MEMORANDUM

Date:	October 22, 2019
To:	Terry Henry, Waveny LifeCare Network
From: Contact Information:	Georges Jacquemart, P.E., AICP g.jacquemart@bfjplanning.com
Subject:	Traffic Impact Analysis of Proposed Continuing Care Retirement Community on Oenoke Ridge Road in New Canaan, CT – October 2019 Count Update

Introduction

The purpose of this memorandum is to provide updated traffic data and analysis of the traffic impacts of the proposed Continuing Care Retirement Community (CCRC) project on Oenoke Ridge in the Town of New Canaan, CT. Traffic count data collected on October 15th, 2019 are presented here as an update to data collected on July 9th and 10th, 2019.

Updated Traffic Counts

Figure 1 shows the October 2019 morning and afternoon peak hour traffic movements through the intersection of The Inn's driveway and Oenoke Ridge Road. Oenoke Ridge Road south of The Inn Driveway carries about 490 vehicles in the morning peak hour (8:00 to 9:00 AM) and about 450 vehicles during the PM peak hour (4:30 to 5:30 PM).

Both morning and afternoon peak hour traffic volumes were higher in October as compared to July. The total AM peak hour volume was 13.6 percent higher and the total PM peak hour volume was 12.2 percent higher.

Traffic Impacts of Proposed Oenoke Ridge CCRC Based on October 2019 Counts

To estimate the traffic impacts of the proposed CCRC development on local traffic conditions we first project the 2019 traffic peak hour traffic volumes to the build year for the CCRC, i.e. 2021. It is assumed that traffic volumes would increase by 1 percent per year.

Figure 2 shows the 2021 peak-hour traffic volumes for the Oenoke Ridge/The Inn intersection for the future no-build condition. Figure 3 shows the peak-hour traffic volumes added by the proposed CCRC and Figure 4 shows the future traffic volumes with the CCRC traffic.

Table 1 compares traffic conditions at the intersection of Oenoke Ridge Road and The Inn Driveway as they are projected to exist in 2021 without the proposed CCR and in 2021 with the proposed CCRC based on October counts.

Table 1: Oenoke Ridge & The Inn Driveway Level of Service Analysis Summary

	AM Peak Hour				PM Peak Hour			
	Future No Build		Future Build		Future No Build		Future Build	
Movements	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Southbound Left-turn	8	A	8	A	7.7	A	7.8	A
Westbound Left-turn	13.2	B	13.3	B	11.4	B	12	B

As seen in Table 1, the peak-hour traffic conditions are good in the sense that all movements through this intersection operate with short delays and will continue to operate at about the same conditions as today. Peak–hour traffic volumes on Oenoke Ridge Road south of the project site are projected to increase by 7.8 percent in the AM peak hour and by 7.4 percent in the PM peak hour as the result of the proposed CCRC project. Further south the CCRC traffic will use either Park Street or Main Street, thus further diluting the impacts. In addition the base volumes on Park and on Main Street are higher. The traffic impacts of the proposed CCRC will therefore not be noticeable on Park Street and on Main Street in downtown New Canaan.

Comparing the Level of Service Analysis Summary generated from July counts versus October counts, the LOS remained the same for each movement during both the AM and PM peak hours. The delay time nearly remained the same for the southbound left-turn in both the AM and PM peaks whereas the westbound left-turn generally increased slightly, primarily during the AM peak hour for the westbound left-turn (~ two seconds).

Sight Distances at The Inn Driveway

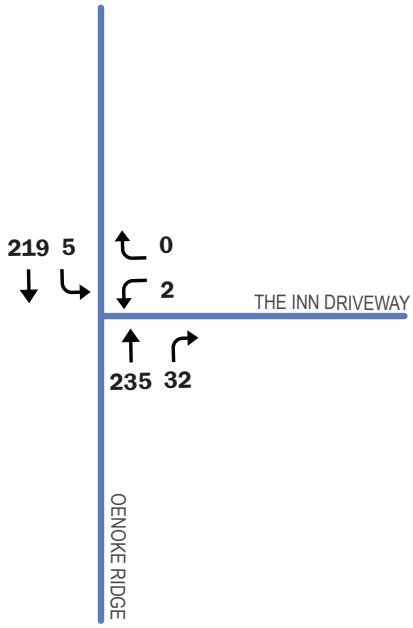
Sight distances from The Inn's Driveway were verified based on Google Earth maps. Location information was mapped and measured in Google Earth to identify a sight distance for northbound vehicles of 410 feet and a sight distance for southbound vehicles of 1,215 feet. The posted legal speed limit in this area is 25 MPH and there is a posted 15 MPH advisory sign at the Oenoke Ridge road curve south of Oenoke Lane.

