UPDATED
TRAFFIC IMPACT ASSESSMENT

for a

Hannaford Supermarket

Lot 15 - Commerce Park
Hinesburg, Vermont

APPENDICES

February 28, 2011

LAMOUREUX & DICKINSON
14 Morse Drive
Essex Junction, Vermont 05452
(802) 878-4450
Consulting Engineers, Inc.

Appendix A
DHV Calculations

LAMOUREUX & DICKINSON
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Project: HINESBURG HANNAFORD
Project No. 10024 Sheet No. 1 of
Calculated by RD Date 2-01-11
Checked by Date
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VTRANS 2010 RED BOOK (2009 DATA)
RURAL PRIMARY & SECONDARY GROWTH RATES
2010 → 2012 = 1.01
2010 → 2017 = 1.03

SEGMENT	AADT 2010	AADT 2012	AADT 2017
CVU - COMMERCE	9,400	9,500	9,700
COMMERCE - MECHANICSVILLE	9,400	9,500	9,700
MECHANICSVILLE - CHARLOTTE	11,800	11,900	12,200
CHARLOTTE - SILVER	10,300	10,400	10,600
CVU → NORTH	9,200	9,300	9,500

CALCULATE DHV'S

VTRANS 2010 RED BOOK
RURAL NON-INTERSTATE - USE LOWER OF:
EQUATION DHV = 0.1084 × AADT + 30
OR
K-FACTOR 0.1127

SEGMENT	2012 DHV	2017 DHV
CVU - COMMERCE	1,060	1,080
COMMERCE - MECH.	1,060	1,080
MECH. - CHARLOTTE	1,320	1,350
CHARLOTTE - SILVER	1,160	1,180
CVU → NORTH	1,040	1,060

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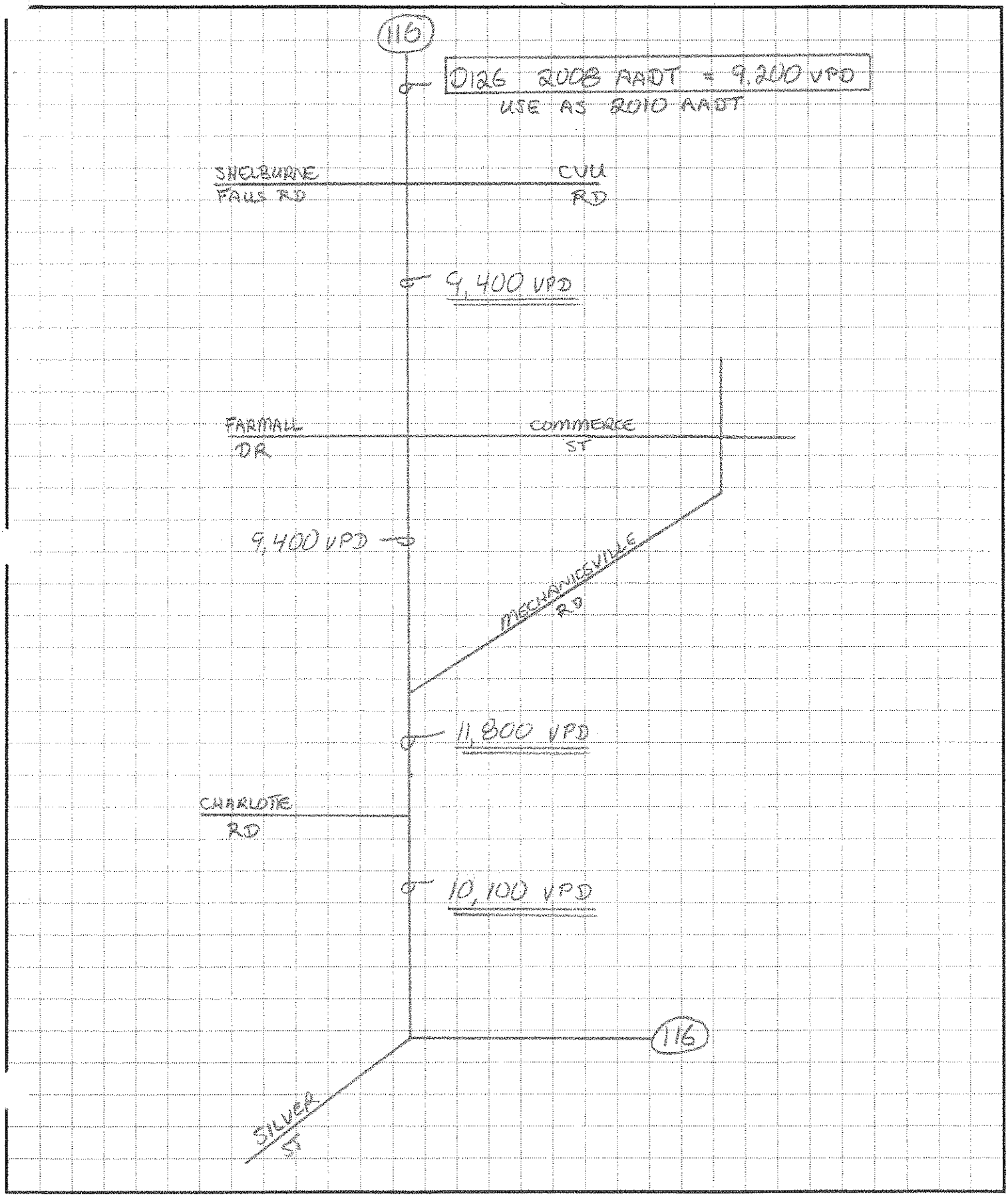

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Scale

AADT CALCULATIONS

CVU / SHELBURNE FALLS RD.

	AADT	Σ 12 HR
NORTH APPROACH	9,200	8,549
SOUTH APPROACH	?	8,696

SOURCE: D126 2008 ATR - $\boxed{\text{USE AS 8010 AADT}}$
VTRANS 4/29 & 30/09 TMC

SOUTH APPROACH AADT = 9,200 × (8,696/8,549)
= 9,400 VPD

COMMERCE ST. / FARMALL DR

	AADT	Σ 12 HR
NORTH APPROACH	9,400	9,144
SOUTH APPROACH	?	9,123

SOURCE: CCMPO 6/02/10 TMC

SOUTH APPROACH AADT = 9,400 × (9,123/9,144)
= 9,400 VPD

MECHANICSVILLE RD

	AADT	Σ 12 HR
NORTH APPROACH	9,400	8,859
SOUTH APPROACH	?	11,084

SOURCE: CCMPO 6/03/10 TMC

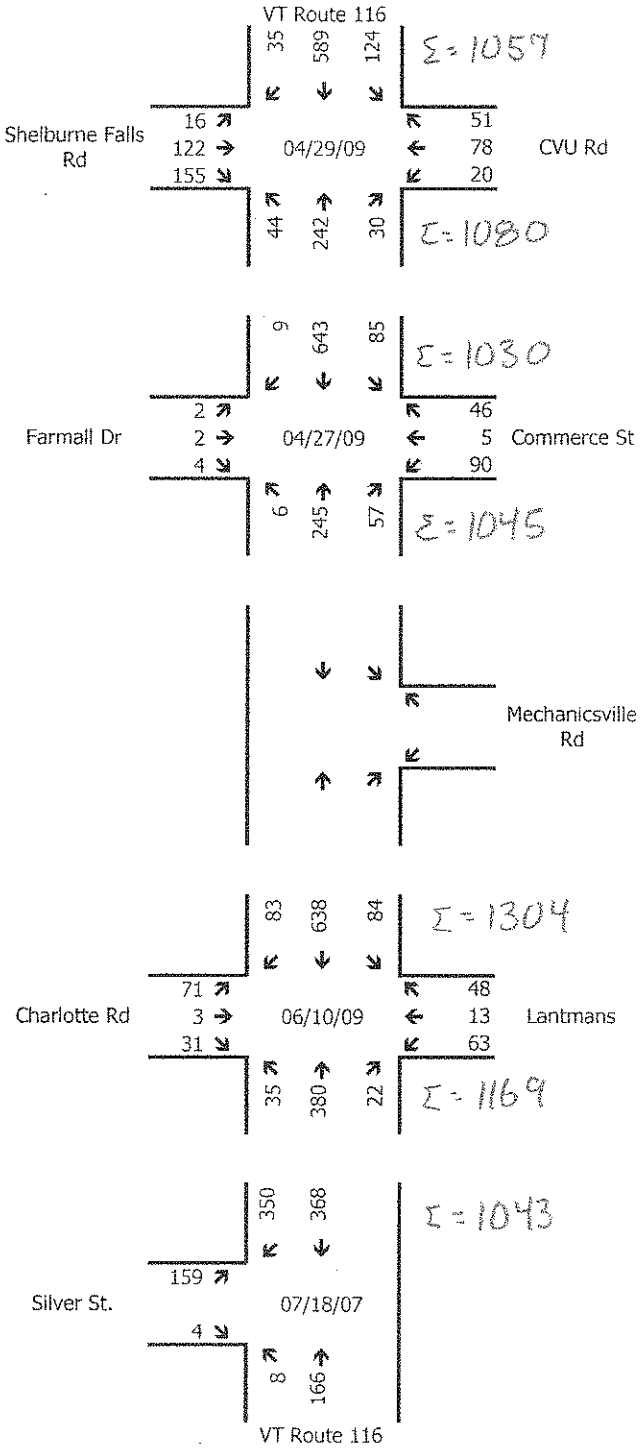
SOUTH APPROACH AADT = 9,400 × (11,084/8,859)
= 11,800 VPD

CHARLOTTE RD

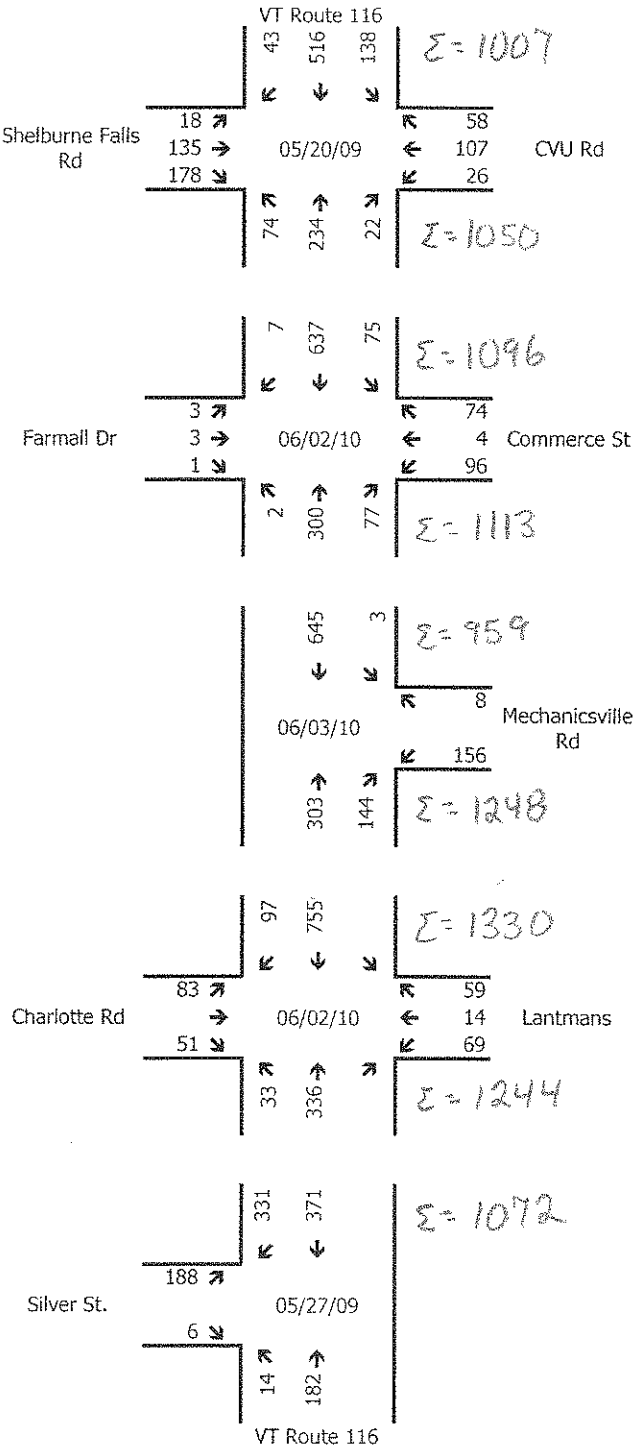
	AADT	Σ 12 HR
NORTH APPROACH	11,800	11,399
SOUTH APPROACH	?	10,199 - 465 + 205 = 9,939

SOURCE: CCMPO 6/02/10 TMC
VTRANS 6/10/09 TMC

SOUTH APPROACH AADT = 11,800 × (9,939/11,399)
= 10,300 VPD



VTRANS COUNTS



CCMPO COUNTS

PM PEAK HOUR

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DHV ADJUSTMENT FACTORS

SHELBURNE FALLS / CVU RD

CCMPO 5/20/09 TMC

	2012	2017
NORTH APPR.	1,040/1007	1060/1007
	1.033	1.053

FARMALL / COMMERCE ST

CCMPO 6/02/10 TMC

	2012	2017
NORTH APPR.	1060/1096	1080/1096
	0.967	0.985

MECHANICSVILLE RD

CCMPO 6/03/10 TMC

	2012	2017
SOUTH APPR.	1320/1248	1350/1248
	1.058	1.082

CHARLOTTE RD

CCMPO 6/02/10 TMC

	2012	2017
NORTH APPR.	1320/1330	1350/1330
	0.993	1.015

SILVER ST

CCMPO 5/27/09 TMC

	2012	2017
NORTH APPR.	1,160/1072	1180/1072
	1.082	1.101

LAMOUREUX & DICKINSON CONSULTING ENGINEERS, INC.
INTERSECTION TURNING MOVEMENT DHV CALCULATIONS

PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: VT 116 / Shelburne Falls Rd / CVU Rd

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 05/20/09
AM/PM?: PM

ENTER DHV ADJ. FACTORS:

DHV		= 1.000
BASE YEAR	2012	= 1.033
FUT. YEAR	2017	= 1.053

(43)	(516)	(138)
[44]	[533]	[143]
{ 45 }	{ 543 }	{ 145 }

KEY

( )	OBSERVED PEAK HOUR VOLUME
[ ]	2012 DHV
{ }	2017 DHV

(18)	[19]	{ 19 }
(135)	[139]	{ 142 }
(178)	[184]	{ 187 }

(58)	[60]	{ 61 }
(107)	[111]	{ 113 }
(26)	[27]	{ 27 }

(74)	(234)	(22)
[76]	[242]	[23]
{ 78 }	{ 246 }	{ 23 }

NORTH

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(555)	(486)	(1007)	(1050)
2012	[573]	[503]	[1041]	[1085]
2017	{ 584 }	{ 511 }	{ 1059 }	{ 1104 }

LAMOUREUX & DICKINSON CONSULTING ENGINEERS, INC.
INTERSECTION TURNING MOVEMENT DHV CALCULATIONS

PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: VT 116 / Farmall Dr / Commerce St

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 06/02/10
AM/PM?: PM

ENTER DHV ADJ. FACTORS:

DHV		= 1.000
BASE YEAR	2012	= 0.967
FUT. YEAR	2017	= 0.985

KEY

( )	OBSERVED PEAK HOUR VOLUME
[ ]	2012 DHV
{ }	2017 DHV

(7)	(637)	(75)
[7]	[616]	[73]
{ 7 }	{ 627 }	{ 74 }

(3)	[3]	{ 3 }
(3)	[3]	{ 3 }
(1)	[1]	{ 1 }

(74)	[72]	{ 73 }
(4)	[4]	{ 4 }
(96)	[93]	{ 95 }

NORTH

(2)	(300)	(77)
[2]	[290]	[74]
{ 2 }	{ 296 }	{ 76 }

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(20)	(329)	(1096)	(1113)
2012	[20]	[319]	[1061]	[1076]
2017	{ 20 }	{ 325 }	{ 1080 }	{ 1097 }

LAMOUREUX & DICKINSON CONSULTING ENGINEERS, INC.
INTERSECTION TURNING MOVEMENT DHV CALCULATIONS

PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: VT 116 / Mechanicsville Rd

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 06/03/10
AM/PM?: PM

ENTER DHV ADJ. FACTORS:

DHV		=	1.000
BASE YEAR	2012	=	1.058
FUT. YEAR	2017	=	1.082

KEY
( ) OBSERVED PEAK HOUR VOLUME
[ ] 2012 DHV
{ } 2017 DHV

( )	(645)	(3)
[0]	[682]	[3]
{ 0 }	{ 698 }	{ 3 }

( )	[0]	{ 0 }
( )	[0]	{ 0 }
( )	[0]	{ 0 }

(8)	[8]	{ 9 }
( )	[0]	{ 0 }
(156)	[165]	{ 169 }

NORTH

( )	(303)	(144)
[0]	[321]	[152]
{ 0 }	{ 328 }	{ 156 }

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(0)	(311)	(959)	(1248)
2012	[0]	[328]	[1014]	[1320]
2017	{ 0 }	{ 337 }	{ 1038 }	{ 1351 }

LAMOUREUX & DICKINSON CONSULTING ENGINEERS, INC.
INTERSECTION TURNING MOVEMENT DHV CALCULATIONS

PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: VT 116 / Charlotte Rd

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 06/02/10
AM/PM?: PM

ENTER DHV ADJ. FACTORS:

DHV		=	1.000
BASE YEAR	2012	=	0.993
FUT. YEAR	2017	=	1.015

(97)	(671)	(84)
[96]	[666]	[83]
{ 98 }	{ 681 }	{ 85 }

KEY

( ) OBSERVED PEAK HOUR VOLUME
[ ] 2012 DHV
{ } 2017 DHV

(83)	[82]	{ 84 }
( )	[0]	{ 0 }
(51)	[51]	{ 52 }

(59)	[59]	{ 60 }
(14)	[14]	{ 14 }
(69)	[69]	{ 70 }

NORTH

(33)	(336)	(22)
[33]	[334]	[22]
{ 33 }	{ 341 }	{ 22 }

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(278)	(248)	(1330)	(1182)
2012	[276]	[247]	[1320]	[1175]
2017	{ 281 }	{ 251 }	{ 1349 }	{ 1199 }

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INTERSECTION TURNING MOVEMENT DHV CALCULATIONS

PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: VT 116 / Silver St

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 05/27/09
AM/PM?: PM

ENTER DHV ADJ. FACTORS:

DHV		=	1.000
BASE YEAR	2012	=	1.082
FUT. YEAR	2017	=	1.101

(331)	(371)	( )
[358]	[401]	[0]
{ 364 }	{ 408 }	{ 0 }

KEY

( ) OBSERVED PEAK HOUR VOLUME
[ ] 2012 DHV
{ } 2017 DHV

(188)	[203]	{ 207 }
( )	[0]	{ 0 }
(6)	[6]	{ 7 }

( )	[0]	{ 0 }
( )	[0]	{ 0 }
( )	[0]	{ 0 }

(14)	(182)	( )
[15]	[197]	[0]
{ 15 }	{ 200 }	{ 0 }

NORTH

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(539)	(0)	(1072)	(573)
2012	[582]	[0]	[1159]	[619]
2017	{ 593 }	{ 0 }	{ 1179 }	{ 630 }

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Project: HINESBURG HANNAFORD
Project No. 10024 Sheet No. 11 of
Calculated by RD Date 2-01-11
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MECHANICSVILLE RD / COMMERCE ST

2008 AADT = 2,600 VPD (BTWN VT 116 + COMMERCE ST)
SOURCE: CCMPO HBRG 11

2012 AADT = 2,600 × 1.01 = 2630 VPD
DHV = 2630 × 0.1127 = 296 VPH
(2630 × 0.1084) + 30 = 315 VPH

2017 AADT = 2,600 × 1.03 = 2,680 VPD
DHV = 2680 × 0.1127 = 302 VPH
(2680 × 0.1084) + 30 = 320 VPH

USE RAW COUNT AS 2010 DHV &
APPLY GROWTH FACTORS:
2010 → 2012 = 1.01
2010 → 2017 = 1.03

LAMOUREUX & DICKINSON CONSULTING ENGINEERS, INC.
INTERSECTION TURNING MOVEMENT DHV CALCULATIONS

PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: Mechanicsville Rd/Commerce St

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 06/03/10
AM/PM?: PM

ENTER DHV ADJ. FACTORS:

DHV		=	1.000
BASE YEAR	2012	=	1.010
FUT. YEAR	2017	=	1.030

KEY

( ) OBSERVED PEAK HOUR VOLUME
[ ] 2012 DHV
{ } 2017 DHV

(57)	(147)	(0)
[58]	[148]	[0]
{ 59 }	{ 151 }	{ 0 }

(94)	[95]	{ 97 }
(7)	[7]	{ 7 }
(18)	[18]	{ 19 }

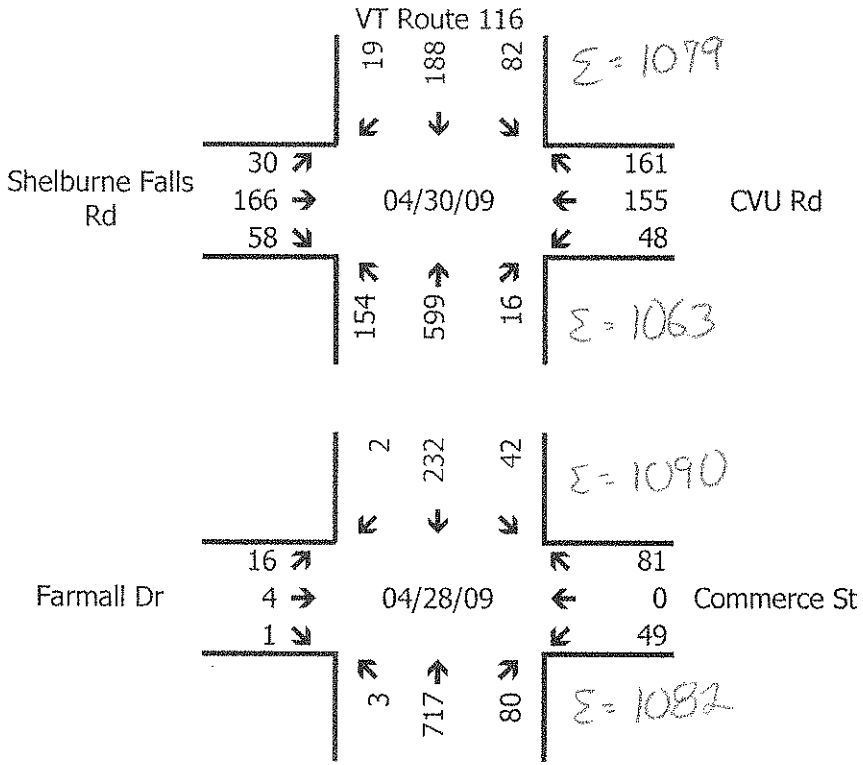
(4)	[4]	{ 4 }
(13)	[13]	{ 13 }
(12)	[12]	{ 12 }

