

Traffic Impact Analysis Farmington Center Village

Route 4 (Farmington Avenue) Farmington, Connecticut



Prepared for:
The Town of Farmington, CT

Prepared By:
BL Companies
Meriden, Connecticut

December 2016

CONTENTS

<u>Part</u>	<u>Description</u>	<u>Page</u>
	EXECUTIVE SUMMARY	i
I	INTRODUCTION	1
II	EXISTING CONDITIONS	3
	Access Network	3
	Intersection Geometry and Control	4
	Current Traffic Volumes	5
III	ANTICIPATED TRAFFIC CONDITIONS	7
	Background Traffic Volumes	7
	Trip Distribution	7
	Site Traffic Volumes	8
	Build Traffic Volumes	9
IV	ROADWAY ADEQUACY	10
	Signalized Intersections	10
	Intersection Analyses	11
V	CONCLUSION	14

ILLUSTRATIONS

<u>Number</u>	<u>Figure</u>	<u>Follows Page</u>
1	Site Location Map	3
2	Current Traffic Volumes	5
3	Background Traffic Volumes	7
4	Trip Distribution	7
5	Site Traffic Volumes	8
6	Build Traffic Volumes	9

TABLES

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Peak Hour Trip Generation	8
2	Peak Hour Level of Service – Signalized Intersections	11
3 AM	Morning Peak Hour Level of Service Summary	12
3 PM	Afternoon Peak Hour Level of Service Summary	13

APPENDIX

Capacity Analyses

EXECUTIVE SUMMARY

The redevelopment of a property located on the northwesterly side of Route 4 (Farmington Avenue) east of High Street in the Town of Farmington, Connecticut is being considered. Specifically, the plan will redevelop a site formerly occupied by an automobile dealership. The proposal includes the construction of 9,600± square feet of commercial space, 62 residential units and 256 parking spaces.

This study investigated the traffic impacts associated with the proposed development during the weekday morning and afternoon peak traffic periods. For the purpose of this study, the proposed development is projected to generate about 42 and 77 new vehicular trips during the weekday morning and afternoon peak hours, respectively.

The proposed site reconfiguration will provide primary access to Route 4 (Farmington Avenue) via a new street, temporarily called Backage Road, at its signalized intersection opposite High Street, currently being constructed under State Project #51-260. The site will also have limited access about 400' to the west at the reconstructed driveway to Farmington Commons.

Capacity analyses were performed at the two key signalized intersections near the site to evaluate levels of service (LOS). The Levels of Service (LOS) for all traffic movements will remain essentially unchanged at the signalized Route 4 (Farmington Avenue)

intersection with Route 10. State Project #51-260 will not make any significant capacity improvements at this intersection, which will continue to operate very poorly with long queues. The new Route 4 (Farmington Avenue) intersection with High Street and Backage Road is theoretically projected to operate well, at overall LOS C, but with relatively long delays for traffic exiting Backage Road and High Street (LOS “E”), as the cycle lengths need to accommodate the critical Route 4/Route 10 intersection.

Given the existing and background conditions along Route 4 (Farmington Avenue) and the relatively small change in traffic volume projected from the site, no significant changes in projected background traffic operations are anticipated. However, it should be noted that the projected good (“C”) overall peak period levels of service for the High Street/Backage Road signalized intersection may be somewhat misleading and not actually be achievable in the field due to the interference of queue spillback from Route 10, which is difficult to accurately model. Consideration should be given to the installation of “Don’t Block The Box” regulatory signing and pavement markings for the Backage Road/High Street intersection if queue blockage occurs.

Due to the provision of more than 200 parking spaces or 100,000 square feet of building area, the development will have to be submitted to the Office of State Traffic Administration (OSTA) for review as a major traffic generator. Subsequently, an encroachment permit from the CTDOT District 4 office will be required for any work in the State right of way.

I. INTRODUCTION

The redevelopment of a vacant site is being considered on the northwesterly side of Route 4 (Farmington Avenue), east of High Street in Farmington, Connecticut. The site was once occupied by an auto dealership and is now vacant (temporarily used for construction operations) as the property was acquired as part of a Connecticut Department of Transportation Route 4 corridor improvement project (#51-260), now under construction.

The suggested development plan for the remaining portions of the site includes the construction of 9,600± square feet of commercial space, 62 residential units and 256 parking spaces. The proposed parking is well in excess of that needed for the development proper, but is anticipated to be available for other nearby developments in the future. For the purpose of this study, construction completion is anticipated in the year 2019.

This study investigated the traffic impacts associated with the proposed development during the weekday morning and afternoon peak periods.

The development plan proposes access to Route 4 (Farmington Avenue) via the signalized Backage Road intersection to be constructed under project #51-260, and via a partial access connection to Route 4 at the current driveway location to Farmington Commons, about 400' to the west. Backage Road (temporary name) is a proposed street,

to be constructed under project #51-260, which will intersect Route 4 (Farmington Avenue) opposite High Street.

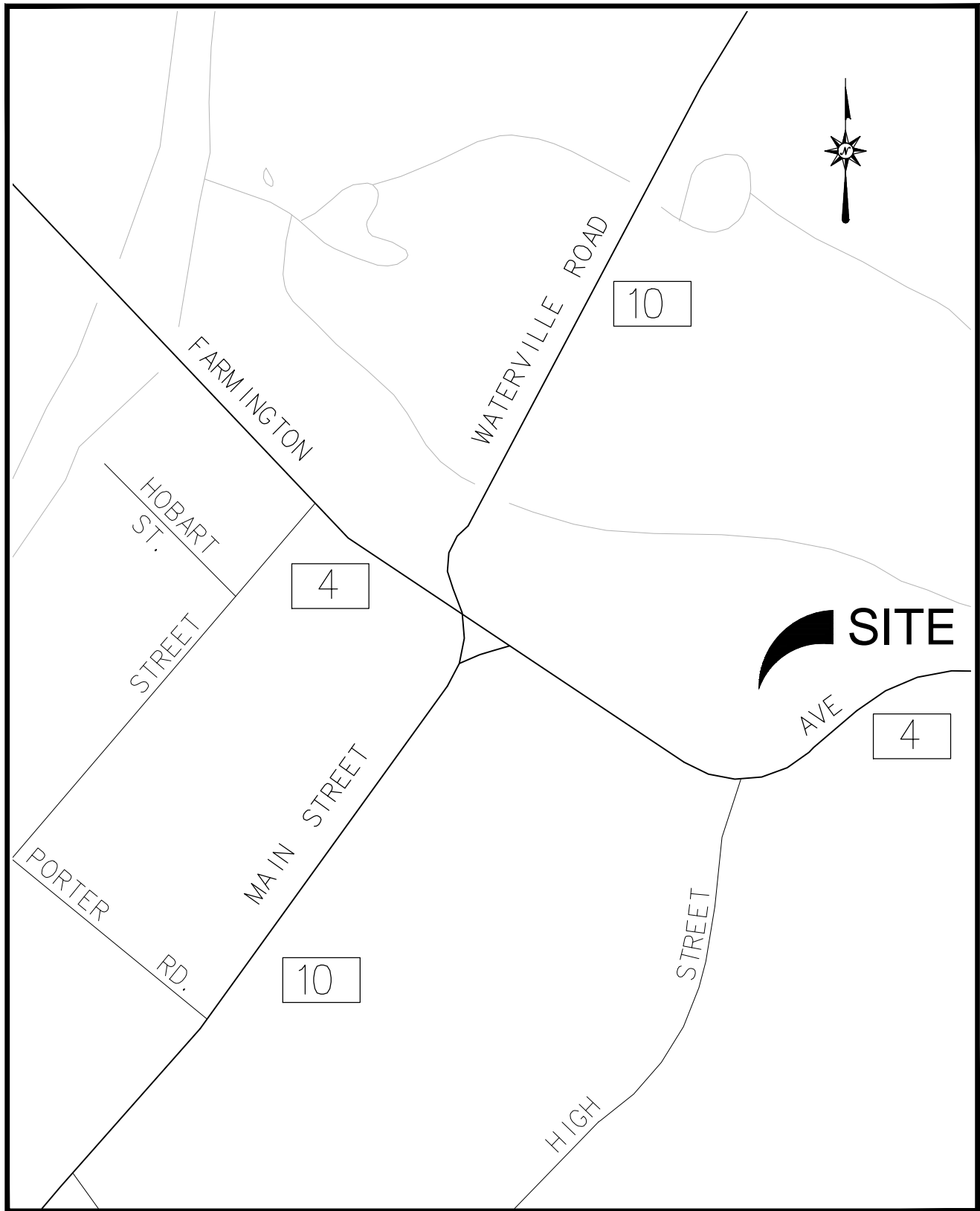
II. EXISTING CONDITIONS

An investigation of the existing conditions on the adjacent roadway network formed the basis for determining the traffic impacts of the proposed development. This investigation included a field reconnaissance and research of pertinent planning and traffic data at local and State agencies.

Access Network

As illustrated in Figure 1, the site is located on the northwesterly side of Route 4 (Farmington Avenue), east of the intersection with High Street. More specifically, it is the former auto dealership site that was acquired by the Department of Transportation.

Route 4 (Farmington Avenue) is an east/west oriented State maintained principal arterial. Along the site frontage, Route 4 (Farmington Avenue) has two travel lanes in a width of 38-40 feet. Just west of High Street, a second westbound travel lane is added through the intersection with Route 10. Route 4 (Farmington Avenue) has a 30-mile per hour speed limit and is on a downgrade traveling west. There is a sharp horizontal curve at the High Street intersection. Abutting land uses near the site are a mix of small retail and commercial establishments. Sidewalks and illumination are present to the west of High Street. The CT Transit Farmington Avenue (#66) bus route to/from downtown Hartford, and the Unionville Express (#909), also to/from downtown Hartford pass the site.



LOCATION PLAN
 FARMINGTON CENTER VILLAGE
 FARMINGTON, CT

FIGURE 1

State Project #51-260, safety and traffic operational improvement on Route 4 (Farmington Avenue) from Garden Street to Mountain Spring Road, is currently under construction. The primary traffic operational enhancement under this project is in the eastbound direction where two continuous lanes will now be provided from the Route 10 intersection through the Mountain Spring Road intersection, where only one lane was previously provided. In addition, the High Street/Backage Road intersection will be signalized.

Intersection Geometry and Control

The signalized intersections of Route 4 (Farmington Avenue) at Route 10 (Main Street/Waterville Road) and High Street/Backage Road were included in this study. The descriptions of the intersections below reflect the changes currently under construction in State Project #51-260.

