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To: Mercer County Planning Department

From: Kelsey McElduff, DVRPC

Date: March 7, 2022

Subject: CR 636 Multimodal Intersection Analysis (Product #TM20033)

Purpose

This memo presents the findings of a pilot project where DVRPC staff worked with Mercer County to develop plans to incorporate bicycle facilities on County roads, as recommended in the Mercer County Bicycle Plan, as part of regularly scheduled repaving projects. The study considers improvements limited to striping and signal retiming without making changes to the roadway width or signal hardware. Potential future plans could include more substantial improvements. The project team identified specific locations and worked to develop planning-level design concepts as presented in this document.

Mercer County is planning to restripe CR 636 (Parkside Avenue) and other roadways with bicycle lanes when they are due for repaving as part of implementing the Mercer County 2020 Bicycle Master Plan. Future plans to incorporate a road diet along NJ 31 (Pennington Road) may also include bicycle lanes. These bicycle facilities are anticipated to serve as key elements in the local network and enhance connectivity for cyclists throughout Mercer County.

CR 636 (Parkside Avenue) provides a wide cartway and is designed for higher speeds and volume than it currently serves, making the roadway a candidate for bicycle lane installation. However, connecting the proposed bicycle lanes through major intersections presents significant safety and connectivity challenges. Design alternatives must be considered at major intersections to ensure the network is safe and comprehensive.

Two signalized intersections along CR 636 within Ewing Township were chosen to be evaluated for potential bike lane installation:

- CR 636 (Parkside Avenue) & CR 622 (Olden Avenue) and
- CR 636 (Parkside Avenue) & NJ 31 (Pennington Road).

Both study intersections were analyzed with microsimulation under the existing conditions and re-pavement scenario. An aerial view of the study intersections is shown in **Figure 1**.

Figure 1: Study Intersections

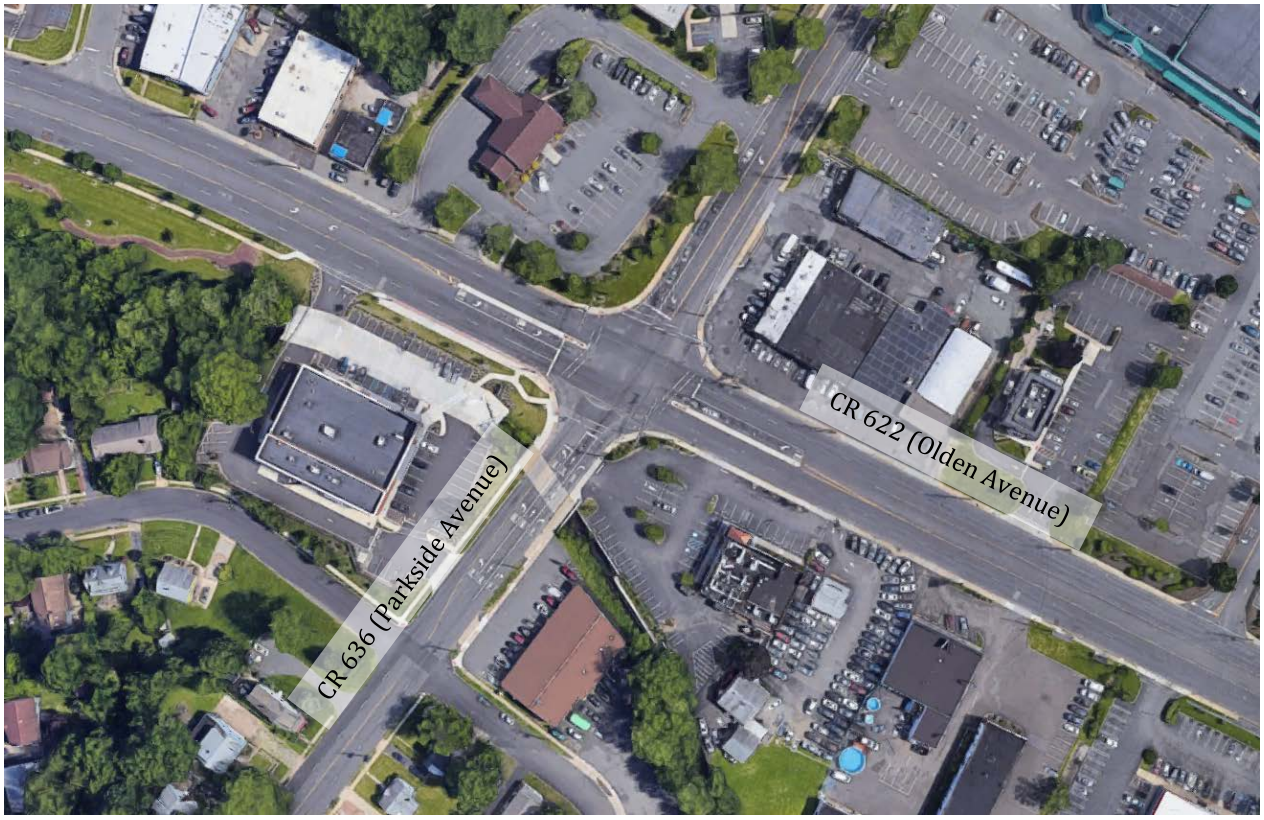
Source: Google Maps

Existing Conditions

North of CR 622 (Olden Avenue), CR 636 provides one lane in each direction with a center turn lane. Between its intersections with NJ 31 and CR 622, CR 636 provides two lanes in each direction. West of its intersection with NJ 31, CR 636 provides one lane in each direction. In order to install bicycle lanes along CR 636, a road diet would need to be incorporated along the portion that currently supports a 4-lane cross section.

CR 636 & CR 622: At the intersection of CR 636 and CR 622, the northbound approach of CR 636 currently provides one designated left-turn lane, one designated through lane, and one designated right-turn lane. The southbound approach of CR 636 currently provides one designated left-turn lane and one shared through/right-turn lane. In order to incorporate bike lanes in both directions through the intersection without increasing the cartway width, the northbound approach would have to be converted from three lanes to two. The existing signal phasing is CR 622 EB and WB protected-only lead left turns, CR 622 EB and WB right-of-way (ROW), and CR 636 NB and SB ROW. An aerial of the intersection of CR 636 and CR 622 is shown in **Figure 2**.

