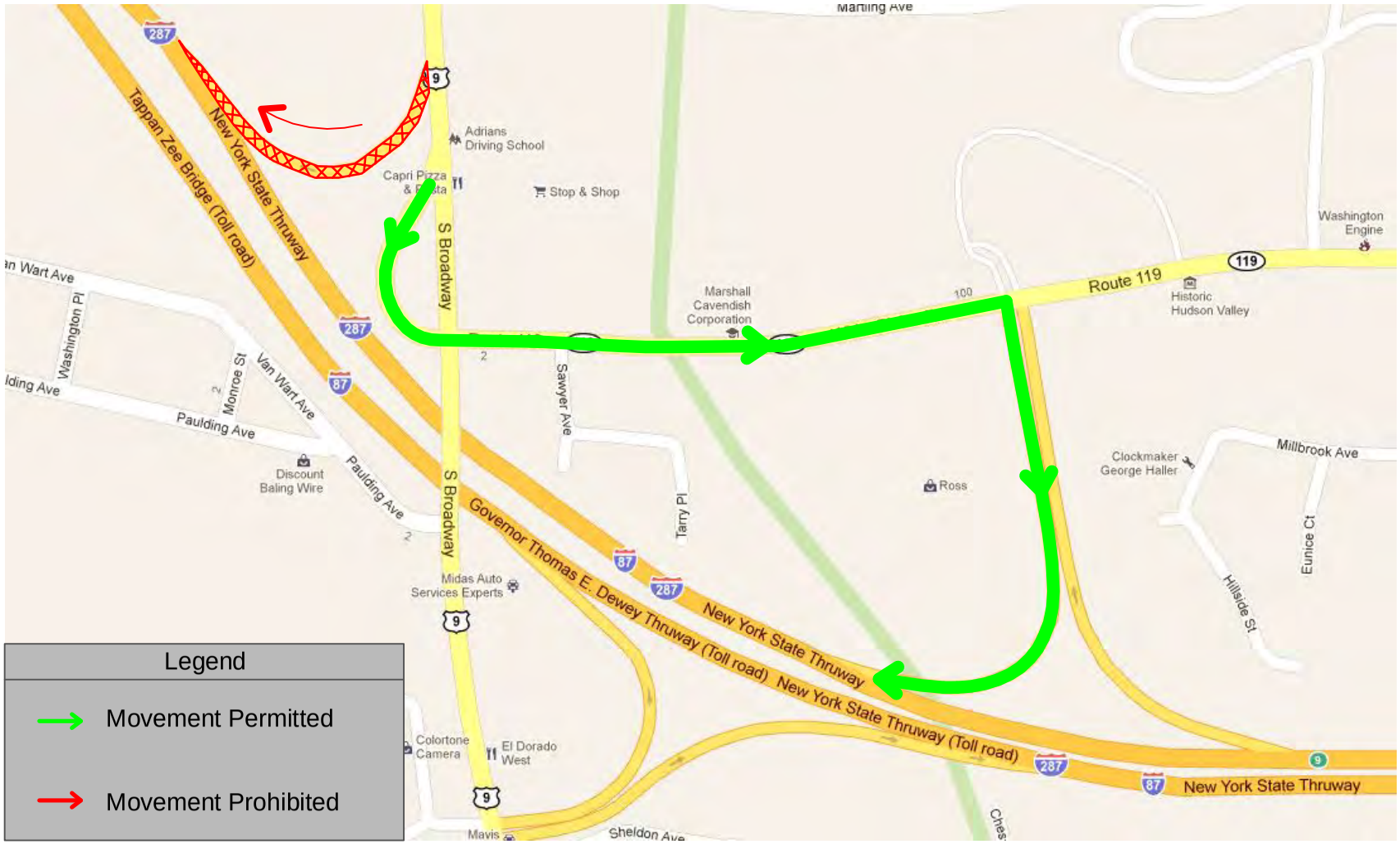


AECOM	Tappan Zee Bridge EIS Tarrytown, NY	Closure of on-ramp to I-287 from S Broadway Figure 2

Table 3-1
TZB Only EIS
Future Construction Volumes (Intersections)

10/10/2011

Base Year (Y_0)	2011
Peak Construction Year	2017
? ETC	2018

Growth Rate Thru ETC	0.5%
GF (Peak Construction Year)	1.0300

Weekday AM Peak Hour (8:15 AM - 9:15 AM) - Tarrytown - Thruway Int. 9

Locations	Movement	2011 Base Volumes	2017 Expanded Volumes	2017 Diverted Volumes	2017 Workers Volumes	2017 Construction Volumes
White Plains Rd (NY119)/I-287 Ramps/ Office Driveway	**Med**					
NY119	EBL	25	26			26
	EBT	670	690			690
	EBR	105	108	216		324
NY119	WBL	30	31			31
	WBT	310	319			319
	WBR	0	0			0
I-287 Off-Ramp	NBL	900	927			927
	NBT	15	15			15
	NBR	130	134			134
Med Office Driveway	SBL	5	5			5
	SBT	5	5			5
	SBR	0	0			0
White Plains Rd (NY119)/S. Broadway (U.S. 9)						
Jughandle (from S. Broadway)	EBL		0			0
	EBT	170	175	216		391
	EBR		0			0
NY119	WBL	720	742			742
	WBT		0			0
	WBR	470	484			484
S. Broadway	NBL		0			0
	NBT	810	834			834
	NBR	630	649			649
S. Broadway	SBL		0			0
	SBT	565	582			582
	SBR		0			0
On-Ramp to WB I-287 from S. Broadway (U.S. 9)						
SB	WBR	210	216	-216		0
Int. 9 On-Ramp to WB I-287 from NY119						
	WBR	140	144	216		361
Int. 9 Off-Ramp from WB I-287 to NY119						
	WBR	1,045	1076			1076

Table 3-2
TZB Only EIS
Future Construction Volumes

10/10/2011

Base Year (Y_0)	2011
Peak Construction Year	2017
? ETC	2018

Growth Rate Thru ETC	0.5%
GF (Peak Construction Year)	1.0300

Weekday PM Peak Hour (5:00 PM - 6:00 PM) - Tarrytown - Thruway Int. 9

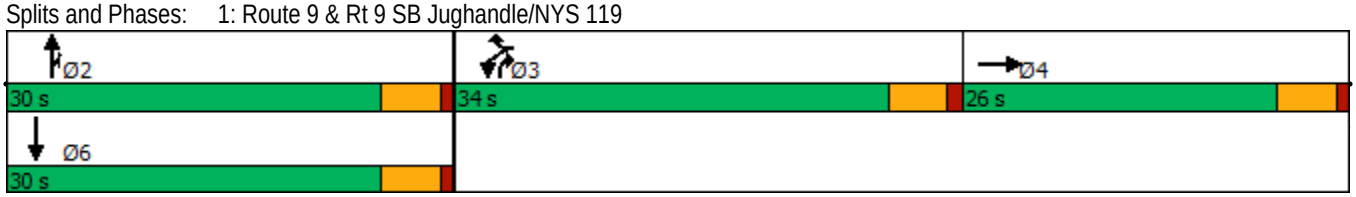
Locations	Movement	2011 Base Volumes	2017 Expanded Volumes	2017 Diverted Volumes	2017 Workers Volumes	2017 Construction Volumes
White Plains Rd (NY119)/I-287 Ramps/ Office Driveway	**Med**					
NY119	EBL	10	10			10
	EBT	345	355			355
	EBR	305	314	464		778
NY119	WBL	305	314			314
	WBT	465	479			479
	WBR	0	0			0
I-287 Off-Ramp	NBL	325	335			335
	NBT	5	5			5
	NBR	55	57			57
Med Office Driveway	SBL	5	5			5
	SBT	5	5			5
	SBR	15	15			15
White Plains Rd (NY119)/S. Broadway (U.S. 9)						
Jughandle (from S. Broadway)	EBL		0			0
	EBT	275	283	464		747
	EBR		0			0
NY119	WBL	465	479			479
	WBT		0			0
	WBR	305	314			314
S. Broadway	NBL		0			0
	NBT	620	639			639
	NBR	385	397			397
S. Broadway	SBL		0			0
	SBT	705	726			726
	SBR		0			0
On-Ramp to WB I-287 from S. Broadway (U.S. 9)						
SB	WBR	450	464	-464		0
Int. 9 On-Ramp to WB I-287 from NY119						
	WBR	615	633	464		1097
Int. 9 Off-Ramp from WB I-287 to NY119						
	WBR	385	397			397

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	390	0	520	0	412	0	702	642	0	540	0
Future Volume (vph)	0	390	0	520	0	412	0	702	642	0	540	0
Satd. Flow (prot)	0	3406	0	3337	0	1510	0	3421	1560	0	3374	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	3406	0	3337	0	1510	0	3421	1560	0	3374	0
Satd. Flow (RTOR)									103			
Confl. Peds. (#/hr)						5						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	6%	2%	6%	2%	8%	2%	5%	3%	2%	7%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	415	0	553	0	438	0	747	683	0	574	0
Turn Type		NA		Prot		Prot		NA	pt+ov		NA	
Protected Phases		4		3		3		2	2 3		6	
Permitted Phases												
Total Split (s)		26.0		34.0		34.0		30.0			30.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0			5.0	
Act Effct Green (s)		15.7		27.7		27.7		25.1	57.8		25.1	
Actuated g/C Ratio		0.19		0.33		0.33		0.30	0.69		0.30	
v/c Ratio		0.65		0.50		0.88		0.73	0.61		0.57	
Control Delay		36.6		24.7		47.7		32.0	9.2		28.2	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		36.6		24.7		47.7		32.0	9.2		28.2	
LOS		D		C		D		C	A		C	
Approach Delay		36.6			34.8			21.1			28.2	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)		108		117		212		186	132		135	
Queue Length 95th (ft)		155		180		#414		274	284		204	
Internal Link Dist (ft)		335			1262			383			400	
Turn Bay Length (ft)				450					370			
Base Capacity (vph)		860		1164		526		1029	1137		1015	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.48		0.48		0.83		0.73	0.60		0.57	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 83.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 28.2 — Intersection LOS: C
Intersection Capacity Utilization 58.9% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

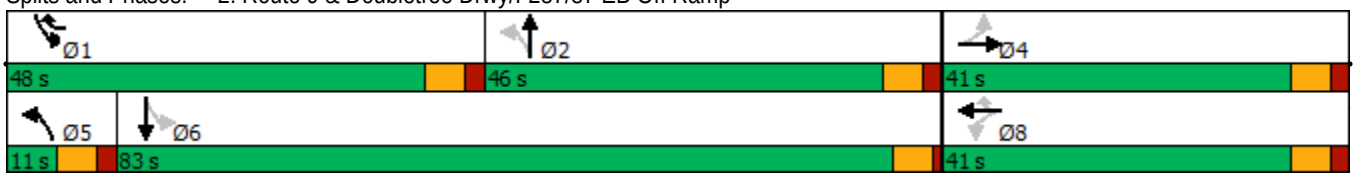
Splits and Phases: 1: Route 9 & Rt 9 SB Jughandle/NYS 119



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	24	9	240	5	893	11	430	158	253	685	74
Future Volume (vph)	46	24	9	240	5	893	11	430	158	253	685	74
Satd. Flow (prot)	0	1785	0	0	1759	1568	1687	3203	0	1654	3367	0
Flt Permitted		0.503			0.685		0.350			0.253		
Satd. Flow (perm)	0	917	0	0	1246	1508	615	3203	0	441	3367	0
Satd. Flow (RTOR)		4				139		39			14	
Confl. Peds. (#/hr)	12		8	8		12	8		5	5		8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	4%	2%	4%	7%	6%	10%	6%	6%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	82	0	0	258	940	12	619	0	266	799	0
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		
Total Split (s)	41.0	41.0		41.0	41.0	48.0	11.0	46.0		48.0	83.0	
Total Lost Time (s)		6.0			5.5	5.0	6.0	6.0		6.0	5.0	
Act Effct Green (s)		30.0			30.5	74.1	45.1	40.1		88.2	84.9	
Actuated g/C Ratio		0.23			0.23	0.57	0.35	0.31		0.68	0.65	
v/c Ratio		0.38			0.89	1.00	0.05	0.61		0.39	0.36	
Control Delay		45.3			78.4	52.8	15.6	39.6		10.6	12.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		45.3			78.4	52.8	15.6	39.6		10.6	12.0	
LOS		D			E	D	B	D		B	B	
Approach Delay		45.3			58.3			39.2			11.7	
Approach LOS		D			E			D			B	
Queue Length 50th (ft)		56			211	611	3	228		87	144	
Queue Length 95th (ft)		107			#348	#1047	11	299		133	237	
Internal Link Dist (ft)		198			290			153			652	
Turn Bay Length (ft)							50			115		
Base Capacity (vph)		249			340	938	254	1012		690	2200	
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		0.33			0.76	1.00	0.05	0.61		0.39	0.36	

Intersection Summary			
Cycle Length: 135			
Actuated Cycle Length: 130.2			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 37.2		Intersection LOS: D	
Intersection Capacity Utilization 94.7%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Route 9 & Doubletree Drwy/I-287/87 EB Off Ramp