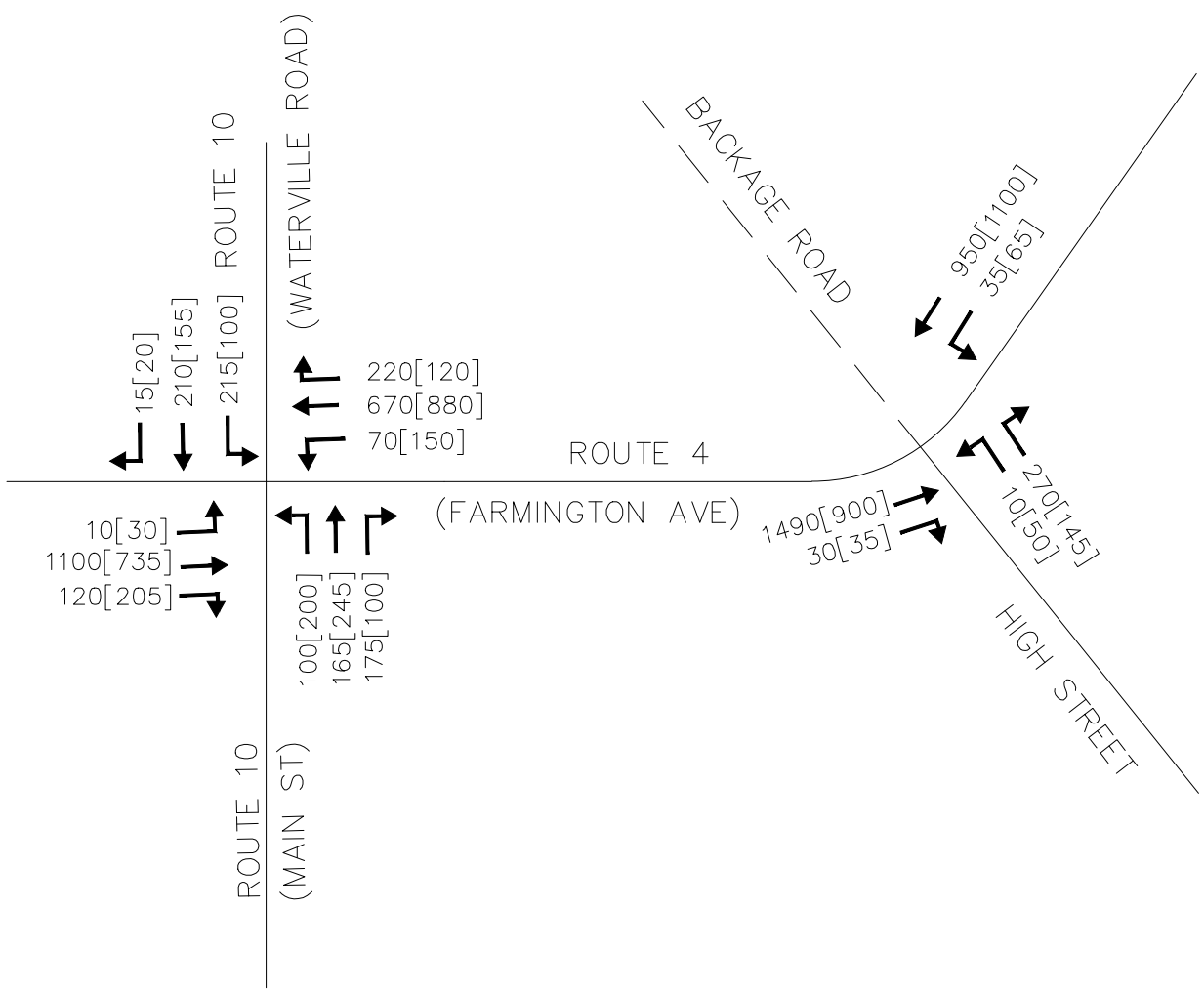
Route 4 (Farmington Avenue) at Route 10 (Main Street/Waterville Road) is a signalized, skewed, four-legged intersection. The Route 4 (Farmington Avenue) eastbound approach provides a left turn lane, two through lanes, and a right turn lane, while the Route 4 (Farmington Avenue) westbound approach has a left turn lane and a through/right lane. The Route 10 (Main Street) northbound approach has a left turn lane, a through lane and a channelized right turn lane. The Route 10 (Waterville Road) southbound approach has a single travel lane. The primary lane arrangement differences between the existing layout and that proposed under project #51-260 is the addition of a left turn lane for the northbound Route 10 (Main Street) approach and conversion of a westbound Route 4 (Farmington Avenue) through lane to a left turn lane. The traffic

signal will have relatively complex phasing with Route 4 (Farmington Avenue) provided a protected/permitted left turn phase, split phasing for the Route 10 approaches, a pedestrian phase and emergency vehicle pre-emption. The traffic signal is part of a coordinated signal system along Route 4 (Farmington Avenue).

Route 4 (Farmington Avenue) at High Street/Backage Road will be a signalized, four-way intersection under State Project #51-260. High Street currently intersects Route 4 (Farmington Avenue) on the outside of a sharp curve, where an overhead warning flasher is provided. The Route 4 (Farmington Avenue) eastbound approach will provide a left turn lane and two through lanes, while the Route 4 (Farmington Avenue) westbound approach will have a left turn lane and a through lane. The High Street approach will have a combined left/through lane and a right turn lane, while Backage Road has a single lane. The traffic signal will provide protected/permitted left turn phasing for Route 4, a pedestrian phase, an advance left turn phase for High Street and emergency vehicle pre-emption. The traffic signal will be part of the coordinated signal system along Route 4 (Farmington Avenue).

Current Traffic Volumes

Manual turning movement counts were conducted at the above intersections, by others, during weekday morning and afternoon commuter peak periods in September of 2015 for the High Street evaluation study, prepared for the Town. The current peak hour traffic volumes are illustrated in Figure 2. Peak hour traffic volumes passing the site were approximately 2800 trips during the morning and 2250 during the afternoon. There was a



LEGEND

AM PEAK HOUR: XXX
 PM PEAK HOUR: [XXX]

Ref: High Street Study, December 2015



**CURRENT TRAFFIC VOLUMES
 FARMINGTON CENTER VILLAGE
 FARMINGTON, CT**

SCHEMATIC, NOT TO SCALE

FIGURE 2

sharp directional distribution (64% EB) during the morning peak hour and a more even distribution (54% WB) during the afternoon peak hour. Peak period queue spillback from the Route 4/Route 10 intersection was observed well past the High Street intersection, as well as relatively long queues on the other approaches.

Average daily traffic volumes (ADT'S) obtained from the Connecticut Department of Transportation indicates that Route 4 (Farmington Avenue) carries an ADT of about 28,000 vehicular trips in this area. ADT information is not used in the capacity analyses, which use peak hour data, but provides information regarding roadway function and usage.

III. ANTICIPATED TRAFFIC CONDITIONS

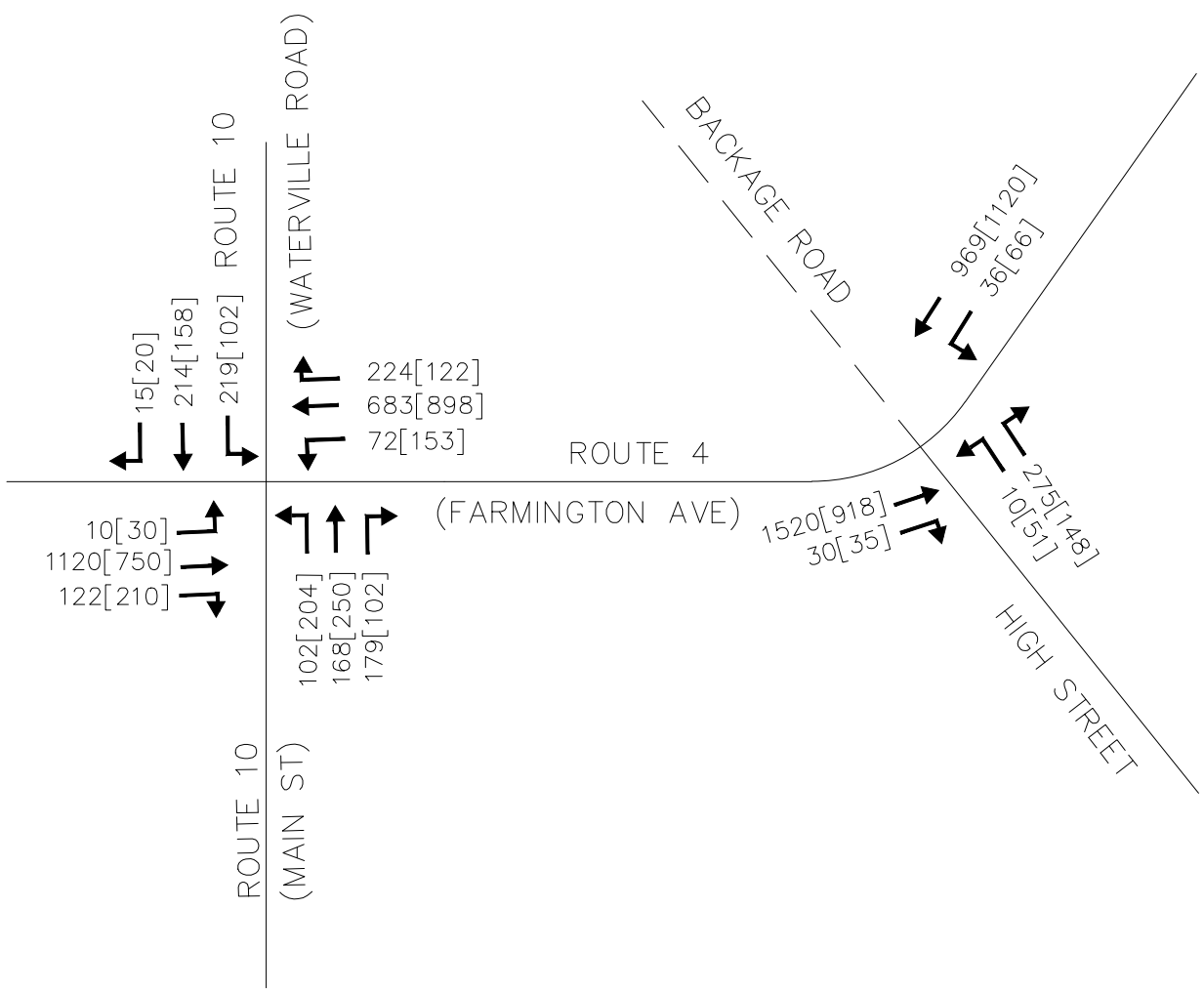
Peak hour traffic volumes expected for the Temple development were estimated, assigned to the roadway network, and superimposed onto projected year 2019 background traffic volumes. This methodology provides a year of completion estimate for analysis.

Background Traffic Volumes

Background growth was added to the existing peak hour traffic volumes in order to simulate the typical increase in traffic to the year of project completion (2019). This includes the normal increases, as well as traffic from other infill developments, such as the recently approved condo project at the former Chucks site. The background growth was based on a rate of 0.5 percent per year, currently the norm in CT. These weekday morning and afternoon peak hour year 2019 background traffic volumes are depicted in Figure 3.

Trip Distribution

Trip distribution is the projected percentage of the site traffic oriented along specific directions and routes, which are utilized to arrive and depart the site. The trip distribution was assumed to be skewed to/from the east, where access to the regional expressway system (I-84) is available and the UCONN Health Center is located. Figure 4 shows the expected trip distribution.



