB		T	9	A	104	22	C	256
	Route 38 EB		R	5	A	m9	19	B	50
	Route 38 EB		ALL	11	B	-	29	C	-
	Route 38 WB		L	40	D	#81	53	D	140
	Route 38 WB		T	23	C	176	39	D	#640
	Route 38 WB		R	19	B	43	25	C	97
	Route 38 WB		ALL	24	C	-	38	D	-
	Home Depot driveway NB		L	32	C	#128	70	E	#252
	Home Depot driveway NB		T	31	C	49	44	D	82
Home Depot driveway NB		R	29	C	26	42	D	38	
Home Depot driveway NB		ALL	29	C	-	57	E	-	
INTERSECTION				21	C	-	44	D	-

TABLE C-2- 2030 No-Build Signalized Intersections

Exit	Approach	Dir.	Mvmt.	AM			PM		
				Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
38 SB	Exit ramp SB	L		30	C	143	36	D	#196
	Exit ramp SB	L/R		30	C	141	41	D	#236
	Exit ramp SB	R		25	C	67	31	C	#172
	Exit ramp SB	ALL		28	C	-	36	D	-
	Route 38 EB	ALL		21	C	#297	63	E	#428
	Route 38 WB	L		17	B	#253	35	C	#405
	Route 38 WB	T		3	A	58	6	A	154
	Route 38 WB	ALL		8	A	-	16	B	-
INTERSECTION				18	B	-	36	D	-
39 NB	Exit ramp NB	L		52	D	#469	51	D	148
	Exit ramp NB	R		47	D	#440	47	D	75
	Exit ramp NB	ALL		49	D	-	48	D	-
	Route 133 EB	T/R		5	A	125	5	A	m131
	Route 133 WB	L		55	D	71	55	D	97
	Route 133 WB	T		13	B	445	5	A	310
	Route 133 WB	ALL		15	B	-	8	A	-
INTERSECTION				26	C	-	15	B	-
39 SB	Exit ramp SB	L		49	D	89	133	F	#126
	Exit ramp SB	T		122	F	#367	43	D	87
	Exit ramp SB	R		48	D	108	43	D	85
	Exit ramp SB	ALL		72	E	-	53	D	-
	Route 133 EB	L		8	A	21	29	C	#212
	Route 133 EB	T/R		17	B	480	8	A	266
	Route 133 EB	ALL		16	B	-	13	B	-
	Route 133 WB	L		26	C	#524	6	A	m19
	Route 133 WB	T/R		3	A	74	14	B	555
	Route 133 WB	ALL		13	B	-	13	B	-
	International Pl. NB	L		48	D	28	42	D	38
	International Pl. NB	T		47	D	75	117	F	#425
	International Pl. NB	R		46	D	43	43	D	51
	International Pl. NB	ALL		47	D	-	76	E	-
INTERSECTION				31	C	-	35	C	-

TABLE C-2- 2030 No-Build Signalized Intersections

Exit	Approach	Dir.	Mvmt.	AM			PM		
				Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
42 NB	Exit ramp SB		R	1	A	0	1	A	0
	Route 114 EB		L	17	B	57	22	C	129
	Route 114 EB		T	0	A	0	0	A	0
	Route 114 EB		ALL	2	A	-	5	A	-
	Route 114 WB		T	5	A	111	5	A	106
	Route 114 WB		R	5	A	30	10	A	231
	Route 114 WB		ALL	5	A	-	7	A	-
	Exit ramp NB		R	0	A	0	1	A	0
INTERSECTION				3	A	-	5	A	-
42 SB	Route 114 EB		T	7	A	82	13	B	135
	Route 114 WB		L	24	C	206	32	C	#396
	Route 114 WB		T	0	A	0	0	A	0
	Route 114 WB		ALL	11	B	-	18	B	-
INTERSECTION				8	A	-	13	B	-
44* SB	Merrimack Street EB		ALL	8	A	51	8	A	87
	Merrimack Street WB		ALL	8	A	47	7	A	32
	Exit Ramp SB		L	7	A	153	8	A	148
	Exit Ramp SB		R	4	A	-	5	A	17
	Exit Ramp SB		ALL	6	A	-	8	A	-
INTERSECTION				7	A	-	8	A	-
46 NB	Route 110 EB		T/R	25	C	108	25	C	m236
	Route 110 WB		L	10	A	65	7	A	33
	Route 110 WB		T	0	A	0	0	A	0
	Route 110 WB		ALL	1	A	-	1	A	-
INTERSECTION				10	B	-	14	B	-
46 NB	Route 110 EB		T/R	2	A	12	1	A	4
	Route 110 WB		L	21	C	m33	17	B	m74
	Route 110 WB		T	8	A	270	7	A	159
	Route 110 WB		ALL	8	A	-	8	A	-
	Calumet Rd. NB		L/R	29	C	129	31	C	81
INTERSECTION				9	A	-	7	A	-