Existing

AM Peak Hour

3: I-287/87 WB Off-Ramp/Western Site Drwy & NYS 119/Rt 119

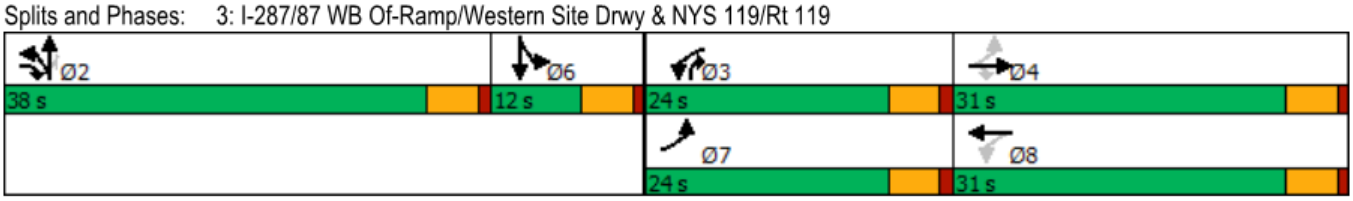
11/16/2018

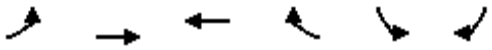
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	700	317	46	305	4	820	22	162	1	0	6
Future Volume (vph)	25	700	317	46	305	4	820	22	162	1	0	6
Satd. Flow (prot)	1752	3436	1508	1762	3418	0	1602	1614	1567	0	1872	0
Flt Permitted	0.551			0.131			0.950	0.955			0.993	
Satd. Flow (perm)	1003	3436	1463	243	3418	0	1602	1614	1543	0	1871	0
Satd. Flow (RTOR)			341		1				174		125	
Confl. Peds. (#/hr)	8		3	3		8			2	2		
Confl. Bikes (#/hr)			2			2						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	4%	7%	2%	6%	1%	2%	1%	1%	1%
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	27	753	341	49	332	0	450	456	174	0	7	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases	4		4	8					2			
Total Split (s)	24.0	31.0	38.0	24.0	31.0		38.0	38.0	24.0	12.0	12.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	
Act Effct Green (s)	31.9	25.3	58.3	35.4	30.5		33.0	33.0	40.4		18.0	
Actuated g/C Ratio	0.31	0.24	0.56	0.34	0.29		0.32	0.32	0.39		0.17	
v/c Ratio	0.08	0.90	0.35	0.26	0.33		0.88	0.89	0.25		0.02	
Control Delay	21.8	53.1	2.0	24.9	30.9		54.7	55.2	2.5		0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	21.8	53.1	2.0	24.9	30.9		54.7	55.2	2.5		0.0	
LOS	C	D	A	C	C		D	E	A		A	
Approach Delay		36.8			30.2			46.5				
Approach LOS		D			C			D				
Queue Length 50th (ft)	11	254	0	21	95		298	303	0		0	
Queue Length 95th (ft)	30	#370	35	46	140		#509	#515	21		0	
Internal Link Dist (ft)		1262			293			544			62	
Turn Bay Length (ft)	145		215	220			350		350			
Base Capacity (vph)	501	861	986	366	1005		509	513	865		428	
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	0.05	0.87	0.35	0.13	0.33		0.88	0.89	0.20		0.02	

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 103.7	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 39.8	Intersection LOS: D
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: I-287/87 WB Off-Ramp/Western Site Drwy & NYS 119/Rt 119





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	845	353	7	5	2
Future Volume (Veh/h)	17	845	353	7	5	2
Sign Control		Free	Free		Stop	
Grade		2%	-2%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	939	392	8	6	2
Pedestrians					9	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		373				
pX, platoon unblocked					0.79	
vC, conflicting volume	409				912	209
vC1, stage 1 conf vol					405	
vC2, stage 2 conf vol					508	
vCu, unblocked vol	409				373	209
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	100
cM capacity (veh/h)	1144				599	793

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	332	626	261	139	8
Volume Left	19	0	0	0	6
Volume Right	0	0	0	8	2
cSH	1144	1700	1700	1700	638
Volume to Capacity	0.02	0.37	0.15	0.08	0.01
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	0.6	0.0	0.0	0.0	10.7
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		10.7
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	207	0	547	0	462	0	741	669	0	621	0
Future Volume (vph)	0	207	0	547	0	462	0	741	669	0	621	0
Satd. Flow (prot)	0	3406	0	3337	0	1510	0	3421	1560	0	3374	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	3406	0	3275	0	1510	0	3421	1560	0	3374	0
Satd. Flow (RTOR)									321			
Confl. Peds. (#/hr)				10		15			15			
Confl. Bikes (#/hr)			10			10			10			10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	6%	2%	6%	2%	8%	2%	5%	3%	2%	7%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	220	0	582	0	491	0	788	712	0	661	0
Turn Type		NA		Prot		Prot		NA	pt+ov		NA	
Protected Phases		4		3		3		2	2 3		6	
Permitted Phases												
Total Split (s)		26.0		34.0		34.0		30.0			30.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0			5.0	
Act Effct Green (s)		10.4		29.0		29.0		25.0	59.0		25.0	
Actuated g/C Ratio		0.13		0.37		0.37		0.31	0.74		0.31	
v/c Ratio		0.49		0.48		0.89		0.73	0.57		0.62	
Control Delay		35.9		21.3		45.5		29.3	4.5		26.6	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		35.9		21.3		45.5		29.3	4.5		26.6	
LOS		D		C		D		C	A		C	
Approach Delay		35.9			32.4			17.6			26.6	
Approach LOS		D			C			B			C	
Queue Length 50th (ft)		54		111		225		181	52		145	
Queue Length 95th (ft)		87		167		#429		259	135		212	
Internal Link Dist (ft)		335			1262			383			400	
Turn Bay Length (ft)				450					370			
Base Capacity (vph)		900		1218		551		1077	1241		1062	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.24		0.48		0.89		0.73	0.57		0.62	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.4	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	25	9	247	5	933	11	455	163	319	724	76
Future Volume (vph)	47	25	9	247	5	933	11	455	163	319	724	76
Satd. Flow (prot)	0	1787	0	0	1759	1568	1687	3214	0	3209	3366	0
Flt Permitted		0.561			0.719		0.950			0.950		
Satd. Flow (perm)	0	1024	0	0	1310	1520	1667	3214	0	3183	3366	0
Satd. Flow (RTOR)		7				109		50			17	
Confl. Peds. (#/hr)	13		10	10		13	15		8	8		15
Confl. Bikes (#/hr)			3						3			10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	4%	2%	4%	7%	6%	10%	6%	6%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	0	265	982	12	651	0	336	842	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Total Split (s)	30.0	30.0		30.0	30.0	36.0	11.0	24.0		36.0	49.0	
Total Lost Time (s)		6.0			6.0	4.9	6.0	6.0		6.0	6.0	
Act Effct Green (s)		21.0			21.0	53.3	5.0	18.0		30.1	52.0	
Actuated g/C Ratio		0.24			0.24	0.61	0.06	0.21		0.35	0.60	
v/c Ratio		0.33			0.84	0.99	0.12	0.92		0.30	0.42	
Control Delay		28.7			55.1	41.2	43.5	53.0		22.5	11.2	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.7			55.1	41.2	43.5	53.0		22.5	11.2	
LOS		C			E	D	D	D		C	B	
Approach Delay		28.7			44.2			52.8			14.4	
Approach LOS		C			D			D			B	
Queue Length 50th (ft)		35			139	360	7	180		72	120	
Queue Length 95th (ft)		76			#259	#519	24	#292		107	218	
Internal Link Dist (ft)		198			271			153			652	
Turn Bay Length (ft)							50			300		
Base Capacity (vph)		287			361	988	96	704		1106	2013	
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		0.29			0.73	0.99	0.13	0.92		0.30	0.42	

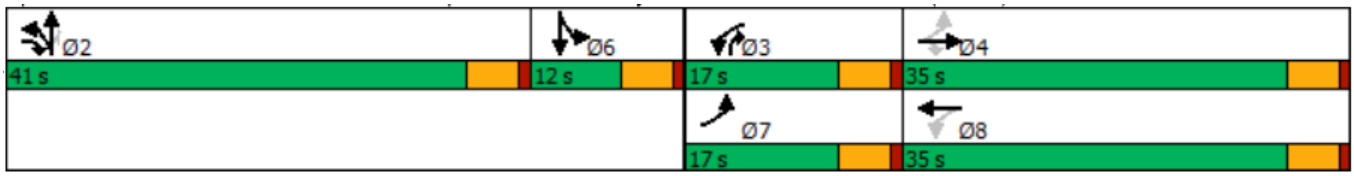
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 87.2	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 98.7%	ICU Level of Service F
Analysis Period (min) 15	

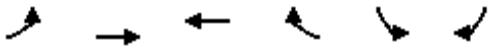
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	741	119	57	336	5	872	24	170	0	0	6
Future Volume (vph)	28	741	119	57	336	5	872	24	170	0	0	6
Satd. Flow (prot)	1752	3436	1508	1762	3416	0	1602	1614	1567	0	1844	0
Flt Permitted	0.518			0.117			0.950	0.955				
Satd. Flow (perm)	934	3436	1426	216	3416	0	1602	1614	1530	0	1844	0
Satd. Flow (RTOR)			128		1				183		251	
Confl. Peds. (#/hr)	14		10	10		14			7	7		
Confl. Bikes (#/hr)			10			10						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	4%	7%	2%	6%	1%	2%	1%	1%	1%
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	30	797	128	61	366	0	478	486	183	0	6	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Split	NA	pm+ov		NA	
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases	4		4	8					2			
Total Split (s)	17.0	35.0	41.0	17.0	35.0		41.0	41.0	17.0	12.0	12.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	
Act Effct Green (s)	35.3	28.5	64.6	39.4	34.1		36.0	36.0	43.9		18.0	
Actuated g/C Ratio	0.32	0.26	0.58	0.36	0.31		0.33	0.33	0.40		0.16	
v/c Ratio	0.09	0.90	0.14	0.33	0.35		0.92	0.92	0.25		0.01	
Control Delay	22.4	54.0	1.9	26.8	31.7		60.7	61.8	2.5		0.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	22.4	54.0	1.9	26.8	31.7		60.7	61.8	2.5		0.0	
LOS	C	D	A	C	C		E	E	A		A	
Approach Delay		46.0			31.0			51.9				
Approach LOS		D			C			D				
Queue Length 50th (ft)	13	287	0	28	111		348	355	0		0	
Queue Length 95th (ft)	33	#404	22	56	158		#582	#591	24		0	
Internal Link Dist (ft)		1262			293			544			62	
Turn Bay Length (ft)	145		215	220			350		350			
Base Capacity (vph)	428	934	912	248	1054		522	526	772		510	
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	0.07	0.85	0.14	0.25	0.35		0.92	0.92	0.24		0.01	

Intersection Summary		
Cycle Length: 105		
Actuated Cycle Length: 110.5		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 46.0	Intersection LOS: D	
Intersection Capacity Utilization 68.6%	ICU Level of Service C	
Analysis Period (min) 15		

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	893	395	8	5	2
Future Volume (Veh/h)	18	893	395	8	5	2
Sign Control		Free	Free		Stop	
Grade		2%	-2%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	992	439	9	6	2
Pedestrians					14	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		373				
pX, platoon unblocked					0.78	
vC, conflicting volume	462				994	238
vC1, stage 1 conf vol					458	
vC2, stage 2 conf vol					536	
vCu, unblocked vol	462				435	238
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	100
cM capacity (veh/h)	1088				560	756

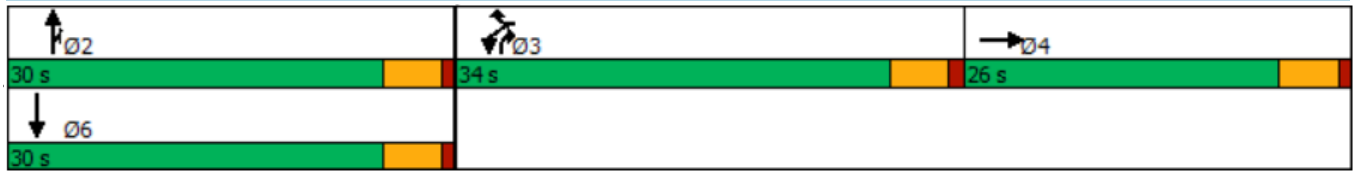
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	351	661	293	155	8
Volume Left	20	0	0	0	6
Volume Right	0	0	0	9	2
cSH	1088	1700	1700	1700	599
Volume to Capacity	0.02	0.39	0.17	0.09	0.01
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	0.7	0.0	0.0	0.0	11.1
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		11.1
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	209	0	548	0	462	0	741	673	0	621	0
Future Volume (vph)	0	209	0	548	0	462	0	741	673	0	621	0
Satd. Flow (prot)	0	3406	0	3337	0	1510	0	3421	1560	0	3374	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	3406	0	3275	0	1510	0	3421	1560	0	3374	0
Satd. Flow (RTOR)									317			
Confl. Peds. (#/hr)				10		15			15			
Confl. Bikes (#/hr)			10			10			10			10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	6%	2%	6%	2%	8%	2%	5%	3%	2%	7%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	222	0	583	0	491	0	788	716	0	661	0
Turn Type		NA		Prot		Prot		NA	pt+ov		NA	
Protected Phases		4		3		3		2	2 3		6	
Permitted Phases												
Total Split (s)		26.0		34.0		34.0		30.0			30.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0			5.0	
Act Effct Green (s)		10.4		29.0		29.0		25.0	59.1		25.0	
Actuated g/C Ratio		0.13		0.36		0.36		0.31	0.74		0.31	
v/c Ratio		0.50		0.48		0.89		0.73	0.58		0.62	
Control Delay		36.0		21.4		45.6		29.4	4.6		26.6	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		36.0		21.4		45.6		29.4	4.6		26.6	
LOS		D		C		D		C	A		C	
Approach Delay		36.0			32.4			17.6			26.6	
Approach LOS		D			C			B			C	
Queue Length 50th (ft)		54		112		225		181	54		145	
Queue Length 95th (ft)		88		167		#429		260	140		212	
Internal Link Dist (ft)		335			1262			383			400	
Turn Bay Length (ft)				450					370			
Base Capacity (vph)		900		1218		551		1076	1240		1062	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.25		0.48		0.89		0.73	0.58		0.62	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.5	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Build