LEGEND

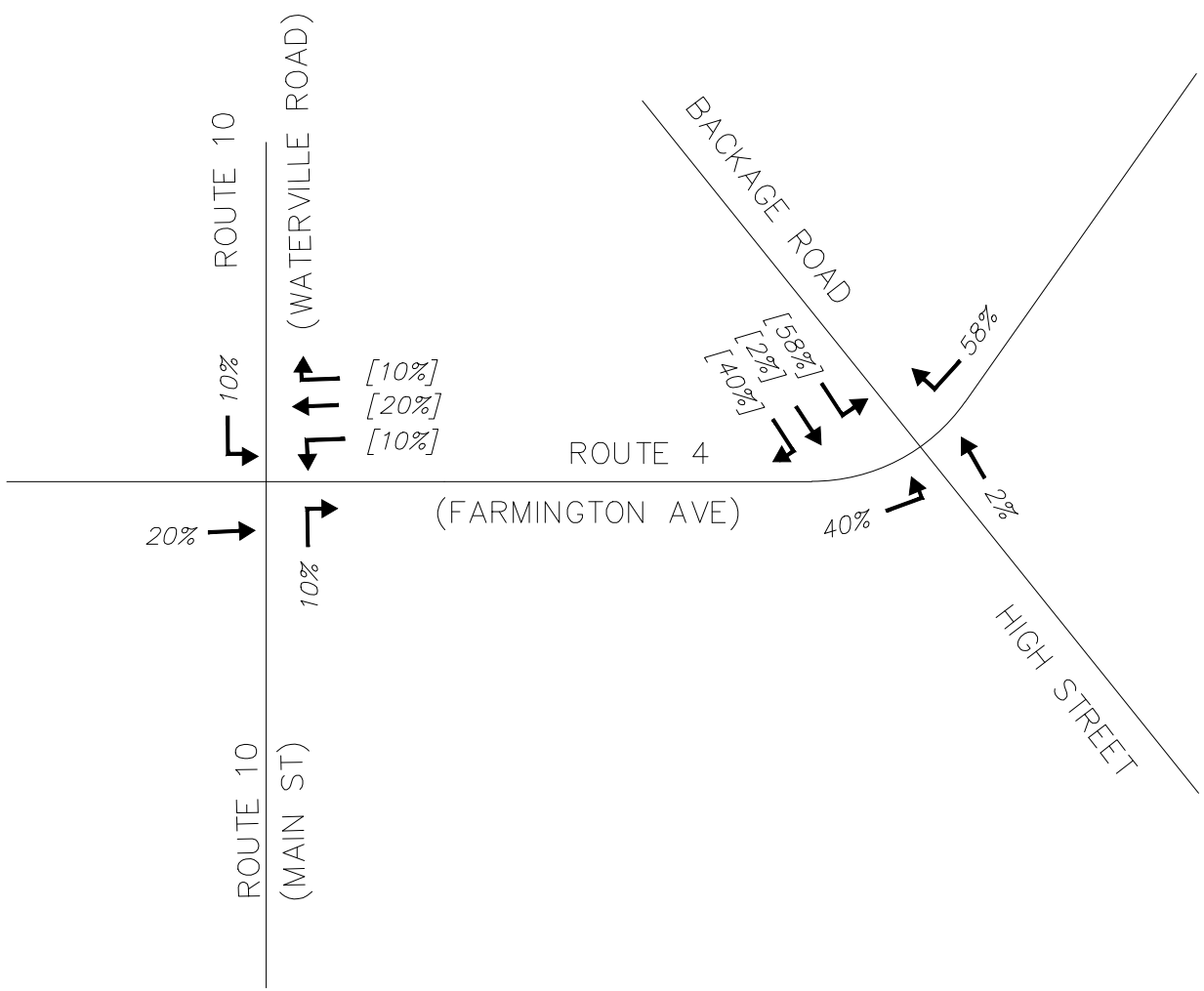
AM PEAK HOUR: XXX
PM PEAK HOUR: [XXX]



**BACKGROUND (2019) TRAFFIC VOLUMES
FARMINGTON CENTER VILLAGE
FARMINGTON, CT**

SCHEMATIC, NOT TO SCALE

FIGURE 3



LEGEND

PERCENT ARRIVING: XX%
PERCENT DEPARTING: (XX%)



**TRIP DISTRIBUTION
FARMINGTON CENTER VILLAGE
FARMINGTON, CT**

SCHEMATIC, NOT TO SCALE

FIGURE 4

Site Traffic Volumes

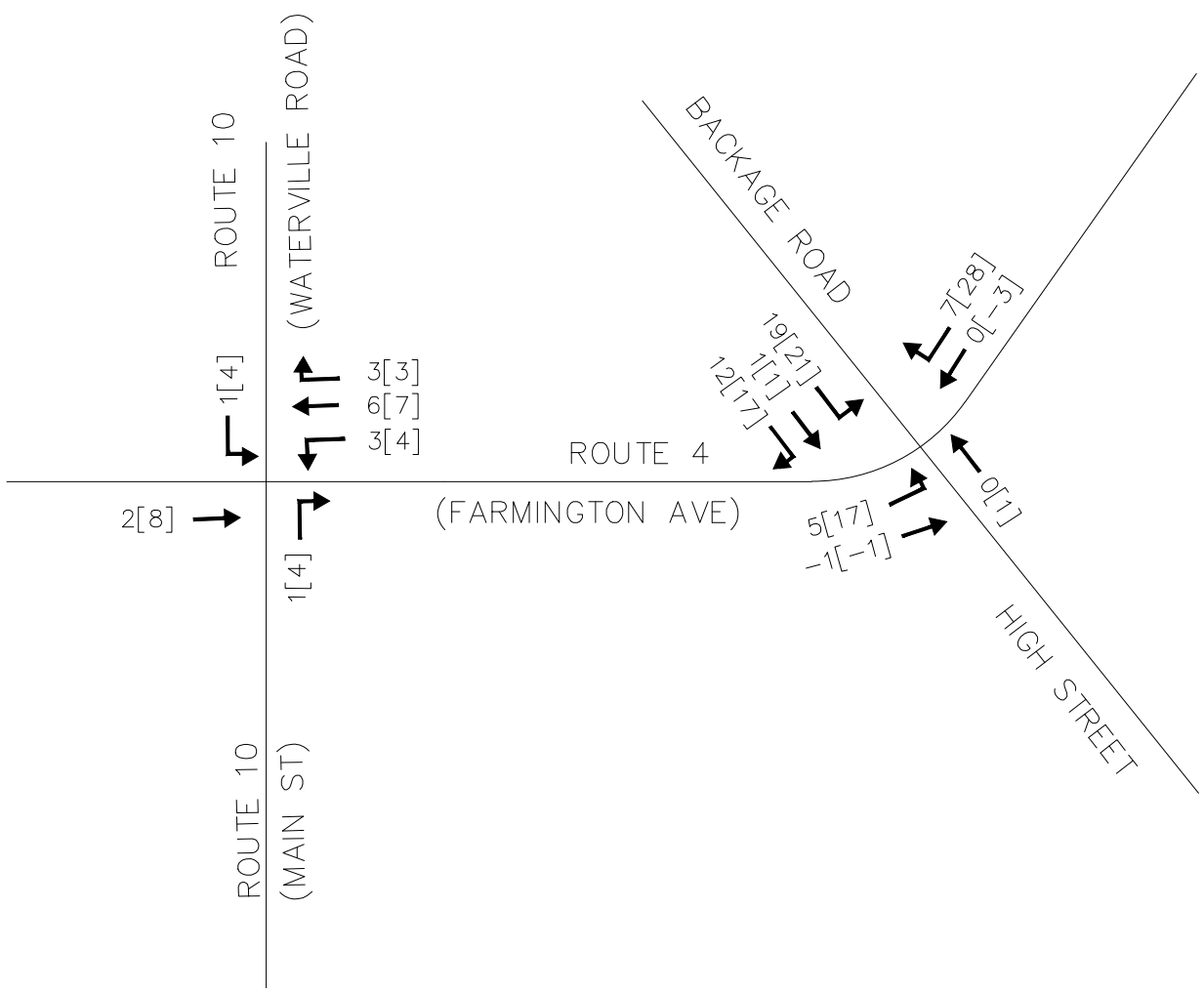
Trip generation defines the number of trips oriented to and from a particular land use. Typically, trip generation rates quantify a per unit relationship between the size of a specific land use and the number of vehicles generated per unit of time. The rates found in the Institute of Transportation Engineers (ITE) Trip Generation, 9th edition, the most commonly utilized source, are based on studies of actual facilities. For the purpose of this study, the commercial uses were assumed to be small retail shops.

Table 1 shows the resulting peak hour trip generation projected for the proposed development, 42 new trips during the morning commuter peak hour and 77 during the afternoon commuter peak hour.

Table 1
Peak Hour Trip Generation

LAND USE	AM Peak			PM Peak		
	Total	In	Out	Total	In	Out
Apartments (62)	34	6	28	40	26	14
Specialty Retail (9,600 s.f.)	10	6	4	45	20	25
Gross Total Trips	44	12	32	85	46	39
Less Retail Passby (20%)	-2	-1	-1	-8	-4	-4
Net New Trips	42	11	31	77	42	35

The site generated traffic volumes were assigned onto the adjacent roadway network and are shown in Figure 5.



LEGEND

AM PEAK HOUR: XXX
PM PEAK HOUR: [XXX]



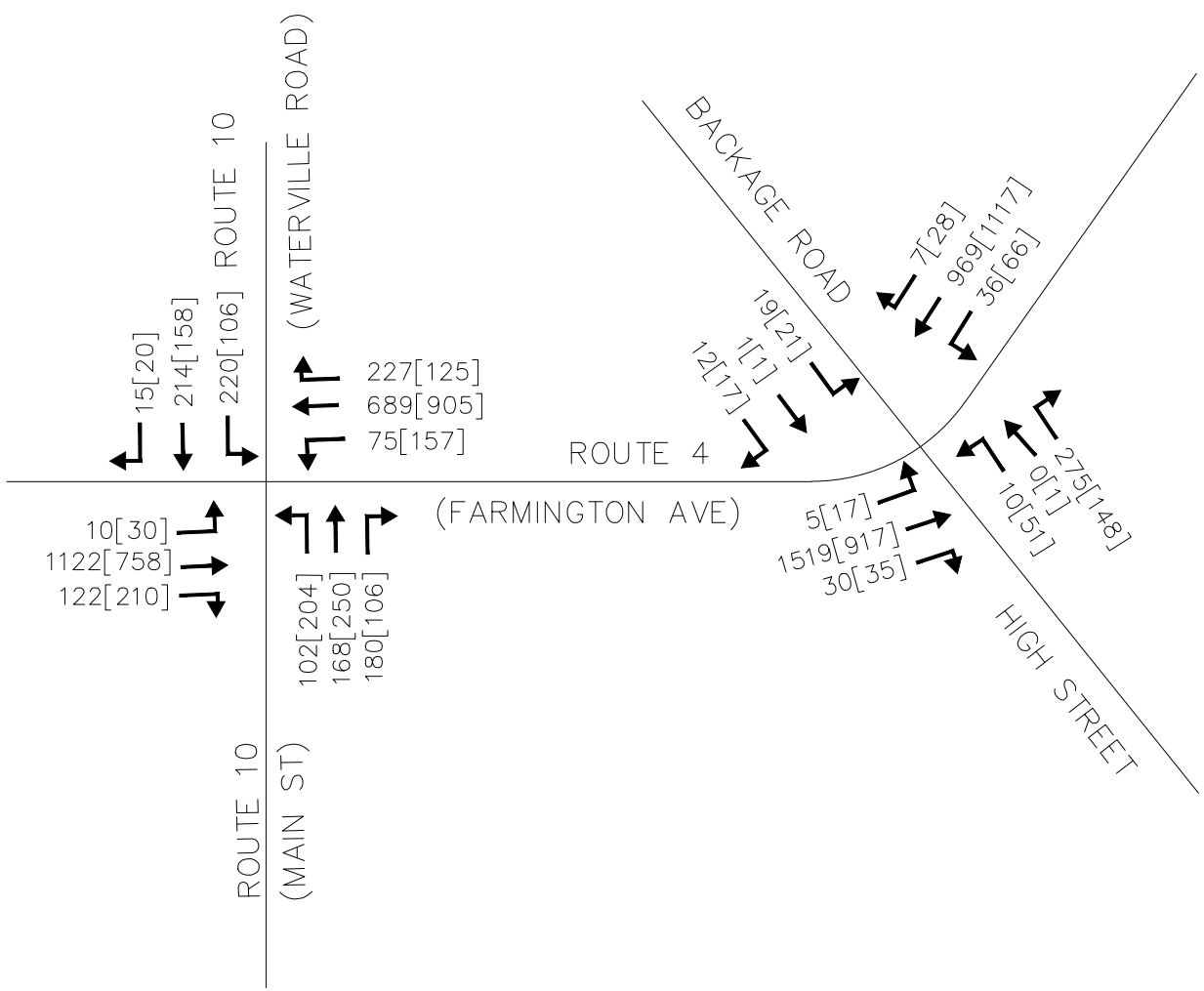
**SITE TRAFFIC VOLUMES
FARMINGTON CENTER VILLAGE
FARMINGTON, CT**

SCHEMATIC, NOT TO SCALE

FIGURE 5

Build Traffic Volumes

The anticipated traffic volumes generated by the proposed development were superimposed onto the background traffic volumes to establish the 2019 build traffic volumes as depicted in Figure 6.



