EXHIBIT A-45E

McMAHON ASSOCIATES, INC.
835 Springdale Drive, Suite 200
Exton, PA 19341
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FOUNDER
Joseph W. McMahon, P.E.

May 27, 2020

Mr. Russell Hatton, Chair
Westtown Township Planning Commission
1039 Wilmington Pike
West Chester, PA 19382

RE: **Robinson Tract Residential Development**
Stetson School Drive Afternoon School Peak Traffic Operations
Westtown Township, Chester County, PA
McMahon Project No. 816451.11

Dear Mr. Hatton:

In response to the comment from the Township's Traffic Engineer from the May 20, 2020 Planning Commission Meeting, McMahon Associates, Inc. has prepared this letter to describe the traffic operations at the intersection of Wilmington Pike (U.S. Route 202) and Skiles Boulevard / Stetson School Drive during the weekday afternoon school peak hour, as related to the intersection improvements proposed by the applicant. This comment was not included in the Township Traffic Engineer's review letters. All of the traffic count data presented in this letter is included in the applicant's submitted transportation impact studies, but is organized here to directly address the Township Traffic Engineer's comment from the May 20, 2020 Planning Commission Meeting.

In order to complete this evaluation, the following school operations were considered:

Stetson Middle School

- Approximately 1,000 total students
- School dismissal occurs at 2:50 PM

Starkweather Elementary School

- Approximately 600 total students
- School dismissal occurs at 3:40 PM
- ITE trip generation data indicates the elementary school generates more traffic during the weekday afternoon peak of the generator, as compared to the middle school peak hour of the generator. Therefore, the peak of the elementary school (dictated by the dismissal time) will result in the highest trips.

The elementary school dismissal time was correlated to the traffic count data collected at the intersection, as contained in the TIS. The counted afternoon school entering and exiting traffic is summarized below in **Table 1** in 15-minute intervals. The traffic count sheets are provided in **Attachment 1**.

Table 1. School Traffic by 15-Minute Intervals (1)

	Entering	Exiting	Total
4:00-4:15 PM	32	32	82
4:15-4:30 PM	**38**	**46**	**102**
4:30-4:45 PM	**53**	**61**	**134**
4:45-5:00 PM	**47**	**86**	**148**
5:00-5:15 PM	**23**	**65**	**105**
5:15-5:30 PM	25	33	71

(1) Based on intersection turning movement counts conducted on October 10, 2019.

As shown in Table 1, the school peak hour occurs from 4:15 PM to 5:15 PM. During this period, 489 total vehicles (entering and exiting the schools) were counted.

For further comparison purposes and validation of the data, the counted trips were compared to ITE trip generation data for the elementary and middle school land uses. Based on the ITE trip generation calculations for the weekday afternoon peak hour of the generator, the elementary school would generate 204 total trips and the middle school would generate 321 total trips during their respective dismissal hour. This equates to approximately 525 trips in total for both schools, if the dismissal periods coincided. However, given the staggered dismissal times of the schools, less trips occur during the weekday afternoon school peak hour. This ITE data comparison validates the counted traffic volumes represented in the afternoon school peak hour, since 489 total vehicles were counted (entering and exiting the schools with offset dismissal times) and ITE predicts 525 total trips if the school dismissal periods coincided, only seven (7) percent higher than the counted traffic volumes with dismissal periods approximately one hour apart.

Traffic Operations

The weekday afternoon school peak hour (4:15 to 5:15 PM) has been analyzed at the intersection of Wilmington Pike (U.S. Route 202) and Skiles Boulevard / Stetson School Drive under 2030 future with-development conditions, which includes the traffic diversions resulting from the Township required Collector Road.

As detailed in the submitted TIS, the applicant is proposing the following improvements at the intersection:

- To mitigate the Township's Collector Road traffic impact along Stetson School, the applicant will restripe the eastbound approach to provide dual left-turn lanes and a shared through/right-turn lane and complete the necessary traffic signal phasing modifications.

- Additionally, the applicant will widen westbound Skiles Boulevard to provide a dedicated right-turn lane, subject to the ability to acquire any necessary additional right-of-way.