AM Peak Hour

2: Route 9 & Doubletree Drwy/I-287/87 EB Off Ramp

11/16/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	25	9	247	5	935	11	457	163	320	724	76
Future Volume (vph)	47	25	9	247	5	935	11	457	163	320	724	76
Satd. Flow (prot)	0	1787	0	0	1759	1568	1687	3214	0	3209	3366	0
Flt Permitted		0.561			0.719		0.950			0.950		
Satd. Flow (perm)	0	1024	0	0	1310	1520	1667	3214	0	3183	3366	0
Satd. Flow (RTOR)		7				109		50			17	
Confl. Peds. (#/hr)	13		10	10		13	15		8	8		15
Confl. Bikes (#/hr)			3						3			10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	1%	4%	2%	4%	7%	6%	10%	6%	6%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	0	265	984	12	653	0	337	842	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Total Split (s)	30.0	30.0		30.0	30.0	36.0	11.0	24.0		36.0	49.0	
Total Lost Time (s)		6.0			6.0	4.9	6.0	6.0		6.0	6.0	
Act Effct Green (s)		21.0			21.0	53.3	5.0	18.0		30.1	52.0	
Actuated g/C Ratio		0.24			0.24	0.61	0.06	0.21		0.35	0.60	
v/c Ratio		0.33			0.84	1.00	0.12	0.93		0.30	0.42	
Control Delay		28.7			55.1	41.7	43.5	53.4		22.5	11.2	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		28.7			55.1	41.7	43.5	53.4		22.5	11.2	
LOS		C			E	D	D	D		C	B	
Approach Delay		28.7			44.6			53.2			14.5	
Approach LOS		C			D			D			B	
Queue Length 50th (ft)		35			139	363	7	181		72	120	
Queue Length 95th (ft)		76			#259	#522	24	#294		107	218	
Internal Link Dist (ft)		198			271			153			652	
Turn Bay Length (ft)							50			300		
Base Capacity (vph)		287			361	988	96	704		1106	2013	
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		0.29			0.73	1.00	0.13	0.93		0.30	0.42	

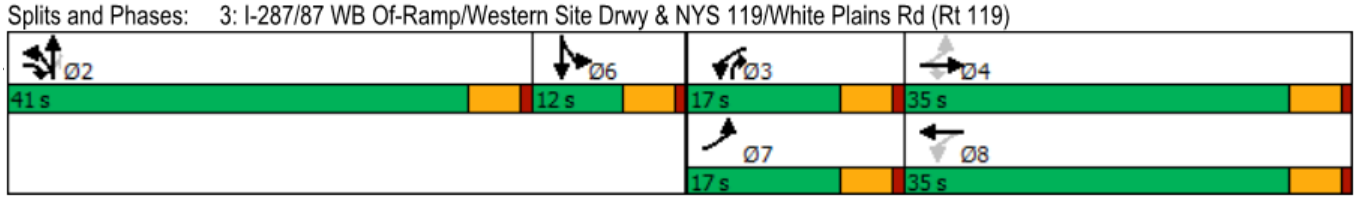
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 87.2	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 98.9%	ICU Level of Service F
Analysis Period (min) 15	

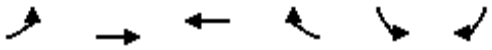
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	741	119	57	337	6	872	27	170	1	0	7
Future Volume (vph)	33	741	119	57	337	6	872	27	170	1	0	7
Satd. Flow (prot)	1752	3436	1508	1762	3416	0	1602	1614	1567	0	1865	0
Flt Permitted	0.514			0.118			0.950	0.955			0.994	
Satd. Flow (perm)	927	3436	1426	218	3416	0	1602	1614	1530	0	1864	0
Satd. Flow (RTOR)			128		2				183		125	
Confl. Peds. (#/hr)	14		10	10		14			7	7		
Confl. Bikes (#/hr)			10			10						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	4%	7%	2%	6%	1%	2%	1%	1%	1%
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	35	797	128	61	368	0	478	489	183	0	9	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases	4		4	8					2			
Total Split (s)	17.0	35.0	41.0	17.0	35.0		41.0	41.0	17.0	12.0	12.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	
Act Effct Green (s)	35.5	28.5	64.6	39.3	34.0		36.0	36.0	43.9		18.0	
Actuated g/C Ratio	0.32	0.26	0.58	0.36	0.31		0.33	0.33	0.40		0.16	
v/c Ratio	0.10	0.90	0.14	0.33	0.35		0.92	0.93	0.25		0.02	
Control Delay	22.5	54.0	1.9	26.8	31.8		60.7	62.8	2.5		0.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	22.5	54.0	1.9	26.8	31.8		60.7	62.8	2.5		0.1	
LOS	C	D	A	C	C		E	E	A		A	
Approach Delay		45.9			31.1			52.3			0.1	
Approach LOS		D			C			D			A	
Queue Length 50th (ft)	16	287	0	28	112		348	357	0		0	
Queue Length 95th (ft)	37	#404	22	56	160		#582	#598	24		0	
Internal Link Dist (ft)		1262			293			544			62	
Turn Bay Length (ft)	145		215	220			350		350			
Base Capacity (vph)	426	934	912	248	1051		522	526	772		408	
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	0.08	0.85	0.14	0.25	0.35		0.92	0.93	0.24		0.02	

Intersection Summary		
Cycle Length: 105		
Actuated Cycle Length: 110.5		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 46.1	Intersection LOS: D	
Intersection Capacity Utilization 68.7%	ICU Level of Service C	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 3: I-287/87 WB Off-Ramp/Western Site Drwy & NYS 119/White Plains Rd (Rt 119)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	894	397	9	5	3
Future Volume (Veh/h)	19	894	397	9	5	3
Sign Control		Free	Free		Stop	
Grade		2%	-2%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	993	441	10	6	3
Pedestrians					14	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		373				
pX, platoon unblocked					0.78	
vC, conflicting volume	465				998	240
vC1, stage 1 conf vol					460	
vC2, stage 2 conf vol					538	
vCu, unblocked vol	465				441	240
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	100
cM capacity (veh/h)	1085				558	754

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	352	662	294	157	9
Volume Left	21	0	0	0	6
Volume Right	0	0	0	10	3
cSH	1085	1700	1700	1700	611
Volume to Capacity	0.02	0.39	0.17	0.09	0.01
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	0.7	0.0	0.0	0.0	11.0
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		11.0
Approach LOS					B

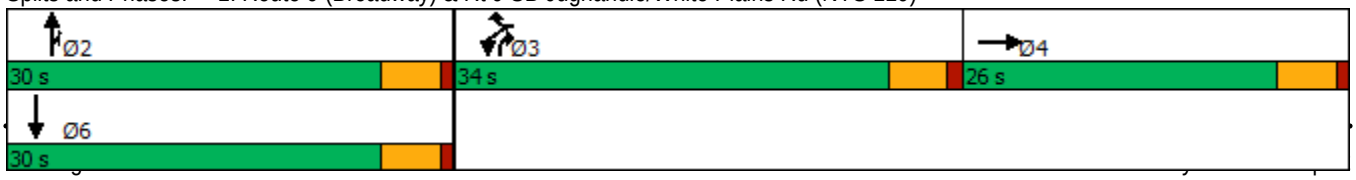
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	512	0	350	0	270	0	605	340	0	741	0
Future Volume (vph)	0	512	0	350	0	270	0	605	340	0	741	0
Satd. Flow (prot)	0	3471	0	3467	0	1599	0	3487	1560	0	3539	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	3471	0	3467	0	1599	0	3487	1560	0	3539	0
Satd. Flow (RTOR)									46			
Confl. Peds. (#/hr)						5			2			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	551	0	376	0	290	0	651	366	0	797	0
Turn Type		NA		Prot		Prot		NA	pt+ov		NA	
Protected Phases		4		3		3		2	2 3		6	
Permitted Phases												
Total Split (s)		26.0		34.0		34.0		30.0			30.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0			5.0	
Act Effct Green (s)		17.5		20.4		20.4		25.4	50.9		25.4	
Actuated g/C Ratio		0.22		0.26		0.26		0.32	0.65		0.32	
v/c Ratio		0.71		0.42		0.70		0.58	0.36		0.70	
Control Delay		34.7		25.4		36.0		26.5	6.8		29.1	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		34.7		25.4		36.0		26.5	6.8		29.1	
LOS		C		C		D		C	A		C	
Approach Delay		34.7			30.1			19.4			29.1	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		132		79		129		142	63		183	
Queue Length 95th (ft)		207		120		218		233	116		293	
Internal Link Dist (ft)		335			1262			383			400	
Turn Bay Length (ft)				450					370			
Base Capacity (vph)		943		1301		600		1128	1202		1145	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.58		0.29		0.48		0.58	0.30		0.70	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 27.1 — Intersection LOS: C
Intersection Capacity Utilization 56.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Route 9 (Broadway) & Rt 9 SB Jughandle/White Plains Rd (NYS 119)

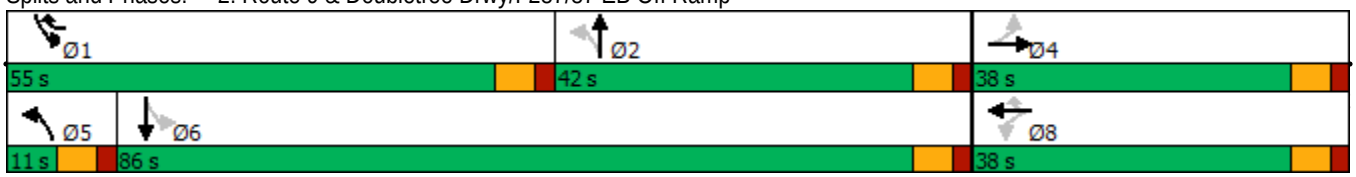


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	31	7	134	7	313	6	580	382	562	445	71
Future Volume (vph)	48	31	7	134	7	313	6	580	382	562	445	71
Satd. Flow (prot)	0	1791	0	0	1797	1599	1770	3230	0	1719	3466	0
Flt Permitted		0.621			0.682		0.449			0.105		
Satd. Flow (perm)	0	1139	0	0	1272	1566	830	3230	0	190	3466	0
Satd. Flow (RTOR)		3				46		112			23	
Confl. Peds. (#/hr)	4		5	5		4	4		8	8		4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	91	0	0	148	329	6	1013	0	592	543	0
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		
Total Split (s)	38.0	38.0		38.0	38.0	55.0	11.0	42.0		55.0	86.0	
Total Lost Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Act Effct Green (s)		19.0			19.0	58.4	45.0	40.0		85.4	83.5	
Actuated g/C Ratio		0.16			0.16	0.50	0.39	0.34		0.73	0.72	
v/c Ratio		0.48			0.71	0.40	0.02	0.86		0.90	0.22	
Control Delay		52.3			66.0	13.0	15.3	42.3		45.7	6.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		52.3			66.0	13.0	15.3	42.3		45.7	6.6	
LOS		D			E	B	B	D		D	A	
Approach Delay		52.3			29.4			42.1			27.0	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)		60			105	102	2	347		338	56	
Queue Length 95th (ft)		119			187	154	7	#594		#603	133	
Internal Link Dist (ft)		198			290			153			652	
Turn Bay Length (ft)							50			115		
Base Capacity (vph)		317			352	952	361	1181		787	2490	
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		0.29			0.42	0.35	0.02	0.86		0.75	0.22	

Intersection Summary	
Cycle Length: 135	
Actuated Cycle Length: 116.5	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 33.9	Intersection LOS: C
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Route 9 & Doubletree Drwy/I-287/87 EB Off Ramp

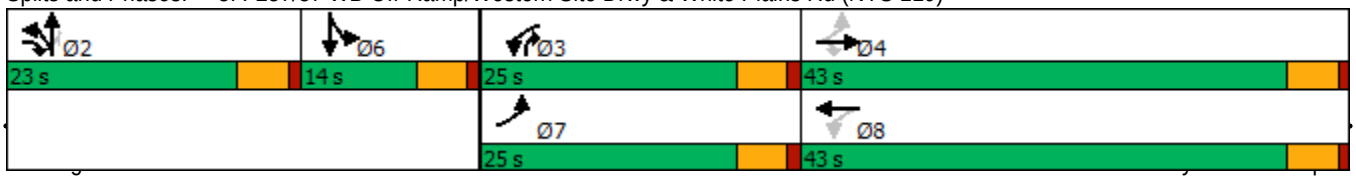


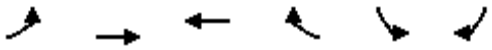
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	345	589	287	397	1	217	1	55	14	5	28
Future Volume (vph)	6	345	589	287	397	1	217	1	55	14	5	28
Satd. Flow (prot)	1752	3436	1537	1796	3592	0	1664	1670	1567	0	1889	0
Flt Permitted	0.500			0.333			0.950	0.953			0.985	
Satd. Flow (perm)	916	3436	1498	628	3592	0	1664	1670	1567	0	1889	0
Satd. Flow (RTOR)			524						73		30	
Confl. Peds. (#/hr)	5		2	2		5						
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
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	4%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	7	375	640	312	433	0	118	119	60	0	50	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases	4		4	8					2			
Total Split (s)	25.0	43.0	23.0	25.0	43.0		23.0	23.0	25.0	14.0	14.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	
Act Effct Green (s)	20.6	14.8	32.9	35.6	33.6		18.1	18.1	33.9		18.1	
Actuated g/C Ratio	0.24	0.17	0.38	0.41	0.39		0.21	0.21	0.39		0.21	
v/c Ratio	0.03	0.64	0.71	0.66	0.31		0.34	0.34	0.09		0.12	
Control Delay	16.0	39.3	8.8	25.3	19.6		34.6	34.6	2.1		17.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	16.0	39.3	8.8	25.3	19.6		34.6	34.6	2.1		17.6	
LOS	B	D	A	C	B		C	C	A		B	
Approach Delay		20.1			22.0			28.0			17.6	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	2	102	38	118	81		57	58	0		9	
Queue Length 95th (ft)	10	154	147	183	141		123	124	9		41	
Internal Link Dist (ft)		1262			293			544			62	
Turn Bay Length (ft)	145		215	220			350		350			
Base Capacity (vph)	549	1510	900	527	1595		346	347	729		417	
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	0.01	0.25	0.71	0.59	0.27		0.34	0.34	0.08		0.12	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 86.9
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 21.8 Intersection LOS: C
Intersection Capacity Utilization 69.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: I-287/87 WB Off-Ramp/Western Site Drwy & White Plains Rd (NYS 119)