LEGEND

AM PEAK HOUR: XXX
 PM PEAK HOUR: [XXX]



**BUILD (2019) TRAFFIC VOLUMES
 FARMINGTON CENTER VILLAGE
 FARMINGTON, CT**

SCHEDULED, TYPED, AND SCALED

FIGURE 6

IV. ROADWAY ADEQUACY

Roadway adequacy analyses were performed for the background and build traffic conditions to simulate the traffic impact of the proposed development on the adjacent roadway network. These analyses were based on the level of service methodology described in the 2010 Highway Capacity Manual (HCM), published by the Transportation Research Board.

Signalized Intersections

Signalized intersections are analyzed in terms of vehicle capacity and motorist delay. Capacity is the maximum rate of vehicle flow through an intersection given typical operating conditions. The number of vehicles traveling through an intersection is divided by the capacity of the intersection to determine an overall volume to capacity ratio (v/c). A v/c value under 1.00 indicates that the number of vehicles traveling through an intersection is less than capacity.

As stated in the HCM, level of service for signalized intersections is defined in terms of control delay. Control delay measures the increase in delay a motorist experiences while encountering a traffic control signal. These factors include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. This delay is measured per vehicle for a 15-minute analysis period and is associated with the levels of service, which are summarized in Table 2 below:

Table 2
Peak Hour Level of Service –Signalized Intersections

<u>Level of Service</u>	<u>Control Delay per Vehicle (seconds)</u>
A	< 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Level of service A represents the optimum level where most motorists arrive at the subject intersection during the green phase and thus experience virtually no delay. Conversely, level of service F indicates that motorists are delayed on average over 80 seconds while traveling through the intersection, and implies a complete breakdown of that location. Level of service D is generally considered the limit of acceptable motorist delay. The signalized intersections of Route 4 (Farmington Avenue) at Route 10 (Main Street/Waterville Road) and at High Street/Backage Road were analyzed in this study.

Intersection Analyses

The capacity calculations, which are contained in the Appendix, and summarized in Tables 3 AM and PM, show the overall intersection levels of service, as well as the level of service, volume to capacity ratios and 95% queue lengths for each individual lane group.

**Table 3 AM
Morning Peak Hour Level of Service Summary**

Intersection/Movement	Background	Build
Route 4 at Route 10	F (89") ¹	F (91") ¹
Route 4 EB Left turn	C/.09/25'	C/.09/25'
Route 4 EB Through	D/.92/965'	D/.92/965'
Route 4 EB Right	C/.22/170'	C/.22/170'
Route 4 WB Left	C/.46/40'	C/.49/40'
Route 4 WB Through	F/1.22/1600'	F/1.23/1615'
Route 10 (Main Street Left)	E/.60/155'	E/.60/155'
Route 10 (Main Street Through)	F/.95/305'	F/.95/305'
Route 10 (Main Street Right)	D/.55/220'	D/.56/220'
Route 10 (Waterville Road)	F/1.17/705'	F/1.17/705'
Route 4 at High/Backage¹	B (20") ¹	C (22") ¹
Route 4 EB Left turn	N/A	B/.03/25'
Route 4 EB Through	C/.76/820'	C/.76/820'
Route 4 WB Left	B/.25/30'	B/.26/30'
Route 4 WB Through	C/.81/1200'	C/.83/1320'
High Street Left/Through	D/.04/25'	D/.04/25'
High Street Right	B/.60/85'	B/.70/120'
Backage Road	N/A	E/.40/65'

X/0.00/000 – Level of Service/Volume to Capacity Ratio/95% Queue length in feet

¹ – Overall Intersection LOS and average delay

**Table 3 PM
Afternoon Peak Hour Level of Service Summary**

Intersection/Movement	Background	Build
Route 4 at Route 10	F (115") ¹	F (118") ¹
Route 4 EB Left turn	C/.25/40'	C/.25/40'
Route 4 EB Through	C/.57/535'	C/.58/545'
Route 4 EB Right	C/.34/270'	C/.35/270'
Route 4 WB Left	B/.56/60'	C/.54/60'
Route 4 WB Through	F/1.25/1640'	F/1.27/1530'
Route 10 (Main Street Left)	F/1.41/415'	F/1.41/415'
Route 10 (Main Street Through)	F/1.64/510'	F/1.64/510'
Route 10 (Main Street Right)	D/.31/135'	D/.32/140'
Route 10 (Waterville Road)	E/.87/380'	E/.88/390'
Route 4 at High/Backage	C (23") ¹	C (32") ¹
Route 4 EB Left turn	N/A	B/.14/25'
Route 4 EB Through	B/.48/345'	B/.48/345'
Route 4 WB Left	A/.21/50'	A/.21/50'
Route 4 WB Through	C/.94/1500'	D/1.01/1680'
High Street Left/Through	D/.19/80'	D/.22/85'
High Street Right	B/.41/65'	B/.60/85'
Backage Road	N/A	E/.39/75'

X/0.00/000 – Level of Service/Volume to Capacity Ratio/95% Queue length in feet

¹ – Overall Intersection LOS and average delay

In general, the background levels of service for individual traffic movements at the Route 4 (Farmington Avenue) signalized intersections of concern are maintained under the build condition. The Route 4/Route 10 intersection remains problematic as the States' project does not make significant capacity improvements there. One should expect relatively long delays exiting the site from Backage Road and High Street as the traffic signal cycle lengths are long in order to accommodate the critical Route 4/Route 10 intersection and queue spillback may interfere with traffic operations.

V. CONCLUSION

This study investigated the traffic impacts associated with the proposed development during the weekday morning and afternoon peak traffic periods. For the purpose of this study, the proposed development is projected to generate about 42 and 77 new vehicular trips during the weekday morning and afternoon peak hours, respectively.

Given the existing and background conditions along Route 4 (Farmington Avenue) and the relatively small change in traffic volume projected from the site, no significant changes in projected background traffic operations are anticipated. However, it should be noted that the projected good (“C”) overall peak period levels of service for the High Street/Backage Road intersection may be somewhat misleading and not actually be achievable in the field due to the interference of queue spillback from the Route 10 intersection. Levels of service of “E” could be experienced by those leaving Backage Road and High Street. Consideration should be given to the installation of “Don’t Block The Box” regulatory signing and pavement markings for the Backage Road/High Street intersection if queue blockage occurs.

Due to the provision of more than 200 parking spaces or 100,000 square feet of building area, the development will have to be submitted to the Office of State Traffic Administration (OSTA) for review as a major traffic generator. Subsequently, an

encroachment permit from the CTDOT District 4 office will be required for any work in the State right of way.

APPENDIX



Farmington Center Study
1: Route 10 & Route 4

Background-with Proj #51-260
Timing Plan: AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖	↗	
Traffic Volume (vph)	10	1120	122	72	683	224	102	168	179	219	214	15	
Future Volume (vph)	10	1120	122	72	683	224	102	168	179	219	214	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	11	11	12	11	11	14	12	15	12	
Grade (%)		2%			-1%			0%			1%		
Storage Length (ft)	100		175	260		0	75		75	0		0	
Storage Lanes	1		1	1		0	1		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Satd. Flow (prot)	1694	3387	1567	1719	1743	0	1711	1801	1689	0	1982	0	
Flt Permitted	0.084		0.076			0.950				0.976			
Satd. Flow (perm)	150	3387	1567	138	1743	0	1711	1801	1689	0	1982	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		35			35			35				35	
Link Distance (ft)		354			900			474				234	
Travel Time (s)		6.9			17.5			9.2				4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	1217	133	78	985	0	111	183	195	0	487	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	pt+ov	Split	NA		
Protected Phases	5	2	2	1	6		8	8	8	4	4		9
Permitted Phases	2			6									
Detector Phase	5	2	2	1	6		8	8	8	4	4		
Switch Phase													
Minimum Initial (s)	5.0	20.0	20.0	7.0	20.0		7.0	7.0	7.0	7.0	7.0		1.0
Minimum Split (s)	9.0	27.3	27.3	12.0	27.3		13.0	13.0	13.0	12.7	12.7		28.0
Total Split (s)	10.0	28.0	28.0	21.0	39.0		20.0	20.0	20.0	33.0	33.0		28.0
Total Split (%)	7.7%	21.5%	21.5%	16.2%	30.0%		15.4%	15.4%	15.4%	25.4%	25.4%		22%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	1.0	2.8	2.8	2.0	2.8		3.0	3.0	3.0	2.7	2.7		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.0	7.3	7.3	5.0	7.3		6.0	6.0	6.0	5.7	5.7		5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		

Farmington Center Study
1: Route 10 & Route 4

Background-with Proj #51-260
Timing Plan: AM Peak



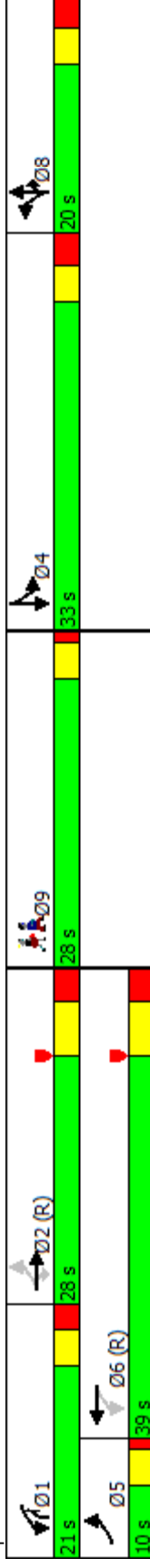
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	None	None	None	None	None	None	None
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None	None
Act Effct Green (s)	59.4	51.0	51.0	66.1	60.4	60.4	14.0	14.0	27.1	None	None	27.3	27.3
Actuated g/C Ratio	0.46	0.39	0.39	0.51	0.46	0.46	0.11	0.11	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.09	0.92	0.22	0.46	1.22	1.22	0.60	0.95	0.55	0.55	1.17	1.17	1.17
Control Delay	22.2	48.5	31.5	24.0	129.7	129.7	69.9	110.0	52.4	52.4	144.5	144.5	144.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	48.5	31.5	24.0	129.7	129.7	69.9	110.0	52.4	52.4	144.5	144.5	144.5
LOS	C	D	C	C	F	F	E	F	D	D	F	F	F
Approach Delay		46.6			122.0			77.9			144.5		144.5
Approach LOS		D			F			E			F		F
Queue Length 50th (ft)	4	460	67	14	~911		91	156	150		~488		~488
Queue Length 95th (ft)	20	#963	167	m40	#1600		156	#303	221		#704		#704
Internal Link Dist (ft)		274			820			394			154		154
Turn Bay Length (ft)	100		175	260			75		75				75
Base Capacity (vph)	140	1328	614	265	809		184	193	454		416		416
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0	0	0		0		0
Reduced v/c Ratio	0.08	0.92	0.22	0.29	1.22		0.60	0.95	0.43		1.17		1.17

