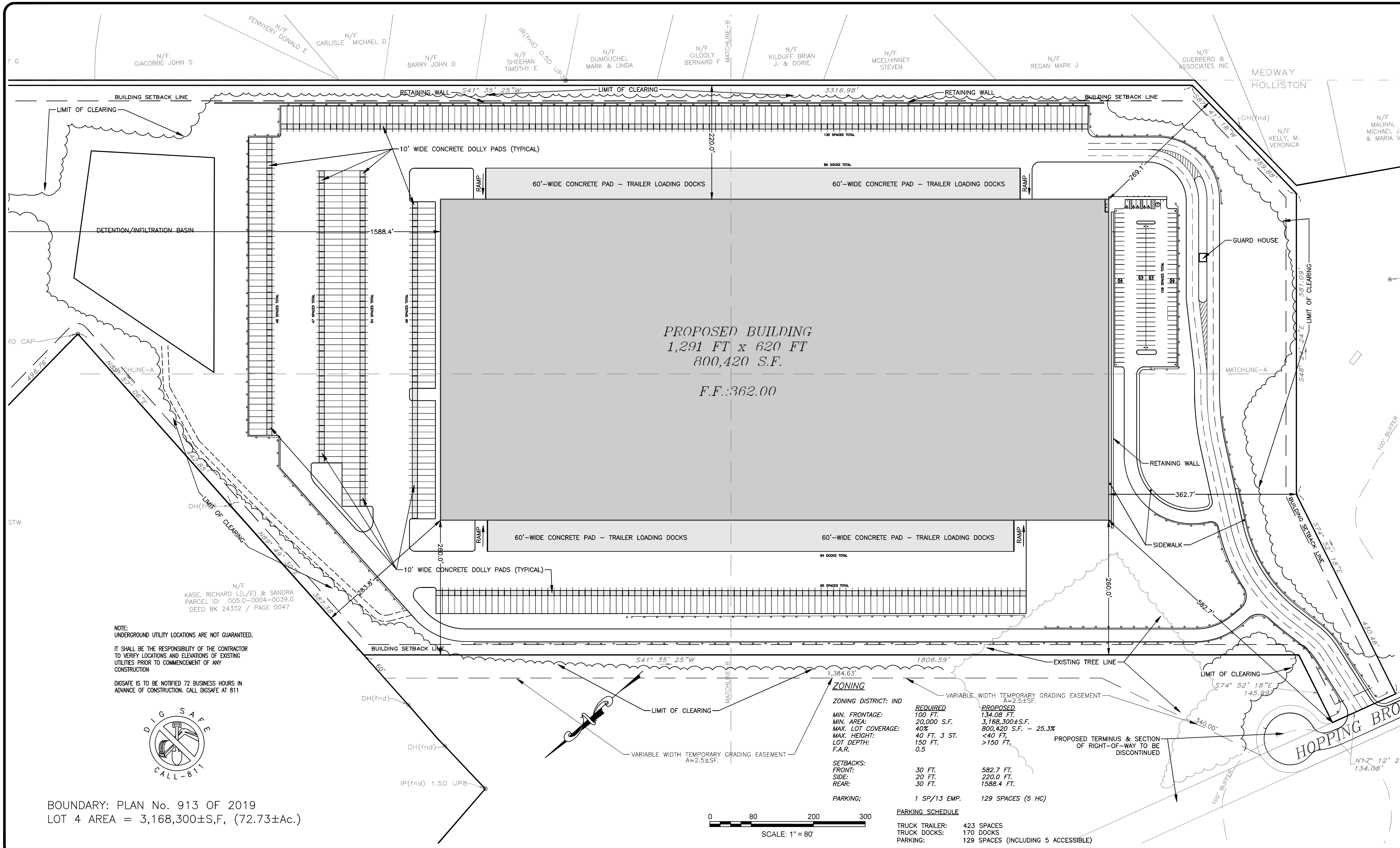
APPENDIX

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
MANUAL TURNING MOVEMENT COUNT DATA
SEASONAL ADJUSTMENT DATA
PUBLIC TRANSPORTATION SCHEDULES
CRASH DATA
MASSDOT CRASH RATE WORKSHEETS
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND DEVELOPMENT NETWORKS
TRIP-GENERATION CALCULATIONS
CAPACITY ANALYSIS WORKSHEETS
HCS SIGNAL WARRANT ANALYSIS

PROJECT SITE PLAN



N/F GIACOBBE JOHN S
N/F FENNYERY DONALD E
N/F CARLISLE MICHAEL D
N/F BARRY JOHN D
N/F SHEEHAN TIMOTHY E
IR(fnd) 0.5D UP3
N/F DUMOUCHEL MARK & LINDA
N/F GILOOLY BERNARD F
MATCHLINE-B
N/F KILDUFF BRIAN J. & DORIE
N/F MCELHINNEY STEVEN
N/F REGAN MARK J
N/F GUERRERO & ASSOCIATES INC
MEDWAY
HOLLISTON
N/F KELLY, M. VERONICA
N/F MALINN, MICHAEL J & MARIA V
BUILDING SETBACK LINE
RETAINING WALL
S41° 35' 25"W
LIMIT OF CLEARING
3316.98'
130 SPACES TOTAL
10' WIDE CONCRETE DOLLY PADS (TYPICAL)
220.0'
86 DOCKS TOTAL
RAMP
60'-WIDE CONCRETE PAD – TRAILER LOADING DOCKS
DETENTION/INFILTRATION BASIN
1588.4'
269.1'
289.88'
DH(fnd)
GUARD HOUSE
129 SPACES TOTAL
PROPOSED BUILDING
1,291 FT x 620 FT
800,420 S.F.
F.F.:362.00
MATCHLINE-A
RO CAP
496.76'
N89° 51' 06"E
S48° 24' 24"E 581.09'
100' BUFFER
RETAINING WALL
362.7'
SIDEWALK
LIMIT OF CLEARING
N89° 49' 30"E
283.8'
387.39'
260.0'
84 DOCKS TOTAL
85 SPACES TOTAL
STW
N/F KASE, RICHARD L(L/E) & SANDRA
PARCEL ID: 005.0-0004-0039.0
DEED BK 24332 / PAGE 0047
S74° 52' 18"E
430.48'
582.7'
EXISTING TREE LINE
S41° 35' 25"W
1806.59'
1,384.63'
LIMIT OF CLEARING
S74° 52' 18"E 145.99'
VARIABLE WIDTH TEMPORARY GRADING EASEMENT
A=2.5±SF.
340.00'
PROPOSED TERMINUS & SECTION OF RIGHT-OF-WAY TO BE DISCONTINUED
HOPPING BROO
N12° 12' 27" 134.08'
DH(fnd)
IP(fnd) 1.5D UP8
DIG SAFE CALL-811
0 80 200 300
SCALE: 1" = 80'

NOTE:
UNDERGROUND UTILITY LOCATIONS ARE NOT GUARANTEED.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION

DIGSAFE IS TO BE NOTIFIED 72 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION. CALL DIGSAFE AT 811

BOUNDARY: PLAN No. 913 OF 2019
LOT 4 AREA = 3,168,300±S,F, (72.73±Ac.)

ZONING

ZONING DISTRICT: IND

	REQUIRED	PROPOSED
MIN. FRONTAGE:	100 FT.	134.08 FT.
MIN. AREA:	20,000 S.F.	3,168,300±S.F.
MAX. LOT COVERAGE:	40%	800,420 S.F. – 25.3%
MAX. HEIGHT:	40 FT. 3 ST.	<40 FT.
LOT DEPTH:	150 FT.	>150 FT.
F.A.R.	0.5	
SETBACKS:		
FRONT:	30 FT.	582.7 FT.
SIDE:	20 FT.	220.0 FT.
REAR:	30 FT.	1588.4 FT.
PARKING;	1 SP/13 EMP.	129 SPACES (5 HC)

PARKING SCHEDULE

TRUCK TRAILER:	423 SPACES
TRUCK DOCKS:	170 DOCKS
PARKING:	129 SPACES (INCLUDING 5 ACCESSIBLE)

ENGINEERING DESIGN CONSULTANTS, INC. SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, NOR FOR THE SAFETY OF PUBLIC OR CONTRACTORS EMPLOYEES; OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

ENGINEERING DESIGN CONSULTANTS, INC.'S LIABILITY FOR THIS PLAN IS LIMITED TO THE EXTENT OF ITS FEE LESS THIRD PARTY COSTS.

DRWN BY:	WML
CHK'D BY:	PSB
APPRVD BY:	PSB

REVISIONS:

REV #	DATE	DESCRIPTION
2	3/2/20	PEER REVIEW COMMENTS
1	2/5/20	PEER REVIEW COMMENTS
0	11/16/19	ISSUED FOR REVIEW

COMMONWEALTH OF MASSACHUSETTS
WALTER M. LEWINSKI
CIVIL
No. 32327
REGISTERED PROFESSIONAL ENGINEER

PREPARED BY:

Engineering Design Consultants, Inc.
32 Turnpike Road
Southborough, Massachusetts
ph:(508) 480-0225 fax:(800)832-5781

PROJECT:

555 HOPPING BROOK ROAD
HOLLISTON, MASSACHUSETTS
(MIDDLESEX COUNTY)

TITLE:

LAYOUT & MATERIALS
555 HOPPING BROOK ROAD
HOLLISTON, MASSACHUSETTS

OWNER/APPLICANT:

CRG INTEGRATED REAL ESTATE SOLUTIONS
200 Barr Harbor Drive
Conshohocken, PA 19248

FILE NO.: 3663 PROP LAYOUT
LO(5)
DATE: NOVEMBER 16, 2019
DEFINITIVE PLAN NO.: 2 OF 37

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Hopping Brook Road
Approx 450' south of Washington Street
City, State: Holliston, MA
Client: EDC/ P. Bemis

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197374 B Volume
Site Code: TBA
Date Start: 12/16/19
Date End: 12/19/19

Start	12/16/19		12/17/19		12/18/19		12/19/19		12/20/19		12/21/19		12/22/19		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	0	0	6	0	3	2	5	0	*	*	*	*	*	*	4	0
01:00	2	1	12	1	8	2	8	0	*	*	*	*	*	*	8	1
02:00	2	1	4	2	13	0	8	2	*	*	*	*	*	*	7	1
03:00	1	1	2	1	2	6	1	1	*	*	*	*	*	*	2	2
04:00	1	17	1	17	4	22	1	18	*	*	*	*	*	*	2	18
05:00	7	84	16	95	15	102	13	90	*	*	*	*	*	*	13	93
06:00	20	239	34	237	45	**256**	41	**241**	*	*	*	*	*	*	35	243
07:00	52	**263**	39	**260**	59	240	48	219	*	*	*	*	*	*	50	**246**
08:00	54	184	60	169	43	195	40	179	*	*	*	*	*	*	49	182
09:00	53	102	27	91	41	106	43	97	*	*	*	*	*	*	41	99
10:00	52	74	51	59	62	69	75	95	*	*	*	*	*	*	60	74
11:00	**96**	67	**61**	60	**93**	69	**97**	85	*	*	*	*	*	*	**87**	70
12:00 PM	175	128	92	79	193	**143**	211	**145**	*	*	*	*	*	*	168	124
01:00	86	**138**	79	**84**	106	139	99	140	*	*	*	*	*	*	92	**125**
02:00	128	100	104	73	101	115	122	101	*	*	*	*	*	*	114	97
03:00	189	56	218	53	174	64	176	53	*	*	*	*	*	*	189	56
04:00	221	45	**224**	38	232	32	212	38	*	*	*	*	*	*	222	38
05:00	**231**	27	194	28	**260**	32	**223**	27	*	*	*	*	*	*	**227**	28
06:00	52	21	67	21	69	23	58	26	*	*	*	*	*	*	62	23
07:00	34	6	26	9	11	10	26	15	*	*	*	*	*	*	24	10
08:00	20	5	12	12	15	6	10	3	*	*	*	*	*	*	14	6
09:00	8	5	10	1	5	2	6	4	*	*	*	*	*	*	7	3
10:00	7	4	6	4	11	6	10	4	*	*	*	*	*	*	8	4
11:00	5	1	4	0	4	1	6	1	*	*	*	*	*	*	5	1
Total	1496	1569	1349	1394	1569	1642	1539	1584	0	0	0	0	0	0	1490	1544
Day	3065		2743		3211		3123		0		0		0		3034	
AM Peak	11:00	07:00	11:00	07:00	11:00	06:00	11:00	06:00	-	-	-	-	-	-	11:00	07:00
Vol.	96	263	61	260	93	256	97	241	-	-	-	-	-	-	87	246
PM Peak	17:00	13:00	16:00	13:00	17:00	12:00	17:00	12:00	-	-	-	-	-	-	17:00	13:00
Vol.	231	138	224	84	260	143	223	145	-	-	-	-	-	-	227	125