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	413	674	9	3	11
Future Volume (Veh/h)	1	413	674	9	3	11
Sign Control		Free	Free		Stop	
Grade		2%	-2%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	449	733	10	3	12
Pedestrians		5			5	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		373				
pX, platoon unblocked					0.91	
vC, conflicting volume	748				970	382
vC1, stage 1 conf vol					743	
vC2, stage 2 conf vol					226	
vCu, unblocked vol	748				772	382
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	98
cM capacity (veh/h)	846				417	613

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	151	299	489	254	15
Volume Left	1	0	0	0	3
Volume Right	0	0	0	10	12
cSH	846	1700	1700	1700	561
Volume to Capacity	0.00	0.18	0.29	0.15	0.03
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.1	0.0	0.0	0.0	11.6
Lane LOS	A				B
Approach Delay (s)	0.0		0.0		11.6
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	157	0	370	0	347	0	647	368	0	810	0
Future Volume (vph)	0	157	0	370	0	347	0	647	368	0	810	0
Satd. Flow (prot)	0	3471	0	3467	0	1599	0	3487	1560	0	3539	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	3471	0	3467	0	1599	0	3487	1560	0	3539	0
Satd. Flow (RTOR)									396			
Confl. Peds. (#/hr)						15			8			
Confl. Bikes (#/hr)			10			10			10			10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	169	0	398	0	373	0	696	396	0	871	0
Turn Type		NA		Prot		Prot		NA	pt+ov		NA	
Protected Phases		4		3		3		2	2 3		6	
Permitted Phases												
Total Split (s)		26.0		34.0		34.0		30.0			30.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0			5.0	
Act Effct Green (s)		8.9		22.2		22.2		25.3	52.6		25.3	
Actuated g/C Ratio		0.12		0.31		0.31		0.35	0.73		0.35	
v/c Ratio		0.39		0.37		0.75		0.57	0.32		0.70	
Control Delay		32.9		20.0		32.6		22.4	1.1		25.1	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		32.9		20.0		32.6		22.4	1.1		25.1	
LOS		C		C		C		C	A		C	
Approach Delay		32.9			26.1			14.7			25.1	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		37		69		145		131	0		174	
Queue Length 95th (ft)		70		107		249		215	19		280	
Internal Link Dist (ft)		335			1262			383			400	
Turn Bay Length (ft)				450					370			
Base Capacity (vph)		1029		1420		655		1231	1366		1249	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.16		0.28		0.57		0.57	0.29		0.70	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.6	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 49.8%	ICU Level of Service A
Analysis Period (min) 15	

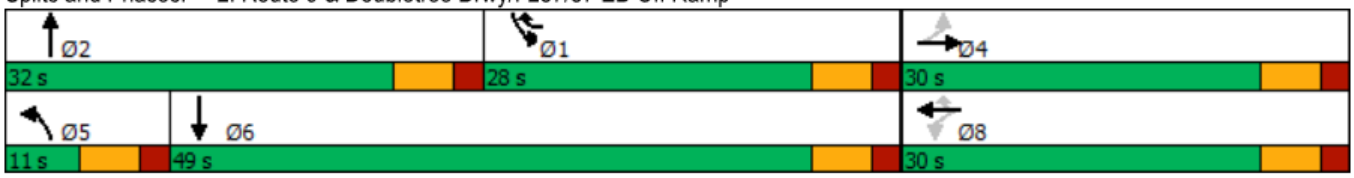
Splits and Phases: 1: Route 9 & Rt 9 SB Jughandle/NYS 119

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	32	7	138	7	343	6	618	393	618	475	73
Future Volume (vph)	50	32	7	138	7	343	6	618	393	618	475	73
Satd. Flow (prot)	0	1791	0	0	1795	1599	1770	3256	0	3335	3455	0
Flt Permitted		0.724			0.728		0.950			0.950		
Satd. Flow (perm)	0	1325	0	0	1353	1560	1742	3256	0	3311	3455	0
Satd. Flow (RTOR)		4				109		158			26	
Confl. Peds. (#/hr)	8		10	10		8	14		13	13		14
Confl. Bikes (#/hr)			2			2			6			15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	152	361	6	1065	0	651	577	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Total Split (s)	30.0	30.0		30.0	30.0	28.0	11.0	32.0		28.0	49.0	
Total Lost Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Act Effct Green (s)		14.3			14.3	34.0	5.1	26.3		19.7	50.0	
Actuated g/C Ratio		0.18			0.18	0.43	0.07	0.34		0.25	0.64	
v/c Ratio		0.39			0.62	0.48	0.05	0.89		0.78	0.26	
Control Delay		32.0			41.2	10.1	39.2	33.6		35.3	7.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		32.0			41.2	10.1	39.2	33.6		35.3	7.6	
LOS		C			D	B	D	C		D	A	
Approach Delay		32.0			19.3			33.7			22.3	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)		40			71	67	3	233		152	48	
Queue Length 95th (ft)		82			130	122	16	#413		235	128	
Internal Link Dist (ft)		198			271			153			652	
Turn Bay Length (ft)							50			300		
Base Capacity (vph)		412			418	787	114	1195		945	2214	
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		0.23			0.36	0.46	0.05	0.89		0.69	0.26	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 78.4	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 75.8%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

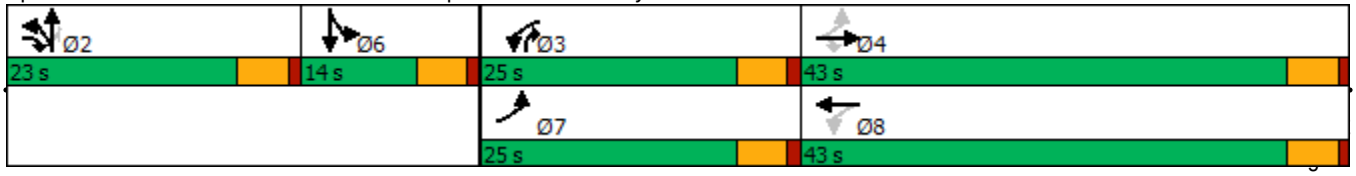
Splits and Phases: 2: Route 9 & Doubletree Drwy/I-287/87 EB Off Ramp

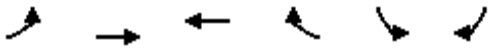


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	387	223	302	430	1	279	1	65	15	6	31
Future Volume (vph)	7	387	223	302	430	1	279	1	65	15	6	31
Satd. Flow (prot)	1752	3436	1537	1796	3592	0	1664	1670	1567	0	1862	0
Flt Permitted	0.483			0.304			0.950	0.953			0.986	
Satd. Flow (perm)	874	3436	1462	568	3592	0	1651	1656	1535	0	1858	0
Satd. Flow (RTOR)			242						73		34	
Confl. Peds. (#/hr)	15		8	8		15	5		5	5		5
Confl. Bikes (#/hr)			9			9						2
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
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	4%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	8	421	242	328	468	0	151	153	71	0	57	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases	4		4	8					2			
Total Split (s)	25.0	43.0	23.0	25.0	43.0		23.0	23.0	25.0	14.0	14.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	
Act Effct Green (s)	22.2	16.4	34.5	37.7	35.7		18.1	18.1	34.4		18.1	
Actuated g/C Ratio	0.25	0.18	0.39	0.42	0.40		0.20	0.20	0.39		0.20	
v/c Ratio	0.03	0.67	0.33	0.71	0.33		0.45	0.45	0.11		0.14	
Control Delay	15.7	39.6	3.5	26.5	19.4		37.9	37.9	2.7		18.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	15.7	39.6	3.5	26.5	19.4		37.9	37.9	2.7		18.1	
LOS	B	D	A	C	B		D	D	A		B	
Approach Delay		26.3			22.4			31.2			18.1	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	3	117	0	125	88		78	80	0		11	
Queue Length 95th (ft)	10	172	41	192	152		156	157	13		46	
Internal Link Dist (ft)		1262			293			544			62	
Turn Bay Length (ft)	145		215	220			350		350			
Base Capacity (vph)	548	1475	729	518	1584		338	339	708		405	
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	0.01	0.29	0.33	0.63	0.30		0.45	0.45	0.10		0.14	

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 89	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 25.4	Intersection LOS: C
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: I-287/87 WB Off-Ramp/Western Site Drwy & NYS 119/Rt 119





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	466	721	10	3	12
Future Volume (Veh/h)	1	466	721	10	3	12
Sign Control		Free	Free		Stop	
Grade		2%	-2%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	507	784	11	3	13
Pedestrians		10	10		10	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		373				
pX, platoon unblocked					0.90	
vC, conflicting volume	805				1065	418
vC1, stage 1 conf vol					800	
vC2, stage 2 conf vol					266	
vCu, unblocked vol	805				846	418
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	98
cM capacity (veh/h)	801				388	576

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	170	338	523	272	16
Volume Left	1	0	0	0	3
Volume Right	0	0	0	11	13
cSH	801	1700	1700	1700	528
Volume to Capacity	0.00	0.20	0.31	0.16	0.03
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.1	0.0	0.0	0.0	12.0
Lane LOS	A				B
Approach Delay (s)	0.0		0.0		12.0
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Build

PM Peak Hour

1: Route 9 & Rt 9 SB Jughandle/NYS 119

12/27/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	158	0	375	0	349	0	647	370	0	810	0
Future Volume (vph)	0	158	0	375	0	349	0	647	370	0	810	0
Satd. Flow (prot)	0	3471	0	3467	0	1599	0	3487	1560	0	3539	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	3471	0	3467	0	1599	0	3487	1560	0	3539	0
Satd. Flow (RTOR)									398			
Confl. Peds. (#/hr)						15			8			
Confl. Bikes (#/hr)			10			10			10			10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	170	0	403	0	375	0	696	398	0	871	0
Turn Type		NA		Prot		Prot		NA	pt+ov		NA	
Protected Phases		4		3		3		2	2 3		6	
Permitted Phases												
Total Split (s)		26.0		34.0		34.0		30.0			30.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0			5.0	
Act Effct Green (s)		8.9		22.4		22.4		25.3	52.7		25.3	
Actuated g/C Ratio		0.12		0.31		0.31		0.35	0.73		0.35	
v/c Ratio		0.39		0.37		0.75		0.57	0.32		0.70	
Control Delay		33.0		20.0		32.6		22.5	1.1		25.2	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		33.0		20.0		32.6		22.5	1.1		25.2	
LOS		C		C		C		C	A		C	
Approach Delay		33.0			26.1			14.7			25.2	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		37		70		147		132	0		175	
Queue Length 95th (ft)		70		109		251		215	19		280	
Internal Link Dist (ft)		335			1262			383			400	
Turn Bay Length (ft)				450					370			
Base Capacity (vph)		1027		1417		653		1228	1364		1247	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.17		0.28		0.57		0.57	0.29		0.70	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Route 9 & Rt 9 SB Jughandle/NYS 119

Build

PM Peak Hour

2: Route 9 & Doubletree Drwy/I-287/87 EB Off Ramp

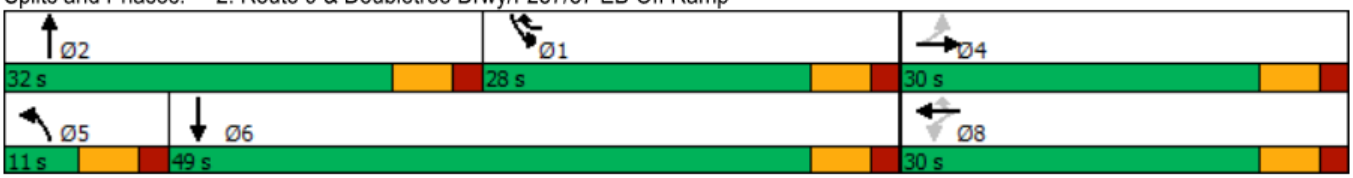
12/27/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	32	7	138	7	344	6	618	393	622	477	73
Future Volume (vph)	50	32	7	138	7	344	6	618	393	622	477	73
Satd. Flow (prot)	0	1791	0	0	1795	1599	1770	3256	0	3335	3455	0
Flt Permitted		0.724			0.728		0.950			0.950		
Satd. Flow (perm)	0	1325	0	0	1353	1560	1742	3256	0	3311	3455	0
Satd. Flow (RTOR)		4				109		158			26	
Confl. Peds. (#/hr)	8		10	10		8	14		13	13		14
Confl. Bikes (#/hr)			2			2			6			15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	152	362	6	1065	0	655	579	0
Turn Type	Perm	NA		Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4			8		8						
Total Split (s)	30.0	30.0		30.0	30.0	28.0	11.0	32.0		28.0	49.0	
Total Lost Time (s)		6.0			6.0	6.0	6.0	6.0		6.0	6.0	
Act Effct Green (s)		14.3			14.3	34.0	5.0	26.2		19.7	50.0	
Actuated g/C Ratio		0.18			0.18	0.43	0.06	0.33		0.25	0.64	
v/c Ratio		0.39			0.62	0.48	0.05	0.89		0.78	0.26	
Control Delay		32.0			41.2	10.2	39.2	33.7		35.4	7.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		32.0			41.2	10.2	39.2	33.7		35.4	7.6	
LOS		C			D	B	D	C		D	A	
Approach Delay		32.0			19.3			33.7			22.4	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)		40			71	67	3	233		153	48	
Queue Length 95th (ft)		82			130	123	16	#413		237	130	
Internal Link Dist (ft)		198			271			153			652	
Turn Bay Length (ft)							50			300		
Base Capacity (vph)		412			417	787	114	1195		944	2215	
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		0.23			0.36	0.46	0.05	0.89		0.69	0.26	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 78.4	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

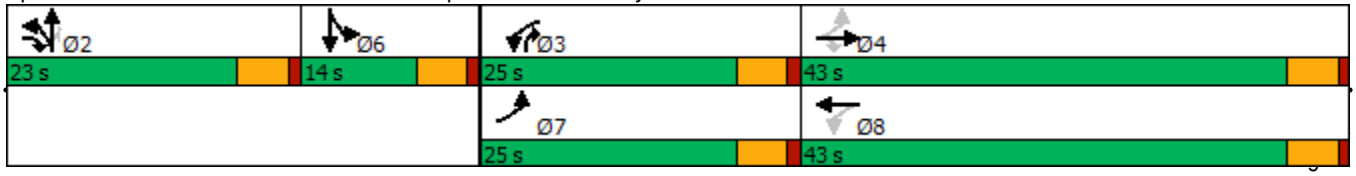
Splits and Phases: 2: Route 9 & Doubletree Drwy/I-287/87 EB Off Ramp