For a 25 MPH speed the recommended stopping distance is 155 feet as per the AASHTO 2011 policy on Geometric Design of Highways and Streets Table 3-1 page 3-4. For both northbound and southbound traffic, the available sight distance exceeds the required sight distance for 25 MPH on a level roadway. Refer to Figure 5. The stopping sight distance from The Inn's driveway for Northbound traffic on Oenoke Ridge is sufficient for vehicles traveling at a speed of up to 45 MPH, whereas the stopping sight distance for southbound vehicles is sufficient for vehicles traveling at a speed of up to 80 MPH.

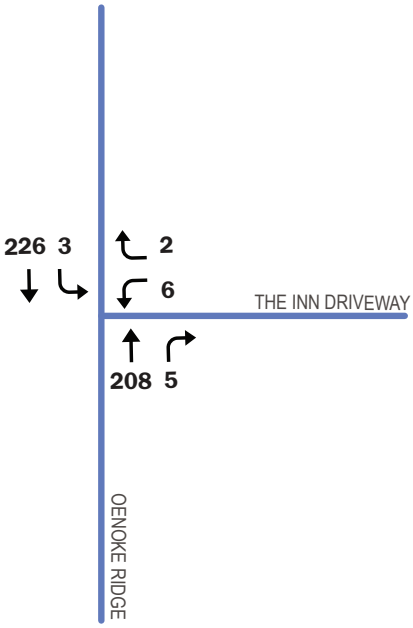
Conclusions

The above analysis has shown that the proposed CCRC is a relatively low traffic generator due to the nature of the residents and the fact they will be provided with shuttle services. The employees working at the CCRC are a more important component to the traffic generation compared to the residents. The intersection of Oenoke Ridge Road and The Inn driveway will continue to operate at good conditions with delays for the turning movements out of the driveway not exceeding 14 seconds per vehicle. The impacts on Main Street and Park Street in downtown New Canaan will be "de minimus" and will not be noticeable. Available sight distances at The Inn Driveway exceed the required stop sight distances.