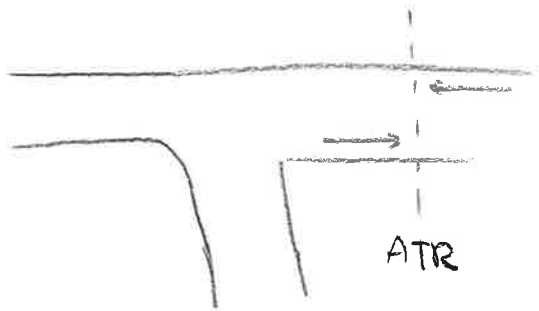
278 ✓
296 ✓
231
140
292 ✓
217 ✓
211 ✓
245 ✓
260 ✓
255 ✓

Washington Street (Route 16)
approx 500' east of Hopping Brook Road
City, State: Holliston, MA
Client: EDC/ P. Bemis

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197374 A Volume
Site Code: TBA
Date Start: 12/16/19
Date End: 12/19/19

Start	12/16/19		12/17/19		12/18/19		12/19/19		12/20/19		12/21/19		12/22/19		Week Average		
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	
12:00 AM	19	18	17	18	35	16	29	28	*	*	*	*	*	*	25	20	
01:00	16	12	13	20	22	20	22	16	*	*	*	*	*	*	18	17	
02:00	4	13	5	16	12	20	5	17	*	*	*	*	*	*	6	16	
03:00	6	18	14	25	21	30	13	24	*	*	*	*	*	*	14	24	
04:00	16	44	30	68	28	61	25	42	*	*	*	*	*	*	25	54	
05:00	89	312	80	284	93	268	81	296	*	*	*	*	*	*	86	290	
06:00	244	**620**	225	502	238	573	249	**590**	*	*	*	*	*	*	239	**571**	810
07:00	426	609	368	**507**	434	574	416	575	*	*	*	*	*	*	411	566	977 ✓
08:00	**489**	577	**394**	446	**502**	**624**	426	560	*	*	*	*	*	*	**453**	552	1005 ✓
09:00	457	428	345	330	409	487	429	434	*	*	*	*	*	*	410	420	830
10:00	438	443	311	333	412	423	410	408	*	*	*	*	*	*	393	402	795
11:00	465	421	303	332	464	426	**457**	405	*	*	*	*	*	*	422	396	818
12:00 PM	509	466	356	293	530	437	486	465	*	*	*	*	*	*	470	415	885
01:00	504	457	371	376	533	444	492	441	*	*	*	*	*	*	475	430	905 ✓
02:00	607	534	472	339	615	493	597	503	*	*	*	*	*	*	573	467	1040 ✓
03:00	**705**	496	542	375	699	536	687	472	*	*	*	*	*	*	658	470	1128 ✓
04:00	670	567	570	408	681	564	681	591	*	*	*	*	*	*	650	532	1182 ✓
05:00	694	**612**	**572**	**412**	**704**	**637**	**706**	**612**	*	*	*	*	*	*	**669**	**568**	1237 ✓
06:00	590	412	354	226	587	418	596	438	*	*	*	*	*	*	532	374	906 ✓
07:00	318	302	214	189	447	262	365	304	*	*	*	*	*	*	336	264	600
08:00	221	222	161	130	265	242	257	221	*	*	*	*	*	*	226	204	430
09:00	182	142	122	83	232	165	211	183	*	*	*	*	*	*	187	143	330
10:00	91	106	81	72	107	145	119	132	*	*	*	*	*	*	100	114	214
11:00	62	49	82	32	88	69	104	66	*	*	*	*	*	*	84	54	138
Total	7822	7880	6002	5816	8158	7934	7863	7823	0	0	0	0	0	0	7462	7363	
Day	15702		11818		16092		15686		0		0		0		14825		
AM Peak	08:00	06:00	08:00	07:00	08:00	08:00	11:00	06:00	-	-	-	-	-	-	08:00	06:00	
Vol.	489	620	394	507	502	624	457	590	-	-	-	-	-	-	453	571	
PM Peak	15:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00	-	-	-	-	-	-	17:00	17:00	
Vol.	705	612	572	412	704	637	706	612	-	-	-	-	-	-	669	568	



MANUAL TURNING MOVEMENT COUNT DATA

TURNING MOVEMENT COUNT REDUCTION WORKSHEET

INTERSECTION: Washington Street at Hopping Brook Driove
COUNT DATE: 7AM-9AM Wednesday 12/18/19 3PM-6PM Thursday 12/12/19

Counted By: ZRB
Weather Conditions: Clear 20-30 deg F

TIME:	Washington Street WB				Washington Street EB					Hopping Brook Drive NB					SB				TOTAL (15 Min.)	TOTAL (Hour)
	L	T	R	Total	L	T	R	RR	Total	L	T	R	RR	Total	L	T	R	Total		
6:30 - 6:45				0					0					0				0	0	
6:45 - 7:00				0					0					0				0	0	
7:00 - 7:15	9	72		81		90	44		134	3		2		5				0	220	
7:15 - 7:30	9	68		77		129	59		188	8		4		12				0	277	497
7:30 - 7:45	9	119		128		114	52		166	22		7		29				0	323	820
7:45 - 8:00	15	130		145		151	43		194	12		1		13				0	352	1172
8:00 - 8:15	13	122		135		149	54		203	13		6		19				0	357	1309
8:15 - 8:30	8	103		111		172	30		202	4		4		8				0	321	1353
8:30 - 8:45	7	106		113		147	40		187	5		3		8				0	308	1338
8:45 - 9:00	7	113		120		130	25		155	3		7		10				0	285	1271
9:00 - 9:15				0					0					0				0	0	914
9:15 - 9:30				0					0					0				0	0	593
				0					0					0				0	0	
TOTAL	77	833	0	910	0	1082	347	0	1429	70	0	34	0	104	0	0	0	0	2443	
15:00 - 15:15	7	136		143		90	18		108	46		18		64				0	315	
15:15 - 15:30	4	129		133		87	8		95	20		9		29				0	257	
15:30 - 15:45	9	169		178		105	8		113	63		22		85				0	376	
15:45 - 16:00	4	178		182		117			117	39		12		51				0	350	1298
16:00 - 16:15	2	165		167		104	5		109	51		14		65				0	341	1324
16:15 - 16:30	3	180		183		114	9		123	28		9		37				0	343	1410
16:30 - 16:45	6	185		191		124	7		131	42		19		61				0	383	1417
16:45 - 17:00	3	156		159		113	13		126	45		17		62				0	347	1414
17:00 - 17:15	5	178		183		126	5		131	57		26		83				0	397	1470
17:15 - 17:30	3	185		188		137	1		138	38		11		49				0	375	1502
17:30 - 17:45	1	175		176		110	3		113	33		4		37				0	326	1445
17:45 - 18:00	2	149		151		116	2		118	16		8		24				0	293	1391
TOTAL 4:00 - 6:00	49	1985	0	2034	0	1343	79	0	1422	478	0	169	0	647	0	0	0	0	4103	

PEAK HOUR VOLUMES:

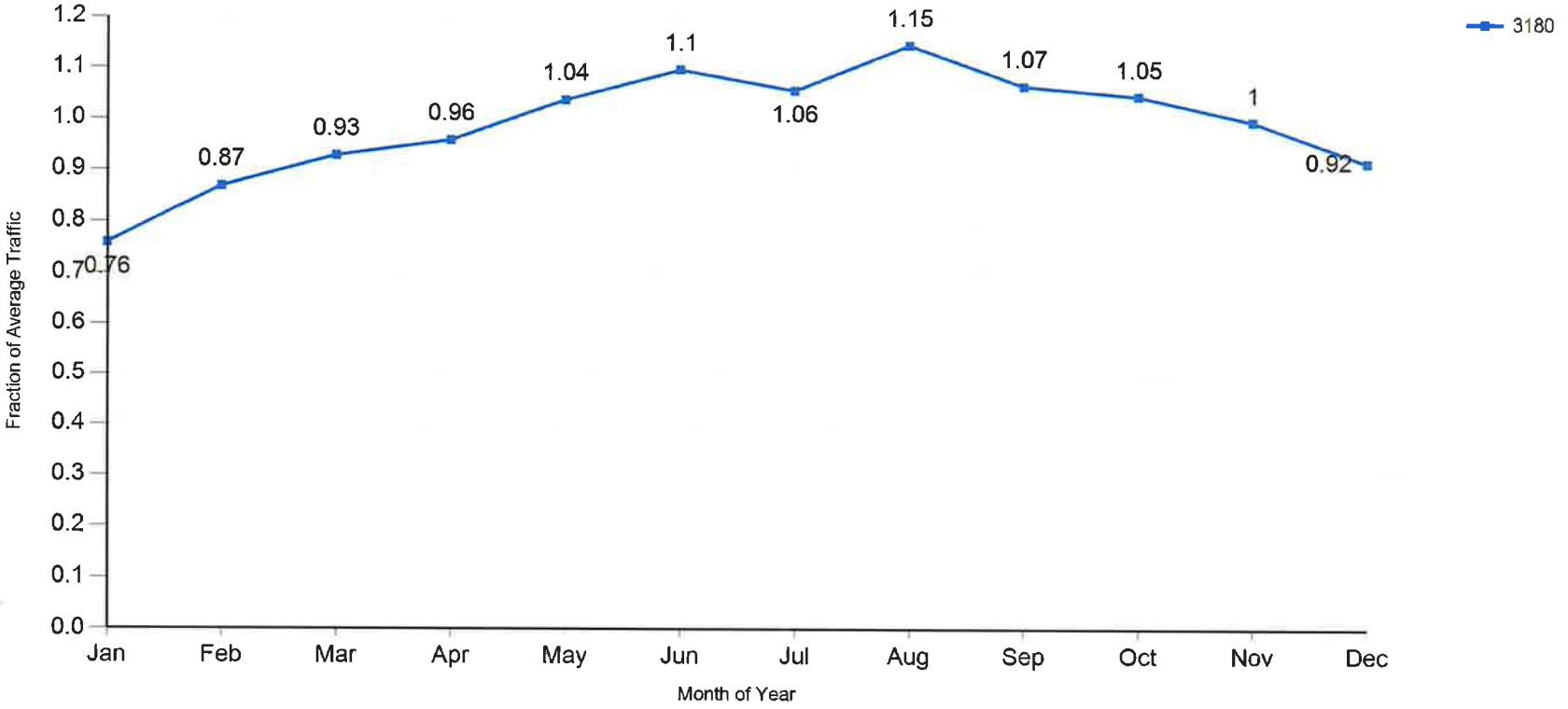
TIME: MORNING PEAK PERIOD	Washington Street WB				Washington Street EB					Hopping Brook Drive NB					0 SB				TOTAL (Hour)	
	L	T	R	Total	L	T	R	RR	Total	L	T	R	RR	Total	L	T	R	Total		
7:30 - 7:45	9	119		128		114	52		166	22		7		29				0	323	
7:45 - 8:00	15	130		145		151	43		194	12		1		13				0	352	
8:00 - 8:15	13	122		135		149	54		203	13		6		19				0	357	
8:15 - 8:30	8	103		111		172	30		202	4		4		8				0	321	
	45	474	0	519	0	586	179	0	765	51	0	18	0	69	0	0	0	0	1353	
PHF				0.89					0.94					0.59					0.95	PHF

TIME: EVENING PEAK PERIOD	Washington Street WB				Washington Street EB					Hopping Brook Drive NB					0 SB				TOTAL (Hour)	
	L	T	R	Total	L	T	R	RR	Total	L	T	R	RR	Total	L	T	R	Total		
16:30 - 16:45	6	185		191		124	7		131	42		19		61				0	383	383
16:45 - 17:00	3	156		159		113	13		126	45		17		62				0	347	730
17:00 - 17:15	5	178		183		126	5		131	57		26		83				0	397	1127
17:15 - 17:30	3	185		188		137	1		138	38		11		49				0	375	1502
	17	704	0	721	0	500	26	0	526	182	0	73	0	255	0	0	0	0	1502	
PHF				0.94					0.95					0.77				####	0.95	PHF

SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department

Traffic Pattern by Month for 1/1/2017 - 12/31/2017



Massachusetts Highway Department

Traffic Pattern by Month for 1/1/2017 - 12/31/2017

Factor Group	Station	Weight	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
U1-Boston	3180	0	0.756	0.867	0.927	0.962	1.042	1.097	1.062	1.149	1.073	1.048	1.000	0.918
	Average of Weighted Factors		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

PUBLIC TRANSPORTATION SCHEDULES

6 ROUTE 6: Holliston/Milford Line

MetroWestRegionalTransportationAuthority

ROUTE 6 (Monday-Friday Service)

Fare Information

Adult fare: $1.50 cash / $1.25 with a Charlie Card.