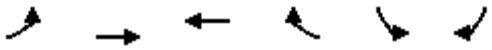


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	387	223	302	432	2	279	2	65	18	7	36
Future Volume (vph)	8	387	223	302	432	2	279	2	65	18	7	36
Satd. Flow (prot)	1752	3436	1537	1796	3588	0	1664	1670	1567	0	1865	0
Flt Permitted	0.482			0.304			0.950	0.953			0.985	
Satd. Flow (perm)	872	3436	1462	568	3588	0	1651	1656	1535	0	1861	0
Satd. Flow (RTOR)			242						73		39	
Confl. Peds. (#/hr)	15		8	8		15	5		5	5		5
Confl. Bikes (#/hr)			9			9						2
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
Heavy Vehicles (%)	2%	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	4%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	9	421	242	328	472	0	151	154	71	0	67	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases	4		4	8					2			
Total Split (s)	25.0	43.0	23.0	25.0	43.0		23.0	23.0	25.0	14.0	14.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0	
Act Effct Green (s)	22.2	16.4	34.5	37.7	35.6		18.1	18.1	34.4		18.1	
Actuated g/C Ratio	0.25	0.18	0.39	0.42	0.40		0.20	0.20	0.39		0.20	
v/c Ratio	0.03	0.67	0.33	0.71	0.33		0.45	0.45	0.11		0.16	
Control Delay	15.8	39.6	3.5	26.5	19.5		37.9	38.0	2.7		18.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	15.8	39.6	3.5	26.5	19.5		37.9	38.0	2.7		18.2	
LOS	B	D	A	C	B		D	D	A		B	
Approach Delay		26.3			22.4			31.3			18.2	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	3	117	0	125	89		78	80	0		13	
Queue Length 95th (ft)	11	172	41	192	154		156	160	13		52	
Internal Link Dist (ft)		1262			293			544			62	
Turn Bay Length (ft)	145		215	220			350		350			
Base Capacity (vph)	547	1475	729	518	1582		338	339	708		410	
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	0.02	0.29	0.33	0.63	0.30		0.45	0.45	0.10		0.16	

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 89	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: I-287/87 WB Of-Ramp/Western Site Drwy & NYS 119/Rt 119



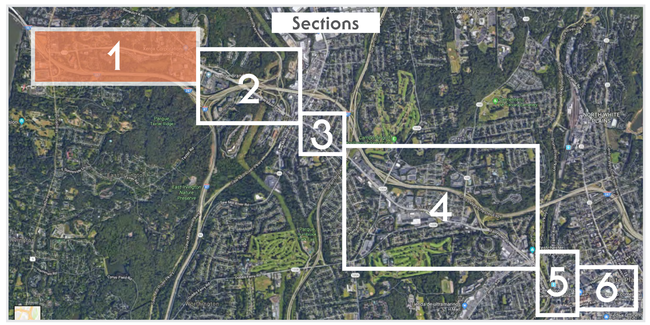


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	469	721	11	4	14
Future Volume (Veh/h)	1	469	721	11	4	14
Sign Control		Free	Free		Stop	
Grade		2%	-2%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	510	784	12	4	15
Pedestrians		10	10		10	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		3.5	3.5		3.5	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		373				
pX, platoon unblocked					0.90	
vC, conflicting volume	806				1067	418
vC1, stage 1 conf vol					800	
vC2, stage 2 conf vol					267	
vCu, unblocked vol	806				849	418
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	97
cM capacity (veh/h)	800				387	575

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	171	340	523	273	19
Volume Left	1	0	0	0	4
Volume Right	0	0	0	12	15
cSH	800	1700	1700	1700	522
Volume to Capacity	0.00	0.20	0.31	0.16	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.1	0.0	0.0	0.0	12.2
Lane LOS	A				B
Approach Delay (s)	0.0		0.0		12.2
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

ROUTE 119 COMPLETE STREETS DESIGN ALTERNATIVES



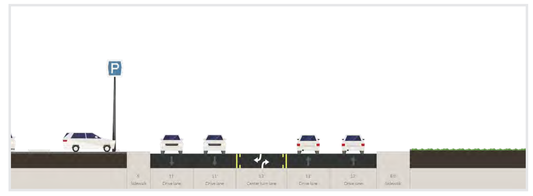
Section 1

Rt. 9 to Benedict Ave. (Tarrytown)

Existing Conditions

2015 Average Annual Daily Traffic: 11,500

Curb-to-curb Road Width: 57 ft.

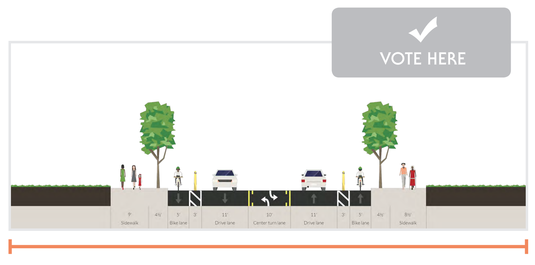


Option 1: Buffered Dual Bike Lane on North Side & Road Diet

Road Diet: Removal of one travel lane per direction and extension of the sidewalk on the south side.

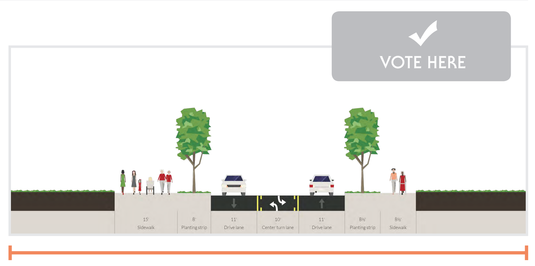
Option 2: Buffered Bike Lanes in Each Direction & Road Diet

Road Diet: Removal of one travel lane per direction.



Option 3: Shared Sidewalk & Road Diet

Road Diet: Removal of one travel lane per direction and extension of both sidewalks.



Section 2

Benedict Ave. (Tarrytown) to Saw Mill River Rd. (Elmsford)

Existing Conditions

2015 Average Annual Daily Traffic: 29,000

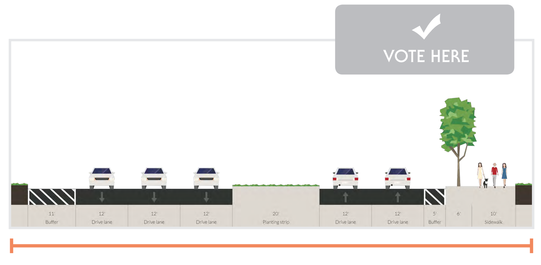
Curb-to-curb Road Width: 88 - 112 ft.

Option 1: Buffered Dual Bike Lane & Road Diet

Road Diet: Removal of one travel lane per direction and addition of sidewalk on north side.

Option 2: Shared Use Path & Road Diet

Road Diet: Removal of southern travel lane.



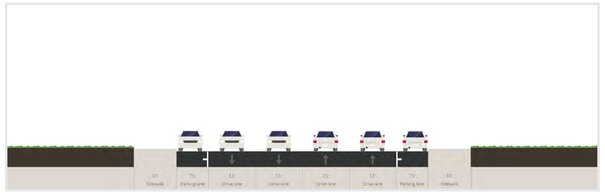
Section 3

Saw Mill River Rd. to Old Rd. (Elmsford)

Existing Conditions

2015 Average Annual Daily Traffic: 19,500

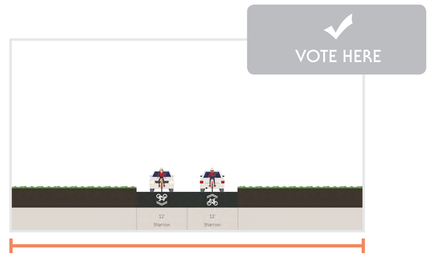
Curb-to-curb Road Width: 59 - 64 ft.



Option 1: Buffered Bike Lanes in Each Direction

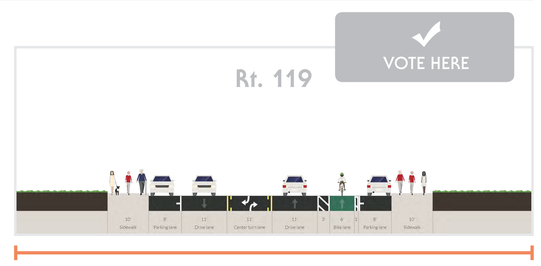
Road Diet: Removal of one travel lane per direction, addition of central turning lane, and preservation of on-street parking.

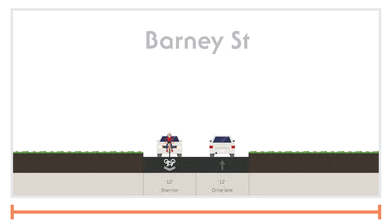
Option 2: Boulevard on Barney St.



Option 3: Buffered Bike Lane EB on Route 119 / Boulevard WB on Barney St.

Road Diet: Removal of one travel lane per direction, addition of central turning lane, and preservation of on-street parking.





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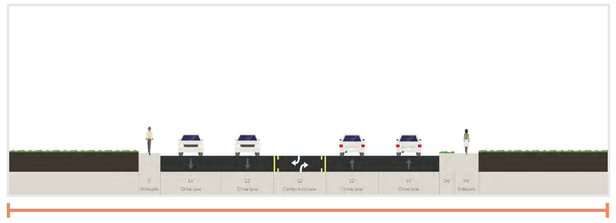
ROUTE 119 COMPLETE STREETS DESIGN ALTERNATIVES

Section 4

Old Rd. (Elmsford) - Westchester County Center (White Plains)

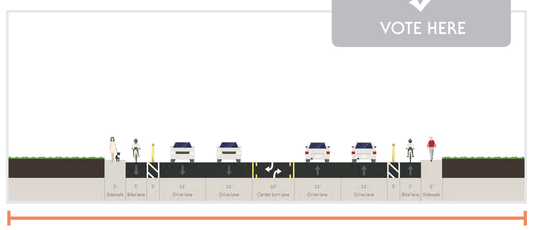
Segment A — **Existing Conditions**

2015 Average Annual Daily Traffic: 20,000
Curb-to-curb Road Width: 64 ft.



Option 1: Buffered Bike Lanes in Each Direction

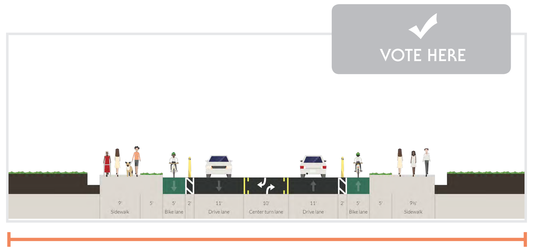
VOTE HERE



Option 2: Buffered Bike Lanes & Road Diet

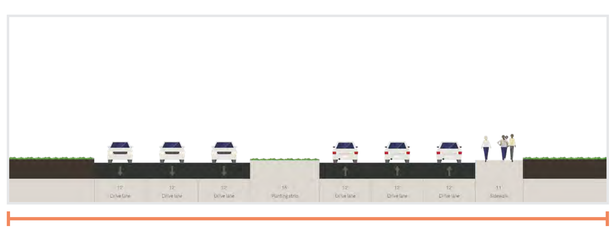
Road Diet: Removing one travel lane per direction and adding a central turning lane.

VOTE HERE

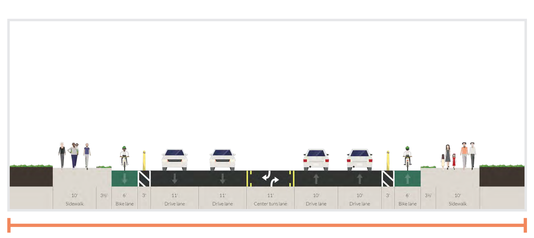


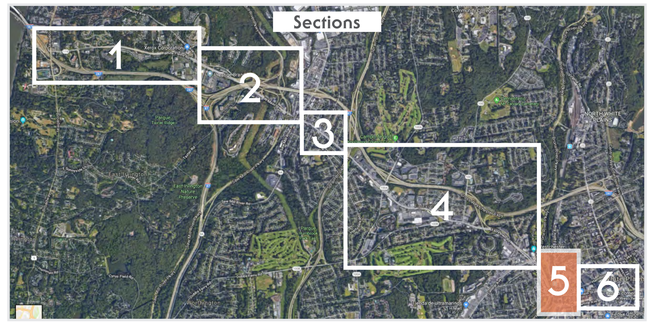
Segment B — **Existing Conditions**

2015 Average Annual Daily Traffic: 27,000
Curb-to-curb Road Width: 64 ft.



Option 1: Buffered Bike Lanes & Road Diet



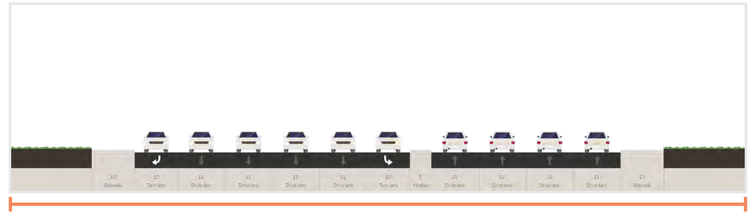


Section 5

Westchester County Center - Bronx St. (White Plains)

Existing Conditions

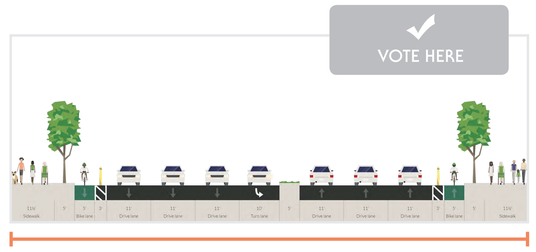
2015 Average Annual Daily Traffic: 27,000 - 43,000
Curb-to-curb Road Width: 117 - 135 ft.