NORTH

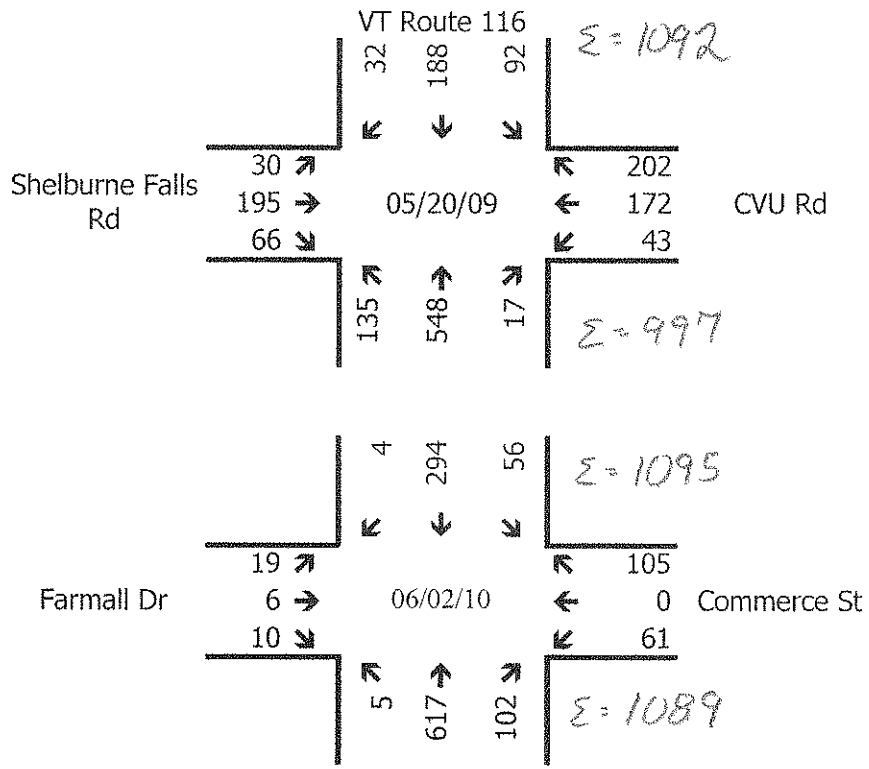
(15)	(138)	(4)
[15]	[139]	[4]
{ 15 }	{ 142 }	{ 4 }

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(204)	(40)	(440)	(334)
2012	[206]	[40]	[444]	[336]
2017	{ 210 }	{ 40 }	{ 453 }	{ 343 }



VTrans Counts



CCMPO Counts

AM PEAK HOUR

CVU RD

2012 DHV

1040/1092 = 0.952

2017 DHV

1060/1092 = 0.971

Commerce St.

2012 DHV

1060/1095 = 0.968

2017 DHV

1080/1095 = 0.986

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RD
2-03-11

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PROJECT / TOWN: Hannaford / Hinesburg
PROJECT #: 10024
INTERSECTION: VT 116 / Shelburne Falls Rd / CVU Rd

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 05/20/09
AM/PM?: AM

ENTER DHV ADJ. FACTORS:

DHV		= 1.000
BASE YEAR	2012	= 0.952
FUT. YEAR	2017	= 0.971

(32)	(188)	(92)
[30]	[179]	[88]
{ 31 }	{ 183 }	{ 89 }

KEY

( )	OBSERVED PEAK HOUR VOLUME
[ ]	2012 DHV
{ }	2017 DHV

(30)	[29]	{ 29 }
(195)	[186]	{ 189 }
(66)	[63]	{ 64 }

(202)	[192]	{ 196 }
(172)	[164]	{ 167 }
(43)	[41]	{ 42 }

NORTH

(135)	(548)	(17)
[129]	[522]	[16]
{ 131 }	{ 532 }	{ 17 }

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(630)	(721)	(1092)	(997)
2012	[601]	[687]	[1040]	[950]
2017	{ 611 }	{ 700 }	{ 1060 }	{ 969 }

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PROJECT #: 10024
INTERSECTION: VT 116 / Farmall Dr / Commerce St

BY: R. Dickinson
CHECKED:

COUNT DAY/DATE: CCMPO 06/02/10
AM/PM?: AM

ENTER DHV ADJ. FACTORS:

DHV		= 1.000
BASE YEAR	2012	= 0.968
FUT. YEAR	2017	= 0.986

KEY

( )	OBSERVED PEAK HOUR VOLUME
[ ]	2012 DHV
{ }	2017 DHV

(4)	(294)	(56)
[4]	[285]	[54]
{ 4 }	{ 290 }	{ 55 }

(19)	[18]	{ 19 }
(6)	[6]	{ 6 }
(10)	[10]	{ 10 }

(105)	[102]	{ 104 }
(0)	[0]	{ 0 }
(61)	[59]	{ 60 }

NORTH

(5)	(617)	(102)
[5]	[597]	[99]
{ 5 }	{ 608 }	{ 101 }

TOTAL APPROACH VOLUMES:

YEAR	WEST	EAST	NORTH	SOUTH
COUNT	(44)	(330)	(1095)	(1089)
2012	[43]	[320]	[1060]	[1055]
2017	{ 44 }	{ 326 }	{ 1080 }	{ 1074 }

Appendix B-1
VT-Based Project Trip Generation & Distribution Calculations

LAMOUREUX & DICKINSON
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TRIP GENERATION & DISTRIBUTION CALCULATIONS

SOURCE: VT TRIP GENERATION MANUAL

PM PEAK HOUR (SEE PG. 2)

ENTER 170
EXIT 156
325 VTE/HR

PRIMARY TRIPS

64% FROM TABLE 5.10 ITE TRIP GENERATION HANDBOOK LUC #850

ENTER 170 × 0.64 = 109
EXIT 156 × 0.64 = 100
209 VTE/HR

TO/FROM	PERCENT	# TRIPS ENTER	# TRIPS EXIT
VT 116N	6%	7	6
VT 116S	24%	26	24
SILVER ST.	12%	13	12
MECHANICSVILLE RD.	18%	20	18
CHARLOTTE RD	22%	24	22
SHELBURNE FALLS RD	12%	13	12
HINESBURG VILLAGE	6%	6	6
		109	100

PASS-BY TRIPS

36% FROM TABLE 5.10 LUC #850

ENTER 170 × 0.36 = 61
EXIT 156 × 0.36 = 56
117 VTE/HR

Supermarket – Chittenden County
(850)

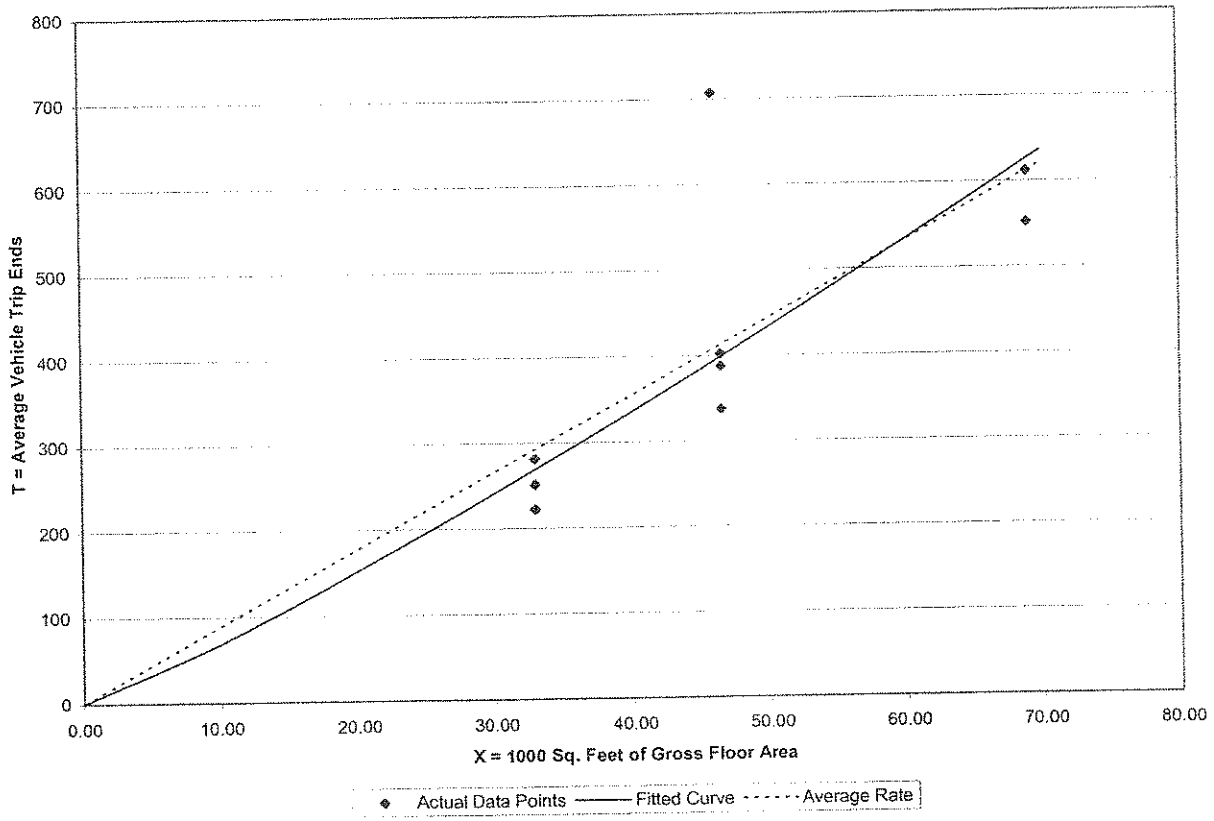
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday**
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Number of Studies 10
Average 1000 Sq. Feet GFA 49.1
Directional Distribution 52% entering; 48% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
8.87	6.73 – 15.37	2.31

Data Plot and Equation 8.87 × 36.783 KSF = 326 VTE/HR



Fitted Curve Equation: Ln(T) = 1.145 Ln(X) + 1.591

$R^2 = 0.713$

< 0.75
USE AVG. RATE

X: 36.783
T = 305 VTE/HR

2-3-11
RD

Table 5.10
Pass-By Trips and Diverted Linked Trips
Weekday, p.m. Peak Period

Land Use 850—Supermarket

SIZE (1,000 SQ. FT. GFA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PRIMARY TRIP (%)	NON-PASS-BY TRIP (%)	DIVERTED LINKED TRIP (%)	PASS-BY TRIP (%)	AVERAGE DAILY TRAFFIC	SOURCE
30	Overland Park, KS	1987	40	4:30–5:30 p.m.	48	—	20	32	n/a	n/a
<25	Chicago suburbs, IL	1987	155	3:00–6:00 p.m.	—	44	—	56	n/a	Kenig, O'Hara, Humes, Flock
<25	Chicago suburbs, IL	1987	191	3:00–6:00 p.m.	—	43	—	57	n/a	Kenig, O'Hara, Humes, Flock
<25	Chicago suburbs, IL	1987	113	3:00–6:00 p.m.	—	44	—	56	n/a	Kenig, O'Hara, Humes, Flock
34	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	29	—	27	44	15,200	University of Nebraska—Lincoln
66	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	30	—	47	23	63,000	University of Nebraska—Lincoln
70	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	30	—	44	26	34,300	University of Nebraska—Lincoln
31	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	36	—	45	19	48,700	University of Nebraska—Lincoln
31	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	40	—	32	28	23,500	University of Nebraska—Lincoln
55	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	35	—	38	27	27,200	University of Nebraska—Lincoln
65	Omaha, NE	n/a	n/a	4:00–6:00 p.m.	25	—	50	25	44,700	University of Nebraska—Lincoln
31	Orlando, FL	1993	440	2:00–6:00 p.m.	—	65	—	35	n/a	TPD Inc.

Average Pass-By Trip Percentage: 36

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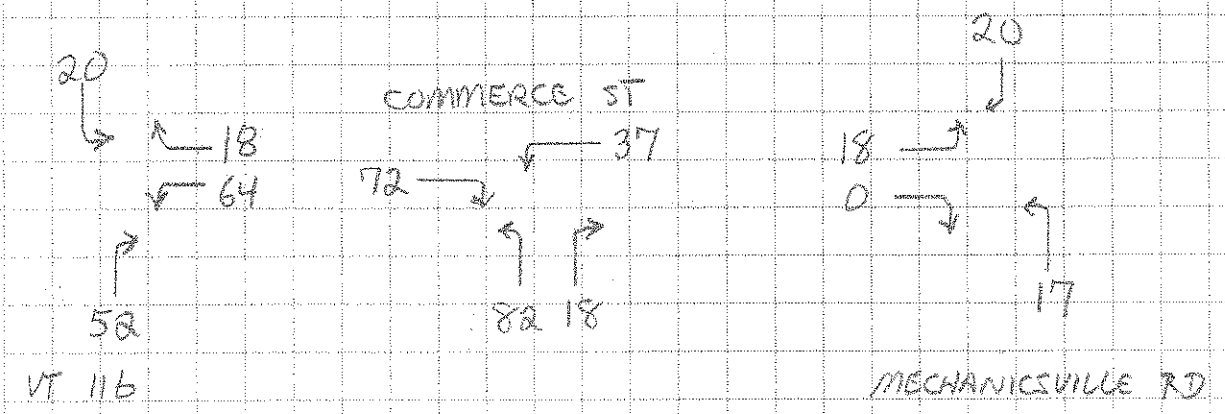
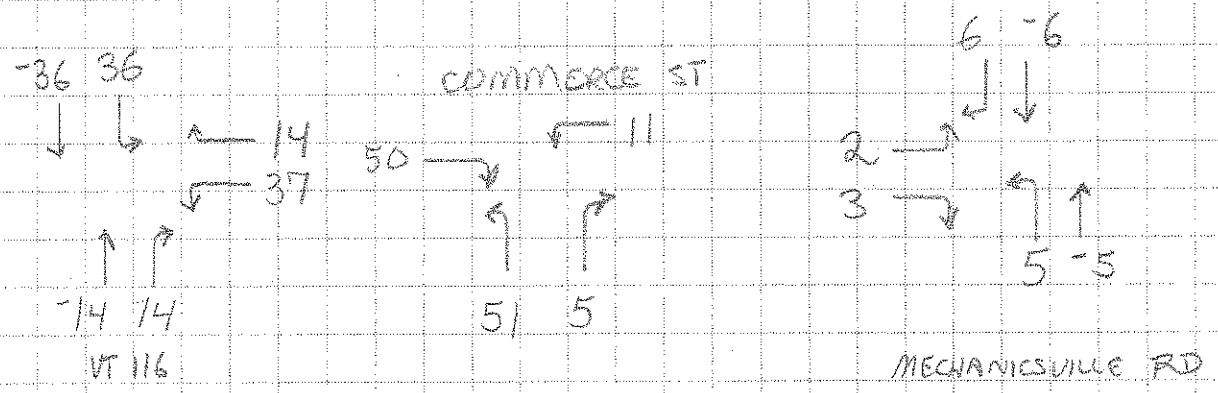
Project
Project No. 10024 Sheet No. ____ of ____
Calculated by R. DICKINSON Date 8-05-11
Checked by ____ Date ____
Scale ____

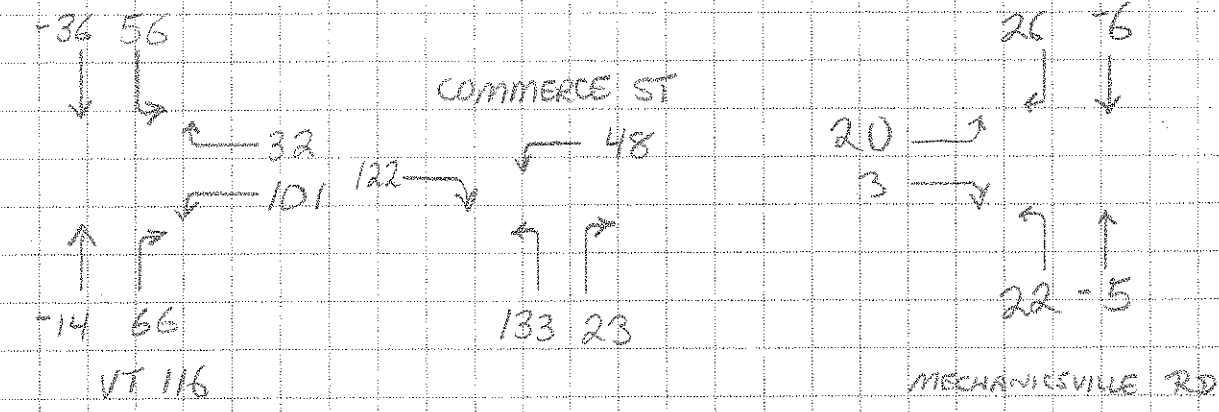
PRIMARY TRIP DISTRIBUTION



PASS-BY TRIP DISTRIBUTION



TOTALS



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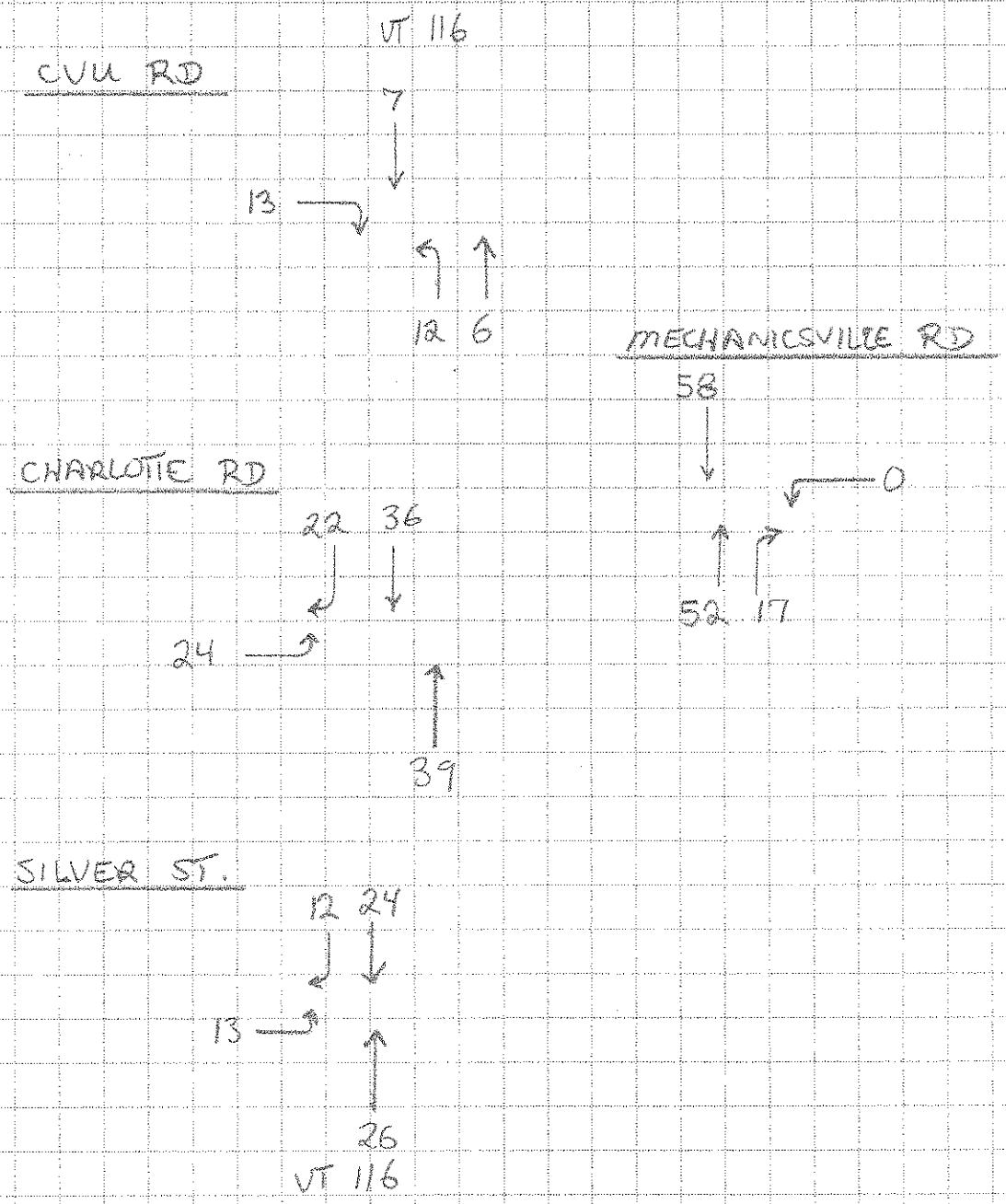
PRIMARY TRIP DISTRIBUTION (CONT.)