Student fare: $1.00 cash with valid Student ID.

Children under 6 ride free when accompanied by an adult. Children under 12 may not ride unaccompanied.

Elderly (65 years of age or older): $0.75 cash with photo ID indicating date of birth or $0.70 with an MWRTA Senior TAP Pass.

Individuals with disabilities: $0.75 cash or $0.70 with a valid MBTA Access Card, Medicare Card or MWRTA Disabled TAP Pass.

Charlie Cards are available free of charge at the Blandin Hub or on the bus. Value can be added to existing cards onboard, online at mbta.com, or at an MBTA kiosk.

MetroWest Regional Transit Authority
Public Transportation System

Transfer/Connections

Transfer coupons are available on all buses and are good for transfers going in the same direction within the MWRTA system only. Transfers are not compatible within the MBTA system. One transfer per paid fare is issued upon request and must be presented to the next driver within 90 minutes.

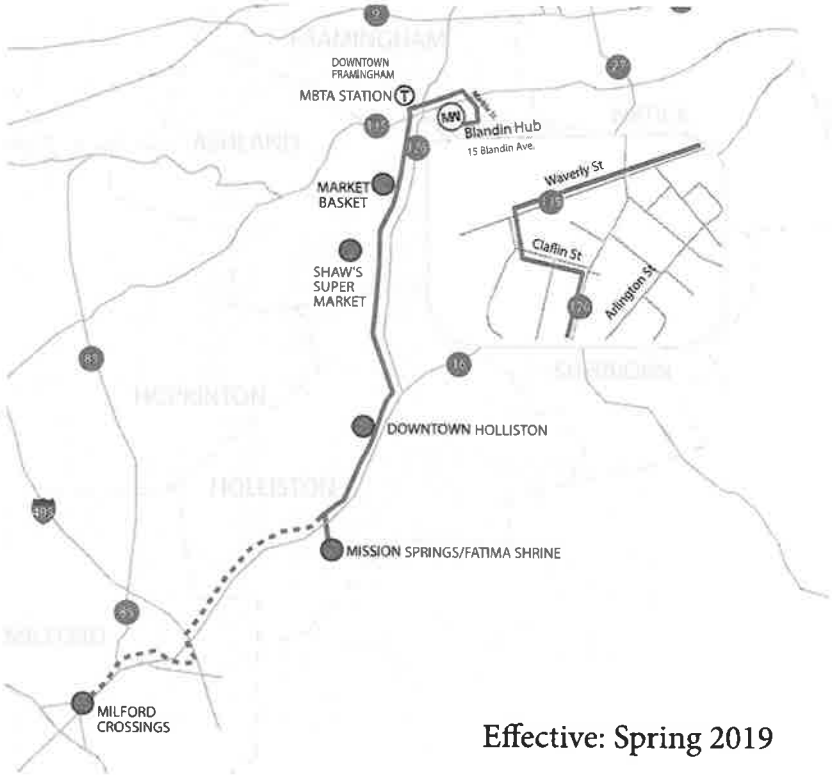
Riders can access MBTA Commuter Rail Service in Downtown Framingham, Ashland, Southborough, and Natick. For MBTA schedule and service information call 617.222.3200.

Scan the QR code below with your smartphone to be directed to the MWRTA Routes and Schedules website.

No service provided on the following Holidays:

New Year's Day
Patriot's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Route 6 (Monday-Friday Service)



Effective: Spring 2019

MWRTA Customer Service:
(508) 935-2222
Blandin Hub: 15 Blandin Ave.
Framingham, MA 01702

www.mwrta.com Follow Us: @mwrta

6 ROUTE 6 Weekday (Monday-Friday Service) 6

v. 5.19

		AM					PM						
OUTBOUND	Blandin Hub (15 Blandin Ave.)	5:51	7:14	8:30	9:40	10:54	12:03	1:11	2:03	3:24	4:42	5:58	7:12
	Framingham MBTA	5:57	7:17	8:33	9:43	10:57	12:06	1:14	2:07	3:28	4:46	6:02	7:15
	Winthrop / Hollis Sts.	—	7:19	8:35	9:45	11:00	12:09	1:17	2:09	3:31	4:49	6:04	7:18
	Market Basket	—	7:24	8:39	9:49	11:03	12:12	1:20	2:12	3:36	4:51	6:08	7:21
	Shaw's	—	7:29	8:43	9:53	11:07	12:16	1:24	2:17	3:42	4:57	6:12	7:25
	Washington St. at Cong. Church	6:16	7:35	8:50	10:00	11:13	12:22	1:30	2:24	3:49	5:05	6:19	7:32
	Milford Crossings	—	7:55	9:04	10:14	11:27	12:36	1:45	2:46	4:04	5:20	6:34	7:47
	Spruce St.	6:31	—	—	—	—	—	—	—	—	—	—	—
INBOUND	Beaver St.	6:42	—	—	—	—	—	—	—	—	—	—	—
	Mission Springs*	—	8:00	9:14	10:24	11:37	12:46	1:55	2:58	4:14	5:30	6:44	7:57
	Holliston Public Library	—	8:05	9:19	10:29	11:42	12:51	1:59	3:02	4:18	5:32	6:48	8:02
	Shaw's	—	8:11	9:25	10:35	11:48	12:57	2:04	3:07	4:23	5:37	6:53	8:08
	Market Basket	—	8:16	9:30	10:40	11:53	1:02	2:09	3:12	4:28	5:42	6:58	8:13
	Winthrop / Hollis Sts.	—	8:19	9:33	10:43	11:55	1:04	2:11	3:14	4:30	5:44	7:00	8:15
	Framingham MBTA	7:06	8:22	9:36	10:46	11:59	1:08	2:15	3:18	4:34	5:50	7:04	8:19
	Blandin Hub (15 Blandin Ave.)	7:09	8:25	9:39	10:49	12:02P	1:11	2:18	3:21	4:37	5:56	7:07	8:22

Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus. For up to the minute bus information call the MWRTA at 508.935.2222 or visit www.mwrta.com for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

Transfers

Route 6 passengers can make the following transfers:

**Route 14 at Milford Crossings (Stop & Shop)

Route 4S & 5 at the Framingham MBTA station
Routes 4N, 4S, 5, 10, and 11 at the Blandin Hub.

Times: P - PM

*Stop may NOT be serviced due to snow/ice.

CRASH DATA

Crash Number	City Town Name	Crash Severity	Crash Status	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Police Agency Type	sptroop	Age of Driver Youngest	Age of Driver Oldest	Crash Hour	Driver Contributing Circumstances (All Drivers)	First Harmful Event	Is Geocoded	Light Conditions	Manner of Collision	MassDOT District	MSP Document Numbers	Road Surface Condition	Roadway Junction Type	RPA Abbreviation	Total Fatalities	Total Non-Fatal Injuries	Traffic Control Device Type	Vehicle Towed From Scene (All Vehicles)	Vehicle Travel Direction (All Vehicles)	Weather Conditions
3803351	HOLLISTON	Property damage only (none injured)	Closed	1:11 PM	2014	No injury	2	Local police		45-54	55-64	01:00PM to 01:59PM	D1: (Unknown) / D2: (Unknown)	Collision with motor vehicle in traffic	Yes	Daylight	Sideswipe, same direction	3	PW20141 4000211	Dry	T-intersection	MAPC	0	0	Stop signs	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: N / V2: N	Cloudy
3803355	HOLLISTON	Non-fatal injury	Closed	7:31 AM	2014	Non-fatal injury - Non-incapacitating	1	Local police		25-34	25-34	07:00AM to 07:59AM	D1: (Physical impairment),(Unknown)	Collision with curb	Yes	Daylight	Single vehicle crash	3	PW20141 4000215	Dry	Not at junction	MAPC	0	1	No controls	V1:(Yes, vehicle or trailer disabled)	V1: E	Clear/Unknown
3875931	HOLLISTON	Non-fatal injury	Closed	12:40 PM	2014	Non-fatal injury - Non-incapacitating	2	Local police		45-54	55-64	12:00PM to 12:59PM	D1: (No improper driving) / D2: (Visibility obstructed)	Collision with motor vehicle in traffic	Yes	Daylight	Angle	3	PW20141 8800203	Dry	T-intersection	MAPC	0	1	Stop signs	V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: E / V2: N	Clear
3990139	HOLLISTON	Property damage only (none injured)	Closed	7:12 PM	2015	No injury	1	Local police		21-24	21-24	07:00PM to 07:59PM	D1: (Driving too fast for conditions)	Collision with utility pole	Yes	Dark - lighted roadway	Single vehicle crash	3	PW20150 0600226	Snow	Not at junction	MAPC	0	0	No controls	V1:(Yes, vehicle or trailer disabled)	V1: E	Snow
4054743	HOLLISTON	Property damage only (none injured)	Closed	11:52 AM	2015	No injury	2	Local police		45-54	75-84	11:00AM to 11:59AM	D1: (Failed to yield right of way) / D2: (No improper driving)	Collision with motor vehicle in traffic	Yes	Daylight	Sideswipe, opposite direction	3	PW20151 7500108	Dry	Not at junction	MAPC	0	0	No controls	V1:(No) / V2:(No)	V1: E / V2: W	Clear
4114716	HOLLISTON	Property damage only (none injured)	Closed	4:34 PM	2015	No injury	2	Local police		35-44	55-64	04:00PM to 04:59PM	D1: (Failed to yield right of way),(Inattention) / D2: (No improper driving)	Collision with motor vehicle in traffic	Yes	Dark - lighted roadway	Angle	3	PW20153 3400125	Dry	Four-way intersection	MAPC	0	0	Stop signs	V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: S / V2: W	Cloudy
4352416	HOLLISTON	Property damage only (none injured)	Closed	12:58 PM	2017	No injury	2	Local police		21-24	25-34	12:00PM to 12:59PM	D1: (No improper driving) / D2: (Inattention)	Collision with motor vehicle in traffic	Yes	Daylight	Angle	3	PW20171 0802153	Dry	T-intersection	MAPC	0	0	No controls	V1:(No) / V2:(No)	V1: E / V2: W	Cloudy

Data Level: CRASH
Query Type: Spatial
Criteria: If you conducted an Advanced Query your SQL statement will be listed here

MASSDOT CRASH RATE WORKSHEETS

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Holliston,MA COUNT DATE : Dec-19

DISTRICT : UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street

MINOR STREET(S) : Hopping Brook Road

INTERSECTION DIAGRAM (Label Approaches)

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NEB	SWB	NB			
PEAK HOURLY VOLUMES (PM) :	571	785	255			**1,611**

" K " FACTOR : **0.092** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,511**

TOTAL # OF CRASHES : 7 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.40**

CRASH RATE CALCULATION : **0.22** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below Statewide and District Crash Rates