Option 1: Buffered Bike Lanes & Road Diet

Road Diet: Removing one travel lane per direction.

VOTE HERE



Option 2: Bronx River Pathway

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WE WANT YOUR INPUT!

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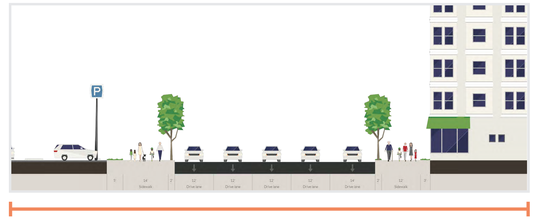
Section 6

Bronx St. - Broadway (White Plains)

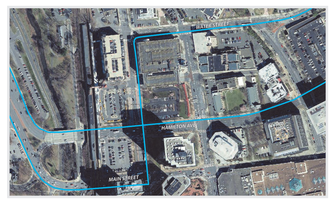
Hamilton Ave. — **Existing Conditions**

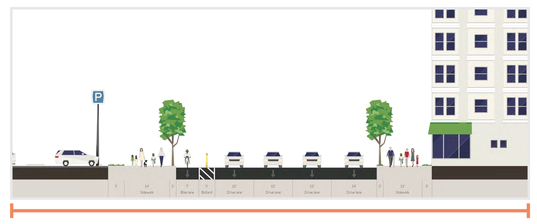
2015 Average Annual Daily Traffic: 23,000
Curb-to-curb Road Width: 62 ft.



Option 1: Buffered Bike Lane & Road Diet

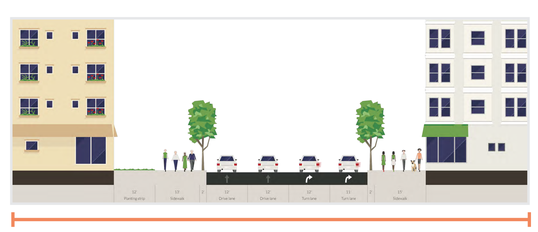
Road Diet: Removing one travel lane per direction.





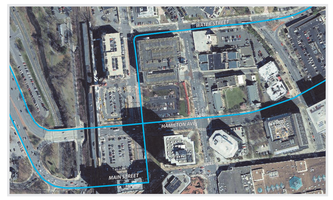
Main St. — **Existing Conditions**

2015 Average Annual Daily Traffic: 43,000
Curb-to-curb Road Width: 47 ft.

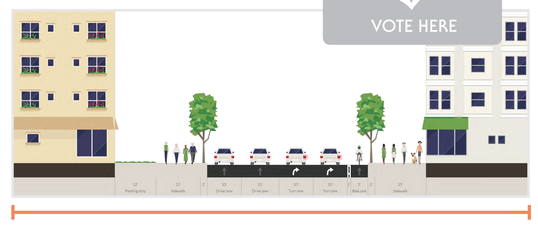


Option 1: Buffered Bike Lane & Road Diet

Road Diet: Removing one travel lane per direction.



VOTE HERE



Option 2: Bronx River Pathway - Baker Ave

VOTE HERE

Image Source: http://www.cityofwhiteplains.com/DocumentCenterView/336

Comparison of Current and Previous Traffic Volumes

Existing Balanced Traffic Volumes		*2005*	*2018*	*% Change*
NYS 119 @ 155 East Driveway	AM	1391	1229	-12%
	PM	1149	1111	-3%
Route 9 @ I-87/287 WB Ramps[1]	AM	2236	2090	-7%
	PM	1513	1356	-10%
Route 9 @ NYS 119[2]	AM	2919	2816	-4%
	PM	2439	2306	-5%
Total Existing Volumes	AM	6546	6135	-6%
	PM	5101	4773	-6%
No-Build Traffic Volumes		*2011*	*2021*	
Route 9 @ I-87/287 EB Ramps[3]	AM	3707	3015	-19%
	PM	3639	2762	-24%
Total (all Volumes)	AM	10253	9150	-11%
	PM	8740	7535	-14%

1. Excluding EB right movement impacted by Ramp E closure
2. Excluding EB Through movement impacted by Ramp E closure
3. No-Build Volumes as Existing Volumes were not available

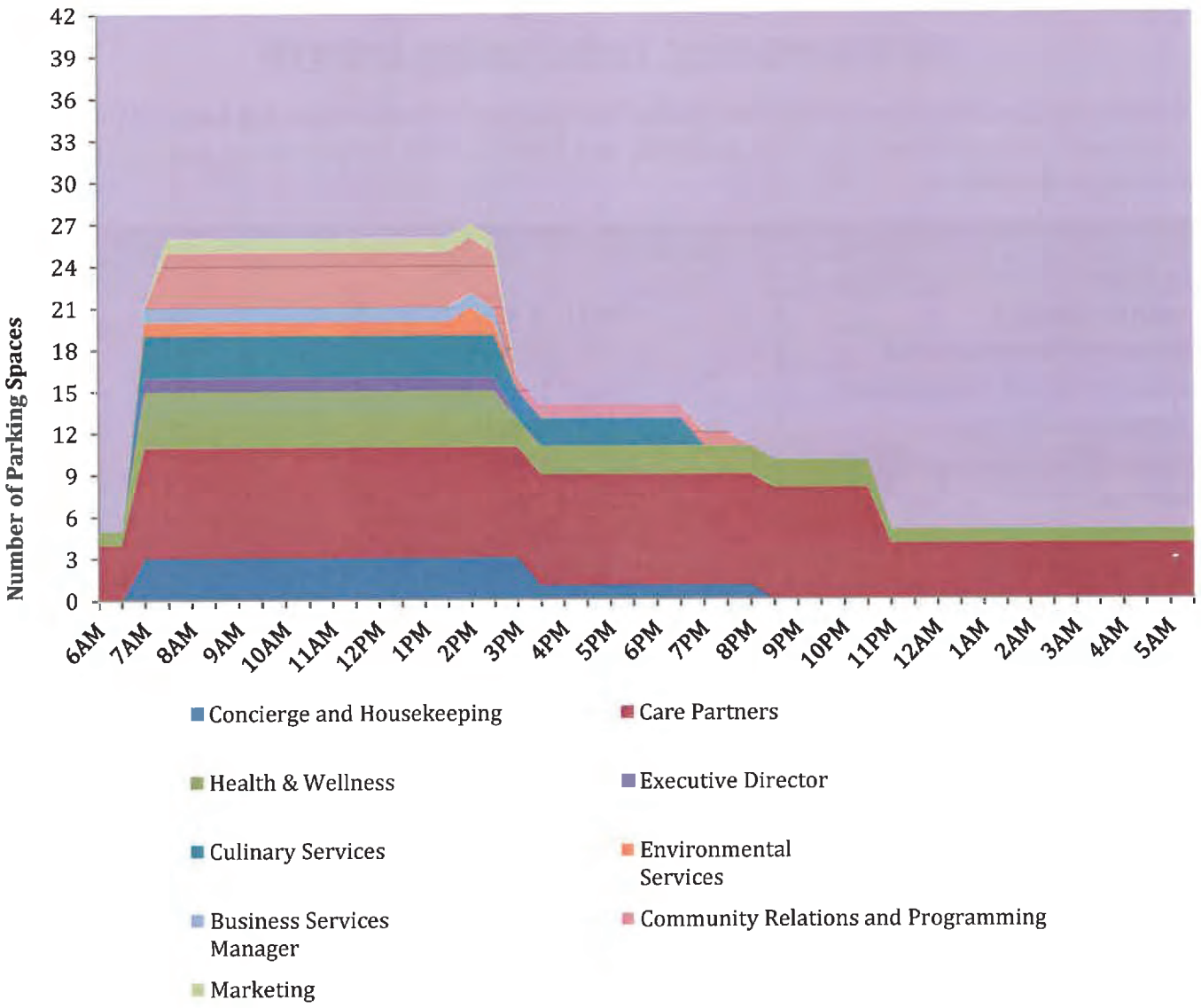
Table 7 - LOS Comparison to 2006 Study

Approach	Weekday AM Peak Hour								Weekday PM Peak Hour							
	Proposed Action				2006 Studies for 60,000 sf Office				Proposed Action				60,000 sf Office (2006 Studies)			
	No-Build		Build		No-Build		Build (60,000 sf Office)		No-Build		Build		No-Build		Build (60,000 sf Office)	
	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS
1. US Route 9 (Broadway) at White Plains Rd (NYS 119)																
EB T	35.9	D	36.0	D	48.8	D	53.7	D	32.9	C	33.0	C	40.8	D	41.3	D
WB L	21.3	C	21.4	C	23.6	C	23.7	C	20.0	C	20.0	C	16.1	B	16.4	B
WB R	45.5	D	45.6	D	43.8	D	45.2	D	32.6	C	32.6	C	36.2	D	41.7	D
NB T	29.3	C	29.4	C	21.6	C	21.6	C	22.4	C	22.5	C	31.5	C	31.5	C
NB R	4.5	A	4.6	A	6.7	A	8.0	A	1.1	A	1.1	A	2.4	A	2.4	A
SB T	26.6	C	26.6	C	22.2	C	22.2	C	25.1	C	25.2	C	34.7	C	34.7	C
OVERALL INT	**25.1**	**C**	**25.1**	**C**	**23.4**	**C**	**24.2**	**C**	**21.9**	**C**	**22.0**	**C**	**28.1**	**C**	**29.0**	**C**
2. US Route 9 (Broadway) at I-287/I-87 EB Ramps/Doubletree																
EB LTR	28.7	C	28.7	C	26.2	C	25.8	C	32.0	C	32.0	C	51.7	D	64.3	E
WB LT	55.1	E	55.1	E	55.9	E	54.8	D	41.2	D	41.2	D	62.7	E	69.4	E
WB R	41.2	D	41.7	D	118.9	F	126.6	F	10.1	B	10.2	B	20.0	C	19.8	B
NB L	43.5	D	43.5	D	40.7	D	40.6	D	39.2	D	39.2	D	28.0	C	28.9	C
NB TR	53.0	D	53.4	D	56.7	E	69.9	E	33.6	C	33.7	C	104.0	F	114.1	F
SB L	22.5	C	22.5	C	42.2	D	39.7	D	35.3	D	35.4	D	143.8	F	136.7	F
SB TR	11.2	B	11.2	B	12.3	B	12.4	B	7.6	A	7.6	A	4.3	A	4.0	A
OVERALL INT	**34.5**	**C**	**34.8**	**C**	**58.4**	**E**	**63.2**	**E**	**26.3**	**C**	**26.3**	**C**	**76.5**	**E**	**79.1**	**E**
3. White Plains Rd (NYS 119) at I-287/I-87 WB Ramps/W. Site Drwy.																
EB L	22.4	C	22.5	C	23.0	C	30.5	C	15.7	B	15.8	B	24.3	C	25.5	C
EB T	54.0	D	54.0	D	28.9	C	29.0	C	39.6	D	39.6	D	28.4	C	28.5	C
EB R	1.9	A	1.9	A	5.2	A	5.2	A	3.5	A	3.5	A	14.7	B	14.7	B
WB L	26.8	C	26.8	C	26.4	C	26.7	C	26.5	C	26.5	C	23.1	C	23.6	C
WB TR	31.7	C	31.8	C	18.3	B	18.4	B	19.4	B	19.5	B	14.2	B	14.3	B
NB L	60.7	E	60.7	E	45.4	D	42.9	D	37.9	D	37.9	D	40.9	D	40.9	D
NB LT	61.8	E	62.8	E	31.5	C	35.0	C	37.9	D	38.0	D	38.3	D	38.9	D
NB R	2.5	A	2.5	A	14.5	B	14.5	B	2.7	A	2.7	A	14.0	B	14.0	B
SB LTR	0.0	A	0.1	A	39.9	D	40.2	D	18.1	B	18.2	B	36.1	D	37.4	D
OVERALL INT	**46.0**	**D**	**46.1**	**D**	**27.8**	**C**	**28.2**	**C**	**25.4**	**C**	**25.3**	**C**	**25.0**	**C**	**25.5**	**C**
4. White Plains Rd (NYS 119) at Eastern Site Drwy (unsignalized)																
EB L	0.2	A	0.2	A	9.1	A	9.3	A	0.0	A	0.0	A	9.6	A	9.6	A
SB LR	11.1	B	11.0	B	18.7	C	18.7	C	12.0	B	12.2	B	16.8	C	18.0	C

Tarrytown, New York- Parking Analysis

Artis memory care assisted living facilities are staffed 24 hours per day, seven days per week. While there are three main work shifts 7AM to 3 PM, 3PM to 11PM, and 11PM to 7AM for the nursing and care giving staff, the hours for other staff vary.

Staff Department	Shift	Number of Shift Employees
LEADERSHIP & FRONT OF HOUSE		
Executive Director	7 AM – 3PM	1
Director of Business Service	7 AM – 3PM	1
Director of Community Relations	7 AM – 3PM	1
Director of Marketing	7 AM – 3PM	1
Director of Environmental Services	7 AM – 3PM	1
Concierge	7 AM – 3PM	1
	4 PM – 8 PM	1
COMMUNITY CARE & PROGRAMMING		
Housekeeper	7 AM – 3PM	2
Director of Health & Wellness	7 AM – 3PM	1
Coordinator of Health & Wellness	7 AM – 3PM	3
	3 PM – 11 PM	2
	11 PM – 7 AM	1
Director of Partnership Development	7 AM – 3PM	1
Life Enrichment Assistants	7 AM – 3PM	2
	4 PM – 8 PM	1
Care Partners	7 AM – 3 PM	8
	3 PM – 11 PM	8
	11 PM – 7 AM	4
Director of Culinary Services	7 AM – 3PM	1
Culinary Services Assistant	7 AM – 3PM	1
	3 PM – 7 PM	1
Cook	7 AM – 3PM	1
	3 PM – 7 PM	1


Number of Parking Spaces
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
6AM
7AM
8AM
9AM
10AM
11AM
12PM
1PM
2PM
3PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
11PM
12AM
1AM
2AM
3AM
4AM
5AM
Concierge and Housekeeping
Care Partners
Health & Wellness
Executive Director
Culinary Services
Environmental Services
Business Services Manager
Community Relations and Programming
Marketing

HARRY BAKER & ASSOCIATES, 3 Dolphin Road, New City, New York 10956 (914) 638-2361

March 16, 2015
Revised April 9, 2015

Mr. Max Ferentinos
Vice President
Artis Senior Living, LLC
1651 Old Meadow Road, Suite 100
McLean, Virginia, 22102

Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY

Dear Mr. Ferentinos:

Harry Baker & Associates (HBA) has undertaken a traffic and parking study to determine the amount of vehicles entering and exiting an existing adult care facility and how many cars are parked during the day. The study was conducted at the Sunrise Adult facility located on Main Street in New City, New York on Friday, February 6, 2015. Surveyors counted the vehicles entering and exiting during the following time periods: 7:00 AM-8:00 AM, 8:00 AM-9:00 AM,11:00 AM – 12:00 Noon, 12:00 Noon – 1:00 PM, 4:00 PM – 5:00 PM, and 5:00 PM- 6:00 PM. For these same time periods, we noted the number of cars parked in the parking lot.