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AM PEAK HOUR TRIP GENERATION & DISTRIBUTION CALCULATIONS

AM PEAK HOUR TRIPS (VT RATE SCENARIO)

REDUCE ITE RATE BY 16% (326/386)

ENTER	68
EXIT	43
	111 VTE/HR

PRIMARY TRIPS

USE 64% FROM PM PEAK HOUR

TO/FROM	PERCENT	# TRIPS ENTER	# TRIPS EXIT
VT 116 N	18%	8	5
VT 116 S	64%	28	18
MECH'VILLE RD	18%	8	5
		44	28

Σ = 72 VTE/HR

PASS-BY TRIPS

USE 36% FROM PM PEAK HOUR
(CONSERVATIVE - ACTUAL AM PEAK HOUR DIVERSION EXPECTED TO BE HIGHER)

ENTER	24
EXIT	15
	39 VTE/HR

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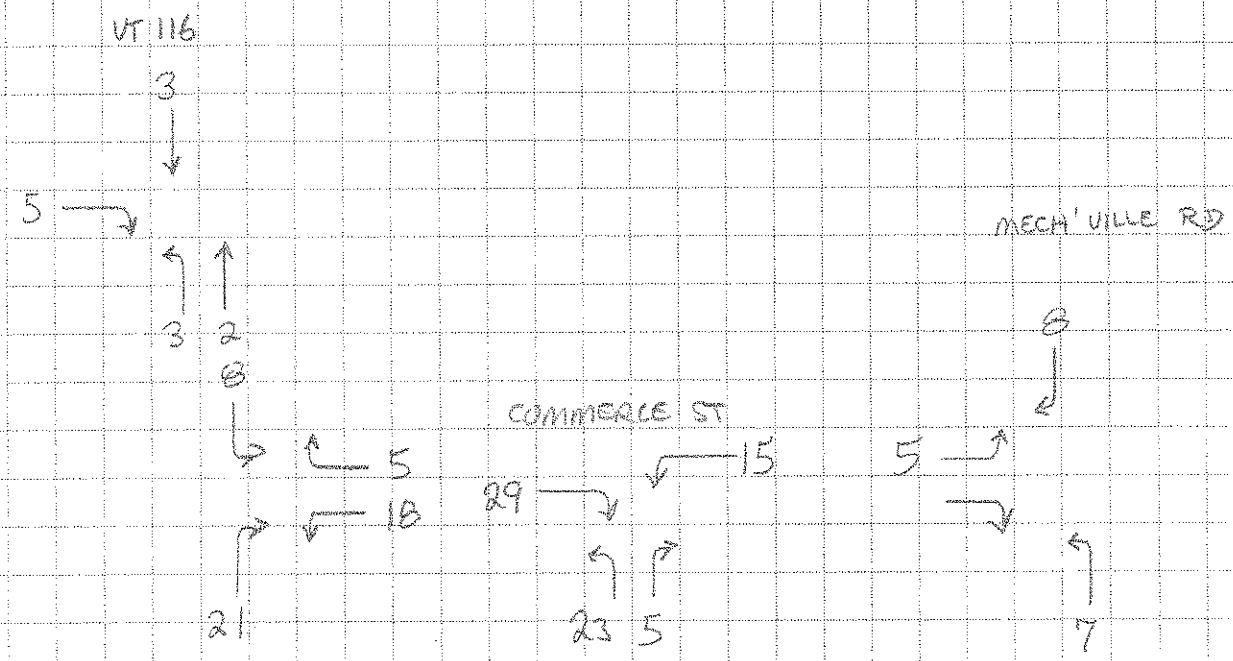
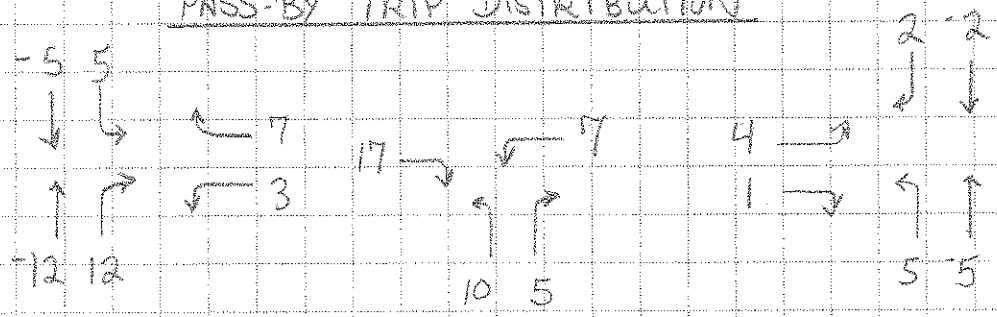
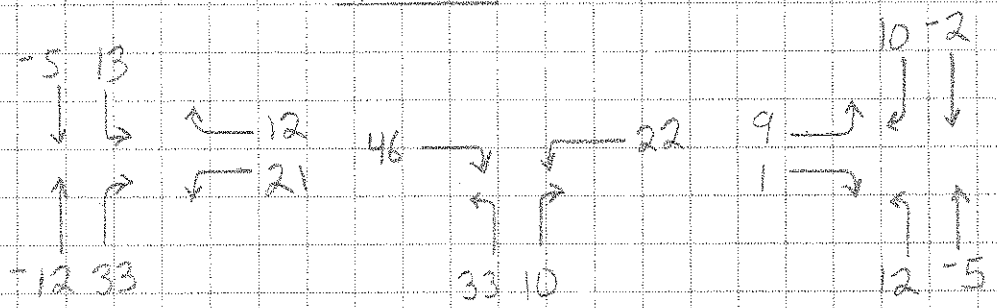
AM PEAK HOUR
PRIMARY TRIP DISTRIBUTION



PASS-BY TRIP DISTRIBUTION



TOTAL



Appendix B-2
ITE-Based Project Trip Generation & Distribution Calculations

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TRIP GENERATION & DISTRIBUTION CALCULATIONS
SOURCE: ITE TRIP GENERATION 8th ED. LUC #850

PM PEAK HOUR
(SEE PG 2)

ENTER	197
EXIT	189
	386 VTE/HR

AVG. RATE IS USED INSTEAD OF EQUATION DUE TO EQUATION $R^2 < 0.75$
(ITE TRIP GENERATION HANDBOOK, 2nd ED.)

PRIMARY TRIPS
64% FROM TABLE 5.10 ITE TRIP GENERATION HANDBOOK, LUC #850

ENTER	197 × 0.64 =	126
EXIT	189 × 0.64 =	121
		247 VTE/HR

TO/FROM	PERCENT	# TRIPS ENTER	# TRIPS EXIT
VT 116N	6%	8	7
VT 116S	24%	30	29
SILVER ST.	12%	15	14
MECHANICSVILLE RD	18%	23	22
CHARLOTTE RD	22%	28	27
SHELBURNE FALLS RD	12%	15	15
HINESBURG VILLAGE	6%	7	7
		126	121

PASS-BY TRIPS
36% FROM TABLE 5.10

ENTER	197 × 0.36 =	71
EXIT	189 × 0.36 =	68
		139 VTE/HR

(2)

Supermarket
(850)

Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

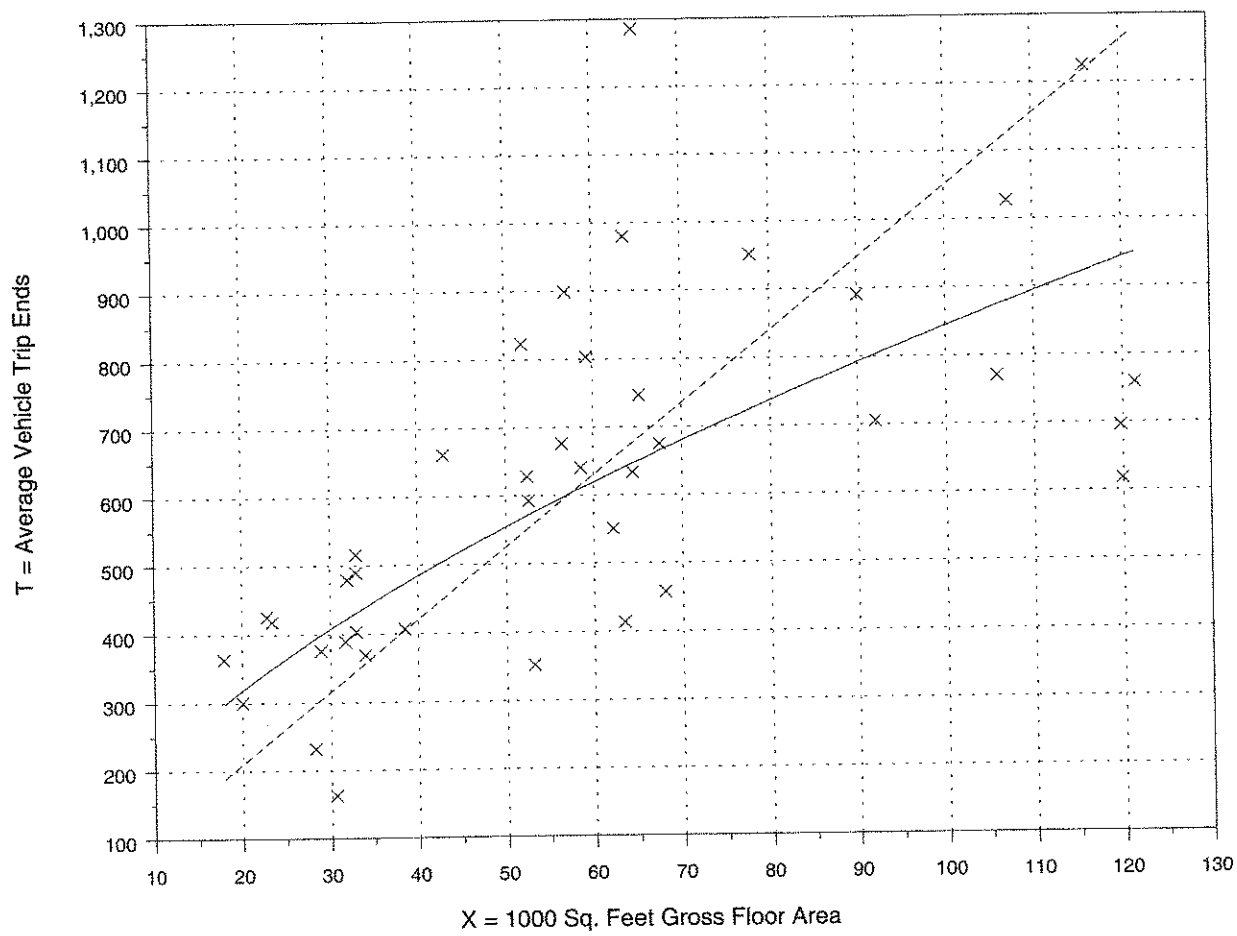
Number of Studies: 40
Average 1000 Sq. Feet GFA: 59
Directional Distribution: 51% entering, 49% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
10.50	5.15 - 20.29	4.97

10.50 × 36.783 = 386 VTE/HR (197 IN, 189 OUT)

Data Plot and Equation



X = 36.783
T = 468 VTE/HR

Fitted Curve Equation: Ln(T) = 0.61 Ln(X) + 3.95

R^2 = 0.52 <0.75

USE AVG. RATE

2-17-11
RD

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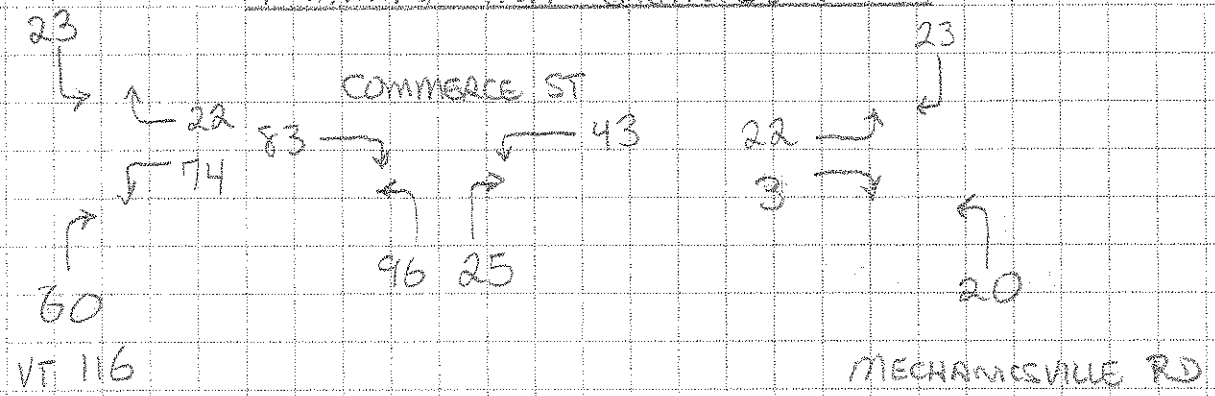
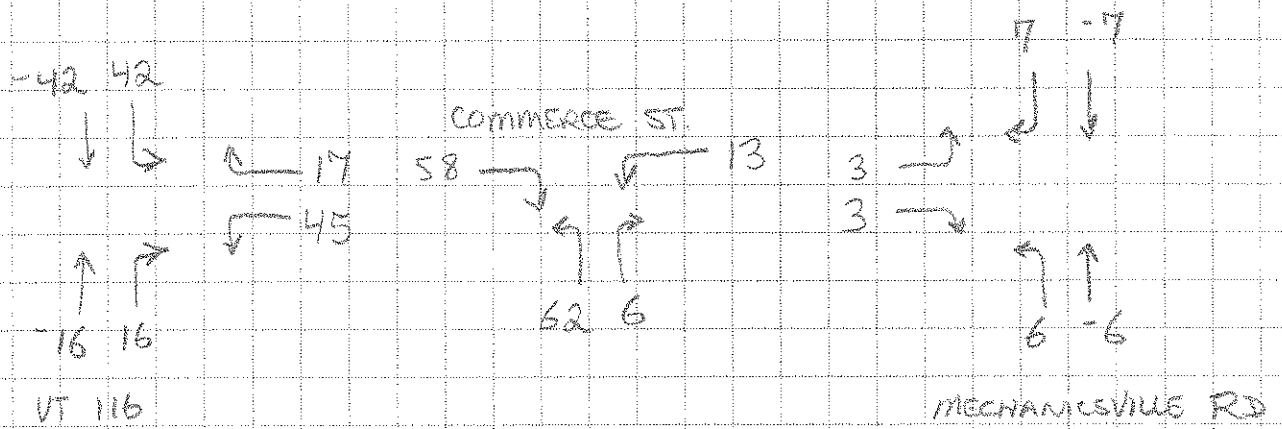
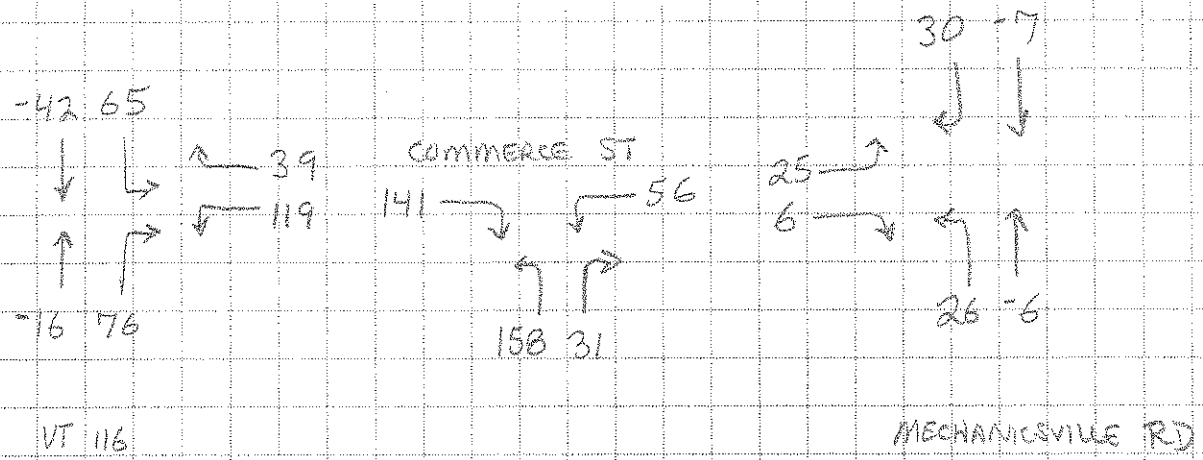
PRIMARY TRIP DISTRIBUTION



PASS-BY TRIP DISTRIBUTION



TOTALS



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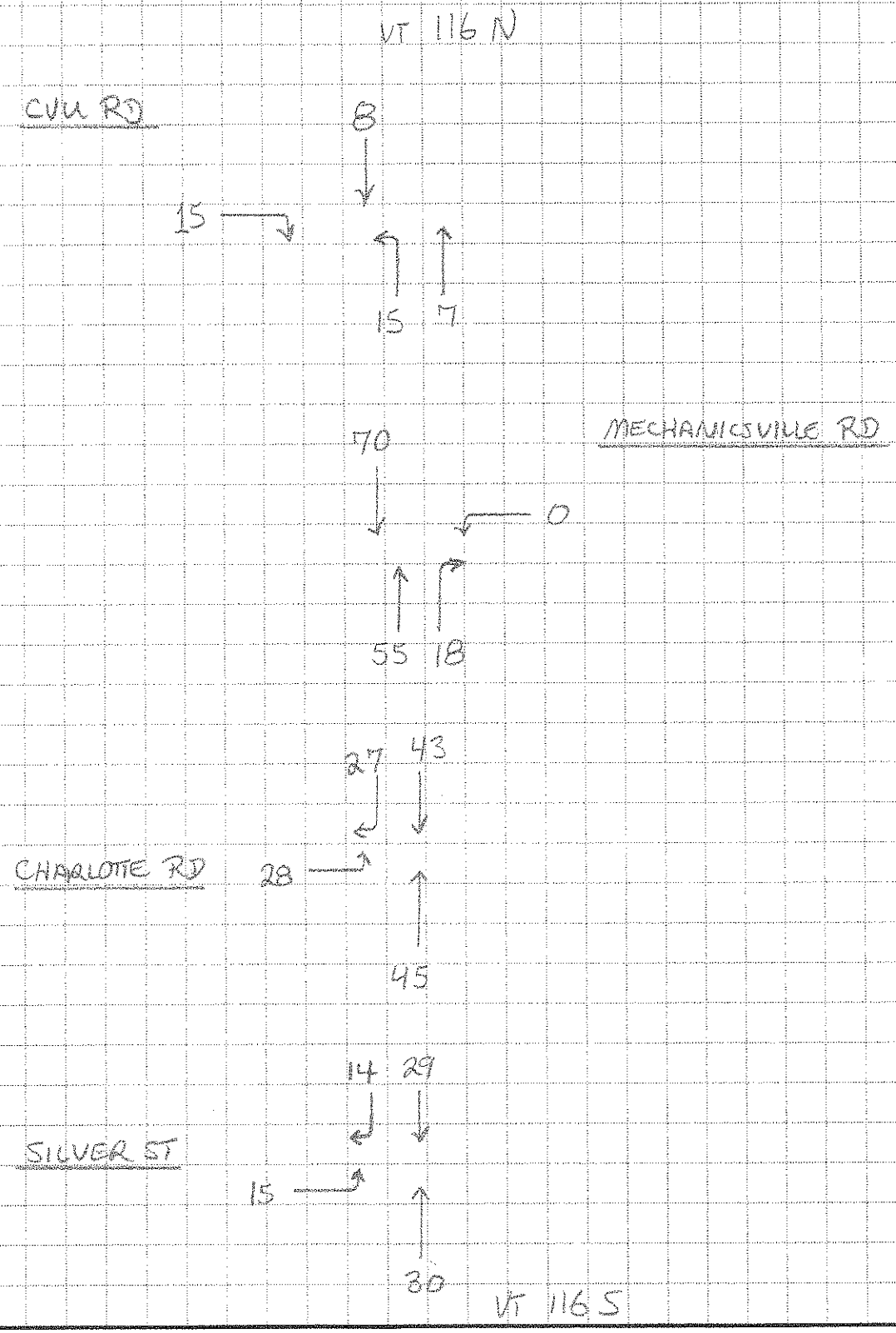
PRIMARY TRIP DISTRIBUTION (CONT.)