TABLE C-2- 2030 No-Build Signalized Intersections

Exit	Approach	Dir.	Mvmt.	AM			PM		
				Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
46 NB	Exit ramp SB		L/T	34	C	117	264	F	#615
	Exit ramp SB		R	0	A	0	0	A	0
	Exit ramp SB		ALL	17	B	-	181	F	-
	Route 110 EB		T/R	1	A	55	17	B	217
	Route 110 WB		L	4	A	12	7	A	17
	Route 110 WB		T	6	A	188	8	A	81
	Route 110 WB		ALL	5	A	-	8	A	-
	Gas station dirveway NB		L/R	29	C	15	32	C	#76
INTERSECTION				7	A	-	82	F	-
46 SB	Exit ramp SB		L	28	C	69	25	C	86
	Exit ramp SB		T	32	C	126	25	C	99
	Exit ramp SB		R	7	A	32	7	A	32
	Exit ramp SB		ALL	20	C	-	17	B	-
	Route 110 EB		T/R	22	C	196	24	C	161
	Route 110 EB		R	23	C	195	25	C	158
	Route 110 EB		ALL	22	C	-	25	C	-
	Route 110 WB		L	27	C	158	15	B	42
	Route 110 WB		L/T	30	C	#203	21	C	94
	Route 110 WB		ALL	28	C	-	19	C	-
	Merrimack St. NB		L	29	C	43	31	C	103
	Merrimack St. NB		T/R	32	C	107	67	E	186
	Merrimack St. NB		ALL	32	C	-	62	E	-
INTERSECTION				26	C	-	32	C	-
50 NB	Monument St. SB		L/T	13	B	90	13	B	79
	Monument St. SB		R	16	B	156	13	B	42
	Monument St. SB		ALL	15	B	-	13	B	-
	Route 97 EB		L	7	A	24	13	B	46
	Route 97 EB		T/R	11	B	128	19	B	252
	Route 97 EB		ALL	11	B	-	19	B	-
	Route 97 WB		L	23	C	80	43	D	#155
	Route 97 WB		T/R	10	B	104	16	B	172
	Route 97 WB		ALL	12	B	-	20	C	-
	Exit ramp NB		L	13	B	73	17	B	246
	Exit ramp NB		L/T	13	B	108	23	C	490
	Exit ramp NB		R	12	B	34	13	B	77
	Exit ramp NB		ALL	12	B	-	19	B	-
INTERSECTION				13	B	-	18	B	-

TABLE C-2- 2030 No-Build Signalized Intersections

Exit	Approach	Dir.	Mvmt.	AM			PM		
				Delay (s)	LOS	Queue (ft)	Delay (s)	LOS	Queue (ft)
50* SB	Exit ramp	SB	L	41	D	112	36	D	213
	Exit ramp	SB	R	39	D	54	32	C	164
	Route 97	EB	L	52	D	146	128	F	180
	Route 97	EB	T	3	A	52	5	A	97
	Route 97	WB	TR	2	A	16	2	A	32
INTERSECTION				15	B	-	21	C	-

95th percentile volume exceeds capacity, queue may be longer.

^mVolume for 95th percentile queue is metered by upstream signal.

*Intersection was signalized after the data was collected for 2006 existing conditions. It is analyzed in the future 2030 case as signalized.