Figure 2: CR 636 & CR 622



Source: Google Maps

CR 636 & NJ 31: At the intersection of CR 636 and NJ 31, CR 636 represents the eastbound and westbound approaches. New Hillcrest Avenue is located adjacent to the intersection and is one-way southbound. Both approaches of CR 636 currently provide one designated left-turn lane and one shared through/right-turn lane with channelization. However, there are two eastbound receiving lanes, causing vehicles to use both lanes along the eastbound approach to travel through the intersection. The existing signal phasing is CR 636 EB and WB permitted/protected left turns, CR 636 EB and WB ROW, and NJ 31 ROW. An aerial of the intersection of CR 636 and NJ 31 is shown in **Figure 3**.

Figure 3: CR 636 & NJ 31

Source: Google Maps

Traffic Counts

Turning movement counts were recorded at both intersections in 15-minute intervals via video on typical weekdays in June 2019. The morning peak hour was found to be from 8:00 AM to 9:00 AM and the evening peak hour was found to be from 4:30 PM to 5:30 PM. Of the two intersections, the volumes at CR 622 are considerably larger, especially in the afternoon and evening. The peak-hour turning movement volumes at both intersections are shown in **Tables 1** and **2**.

Table 1: Peak-Hour Intersection Turning Movement Counts – CR 636 & CR 622

Intersection	Approach		Movement	Volume	
				AM Peak Hour	PM Peak Hour
CR 636 & CR 622	CR 622	EB	L	79	161
			T	399	633
			R	10	28
		WB	L	107	178
			T	503	579
			R	81	115
	CR 636	NB	L	13	17
			T	177	256
			R	141	206
		SB	L	53	104
			T	164	244
			R	93	168

Source: DVRPC

The hourly peak-hour volumes along the northbound CR 636 approach at its intersection with CR 622 indicate that the right-turning volume is significantly higher than the left-turning volume. This presents a conflict with cyclists and also complicates the necessary lane reduction. During the AM peak hour, five pedestrians and zero bikes were observed at the intersection of CR 636 & CR 622. Seven pedestrians and zero bikes were observed at the intersection during the PM peak hour.

Table 2: Peak-Hour Intersection Turning Movement Counts – CR 636 & NJ 31

Intersection	Approach		Movement	Volume	
				AM Peak Hour	PM Peak Hour
CR 636 & NJ 31 & New Hillcrest Avenue	CR 636	EB	L	140	144
			T	236	292
			BR	4	5
			R	12	19
		WB	HL	4	12
			L	69	118
			T	185	297
			R	7	8
	NJ 31	NB	L	9	13
			T	172	216
			R	86	131
			HR	1	2
		SB	L	3	7
			BL	4	9
			T	200	166
			R	144	193

Source: DVRPC

While the NJ 31 approaches are considered to be the major approaches at this intersection and are given longer green times, the volumes along CR 636 are comparable. During the AM peak hour, five pedestrians and zero bikes were observed at the intersection of CR 636 & NJ 31. Five pedestrians and three bikes were observed at the intersection during the PM peak hour.

Proposed Re-pavement

In order to accommodate the proposed bike lanes along CR 636, lane geometry at both intersections would need to be adjusted. Concept plans for the proposed re-pavement scenario are provided along with this report.

Due to the heavy right turning volumes along CR 636 northbound at its intersection with CR 622, the left-turn lane is proposed to be removed. The proposed restriping provides one shared left-turn/through lane and one designated right-turn lane. A southbound protected-only left-turn phase is proposed along with dashed centerline striping through the intersection in order to accommodate the different lane assignments along the northbound and southbound approaches. The new signal phase would increase the cycle length and the intersection would no longer be in coordination with the adjacent signals along CR 622. However, this improvement is considered necessary for multimodal safety.

The lane geometry at the intersection of CR 636 & NJ 31 would not need drastic modification in order to accommodate the proposed bike lanes. The CR 636 westbound left-turn lane would provide less storage in the proposed condition than in the existing geometry, but the intersection will maintain performance. The CR 636 eastbound lane widths would need to be reduced to just under 11 feet in order to accommodate the proposed bike lanes. While the new widths are not ideal, they are necessary for bike lane implementation. Maintaining the full bike lane width through the intersection was determined to be

a priority for safety, eliminating the possibility of using sharrows as an alternative to lane width reduction. Additionally, the eastbound receiving lanes are proposed to be reduced to one and the New Hillcrest Avenue entrance would need to be narrowed in order to slow down turning movements and promote safety.

Long-term Improvements

In addition to the proposed restriping scenario, the intersection of CR 636 & NJ 31 was also analyzed under a long-term improvement scenario. The existing geometry and volumes of the intersection create unsafe conditions for all users and it has been noted as a potential candidate for roundabout installation. The long-term improvements include removing the traffic signal, reducing each approach to one lane in each direction, and installing a roundabout. This concept is also provided.

Analysis

Traffic analysis was conducted for the existing and proposed re-pavement scenarios in Synchro, using the intersection turning movement counts and traffic signal plans provided by NJDOT. Peak hours were identified based on 15-minute volumes at Morris Road and Broad/Schultz. Level of service (LOS) and average vehicle delay were calculated for each movement and for the overall intersections. Synchro reports are provided along with this report. The results are shown in **Tables 3** and **4**.