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AM PEAK HOUR TRIP GENERATION
& DISTRIBUTION CALCULATIONS

AM PEAK HOUR (SEE PG 6)

ENTER	81
EXIT	51
	132 VTE/HR

PRIMARY TRIPS
USE 64% FROM PM PEAK HOUR

TO/FROM	PERCENT	# TRIPS ENTER	# TRIPS EXIT
VT 116N	18%	9	6
VT 116S	64%	33	21
MECH'VILLE RD	18%	9	6
		51	33

Σ = 84 VTE/HR

PASS-BY TRIPS
USE 36% FROM PM PEAK HOUR
(CONSERVATIVE - ACTUAL AM PEAK HOUR EXPECTED TO BE GREATER)

ENTER	30
EXIT	18
	48 VTE/HR

Supermarket
(850)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 5
Average 1000 Sq. Feet GFA: 30
Directional Distribution: 61% entering, 39% exiting

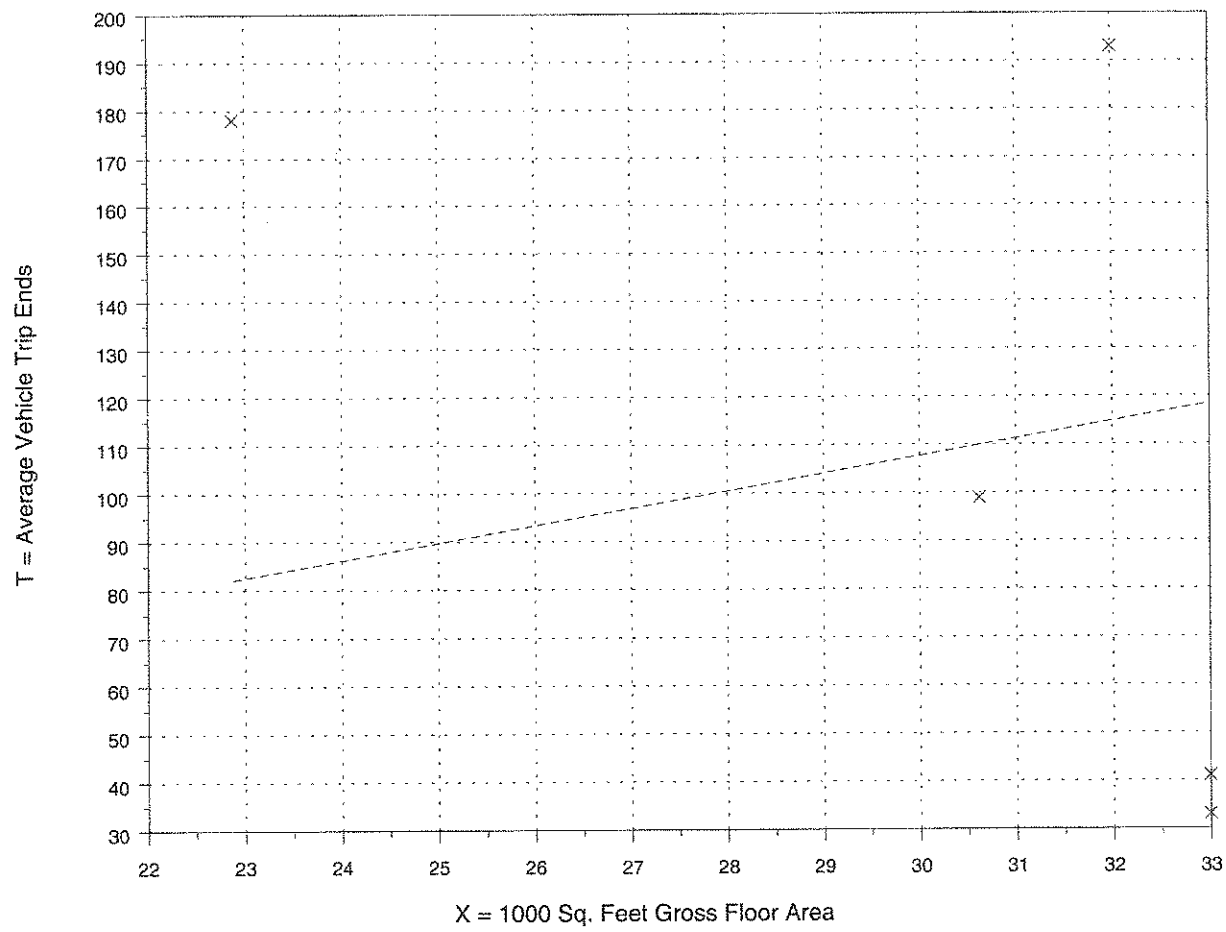
Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
3.59	1.00 - 7.78	3.18

3.59 × 36.783 KSF = 132 VTE/HR (81 IN, 51 OUT)

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



× **Actual Data Points**

------ **Average Rate**

Fitted Curve Equation: Not given

R^2 = ****

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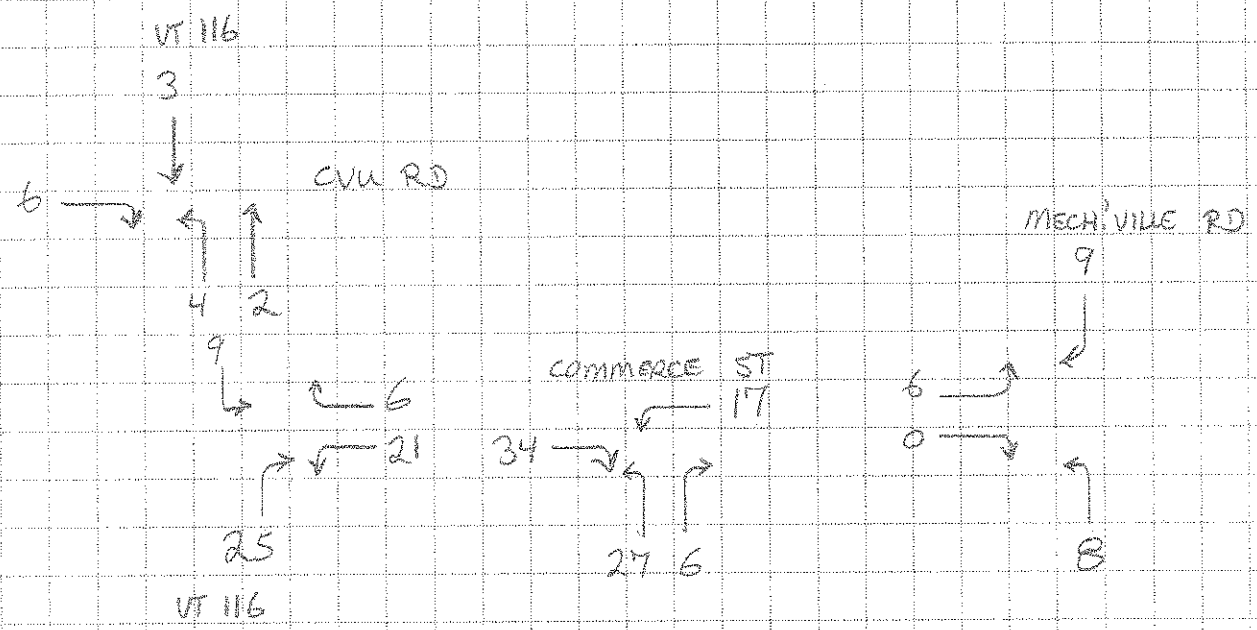
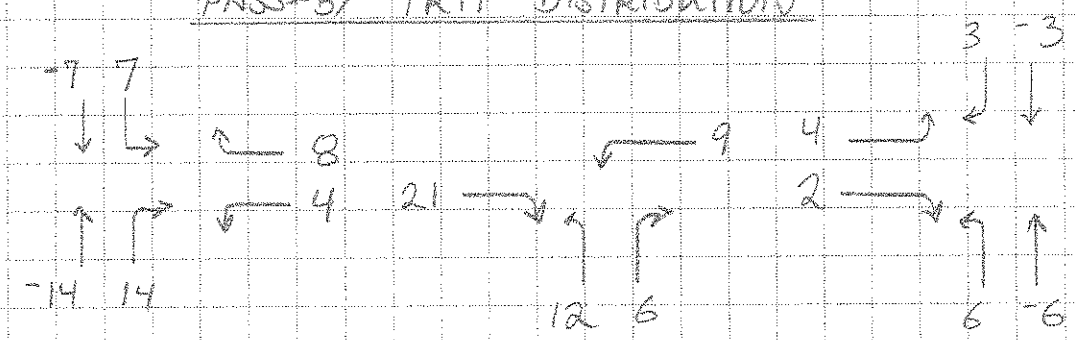
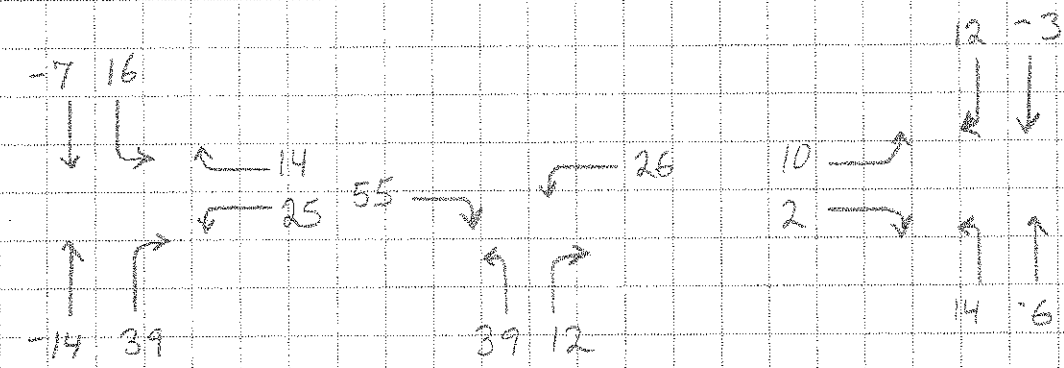
AM PEAK HOUR
PRIMARY TRIP DISTRIBUTION



PASS-BY TRIP DISTRIBUTION



TOTAL



Appendix C
VT Route 116 & CVU Rd
Capacity Analyses

3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			0.99			0.98	
Flt Protected		1.00			0.99			0.99			0.99	
Satd. Flow (prot)		1696			1794			1787			1781	
Flt Permitted		0.96			0.85			0.72			0.85	
Satd. Flow (perm)		1632			1530			1304			1530	
Volume (vph)	39	143	236	27	115	60	110	242	23	143	513	82
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	143	236	27	115	60	110	242	23	143	513	82
RTOR Reduction (vph)	0	81	0	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	337	0	0	176	0	0	371	0	0	731	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.5			13.5			34.5			34.5	
Effective Green, g (s)		15.5			15.5			36.5			36.5	
Actuated g/C Ratio		0.26			0.26			0.61			0.61	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		422			395			793			931	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.12			0.28			c0.48	
v/c Ratio		0.80			0.45			0.47			0.79	
Uniform Delay, d1		20.8			18.6			6.4			8.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		10.2			0.3			2.0			6.9	
Delay (s)		31.0			18.9			8.4			15.7	
Level of Service		C			B			A			B	
Approach Delay (s)		31.0			18.9			8.4			15.7	
Approach LOS		C			B			A			B	

Intersection Summary

HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

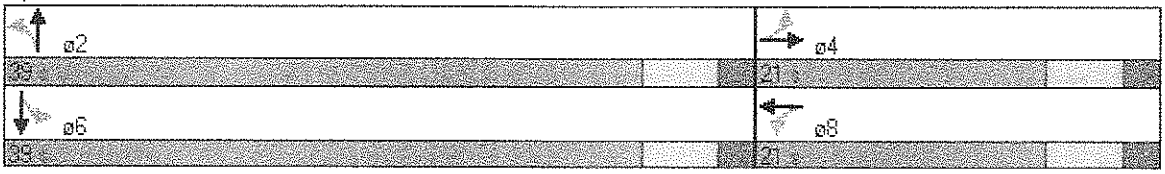
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	39	143	27	115	110	242	143	513
Lane Group Flow (vph)	0	418	0	202	0	375	0	738
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.83		0.46		0.47		0.78
Control Delay		33.1		18.6		9.3		17.9
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		33.1		18.6		9.3		17.9
Queue Length 50th (ft)		101		48		68		182
Queue Length 95th (ft)		#289		116		155		#494
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		541		476		792		941
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.77		0.42		0.47		0.78

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



VT

3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			0.99			0.99	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		1693			1794			1787			1781	
Flt Permitted		0.96			0.84			0.70			0.85	
Satd. Flow (perm)		1632			1524			1265			1524	
Volume (vph)	39	143	249	27	115	60	122	248	23	143	520	82
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	143	249	27	115	60	122	248	23	143	520	82
RTOR Reduction (vph)	0	85	0	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	346	0	0	176	0	0	389	0	0	738	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7			34.3			34.3	
Effective Green, g (s)		15.7			15.7			36.3			36.3	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		427			399			765			922	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.12			0.31			c0.48	
v/c Ratio		0.81			0.44			0.51			0.80	
Uniform Delay, d1		20.8			18.5			6.8			9.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.5			0.3			2.4			7.7	
Delay (s)		32.2			18.8			9.2			16.7	
Level of Service		C			B			A			B	
Approach Delay (s)		32.2			18.8			9.2			16.7	
Approach LOS		C			B			A			B	

Intersection Summary

HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

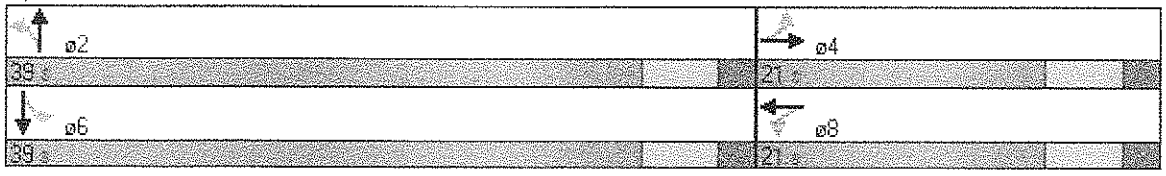
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	39	143	27	115	122	248	143	520
Lane Group Flow (vph)	0	431	0	202	0	393	0	745
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.84		0.46		0.51		0.80
Control Delay		34.3		18.6		10.1		18.7
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		34.3		18.6		10.1		18.7
Queue Length 50th (ft)		104		48		73		185
Queue Length 95th (ft)		#300		116		173		#502
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		545		473		764		935
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.79		0.43		0.51		0.80

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



ITE

3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			0.99			0.99	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		1692			1794			1787			1781	
Flt Permitted		0.96			0.84			0.69			0.85	
Satd. Flow (perm)		1632			1521			1256			1523	
Volume (vph)	39	143	251	27	115	60	125	249	23	143	521	82
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	143	251	27	115	60	125	249	23	143	521	82
RTOR Reduction (vph)	0	85	0	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	348	0	0	176	0	0	393	0	0	739	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7			34.3			34.3	
Effective Green, g (s)		15.7			15.7			36.3			36.3	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		427			398			760			921	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.12			0.31			c0.49	
v/c Ratio		0.82			0.44			0.52			0.80	
Uniform Delay, d1		20.8			18.5			6.8			9.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.8			0.3			2.5			7.8	
Delay (s)		32.6			18.8			9.4			16.9	
Level of Service		C			B			A			B	
Approach Delay (s)		32.6			18.8			9.4			16.9	
Approach LOS		C			B			A			B	

Intersection Summary

HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

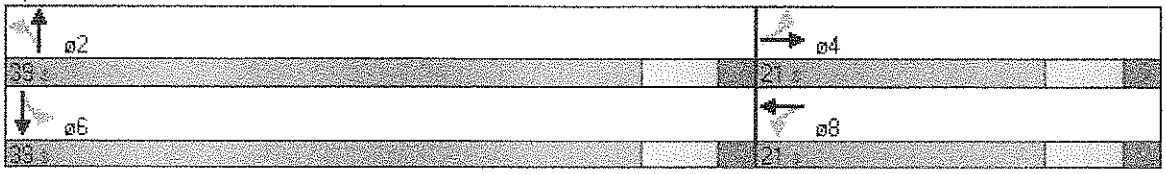
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	39	143	27	115	125	249	143	521
Lane Group Flow (vph)	0	433	0	202	0	397	0	746
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.84		0.46		0.52		0.80
Control Delay		34.7		18.6		10.4		18.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		34.7		18.6		10.4		18.8
Queue Length 50th (ft)		105		48		75		186
Queue Length 95th (ft)		#301		116		177		#503
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		545		472		757		935
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.79		0.43		0.52		0.80

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			0.99			0.99	
Flt Protected		1.00			0.99			0.99			0.99	
Satd. Flow (prot)		1696			1794			1787			1781	
Flt Permitted		0.96			0.85			0.71			0.85	
Satd. Flow (perm)		1634			1535			1294			1527	
Volume (vph)	39	146	239	27	117	61	112	246	23	145	523	83
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	146	239	27	117	61	112	246	23	145	523	83
RTOR Reduction (vph)	0	80	0	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	344	0	0	179	0	0	377	0	0	744	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7			34.3			34.3	
Effective Green, g (s)		15.7			15.7			36.3			36.3	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		428			402			783			924	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.12			0.29			c0.49	
v/c Ratio		0.80			0.45			0.48			0.81	
Uniform Delay, d1		20.7			18.5			6.6			9.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		10.7			0.3			2.1			7.9	
Delay (s)		31.5			18.8			8.7			17.0	
Level of Service		C			B			A			B	
Approach Delay (s)		31.5			18.8			8.7			17.0	
Approach LOS		C			B			A			B	

Intersection Summary

HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

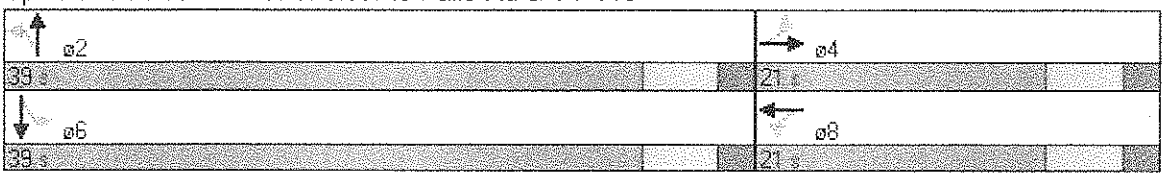
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	39	146	27	117	112	246	145	523
Lane Group Flow (vph)	0	424	0	205	0	381	0	751
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.84		0.46		0.49		0.80
Control Delay		34.1		18.7		9.6		19.0
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		34.1		18.7		9.6		19.0
Queue Length 50th (ft)		104		49		69		188
Queue Length 95th (ft)		#296		118		160		#507
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		540		475		783		936
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.79		0.43		0.49		0.80

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

VT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			0.99			0.99	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		1693			1794			1787			1781	
Flt Permitted		0.96			0.84			0.69			0.85	
Satd. Flow (perm)		1633			1524			1255			1525	
Volume (vph)	39	146	252	27	117	61	124	252	23	145	530	83
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	146	252	27	117	61	124	252	23	145	530	83
RTOR Reduction (vph)	0	84	0	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	353	0	0	179	0	0	395	0	0	751	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.8			13.8			34.2			34.2	
Effective Green, g (s)		15.8			15.8			36.2			36.2	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		430			401			757			920	
v/s Ratio Prot												
v/s Ratio Perm		c0.22			0.12			0.32			c0.49	
v/c Ratio		0.82			0.45			0.52			0.82	
Uniform Delay, d1		20.8			18.5			6.9			9.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		12.5			0.3			2.6			8.5	
Delay (s)		33.3			18.7			9.5			17.8	
Level of Service		C			B			A			B	
Approach Delay (s)		33.3			18.7			9.5			17.8	
Approach LOS		C			B			A			B	

Intersection Summary

HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

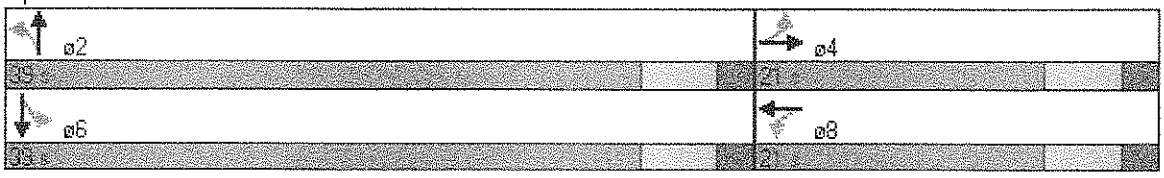
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	39	146	27	117	124	252	145	530
Lane Group Flow (vph)	0	437	0	205	0	399	0	758
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.85		0.46		0.53		0.82
Control Delay		35.4		18.7		10.5		19.9
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		35.4		18.7		10.5		19.9
Queue Length 50th (ft)		107		49		75		192
Queue Length 95th (ft)		#306		118		179		#515
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		544		472		755		930
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.80		0.43		0.53		0.82

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

ITE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			0.99			0.99	
Flt Protected		1.00			0.99			0.98			0.99	
Satd. Flow (prot)		1693			1794			1787			1781	
Flt Permitted		0.96			0.85			0.69			0.85	
Satd. Flow (perm)		1633			1526			1244			1526	
Volume (vph)	39	146	254	27	117	61	127	253	23	145	531	83
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	146	254	27	117	61	127	253	23	145	531	83
RTOR Reduction (vph)	0	85	0	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	354	0	0	179	0	0	399	0	0	752	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.9			13.9			34.1			34.1	
Effective Green, g (s)		15.9			15.9			36.1			36.1	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		433			404			748			918	
v/s Ratio Prot												
v/s Ratio Perm		c0.22			0.12			0.32			c0.49	
v/c Ratio		0.82			0.44			0.53			0.82	
Uniform Delay, d1		20.7			18.4			7.0			9.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.9			0.3			2.7			8.6	
Delay (s)		32.6			18.7			9.8			18.0	
Level of Service		C			B			A			B	
Approach Delay (s)		32.6			18.7			9.8			18.0	
Approach LOS		C			B			A			B	

Intersection Summary

HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	60		

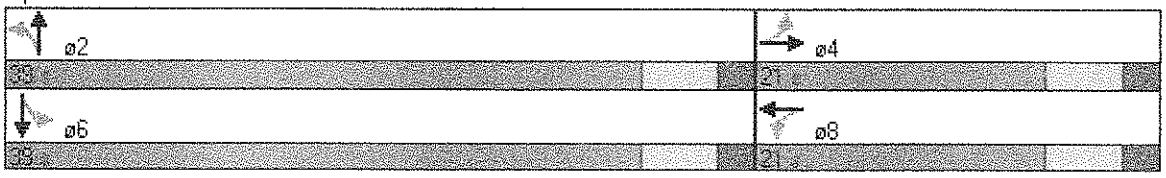
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	39	146	27	117	127	253	145	531
Lane Group Flow (vph)	0	439	0	205	0	403	0	759
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.85		0.46		0.54		0.82
Control Delay		35.4		18.7		10.7		20.1
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		35.4		18.7		10.7		20.1
Queue Length 50th (ft)		107		49		77		193
Queue Length 95th (ft)		#308		118		183		#516
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		545		471		748		929
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.81		0.44		0.54		0.82

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.94			1.00			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1742			1737			1797			1776	
Flt Permitted		0.90			0.94			0.82			0.70	
Satd. Flow (perm)		1576			1636			1483			1265	
Volume (vph)	34	213	77	41	199	192	163	544	16	88	189	37
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	213	77	41	199	192	163	544	16	88	189	37
RTOR Reduction (vph)	0	16	0	0	41	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	308	0	0	391	0	0	722	0	0	307	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.8			15.8			31.5			20.7	
Effective Green, g (s)		17.8			17.8			33.5			22.7	
Actuated g/C Ratio		0.30			0.30			0.56			0.38	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		473			491			874			484	
v/s Ratio Prot								c0.09				
v/s Ratio Perm		0.20			c0.24			c0.37			0.24	
v/c Ratio		0.65			0.80			0.83			0.63	
Uniform Delay, d1		18.0			19.1			10.5			14.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			8.7			6.5			2.0	
Delay (s)		20.5			27.7			17.0			16.9	
Level of Service		C			C			B			B	
Approach Delay (s)		20.5			27.7			17.0			16.9	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