Table C-3 2030 No-Build Ramp Operations LOS

Interchange	AM		PM	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Exit 32: I-495 at Boston Rd.				
I-495 NB off-ramp to Boston Rd.	over cap	F	21	C
I-495 NB on-ramp to Boston Rd.	over cap	F	32	D
I-495 SB off-ramp to Boston Rd.	33	D	over cap	F
I-495 SB on-ramp to Boston Rd.	32	D	over cap	F
Exit 33: I-495 at Route 4				
I-495 NB off-ramp to Route 4	over cap	F	26	C
I-495 SB on-ramp to Route 4	33	D	over cap	F
Exit 34: I-495 at Route 110				
I-495 NB off-ramp to Route 110	33	D	29	D
I-495 SB off-ramp to Route 110	over cap	F	over cap	F
I-495 SB on-ramp to Route 110	30	D	over cap	F
Exit 34-35: I-495 at Route 110-Route 3				
I-495 NB weave to Route 110-Route 3	>43	F	>43	F
Exit 35: I-495 at 495 NB C-D				
I-495 NB C-D off-ramp to Route 3 SB	21	C	21	C
I-495 NB C-D weave to Route 3	>43	F	>43	F
I-495 SB C-D off-ramp to Route 3 NB	11	B	11	B
I-495 SB C-D weave to Route 3	>43	F	>43	F
I-495 SB C-D on-ramp to Route 3 SB	17	B	17	B
Exit 36: I-495 at Lowell Connector SB				
I-495 NB C-D on-ramp to Lowell Connector SB	16	B	14	B
I-495 NB C-D on-ramp to Lowell Connector NB	21	C	21	C
I-495 NB on-ramp to 495 NB C-D	over cap	F	over cap	F
I-495 SB off-ramp to 495 SB C-D	33	D	over cap	F
I-495 SB C-D off-ramp to Lowell Connector NB	20	C	18	B
Exit 37: I-495 at Woburn St.				
I-495 NB off-ramp to Woburn St.	over cap	F	over cap	F
I-495 NB on-ramp to Woburn St.	over cap	F	33	D
I-495 SB off-ramp to Woburn St.	28	D	29	D
I-495 SB on-ramp to Woburn St.	over cap	F	over cap	F
Exit 38: I-495 at Route 38				
I-495 NB off-ramp to Route 38	over cap	F	32	D
I-495 NB on-ramp to Route 38	30	D	29	D
I-495 SB off-ramp to Route 38	26	C	27	C
I-495 SB on-ramp to Route 38	35	E	36	E
Exit 39: I-495 at Route 133				
I-495 NB off-ramp to Route 133	34	D	31	D
I-495 NB on-ramp to Route 133	27	C	32	D
I-495 SB off-ramp to Route 133	35	D	30	D
I-495 SB on-ramp to Route 133	31	D	33	D
Exit 40: I-495 at I-93 SB				
I-495 NB off-ramp to I-93 SB	31	D	33	D
I-495 NB weave to I-93	30	D	39	E
I-495 NB on-ramp to I-93 NB	23	C	34	D
I-495 SB off-ramp to I-93 NB	32	D	24	C
I-495 SB weave to I-93	>43	F	>43	F
I-495 SB on-ramp to I-93 SB	over cap	F	over cap	F