Table 3: Intersection LOS and Delay – Existing Conditions and Proposed Re-pavement

Intersection	Approach		Movement	Existing Conditions				Proposed Re-pavement			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)
CR 636 & CR 622	CR 622	EB	L	D	39.4	E	66.8	D	49.5	E	55.5
			TR	B	11.2	B	18.9	B	15.7	C	24.9
		WB	L	D	37.3	F	91.2	E	58.9	E	59.0
			TR	B	11.4	B	19.6	B	16.4	C	24.8
	CR 636	NB	L	C	35.0	D	36.7	C	34.3	D	42.1
			T	C	27.8	C	24.0	C	25.8	C	25.6
			R	C	27.6	C	23.8				
		SB	L	C	32.4	C	31.7	D	35.0	D	54.1
			TR	D	37.9	D	53.0	C	23.3	D	33.1
	Overall			**C**	**21.5**	**C**	**33.4**	**C**	**24.3**	**C**	**33.1**
CR 636 & NJ 31 & New Hillcrest Avenue	CR 636	EB	L	C	20.1	C	20.6	C	20.1	C	20.6
			TR	C	27.2	C	28.9	C	27.2	C	28.9
		WB	L	C	22.1	C	20.7	C	22.1	C	20.7
			TR	C	29.9	C	30.3	C	29.9	C	30.3
	NJ 31	NB	LT	A	7.6	B	10.1	A	7.6	B	10.1
			TR	A	7.8	B	10.4	A	7.8	B	10.4
		SB	LT	A	7.9	A	10.0	A	7.9	A	10.0
			TR	A	8.2	B	10.9	A	8.2	B	10.9
	Overall			**B**	**17.2**	**B**	**19.4**	**B**	**17.2**	**B**	**19.4**

Source: DVRPC

Table 4: Intersection LOS and Delay – Long-term Improvements

Intersection	Approach		Movement	Existing Conditions				Proposed Roundabout			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)
CR 636 & NJ 31 & New Hillcrest Avenue	CR 636	EB	L	C	20.1	C	20.6	B	11.1	B	13.8
			TR	C	27.2	C	28.9				
		WB	L	C	22.1	C	20.7	A	9.1	B	14.8
			TR	C	29.9	C	30.3				
	NJ 31	NB	LT	A	7.6	B	10.1	B	10.4	B	14.1
			TR	A	7.8	B	10.4				
		SB	LT	A	7.9	A	10.0	B	10.2	B	14.1
			TR	A	8.2	B	10.9				
	Overall			**B**	**17.2**	**B**	**19.4**	**B**	**10.3**	**B**	**14.2**

Source: DVRPC

Under existing conditions during the AM peak hour, all movements at the intersection of CR 636 & CR 622 perform at a LOS D or better. During the PM peak hour, the CR 622 westbound left turn fails and the CR 622 eastbound left turn operates at a LOS E. The overall intersection operates at a LOS C during both peak hours under existing conditions. With the proposed restriping and signal adjustments, all movements operate at LOS E or better during both peak hours and the overall intersection operates at a LOS C during both peak hours.

Under existing conditions, all movements at the intersection of CR 636 & NJ 31 operate at LOS C or better during both peak hours and the overall intersection operates at LOS B during both peak hours. The proposed restriping does not change the lane assignment or operation of the intersection, so the LOS and delay are maintained in the proposed restriping scenario. With the long-term roundabout improvement, all intersection movements operate at a LOS B or better during both peak hours and the intersection operates at an overall LOS B during both peak hours.

Conclusion

In order to accommodate the proposed bike lanes along CR 636, the geometry at its intersection with CR 622 and NJ 31 will need to be adjusted. With the proposed concepts and traffic signal timing, the intersections will operate at similar or improved levels of service. The intersection of CR 636 & NJ 31 will also operate at satisfactory levels of service with the proposed restriping or with the long-term installment of a roundabout.

DVRPC serves strictly as an advisory agency. Any planning or design concepts as prepared by DVRPC are conceptual and may require engineering design and feasibility analysis. Actual authority for carrying out any planning proposals rest solely with the governing bodies of the states, local governments or authorities that have the primary responsibility to own, manage or maintain any transportation facility.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	399	10	107	503	81	13	177	141	53	164	93
Future Volume (vph)	79	399	10	107	503	81	13	177	141	53	164	93
Confl. Peds. (#/hr)	4					4	1					1
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 (%)	6%	2%	0%	3%	5%	6%	0%	2%	1%	8%	2%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	28.0		5.0	28.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	34.0		10.0	34.0		11.0	11.0	11.0	11.0	11.0	
Total Split (s)	15.0	37.0		15.0	37.0		23.0	23.0	23.0	23.0	23.0	
Total Split (%)	20.0%	49.3%		20.0%	49.3%		30.7%	30.7%	30.7%	30.7%	30.7%	
Yellow Time (s)	3.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	

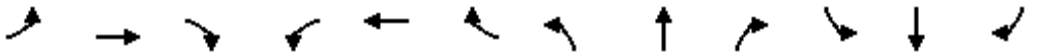
Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 37 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Parkside Avenue (CR 636) & Olden Avenue (CR 622)

1: Parkside Avenue (CR 636) & Olden Avenue (CR 622)

Timing Plan: AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	399	10	107	503	81	13	177	141	53	164	93
Future Volume (veh/h)	79	399	10	107	503	81	13	177	141	53	164	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1856	1826	1826	1900	1870	1885	1781	1870	1870
Adj Flow Rate, veh/h	83	420	11	113	529	85	14	186	148	56	173	98
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
Percent Heavy Veh, %	6	2	2	3	5	5	0	2	1	8	2	2
Cap, veh/h	106	1776	46	144	1563	250	143	355	303	196	213	121
Arrive On Green	0.06	0.50	0.50	0.08	0.52	0.52	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1725	3538	93	1767	2993	479	1125	1870	1595	996	1120	635
Grp Volume(v), veh/h	83	211	220	113	306	308	14	186	148	56	0	271
Grp Sat Flow(s),veh/h/ln	1725	1777	1853	1767	1735	1737	1125	1870	1595	996	0	1755
Q Serve(g_s), s	3.6	5.0	5.0	4.7	7.7	7.7	0.9	6.7	6.2	4.0	0.0	11.1
Cycle Q Clear(g_c), s	3.6	5.0	5.0	4.7	7.7	7.7	12.0	6.7	6.2	10.7	0.0	11.1
Prop In Lane	1.00		0.05	1.00		0.28	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	106	892	930	144	906	907	143	355	303	196	0	333
V/C Ratio(X)	0.78	0.24	0.24	0.78	0.34	0.34	0.10	0.52	0.49	0.29	0.00	0.81
Avail Cap(c_a), veh/h	230	892	930	236	906	907	185	424	362	233	0	398
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.7	10.6	10.6	33.8	10.4	10.4	34.9	27.3	27.1	32.2	0.0	29.1
Incr Delay (d2), s/veh	4.7	0.6	0.6	3.5	1.0	1.0	0.1	0.4	0.5	0.3	0.0	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.8	3.4	3.6	3.7	5.0	5.1	0.4	5.2	4.1	1.7	0.0	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	11.2	11.2	37.3	11.4	11.4	35.0	27.8	27.6	32.4	0.0	37.9
LnGrp LOS	D	B	B	D	B	B	C	C	C	C	A	D
Approach Vol, veh/h		514			727			348			327	
Approach Delay, s/veh		15.7			15.4			28.0			37.0	
Approach LOS		B			B			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	43.6		20.2	9.6	45.2		20.2				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	31.0		17.0	10.0	31.0		17.0				
Max Q Clear Time (g_c+I1), s	6.7	7.0		13.1	5.6	9.7		14.0				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	1.1		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		21.5	
HCM 6th LOS		C	