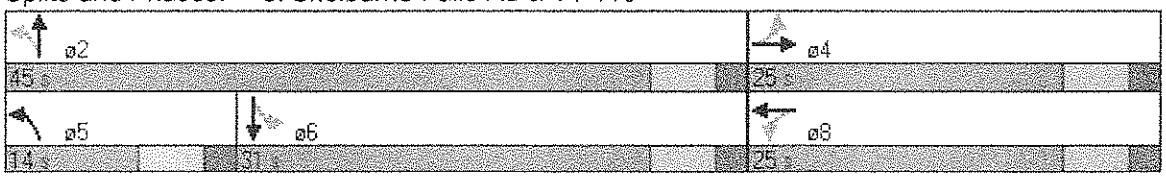
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	213	41	199	163	544	88	189
Lane Group Flow (vph)	0	324	0	432	0	723	0	314
Turn Type	Perm		Perm		pm+pt		Perm	
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	14.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	14.0	45.0	31.0	31.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	20.0%	64.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.67		0.82		0.84		0.65
Control Delay		26.9		34.7		22.5		22.1
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		26.9		34.7		22.5		22.1
Queue Length 50th (ft)		110		145		192		93
Queue Length 95th (ft)		#263		#362		#548		202
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		547		593		937		566
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.59		0.73		0.77		0.55

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 60.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

VT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.94			1.00			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1740			1737			1797			1777	
Flt Permitted		0.90			0.94			0.81			0.70	
Satd. Flow (perm)		1574			1632			1475			1267	
Volume (vph)	34	213	82	41	199	192	166	546	16	88	192	37
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	213	82	41	199	192	166	546	16	88	192	37
RTOR Reduction (vph)	0	17	0	0	41	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	312	0	0	391	0	0	727	0	0	310	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.9			15.9			32.0			21.2	
Effective Green, g (s)		17.9			17.9			34.0			23.2	
Actuated g/C Ratio		0.30			0.30			0.57			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		470			488			874			491	
v/s Ratio Prot								c0.09				
v/s Ratio Perm		0.20			c0.24			c0.38			0.24	
v/c Ratio		0.66			0.80			0.83			0.63	
Uniform Delay, d1		18.4			19.4			10.6			14.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.8			9.2			6.9			2.0	
Delay (s)		21.1			28.6			17.5			16.9	
Level of Service		C			C			B			B	
Approach Delay (s)		21.1			28.6			17.5			16.9	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

3: Shelburne Falls Rd & VT 116

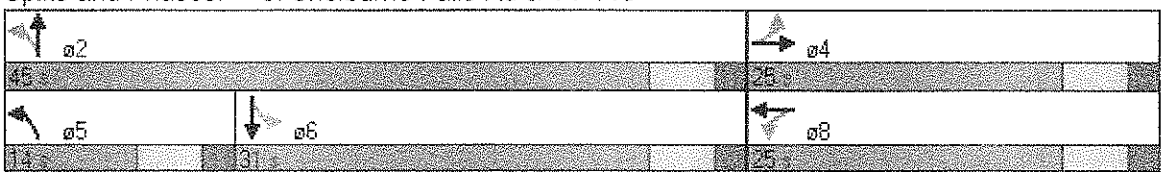
VT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	213	41	199	166	546	88	192
Lane Group Flow (vph)	0	329	0	432	0	728	0	317
Turn Type	Perm		Perm		pm+pt		Perm	
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	14.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	14.0	45.0	31.0	31.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	20.0%	64.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.68		0.82		0.84		0.65
Control Delay		27.6		35.4		23.2		22.1
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		27.6		35.4		23.2		22.1
Queue Length 50th (ft)		114		148		195		94
Queue Length 95th (ft)		#268		#362		#555		205
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		545		589		931		568
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.60		0.73		0.78		0.56

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 60.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

ITE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.94			1.00			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1739			1737			1797			1777	
Flt Permitted		0.91			0.94			0.81			0.70	
Satd. Flow (perm)		1582			1636			1469			1265	
Volume (vph)	34	213	83	41	199	192	167	546	16	88	192	37
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	213	83	41	199	192	167	546	16	88	192	37
RTOR Reduction (vph)	0	17	0	0	42	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	313	0	0	390	0	0	728	0	0	310	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.2			16.2			31.6			20.8	
Effective Green, g (s)		18.2			18.2			33.6			22.8	
Actuated g/C Ratio		0.30			0.30			0.56			0.38	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		481			498			863			482	
v/s Ratio Prot								c0.10				
v/s Ratio Perm		0.20			c0.24			c0.38			0.25	
v/c Ratio		0.65			0.78			0.84			0.64	
Uniform Delay, d1		18.0			19.0			10.9			15.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.3			7.7			7.8			2.2	
Delay (s)		20.3			26.7			18.7			17.4	
Level of Service		C			C			B			B	
Approach Delay (s)		20.3			26.7			18.7			17.4	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	59.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

3: Shelburne Falls Rd & VT 116

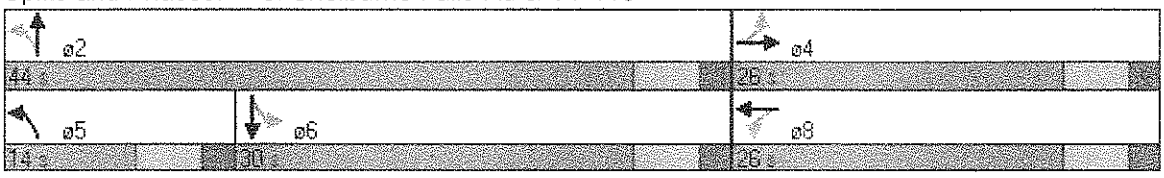
ITE

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	213	41	199	167	546	88	192
Lane Group Flow (vph)	0	330	0	432	0	729	0	317
Turn Type	Perm		Perm		pm+pt		Perm	
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	14.0	21.0	21.0	21.0
Total Split (s)	26.0	26.0	26.0	26.0	14.0	44.0	30.0	30.0
Total Split (%)	37.1%	37.1%	37.1%	37.1%	20.0%	62.9%	42.9%	42.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.66		0.80		0.86		0.66
Control Delay		25.9		32.5		25.5		23.2
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		25.9		32.5		25.5		23.2
Queue Length 50th (ft)		111		144		204		97
Queue Length 95th (ft)		#255		#350		#571		212
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		572		612		911		551
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.58		0.71		0.80		0.58

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 60.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.94			1.00			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1742			1736			1797			1776	
Flt Permitted		0.90			0.94			0.81			0.70	
Satd. Flow (perm)		1574			1632			1477			1261	
Volume (vph)	34	216	78	42	202	196	165	554	17	89	193	38
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	216	78	42	202	196	165	554	17	89	193	38
RTOR Reduction (vph)	0	16	0	0	41	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	312	0	0	399	0	0	735	0	0	313	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.3			16.3			32.3			21.5	
Effective Green, g (s)		18.3			18.3			34.3			23.5	
Actuated g/C Ratio		0.30			0.30			0.57			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		475			493			872			489	
v/s Ratio Prot								c0.09				
v/s Ratio Perm		0.20			c0.24			c0.38			0.25	
v/c Ratio		0.66			0.81			0.84			0.64	
Uniform Delay, d1		18.4			19.5			10.9			15.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			9.6			7.7			2.2	
Delay (s)		20.9			29.2			18.6			17.3	
Level of Service		C			C			B			B	
Approach Delay (s)		20.9			29.2			18.6			17.3	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

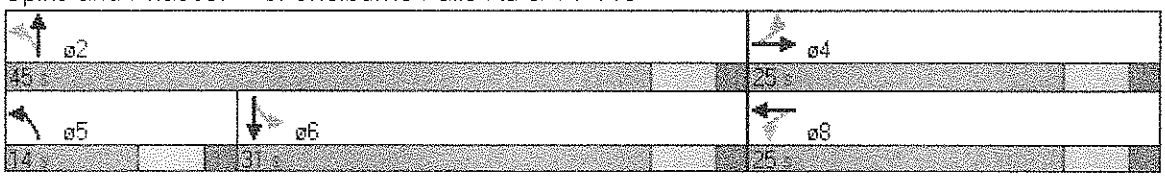
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	216	42	202	165	554	89	193
Lane Group Flow (vph)	0	328	0	440	0	736	0	320
Turn Type	Perm		Perm		pm+pt		Perm	
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	14.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	14.0	45.0	31.0	31.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	20.0%	64.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.68		0.83		0.85		0.66
Control Delay		27.6		36.6		24.2		22.4
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		27.6		36.6		24.2		22.4
Queue Length 50th (ft)		114		153		199		96
Queue Length 95th (ft)		#269		#372		#564		209
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		540		585		928		562
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.61		0.75		0.79		0.57

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 61.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



VT

3: Shelburne Falls Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.94			1.00			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1740			1736			1797			1777	
Flt Permitted		0.90			0.93			0.81			0.70	
Satd. Flow (perm)		1572			1628			1469			1263	
Volume (vph)	34	216	83	42	202	196	168	556	17	89	196	38
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	216	83	42	202	196	168	556	17	89	196	38
RTOR Reduction (vph)	0	17	0	0	41	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	316	0	0	399	0	0	740	0	0	316	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.3			16.3			32.5			21.8	
Effective Green, g (s)		18.3			18.3			34.5			23.8	
Actuated g/C Ratio		0.30			0.30			0.57			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		473			490			870			494	
v/s Ratio Prot								c0.09				
v/s Ratio Perm		0.20			c0.24			c0.39			0.25	
v/c Ratio		0.67			0.81			0.85			0.64	
Uniform Delay, d1		18.6			19.7			11.0			15.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.8			10.3			8.3			2.1	
Delay (s)		21.4			29.9			19.3			17.2	
Level of Service		C			C			B			B	
Approach Delay (s)		21.4			29.9			19.3			17.2	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

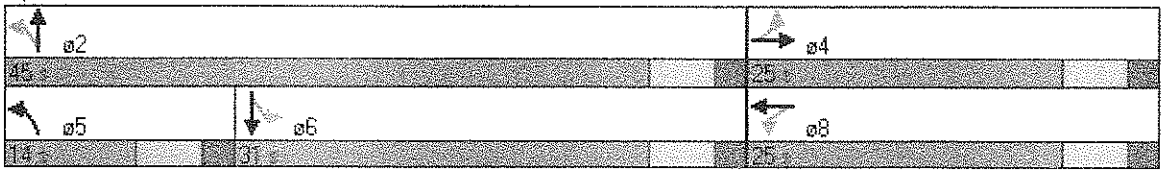
3: Shelburne Falls Rd & VT 116

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	216	42	202	168	556	89	196
Lane Group Flow (vph)	0	333	0	440	0	741	0	323
Turn Type	Perm		Perm		pm+pt		Perm	
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	14.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	14.0	45.0	31.0	31.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	20.0%	64.3%	44.3%	44.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.69		0.83		0.86		0.66
Control Delay		28.1		36.9		25.3		22.4
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		28.1		36.9		25.3		22.4
Queue Length 50th (ft)		116		153		201		97
Queue Length 95th (ft)		#274		#373		#572		211
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		538		582		922		562
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.62		0.76		0.80		0.57

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 61.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



3: Shelburne Falls Rd & VT 116

ITE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.94			1.00			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1739			1736			1796			1777	
Flt Permitted		0.90			0.93			0.81			0.70	
Satd. Flow (perm)		1578			1631			1463			1260	
Volume (vph)	34	216	84	42	202	196	169	556	17	89	196	38
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	216	84	42	202	196	169	556	17	89	196	38
RTOR Reduction (vph)	0	17	0	0	42	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	317	0	0	398	0	0	741	0	0	316	0
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm			Perm			pm+pt			Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.5			16.5			32.2			21.4	
Effective Green, g (s)		18.5			18.5			34.2			23.4	
Actuated g/C Ratio		0.30			0.30			0.56			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		481			497			862			486	
v/s Ratio Prot								c0.10				
v/s Ratio Perm		0.20			c0.24			c0.39			0.25	
v/c Ratio		0.66			0.80			0.86			0.65	
Uniform Delay, d1		18.4			19.4			11.2			15.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			9.1			9.0			2.4	
Delay (s)		20.9			28.5			20.2			17.7	
Level of Service		C			C			C			B	
Approach Delay (s)		20.9			28.5			20.2			17.7	
Approach LOS		C			C			C			B	

Intersection Summary

HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	60.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	60		

c Critical Lane Group

3: Shelburne Falls Rd & VT 116

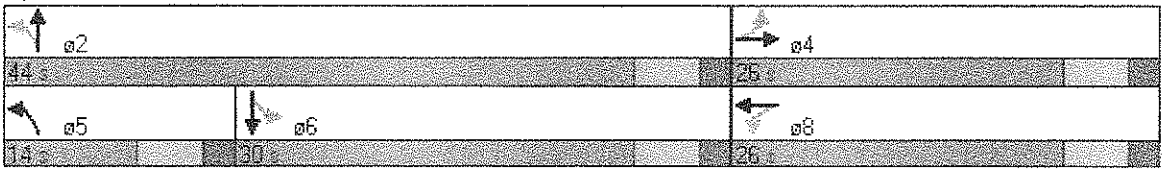
ITE

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	216	42	202	169	556	89	196
Lane Group Flow (vph)	0	334	0	440	0	742	0	323
Turn Type	Perm		Perm		pm+pt		Perm	
Protected Phases		4		8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	14.0	21.0	21.0	21.0
Total Split (s)	26.0	26.0	26.0	26.0	14.0	44.0	30.0	30.0
Total Split (%)	37.1%	37.1%	37.1%	37.1%	20.0%	62.9%	42.9%	42.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio		0.67		0.82		0.88		0.67
Control Delay		26.4		34.3		27.5		23.5
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		26.4		34.3		27.5		23.5
Queue Length 50th (ft)		113		149		210		100
Queue Length 95th (ft)		#261		#360		#586		#219
Internal Link Dist (ft)		677		742		2508		498
Turn Bay Length (ft)								
Base Capacity (vph)		565		605		905		546
Starvation Cap Reductn		0		0		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.59		0.73		0.82		0.59

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 61.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Shelburne Falls Rd & VT 116



Appendix D
VT Route 116 & Commerce St
Capacity Analyses

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1795	1583		1782	1583	1711	1810	1531	1711	1795	
Flt Permitted		0.76	1.00		0.72	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1409	1583		1344	1583	1711	1810	1531	1711	1795	
Volume (vph)	24	8	51	93	9	82	36	293	74	81	604	43
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	8	51	93	9	82	36	293	74	81	604	43
RTOR Reduction (vph)	0	0	44	0	0	71	0	0	22	0	2	0
Lane Group Flow (vph)	0	32	7	0	102	11	36	293	52	81	645	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		12.4	12.4		12.4	12.4	4.5	62.4	62.4	8.4	66.3	
Effective Green, g (s)		14.4	14.4		14.4	14.4	6.5	64.4	64.4	10.4	68.3	
Actuated g/C Ratio		0.13	0.13		0.13	0.13	0.06	0.59	0.59	0.09	0.62	
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		184	207		176	207	101	1060	896	162	1115	
v/s Ratio Prot							0.02	0.16		c0.05	c0.36	
v/s Ratio Perm		0.02	0.00		c0.08	0.01			0.03			
v/c Ratio		0.17	0.03		0.58	0.05	0.36	0.28	0.06	0.50	0.58	
Uniform Delay, d1		42.5	41.7		45.0	41.8	49.7	11.3	9.8	47.3	12.3	
Progression Factor		1.00	1.00		1.00	1.00	1.14	0.94	0.96	1.00	1.00	
Incremental Delay, d2		0.2	0.0		2.9	0.0	0.7	0.5	0.1	0.9	2.2	
Delay (s)		42.7	41.7		47.8	41.9	57.6	11.2	9.5	48.2	14.6	
Level of Service		D	D		D	D	E	B	A	D	B	
Approach Delay (s)		42.1			45.2			15.0			18.3	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	60		

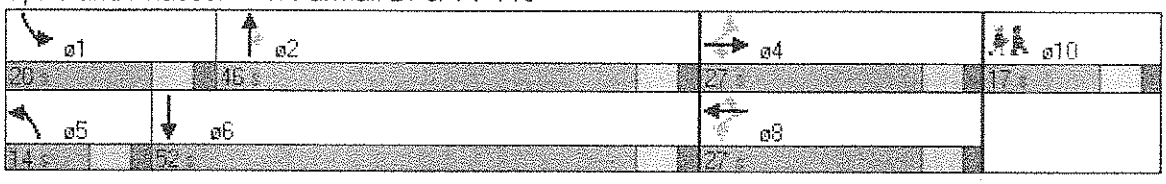
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations												
Volume (vph)	24	8	51	93	9	82	36	293	74	81	604	
Lane Group Flow (vph)	0	32	51	0	102	82	36	293	74	81	647	
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	10
Permitted Phases	4		4	8		8			2			
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	14.0	46.0	46.0	20.0	52.0	17.0
Total Split (%)	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%	12.7%	41.8%	41.8%	18.2%	47.3%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.17	0.20		0.58	0.29	0.27	0.25	0.07	0.46	0.52	
Control Delay		42.3	12.8		58.0	11.5	58.4	12.5	6.3	53.9	14.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		42.3	12.8		58.0	11.5	58.4	12.5	6.3	53.9	14.9	
Queue Length 50th (ft)		20	0		69	0	25	69	1	55	203	
Queue Length 95th (ft)		53	41		134	52	m41	m243	m25	113	#728	
Internal Link Dist (ft)		686			1356			1990			2508	
Turn Bay Length (ft)						125	75		75	175		
Base Capacity (vph)		309	371		281	396	156	1159	1000	249	1234	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.14		0.36	0.21	0.23	0.25	0.07	0.33	0.52	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Farmall Dr & VT 116



1: Farmall Dr & VT 116

VT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.86		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1795	1583	1770	1604		1711	1810	1531	1711	1794	
Flt Permitted		0.77	1.00	0.74	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1444	1583	1372	1604		1711	1810	1531	1711	1794	
Volume (vph)	24	8	51	194	9	114	36	279	140	137	568	43
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	8	51	194	9	114	36	279	140	137	568	43
RTOR Reduction (vph)	0	0	42	0	93	0	0	0	52	0	2	0
Lane Group Flow (vph)	0	32	9	194	30	0	36	279	88	137	609	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		18.2	18.2	18.2	18.2		4.5	53.4	53.4	12.2	61.1	
Effective Green, g (s)		20.2	20.2	20.2	20.2		6.5	55.4	55.4	14.2	63.1	
Actuated g/C Ratio		0.18	0.18	0.18	0.18		0.06	0.50	0.50	0.13	0.57	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		265	291	252	295		101	912	771	221	1029	
v/s Ratio Prot					0.02		0.02	0.15		c0.08	c0.34	
v/s Ratio Perm		0.02	0.01	c0.14					0.06			
v/c Ratio		0.12	0.03	0.77	0.10		0.36	0.31	0.11	0.62	0.59	
Uniform Delay, d1		37.5	36.9	42.7	37.4		49.7	16.0	14.4	45.3	15.1	
Progression Factor		1.00	1.00	1.00	1.00		1.12	0.95	1.05	1.00	1.00	
Incremental Delay, d2		0.1	0.0	13.0	0.1		0.5	0.6	0.2	3.7	2.5	
Delay (s)		37.6	36.9	55.7	37.4		56.3	15.8	15.3	49.0	17.7	
Level of Service		D	D	E	D		E	B	B	D	B	
Approach Delay (s)		37.1			48.6			18.8			23.4	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

VT

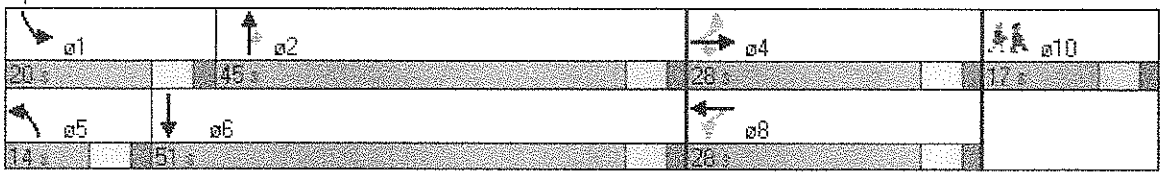
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	24	8	51	194	9	36	279	140	137	568	
Lane Group Flow (vph)	0	32	51	194	123	36	279	140	137	611	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	14.0	45.0	45.0	20.0	51.0	17.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	25.5%	12.7%	40.9%	40.9%	18.2%	46.4%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.12	0.15	0.77	0.32	0.27	0.28	0.16	0.62	0.53	
Control Delay		36.6	10.8	65.2	10.3	56.7	16.1	6.6	58.3	17.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		36.6	10.8	65.2	10.3	56.7	16.1	6.6	58.3	17.1	
Queue Length 50th (ft)		19	0	130	5	25	103	8	92	231	
Queue Length 95th (ft)		50	39	#258	68	m34	m192	m27	176	#678	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		320	385	299	439	156	992	886	254	1147	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.13	0.65	0.28	0.23	0.28	0.16	0.54	0.53	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Farmall Dr & VT 116



ITE

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.86		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1795	1583	1770	1603		1711	1810	1531	1711	1794	
Flt Permitted		0.78	1.00	0.74	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1444	1583	1372	1603		1711	1810	1531	1711	1794	
Volume (vph)	24	8	51	212	9	121	36	277	150	146	562	43
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	8	51	212	9	121	36	277	150	146	562	43
RTOR Reduction (vph)	0	0	41	0	98	0	0	0	57	0	2	0
Lane Group Flow (vph)	0	32	10	212	32	0	36	277	93	146	603	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		19.2	19.2	19.2	19.2		4.5	51.9	51.9	12.7	60.1	
Effective Green, g (s)		21.2	21.2	21.2	21.2		6.5	53.9	53.9	14.7	62.1	
Actuated g/C Ratio		0.19	0.19	0.19	0.19		0.06	0.49	0.49	0.13	0.56	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		278	305	264	309		101	887	750	229	1013	
v/s Ratio Prot					0.02		0.02	0.15		c0.09	c0.34	
v/s Ratio Perm		0.02	0.01	c0.15					0.06			
v/c Ratio		0.12	0.03	0.80	0.10		0.36	0.31	0.12	0.64	0.60	
Uniform Delay, d1		36.7	36.1	42.4	36.6		49.7	16.9	15.2	45.1	15.7	
Progression Factor		1.00	1.00	1.00	1.00		1.12	0.94	1.02	1.00	1.00	
Incremental Delay, d2		0.1	0.0	17.0	0.1		0.5	0.6	0.2	4.3	2.6	
Delay (s)		36.7	36.1	59.4	36.6		56.1	16.5	15.8	49.4	18.3	
Level of Service		D	D	E	D		E	B	B	D	B	
Approach Delay (s)		36.3			50.7			19.4			24.4	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	60		