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	145
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.22
Intersection Signal Delay:	88.7
Intersection Capacity Utilization:	106.0%
Analysis Period (min):	15
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

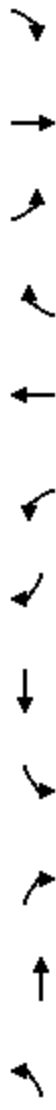
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Route 10 & Route 4



Farmington Center Study
5: High/Backage & Route 4

Background-with Proj #51-260
Timing Plan: AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lane Configurations	↖	↗	↘	↙	↖	↗	↘	↙	↖	↗	↘	↙		
Traffic Volume (vph)	0	1520	30	36	969	0	10	0	275	0	0	0	0	0
Future Volume (vph)	0	1520	30	36	969	0	10	0	275	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	12	11	11	12	14	12		
Grade (%)		2%			-4%			0%			-1%			
Storage Length (ft)	100		0	125	0	0	0	0	75	0	0	0		
Storage Lanes	1		0	1	0	0	0	0	1	0	0	0		
Taper Length (ft)	25			25		25				25				
Satd. Flow (prot)	1783	3377	0	1745	1837	0	0	1711	1531	0	1997	0		
Flt Permitted				0.068				0.950						
Satd. Flow (perm)	1783	3377	0	125	1837	0	0	1711	1531	0	1997	0		
Right Turn on Red			Yes		Yes				Yes		No			
Satd. Flow (RTOR)	2								299					
Link Speed (mph)	35			35				30			30			
Link Distance (ft)	900			377				330			182			
Travel Time (s)	17.5			7.3				7.5			4.1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		0.92
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	1685	0	39	1053	0	0	11	299	0	0	0		0
Turn Type	pm+pt	NA		pm+pt	NA		custom	NA	Perm					
Protected Phases	5	2		1	6		3	3		4			8	9
Permitted Phases	2			6			8	8	3	4				
Detector Phase	5	2		1	6		3.8	3.8	3.8	4	4			
Switch Phase														
Minimum Initial (s)	5.0	15.0		5.0	15.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	1.0
Minimum Split (s)	9.0	24.7		9.0	24.7		11.7	11.7	11.7	12.0	12.0	12.0	12.0	24.0
Total Split (s)	12.0	68.0		12.0	68.0		14.0	14.0	14.0	14.0	12.0	12.0	26.0	24.0
Total Split (%)	9.2%	52.3%		9.2%	52.3%		10.8%	10.8%	10.8%	9.2%	9.2%	9.2%	20%	18%
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	2.2		1.0	2.2		1.7	1.7	1.7	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7		4.0	6.7		4.7	4.7	4.7	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag

Farmington Center Study
5: High/Backage & Route 4

Background-with Proj #51-260
Timing Plan: AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lead-Lag Optimize?														
Recall Mode	None	C-Min	None	None	C-Min	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	84.9		95.2	92.5		92.5	21.3	21.3	21.3					
Actuated g/C Ratio	0.65		0.73	0.71		0.71	0.16	0.16	0.16					
v/c Ratio	0.76		0.25	0.81		0.81	0.04	0.04	0.60					
Control Delay	20.4		10.6	20.7		20.7	46.4	46.4	10.7					
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0	0.0					
Total Delay	20.4		10.6	20.7		20.7	46.4	46.4	10.7					
LOS	C		B	C		C	D	D	B					
Approach Delay	20.4		20.4			20.4	11.9							
Approach LOS	C		C			C	B							
Queue Length 50th (ft)	218		7	459		459	8	8	0					
Queue Length 95th (ft)	m#821		29	#1196		#1196	26	26	85					
Internal Link Dist (ft)	820			297		297	250	250	102					
Turn Bay Length (ft)			125			125	75							
Base Capacity (vph)	2206		190	1306		1306	280	280	500					
Starvation Cap Reductn	0		0	0		0	0	0	0					
Spillback Cap Reductn	0		0	0		0	0	0	0					
Storage Cap Reductn	0		0	0		0	0	0	0					
Reduced v/c Ratio	0.76		0.21	0.81		0.81	0.04	0.04	0.60					

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 129 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 19.6

Intersection Capacity Utilization 69.5%

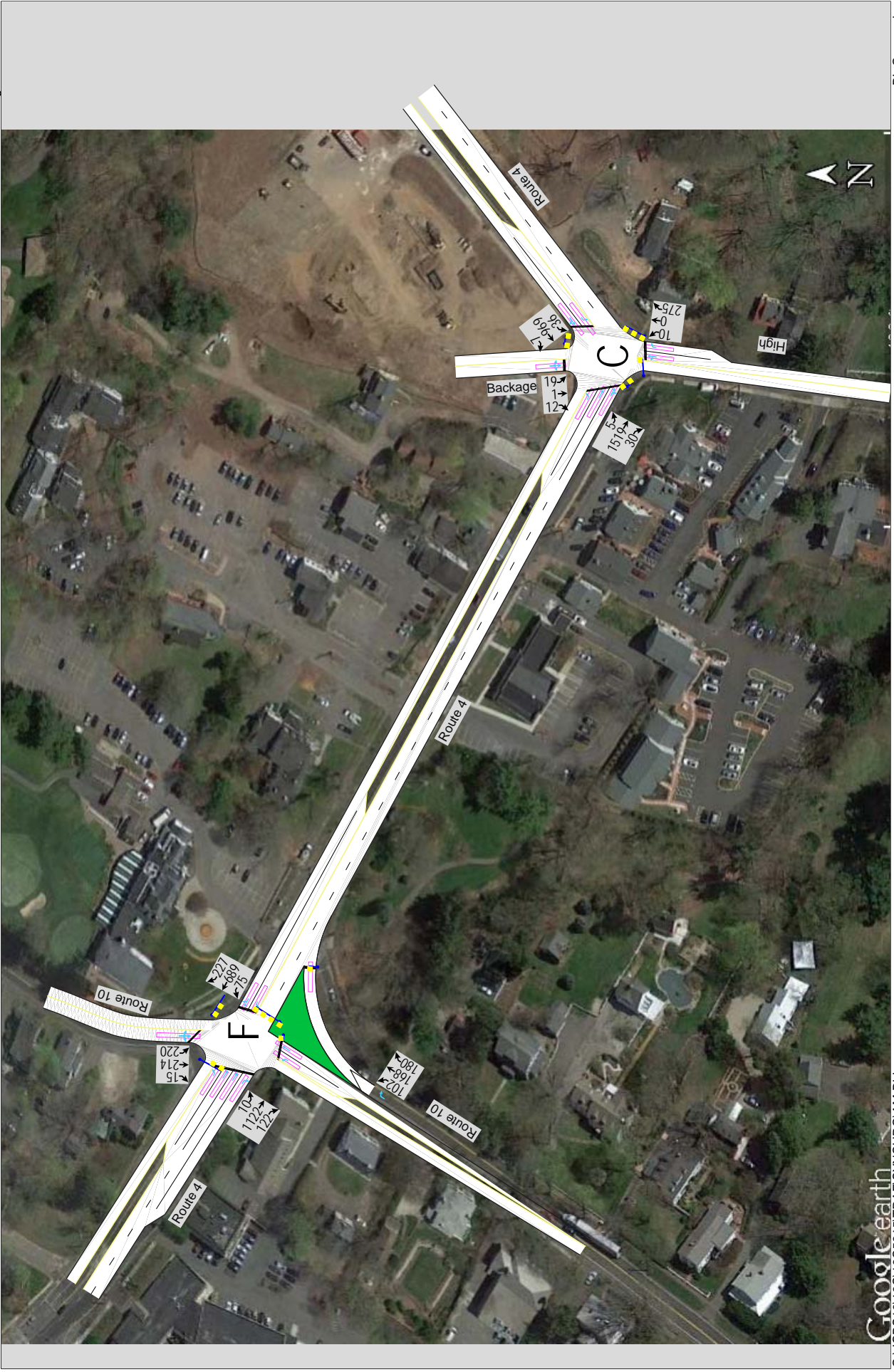
Analysis Period (min) 15

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: 5: High/Backage & Route 4





Farmington Center Study
1: Route 10 & Route 4

Build-with Proj #51-260
Timing Plan: AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖	↗	
Traffic Volume (vph)	10	1122	122	75	689	227	102	168	180	220	214	15	
Future Volume (vph)	10	1122	122	75	689	227	102	168	180	220	214	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	11	11	12	11	11	14	12	15	12	
Grade (%)		2%			-1%			0%			1%		
Storage Length (ft)	100		175	260		0	75		75	0		0	
Storage Lanes	1		1	1		0	1		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Satd. Flow (prot)	1694	3387	1567	1719	1743	0	1711	1801	1689	0	1982	0	
Flt Permitted	0.084		0.076			0.950				0.976			
Satd. Flow (perm)	150	3387	1567	138	1743	0	1711	1801	1689	0	1982	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		35		35				35				35	
Link Distance (ft)		354		900				474				234	
Travel Time (s)		6.9		17.5				9.2				4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	1220	133	82	996	0	111	183	196	0	488	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	pt+ov	Split	NA		
Protected Phases	5	2	2	1	6		8	8	8	4	4		9
Permitted Phases	2			6									
Detector Phase	5	2	2	1	6		8	8	8	4	4		
Switch Phase													
Minimum Initial (s)	5.0	20.0	20.0	7.0	20.0		7.0	7.0	7.0	7.0	7.0		1.0
Minimum Split (s)	9.0	27.3	27.3	12.0	27.3		13.0	13.0	13.0	12.7	12.7		28.0
Total Split (s)	10.0	28.0	28.0	21.0	39.0		20.0	20.0	20.0	33.0	33.0		28.0
Total Split (%)	7.7%	21.5%	21.5%	16.2%	30.0%		15.4%	15.4%	15.4%	25.4%	25.4%		22%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	1.0	2.8	2.8	2.0	2.8		3.0	3.0	3.0	2.7	2.7		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.0	7.3	7.3	5.0	7.3		6.0	6.0	6.0	5.7	5.7		5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		