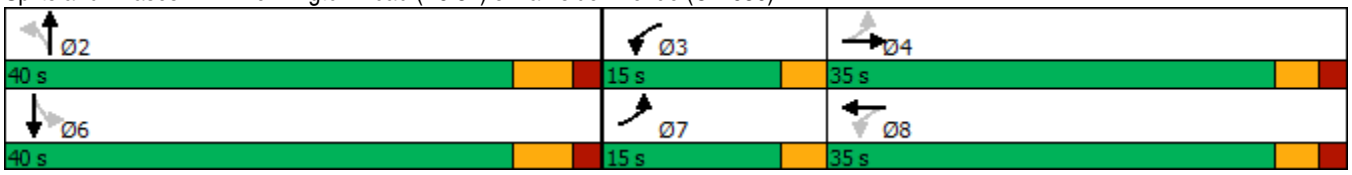
2: Pennington Road (NJ 31) & Parkside Avenue (CR 636)

Timing Plan: AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	240	12	69	185	7	9	172	87	7	200	144
Future Volume (vph)	140	240	12	69	185	7	9	172	87	7	200	144
Confl. Peds. (#/hr)	1					1	1		2	2		1
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 (%)	0%	0%	0%	4%	2%	14%	0%	4%	7%	14%	2%	3%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		34.0	34.0		34.0	34.0	
Minimum Split (s)	6.0	13.0		6.0	13.0		40.0	40.0		40.0	40.0	
Total Split (s)	15.0	35.0		15.0	35.0		40.0	40.0		40.0	40.0	
Total Split (%)	16.7%	38.9%		16.7%	38.9%		44.4%	44.4%		44.4%	44.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	3.0	5.0		3.0	5.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	None		None	None		Max	Max		Max	Max	

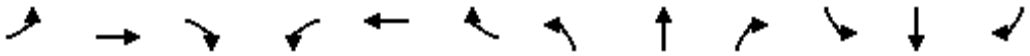
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 71.5
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Pennington Road (NJ 31) & Parkside Avenue (CR 636)



2: Pennington Road (NJ 31) & Parkside Avenue (CR 636)

Timing Plan: AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	240	12	69	185	7	9	172	87	7	200	144
Future Volume (veh/h)	140	240	12	69	185	7	9	172	87	7	200	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1976	1841	1870	1945	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	149	255	13	73	197	7	10	183	93	7	213	153
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
Percent Heavy Veh, %	0	0	0	4	2	2	4	4	4	2	2	2
Cap, veh/h	332	341	17	261	263	9	87	1182	562	68	1067	713
Arrive On Green	0.09	0.19	0.19	0.05	0.15	0.15	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	1810	1792	91	1753	1795	64	48	2194	1044	16	1980	1324
Grp Volume(v), veh/h	149	0	268	73	0	204	154	0	132	204	0	169
Grp Sat Flow(s),veh/h/ln	1810	0	1883	1753	0	1859	1800	0	1486	1859	0	1461
Q Serve(g_s), s	4.1	0.0	8.5	2.2	0.0	6.6	0.0	0.0	2.8	0.0	0.0	3.8
Cycle Q Clear(g_c), s	4.1	0.0	8.5	2.2	0.0	6.6	2.7	0.0	2.8	3.6	0.0	3.8
Prop In Lane	1.00		0.05	1.00		0.03	0.07		0.70	0.03		0.91
Lane Grp Cap(c), veh/h	332	0	359	261	0	273	1030	0	800	1060	0	787
V/C Ratio(X)	0.45	0.00	0.75	0.28	0.00	0.75	0.15	0.00	0.17	0.19	0.00	0.21
Avail Cap(c_a), veh/h	508	0	895	509	0	883	1030	0	800	1060	0	787
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	24.1	21.6	0.0	25.8	7.3	0.0	7.4	7.5	0.0	7.6
Incr Delay (d2), s/veh	1.0	0.0	3.1	0.6	0.0	4.1	0.3	0.0	0.4	0.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	0.0	6.8	1.6	0.0	5.4	1.7	0.0	1.5	2.3	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	0.0	27.2	22.1	0.0	29.9	7.6	0.0	7.8	7.9	0.0	8.2
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		417			277			286			373	
Approach Delay, s/veh		24.7			27.9			7.7			8.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		40.0	6.1	17.0		40.0	8.9	14.3				
Change Period (Y+Rc), s		6.0	3.0	5.0		6.0	3.0	5.0				
Max Green Setting (Gmax), s		34.0	12.0	30.0		34.0	12.0	30.0				
Max Q Clear Time (g_c+I1), s		0.0	4.2	10.5		0.0	6.1	8.6				
Green Ext Time (p_c), s		0.0	0.1	0.8		0.0	0.2	0.6				