Project Title & Date: Proposed Warehouse Development

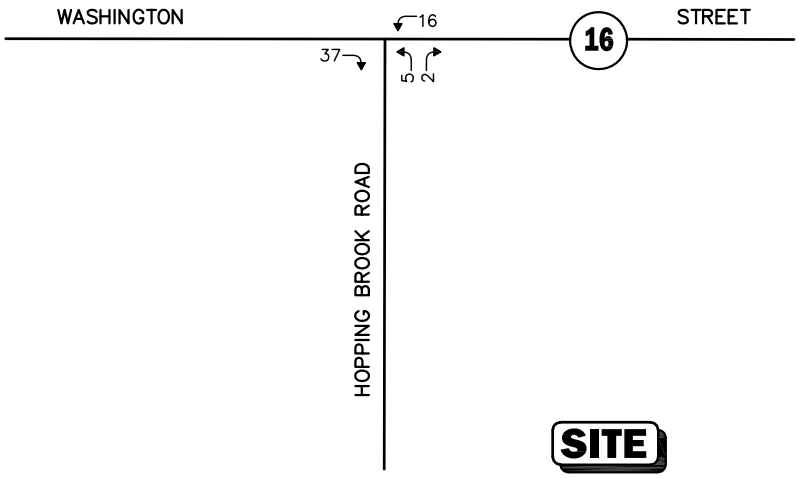
GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth - Daily Traffic Volumes

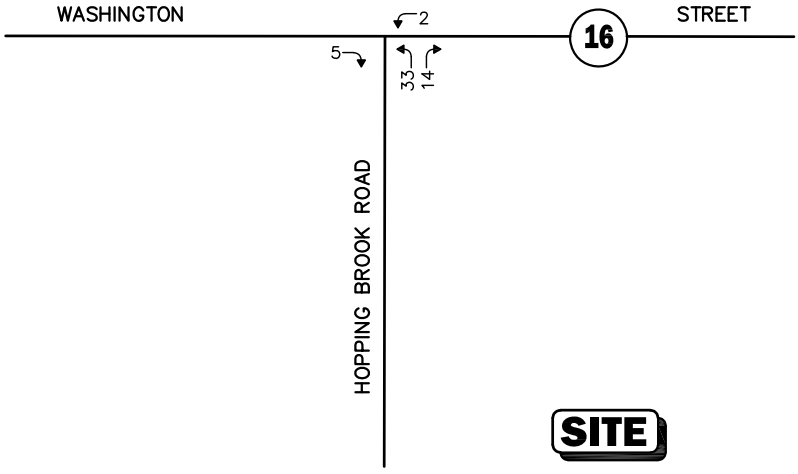
CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average Annual
Medfield	Route 27	NORTH MEADOWS ROAD		7,500								*8,513*	*8,547*	*1.2%*
Holliston	Route 16	WASHINGTON STREET	19,300	19,368	19,659	20,893	21,023	22,179	*19,653*	*19,908*	20,127	*20,409*	*20,491*	**0.47%**
														0.81%

BACKGROUND DEVELOPMENT NETWORKS

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Not To Scale

Figure A-1

Background Developments
Peak Hour Traffic Volumes

Vanasse & Associates inc

10/2/2020 2:39:38 PM, R:\8582

TRIP-GENERATION CALCULATIONS

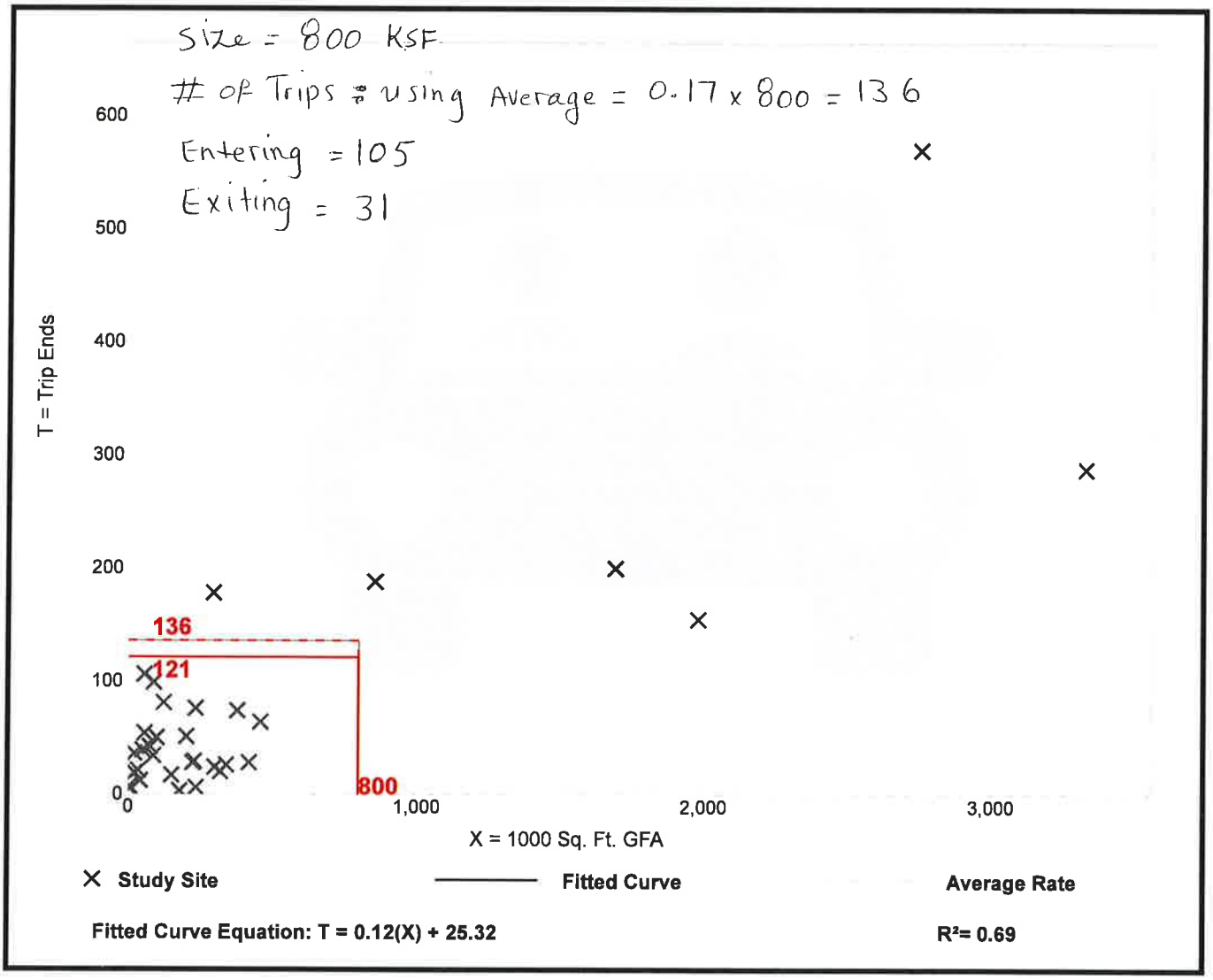
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 451
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.20

Data Plot and Equation



Warehousing
(150)

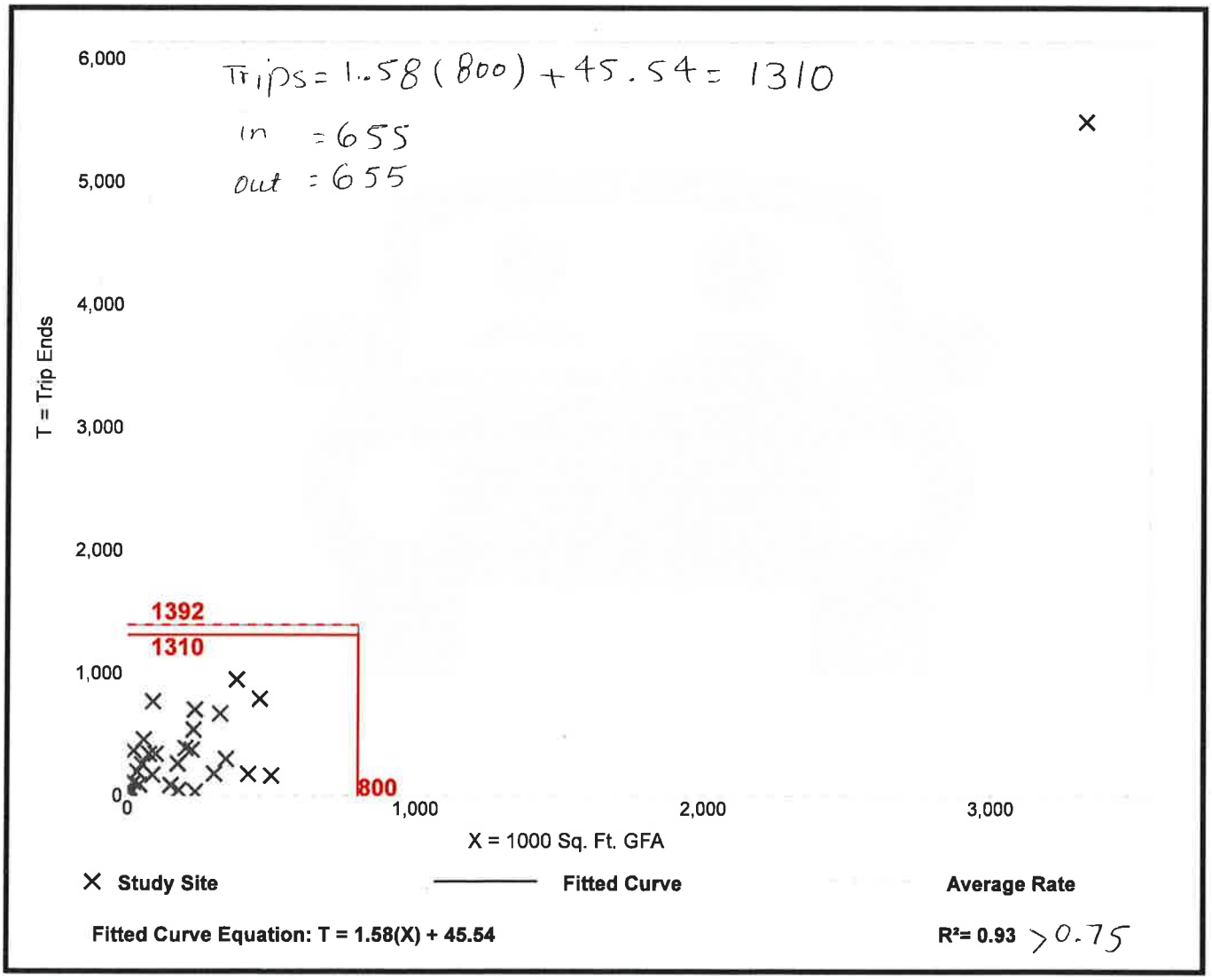
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 29
Avg. 1000 Sq. Ft. GFA: 285
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.74	0.15 - 16.93	1.55