Farmington Center Study
1: Route 10 & Route 4

Build-with Proj #51-260
Timing Plan: AM Peak



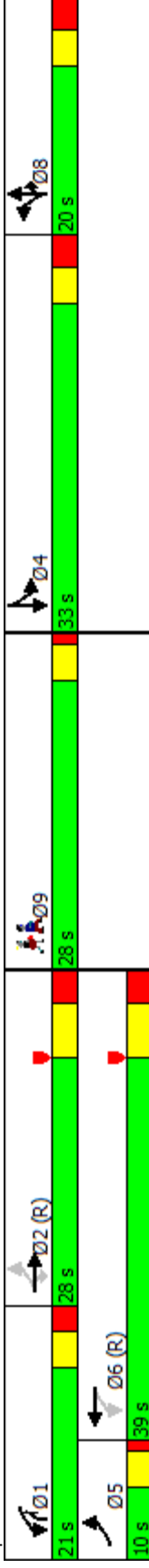
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	None	None	None	None	None	None	None
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None	None
Act Effct Green (s)	59.3	50.9	50.9	66.2	60.4	60.4	14.0	14.0	27.2	27.2	27.3	27.3	27.3
Actuated g/C Ratio	0.46	0.39	0.39	0.51	0.46	0.46	0.11	0.11	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.09	0.92	0.22	0.49	1.23	1.23	0.60	0.95	0.56	0.56	1.17	1.17	1.17
Control Delay	22.2	49.0	31.6	27.2	135.4	135.4	69.9	110.0	52.4	52.4	145.4	145.4	145.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	49.0	31.6	27.2	135.4	135.4	69.9	110.0	52.4	52.4	145.4	145.4	145.4
LOS	C	D	C	C	F	F	E	F	D	D	F	F	F
Approach Delay	47.0				127.1			77.9			145.4		145.4
Approach LOS	D				F			E			F		F
Queue Length 50th (ft)	4	462	67	16	-932		91	156	151		-490		-490
Queue Length 95th (ft)	20	#966	168	m39	#1614		156	#303	221		#705		#705
Internal Link Dist (ft)		274			820			394			154		154
Turn Bay Length (ft)	100		175	260			75		75				75
Base Capacity (vph)	140	1326	613	265	809		184	193	454		416		416
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0	0	0		0		0
Reduced v/c Ratio	0.08	0.92	0.22	0.31	1.23		0.60	0.95	0.43		1.17		1.17

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	145
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.23
Intersection Signal Delay:	90.7
Intersection Capacity Utilization:	106.6%
Analysis Period (min):	15
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

- # 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: Route 10 & Route 4



Farmington Center Study
5: High/Backage & Route 4

Build-with Proj #51-260
Timing Plan: AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lane Configurations	5	1519	30	36	969	7	10	0	275	19	1	12		
Traffic Volume (vph)	5	1519	30	36	969	7	10	0	275	19	1	12		
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Ideal Flow (vphpl)	11	11	12	11	11	12	12	11	11	12	14	12		
Lane Width (ft)	2%				-4%			0%			-1%			
Grade (%)	100		0	125	0	0	0	0	75	0	0	0		
Storage Length (ft)	1		0	1	0	0	0	0	1	0	0	0		
Storage Lanes	25		25	25	25	25	25	25	25	25	25	25		
Taper Length (ft)	1694	3377	0	1745	1835	0	0	1711	1531	0	1842	0		
Satd. Flow (prot)	0.074		0.063			0.689			0.810					
Flt Permitted	132	3377	0	116	1835	0	0	1241	1531	0	1537	0		
Satd. Flow (perm)	Right Turn on Red	Yes			Yes			Yes	No					
Right Turn on Red	Satd. Flow (RTOR)	2				299								
Satd. Flow (RTOR)	Link Speed (mph)	35		35		30					30			
Link Speed (mph)	Link Distance (ft)	900		377		330					182			
Link Distance (ft)	Travel Time (s)	17.5		7.3		7.5					4.1			
Travel Time (s)	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Peak Hour Factor	Shared Lane Traffic (%)													
Shared Lane Traffic (%)	Lane Group Flow (vph)	5	1684	0	39	1061	0	0	11	299	0	35	0	0
Lane Group Flow (vph)	Turn Type	pm+pt	NA	pm+pt	NA	custom	3	3	3	4	8	9		
Turn Type	Protected Phases	5	2	1	6	6	8	8	3	4	4	4		
Protected Phases	Permitted Phases	2		6		3.8	3.8	3.8	3.8	4	4	4		
Permitted Phases	Detector Phase	5	2	1	6	6	6	6	6	6	6	6		
Detector Phase	Switch Phase													
Switch Phase	Minimum Initial (s)	5.0	15.0	5.0	15.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	1.0
Minimum Initial (s)	Minimum Split (s)	9.0	24.7	9.0	24.7	11.7	11.7	11.7	11.7	12.0	12.0	12.0	12.0	24.0
Minimum Split (s)	Total Split (s)	12.0	68.0	12.0	68.0	14.0	14.0	14.0	14.0	14.0	12.0	12.0	26.0	24.0
Total Split (s)	Total Split (%)	9.2%	52.3%	9.2%	52.3%	10.8%	10.8%	10.8%	10.8%	9.2%	9.2%	9.2%	20%	18%
Total Split (%)	Yellow Time (s)	3.0	4.5	3.0	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Yellow Time (s)	All-Red Time (s)	1.0	2.2	1.0	2.2	1.7	1.7	1.7	1.7	2.0	2.0	2.0	2.0	1.0
All-Red Time (s)	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	Total Lost Time (s)	4.0	6.7	4.0	6.7	4.7	4.7	4.7	4.7	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead/Lag														



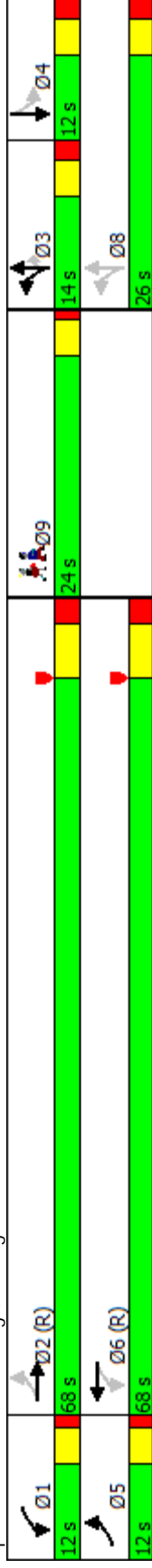
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lead-Lag Optimize?														
Recall Mode	None	C-Min	None	None	C-Min	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	91.6	84.9	94.8	94.8	90.7	94.8	90.7	21.3	13.6	None	None	None	7.5	7.5
Actuated g/C Ratio	0.70	0.65	0.73	0.73	0.70	0.73	0.70	0.16	0.10	0.10	0.06	0.06	0.06	0.06
v/c Ratio	0.03	0.76	0.26	0.26	0.83	0.26	0.83	0.04	0.70	0.70	0.40	0.40	0.40	0.40
Control Delay	14.8	20.4	11.0	11.0	23.3	11.0	23.3	46.4	15.7	15.7	73.0	73.0	73.0	73.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	20.4	11.0	11.0	23.3	11.0	23.3	46.4	15.7	15.7	73.0	73.0	73.0	73.0
LOS	B	C	B	B	C	B	C	D	B	B	E	E	E	E
Approach Delay	20.4	20.4	20.4	20.4	22.9	20.4	22.9	16.8	16.8	16.8	73.0	73.0	73.0	73.0
Approach LOS	C	C	C	C	C	C	C	B	B	B	E	E	E	E
Queue Length 50th (ft)	1	218	7	7	467	7	467	8	0	0	29	29	29	29
Queue Length 95th (ft)	m3	m#819	29	29	#1322	29	#1322	26	#118	#118	66	66	66	66
Internal Link Dist (ft)	820	820	820	820	297	820	297	250	250	250	102	102	102	102
Turn Bay Length (ft)	100	100	125	125	125	100	125	75	75	75	102	102	102	102
Base Capacity (vph)	191	2206	185	185	1280	185	1280	254	432	432	87	87	87	87
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.76	0.21	0.21	0.83	0.21	0.83	0.04	0.69	0.69	0.40	0.40	0.40	0.40

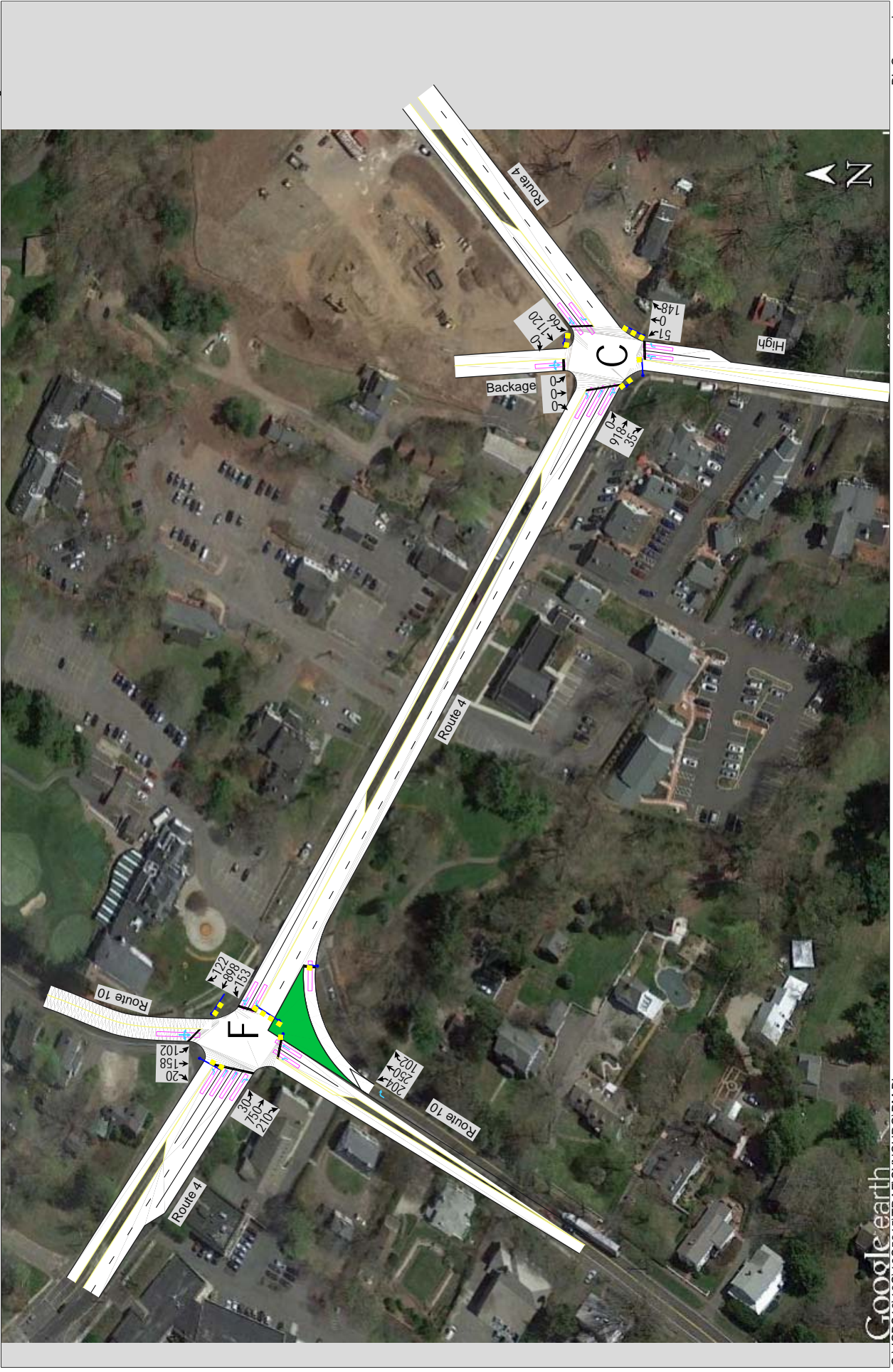
Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 129 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 21.5
 Intersection Capacity Utilization 79.5%
 Analysis Period (min) 15
 # 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: 5: High/Backage & Route 4