Intersection Summary												
HCM 6th Ctrl Delay			17.2									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	633	28	178	579	115	17	256	206	104	244	168
Future Volume (vph)	161	633	28	178	579	115	17	256	206	104	244	168
Confl. Peds. (#/hr)	3		1	1		3			3	3		
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 (%)	1%	1%	0%	1%	1%	2%	0%	0%	1%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	28.0		5.0	28.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	34.0		10.0	34.0		11.0	11.0	11.0	11.0	11.0	
Total Split (s)	13.0	36.0		13.0	36.0		26.0	26.0	26.0	26.0	26.0	
Total Split (%)	17.3%	48.0%		17.3%	48.0%		34.7%	34.7%	34.7%	34.7%	34.7%	
Yellow Time (s)	3.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 37 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 1: Parkside Avenue (CR 636) & Olden Avenue (CR 622)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	633	28	178	579	115	17	256	206	104	244	168
Future Volume (veh/h)	161	633	28	178	579	115	17	256	206	104	244	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1900	1900	1885	1870	1870	1870
Adj Flow Rate, veh/h	169	666	29	187	609	121	18	269	217	109	257	177
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
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	1	2	2	2
Cap, veh/h	192	1398	61	192	1191	236	118	507	425	228	275	189
Arrive On Green	0.11	0.40	0.40	0.11	0.40	0.40	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1795	3496	152	1795	2977	590	969	1900	1592	909	1030	710
Grp Volume(v), veh/h	169	341	354	187	366	364	18	269	217	109	0	434
Grp Sat Flow(s),veh/h/ln	1795	1791	1857	1795	1791	1776	969	1900	1592	909	0	1740
Q Serve(g_s), s	7.0	10.6	10.6	7.8	11.6	11.6	1.4	9.1	8.7	8.7	0.0	18.3
Cycle Q Clear(g_c), s	7.0	10.6	10.6	7.8	11.6	11.6	19.7	9.1	8.7	17.8	0.0	18.3
Prop In Lane	1.00		0.08	1.00		0.33	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	192	716	743	192	716	711	118	507	425	228	0	464
V/C Ratio(X)	0.88	0.48	0.48	0.98	0.51	0.51	0.15	0.53	0.51	0.48	0.00	0.94
Avail Cap(c_a), veh/h	192	716	743	192	716	711	118	507	425	228	0	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	16.7	16.7	33.4	17.0	17.0	36.5	23.5	23.3	31.1	0.0	26.9
Incr Delay (d2), s/veh	33.8	2.3	2.2	57.8	2.6	2.6	0.2	0.5	0.4	0.6	0.0	26.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	7.8	8.1	10.4	8.4	8.4	0.6	7.0	5.6	3.3	0.0	15.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	18.9	18.9	91.2	19.6	19.6	36.7	24.0	23.8	31.7	0.0	53.0
LnGrp LOS	E	B	B	F	B	B	D	C	C	C	A	D
Approach Vol, veh/h		864			917			504			543	
Approach Delay, s/veh		28.3			34.2			24.4			48.7	
Approach LOS		C			C			C			D	

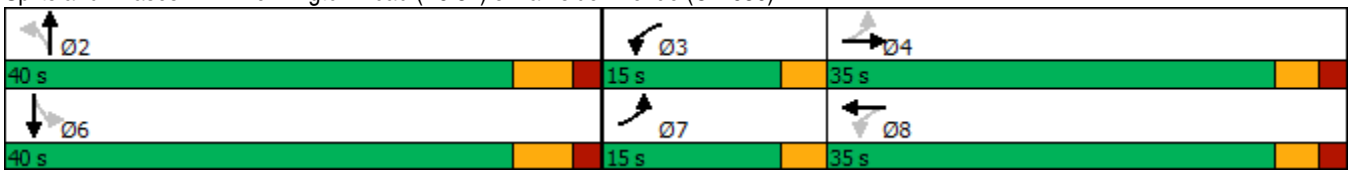
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	36.0		26.0	13.0	36.0		26.0				
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	30.0		20.0	8.0	30.0		20.0				
Max Q Clear Time (g_c+I1), s	9.8	12.6		20.3	9.0	13.6		21.7				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	1.3		0.0				

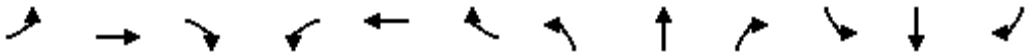
Intersection Summary												
HCM 6th Ctrl Delay			33.4									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	297	19	118	297	8	13	216	133	16	166	193
Future Volume (vph)	144	297	19	118	297	8	13	216	133	16	166	193
Confl. Peds. (#/hr)			1	1			4					4
Confl. Bikes (#/hr)			2						1			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	0%	0%	3%	1%	0%	0%	1%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		34.0	34.0		34.0	34.0	
Minimum Split (s)	6.0	13.0		6.0	13.0		40.0	40.0		40.0	40.0	
Total Split (s)	15.0	35.0		15.0	35.0		40.0	40.0		40.0	40.0	
Total Split (%)	16.7%	38.9%		16.7%	38.9%		44.4%	44.4%		44.4%	44.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	3.0	5.0		3.0	5.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	None		None	None		Max	Max		Max	Max	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 76.5
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Pennington Road (NJ 31) & Parkside Avenue (CR 636)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	297	19	118	297	8	13	216	133	16	166	193
Future Volume (veh/h)	144	297	19	118	297	8	13	216	133	16	166	193
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1900	1900	1856	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	150	309	20	123	309	8	14	225	139	17	173	201
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	0	0	3	1	1	1	1	1	2	2	2
Cap, veh/h	315	386	25	297	376	10	83	1034	596	98	858	717
Arrive On Green	0.09	0.22	0.22	0.08	0.21	0.21	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	1795	1763	114	1767	1829	47	53	2072	1194	81	1721	1437
Grp Volume(v), veh/h	150	0	329	123	0	317	206	0	172	190	0	201
Grp Sat Flow(s),veh/h/ln	1795	0	1877	1767	0	1877	1840	0	1479	1802	0	1437
Q Serve(g_s), s	4.4	0.0	11.3	3.7	0.0	11.0	0.0	0.0	4.5	0.0	0.0	5.6
Cycle Q Clear(g_c), s	4.4	0.0	11.3	3.7	0.0	11.0	4.2	0.0	4.5	3.9	0.0	5.6
Prop In Lane	1.00		0.06	1.00		0.03	0.07		0.81	0.09		1.00
Lane Grp Cap(c), veh/h	315	0	410	297	0	385	974	0	738	956	0	717
V/C Ratio(X)	0.48	0.00	0.80	0.41	0.00	0.82	0.21	0.00	0.23	0.20	0.00	0.28
Avail Cap(c_a), veh/h	469	0	826	472	0	826	974	0	738	956	0	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	0.0	25.2	19.8	0.0	25.9	9.6	0.0	9.7	9.5	0.0	10.0
Incr Delay (d2), s/veh	1.1	0.0	3.7	0.9	0.0	4.4	0.5	0.0	0.7	0.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	0.0	8.8	2.6	0.0	8.7	2.9	0.0	2.5	2.7	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	0.0	28.9	20.7	0.0	30.3	10.1	0.0	10.4	10.0	0.0	10.9
LnGrp LOS	C	A	C	C	A	C	B	A	B	A	A	B
Approach Vol, veh/h		479			440			378			391	
Approach Delay, s/veh		26.3			27.6			10.3			10.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		40.0	8.3	19.9		40.0	9.2	19.0				
Change Period (Y+Rc), s		6.0	3.0	5.0		6.0	3.0	5.0				
Max Green Setting (Gmax), s		34.0	12.0	30.0		34.0	12.0	30.0				
Max Q Clear Time (g_c+I1), s		0.0	5.7	13.3		0.0	6.4	13.0				
Green Ext Time (p_c), s		0.0	0.2	1.0		0.0	0.2	1.0				