The results of the weekday afternoon school peak hour with-development traffic conditions, both without and with the improvements proposed by the applicant, as listed above, are illustrated in **Table 2** below.

Table 2. Wilmington Pike (U.S. Route 202) and Skiles Boulevard / Stetson School Drive
2030 Future with Development and Collector Road Diversions
Level-of-Service and Delay (in seconds) for Stetson School Drive

	Stetson School Eastbound Left	**Stetson School Eastbound Thru**	**Stetson School Eastbound Right**	**Stetson School Approach**	**Overall Intersection**
Afternoon School Peak Hour Existing Intersection Geometry	F 106.5	D 35.1	C 32.0	E 77.2	C 31.6
Afternoon School Peak Hour With Applicant Improvements	D 49.6	D 36.1		D 44.1	C 29.2

As shown in Table 2, with the significant volume increase along Stetson School Drive as a result of the traffic diversions from the Township's required Collector Road, the eastbound left-turn movement results in failing conditions with the existing intersection geometry. However, with the improvements proposed by the applicant, the delay for this movement is reduced by 53 percent resulting in acceptable LOS D conditions, and therefore, the applicant's improvements at the intersection will have a substantial benefit to capacity for traffic along Stetson School Drive compared to the existing intersection geometry. The delay on the Stetson School approach (combination of all movements) is decreased by 43 percent, and the overall intersection delay (PennDOT standard measurement of operations) is decreased by 8 percent. The capacity level-of-service analysis worksheets are provided in **Attachment 2**.

Conclusions

The improvements proposed by the applicant clearly provide additional capacity along Stetson School Drive, substantially benefiting traffic operations during the weekday afternoon school peak hour with the proposed development and the diverted traffic as a result of the Township required Collector Road.

If there are any questions or if additional information is needed, please feel free to contact me at nkline@mcmahonassociates.com or (610) 594-9995.

Sincerely,

Nicole R. Kline-Elsier

Nicole R. Kline-Elsier, P.E., PTOE
Regional Service Leader - Traffic

NRKE

cc: Robert Pingar, P.E., Westtown Township
Will Ethridge, Westtown Township
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Albert Federico, P.E., PTOE, Albert Federico Consulting, LLC
Andrew Semon, Toll Brothers
Michael Downs, P.E., Toll Brothers
Gregg Adelman, Esq., Kaplin Stewart

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ATTACHMENT 1

McMahon Associates, Inc.

Transportation Engineers and Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Westtown Township
Location: Route 202 &
Skiles Boulevard
Counter: M

File Name : westtown01w
Site Code :
Start Date : 10/10/2019
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Route 202 Southbound			Skiles Boulevard Westbound			Route 202 Northbound			Skiles Boulevard Eastbound			
Start Time	To Jughandle	Thru	Right	Left	Thru	Right	To Jughandle	Thru	Right	Left	Thru	Right	Int. Total
07:00	17	495	25	9	14	13	7	542	1	9	12	3	1147
07:15	15	493	44	11	13	11	3	557	0	10	16	2	1175
07:30	42	441	35	12	41	15	4	471	1	29	33	7	1131
07:45	28	445	50	18	66	15	9	466	4	33	80	19	1233
Total	102	1874	154	50	134	54	23	2036	6	81	141	31	4686
08:00	0	493	23	15	34	17	0	460	4	34	42	16	1138
08:15	0	480	28	13	9	16	0	465	3	18	12	3	1047
08:30	0	452	22	8	21	17	0	486	6	29	27	10	1078
08:45	0	460	31	13	24	14	0	481	8	45	21	18	1115
Total	0	1885	104	49	88	64	0	1892	21	126	102	47	4378
16:00	0	400	16	11	16	11	0	464	11	20	23	7	979
16:15	0	494	18	8	20	9	0	484	9	17	34	13	1106
16:30	0	431	23	5	30	5	0	492	3	34	38	9	1070
16:45	0	461	18	10	29	7	0	465	3	42	45	14	1094
Total	0	1786	75	34	95	32	0	1905	26	113	140	43	4249
17:00	17	521	12	4	11	16	6	502	3	18	47	17	1174
17:15	13	490	21	9	4	12	3	497	9	21	21	4	1104
17:30	17	479	20	7	20	14	5	500	6	26	32	20	1146
17:45	15	435	16	7	8	17	7	494	7	55	29	20	1110
Total	62	1925	69	27	43	59	21	1993	25	120	129	61	4534
Grand Total	164	7470	402	160	360	209	44	7826	78	440	512	182	17847
Apprch %	2	93	5	21.9	49.4	28.7	0.6	98.5	1	38.8	45.1	16	
Total %	0.9	41.9	2.3	0.9	2	1.2	0.2	43.9	0.4	2.5	2.9	1	
Passenger Vehicles	164	7003	387	153	344	204	44	7391	75	421	494	174	16854
% Passenger Vehicles	100	93.7	96.3	95.6	95.6	97.6	100	94.4	96.2	95.7	96.5	95.6	94.4
Heavy Vehicles	0	467	15	7	16	5	0	435	3	19	18	8	993
% Heavy Vehicles	0	6.3	3.7	4.4	4.4	2.4	0	5.6	3.8	4.3	3.5	4.4	5.6