Data Plot and Equation



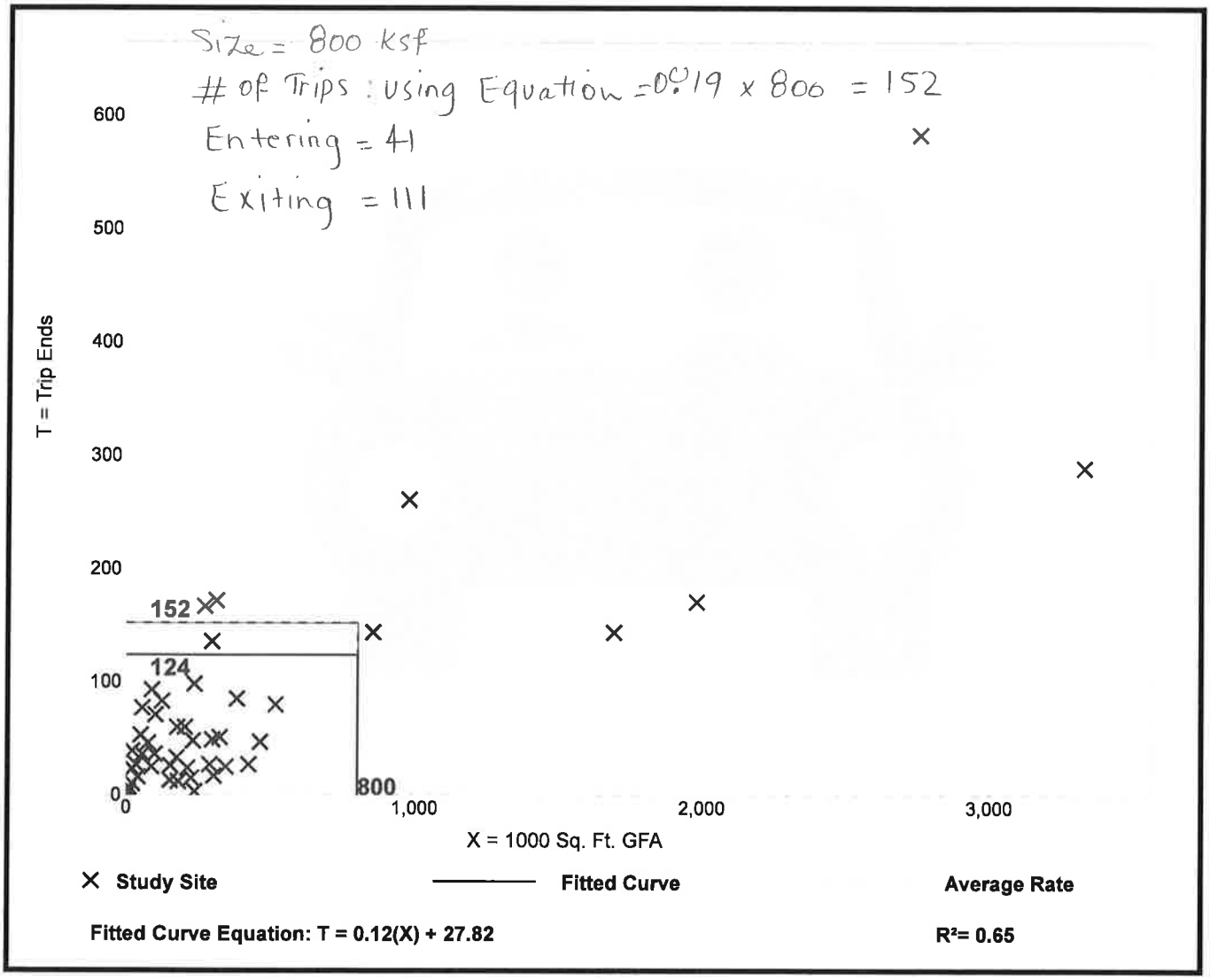
Warehousing
(150)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	47
Avg. 1000 Sq. Ft. GFA:	400
Directional Distribution:	27% entering, 73% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.19	0.01 - 1.80	0.18

Data Plot and Equation



General Light Industrial
(110)

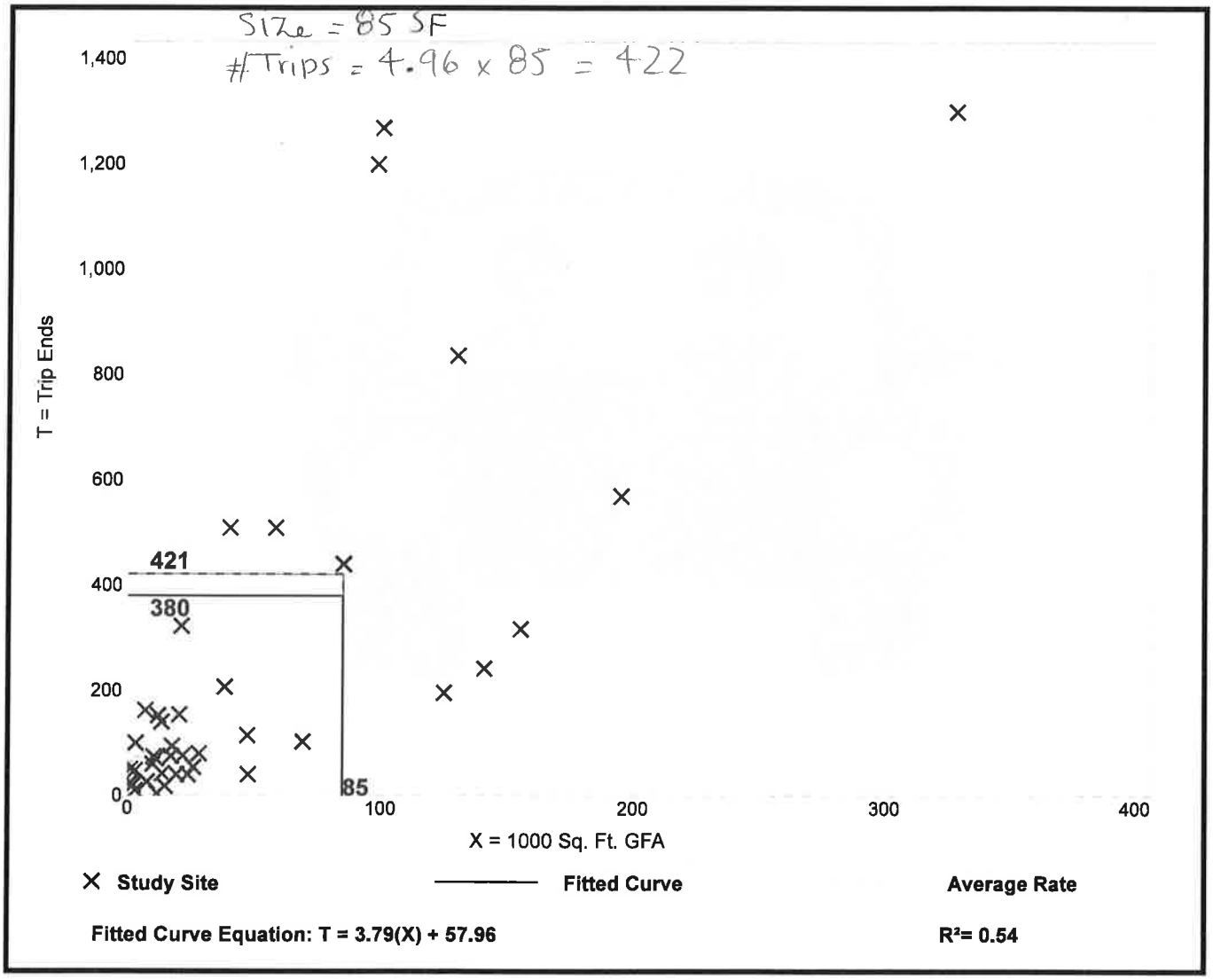
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 40
Avg. 1000 Sq. Ft. GFA: 49
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.96	0.34 - 43.86	4.20

Data Plot and Equation



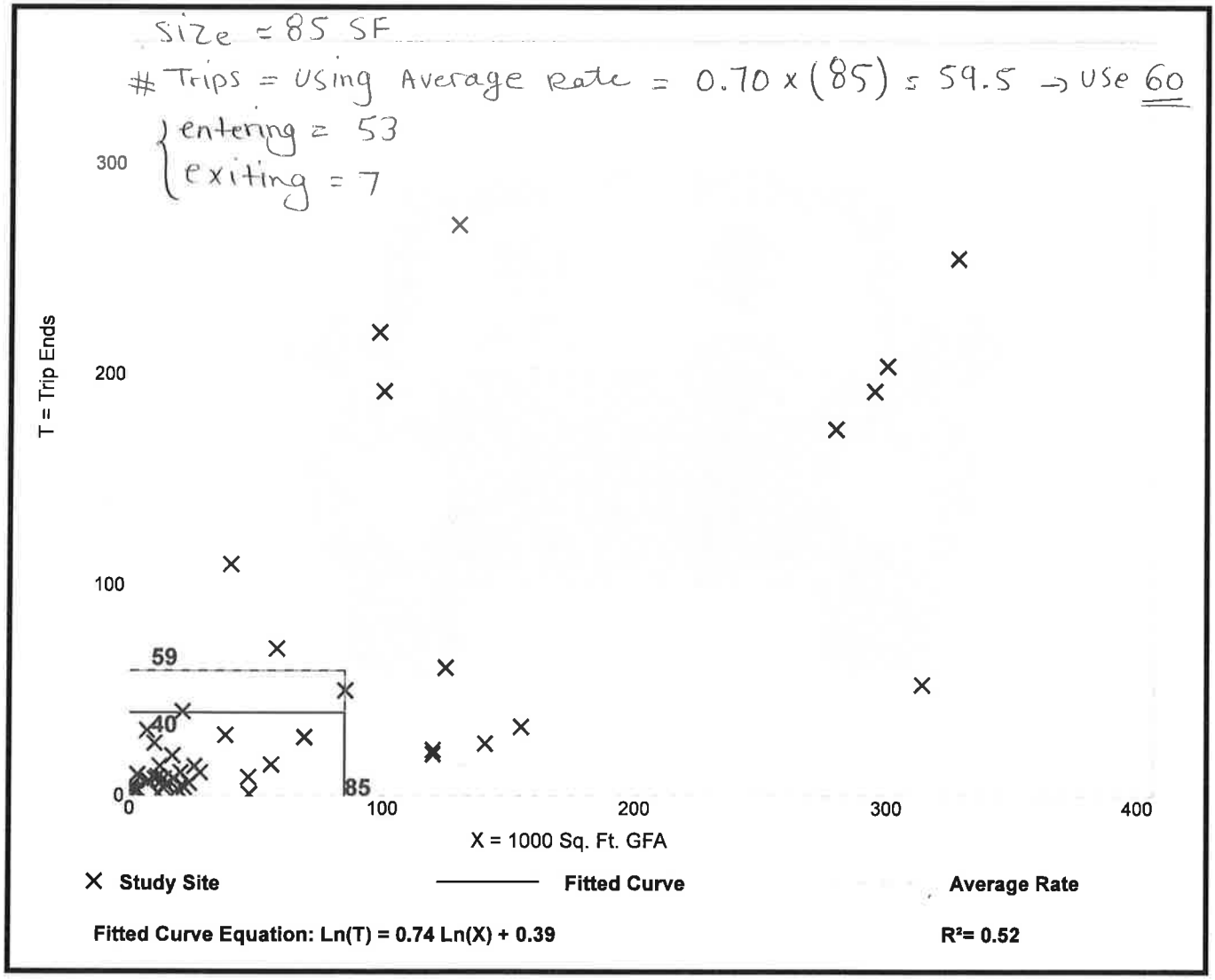
General Light Industrial
(110)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 45
Avg. 1000 Sq. Ft. GFA: 73
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.70	0.02 - 4.46	0.65

Data Plot and Equation



General Light Industrial
(110)

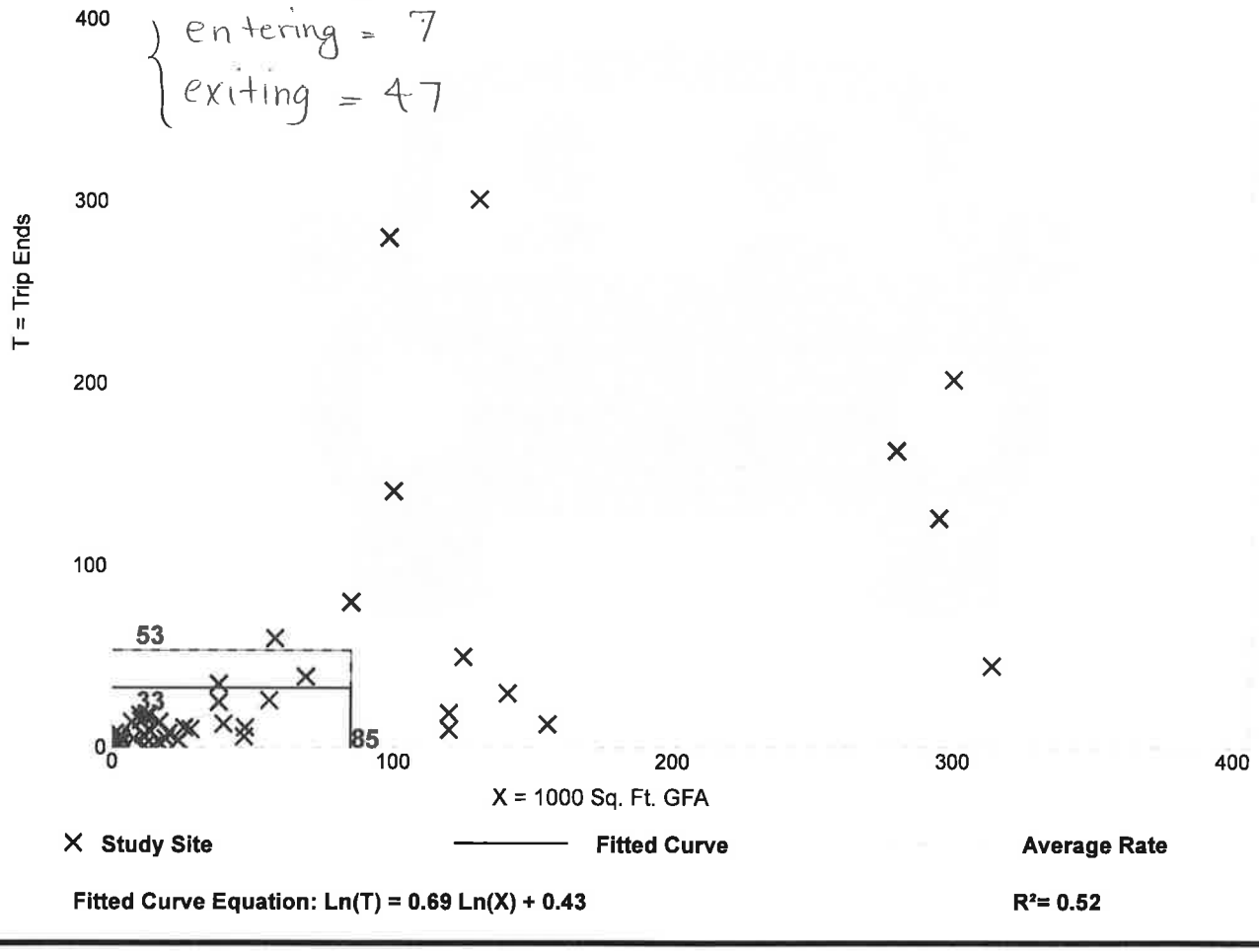
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 44
Avg. 1000 Sq. Ft. GFA: 67
Directional Distribution: 13% entering, 87% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.63	0.07 - 7.02	0.68