Intersection Summary												
HCM 6th Ctrl Delay			19.4									
HCM 6th LOS			B									

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	16	12	423	0	0
Future Volume (vph)	430	16	12	423	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

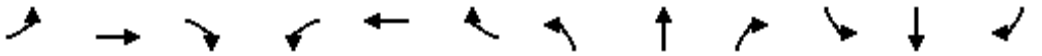
Control Type: Unsignalized

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	399	10	107	503	81	13	177	141	53	164	93
Future Volume (vph)	79	399	10	107	503	81	13	177	141	53	164	93
Confl. Peds. (#/hr)	4					4	1					1
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 (%)	6%	2%	0%	3%	5%	6%	0%	2%	1%	8%	2%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases							8		8			
Detector Phase	5	2		1	6		8	8	1	7	4	
Switch Phase												
Minimum Initial (s)	5.0	28.0		5.0	28.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	34.0		10.0	34.0		11.0	11.0	10.0	11.0	11.0	
Total Split (s)	11.0	35.0		11.0	35.0		18.0	18.0	11.0	11.0	29.0	
Total Split (%)	14.7%	46.7%		14.7%	46.7%		24.0%	24.0%	14.7%	14.7%	38.7%	
Yellow Time (s)	3.0	4.0		3.0	4.0		4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0			6.0	5.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: Parkside Avenue (CR 636) & Olden Avenue (CR 622)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	399	10	107	503	81	13	177	141	53	164	93
Future Volume (veh/h)	79	399	10	107	503	81	13	177	141	53	164	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1856	1826	1826	1870	1870	1885	1781	1870	1870
Adj Flow Rate, veh/h	83	420	11	113	529	85	14	186	148	56	173	98
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
Percent Heavy Veh, %	6	2	2	3	5	5	2	2	1	8	2	2
Cap, veh/h	105	1458	38	141	1290	206	60	238	342	113	315	179
Arrive On Green	0.06	0.41	0.41	0.08	0.43	0.43	0.13	0.13	0.13	0.07	0.28	0.28
Sat Flow, veh/h	1725	3538	93	1767	2993	479	63	1764	1594	1697	1121	635
Grp Volume(v), veh/h	83	211	220	113	306	308	200	0	148	56	0	271
Grp Sat Flow(s),veh/h/ln	1725	1777	1853	1767	1735	1737	1827	0	1594	1697	0	1755
Q Serve(g_s), s	3.6	5.9	6.0	4.7	9.1	9.2	2.9	0.0	6.0	2.4	0.0	9.8
Cycle Q Clear(g_c), s	3.6	5.9	6.0	4.7	9.1	9.2	7.9	0.0	6.0	2.4	0.0	9.8
Prop In Lane	1.00		0.05	1.00		0.28	0.07		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	105	732	764	141	748	749	297	0	342	113	0	494
V/C Ratio(X)	0.79	0.29	0.29	0.80	0.41	0.41	0.67	0.00	0.43	0.50	0.00	0.55
Avail Cap(c_a), veh/h	138	732	764	141	748	749	343	0	383	113	0	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.7	14.7	14.7	33.9	14.7	14.8	31.5	0.0	25.5	33.8	0.0	22.9
Incr Delay (d2), s/veh	14.7	1.0	1.0	25.0	1.7	1.7	2.9	0.0	0.3	1.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	4.3	4.5	5.3	6.5	6.5	6.5	0.0	3.9	1.8	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	15.7	15.7	58.9	16.4	16.4	34.3	0.0	25.8	35.0	0.0	23.3
LnGrp LOS	D	B	B	E	B	B	C	A	C	D	A	C
Approach Vol, veh/h		514			727			348			327	
Approach Delay, s/veh		21.1			23.0			30.7			25.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	36.9		27.1	9.6	38.3	11.0	16.1
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	29.0		23.0	6.0	29.0	5.0	12.0
Max Q Clear Time (g_c+I1), s	6.7	8.0		11.8	5.6	11.2	4.4	9.9
Green Ext Time (p_c), s	0.0	0.7		0.4	0.0	1.1	0.0	0.2

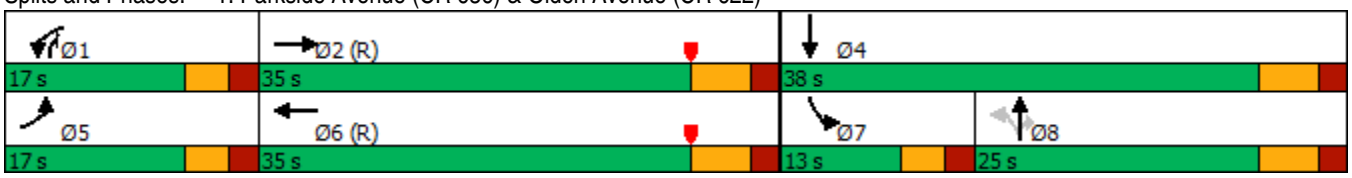
Intersection Summary			
HCM 6th Ctrl Delay		24.3	
HCM 6th LOS		C	