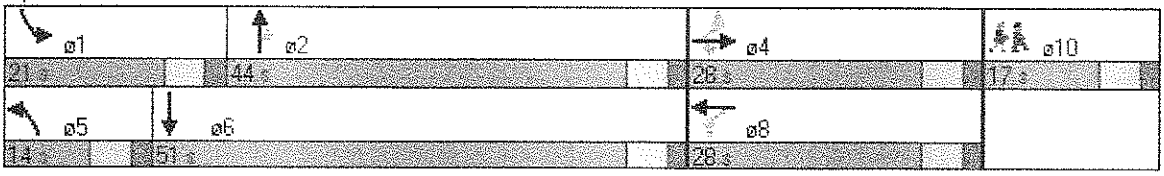
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	24	8	51	212	9	36	277	150	146	562	
Lane Group Flow (vph)	0	32	51	212	130	36	277	150	146	605	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	14.0	44.0	44.0	21.0	51.0	17.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	25.5%	12.7%	40.0%	40.0%	19.1%	46.4%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.11	0.15	0.80	0.32	0.27	0.29	0.17	0.64	0.54	
Control Delay		36.1	10.7	67.9	10.0	56.4	16.8	6.7	58.3	17.5	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		36.1	10.7	67.9	10.0	56.4	16.8	6.7	58.3	17.5	
Queue Length 50th (ft)		18	0	140	5	26	106	10	98	241	
Queue Length 95th (ft)		50	39	#294	70	m33	m183	m27	185	#666	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		319	385	299	444	156	965	868	268	1130	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.13	0.71	0.29	0.23	0.29	0.17	0.54	0.54	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Farmall Dr & VT 116



1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1795	1583		1781	1583	1711	1810	1531	1711	1795	
Flt Permitted		0.76	1.00		0.72	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1408	1583		1343	1583	1711	1810	1531	1711	1795	
Volume (vph)	24	8	51	95	9	83	36	299	76	82	615	43
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	8	51	95	9	83	36	299	76	82	615	43
RTOR Reduction (vph)	0	0	44	0	0	72	0	0	22	0	2	0
Lane Group Flow (vph)	0	32	7	0	104	11	36	299	54	82	656	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		12.5	12.5		12.5	12.5	4.5	62.3	62.3	8.5	66.3	
Effective Green, g (s)		14.5	14.5		14.5	14.5	6.5	64.3	64.3	10.5	68.3	
Actuated g/C Ratio		0.13	0.13		0.13	0.13	0.06	0.58	0.58	0.10	0.62	
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		186	209		177	209	101	1058	895	163	1115	
v/s Ratio Prot							0.02	0.17		c0.05	c0.37	
v/s Ratio Perm		0.02	0.00		c0.08	0.01			0.03			
v/c Ratio		0.17	0.03		0.59	0.05	0.36	0.28	0.06	0.50	0.59	
Uniform Delay, d1		42.4	41.6		44.9	41.7	49.7	11.4	9.8	47.3	12.5	
Progression Factor		1.00	1.00		1.00	1.00	1.14	0.93	0.95	1.00	1.00	
Incremental Delay, d2		0.2	0.0		3.2	0.0	0.6	0.5	0.1	0.9	2.3	
Delay (s)		42.6	41.7		48.2	41.8	57.4	11.1	9.5	48.2	14.8	
Level of Service		D	D		D	D	E	B	A	D	B	
Approach Delay (s)		42.0			45.3			14.9			18.5	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

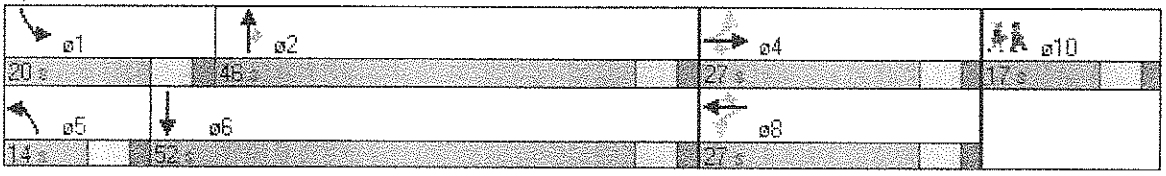
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations												
Volume (vph)	24	8	51	95	9	83	36	299	76	82	615	
Lane Group Flow (vph)	0	32	51	0	104	83	36	299	76	82	658	
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	10
Permitted Phases	4		4	8		8			2			
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	14.0	46.0	46.0	20.0	52.0	17.0
Total Split (%)	24.5%	24.5%	24.5%	24.5%	24.5%	24.5%	12.7%	41.8%	41.8%	18.2%	47.3%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.16	0.20		0.59	0.30	0.27	0.26	0.08	0.46	0.53	
Control Delay		42.1	12.7		58.0	11.4	58.3	12.4	6.3	54.0	15.2	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		42.1	12.7		58.0	11.4	58.3	12.4	6.3	54.0	15.2	
Queue Length 50th (ft)		20	0		70	0	25	76	2	55	209	
Queue Length 95th (ft)		52	41		136	53	m40	m237	m23	113	#747	
Internal Link Dist (ft)		686			1356			1990			2508	
Turn Bay Length (ft)						125	75		75	175		
Base Capacity (vph)		308	371		281	397	156	1157	998	249	1233	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.14		0.37	0.21	0.23	0.26	0.08	0.33	0.53	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Farmall Dr & VT 116



VT

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.86		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1795	1583	1770	1604		1711	1810	1531	1711	1794	
Flt Permitted		0.77	1.00	0.74	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1443	1583	1372	1604		1711	1810	1531	1711	1794	
Volume (vph)	24	8	51	196	9	115	36	285	142	138	579	43
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	8	51	196	9	115	36	285	142	138	579	43
RTOR Reduction (vph)	0	0	42	0	94	0	0	0	52	0	2	0
Lane Group Flow (vph)	0	32	9	196	30	0	36	285	90	138	620	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		18.2	18.2	18.2	18.2		4.5	53.4	53.4	12.2	61.1	
Effective Green, g (s)		20.2	20.2	20.2	20.2		6.5	55.4	55.4	14.2	63.1	
Actuated g/C Ratio		0.18	0.18	0.18	0.18		0.06	0.50	0.50	0.13	0.57	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		265	291	252	295		101	912	771	221	1029	
v/s Ratio Prot					0.02		0.02	0.16		c0.08	c0.35	
v/s Ratio Perm		0.02	0.01	c0.14					0.06			
v/c Ratio		0.12	0.03	0.78	0.10		0.36	0.31	0.12	0.62	0.60	
Uniform Delay, d1		37.5	36.9	42.8	37.4		49.7	16.1	14.4	45.4	15.3	
Progression Factor		1.00	1.00	1.00	1.00		1.12	0.94	1.04	1.00	1.00	
Incremental Delay, d2		0.1	0.0	14.0	0.1		0.5	0.6	0.2	4.0	2.6	
Delay (s)		37.6	36.9	56.8	37.4		56.1	15.7	15.2	49.4	17.9	
Level of Service		D	D	E	D		E	B	B	D	B	
Approach Delay (s)		37.1			49.3			18.7			23.6	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

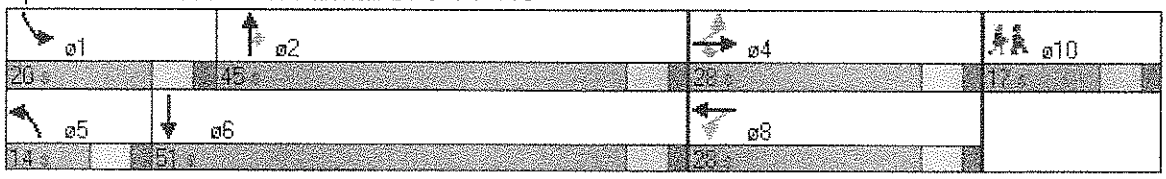
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	24	8	51	196	9	36	285	142	138	579	
Lane Group Flow (vph)	0	32	51	196	124	36	285	142	138	622	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	14.0	45.0	45.0	20.0	51.0	17.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	25.5%	12.7%	40.9%	40.9%	18.2%	46.4%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.12	0.15	0.78	0.32	0.27	0.29	0.16	0.62	0.54	
Control Delay		36.6	10.8	65.9	10.3	56.4	16.1	6.7	58.4	17.4	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		36.6	10.8	65.9	10.3	56.4	16.1	6.7	58.4	17.4	
Queue Length 50th (ft)		19	0	131	5	26	105	10	93	238	
Queue Length 95th (ft)		50	39	#263	68	m32	m182	m25	#178	#696	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		319	385	299	440	156	990	885	254	1148	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.13	0.66	0.28	0.23	0.29	0.16	0.54	0.54	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Farmall Dr & VT 116



ITE

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.86		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1795	1583	1770	1603		1711	1810	1531	1711	1794	
Flt Permitted		0.78	1.00	0.74	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1445	1583	1372	1603		1711	1810	1531	1711	1794	
Volume (vph)	24	8	51	214	9	122	36	283	152	147	573	43
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	8	51	214	9	122	36	283	152	147	573	43
RTOR Reduction (vph)	0	0	41	0	98	0	0	0	56	0	2	0
Lane Group Flow (vph)	0	32	10	214	33	0	36	283	96	147	614	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		19.4	19.4	19.4	19.4		4.5	51.6	51.6	12.8	59.9	
Effective Green, g (s)		21.4	21.4	21.4	21.4		6.5	53.6	53.6	14.8	61.9	
Actuated g/C Ratio		0.19	0.19	0.19	0.19		0.06	0.49	0.49	0.13	0.56	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		281	308	267	312		101	882	746	230	1010	
v/s Ratio Prot					0.02		0.02	0.16		c0.09	c0.34	
v/s Ratio Perm		0.02	0.01	c0.16					0.06			
v/c Ratio		0.11	0.03	0.80	0.10		0.36	0.32	0.13	0.64	0.61	
Uniform Delay, d1		36.5	35.9	42.3	36.4		49.7	17.1	15.4	45.1	16.0	
Progression Factor		1.00	1.00	1.00	1.00		1.11	0.94	1.01	1.00	1.00	
Incremental Delay, d2		0.1	0.0	16.6	0.1		0.5	0.6	0.2	4.3	2.8	
Delay (s)		36.6	35.9	58.9	36.5		55.7	16.6	15.8	49.4	18.7	
Level of Service		D	D	E	D		E	B	B	D	B	
Approach Delay (s)		36.2			50.4			19.4			24.6	
Approach LOS		D			D			B			C	

Intersection Summary

HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	60		

c Critical Lane Group

1: Farmall Dr & VT 116

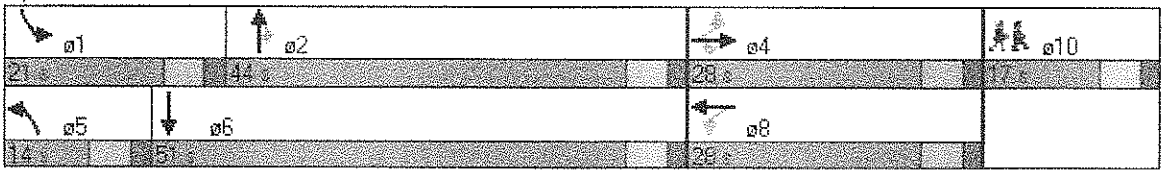
ITE

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	24	8	51	214	9	36	283	152	147	573	
Lane Group Flow (vph)	0	32	51	214	131	36	283	152	147	616	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	28.0	28.0	28.0	28.0	28.0	14.0	44.0	44.0	21.0	51.0	17.0
Total Split (%)	25.5%	25.5%	25.5%	25.5%	25.5%	12.7%	40.0%	40.0%	19.1%	46.4%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.11	0.15	0.80	0.32	0.27	0.29	0.18	0.64	0.55	
Control Delay		36.0	10.7	68.2	9.9	55.8	16.8	6.8	58.4	17.8	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		36.0	10.7	68.2	9.9	55.8	16.8	6.8	58.4	17.8	
Queue Length 50th (ft)		18	0	141	5	26	108	11	99	249	
Queue Length 95th (ft)		50	39	#298	70	m31	m174	m24	186	#686	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		318	385	299	445	156	962	865	268	1129	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.13	0.72	0.29	0.23	0.29	0.18	0.55	0.55	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Farmall Dr & VT 116



1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789	1583		1775	1583	1711	1810	1531	1711	1800	
Flt Permitted		0.72	1.00		0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1347	1583		1306	1583	1711	1810	1531	1711	1800	
Volume (vph)	32	7	16	59	1	116	14	625	99	60	294	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	7	16	59	1	116	14	625	99	60	294	13
RTOR Reduction (vph)	0	0	14	0	0	103	0	0	20	0	1	0
Lane Group Flow (vph)	0	39	2	0	60	13	14	625	79	60	306	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		6.8	6.8		6.8	6.8	1.3	42.3	42.3	4.7	45.7	
Effective Green, g (s)		8.8	8.8		8.8	8.8	3.3	44.3	44.3	6.7	47.7	
Actuated g/C Ratio		0.11	0.11		0.11	0.11	0.04	0.55	0.55	0.08	0.60	
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		148	174		144	174	71	1002	848	143	1073	
v/s Ratio Prot							0.01	c0.35		c0.04	c0.17	
v/s Ratio Perm		0.03	0.00		c0.05	0.01			0.05			
v/c Ratio		0.26	0.01		0.42	0.07	0.20	0.62	0.09	0.42	0.28	
Uniform Delay, d1		32.6	31.7		33.2	31.9	37.1	12.2	8.4	34.8	7.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.0		0.7	0.1	0.5	3.0	0.2	0.7	0.7	
Delay (s)		33.0	31.7		33.9	32.0	37.6	15.1	8.6	35.5	8.5	
Level of Service		C	C		C	C	D	B	A	D	A	
Approach Delay (s)		32.6			32.7			14.7			12.9	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

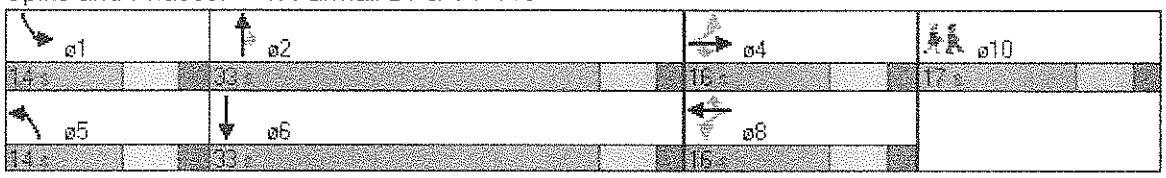
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations												
Volume (vph)	32	7	16	59	1	116	14	625	99	60	294	
Lane Group Flow (vph)	0	39	16	0	60	116	14	625	99	60	307	
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	10
Permitted Phases	4		4	8		8			2			
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	14.0	33.0	33.0	14.0	33.0	17.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	17.5%	41.3%	41.3%	17.5%	41.3%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.23	0.08		0.38	0.40	0.09	0.52	0.10	0.32	0.23	
Control Delay		34.3	15.2		38.9	10.9	34.4	15.4	7.4	37.3	8.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.3	15.2		38.9	10.9	34.4	15.4	7.4	37.3	8.0	
Queue Length 50th (ft)		18	0		28	0	7	167	10	28	30	
Queue Length 95th (ft)		50	19		70	55	26	#605	57	70	208	
Internal Link Dist (ft)		686			1356			1990			2508	
Turn Bay Length (ft)						125	75		75	175		
Base Capacity (vph)		209	251		196	336	214	1211	1039	216	1337	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	
Reduced v/c Ratio		0.19	0.06		0.31	0.35	0.07	0.52	0.10	0.28	0.23	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Farmall Dr & VT 116



VT

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789	1583	1770	1585		1711	1810	1531	1711	1800	
Flt Permitted		0.57	1.00	0.73	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1063	1583	1363	1585		1711	1810	1531	1711	1800	
Volume (vph)	32	7	16	80	1	128	14	613	132	73	289	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	7	16	80	1	128	14	613	132	73	289	13
RTOR Reduction (vph)	0	0	14	0	113	0	0	0	29	0	1	0
Lane Group Flow (vph)	0	39	2	80	16	0	14	613	103	73	301	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		7.2	7.2	7.2	7.2		1.3	40.3	40.3	6.3	45.3	
Effective Green, g (s)		9.2	9.2	9.2	9.2		3.3	42.3	42.3	8.3	47.3	
Actuated g/C Ratio		0.12	0.12	0.12	0.12		0.04	0.53	0.53	0.10	0.59	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		122	182	157	182		71	957	810	178	1064	
v/s Ratio Prot					0.01		0.01	c0.34		c0.04	0.17	
v/s Ratio Perm		0.04	0.00	c0.06					0.07			
v/c Ratio		0.32	0.01	0.51	0.09		0.20	0.64	0.13	0.41	0.28	
Uniform Delay, d1		32.5	31.4	33.3	31.6		37.1	13.4	9.5	33.6	8.0	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6	0.0	1.0	0.1		0.5	3.3	0.3	0.6	0.7	
Delay (s)		33.1	31.4	34.2	31.7		37.6	16.8	9.8	34.1	8.7	
Level of Service		C	C	C	C		D	B	A	C	A	
Approach Delay (s)		32.6			32.7			15.9			13.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

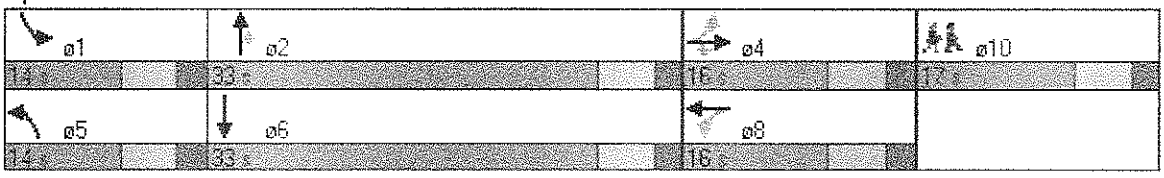
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	32	7	16	80	1	14	613	132	73	289	
Lane Group Flow (vph)	0	39	16	80	129	14	613	132	73	302	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	33.0	33.0	14.0	33.0	17.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	17.5%	41.3%	41.3%	17.5%	41.3%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.24	0.07	0.46	0.41	0.09	0.54	0.13	0.37	0.23	
Control Delay		34.3	15.1	40.9	10.7	34.4	16.9	7.4	37.9	8.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.3	15.1	40.9	10.7	34.4	16.9	7.4	37.9	8.1	
Queue Length 50th (ft)		18	0	37	0	7	173	14	34	32	
Queue Length 95th (ft)		51	19	89	59	26	#589	71	82	204	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		193	251	205	347	214	1138	985	219	1326	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.20	0.06	0.39	0.37	0.07	0.54	0.13	0.33	0.23	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Farmall Dr & VT 116



1: Farmall Dr & VT 116

ITE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789	1583	1770	1585		1711	1810	1531	1711	1800	
Flt Permitted		0.59	1.00	0.73	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1096	1583	1363	1585		1711	1810	1531	1711	1800	
Volume (vph)	32	7	16	84	1	130	14	611	138	76	287	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	7	16	84	1	130	14	611	138	76	287	13
RTOR Reduction (vph)	0	0	14	0	113	0	0	0	31	0	1	0
Lane Group Flow (vph)	0	39	2	84	18	0	14	611	107	76	299	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		8.2	8.2	8.2	8.2		1.3	39.2	39.2	6.4	44.3	
Effective Green, g (s)		10.2	10.2	10.2	10.2		3.3	41.2	41.2	8.4	46.3	
Actuated g/C Ratio		0.13	0.13	0.13	0.13		0.04	0.52	0.52	0.11	0.58	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		140	202	174	202		71	932	788	180	1042	
v/s Ratio Prot					0.01		0.01	c0.34		c0.04	0.17	
v/s Ratio Perm		0.04	0.00	c0.06					0.07			
v/c Ratio		0.28	0.01	0.48	0.09		0.20	0.66	0.14	0.42	0.29	
Uniform Delay, d1		31.6	30.5	32.4	30.8		37.1	14.2	10.1	33.5	8.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.0	0.8	0.1		0.5	3.7	0.4	0.6	0.7	
Delay (s)		32.0	30.5	33.2	30.9		37.6	17.9	10.5	34.1	9.2	
Level of Service		C	C	C	C		D	B	B	C	A	
Approach Delay (s)		31.5			31.8			16.9			14.2	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

1: Farmall Dr & VT 116

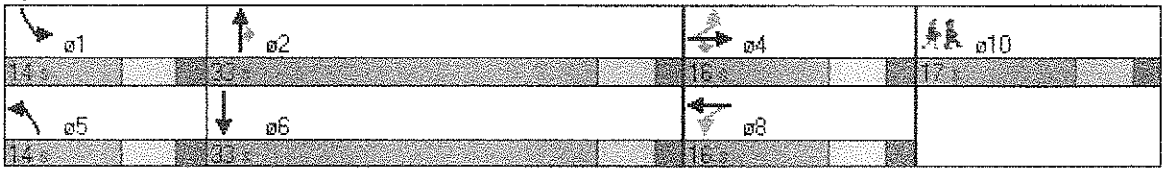
ITE

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	32	7	16	84	1	14	611	138	76	287	
Lane Group Flow (vph)	0	39	16	84	131	14	611	138	76	300	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	33.0	33.0	14.0	33.0	17.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	17.5%	41.3%	41.3%	17.5%	41.3%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.24	0.07	0.48	0.41	0.09	0.57	0.15	0.38	0.24	
Control Delay		34.3	15.1	41.6	10.6	34.4	17.6	7.5	38.2	8.3	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.3	15.1	41.6	10.6	34.4	17.6	7.5	38.2	8.3	
Queue Length 50th (ft)		18	0	39	0	7	174	15	35	33	
Queue Length 95th (ft)		51	19	92	60	26	#587	74	85	203	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		191	251	205	348	214	1068	930	220	1258	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.20	0.06	0.41	0.38	0.07	0.57	0.15	0.35	0.24	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Farmall Dr & VT 116