SUNRISE ADULT CARE FACILITY

The Sunrise Adult Care facility has 94 beds including 48 set aside for people with memory loss, and 37 parking spaces. Currently, there are seven empty beds in the memory loss unit. There are currently 87 residents living at the Sunrise facility. The facility has a memory care unit and assisted living units. There are studio, one and two-bedrooms suites, and companion suites.

Traffic Count

As noted above, a manual traffic count was conducted for the time periods noted above. The result of the counts are shown in **Table 1** below.

TABLE 1 – TRAFFIC COUNT SUMMARY – Sunrise Facility New City, NY		
TIME	IN	OUT
7:00 AM - 8:00 AM	12	5
8:00 AM – 9:00 AM	5	1
11:00 AM – 12:00 NOON	10	4
12:00 NOON – 1:00 PM	11	12
4:00 PM – 5:00 PM	12	8
5:00 PM – 6:00 PM	11	14

The traffic volumes above have been compared to the vehicles that would be generated in accordance with the Institute of Transporation Engineers (ITE), "Trip Generation Manual", 9th Edition. The land Use Code is 254 and the calculation is based on the number of beds. Table 2 shows the calculations based on the ITE Trip Generation Manual.

Mr. Max Ferentinos
Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY
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TABLE 2 - Calculation of Weekday Peak Hour Trips – Sunrise Facility, New City, NY	
Assisted Living Land Use 254 – 94 beds	
Morning Peak Hour	Afternoon Peak Hour
Total Trips = 0.14 x 94 beds = 14 trips	Total Trips = 0.22 x 94 beds= 21 trips
Trips Entering = 0.64 x 13 trips = 9 trips	Trips Entering = 0.45 x 54 trips = 9 trips
Trips Exiting = 0.36 x 13 trips = 5 trips	Trips Exiting = 0.55 x 54 trips = 12 trips

The comparison of the traffic counts during the peak hours are similar for the Sunrise facility. In the morning peak hour, the total vehicle trips counted between 7:00 AM and 8:00 AM was 17. The ITE calculation shows 14 vehicle trips. In the evening peak hour, the 4:00 PM to 5:00 PM hour shows a total of 20 vehicle trips and the 5:00 PM to 6:00 PM hour shows a total of 25 vehicle trips. The ITE calculation also takes into account that there could be empty beds in the facility. The vehicle trips calculated using the ITE Trip Generation Manual are average trips. Therefore, there could be a daily variation as noted by the actual vehicle counts which account for the difference during the evening peak hour.

According to the ITE Trip Generation Manual, for the Saturday peak hour which would occur typically mid to late morning, there would be a total of 31 vehicle trips generated with 14 vehicles entering and 17 vehicles exiting. On Sunday, there would be a total of 36 vehicle trips with 15 vehicles entering and 21 vehicles exiting.

Parking Analysis

A parking accumulation survey was also conducted for the Sunrise Facility during the same hours as the traffic count and supplemented by additional data counted on Wednesday, April 8, 2015 for the hours not counted during the original data collection period. A surveyor noted the number of cars parked each hour beginning at 7:00 AM and continuing until 6:00 PM. **Table 3** shows the number of cars parked by hour of day from 6:00 AM to 6:00 PM.

Table 3	
Parking Accumulation at Sunrise Facility on February 6 and April 8, 2015	
Time	Number of Cars Parked
6AM	9
7 AM	16
8 AM	20
9 AM	26
10 AM	37

Mr. Max Ferentinos
Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY
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11 AM	30
12 N	32
1 PM	33
2 PM	37
3 PM	36
4 PM	31
5 PM	28
6 PM	23

The parking survey shows that peak occupancy occurs at 10:00 AM, 2:00 PM, and 3:00 PM averaging between 97% and 100% occupancy. There is a shift change time at 3:00 PM when there is an overlap in the parking and the parking occupancy reaches 97%. During the remainder of the day, the vehicle occupancy reaches 83% at noon when lunch is served. It should be noted that there were 16 vehicles that arrived and departed within less than one-half hour based on the survey data collected. Several of these vehicles were taxi cabs. There were also three truck deliveries during the day. Once the trucks unloaded, they left the facility.

For the Sunrise Assisted Living Facility, the parking space to bed ratio is 0.40 parking spaces per bed based on the Clarkstown Zoning code. This ratio reflects the need to provide parking for staff, visitors, doctors, etc. The data shows that the parking occupancy did reach 85% for five hours during the day. When the parking occupancy reaches 85% consistently over a period of time, expansion of parking should be considered.

Parking Survey on Monday, February 16, 2015 – Presidents Days

There was a discussion at the board of trustees meeting regarding parking on holidays and weekends. To address this issue, HBA conducted a parking survey on the Presidents Day holiday. **Table 4** summarizes the results of this survey.

Mr. Max Ferentinos
Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY
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Table 4	
Parking Accumulation at Sunrise Facility on Presidents Day	
Time	Number of Cars Parked
7 AM	14
8 AM	18
9 AM	26
10 AM	26
11 AM	26
12 N	30
1 PM	26
2 PM	29
3 PM	23
4 PM	21
5 PM	19

The peak occupancy occurred at noon during the lunch time hour. For this hour, the occupancy rate was 81%. The vehicle occupancy stayed consistent from 9 AM to 3 PM. However, there was still parking spaces available for visitors and additional staff if necessary.

ARTIS FACILITY

The proposed Artis facility will have 64 beds. **Table 5** below shows the vehicle trips that would be generated by the proposed facility during the morning and evening peak hours. On Saturday, there would be a total of 21 vehicle trips generated with 10 vehicles entering and 11 vehicles exiting. On Sunday, there would be a total of 24 vehicle trips with 10 vehicles entering and 14 vehicles exiting.

TABLE 5- Calculation of Weekday Peak Hour Trips – ARTIS Facility	
Assisted Living Land Use 254 – 64 beds	
Morning Peak Hour	Afternoon Peak Hour
Total Trips = 0.14 x 64 beds = 9 trips	Total Trips = 0.22 x 64 beds= 14 trips
Trips Entering = 0.64 x 9 trips = 6 trips	Trips Entering = 0.45 x 14 trips = 6 trips
Trips Exiting = 0.36 x 9 trips = 3 trips	Trips Exiting = 0.55 x 14 trips = 8 trips

Mr. Max Ferentinos
Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY
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Revised April 9, 2015

Projected Parking – Artis Facility in Chestnut Ridge

Village of Chestnut Ridge, New York - Parking Analysis

Artis memory care assisted living facilities are staffed 24 hours per day, seven days per week. While there are three main work shifts 7AM to 3 PM, 3PM to 11PM, and 11PM to 7AM for the nursing and care giving staff, the hours for other staff vary.

Staff Department	Shift	Number of Shift Employees
Nursing/Caregiving Staff	7 AM – 3 PM	8
	3 PM – 11 PM	8
	11 PM – 7 AM	4
	6:30 AM – 6:30 PM	1
	6:30 PM – 6:30 AM	1
Executive Director	8 AM – 6 PM	1
Chef	6:30 AM – 2:30 PM	1
	10:30 AM – 6:30 PM	1
Recreational Services	8 AM – 5 PM	1
	10 AM – 6 PM	1
Environmental Services	6 AM – 2 PM	1
	2 PM – 8 PM	1
Business Manager	8 AM – 5 PM	1
Community Services Coordinator	10 AM – 6:30 PM	1

For the proposed facility using a ratio of 0.40 parking spaces per bed, a total of 26 parking spaces would be required. It would be expected that the parking occupancy rates noted above for Sunrise would be similar for the proposed Artis facility.

Mr. Max Ferentinos
Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY
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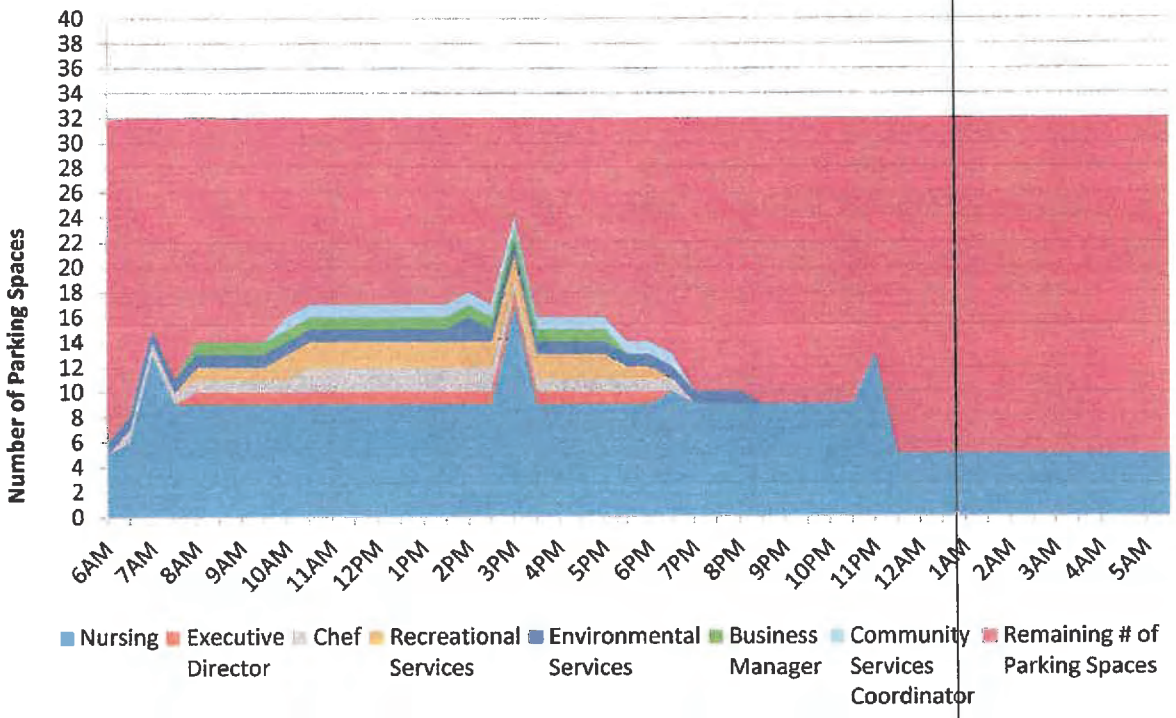

This table shows the entry and exit times for the Artis employees. As you can see in the table, 12 employees will enter the facility between 6:30 AM and 8:00 AM. At 3:00 PM, eight employees will leave and eight employees will arrive. During the PM rush hour 5:00 PM to 6:30 PM, seven employees will leave.

Traffic on Route 45

There is a NYSDOT count station (850012) located on Route 45 located 75 feet north of the state line border with New Jersey. The Average Daily Traffic volume from 2006 is 11,237 vehicles. The proposed facility will generate 12 vehicle trips in the morning peak hour and seven vehicle trips in the evening peak hour. The highest morning peak hour traffic occurred from 8:00 AM to 9:00AM (781 vehicles) and in the evening from 5:00PM to 6:00 PM (935 vehicles). The peak hour vehicle trips generated by the proposed senior facility represents 1.5% (12/781) of the morning peak hour trips and 0.75% (7/935) in the evening peak hour along this section of Route 45.

Mr. Max Ferentinos
Re: Traffic and Parking Study for the Proposed Artis Senior Living Facility, Chestnut Ridge, NY
March 16, 2015
Revised April 9, 2015

Conclusions

1. The number of vehicle trips that would be generated by an assisted living facility will not impact traffic flow. Furthermore, the vehicle trips calculated using the ITE Trip Generation Manual are in line with the actual vehicles counted at the Sunrise facility in New City, NY.
2. There is sufficient parking provided at the Sunrise Assisted Living facility in New City, NY. The parking occupancy ratio exceeded 85% for five hours on the day of the survey. Even with the occupancy over 85%, the number of parking spaces provided is sufficient to meet the demand.
3. A second parking occupancy survey conducted on Presidents Day at the Sunrise facility showed that the peak occupancy was 81% at noon.
4. The proposed facility will have 64 beds requiring 26 parking spaces using the same ratio (0.40 spaces/bed) that applies at the Sunrise Adult Facility in New City, NY. Thirty-two parking spaces will be provided.
5. The proposed facility would generate a total of 12 vehicle trips in the morning peak hour and seven in the evening peak hour based on the staffing for this project. Using ITE trip generation rates, there would be nine vehicle trips in the morning peak hour, 14 vehicle trips during the evening peak hour, 21 during the Saturday peak hour, and 24 during the Sunday peak hour.
6. The proposed traffic that would be generated by the proposed facility will not adversely traffic flow on Route 45.
7. Vehicle queues were observed from 5:00 PM to 6:00 on Route 45 northbound averaged 3.17 cars per cycle. Southbound, the vehicle queues were less than one car per cycle. We did not study the morning peak hour because the peak arrival of the staff is before the morning peak hour.