Data Plot and Equation

Size = 85
#Trips using Average Rate = 0.63 x 85 = 54
entering = 7
exiting = 47



Fitted Curve Equation: Ln(T) = 0.69 Ln(X) + 0.43

R^2= 0.52

Ultimate Buildout

Warehousing
(150)

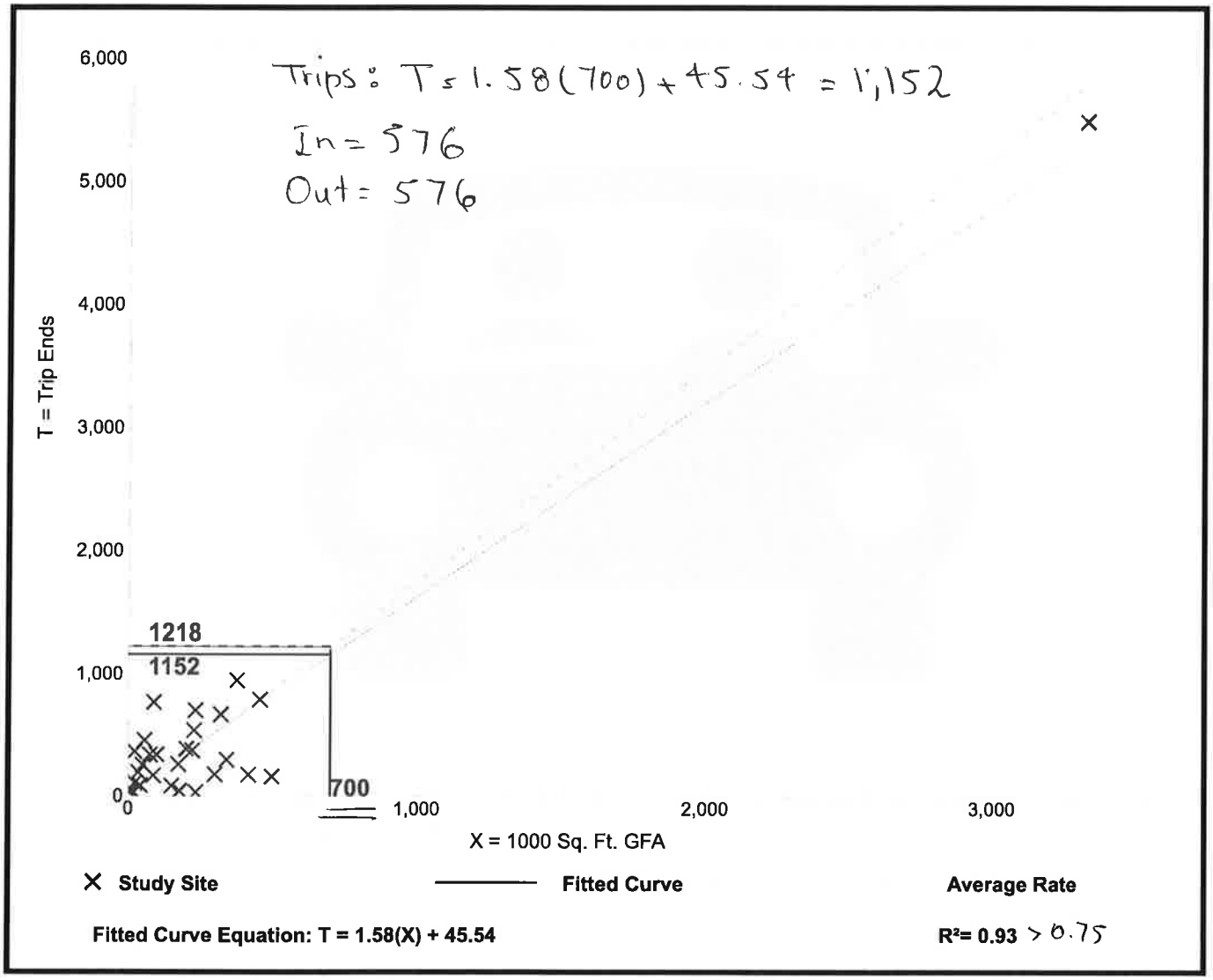
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 29 > 20
Avg. 1000 Sq. Ft. GFA: 285
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.74	0.15 - 16.93	1.55

Data Plot and Equation



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Ultimate Buildout

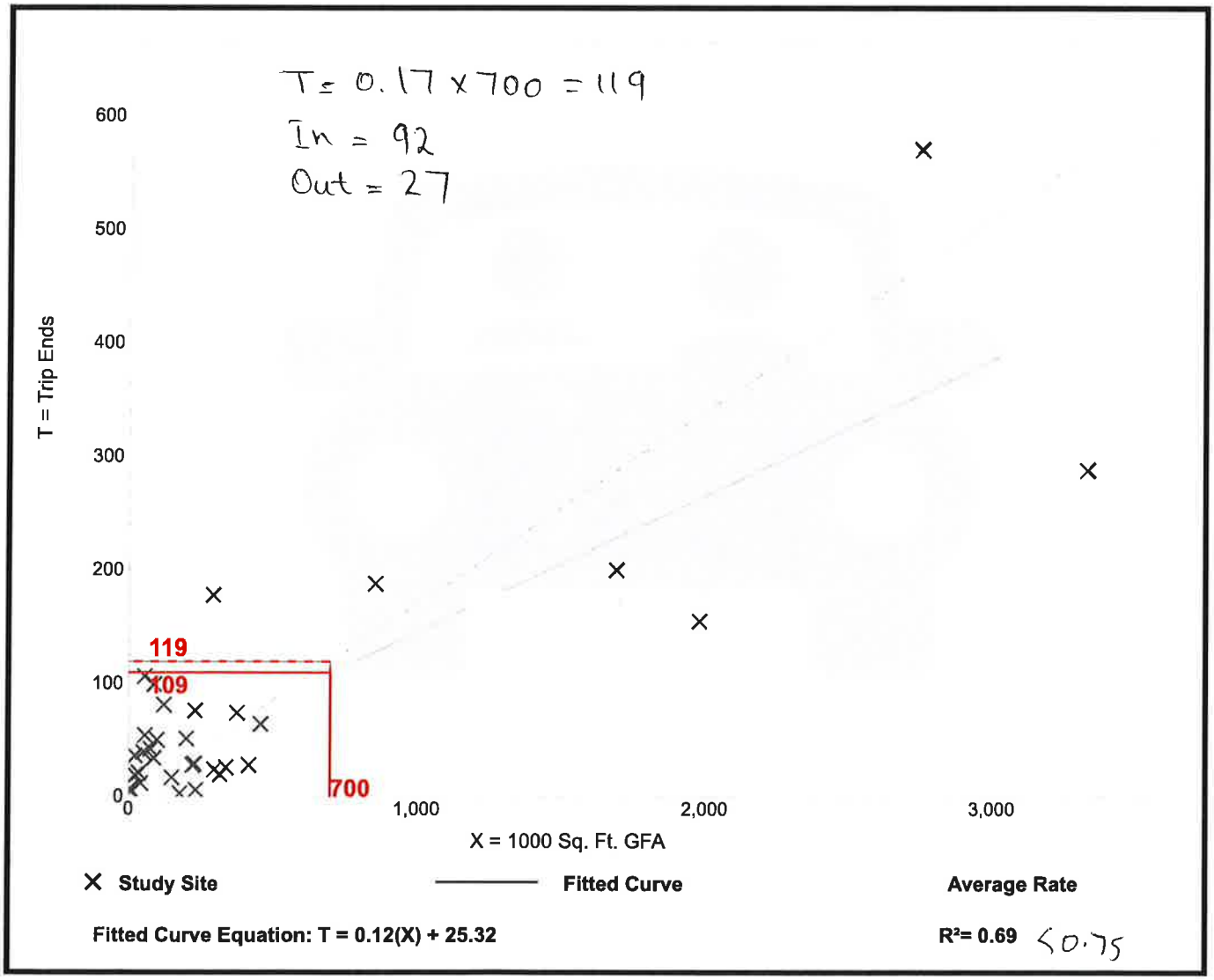
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 451
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.20

Data Plot and Equation



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Ultimate Build out

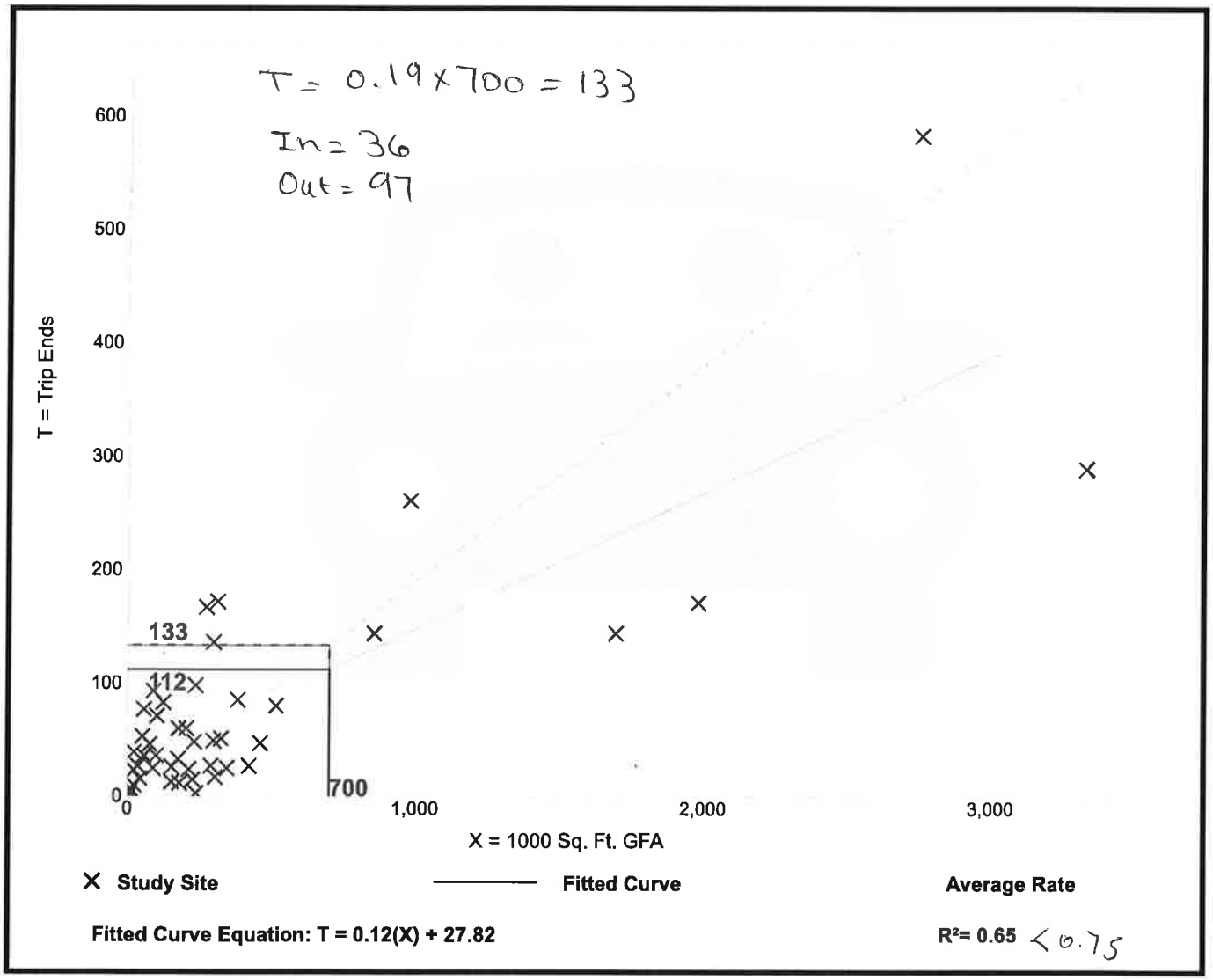
Warehousing
(150)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	47
Avg. 1000 Sq. Ft. GFA:	400
Directional Distribution:	27% entering, 73% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.19	0.01 - 1.80	0.18