1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789	1583		1775	1583	1711	1810	1531	1711	1800	
Flt Permitted		0.72	1.00		0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1344	1583		1304	1583	1711	1810	1531	1711	1800	
Volume (vph)	33	7	16	60	1	118	14	636	101	61	299	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	33	7	16	60	1	118	14	636	101	61	299	13
RTOR Reduction (vph)	0	0	14	0	0	105	0	0	20	0	1	0
Lane Group Flow (vph)	0	40	2	0	61	13	14	636	81	61	311	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		6.8	6.8		6.8	6.8	1.3	42.3	42.3	4.7	45.7	
Effective Green, g (s)		8.8	8.8		8.8	8.8	3.3	44.3	44.3	6.7	47.7	
Actuated g/C Ratio		0.11	0.11		0.11	0.11	0.04	0.55	0.55	0.08	0.60	
Clearance Time (s)		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		148	174		143	174	71	1002	848	143	1073	
v/s Ratio Prot							0.01	c0.35		c0.04	c0.17	
v/s Ratio Perm		0.03	0.00		c0.05	0.01			0.05			
v/c Ratio		0.27	0.01		0.43	0.07	0.20	0.63	0.10	0.43	0.29	
Uniform Delay, d1		32.7	31.7		33.2	31.9	37.1	12.3	8.4	34.8	7.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.0		0.7	0.1	0.5	3.1	0.2	0.7	0.7	
Delay (s)		33.0	31.7		34.0	32.0	37.6	15.4	8.6	35.6	8.6	
Level of Service		C	C		C	C	D	B	A	D	A	
Approach Delay (s)		32.6			32.7			14.9			13.0	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.2
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

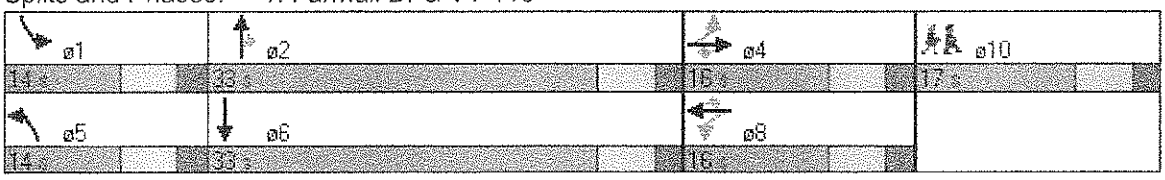
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations												
Volume (vph)	33	7	16	60	1	118	14	636	101	61	299	
Lane Group Flow (vph)	0	40	16	0	61	118	14	636	101	61	312	
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	10
Permitted Phases	4		4	8		8			2			
Detector Phases	4	4	4	8	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	14.0	33.0	33.0	14.0	33.0	17.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	17.5%	41.3%	41.3%	17.5%	41.3%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.24	0.08		0.39	0.40	0.09	0.53	0.10	0.33	0.23	
Control Delay		34.4	15.2		39.0	10.8	34.4	15.7	7.4	37.4	8.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.4	15.2		39.0	10.8	34.4	15.7	7.4	37.4	8.0	
Queue Length 50th (ft)		18	0		28	0	7	172	10	29	31	
Queue Length 95th (ft)		52	19		71	56	26	#619	59	72	212	
Internal Link Dist (ft)		686			1356			1990			2508	
Turn Bay Length (ft)						125	75		75	175		
Base Capacity (vph)		208	251		196	338	214	1209	1038	216	1335	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	
Reduced v/c Ratio		0.19	0.06		0.31	0.35	0.07	0.53	0.10	0.28	0.23	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Farmall Dr & VT 116



VT

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789	1583	1770	1585		1711	1810	1531	1711	1800	
Flt Permitted		0.58	1.00	0.73	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1084	1583	1362	1585		1711	1810	1531	1711	1800	
Volume (vph)	33	7	16	81	1	130	14	624	134	74	294	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	33	7	16	81	1	130	14	624	134	74	294	13
RTOR Reduction (vph)	0	0	14	0	113	0	0	0	30	0	1	0
Lane Group Flow (vph)	0	40	2	81	18	0	14	624	104	74	306	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		8.2	8.2	8.2	8.2		1.3	39.3	39.3	6.3	44.3	
Effective Green, g (s)		10.2	10.2	10.2	10.2		3.3	41.3	41.3	8.3	46.3	
Actuated g/C Ratio		0.13	0.13	0.13	0.13		0.04	0.52	0.52	0.10	0.58	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		138	202	174	202		71	934	790	178	1042	
v/s Ratio Prot					0.01		0.01	c0.34		c0.04	0.17	
v/s Ratio Perm		0.04	0.00	c0.06					0.07			
v/c Ratio		0.29	0.01	0.47	0.09		0.20	0.67	0.13	0.42	0.29	
Uniform Delay, d1		31.6	30.5	32.4	30.8		37.1	14.3	10.0	33.6	8.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.0	0.7	0.1		0.5	3.9	0.3	0.6	0.7	
Delay (s)		32.0	30.5	33.1	30.9		37.6	18.1	10.4	34.2	9.3	
Level of Service		C	C	C	C		D	B	B	C	A	
Approach Delay (s)		31.6			31.7			17.2			14.1	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

1: Farmall Dr & VT 116

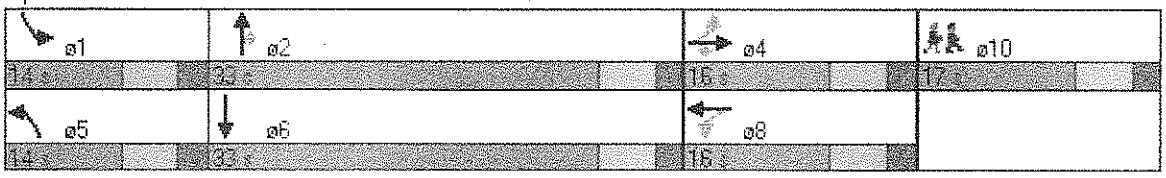
VT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	33	7	16	81	1	14	624	134	74	294	
Lane Group Flow (vph)	0	40	16	81	131	14	624	134	74	307	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	33.0	33.0	14.0	33.0	17.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	17.5%	41.3%	41.3%	17.5%	41.3%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.25	0.07	0.47	0.42	0.09	0.58	0.14	0.38	0.24	
Control Delay		34.6	15.1	41.2	10.6	34.4	17.8	7.6	38.0	8.3	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.6	15.1	41.2	10.6	34.4	17.8	7.6	38.0	8.3	
Queue Length 50th (ft)		18	0	38	0	7	177	14	34	33	
Queue Length 95th (ft)		52	19	89	60	26	#604	73	83	208	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		189	251	204	348	214	1070	930	220	1260	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.21	0.06	0.40	0.38	0.07	0.58	0.14	0.34	0.24	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Farmall Dr & VT 116



ITE

1: Farmall Dr & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	12	11	11	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1789	1583	1770	1585		1711	1810	1531	1711	1800	
Flt Permitted		0.58	1.00	0.73	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1083	1583	1362	1585		1711	1810	1531	1711	1800	
Volume (vph)	33	7	16	85	1	132	14	622	140	77	292	13
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	33	7	16	85	1	132	14	622	140	77	292	13
RTOR Reduction (vph)	0	0	14	0	115	0	0	0	31	0	1	0
Lane Group Flow (vph)	0	40	2	85	18	0	14	622	109	77	304	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%	5%	2%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		8.3	8.3	8.3	8.3		1.3	39.1	39.1	6.4	44.2	
Effective Green, g (s)		10.3	10.3	10.3	10.3		3.3	41.1	41.1	8.4	46.2	
Actuated g/C Ratio		0.13	0.13	0.13	0.13		0.04	0.51	0.51	0.11	0.58	
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		139	204	175	204		71	930	787	180	1040	
v/s Ratio Prot					0.01		0.01	c0.34		c0.05	0.17	
v/s Ratio Perm		0.04	0.00	c0.06					0.07			
v/c Ratio		0.29	0.01	0.49	0.09		0.20	0.67	0.14	0.43	0.29	
Uniform Delay, d1		31.5	30.4	32.4	30.7		37.1	14.4	10.2	33.5	8.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.0	0.8	0.1		0.5	3.9	0.4	0.6	0.7	
Delay (s)		31.9	30.4	33.2	30.8		37.6	18.3	10.5	34.1	9.3	
Level of Service		C	C	C	C		D	B	B	C	A	
Approach Delay (s)		31.5			31.7			17.2			14.3	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	60		

c Critical Lane Group

ITE

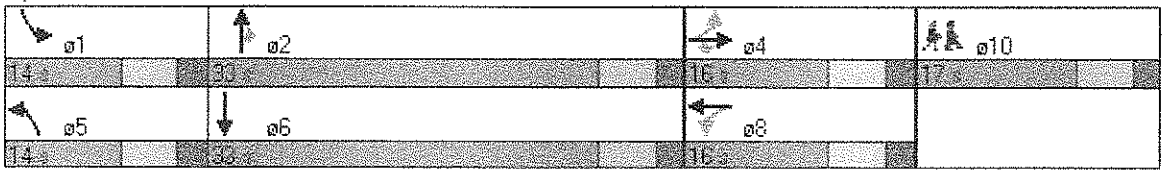
1: Farmall Dr & VT 116

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	ø10
Lane Configurations											
Volume (vph)	33	7	16	85	1	14	622	140	77	292	
Lane Group Flow (vph)	0	40	16	85	133	14	622	140	77	305	
Turn Type	Perm		Perm	Perm		Prot		Perm	Prot		
Protected Phases		4			8	5	2		1	6	10
Permitted Phases	4		4	8				2			
Detector Phases	4	4	4	8	8	5	2	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	16.0	16.0	14.0	16.0	17.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	14.0	33.0	33.0	14.0	33.0	17.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	20.0%	17.5%	41.3%	41.3%	17.5%	41.3%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	None
v/c Ratio		0.25	0.07	0.49	0.42	0.09	0.58	0.15	0.39	0.24	
Control Delay		34.6	15.1	41.8	10.6	34.4	17.9	7.6	38.2	8.3	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.6	15.1	41.8	10.6	34.4	17.9	7.6	38.2	8.3	
Queue Length 50th (ft)		18	0	40	0	7	180	15	36	33	
Queue Length 95th (ft)		52	19	93	60	26	#601	75	86	207	
Internal Link Dist (ft)		686			1356		1990			2508	
Turn Bay Length (ft)						75		75	175		
Base Capacity (vph)		188	251	204	350	214	1066	928	220	1257	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.21	0.06	0.42	0.38	0.07	0.58	0.15	0.35	0.24	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Farmall Dr & VT 116



Appendix E
VT Route 116 & Mechanicsville Rd
Capacity Analyses

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/02/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 No Build
Project ID: 10024
East/West Street: Mechanicsville Rd
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		358	153	3	720	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		358	153	3	720	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	167		8			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	167		8			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		175				
C(m) (vph)		1054		252				
v/c		0.00		0.69				
95% queue length		0.01		5.91				
Control Delay		8.4		50.0+				
LOS		A		F				
Approach Delay				50.0+				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/02/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build VT
Project ID: 10024
East/West Street: Mechanicsville Rd
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		410	170	3	778	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		410	170	3	778	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	167		8			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	167		8			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		175				
C(m) (vph)		994		216				
v/c		0.00		0.81				
95% queue length		0.01		8.92				
Control Delay		8.6		82.1				
LOS		A		F				
Approach Delay				82.1				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build ITE
Project ID: 10024
East/West Street: Mechanicsville Rd
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		413	171	3	790	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		413	171	3	790	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	167		8			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	167		8			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		175				
C(m) (vph)		991		212				
v/c		0.00		0.83				
95% queue length		0.01		9.41				
Control Delay		8.6		88.3				
LOS		A		F				
Approach Delay				88.3				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/02/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 No Build
Project ID: 10024
East/West Street: Mechanicsville Rd
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		365	157	3	736	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		365	157	3	736	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	171		9			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	171		9			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		180				
C(m) (vph)		1044		245				
v/c		0.00		0.73				
95% queue length		0.01		6.86				
Control Delay		8.5		57.4				
LOS		A		F				
Approach Delay				57.4				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/02/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build VT
Project ID: 10024
East/West Street: Mechanicsville Rd
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		417	174	3	794	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		417	174	3	794	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	171		9			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	171		9			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		180				
C(m) (vph)		985		211				
v/c		0.00		0.85				
95% queue length		0.01		10.42				
Control Delay		8.7		98.8				
LOS		A		F				
Approach Delay				98.8				
Approach LOS				F				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build ITE
Project ID: 10024
East/West Street: Mechanicsville Rd
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		420	175	3	806	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		420	175	3	806	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	171		9			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	171		9			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0	0				
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		180				
C(m) (vph)		981		206				
v/c		0.00		0.87				
95% queue length		0.01		11.17				
Control Delay		8.7		109.9				
LOS		A		F				
Approach Delay				109.9				
Approach LOS				F				

Appendix F
VT Route 116 & Charlotte Rd
Capacity Analyses

2: Charlotte Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1700	1900
Lane Width	11	11	11	12	11	12	12	12	12	12	12	12
Grade (%)		6%			-4%			-2%			2%	
Total Lost time (s)	4.0		4.0		4.0			4.0			4.0	
Lane Util. Factor	1.00		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.94			0.99			0.98	
Flt Protected	0.95		1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1659		1485		1725			1814			1583	
Flt Permitted	0.95		1.00		0.98			0.82			1.00	
Satd. Flow (perm)	1659		1485		1725			1490			1583	
Volume (vph)	87	0	54	69	14	61	33	365	22	0	784	101
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	87	0	54	69	14	61	33	365	22	0	784	101
RTOR Reduction (vph)	0	0	49	0	24	0	0	1	0	0	3	0
Lane Group Flow (vph)	87	0	5	0	120	0	0	419	0	0	882	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	2%	5%	2%	2%	5%	2%
Turn Type	Prot		custom	Split			Perm			Perm		
Protected Phases	4			8	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	7.6		7.6		8.2			70.2			70.2	
Effective Green, g (s)	9.6		9.6		10.2			72.2			72.2	
Actuated g/C Ratio	0.09		0.09		0.09			0.66			0.66	
Clearance Time (s)	6.0		6.0		6.0			6.0			6.0	
Vehicle Extension (s)	2.0		2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)	145		130		160			978			1039	
v/s Ratio Prot	c0.05				c0.07						c0.56	
v/s Ratio Perm			0.00					0.28				
v/c Ratio	0.60		0.04		0.75			0.43			0.85	
Uniform Delay, d1	48.4		46.0		48.7			9.0			14.7	
Progression Factor	1.00		1.00		1.00			1.00			0.79	
Incremental Delay, d2	4.8		0.0		17.8			1.4			8.6	
Delay (s)	53.2		46.0		66.4			10.4			20.2	
Level of Service	D		D		E			B			C	
Approach Delay (s)		50.4			66.4			10.4			20.2	
Approach LOS		D			E			B			C	

Intersection Summary

HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

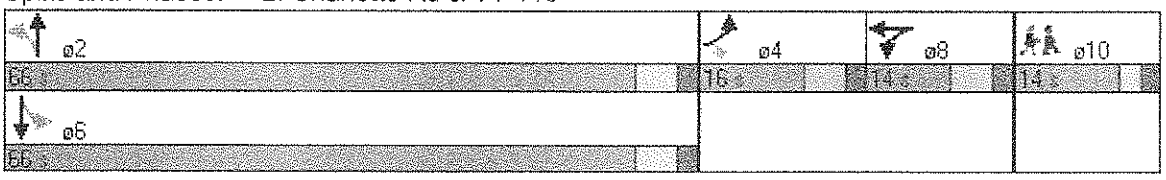
2: Charlotte Rd & VT 116

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	ø10
Lane Configurations							
Volume (vph)	87	54	14	33	365	784	
Lane Group Flow (vph)	87	54	144	0	420	885	
Turn Type	Prot	custom		Perm			
Protected Phases	4		8		2	6	10
Permitted Phases		4		2			
Detector Phases	4	4	8	2	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	14.0	16.0	16.0	16.0	14.0
Total Split (s)	16.0	16.0	14.0	66.0	66.0	66.0	14.0
Total Split (%)	14.5%	14.5%	12.7%	60.0%	60.0%	60.0%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
v/c Ratio	0.54	0.28	0.78		0.54	0.80	
Control Delay	60.1	16.3	73.1		13.8	18.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	60.1	16.3	73.1		13.8	18.4	
Queue Length 50th (ft)	59	0	83		130	456	
Queue Length 95th (ft)	125	46	#230		396	#1057	
Internal Link Dist (ft)			318		1559	1990	
Turn Bay Length (ft)		50					
Base Capacity (vph)	181	210	186		774	1105	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.48	0.26	0.77		0.54	0.80	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Charlotte Rd & VT 116



VT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1700	1900
Lane Width	11	11	11	12	11	12	12	12	12	12	12	12
Grade (%)		6%			-4%			-2%			2%	
Total Lost time (s)	4.0		4.0		4.0			4.0			4.0	
Lane Util. Factor	1.00		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.94			0.99			0.98	
Flt Protected	0.95		1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1659		1485		1725			1816			1581	
Flt Permitted	0.95		1.00		0.98			0.73			1.00	
Satd. Flow (perm)	1659		1485		1725			1332			1581	
Volume (vph)	111	0	54	69	14	61	33	404	22	0	820	123
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	111	0	54	69	14	61	33	404	22	0	820	123
RTOR Reduction (vph)	0	0	48	0	24	0	0	1	0	0	4	0
Lane Group Flow (vph)	111	0	6	0	120	0	0	458	0	0	939	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	2%	5%	2%	2%	5%	2%
Turn Type	Prot		custom	Split			Perm			Perm		
Protected Phases	4			8	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	9.3		9.3		7.9			68.8			68.8	
Effective Green, g (s)	11.3		11.3		9.9			70.8			70.8	
Actuated g/C Ratio	0.10		0.10		0.09			0.64			0.64	
Clearance Time (s)	6.0		6.0		6.0			6.0			6.0	
Vehicle Extension (s)	2.0		2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)	170		153		155			857			1018	
v/s Ratio Prot	c0.07				c0.07						c0.59	
v/s Ratio Perm			0.00					0.34				
v/c Ratio	0.65		0.04		0.78			0.53			0.92	
Uniform Delay, d1	47.5		44.4		49.0			10.6			17.2	
Progression Factor	1.00		1.00		1.00			1.00			0.81	
Incremental Delay, d2	6.9		0.0		22.2			2.4			16.7	
Delay (s)	54.4		44.5		71.1			13.0			30.6	
Level of Service	D		D		E			B			C	
Approach Delay (s)		51.1			71.1			13.0			30.6	
Approach LOS		D			E			B			C	

Intersection Summary

HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	60		

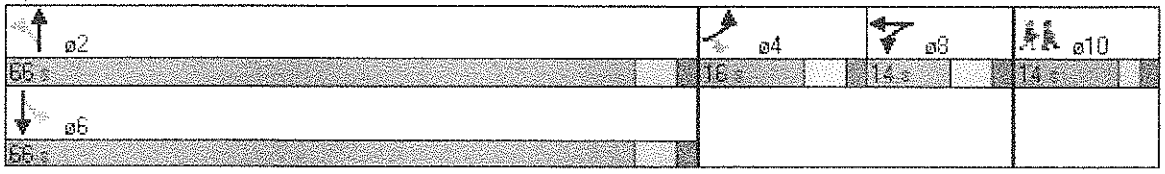
c Critical Lane Group

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	ø10
Lane Configurations							
Volume (vph)	111	54	14	33	404	820	
Lane Group Flow (vph)	111	54	144	0	459	943	
Turn Type	Prot	custom		Perm			
Protected Phases	4		8		2	6	10
Permitted Phases		4		2			
Detector Phases	4	4	8	2	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	14.0	16.0	16.0	16.0	14.0
Total Split (s)	16.0	16.0	14.0	66.0	66.0	66.0	14.0
Total Split (%)	14.5%	14.5%	12.7%	60.0%	60.0%	60.0%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
v/c Ratio	0.65	0.27	0.80		0.71	0.88	
Control Delay	67.2	16.0	77.6		21.5	25.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	67.2	16.0	77.6		21.5	25.3	
Queue Length 50th (ft)	76	0	83		170	435	
Queue Length 95th (ft)	#176	46	#230		#579m	#1155	
Internal Link Dist (ft)			318		1559	1990	
Turn Bay Length (ft)		50					
Base Capacity (vph)	181	210	182		642	1066	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.61	0.26	0.79		0.71	0.88	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Charlotte Rd & VT 116



ITE

2: Charlotte Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1700	1900
Lane Width	11	11	11	12	11	12	12	12	12	12	12	12
Grade (%)		6%			-4%			-2%			2%	
Total Lost time (s)	4.0		4.0		4.0			4.0			4.0	
Lane Util. Factor	1.00		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.94			0.99			0.98	
Flt Protected	0.95		1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1659		1485		1725			1816			1580	
Flt Permitted	0.95		1.00		0.98			0.71			1.00	
Satd. Flow (perm)	1659		1485		1725			1303			1580	
Volume (vph)	115	0	54	69	14	61	33	410	22	0	827	128
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	115	0	54	69	14	61	33	410	22	0	827	128
RTOR Reduction (vph)	0	0	47	0	24	0	0	1	0	0	4	0
Lane Group Flow (vph)	115	0	7	0	120	0	0	464	0	0	951	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	2%	5%	2%	2%	5%	2%
Turn Type	Prot		custom	Split			Perm			Perm		
Protected Phases	4			8	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	9.4		9.4		7.9			68.7			68.7	
Effective Green, g (s)	11.4		11.4		9.9			70.7			70.7	
Actuated g/C Ratio	0.10		0.10		0.09			0.64			0.64	
Clearance Time (s)	6.0		6.0		6.0			6.0			6.0	
Vehicle Extension (s)	2.0		2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)	172		154		155			837			1016	
v/s Ratio Prot	c0.07				c0.07						c0.60	
v/s Ratio Perm			0.00					0.36				
v/c Ratio	0.67		0.05		0.78			0.55			0.94	
Uniform Delay, d1	47.5		44.4		49.0			10.9			17.6	
Progression Factor	1.00		1.00		1.00			1.00			0.81	
Incremental Delay, d2	7.7		0.0		22.2			2.7			19.4	
Delay (s)	55.2		44.5		71.1			13.6			33.8	
Level of Service	E		D		E			B			C	
Approach Delay (s)		51.7			71.1			13.6			33.8	
Approach LOS		D			E			B			C	