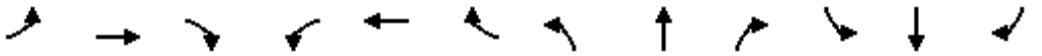
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	633	28	178	579	115	17	256	206	104	244	168
Future Volume (vph)	161	633	28	178	579	115	17	256	206	104	244	168
Confl. Peds. (#/hr)	3		1	1		3			3	3		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	0%	1%	1%	2%	0%	0%	1%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases							8		8			
Detector Phase	5	2		1	6		8	8	1	7	4	
Switch Phase												
Minimum Initial (s)	5.0	28.0		5.0	28.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	34.0		10.0	34.0		11.0	11.0	10.0	11.0	11.0	
Total Split (s)	17.0	35.0		17.0	35.0		25.0	25.0	17.0	13.0	38.0	
Total Split (%)	18.9%	38.9%		18.9%	38.9%		27.8%	27.8%	18.9%	14.4%	42.2%	
Yellow Time (s)	3.0	4.0		3.0	4.0		4.0	4.0	3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0			6.0	5.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 1: Parkside Avenue (CR 636) & Olden Avenue (CR 622)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	633	28	178	579	115	17	256	206	104	244	168
Future Volume (veh/h)	161	633	28	178	579	115	17	256	206	104	244	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1900	1900	1885	1870	1870	1870
Adj Flow Rate, veh/h	169	666	29	187	609	121	18	269	217	109	257	177
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
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	1	2	2	2
Cap, veh/h	203	1295	56	221	1133	225	53	317	483	146	327	225
Arrive On Green	0.11	0.37	0.37	0.12	0.38	0.38	0.18	0.18	0.18	0.08	0.32	0.32
Sat Flow, veh/h	1795	3496	152	1795	2977	590	57	1767	1590	1781	1031	710
Grp Volume(v), veh/h	169	341	354	187	366	364	287	0	217	109	0	434
Grp Sat Flow(s),veh/h/ln	1795	1791	1857	1795	1791	1776	1823	0	1590	1781	0	1740
Q Serve(g_s), s	8.3	13.3	13.3	9.2	14.3	14.4	5.7	0.0	9.9	5.4	0.0	20.4
Cycle Q Clear(g_c), s	8.3	13.3	13.3	9.2	14.3	14.4	13.7	0.0	9.9	5.4	0.0	20.4
Prop In Lane	1.00		0.08	1.00		0.33	0.06		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	203	663	688	221	681	676	370	0	483	146	0	552
V/C Ratio(X)	0.83	0.51	0.51	0.84	0.54	0.54	0.78	0.00	0.45	0.74	0.00	0.79
Avail Cap(c_a), veh/h	239	663	688	239	681	676	426	0	533	158	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.1	22.0	22.0	38.6	21.7	21.7	35.8	0.0	25.3	40.4	0.0	27.9
Incr Delay (d2), s/veh	16.5	2.8	2.7	20.4	3.0	3.1	6.3	0.0	0.2	13.7	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.0	9.8	10.1	8.9	10.4	10.4	10.8	0.0	6.5	5.1	0.0	13.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	24.9	24.8	59.0	24.7	24.8	42.1	0.0	25.6	54.1	0.0	33.1
LnGrp LOS	E	C	C	E	C	C	D	A	C	D	A	C
Approach Vol, veh/h		864			917			504			543	
Approach Delay, s/veh		30.8			31.7			35.0			37.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.1	39.3		34.6	15.2	40.2	12.4	22.2
Change Period (Y+Rc), s	5.0	6.0		6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	12.0	29.0		32.0	12.0	29.0	8.0	19.0
Max Q Clear Time (g_c+I1), s	11.2	15.3		22.4	10.3	16.4	7.4	15.7
Green Ext Time (p_c), s	0.0	1.2		0.7	0.0	1.3	0.0	0.4

Intersection Summary			
HCM 6th Ctrl Delay		33.1	
HCM 6th LOS		C	

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	417	281	285	373
Demand Flow Rate, veh/h	417	289	298	383
Vehicles Circulating, veh/h	305	349	416	291
Vehicles Exiting, veh/h	369	352	306	347
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	1	0
Ped Cap Adj	0.999	1.000	1.000	1.000
Approach Delay, s/veh	11.1	9.1	10.4	10.2
Approach LOS	B	A	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	417	289	298	383
Cap Entry Lane, veh/h	833	797	745	845
Entry HV Adj Factor	1.000	0.973	0.955	0.973
Flow Entry, veh/h	417	281	285	373
Cap Entry, veh/h	832	775	712	822
V/C Ratio	0.501	0.363	0.400	0.453
Control Delay, s/veh	11.1	9.1	10.4	10.2
LOS	B	A	B	B
95th %tile Queue, veh	3	2	2	2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	NW
Entry Lanes	0
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	0
Demand Flow Rate, veh/h	0
Vehicles Circulating, veh/h	701
Vehicles Exiting, veh/h	13
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	0.0
Approach LOS	-

Lane	
Designated Moves	
Assumed Moves	
RT Channelized	
Lane Util	
Critical Headway, s	
Entry Flow, veh/h	
Cap Entry Lane, veh/h	
Entry HV Adj Factor	
Flow Entry, veh/h	
Cap Entry, veh/h	
V/C Ratio	
Control Delay, s/veh	
LOS	
95th %tile Queue, veh	

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	479	453	377	391
Demand Flow Rate, veh/h	481	460	379	394
Vehicles Circulating, veh/h	333	392	490	466
Vehicles Exiting, veh/h	527	447	323	386
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	4	0	1	0
Ped Cap Adj	0.999	1.000	1.000	1.000
Approach Delay, s/veh	13.8	14.8	14.1	14.1
Approach LOS	B	B	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	481	460	379	394
Cap Entry Lane, veh/h	810	764	692	709
Entry HV Adj Factor	0.996	0.984	0.994	0.991
Flow Entry, veh/h	479	453	377	391
Cap Entry, veh/h	806	751	688	703
V/C Ratio	0.594	0.602	0.548	0.556
Control Delay, s/veh	13.8	14.8	14.1	14.1
LOS	B	B	B	B
95th %tile Queue, veh	4	4	3	3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	NW
Entry Lanes	0
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	0
Demand Flow Rate, veh/h	0
Vehicles Circulating, veh/h	839
Vehicles Exiting, veh/h	30
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	0.0
Approach LOS	-