Farmington Center Study
1: Route 10 & Route 4

Background-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗	
Traffic Volume (vph)	30	750	210	153	898	122	204	250	102	102	158	20	
Future Volume (vph)	30	750	210	153	898	122	204	250	102	102	158	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	11	11	12	11	11	14	12	15	12	
Grade (%)		2%			-1%			0%			1%		
Storage Length (ft)	100		175	260		0	75		75	0		0	
Storage Lanes	1		1	1		0	1		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Satd. Flow (prot)	1694	3387	1567	1719	1777	0	1711	1801	1689	0	1982	0	
Flt Permitted	0.077		0.210			0.950				0.982			
Satd. Flow (perm)	137	3387	1567	380	1777	0	1711	1801	1689	0	1982	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		35			35			35			35		
Link Distance (ft)		354			900			474			234		
Travel Time (s)		6.9			17.5			9.2			4.6		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	33	815	228	166	1109	0	222	272	111	0	305	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	pt+ov	Split	NA		
Protected Phases	5	2	2	1	6		8	8	8	4	4		9
Permitted Phases	2			6									
Detector Phase	5	2	2	1	6		8	8	8	4	4		
Switch Phase													
Minimum Initial (s)	5.0	20.0	20.0	7.0	20.0		7.0	7.0	7.0	7.0	7.0		1.0
Minimum Split (s)	9.0	27.3	27.3	12.0	27.3		13.0	13.0	13.0	12.7	12.7		28.0
Total Split (s)	10.0	36.0	36.0	17.0	43.0		18.0	18.0	18.0	31.0	31.0		28.0
Total Split (%)	7.7%	27.7%	27.7%	13.1%	33.1%		13.8%	13.8%	13.8%	23.8%	23.8%		22%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	1.0	2.8	2.8	2.0	2.8		3.0	3.0	3.0	2.7	2.7		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.0	7.3	7.3	5.0	7.3		6.0	6.0	6.0	5.7	5.7		5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		

Farmington Center Study
1: Route 10 & Route 4

Background-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	None	None	None	None	None	None	None
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	12.0	12.0	27.5	None	None	None	None
Act Effct Green (s)	63.5	55.0	55.0	72.8	64.8	64.8	12.0	12.0	27.5	None	None	None	22.9
Actuated g/C Ratio	0.49	0.42	0.42	0.56	0.50	0.50	0.09	0.09	0.21	0.18	0.18	0.18	0.18
v/c Ratio	0.25	0.57	0.34	0.52	1.25	1.25	1.41	1.64	0.31	0.87	0.87	0.87	0.87
Control Delay	22.8	33.0	31.5	17.1	141.9	141.9	261.4	349.1	45.4	76.9	76.9	76.9	76.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.0	31.5	17.1	141.9	141.9	261.4	349.1	45.4	76.9	76.9	76.9	76.9
LOS	C	C	C	B	F	F	F	F	D	E	E	E	E
Approach Delay	32.3				125.6			261.2					76.9
Approach LOS	C				F			F					E
Queue Length 50th (ft)	11	262	124	30	~1172		~250	~331	78	248	248	248	248
Queue Length 95th (ft)	41	#536	270	m57	m#1640		#415	#509	135	#380	#380	#380	#380
Internal Link Dist (ft)		274			820			394					154
Turn Bay Length (ft)	100		175	260			75		75				75
Base Capacity (vph)	139	1431	662	336	885		157	166	376	385	385	385	385
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.57	0.34	0.49	1.25		1.41	1.64	0.30	0.79	0.79	0.79	0.79

Intersection Summary

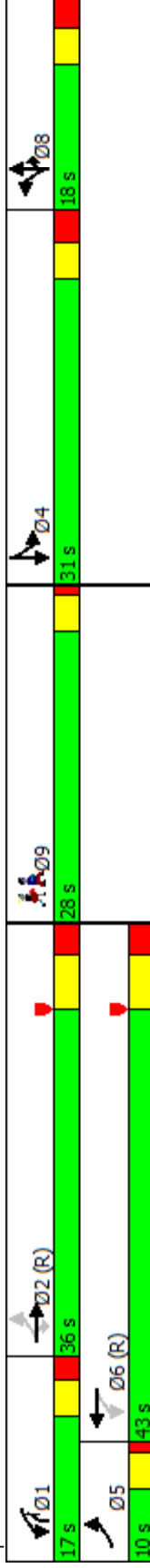
Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 128 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.64
 Intersection Signal Delay: 115.4
 Intersection Capacity Utilization 106.3%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

Farmington Center Study
 1: Route 10 & Route 4

Background-with Proj #51 -260
 Timing Plan: PM Peak

- # 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: Route 10 & Route 4



Farmington Center Study
5: High/Backage & Route 4

Background-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lane Configurations	↖	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖	↗	↘	↙
Traffic Volume (vph)	0	918	35	66	1120	0	51	0	148	0	0	0	0	0
Future Volume (vph)	0	918	35	66	1120	0	51	0	148	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	12	11	11	12	14	12		
Grade (%)		2%			-4%			0%			-1%			
Storage Length (ft)	100		0	125	0	0	0	0	75	0	0	0		
Storage Lanes	1		0	1	0	0	0	0	1	0	0	0		
Taper Length (ft)	25			25			25			25				
Satd. Flow (prot)	1783	3367	0	1745	1837	0	0	1711	1531	0	1997	0		
Flt Permitted				0.212				0.950						
Satd. Flow (perm)	1783	3367	0	389	1837	0	0	1711	1531	0	1997	0		
Right Turn on Red			Yes		Yes				Yes			No		
Satd. Flow (RTOR)	4								161					
Link Speed (mph)	35			35				30			30			
Link Distance (ft)	900			377				330			182			
Travel Time (s)	17.5			7.3				7.5			4.1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		0.92
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	1036	0	72	1217	0	0	55	161	0	0	0		0
Turn Type	pm+pt	NA		pm+pt	NA		custom	NA	Perm					
Protected Phases	5	2		1	6		3	3		4			8	9
Permitted Phases	2			6			8	8	3	4				
Detector Phase	5	2		1	6		3.8	3.8	3.8	4	4			
Switch Phase														
Minimum Initial (s)	5.0	15.0		5.0	15.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	1.0
Minimum Split (s)	9.0	24.7		9.0	24.7		11.7	11.7	11.7	12.0	12.0	12.0	12.0	24.0
Total Split (s)	12.0	65.0		14.0	67.0		12.0	12.0	12.0	15.0	15.0	15.0	27.0	24.0
Total Split (%)	9.2%	50.0%		10.8%	51.5%		9.2%	9.2%	9.2%	11.5%	11.5%	11.5%	21%	18%
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	2.2		1.0	2.2		1.7	1.7	1.7	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7		4.0	6.7		4.7	4.7	4.7	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag

Farmington Center Study
5: High/Backage & Route 4

Background-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lead-Lag Optimize?														
Recall Mode	None	C-Min	None	None	C-Min	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	83.3	94.2	91.5	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
Actuated g/C Ratio	0.64	0.72	0.70	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
v/c Ratio	0.48	0.21	0.94	0.19	0.19	0.41	0.19	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Control Delay	13.5	8.3	33.1	48.1	48.1	10.2	48.1	10.2	10.2	10.2	10.2	10.2	10.2	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	8.3	33.1	48.1	48.1	10.2	48.1	10.2	10.2	10.2	10.2	10.2	10.2	10.2
LOS	B	A	C	D	D	B	D	B	B	B	B	B	B	B
Approach Delay	13.5	31.7	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
Approach LOS	B	C	B	B	B	B	B	B	B	B	B	B	B	B
Queue Length 50th (ft)	86	13	695	40	40	0	40	0	0	0	0	0	0	0
Queue Length 95th (ft)	344	48	#1499	81	81	62	81	62	62	62	62	62	62	62
Internal Link Dist (ft)	820	297	250	250	250	102	250	102	102	102	102	102	102	102
Turn Bay Length (ft)	125	125	75	75	75	75	75	75	75	75	75	75	75	75
Base Capacity (vph)	2159	386	1292	293	293	396	293	396	396	396	396	396	396	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.19	0.94	0.19	0.19	0.41	0.19	0.41	0.41	0.41	0.41	0.41	0.41	0.41