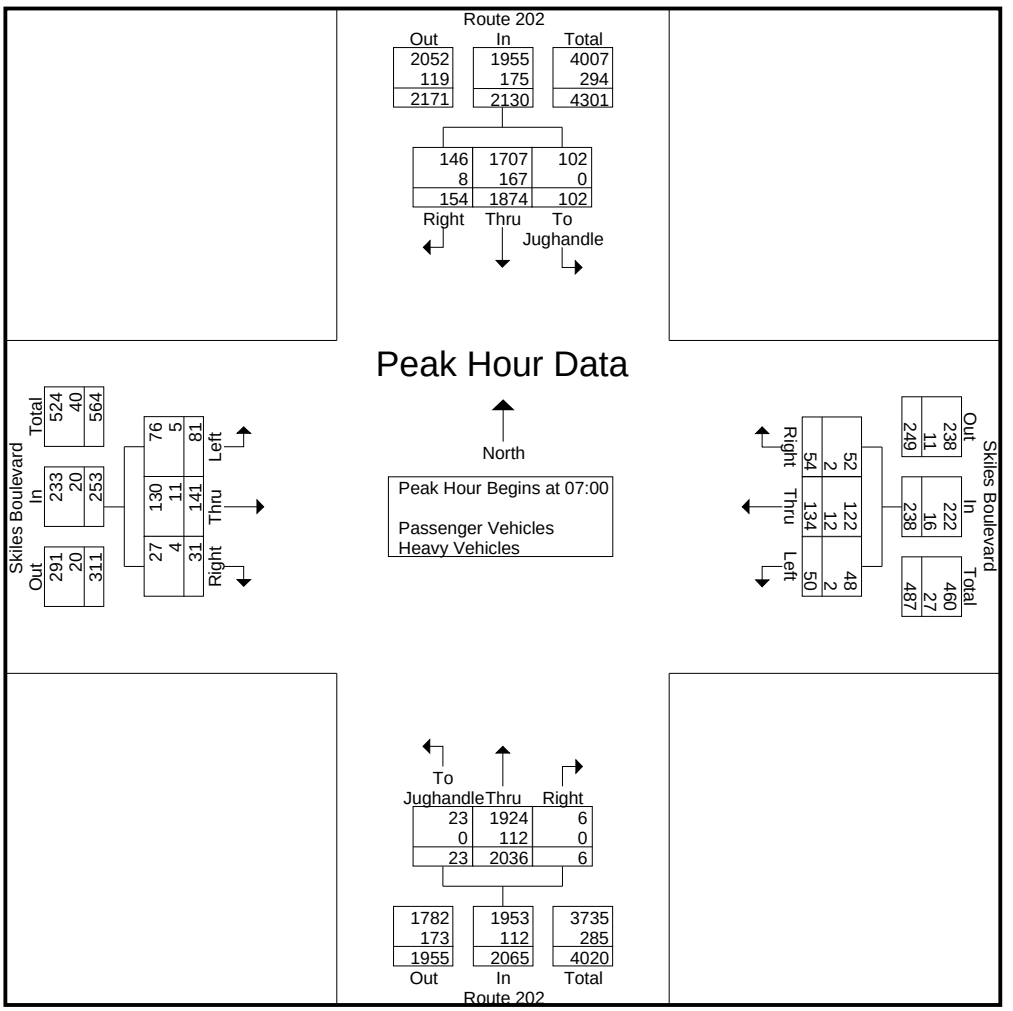
McMahon Associates, Inc.