Lane
Designated Moves
Assumed Moves
RT Channelized
Lane Util
Critical Headway, s
Entry Flow, veh/h
Cap Entry Lane, veh/h
Entry HV Adj Factor
Flow Entry, veh/h
Cap Entry, veh/h
V/C Ratio
Control Delay, s/veh
LOS
95th %tile Queue, veh

Imagery Source: 2015 NJOGIS

LEGEND:

- Proposed Repavement Area
- 4” Yellow Striping
- 4” White Striping
- Existing Curb

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

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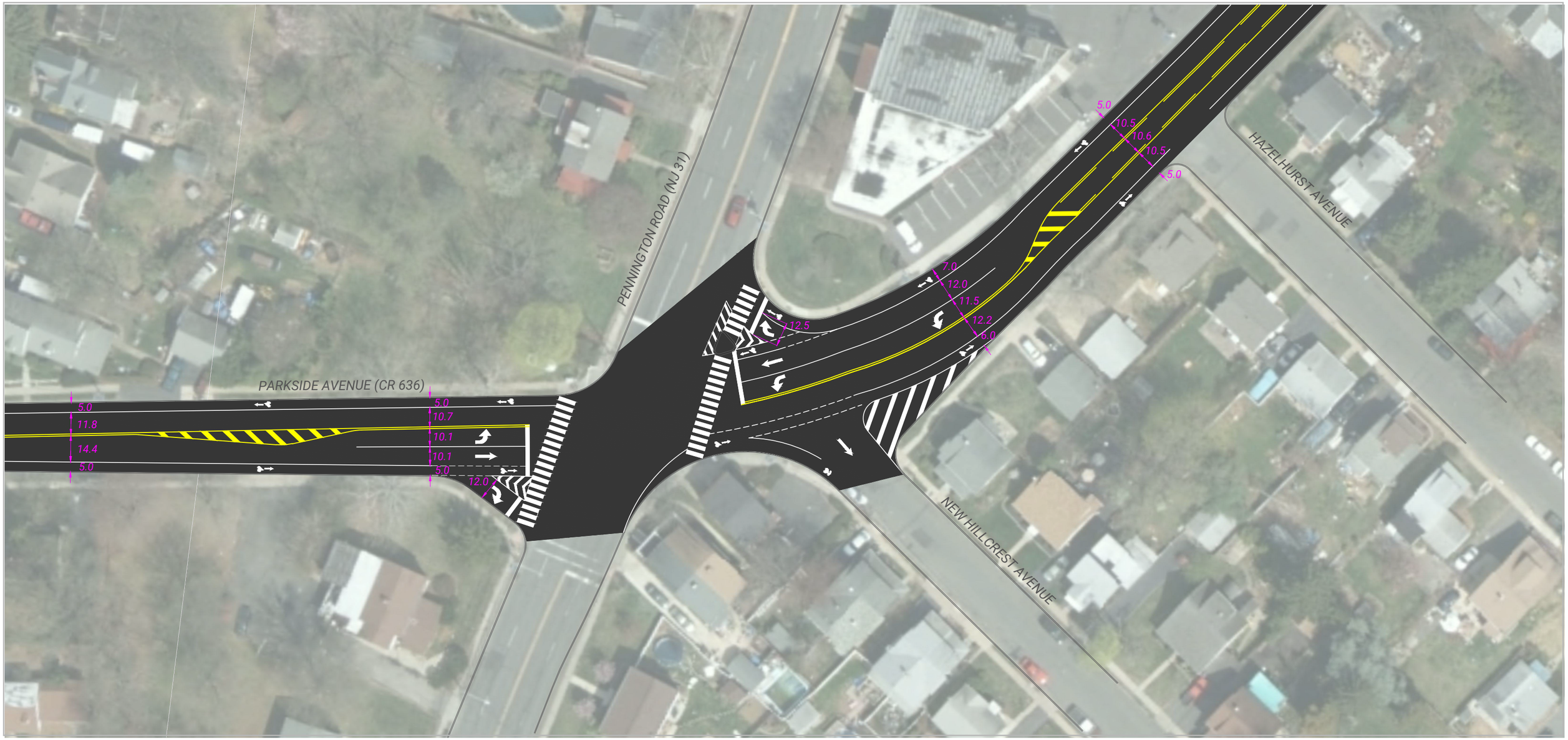
INTERSECTION REPAVEMENT CONCEPT PLANS

CR 636 MULTIMODAL INTERSECTION ANALYSIS

Ewing Township, Mercer County, New Jersey

Date: 06/26/20
Prepared By: KM
Checked By:
Product Number:

SCALE: 1” = 50’



Imagery Source: 2015 NJOGIS

LEGEND:

- Proposed Repavement Area
- 4” Yellow Striping
- 4” White Striping
- Existing Curb

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INTERSECTION REPAVEMENT CONCEPT PLANS

CR 636 MULTIMODAL INTERSECTION ANALYSIS

Ewing Township, Mercer County, New Jersey

Date: 06/26/20
Prepared By: KM
Checked By:
Product Number:

N

SCALE: 1” = 50’

Imagery Source: 2015 NJOGIS

LEGEND:

- Proposed Repavement Area
- Proposed Landscaping
- Proposed Mountable Curb
- 4” Yellow Striping
- 4” White Striping
- Existing Curb
- Proposed Curb

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NJ 31 & CR 636 ROUNDABOUT CONCEPT PLAN

CR 636 MULTIMODAL INTERSECTION ANALYSIS

Ewing Township, Mercer County, New Jersey

Date: 06/29/20
Prepared By: KM
Checked By:
Product Number:

Sheet 01 of 01

N

SCALE: 1” = 50’