Figure 1: Existing Conditions



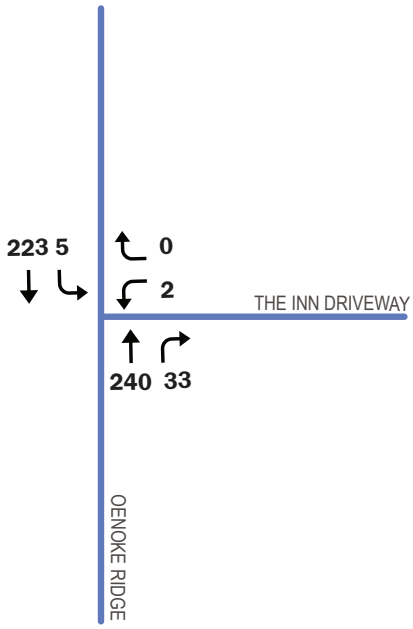
AM Peak Hour



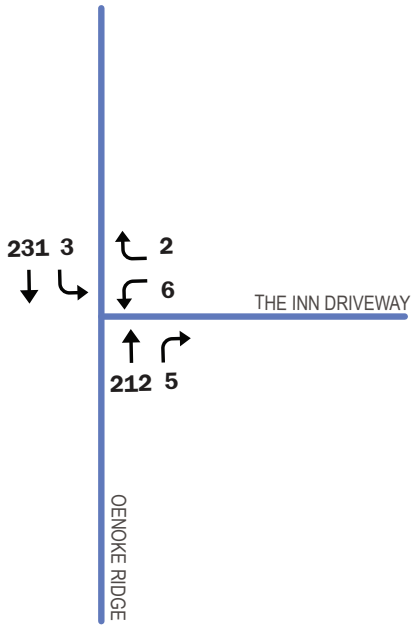
PM Peak Hour

Existing Conditions based on October 15th, 2019 counts

Figure 2: Future No Build Condition

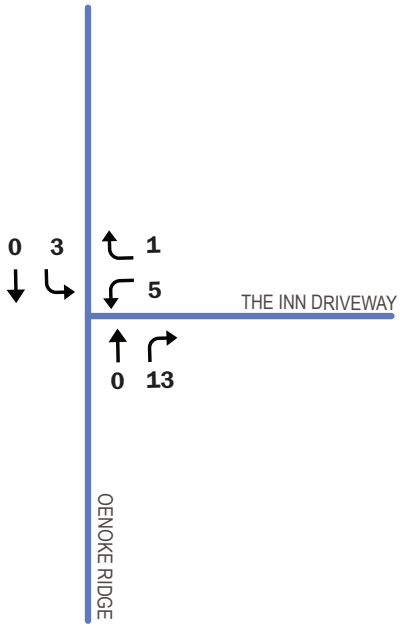


AM Peak Hour

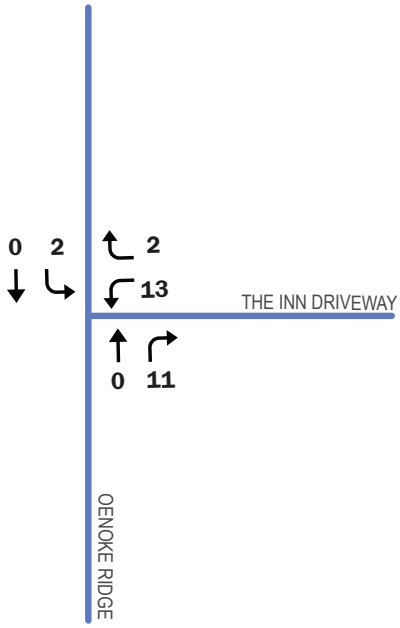


PM Peak Hour

Figure 3: Project Generated Traffic

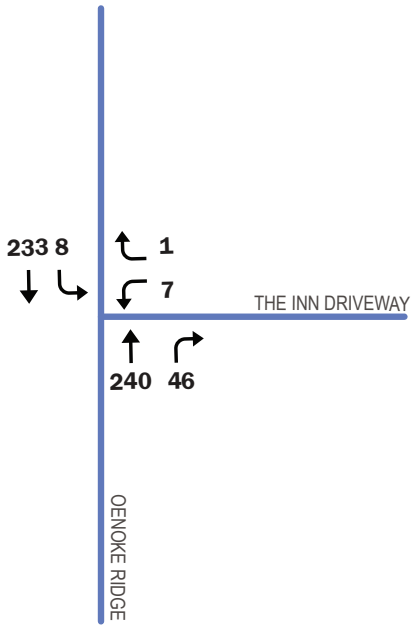


AM Peak Hour

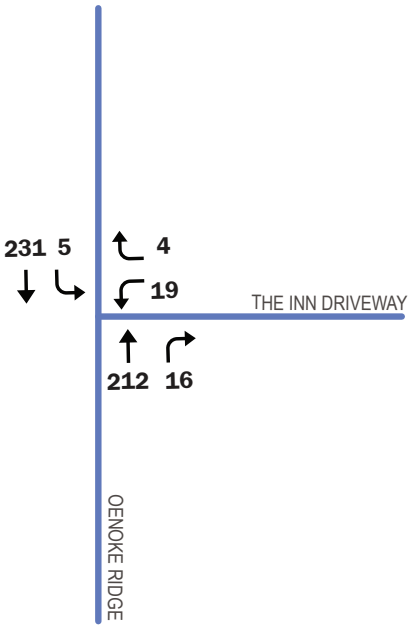


PM Peak Hour

Figure 4: Future Build Condition



AM Peak Hour



PM Peak Hour

Figure 5: Sight Distances for Southbound and Northbound Vehicles from the Inn Driveway

Technical Appendix

1. Turning Movement Count Results (October 15, 2019)
2. Level of Service Analysis Reports
    - Existing Conditions
    - Future No Build Condition
    - Future Build Condition

PEAK HOUR TRAFFIC VOLUMES

Intersection: **Oenoke Ridge & The Inn Driveway**

Date and Time: Tuesday, October 15th, 2019
Project: Waveny - Traffic Study

Municipality, State: New Canaan, CT

Morning Traffic Counts (7:00 - 9:00AM)

		Oenoke Ridge										The Inn Driveway												
		NORTHBOUND					SOUTHBOUND										WESTBOUND					15 minute		
Start	End	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Totals		
7:00	7:15																							
7:15	7:30																						Hourly	
7:30	7:45		53	0		53	0	28			28					0	0		0		0	81	Totals	
7:45	8:00		44	1		45	0	50			50					0	0		1		1	96	177	
8:00	8:15		38	3		41	0	55			55					0	2		0		2	98	275	
8:15	8:30		50	3		53	0	56			56					0	0		0		0	109	384	
8:30	8:45		71	6		77	0	49			49					0	0		0		0	126	429	
8:45	9:00		76	20		96	5	59			64					0	0		0		0	160	493	
Total		0	332	33	0	365	5	297	0	0	302	0	0	0	0	0	2	0	1	0	3			
AM Peak Hour Total (8:00-9:00 AM)		**0**	**235**	**32**	**0**	**267**	**5**	**219**	**0**	**0**	**224**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**		**493**	**Peak Hour**
Peak Hour Factor		**0**	**0.77**	**0.40**	**0.00**	**0.70**	**0.25**	**0.93**	**0.00**	**0.00**	**0.88**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.25**	**0.00**	**0.00**	**0.00**	**0.25**		**0.77**	