Transportation Engineers and Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Westtown Township
Location: Route 202 &
Skiles Boulevard
Counter: M

File Name : westtown01w
Site Code :
Start Date : 10/10/2019
Page No : 2

	Route 202 Southbound				Skiles Boulevard Westbound				Route 202 Northbound				Skiles Boulevard Eastbound				
Start Time	To Jughandle	Thru	Right	App. Total	Left	Thru	Right	App. Total	To Jughandle	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	17	**495**	25	537	9	14	13	36	7	542	1	550	9	12	3	24	1147
07:15	15	493	44	**552**	11	13	11	35	3	**557**	0	**560**	10	16	2	28	1175
07:30	**42**	441	35	518	12	41	**15**	68	4	471	1	476	29	33	7	69	1131
07:45	28	445	**50**	523	**18**	**66**	15	**99**	**9**	466	**4**	479	**33**	**80**	**19**	**132**	**1233**
Total Volume	102	1874	154	2130	50	134	54	238	23	2036	6	2065	81	141	31	253	4686
% App. Total	4.8	88	7.2		21	56.3	22.7		1.1	98.6	0.3		32	55.7	12.3		
PHF	.607	.946	.770	.965	.694	.508	.900	.601	.639	.914	.375	.922	.614	.441	.408	.479	.950
Passenger Vehicles	102	1707	146	1955	48	122	52	222	23	1924	6	1953	76	130	27	233	4363
% Passenger Vehicles	100	91.1	94.8	91.8	96.0	91.0	96.3	93.3	100	94.5	100	94.6	93.8	92.2	87.1	92.1	93.1
Heavy Vehicles	0	167	8	175	2	12	2	16	0	112	0	112	5	11	4	20	323
% Heavy Vehicles	0	8.9	5.2	8.2	4.0	9.0	3.7	6.7	0	5.5	0	5.4	6.2	7.8	12.9	7.9	6.9



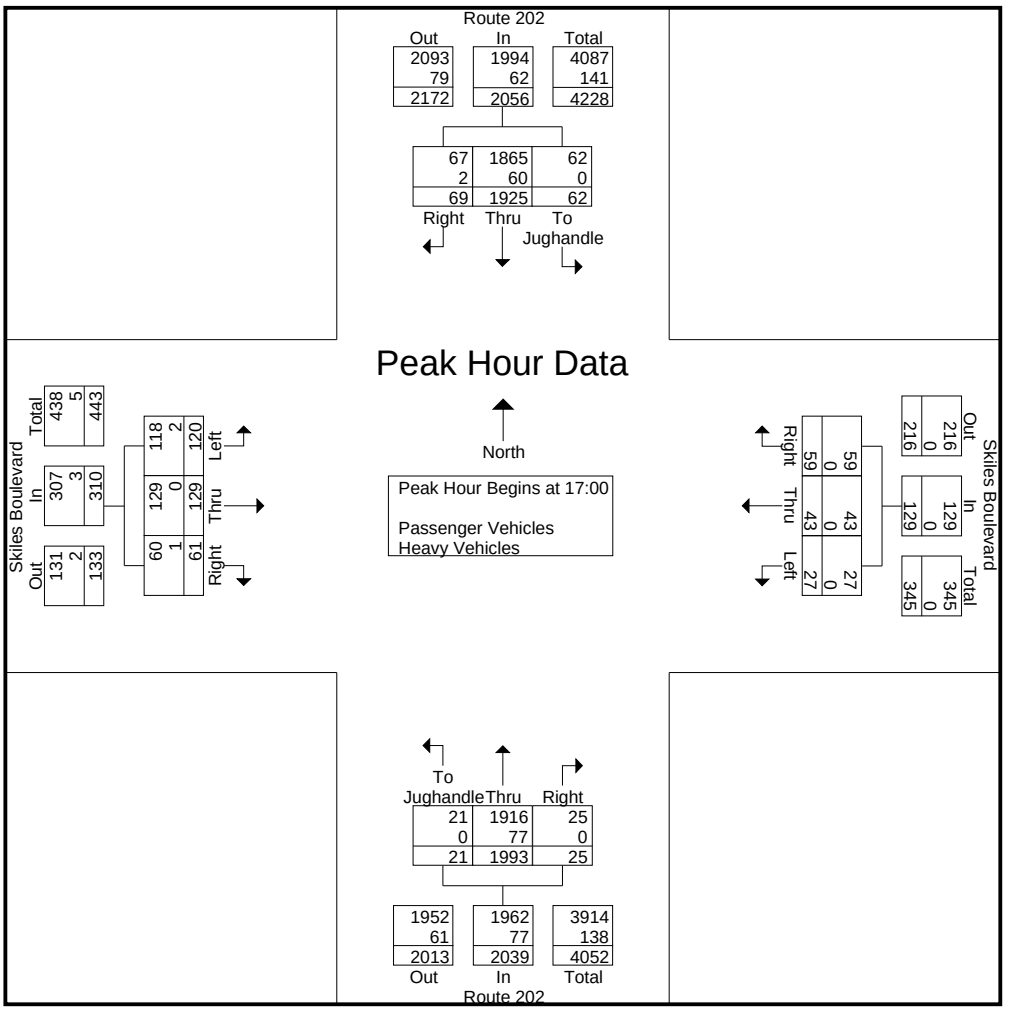
McMahon Associates, Inc.