Table C-3 2030 No-Build Ramp Operations LOS

Interchange	AM		PM	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Exit 41: I-495 at Route 28 SB				
I-495 NB off-ramp to Route 28 SB	23	C	31	D
I-495 NB off-ramp to Route 28 NB	19	B	28	D
I-495 SB off-ramp to Route 28	over cap	F	29	D
I-495 SB on-ramp to Route 28	32	D	24	C
Exit 41-42: I-495 at Route 28-Route 114				
I-495 NB weave to Route 28-Route 114	18	B	34	D
Exit 42: I-495 at Route 114 EB				
I-495 NB off-ramp to Route 114 WB	19	B	30	D
I-495 NB on-ramp to Route 114	19	B	34	D
I-495 SB off-ramp to Route 114 EB	31	D	19	B
I-495 SB on-ramp to Route 114	over cap	F	22	C
Exit 43-42: I-495 at Loring St.-Route 114 WB				
I-495 SB weave to Loring St.-Route 114 WB	34	D	16	B
Exit 43: I-495 at Mass. Ave.				
I-495 NB off-ramp to Mass. Ave.	29	D	over cap	F
I-495 NB C-D on-ramp to Mass. Ave.	4	A	14	B
I-495 SB C-D off-ramp to Loring St.	8	A	7	A
I-495 SB on-ramp to 495 SB C-D	31	D	19	N
Exit 44: I-495 at 495 NB C-D				
I-495 NB C-D off-ramp to 495 NB C-D	19	B	33	D
I-495 SB off-ramp to 495 SB C-D	over cap	F	26	C
Exit 44-45: I-495 at Sutton St.-Marston St.				
I-495 NB C-D weave to Sutton St.-Marston St.	21	B	>43	F
I-495 SB C-D weave to Marston St.-Merrimack St.	27	C	23	B
Exit 45: I-495 at Marston St.				
I-495 NB C-D on-ramp to Marston St.	8	A	14	B
I-495 NB on-ramp to 495 NB C-D	20	B	over cap	F
I-495 SB off-ramp to Marston St.	over cap	F	25	C
Exit 46: I-495 at Route 110				
I-495 NB weave to Route 110	23	B	>43	F
I-495 SB off-ramp to Route 110	over cap	F	34	D
I-495 SB on-ramp to Route 110	over cap	F	23	C
Exit 47: I-495 at Route 213				
I-495 NB off-ramp to Route 213	23	C	36	E
I-495 NB on-ramp to Route 213	25	C	over cap	F
I-495 SB off-ramp to Route 213	over cap	F	26	C
I-495 SB on-ramp to Route 213	over cap	F	23	C
Exit 48: I-495 at Route 125 Connector SB				
I-495 NB off-ramp to Route 125 Connector SB	23	C	over cap	F
I-495 NB on-ramp to Route 125 Connector NB	20	B	over cap	F
I-495 SB weave to Route 125 Connector	>43	F	35	D
Exit 49: I-495 at Route 113				
I-495 NB off-ramp to Route 113	26	C	over cap	F
I-495 NB off-ramp to 495 NB C-D	23	C	37	E
I-495 SB C-D off-ramp to Route 113	16	B	9	A
I-495 SB C-D on-ramp to Route 113	22	C	15	B

Table C-3 2030 No-Build Ramp Operations LOS

Interchange	AM		PM	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Exit 49-50: I-495 at Route 113-Route 97				
I-495 NB C-D weave to Route 113-Route 97	10	A	40	E
Exit 50: I-495 at Route 97				
I-495 NB C-D on-ramp to Route 97	9	A	11	B
I-495 NB on-ramp to 495 NB C-D	18	B	29	D
I-495 SB off-ramp to 495 SB C-D	over cap	F	25	C
I-495 SB C-D off-ramp to Route 97	9	A	11	B
I-495 SB C-D on-ramp to Route 97	14	B	9	A
Exit 51: I-495 at Route 125 SB				
I-495 NB off-ramp to Route 125 SB	17	B	29	D
I-495 NB weave to Route 125	18	B	27	C
I-495 NB on-ramp to Route 125 NB	15	B	20	B
I-495 SB off-ramp to 495 SB C-D	18	B	16	B
I-495 SB C-D off-ramp to Route 125 NB	6	A	8	A
I-495 SB C-D weave to Route 125	32	C	9	A
I-495 SB C-D on-ramp to Route 125 SB	24	C	13	B
I-495 SB on-ramp to 495 SB C-D	over cap	F	22	C
Exit 52: I-495 at Route 110				
I-495 NB off-ramp to Route 110	17	B	22	C
I-495 NB on-ramp to Route 110	14	B	16	B
I-495 SB off-ramp to Route 110	17	B	16	B
I-495 SB on-ramp to Route 110	19	B	17	B
Exit 53: I-495 at Broad St.				
I-495 NB off-ramp to Broad St.	18	B	21	C
I-495 NB on-ramp to Broad St.	14	B	15	B
I-495 SB off-ramp to Broad St.	16	B	16	B
I-495 SB on-ramp to Broad St.	16	B	15	B
Exit 54: I-495 at Route 150				
I-495 NB off-ramp to Route 150	18	B	20	B
I-495 NB on-ramp to Route 150	15	B	17	B
I-495 SB off-ramp to Route 150	17	B	20	C
I-495 SB on-ramp to Route 150	16	B	15	B
Exit 55: I-495 at Route 110				
I-495 NB off-ramp to Route 110	20	B	23	C
I-495 SB on-ramp to Route 110	23	C	24	C