Intersection Summary

HCM Average Control Delay	33.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	60		

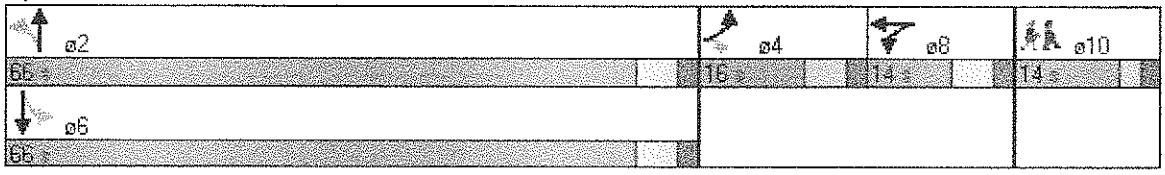
c Critical Lane Group

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	ø10
Lane Configurations							
Volume (vph)	115	54	14	33	410	827	
Lane Group Flow (vph)	115	54	144	0	465	955	
Turn Type	Prot	custom		Perm			
Protected Phases	4		8		2	6	10
Permitted Phases		4		2			
Detector Phases	4	4	8	2	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	14.0	16.0	16.0	16.0	14.0
Total Split (s)	16.0	16.0	14.0	66.0	66.0	66.0	14.0
Total Split (%)	14.5%	14.5%	12.7%	60.0%	60.0%	60.0%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
v/c Ratio	0.67	0.27	0.80		0.75	0.90	
Control Delay	68.6	17.0	78.5		24.0	26.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	68.6	17.0	78.5		24.0	26.7	
Queue Length 50th (ft)	79	1	83		182	442	
Queue Length 95th (ft)	#185	48	#230		#605m	#1158	
Internal Link Dist (ft)			318		1559	1990	
Turn Bay Length (ft)		50					
Base Capacity (vph)	181	208	181		618	1066	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.64	0.26	0.80		0.75	0.90	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Charlotte Rd & VT 116



2: Charlotte Rd & VT 116

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1700	1900
Lane Width	11	11	11	12	11	12	12	12	12	12	12	12
Grade (%)		6%			-4%			-2%			2%	
Total Lost time (s)	4.0		4.0		4.0			4.0			4.0	
Lane Util. Factor	1.00		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.94			0.99			0.98	
Flt Protected	0.95		1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1659		1485		1725			1815			1583	
Flt Permitted	0.95		1.00		0.98			0.80			1.00	
Satd. Flow (perm)	1659		1485		1725			1452			1583	
Volume (vph)	89	0	55	70	14	62	33	372	22	0	801	103
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	89	0	55	70	14	62	33	372	22	0	801	103
RTOR Reduction (vph)	0	0	50	0	24	0	0	1	0	0	3	0
Lane Group Flow (vph)	89	0	5	0	122	0	0	426	0	0	901	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	2%	5%	2%	2%	5%	2%
Turn Type	Prot		custom	Split			Perm			Perm		
Protected Phases	4			8	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	7.7		7.7		8.2			70.1			70.1	
Effective Green, g (s)	9.7		9.7		10.2			72.1			72.1	
Actuated g/C Ratio	0.09		0.09		0.09			0.66			0.66	
Clearance Time (s)	6.0		6.0		6.0			6.0			6.0	
Vehicle Extension (s)	2.0		2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)	146		131		160			952			1038	
v/s Ratio Prot	c0.05				c0.07						c0.57	
v/s Ratio Perm			0.00					0.29				
v/c Ratio	0.61		0.04		0.76			0.45			0.87	
Uniform Delay, d1	48.3		45.9		48.7			9.2			15.1	
Progression Factor	1.00		1.00		1.00			1.00			0.79	
Incremental Delay, d2	5.0		0.0		18.4			1.5			10.0	
Delay (s)	53.3		45.9		67.1			10.8			22.0	
Level of Service	D		D		E			B			C	
Approach Delay (s)		50.5			67.1			10.8			22.0	
Approach LOS		D			E			B			C	

Intersection Summary

HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

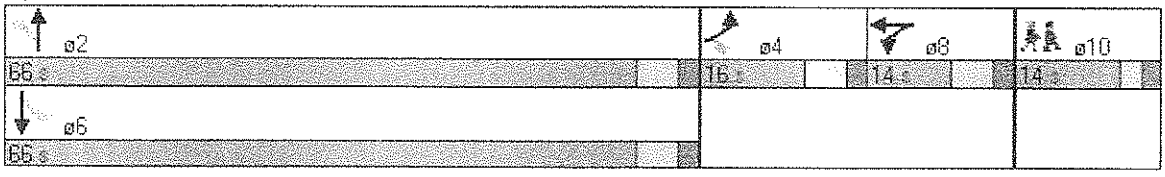
2: Charlotte Rd & VT 116

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	ø10
Lane Configurations							
Volume (vph)	89	55	14	33	372	801	
Lane Group Flow (vph)	89	55	146	0	427	904	
Turn Type	Prot	custom		Perm			
Protected Phases	4		8		2	6	10
Permitted Phases		4		2			
Detector Phases	4	4	8	2	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	14.0	16.0	16.0	16.0	14.0
Total Split (s)	16.0	16.0	14.0	66.0	66.0	66.0	14.0
Total Split (%)	14.5%	14.5%	12.7%	60.0%	60.0%	60.0%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
v/c Ratio	0.55	0.28	0.79		0.58	0.82	
Control Delay	60.6	16.1	74.6		15.0	19.5	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	60.6	16.1	74.6		15.0	19.5	
Queue Length 50th (ft)	60	0	84		138	465	
Queue Length 95th (ft)	127	47	#233		#473	#1094	
Internal Link Dist (ft)			318		1559	1990	
Turn Bay Length (ft)		50					
Base Capacity (vph)	181	211	186		739	1104	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.26	0.78		0.58	0.82	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Charlotte Rd & VT 116



VT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1700	1900
Lane Width	11	11	11	12	11	12	12	12	12	12	12	12
Grade (%)		6%			-4%			-2%			2%	
Total Lost time (s)	4.0		4.0		4.0			4.0			4.0	
Lane Util. Factor	1.00		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.94			0.99			0.98	
Flt Protected	0.95		1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1659		1485		1725			1816			1581	
Flt Permitted	0.95		1.00		0.98			0.71			1.00	
Satd. Flow (perm)	1659		1485		1725			1291			1581	
Volume (vph)	113	0	55	70	14	62	33	411	22	0	837	125
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	0	55	70	14	62	33	411	22	0	837	125
RTOR Reduction (vph)	0	0	48	0	25	0	0	1	0	0	4	0
Lane Group Flow (vph)	113	0	7	0	121	0	0	465	0	0	958	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	2%	5%	2%	2%	5%	2%
Turn Type	Prot		custom	Split			Perm			Perm		
Protected Phases	4			8	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	9.3		9.3		7.9			68.8			68.8	
Effective Green, g (s)	11.3		11.3		9.9			70.8			70.8	
Actuated g/C Ratio	0.10		0.10		0.09			0.64			0.64	
Clearance Time (s)	6.0		6.0		6.0			6.0			6.0	
Vehicle Extension (s)	2.0		2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)	170		153		155			831			1018	
v/s Ratio Prot	c0.07				c0.07						c0.61	
v/s Ratio Perm			0.00					0.36				
v/c Ratio	0.66		0.04		0.78			0.56			0.94	
Uniform Delay, d1	47.5		44.5		49.0			10.9			17.7	
Progression Factor	1.00		1.00		1.00			1.00			0.80	
Incremental Delay, d2	7.6		0.0		23.8			2.7			20.9	
Delay (s)	55.2		44.5		72.8			13.6			35.1	
Level of Service	E		D		E			B			D	
Approach Delay (s)		51.7			72.8			13.6			35.1	
Approach LOS		D			E			B			D	

Intersection Summary

HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	60		

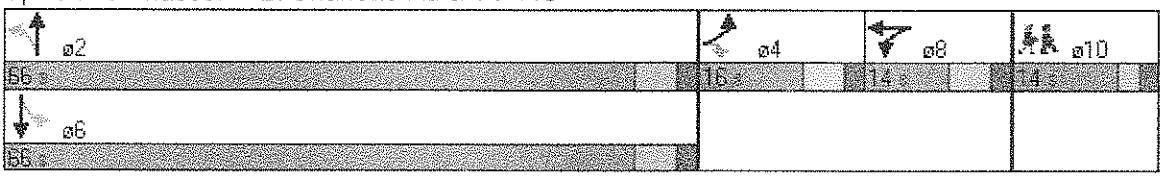
c Critical Lane Group

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	ø10
Lane Configurations							
Volume (vph)	113	55	14	33	411	837	
Lane Group Flow (vph)	113	55	146	0	466	962	
Turn Type	Prot	custom		Perm			
Protected Phases	4		8		2	6	10
Permitted Phases		4		2			
Detector Phases	4	4	8	2	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	14.0	16.0	16.0	16.0	14.0
Total Split (s)	16.0	16.0	14.0	66.0	66.0	66.0	14.0
Total Split (%)	14.5%	14.5%	12.7%	60.0%	60.0%	60.0%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
v/c Ratio	0.66	0.27	0.81		0.77	0.90	
Control Delay	67.8	16.3	79.5		25.5	27.5	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	67.8	16.3	79.5		25.5	27.5	
Queue Length 50th (ft)	78	1	84		187	449	
Queue Length 95th (ft)	#180	48	#233		#615m	#1184	
Internal Link Dist (ft)			318		1559	1990	
Turn Bay Length (ft)		50					
Base Capacity (vph)	181	210	181		604	1066	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.26	0.81		0.77	0.90	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Charlotte Rd & VT 116



2: Charlotte Rd & VT 116

ITE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1700	1900
Lane Width	11	11	11	12	11	12	12	12	12	12	12	12
Grade (%)		6%			-4%			-2%			2%	
Total Lost time (s)	4.0		4.0		4.0			4.0			4.0	
Lane Util. Factor	1.00		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.94			0.99			0.98	
Flt Protected	0.95		1.00		0.98			1.00			1.00	
Satd. Flow (prot)	1659		1485		1725			1816			1580	
Flt Permitted	0.95		1.00		0.98			0.69			1.00	
Satd. Flow (perm)	1659		1485		1725			1260			1580	
Volume (vph)	117	0	55	70	14	62	33	417	22	0	844	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	0	55	70	14	62	33	417	22	0	844	130
RTOR Reduction (vph)	0	0	47	0	25	0	0	1	0	0	4	0
Lane Group Flow (vph)	117	0	8	0	121	0	0	471	0	0	970	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	2%	5%	2%	2%	5%	2%
Turn Type	Prot		custom	Split			Perm			Perm		
Protected Phases	4			8	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	9.4		9.4		7.9			68.7			68.7	
Effective Green, g (s)	11.4		11.4		9.9			70.7			70.7	
Actuated g/C Ratio	0.10		0.10		0.09			0.64			0.64	
Clearance Time (s)	6.0		6.0		6.0			6.0			6.0	
Vehicle Extension (s)	2.0		2.0		2.0			2.0			2.0	
Lane Grp Cap (vph)	172		154		155			810			1016	
v/s Ratio Prot	c0.07				c0.07						c0.61	
v/s Ratio Perm			0.01					0.37				
v/c Ratio	0.68		0.05		0.78			0.58			0.95	
Uniform Delay, d1	47.5		44.4		49.0			11.2			18.2	
Progression Factor	1.00		1.00		1.00			1.00			0.81	
Incremental Delay, d2	8.9		0.1		23.8			3.1			24.9	
Delay (s)	56.4		44.5		72.8			14.3			39.6	
Level of Service	E		D		E			B			D	
Approach Delay (s)		52.6			72.8			14.3			39.6	
Approach LOS		D			E			B			D	

Intersection Summary

HCM Average Control Delay	36.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	60		

c Critical Lane Group

Lane Group	EBL	EBR	WBT	NBL	NBT	SBT	ø10
Lane Configurations							
Volume (vph)	117	55	14	33	417	844	
Lane Group Flow (vph)	117	55	146	0	472	974	
Turn Type	Prot	custom		Perm			
Protected Phases	4		8		2	6	10
Permitted Phases		4		2			
Detector Phases	4	4	8	2	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	14.0	16.0	16.0	16.0	14.0
Total Split (s)	16.0	16.0	14.0	66.0	66.0	66.0	14.0
Total Split (%)	14.5%	14.5%	12.7%	60.0%	60.0%	60.0%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
v/c Ratio	0.68	0.27	0.81		0.82	0.91	
Control Delay	69.4	17.3	79.9		29.9	29.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	69.4	17.3	79.9		29.9	29.4	
Queue Length 50th (ft)	80	2	84		202	457	
Queue Length 95th (ft)	#189	49	#233		#642m	#1189	
Internal Link Dist (ft)			318		1559	1990	
Turn Bay Length (ft)		50					
Base Capacity (vph)	181	208	181		578	1065	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.65	0.26	0.81		0.82	0.91	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Charlotte Rd & VT 116

Appendix G
VT Route 116 & Silver St
Capacity Analyses

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 No Build
Project ID: 10024
East/West Street: Silver St.
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	213			418	374
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	15	213			418	374
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						No
Lanes	0	1			1	1
Configuration		LT			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				218		6
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				218		6
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			4	
Flared Approach: Exists?/Storage				/		No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	15						224	
C(m) (vph)	838						366	
v/c	0.02						0.61	
95% queue length	0.05						4.45	
Control Delay	9.4						30.0	
LOS	A						D	
Approach Delay							30.0	
Approach LOS							D	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build VT
Project ID: 10024
East/West Street: Silver St.
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	239			442	386
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	15	239			442	386
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes	0	1			1	1
Configuration		LT			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				231		7
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				231		7
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			4	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	15						238	
C(m) (vph)	812						339	
v/c	0.02						0.70	
95% queue length	0.06						6.29	
Control Delay	9.5						39.6	
LOS	A						E	
Approach Delay							39.6	
Approach LOS							E	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build ITE
Project ID: 10024
East/West Street: Silver St.
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	243			447	388
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	15	243			447	388
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						No
Lanes	0	1			1	1
Configuration	LT				T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				233		6
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				233		6
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			4	
Flared Approach: Exists?/Storage				/		No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	15						239	
C(m) (vph)	807						334	
v/c	0.02						0.72	
95% queue length	0.06						6.62	
Control Delay	9.5						41.6	
LOS	A						E	
Approach Delay							41.6	
Approach LOS							E	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 No Build
Project ID: 10024
East/West Street: Silver St.
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	216			425	380
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	15	216			425	380
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						No
Lanes	0	1			1	1
Configuration		LT			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				222		7
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				222		7
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			4	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	15						229	
C(m) (vph)	828						360	
v/c	0.02						0.64	
95% queue length	0.06						4.88	
Control Delay	9.4						32.0	
LOS	A						D	
Approach Delay							32.0	
Approach LOS							D	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build VT
Project ID: 10024
East/West Street: Silver St.
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	242			449	392
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	15	242			449	392
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						No
Lanes	0	1			1	1
Configuration	LT				T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				235		7
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				235		7
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			4	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	15						242	
C(m) (vph)	803						334	
v/c	0.02						0.72	
95% queue length	0.06						6.87	
Control Delay	9.6						42.7	
LOS	A						E	
Approach Delay							42.7	
Approach LOS							E	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build ITE
Project ID: 10024
East/West Street: Silver St.
North/South Street: VT 116
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	246			454	394
Peak-Hour Factor, PHF	1.00	1.00			1.00	1.00
Hourly Flow Rate, HFR	15	246			454	394
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						No
Lanes	0	1			1	1
Configuration		LT			T	R
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				237		7
Peak Hour Factor, PHF				1.00		1.00
Hourly Flow Rate, HFR				237		7
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			4	
Flared Approach: Exists?/Storage			/			No /
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	15						244	
C(m) (vph)	798						329	
v/c	0.02						0.74	
95% queue length	0.06						7.34	
Control Delay	9.6						45.5	
LOS	A						E	
Approach Delay							45.5	
Approach LOS							E	

Appendix H
Mechanicsville Rd & Commerce St
Capacity Analyses

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 No Build
Project ID:
East/West Street: Commerce St/Thorn Bush Rd
North/South Street: Mechanicsville Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	139	5	1	148	63
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	15	139	5	1	148	63
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	14	29	6	100	14	18
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	14	29	6	100	14	18
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	15	1		49			132	
C(m) (vph)	1360	1438		598			583	
v/c	0.01	0.00		0.08			0.23	
95% queue length	0.03	0.00		0.27			0.87	
Control Delay	7.7	7.5		11.6			13.0	
LOS	A	A		B			B	
Approach Delay				11.6			13.0	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build VT
Project ID:
East/West Street: Commerce St/Thorn Bush Rd
North/South Street: Mechanicsville Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	37	134	5	1	142	89
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	37	134	5	1	142	89
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	14	29	6	120	14	21
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	14	29	6	120	14	21
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	37	1		49			155	
C(m) (vph)	1337	1445		553			539	
v/c	0.03	0.00		0.09			0.29	
95% queue length	0.09	0.00		0.29			1.20	
Control Delay	7.8	7.5		12.1			14.4	
LOS	A	A		B			B	
Approach Delay				12.1			14.4	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build ITE
Project ID:
East/West Street: Commerce St/Thorn Bush Rd
North/South Street: Mechanicsville Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	41	133	5	1	141	93
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	41	133	5	1	141	93
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	14	29	6	125	14	24
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	14	29	6	125	14	24
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	41	1		49			163	
C(m) (vph)	1333	1446		544			534	
v/c	0.03	0.00		0.09			0.31	
95% queue length	0.10	0.00		0.30			1.31	
Control Delay	7.8	7.5		12.3			14.7	
LOS	A	A		B			B	
Approach Delay				12.3			14.7	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 No Build
Project ID:
East/West Street: Commerce St/Thorn Bush Rd
North/South Street: Mechanicsville Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	15	142	5	1	151	64
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	15	142	5	1	151	64
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	14	29	6	102	14	19
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	14	29	6	102	14	19
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	15	1		49			135	
C(m) (vph)	1355	1435		594			579	
v/c	0.01	0.00		0.08			0.23	
95% queue length	0.03	0.00		0.27			0.91	
Control Delay	7.7	7.5		11.6			13.1	
LOS	A	A		B			B	
Approach Delay				11.6			13.1	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build VT
Project ID:
East/West Street: Commerce St/Thorn Bush Rd
North/South Street: Mechanicsville Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	37	137	5	1	145	90
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	37	137	5	1	145	90
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	14	29	6	122	14	22
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	14	29	6	122	14	22
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	37	1		49			158	
C(m) (vph)	1332	1441		547			534	
v/c	0.03	0.00		0.09			0.30	
95% queue length	0.09	0.00		0.29			1.25	
Control Delay	7.8	7.5		12.2			14.6	
LOS	A	A		B			B	
Approach Delay				12.2			14.6	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build ITE
Project ID:
East/West Street: Commerce St/Thorn Bush Rd
North/South Street: Mechanicsville Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	41	136	5	1	144	94
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	41	136	5	1	144	94
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	14	29	6	127	14	25
Peak Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	14	29	6	127	14	25
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		-2			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	41	1		49			166	
C(m) (vph)	1329	1442		539			530	
v/c	0.03	0.00		0.09			0.31	
95% queue length	0.10	0.00		0.30			1.36	
Control Delay	7.8	7.5		12.3			14.9	
LOS	A	A		B			B	
Approach Delay				12.3			14.9	
Approach LOS				B			B	

Appendix I
Commerce St & NBM/Hannaford Capacity Analyses

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 No Build
Project ID: 10024
East/West Street: Commerce St
North/South Street: NBM/Hannaford
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		119	25	8	94	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		119	25	8	94	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	23		13			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	23		13			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		8		36				
C(m) (vph)		1438		797				
v/c		0.01		0.05				
95% queue length		0.02		0.14				
Control Delay		7.5		9.7				
LOS		A		A				
Approach Delay				9.7				
Approach LOS				A				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build VT
Project ID: 10024
East/West Street: Commerce St
North/South Street: NBM/Hannaford
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		119	147	56	94	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		119	147	56	94	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	156		36			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	156		36			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		56		192				
C(m) (vph)		1298		618				
v/c		0.04		0.31				
95% queue length		0.14		1.34				
Control Delay		7.9		13.4				
LOS		A		B				
Approach Delay				13.4				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2012 Build ITE
Project ID: 10024
East/West Street: Commerce St
North/South Street: NBM/Hannaford
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		119	166	64	94	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		119	166	64	94	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	181		44			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	181		44			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		64		225				
C(m) (vph)		1277		597				
v/c		0.05		0.38				
95% queue length		0.16		1.80				
Control Delay		8.0		14.7				
LOS		A		B				
Approach Delay				14.7				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 No Build
Project ID: 10024
East/West Street: Commerce St
North/South Street: NBM/Hannaford
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		122	26	8	95	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		122	26	8	95	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	24		13			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	24		13			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		8		37				
C(m) (vph)		1434		792				
v/c		0.01		0.05				
95% queue length		0.02		0.15				
Control Delay		7.5		9.8				
LOS		A		A				
Approach Delay				9.8				
Approach LOS				A				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/03/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build VT
Project ID: 10024
East/West Street: Commerce St
North/South Street: NBM/Hannaford
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		122	148	56	95	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		122	148	56	95	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	157		36			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	157		36			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		56		193				
C(m) (vph)		1293		613				
v/c		0.04		0.31				
95% queue length		0.14		1.37				
Control Delay		7.9		13.6				
LOS		A		B				
Approach Delay				13.6				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R. Dickinson
Agency/Co.:
Date Performed: 2/28/11
Analysis Time Period: PM DHV
Intersection:
Jurisdiction: Hinesburg
Units: U. S. Customary
Analysis Year: 2017 Build ITE
Project ID: 10024
East/West Street: Commerce St
North/South Street: NBM/Hannaford
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		122	167	64	95	
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR		122	167	64	95	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	182		44			
Peak Hour Factor, PHF	1.00		1.00			
Hourly Flow Rate, HFR	182		44			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		64		226				
C(m) (vph)		1273		593				
v/c		0.05		0.38				
95% queue length		0.16		1.83				
Control Delay		8.0		14.8				
LOS		A		B				
Approach Delay				14.8				
Approach LOS				B				