Transportation Engineers and Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Westtown Township
Location: Route 202 &
Skiles Boulevard
Counter: M

File Name : westtown01w
Site Code :
Start Date : 10/10/2019
Page No : 3

	Route 202 Southbound				Skiles Boulevard Westbound				Route 202 Northbound				Skiles Boulevard Eastbound				
Start Time	To Jughandle	Thru	Right	App. Total	Left	Thru	Right	App. Total	To Jughandle	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**17**	**521**	12	**550**	4	11	16	31	6	**502**	3	**511**	18	**47**	17	82	**1174**
17:15	13	490	**21**	524	**9**	4	12	25	3	497	**9**	509	21	21	4	46	1104
17:30	17	479	20	516	7	**20**	14	**41**	5	500	6	511	26	32	**20**	78	1146
17:45	15	435	16	466	7	8	**17**	32	**7**	494	7	508	**55**	29	20	**104**	1110
Total Volume	62	1925	69	2056	27	43	59	129	21	1993	25	2039	120	129	61	310	4534
% App. Total	3	93.6	3.4		20.9	33.3	45.7		1	97.7	1.2		38.7	41.6	19.7		
PHF	.912	.924	.821	.935	.750	.538	.868	.787	.750	.993	.694	.998	.545	.686	.763	.745	.966
Passenger Vehicles	62	1865	67	1994	27	43	59	129	21	1916	25	1962	118	129	60	307	4392
% Passenger Vehicles	100	96.9	97.1	97.0	100	100	100	100	100	96.1	100	96.2	98.3	100	98.4	99.0	96.9
Heavy Vehicles	0	60	2	62	0	0	0	0	0	77	0	77	2	0	1	3	142
% Heavy Vehicles	0	3.1	2.9	3.0	0	0	0	0	0	3.9	0	3.8	1.7	0	1.6	1.0	3.1



McMahon Associates, Inc.

Transportation Engineers and Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Westtown Township
Location: Route 202 &
Skiles Boulevard
Counter: M