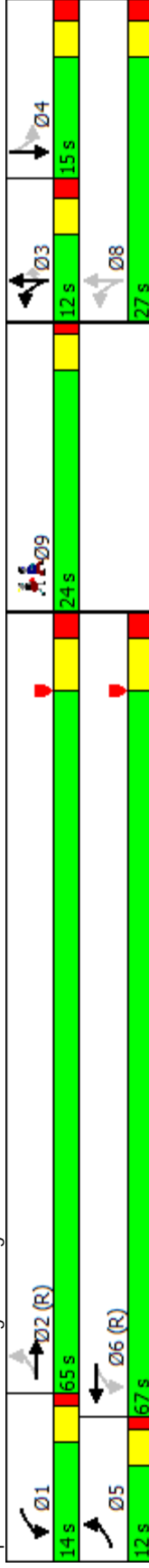
Intersection Summary

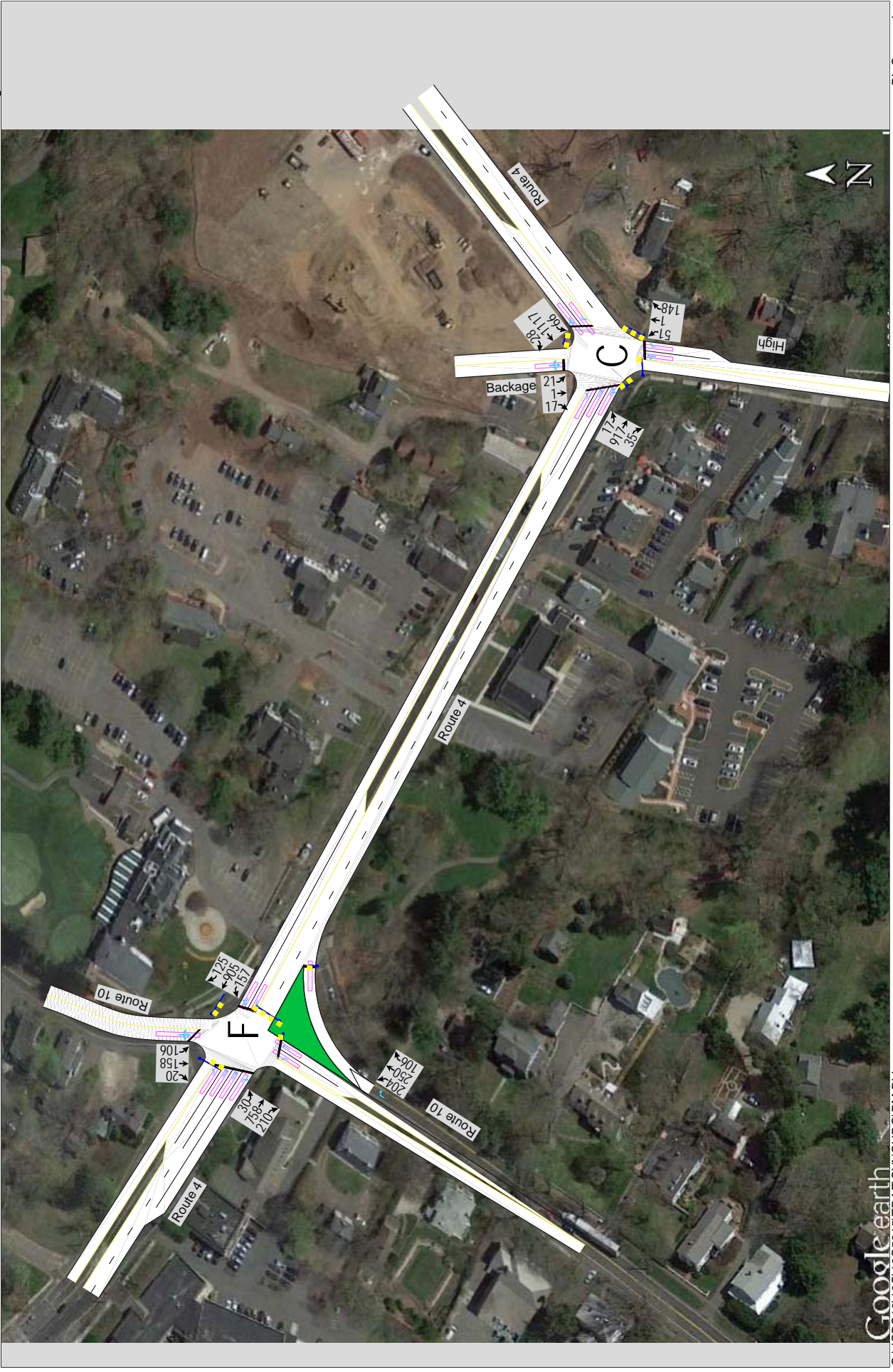
Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	145
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	23.3
Intersection Capacity Utilization:	74.3%
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Farmington Center Study
 5: High/Backage & Route 4

Background-with Proj #51-260
 Timing Plan: PM Peak

Splits and Phases: 5: High/Backage & Route 4





Farmington Center Study
1: Route 10 & Route 4

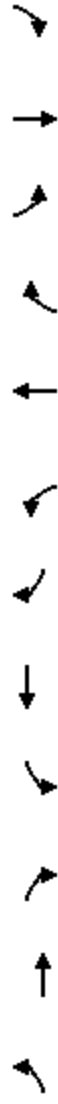
Build-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	30	758	210	157	905	125	204	250	106	106	158	20	
Future Volume (vph)	30	758	210	157	905	125	204	250	106	106	158	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	11	11	12	11	11	14	12	15	12	
Grade (%)		2%			-1%			0%			1%		
Storage Length (ft)	100		175	260		0	75		75	0		0	
Storage Lanes	1		1	1		0	1		1	0		0	
Taper Length (ft)	25		25	25		25	25		25	25		25	
Satd. Flow (prot)	1694	3387	1567	1719	1777	0	1711	1801	1689	0	1982	0	
Flt Permitted	0.078		0.205			0.950				0.982			
Satd. Flow (perm)	139	3387	1567	371	1777	0	1711	1801	1689	0	1982	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		35			35			35			35		
Link Distance (ft)		354			900			474			234		
Travel Time (s)		6.9			17.5			9.2			4.6		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	33	824	228	171	1120	0	222	272	115	0	309	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	pt+ov	Split	NA		
Protected Phases	5	2	2	1	6		8	8	8	4	4		9
Permitted Phases	2			6									
Detector Phase	5	2	2	1	6		8	8	8	4	4		
Switch Phase													
Minimum Initial (s)	5.0	20.0	20.0	7.0	20.0		7.0	7.0	7.0	7.0	7.0		1.0
Minimum Split (s)	9.0	27.3	27.3	12.0	27.3		13.0	13.0	12.7	12.7	12.7		28.0
Total Split (s)	10.0	36.0	36.0	17.0	43.0		18.0	18.0	31.0	31.0	31.0		28.0
Total Split (%)	7.7%	27.7%	27.7%	13.1%	33.1%		13.8%	13.8%	23.8%	23.8%	23.8%		22%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	1.0	2.8	2.8	2.0	2.8		3.0	3.0	2.7	2.7	2.7		1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.0	7.3	7.3	5.0	7.3		6.0	6.0	5.7	5.7	5.7		5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		

Farmington Center Study
1: Route 10 & Route 4

Build-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	None	None	None	None	None	None	None
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	12.0	12.0	27.6	None	None	None	None
Act Effct Green (s)	63.2	54.7	54.7	72.6	64.6	64.6	12.0	12.0	27.6	None	None	None	23.1
Actuated g/C Ratio	0.49	0.42	0.42	0.56	0.50	0.50	0.09	0.09	0.21	0.18	0.18	0.18	0.18
v/c Ratio	0.25	0.58	0.35	0.54	1.27	1.27	1.41	1.64	0.32	0.88	0.88	0.88	0.88
Control Delay	22.8	33.3	31.7	20.8	148.2	148.2	261.4	349.1	45.6	77.2	77.2	77.2	77.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.3	31.7	20.8	148.2	148.2	261.4	349.1	45.6	77.2	77.2	77.2	77.2
LOS	C	C	C	C	F	F	F	F	D	E	E	E	E
Approach Delay		32.6			131.3			259.8			77.3		77.3
Approach LOS		C			F			F			E		E
Queue Length 50th (ft)	11	267	125	33	~1186		~250	~331	81		251		251
Queue Length 95th (ft)	41	#544	270	m60	m#1527		#415	#509	139		#389		#389
Internal Link Dist (ft)		274			820			394			154		154
Turn Bay Length (ft)	100		175	260			75		75				75
Base Capacity (vph)	140	1424	658	331	883		157	166	376		385		385
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0	0	0		0		0
Reduced v/c Ratio	0.24	0.58	0.35	0.52	1.27		1.41	1.64	0.31		0.80		0.80

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 128 (98%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.64

Intersection Signal Delay: 117.5

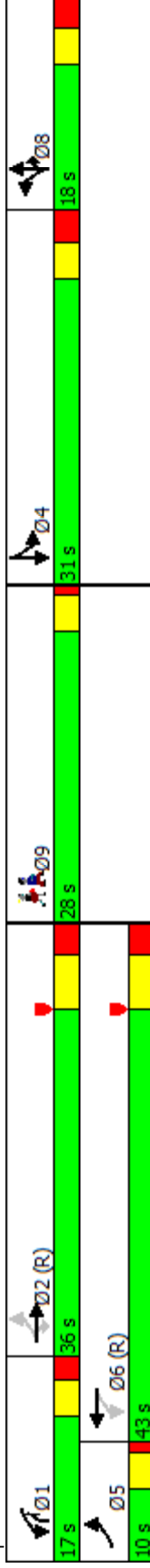
Intersection Capacity Utilization 107.1%

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

- # 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: Route 10 & Route 4



Farmington Center Study
5: High/Backage & Route 4

Build-with Proj #51-260
Timing Plan: PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lane Configurations	↖	↗	↘	↙	↖	↗	↘	↙	↖	↗	↘	↙		
Traffic Volume (vph)	17	917	35	66	1117	28	51	1	148	21	1	17		
Future Volume (vph)	17	917	35	66	1117	28	51	1	148	21	1	17		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	11	11	12	11	11	12	12	11	11	12	14	12		
Grade (%)		2%			-4%			0%			-1%			
Storage Length (ft)	100		0	125		0	0	0	75	0	0	0		
Storage Lanes	1		0	1		0	0	0	1	0	0	0		
Taper Length (ft)	25			25		25				25				
Satd. Flow (prot)	1694	3367	0	1745	1829	0	0	1716	1531	0	1830	0		
Flt Permitted	0.051			0.213				0.717			0.799			
Satd. Flow (perm)	91	3367	0	391	1829	0	0	1291	1531	0	1503	0		
Right Turn on Red		Yes			Yes				Yes		No			
Satd. Flow (RTOR)	4			1					161					
Link Speed (mph)	35			35				30			30			
Link Distance (ft)	900			377				330			182			
Travel Time (s)	17.5			7.3				7.5			4.1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	18	1035	0	72	1244	0	0	56	161	0	42	0		
Turn Type	pm+pt	NA		pm+pt	NA		custom	NA	Perm	Perm	NA			
Protected Phases	5	2		1	6		3	3		4		8	9	
Permitted Phases	2			6			8	8	3	4				
Detector Phase	5	2		1	6		3.8	3.8	3.8	4	4			
Switch Phase														
Minimum Initial (s)	5.0	15.0		5.0	15.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	1.0
Minimum Split (s)	9.0	24.7		9.0	24.7		11.7	11.7	11.7	12.0	12.0	12.0	12.0	24.0
Total Split (s)	12.0	65.0		14.0	67.0		12.0	12.0	12.0	15.0	15.0	15.0	27.0	24.0
Total Split (%)	9.2%	50.0%		10.8%	51.5%		9.2%	9.2%	9.2%	11.5%	11.5%	11.5%	21%	18%
Yellow Time (s)	3.0	4.5		3.0	4.5		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	2.2		1.0	2.2		1.7	1.7	1.7	2.0	2.0	2.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.7		4.0	6.7		4.7	4.7	4.7	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø8	Ø9
Lead-Lag Optimize?														
Recall Mode	None	C-Min	None	None	C-Min	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	90.1	83.3	93.4	93.4	87.8	87.8	None	22.3	10.2	None	None	None	None	9.5
Actuated g/C Ratio	0.69	0.64	0.72	0.72	0.68	0.68	0.17	0.17	0.08	0.07	0.07	0.07	0.07	0.07
v/c Ratio	0.14	0.48	0.21	0.21	1.01	1.01	0.22	0.22	0.60	0.39	0.39	0.39	0.39	0.39
Control Delay	16.8	13.4	8.4	8.4	49.4	49.4	48.7	48.7	18.7	67.8	67.8	67.8	67.8	67.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	13.4	8.4	8.4	49.4	49.4	48.7	48.7	18.7	67.8	67.8	67.8	67.8	67.8
LOS	B	B	A	A	D	D	D	D	B	E	E	E	E	E
Approach Delay	13.4	13.4	13.4	13.4	47.2	47.2	26.4	26.4	75	116	116	116	116	116
Approach LOS	B	B	D	D	D	D	C	C	E	E	E	E	E	E
Queue Length 50th (ft)	2	87	13	13	748	748	41	41	0	34	34	34	34	34
Queue Length 95th (ft)	m10	342	48	48	#1680	#1680	82	82	#82	74	74	74	74	74
Internal Link Dist (ft)	100	820	125	125	297	297	250	250	75	102	102	102	102	102
Turn Bay Length (ft)	163	2159	387	387	1235	1235	255	255	269	116	116	116	116	116
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.48	0.19	0.19	1.01	1.01	0.22	0.22	0.60	0.36	0.36	0.36	0.36	0.36

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	145
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.01
Intersection Signal Delay:	32.3
Intersection Capacity Utilization:	79.2%
Analysis Period (min):	15
# 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: 5: High/Backage & Route 4