Data Plot and Equation



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CAPACITY ANALYSIS WORKSHEETS

CAPACITY ANALYSIS WORKSHEETS

Washington Street at Hopping Brook Road

Washington Street at Hopping Brook Road

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	639	179	45	512	51	18
Future Vol, veh/h	639	179	45	512	51	18
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	89	89	60	60
Heavy Vehicles, %	0	0	2	0	5	2
Mvmt Flow	680	190	51	575	85	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	870	0	1452	775
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	677	-
Critical Hdwy	-	-	4.12	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.318
Pot Cap-1 Maneuver	-	-	775	-	142	398
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	775	-	128	398
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	451	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	60.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	128	398	-	-	775	-
HCM Lane V/C Ratio	0.664	0.075	-	-	0.065	-
HCM Control Delay (s)	76.4	14.8	-	-	10	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	3.6	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	52.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	545	26	17	768	182	73
Future Vol, veh/h	545	26	17	768	182	73
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	95	95	94	94	77	77
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	574	27	18	817	236	95

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	601	0	1441	588
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	853	-
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	-	-	986	-	~ 146	509
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	418	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	986	-	~ 141	509
Mov Cap-2 Maneuver	-	-	-	-	~ 141	-
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	404	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	281.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	141	509	-	-	986	-
HCM Lane V/C Ratio	1.676	0.186	-	-	0.018	-
HCM Control Delay (s)	$ 388.7	13.7	-	-	8.7	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	17.1	0.7	-	-	0.1	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	9.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	685	216	61	554	56	20
Future Vol, veh/h	685	216	61	554	56	20
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	89	89	60	60
Heavy Vehicles, %	0	0	2	0	5	2
Mvmt Flow	729	230	69	622	93	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	959	0	1604	844
Stage 1	-	-	-	-	844	-
Stage 2	-	-	-	-	760	-
Critical Hdwy	-	-	4.12	-	6.45	6.22
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.318
Pot Cap-1 Maneuver	-	-	717	-	114	363
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	456	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	717	-	97	363
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	389	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	122.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	97	363	-	-	717	-
HCM Lane V/C Ratio	0.962	0.092	-	-	0.096	-
HCM Control Delay (s)	160.7	15.9	-	-	10.6	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	5.7	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	97.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	584	31	19	823	215	87
Future Vol, veh/h	584	31	19	823	215	87
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	95	95	94	94	77	77
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	615	33	20	876	279	113

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	648	0	1548	632
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	916	-
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	-	-	947	-	~ 126	480
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	947	-	~ 121	480
Mov Cap-2 Maneuver	-	-	-	-	~ 121	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	374	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	$ 482.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	121	480	-	-	947	-
HCM Lane V/C Ratio	2.308	0.235	-	-	0.021	-
HCM Control Delay (s)	$ 671.7	14.8	-	-	8.9	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	24.1	0.9	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	12.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	685	294	88	554	79	28
Future Vol, veh/h	685	294	88	554	79	28
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	89	89	92	92
Heavy Vehicles, %	0	5	2	0	9	4
Mvmt Flow	729	313	99	622	86	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1042	0	1706	886
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	820	-
Critical Hdwy	-	-	4.12	-	6.49	6.24
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	2.218	-	3.581	3.336
Pot Cap-1 Maneuver	-	-	667	-	96	341
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	667	-	~ 74	341
Mov Cap-2 Maneuver	-	-	-	-	~ 74	-
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	325	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	191.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	74	341	-	-	667	-
HCM Lane V/C Ratio	1.16	0.089	-	-	0.148	-
HCM Control Delay (s)	253.2	16.6	-	-	11.3	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	6.5	0.3	-	-	0.5	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	157.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	584	62	29	823	298	115
Future Vol, veh/h	584	62	29	823	298	115
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	95	95	94	94	92	92
Heavy Vehicles, %	0	11	0	0	8	2
Mvmt Flow	615	65	31	876	324	125

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	680	0	1586	648
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	938	-
Critical Hdwy	-	-	4.1	-	6.48	6.22
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	2.2	-	3.572	3.318
Pot Cap-1 Maneuver	-	-	922	-	~ 115	470
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	371	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	922	-	~ 108	470
Mov Cap-2 Maneuver	-	-	-	-	~ 108	-
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	347	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	$ 715.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	108	470	-	-	922	-
HCM Lane V/C Ratio	2.999	0.266	-	-	0.033	-
HCM Control Delay (s)	$ 985.5	15.4	-	-	9	0
HCM Lane LOS	F	C	-	-	A	A
HCM 95th %tile Q(veh)	30.9	1.1	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	31

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	685	362	112	554	99	35
Future Vol, veh/h	685	362	112	554	99	35
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	89	89	92	92
Heavy Vehicles, %	0	8	2	0	12	3
Mvmt Flow	729	385	126	622	108	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1114	0	1796	922
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	874	-
Critical Hdwy	-	-	4.12	-	6.52	6.23
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	-	-	2.218	-	3.608	3.327
Pot Cap-1 Maneuver	-	-	627	-	~ 83	326
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	392	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	627	-	~ 58	326
Mov Cap-2 Maneuver	-	-	-	-	~ 58	-
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	272	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	$ 416.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	58	326	-	-	627	-
HCM Lane V/C Ratio	1.855	0.117	-	-	0.201	-
HCM Control Delay (s)	$ 557.6	17.5	-	-	12.2	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	10.2	0.4	-	-	0.7	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	272

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	584	89	38	823	370	140
Future Vol, veh/h	584	89	38	823	370	140
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	95	95	94	94	92	92
Heavy Vehicles, %	0	14	0	0	11	5
Mvmt Flow	615	94	40	876	402	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	709	0	1618	662
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	956	-
Critical Hdwy	-	-	4.1	-	6.51	6.25
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.2	-	3.599	3.345
Pot Cap-1 Maneuver	-	-	899	-	~ 108	457
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	~ 360	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	899	-	~ 99	457
Mov Cap-2 Maneuver	-	-	-	-	~ 99	-
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	~ 329	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	$ 1068.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	99	457	-	-	899	-
HCM Lane V/C Ratio	4.062	0.333	-	-	0.045	-
HCM Control Delay (s)	$ 1466.1	16.8	-	-	9.2	0
HCM Lane LOS	F	C	-	-	A	A
HCM 95th %tile Q(veh)	41.5	1.4	-	-	0.1	-

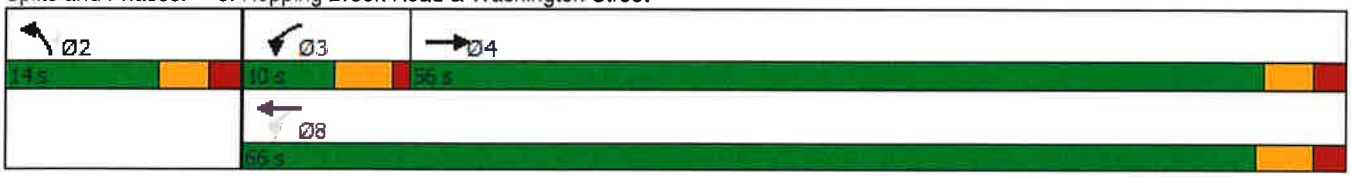
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	685	294	88	554	79	28
Future Volume (vph)	685	294	88	554	79	28
Satd. Flow (prot)	2017	0	1770	1900	1612	1568
Flt Permitted			0.092		0.950	
Satd. Flow (perm)	2017	0	171	1900	1612	1568
Satd. Flow (RTOR)	53					30
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	8%	2%	0%	12%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1065	0	96	602	86	30
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases			8			2
Detector Phase	4		3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	23.0		9.5	23.5	23.0	23.0
Total Split (s)	56.0		10.0	66.0	14.0	14.0
Total Split (%)	70.0%		12.5%	82.5%	17.5%	17.5%
Yellow Time (s)	3.0		3.5	3.5	3.0	3.0
All-Red Time (s)	2.0		1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		4.5	5.5	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None		None	None	Min	Min
Act Effct Green (s)	39.3		47.1	46.0	8.3	8.3
Actuated g/C Ratio	0.60		0.71	0.70	0.13	0.13
v/c Ratio	0.87		0.36	0.45	0.42	0.13
Control Delay	20.0		6.7	5.0	38.8	14.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	20.0		6.7	5.0	38.8	14.2
LOS	B		A	A	D	B
Approach Delay	20.0			5.2	32.5	
Approach LOS	B			A	C	
Queue Length 50th (ft)	339		9	83	37	0
Queue Length 95th (ft)	535		24	126	85	24
Internal Link Dist (ft)	435			455	753	
Turn Bay Length (ft)			150			
Base Capacity (vph)	1544		269	1640	243	262
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.69		0.36	0.37	0.35	0.11

Intersection Summary		
Cycle Length: 80		
Actuated Cycle Length: 65.9		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.87		
Intersection Signal Delay: 15.3	Intersection LOS: B	
Intersection Capacity Utilization 75.3%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 3: Hopping Brook Road & Washington Street



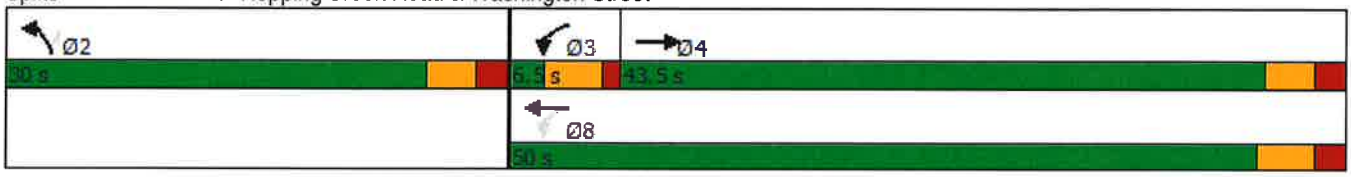
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	584	62	29	823	298	115
Future Volume (vph)	584	62	29	823	298	115
Satd. Flow (prot)	1856	0	1805	1900	1671	1583
Flt Permitted			0.180		0.950	
Satd. Flow (perm)	1856	0	342	1900	1671	1583
Satd. Flow (RTOR)	9					125
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	11%	0%	0%	8%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	702	0	32	895	324	125
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases			8			2
Detector Phase	4		3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	23.0		9.5	23.5	23.0	23.0
Total Split (s)	43.5		6.5	50.0	30.0	30.0
Total Split (%)	54.4%		8.1%	62.5%	37.5%	37.5%
Yellow Time (s)	3.0		3.5	3.5	3.0	3.0
All-Red Time (s)	2.0		1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		4.5	5.5	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None		None	None	Min	Min
Act Effct Green (s)	33.8		36.4	35.4	18.0	18.0
Actuated g/C Ratio	0.52		0.56	0.55	0.28	0.28
v/c Ratio	0.72		0.13	0.86	0.70	0.24
Control Delay	18.6		8.2	23.4	31.2	5.7
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	18.6		8.2	23.4	31.2	5.7
LOS	B		A	C	C	A
Approach Delay	18.6			22.9	24.1	
Approach LOS	B			C	C	
Queue Length 50th (ft)	179		5	279	122	0
Queue Length 95th (ft)	422		18	#607	223	36
Internal Link Dist (ft)	435			455	753	
Turn Bay Length (ft)			150			
Base Capacity (vph)	1186		241	1361	688	725
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.59		0.13	0.66	0.47	0.17