Sincerely yours,

Harry Baker

SENIOR HOUSING TRIP GENERATION AND PARKING DEMAND CHARACTERISTICS

by

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INTRODUCTION

As the baby boomer generation ages, special housing projects have been developed for them in lieu of the traditional single-family home or apartment. Congregate care facilities, independent living apartments, assisted-care units, and senior apartments are being marketed, developed, and built to handle the needs of older adults.

The changing lifestyle of older adults affects their transportation needs and usage as well. Trip generation and parking demand within this age group vary significantly from traditional residential uses because residents no longer have to be at work, pick up their children, or do their shopping at specific times. Also many senior communities provide on-site services to meet their residents' needs. This paper will present the author's experiences with senior housing and its trip and parking characteristics along with data on projects in suburban Chicago, Illinois and around the United States.

SENIOR HOUSING TYPES

Older adults have many special needs that change over time. Many seniors are clearly independent and need little assistance other than help with major chores or repairs. They are generally active and healthy. As time goes by, however, their needs change and grab bars become important, as well as, other features such as higher electrical outlets, emergency response systems, and lower reach cabinets. Good nutrition, socialization, and access to medical and supportive care also becomes more important. Several distinct types of housing have been developed to accommodate these needs:

Senior Single Family Homes are senior-only subdivisions which have been developed for retirees ages 55 and up in the southeast and southwest sections of the United States. These developments typically include recreational facilities. Many of the residents are retired.

Senior Apartments are traditional apartment complexes with a minimum age requirement of 55 years old. Some amenities include recreational facilities, security, and special design features. Residents are independent and may still be working.

Independent Living Units are cottages or apartments were older adults live independently but without the worries of maintenance or housekeeping. Medical care can be available at the facility or by visiting medical staff. A variety of amenities are provided for the residents depending on the size of the community.

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Assisted-Care Units are for older adults having difficulty managing in an independent living arrangement but who do not need nursing home care. Assisted-care is usually apartment living with additional staff to help with normal daily activities.

Congregate Care Facilities contain a full spectrum of housing types in one development with town homes or cottages, independent living units, assisted-care units, and nursing care. Congregate Care Facilities (CCF) allow the elderly to age in one place with nursing care available if they need it. This is particularly important for elderly couples wishing to stay together with one spouse needing special care. CCFs are in essence self-contained communities. **Table 1** lists the amenities that are typically available at a CCF.

Table 1

Typical Congregate Care Facility On-Site Services and Facilities

Standard Services	Extra Services	Common Facilities
• Main Meal of the Day	• Breakfast and Lunch	• Lounge Area
• 24-Hour Nursing	• Extended Room Service	• Dining Room
• Daily Check-In	• Specialized Diets	• Library
• Weekly Laundry	• Guest Meals	• Chapel
• Utilities	• Catering	• Recreation Room
• Housecleaning	• Physician	• Country Store
• Organized Programs	• Podiatrist	• Pharmacy
• In Room Food Service	• Physical/Speech Therapy	• Arts and Crafts Room
• Bus Shuttle	• Insurance	• Workshop
• 24-Hour Security	• Chauffeur Service	• Cafe
• Complete Maintenance	• Garages	• Exercise Room
• Free Parking	• Telephone	• Beauty/Barber Shop
• Garbage Collection	• Cable TV	• Bank Branch Office
• Notary Public Service	• Photocopying	• Solarium
• Supportive Care Nurse		• Whirlpool
• Chaplain		• Outside Patio
		• Garden Plots

Source: Milwaukee, Wisconsin CCF Brochure

LITERATURE REVIEW

A review was made of available data on senior trip generation and parking demands. Information was obtained from the Institute of Transportation Engineers Trip and Parking Generation Manuals, the author's files, data from other consultants, as well as, information from California, Arizona, and Florida Departments of Transportation. After reviewing the data, it became clear that the amount of data is small and that the definition of senior housing was not consistent among each source. The data did not distinguish between the five categories mentioned previously.

FACTORS AFFECTING TRIP GENERATION AND PARKING

Several factors affect the trip generation and parking demand at any particular facility. These include the number of dwelling units, nursing beds, average age of residents, resident's affluence, number of employees, and available bus shuttle/chauffeur service. More data needs to be collected in order to properly analyze their relationship to trip generation and parking demand. The trip generation rates for individual facilities varied. Insufficient information on all the survey locations made it difficult to statistically draw conclusions on individual impact of those factors.

However, experience has indicated that as the average age of residents increases, the number of trips and parking demand decreases. This is an obvious affect of the aging process. Nursing beds require more staff to service a patient needs than a more independent resident. When the proportion of nursing beds to residential units increases, the amount of traffic and parking generally increase. The economic well being of residents increases the likelihood that they own a car and thus drive and park. Lastly, bus shuttle/chauffeur service will provide an option to the auto for residents keeping traffic and parking rates lower.

DAILY TRAFFIC GENERATION

Information on daily trip ends was obtained from surveys by the California Department of Transportation (Caltrans) and the Florida and Arizona Departments of Transportation. This data generally categorized the facilities as retirement communities but included CCFs, senior apartment complexes, and may have nursing beds. The author's data consisted of one CCF in Pennsylvania. **Table 2** summarizes the trip data and rates. The average trip rate daily varied between 2.78 and 8.91 trips per unit. The variation in rates supports the conclusion that the number of units/beds is not the only variable influencing trip production. The weighted average trip ends were 4.52 trips per unit which included one large development of 3,122 units. Without the 3,122 unit project, the weighted average rate was 5.64 trips per units.

The weighted daily trip generation rate, was 5.64 trip ends a day for senior housing developments. Senior housing generates two-thirds the amount of traffic compared to a typical single-family development. It's closer to other multi-family categories, including apartments (6.47 trips/unit) and condominiums or townhouses (5.86 trips/units). **Table 3** shows the weekly variation in volumes based on one facility. The weekday volumes were consistent. Weekend traffic volumes were slightly lower.

Table 4 illustrates the hourly distribution of traffic throughout an average weekday, Saturday, and Sunday. The peak-hour volumes of the facility occurred at lunch time and mid-afternoon (2:00 to 4:00 PM). Caltrans data indicated that the peak-hour occurred between 11:00 AM and 4:00 PM, depending on the facility. These peak-hour times do not coincide with the peak-hour of adjacent street traffic because the residents do not have or want to travel during the rush hour. Also, the employee shifts are generally off peak. Most facilities are staffed 24 hours a day with a 7:00 AM-3:00 PM, 3:00 PM -11:00 PM, 11:00 PM-7:00 AM shift schedule. Some administrative staff follow a typical 9:00 AM to 5:00 PM shift.

PEAK-HOUR TRIP GENERATION RATES

Table 5 shows the trip generation rates for eight facilities during the morning and evening peak-hour of the adjacent street system. The weighted average trip rate was 0.222 trips per unit/bed in the morning peak and 0.247 trips per unit/bed in the evening peak. Trip rates ranged from 0.085 to 0.450 per unit. The directional splits were 65% inbound and 35% outbound in the morning and 40% inbound and 60% outbound in the evening. Compared to other residential land-uses, senior developments generate significantly less traffic on a per unit basis.

Table 2

Daily Trip Generation Rates for Senior Housing

Source	Number of Dwelling Units	Daily Trips	Trip Rates
Caltrans	3122	9630	3.09
	300	830	2.78
	108	310	2.87
	76	260	3.42
	460	2252	4.90
Florida	366	3262	8.91
DOT	560	1985	3.55
	187	1449	7.75
	120	901	7.51
	127	561	4.42
Arizona	125	972	7.78
DOT	176	855	4.86
	74	447	6.04
	60	285	4.75
	216	1386	6.42
	175	1058	6.05
	129	941	7.30
	112	922	8.23
	106	820	7.74
	89	538	6.05
	81	529	6.53
	60	494	8.23
	59	432	7.30
Penn. CCF	247	1163	4.71
Weighted Average	**7135**	**32282**	**4.52**
Without 3,122 units	**4013**	**22652**	**5.64**

ITE Average Weekday Daily Rates

Single-Family (Code 210)	9.55
Apartment (Code 220)	6.47
Condo/townhouse (Code 230)	5.86
Congregate Care Facility (Code 251)	2.15

Table 3

Weekly Volume Distribution

Day of the Week	Percentage
Monday	15%
Tuesday	15%
Wednesday	16%
Thursday	17%
Friday	15%
Saturday	12%
Sunday	10%
Total	100%

Table 4

Hourly Traffic Distribution

Start Hour	Average Weekday	Saturday	Sunday
12:00 AM	1.46%	1.45%	2.76%
1:00 AM	0.07%	0.12%	0.26%
2:00 AM	0%	0.00%	0.26%
3:00 AM	0.12%	0.00%	0.00%
4:00 AM	0.46%	0.00%	0.66%
5:00 AM	0.41%	0.60%	0.39%
6:00 AM	1.94%	2.05%	1.71%
7:00 AM	5.74%	5.06%	3.94%
8:00 AM	6.70%	5.06%	4.99%
9:00 AM	6.19%	5.78%	6.17%
10:00 AM	7.20%	9.40%	7.74%
11:00 AM	9.33%	9.04%	8.53%
12:00 PM	7.05%	8.07%	8.01%
1:00 PM	7.44%	6.27%	4.86%
2:00 PM	9.76%	7.59%	8.40%
3:00 PM	9.54%	10.24%	9.84%
4:00 PM	8.39%	9.40%	9.32%
5:00 PM	5.26%	6.14%	6.96%
6:00 PM	3.14%	3.25%	3.54%
7:00 PM	2.90%	2.89%	4.20%
8:00 PM	2.59%	2.05%	2.49%
9:00 PM	1.10%	1.57%	1.31%
10:00 PM	1.24%	1.33%	1.05%
11:00 PM	1.96%	2.65%	2.62%

Table 5

Peak-Hour Trip Generation Rates

Facility	Location	Occupied Units: Dwelling Units	Occupied Units: Nursing Beds	Total	AM Peak Volume	Rate	PM Peak Volume
Covenant Village	Northbrook, IL	220	151	371	86	.231	133
Friendship Village	Lombard, IL	620	100	720	86	.120	180
Presbyterian Home	Evanston, IL	312	166	478	92	.193	139
Glenview Terrace	Glenview, IL	243		243			21
Good Shephard Manor	Barrington, IL	102		102	18	.180	17
Mayslake	Oakbrook, IL	630		630	67	.106	75
Leisure Village	New Jersey	200		200	65	.325	62
Pennsylvania CCF		210	37	247	78	.316	111
	Totals	**2537**	**454**	**2991**	**492**		**738**
	Weighted Average Trip Rate				**.164**		**.247**
	Inbound Percentage				**65%**		**40%**
	Outbound Percentage				**35%**		**60%**
Comparison to other ITE Residential Rates							
Single Family Homes (Land Use Code 26)					0.74		1.01
Apartments (Land Use Code 220)					0.51		0.63
Condominiums/Townhouses (Land Use Code 230)					0.44		0.55

PARKING DEMAND SURVEYS

Parking demand characteristics were obtained from a number of surveys conducted in the Chicago metropolitan area The peak parking demand occurred during the mid-day between 11:00 AM to 3:00 PM corresponding, in part, with the largest employee shift on-site. **Table 6** summarizes those surveys. The peak day of the year is Mother's Day when many facilities run out of visitor parking, according to the on-site staff.

The peak parking demand rates varied between 0.214 and 0.579 vehicles per unit/bed with a weighted average rate of 0.404 vehicles per unit/bed. Employee, resident, and visitor parking is included. This rate is one third to one half the parking rate of other residential uses. Readers should note that the survey sites with the higher parking rates generally have more nursing beds which requires more employees than the residential units.

Table 6

Peak Parking Demand Surveys

Development	Location	Dwelling Units	Nursing Beds	Total Units/Beds	Peak Parking Rate	Peak Parking Demand
Covenant Village	Northbrook, IL	220	151	371	0.490	182
Beacon Hill	Lombard. IL	235	23	258	0.565	146
Friendship Village	Schaumburg, IL	620	100	720	0.390	281
Presbyterian Home	Evanston, IL	312	166	478	0.579	277
Glenview Terrace	Glenview, IL	243		243	0.214	52
Mayslake	Oakbrook, IL	630		630	0.408	257
EJM Engineering Studies						
Lilac Lodge	Waukegan, IL	203		203	0.315	64
Deerfield Place	Deerfield. IL	98		98	0.230	23
ITE Parking Manual, 2nd Ed						
Retirement Community (Land Use Code 250)		500		500	0.270	135
		3061	440	3501		1417
		Weighted Average			**0.404**	
ITE Parking Manual, 2nd Edition						
Low/Mid-Rise Apartments (Land Use Code 221)					1.21	
High-Rise Apartments (Land Use Code 222)					0.88	
Residential Condominium (Land Use Code 230)					1.11	

Conclusions

Based on the analyses and studies for this paper, the following findings were made:

1. The overall category of senior housing should be broken down into at least five categories for trip generation and parking demand purposes. These categories could be:

- Senior Single-Family Housing
- Senior Apartments
- Independent Living Units
- Assisted-Care Units
- Congregate Care Facility

2. Several factors affect the trip generation and parking demand at any particular facility. Any new survey should include the number of dwelling units, nursing beds, average age of residents, resident's affluence, number of employees, and available bus shuttle/chauffeur service. More data needs to be collected in order to properly analyze their relationship to trip generation and parking demand.

3. Daily trip generation rates were found to be 4.52 to 5.64 trip ends a day for senior housing developments. Senior housing generates two-thirds the amount of traffic compared to a typical single-family development. It's daily rates are similar to other multi-family categories, including apartments (6.47 trips/unit) and condominiums/townhouses (5.86 trips/units).

4. Trip generation rates during the peak hour of adjacent street traffic are significantly less because most employees arrive/depart during off-peak periods and residents avoid the peak-hour congestion. The peak hour rates are one-half to one-fourth that of other residential land-uses.

5. The peak-hours of site traffic occurs in the late-morning or early afternoon.

6. The peak parking demand at most senior facilities occurred midday with an average peak demand of 0.40 vehicles per dwelling unit for residents, employees, and visitors. Mother's Day is the highest parking day of the year with many facilities short of spaces for that one day.

References

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