Afternoon Traffic Counts (4:00 - 6:00PM)

		Oenoke Ridge										The Inn Driveway												
		NORTHBOUND					SOUTHBOUND										WESTBOUND					15 minute		
Start	End	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Totals		
4:00	4:15		54	2		56	0	63			63					0	0		0		0	119		
4:15	4:30		54	2		56	0	51			51					0	1		0		1	108	Hourly	
4:30	4:45		40	0		40	1	56			57					0	0		0		0	97	Totals	
4:45	5:00		44	2		46	1	58			59					0	1		1		2	107	431	
5:00	5:15		56	2		58	1	54			55					0	2		1		3	116	428	
5:15	5:30		68	1		69	0	58			58					0	3		0		3	130	450	
5:30	5:45																							
5:45	6:00																							
Total		0	316	9	0	325	3	340	0	0	343	0	0	0	0	0	7	0	2	0	9			
PM Peak Hour Total (4:30-5:30 PM)		**0**	**208**	**5**	**0**	**213**	**3**	**226**	**0**	**0**	**229**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**2**	**0**	**8**		**450**	**Peak Hour**
Peak Hour Factor		**0.00**	**0.76**	**0.63**	**0.00**	**0.77**	**0.75**	**0.97**	**0.00**	**0.00**	**0.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.50**	**0.00**	**0.50**	**0.00**	**0.67**		**0.87**	

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	235	32	5	219
Future Vol, veh/h	2	0	235	32	5	219
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	0	0	6	0	0	3
Mvmt Flow	3	0	305	42	6	284

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	622	326	0	0	347	0
Stage 1	326	-	-	-	-	-
Stage 2	296	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	454	720	-	-	1223	-
Stage 1	736	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	451	720	-	-	1223	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	736	-	-	-	-	-
Stage 2	754	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	451	1223	-
HCM Lane V/C Ratio	-	-	0.006	0.005	-
HCM Control Delay (s)	-	-	13	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	2	208	5	3	226
Future Vol, veh/h	6	2	208	5	3	226
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	7	2	239	6	3	260

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	508	242	0	0	245	0
Stage 1	242	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	528	802	-	-	1333	-
Stage 1	803	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	526	802	-	-	1333	-
Mov Cap-2 Maneuver	526	-	-	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	781	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	576	1333	-
HCM Lane V/C Ratio	-	-	0.016	0.003	-
HCM Control Delay (s)	-	-	11.4	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	240	33	5	223
Future Vol, veh/h	2	0	240	33	5	223
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	0	0	6	0	0	3
Mvmt Flow	3	0	312	43	6	290

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	636	334	0	0	355	0
Stage 1	334	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	445	712	-	-	1215	-
Stage 1	730	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	442	712	-	-	1215	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	442	1215	-
HCM Lane V/C Ratio	-	-	0.006	0.005	-
HCM Control Delay (s)	-	-	13.2	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	2	212	5	3	231
Future Vol, veh/h	6	2	212	5	3	231
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	7	2	244	6	3	266

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	519	247	0	0	250	0
Stage 1	247	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	521	797	-	-	1327	-
Stage 1	799	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	519	797	-	-	1327	-
Mov Cap-2 Maneuver	519	-	-	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	569	1327	-
HCM Lane V/C Ratio	-	-	0.016	0.003	-
HCM Control Delay (s)	-	-	11.4	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	1	240	46	8	233
Future Vol, veh/h	7	1	240	46	8	233
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	0	0	6	0	0	3
Mvmt Flow	9	1	312	60	10	303

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	665	342	0	0	372	0
Stage 1	342	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	428	705	-	-	1198	-
Stage 1	724	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	424	705	-	-	1198	-
Mov Cap-2 Maneuver	424	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	731	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	446	1198	-
HCM Lane V/C Ratio	-	-	0.023	0.009	-
HCM Control Delay (s)	-	-	13.3	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	4	212	16	5	231
Future Vol, veh/h	19	4	212	16	5	231
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	22	5	244	18	6	266

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	531	253	0	0	262	0
Stage 1	253	-	-	-	-	-
Stage 2	278	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	512	791	-	-	1314	-
Stage 1	794	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	509	791	-	-	1314	-
Mov Cap-2 Maneuver	509	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	770	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	543	1314	-
HCM Lane V/C Ratio	-	-	0.049	0.004	-
HCM Control Delay (s)	-	-	12	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-