Intersection Summary		
Cycle Length: 80		
Actuated Cycle Length: 64.5		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 21.7	Intersection LOS: C	
Intersection Capacity Utilization 68.6%	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: 3: Hopping Brook Road & Washington Street



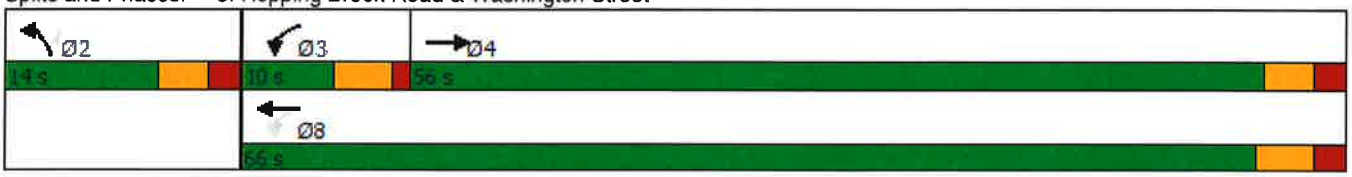
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	685	362	112	554	99	35
Future Volume (vph)	685	362	112	554	99	35
Satd. Flow (prot)	1997	0	1770	1900	1612	1568
Flt Permitted			0.084		0.950	
Satd. Flow (perm)	1997	0	156	1900	1612	1568
Satd. Flow (RTOR)	65					38
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	8%	2%	0%	12%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1138	0	122	602	108	38
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases			8			2
Detector Phase	4		3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	23.0		9.5	23.5	23.0	23.0
Total Split (s)	56.0		10.0	66.0	14.0	14.0
Total Split (%)	70.0%		12.5%	82.5%	17.5%	17.5%
Yellow Time (s)	3.0		3.5	3.5	3.0	3.0
All-Red Time (s)	2.0		1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		4.5	5.5	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None		None	None	Min	Min
Act Effct Green (s)	43.4		51.2	50.1	8.7	8.7
Actuated g/C Ratio	0.62		0.73	0.71	0.12	0.12
v/c Ratio	0.90		0.49	0.44	0.54	0.17
Control Delay	23.0		13.0	4.9	45.0	13.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	23.0		13.0	4.9	45.0	13.5
LOS	C		B	A	D	B
Approach Delay	23.0			6.2	36.8	
Approach LOS	C			A	D	
Queue Length 50th (ft)	394		11	83	52	0
Queue Length 95th (ft)	#739		50	126	#117	27
Internal Link Dist (ft)	435			455	753	
Turn Bay Length (ft)			150			
Base Capacity (vph)	1465		250	1563	223	250
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.78		0.49	0.39	0.48	0.15

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 70.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 81.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Hopping Brook Road & Washington Street



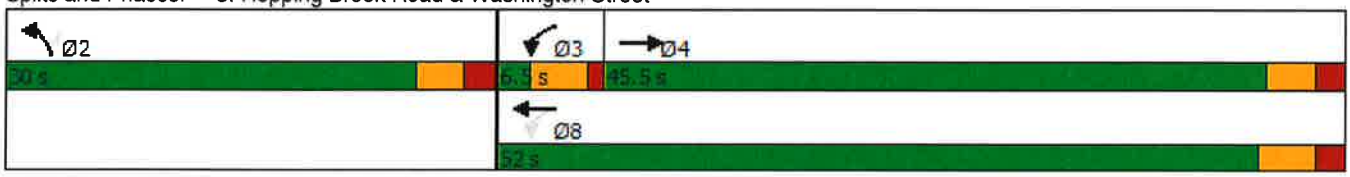
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	584	89	38	823	370	140
Future Volume (vph)	584	89	38	823	370	140
Satd. Flow (prot)	1832	0	1805	1900	1626	1538
Flt Permitted			0.143		0.950	
Satd. Flow (perm)	1832	0	272	1900	1626	1538
Satd. Flow (RTOR)	13					152
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	14%	0%	0%	11%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	732	0	41	895	402	152
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases			8			2
Detector Phase	4		3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	23.0		9.5	23.5	23.0	23.0
Total Split (s)	45.5		6.5	52.0	30.0	30.0
Total Split (%)	55.5%		7.9%	63.4%	36.6%	36.6%
Yellow Time (s)	3.0		3.5	3.5	3.0	3.0
All-Red Time (s)	2.0		1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		4.5	5.5	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None		None	None	Min	Min
Act Effct Green (s)	35.3		39.3	38.2	21.4	21.4
Actuated g/C Ratio	0.50		0.56	0.54	0.30	0.30
v/c Ratio	0.79		0.21	0.87	0.82	0.27
Control Delay	23.6		9.9	25.4	39.9	5.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	23.6		9.9	25.4	39.9	5.5
LOS	C		A	C	D	A
Approach Delay	23.6			24.7	30.5	
Approach LOS	C			C	C	
Queue Length 50th (ft)	294		8	347	179	0
Queue Length 95th (ft)	#467		21	#561	#337	40
Internal Link Dist (ft)	435			455	753	
Turn Bay Length (ft)			150			
Base Capacity (vph)	1108		196	1312	604	667
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.66		0.21	0.68	0.67	0.23

Intersection Summary

Cycle Length: 82
Actuated Cycle Length: 70.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 25.8 Intersection LOS: C
Intersection Capacity Utilization 72.6% 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: 3: Hopping Brook Road & Washington Street



HCS SIGNAL WARRANT ANALYSIS

HCS7 Warrants Report

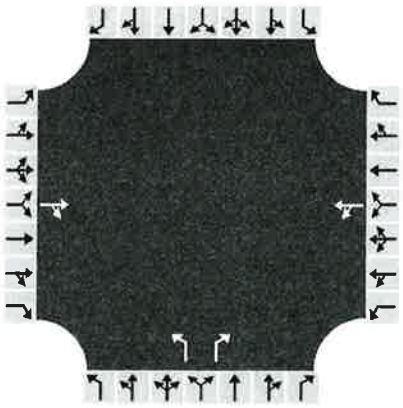
Project Information

Analyst	RE	Date	9/30/2020
Agency	VAI	Analysis Year	2020 Existing
Jurisdiction	MassDOT/Holliston	Time Period Analyzed	
Project Description	Warehouse		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	40	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	9000		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	0	0	1	0	1	0	1	0	0	0
Lane Usage		TR			LT		L		R			
Vehicle Volumes Averages (veh/h)	0	482	0	0	466	0	102	0	10	0	0	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	0

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	947	50	997	0	0	No	No	No	No	No	No	No	No	No
08 - 09	976	49	1025	0	0	No	No	No	No	No	No	No	No	No
09 - 10	804	41	845	0	0	No	No	No	No	No	No	No	No	No
10 - 11	772	60	832	0	0	No	No	No	No	No	No	No	No	No
11 - 12	795	87	882	0	0	No	No	No	Yes	No	No	No	No	No
12 - 13	866	168	1034	0	0	No	Yes	Yes	Yes	No	No	No	No	No
13 - 14	879	92	971	0	0	No	No	No	Yes	No	No	No	No	No
14 - 15	1009	114	1123	0	0	No	No	Yes	Yes	No	No	No	No	No
15 - 16	1098	189	1287	0	0	No	Yes	Yes	Yes	Yes	No	No	No	No
16 - 17	1155	222	1377	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
17 - 18	1209	227	1436	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	873	62	935	0	0	No	No	No	No	No	No	No	No	No
Total	11383	1361	12744	0	0	2	4	5	7	3	0	1	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS7 Warrants Report

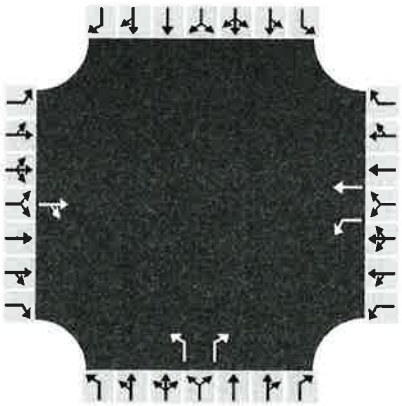
Project Information

Analyst	RE	Date	9/30/2020
Agency	VAI	Analysis Year	2027 Build
Jurisdiction	MassDOT/Holliston	Time Period Analyzed	
Project Description	Warehouse		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	40	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	9000		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	0	1	1	0	1	0	1	0	0	0
Lane Usage		TR		L	T		L		R			
Vehicle Volumes Averages (veh/h)	0	525	0	0	508	0	129	0	19	0	0	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	0

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	1041	88	1129	0	0	No	No	No	Yes	No	No	No	No	No
08 - 09	1061	77	1138	0	0	No	No	No	No	No	No	No	No	No
09 - 10	879	72	951	0	0	No	No	No	No	No	No	No	No	No
10 - 11	844	91	935	0	0	No	No	No	Yes	No	No	No	No	No
11 - 12	873	127	1000	0	0	No	No	No	Yes	No	No	No	No	No
12 - 13	949	213	1162	0	0	Yes	Yes	Yes	Yes	No	No	No	No	No
13 - 14	958	124	1082	0	0	No	No	Yes	Yes	No	No	No	No	No
14 - 15	1102	156	1258	0	0	No	No	Yes	Yes	No	No	No	No	No
15 - 16	1197	236	1433	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
16 - 17	1260	272	1532	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1308	261	1569	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	935	66	1001	0	0	No	No	No	No	No	No	No	No	No
Total	12407	1783	14190	0	0	4	4	6	9	3	0	2	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	✓
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS7 Warrants Report

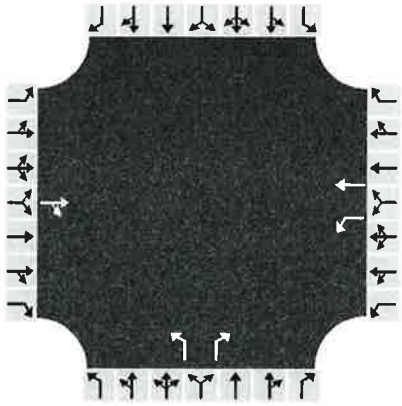
Project Information

Analyst	RE	Date	9/30/2020
Agency	VAI	Analysis Year	2027 Ultimate build
Jurisdiction	MassDOT/Holliston	Time Period Analyzed	
Project Description	Warehouse		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	40	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	9000		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	0	1	1	0	1	0	1	0	0	0
Lane Usage		TR		L	T		L		R			
Vehicle Volumes Averages (veh/h)	0	529	0	0	512	0	138	0	23	0	0	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	0

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	1051	103	1154	0	0	No	No	Yes	Yes	No	No	No	No	No
08 - 09	1068	87	1155	0	0	No	No	No	Yes	No	No	No	No	No
09 - 10	888	87	975	0	0	No	No	No	Yes	No	No	No	No	No
10 - 11	852	105	957	0	0	No	No	No	Yes	No	No	No	No	No
11 - 12	883	143	1026	0	0	No	No	No	Yes	No	No	No	No	No
12 - 13	958	228	1186	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
13 - 14	966	138	1104	0	0	No	No	Yes	Yes	No	No	No	No	No
14 - 15	1111	173	1284	0	0	No	Yes	Yes	Yes	Yes	No	No	No	No
15 - 16	1207	253	1460	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
16 - 17	1270	289	1559	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1313	270	1583	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	937	66	1003	0	0	No	No	No	No	No	No	No	No	No
Total	12504	1942	14446	0	0	4	5	7	11	5	0	2	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	✔
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
Warrant 3: Peak Hour	✔
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	✓
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	