File Name : westtown01w
Site Code :
Start Date : 10/10/2019
Page No : 1

Groups Printed- Heavy Vehicles

	Route 202 Southbound			Skiles Boulevard Westbound			Route 202 Northbound			Skiles Boulevard Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	0	37	0	0	0	0	0	22	0	1	2	0	62
07:15	0	56	0	1	0	0	0	29	0	1	0	0	87
07:30	0	32	2	0	3	0	0	27	0	0	0	0	64
07:45	0	42	6	1	9	2	0	34	0	3	9	4	110
Total	0	167	8	2	12	2	0	112	0	5	11	4	323
08:00	0	35	0	1	1	1	0	37	0	3	2	0	80
08:15	0	27	0	2	0	1	0	36	1	2	0	1	70
08:30	0	41	2	0	1	0	0	43	2	1	2	0	92
08:45	0	48	3	0	2	1	0	36	0	4	3	1	98
Total	0	151	5	3	4	3	0	152	3	10	7	2	340
16:00	0	27	0	0	0	0	0	19	0	0	0	0	46
16:15	0	24	0	1	0	0	0	28	0	1	0	1	55
16:30	0	15	0	0	0	0	0	25	0	1	0	0	41
16:45	0	23	0	1	0	0	0	22	0	0	0	0	46
Total	0	89	0	2	0	0	0	94	0	2	0	1	188
17:00	0	18	1	0	0	0	0	24	0	0	0	0	43
17:15	0	11	1	0	0	0	0	12	0	0	0	0	24
17:30	0	13	0	0	0	0	0	22	0	0	0	1	36
17:45	0	18	0	0	0	0	0	19	0	2	0	0	39
Total	0	60	2	0	0	0	0	77	0	2	0	1	142
Grand Total	0	467	15	7	16	5	0	435	3	19	18	8	993
Apprch %	0	96.9	3.1	25	57.1	17.9	0	99.3	0.7	42.2	40	17.8	
Total %	0	47	1.5	0.7	1.6	0.5	0	43.8	0.3	1.9	1.8	0.8	

U.S. Route 202 and Skiles Boulevard / Stetson School

Combined

	US 202 Southbound			US 202 Northbound			Skiles Westbound			Stetson Eastbound				
	Jughandle	**Thru**	**Right**	**Jughandle**	**Thru**	**Right**	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**	**TOTAL**	
16:15	18	476	18	10	474	9	8	20	9	17	34	13	1106	
16:30	20	411	23	4	488	3	5	30	5	34	38	9	1070	
16:45	15	446	18	4	461	3	10	29	7	42	45	14	1094	
17:00	17	521	12	6	502	3	4	11	16	18	47	17	1174	
Total	70	1854	71	24	1925	18	27	90	37	111	164	53	4444	**PHF**
														0.95

Heavy Vehicles

	US 202 Southbound			US 202 Northbound			Skiles Westbound			Stetson Eastbound		
	Jughandle	**Thru**	**Right**	**Jughandle**	**Thru**	**Right**	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**
16:15		24	0		28	0	1	0	0	1	0	1
16:30		15	0		25	0	0	0	0	1	0	0
16:45		23	0		22	0	1	0	0	0	0	0
17:00		18	1		24	0	0	0	0	0	0	0
Total		80	1		99	0	2	0	0	2	0	1
		4%	1%		5%	0%	7%	0%	0%	2%	0%	2%

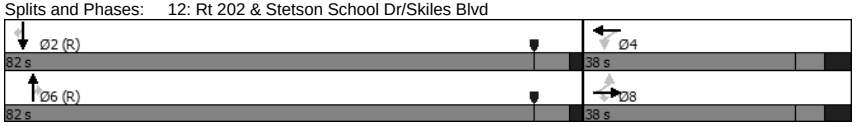
ATTACHMENT 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	347	183	54	60	95	43	0	1896	72	0	1827	392
Future Volume (vph)	347	183	54	60	95	43	0	1896	72	0	1827	392
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	13	13	12	14	14	12	12	14	12	12	16
Grade (%)		-5%			2%			2%			-3%	
Storage Length (ft)	200		200	350		0	0		220	0		200
Storage Lanes	1		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.953				0.850			0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1661	1906	1589	1582	1811	0	0	3225	1616	0	3338	1743
Flt Permitted	0.612			0.531								
Satd. Flow (perm)	1070	1906	1589	884	1811	0	0	3225	1616	0	3338	1743
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		637			560			1356			940	
Travel Time (s)		17.4			15.3			20.5			14.2	
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%	0%	2%	7%	0%	0%	0%	5%	0%	0%	4%	1%
Adj. Flow (vph)	365	193	57	63	100	45	0	1996	76	0	1923	413
Shared Lane Traffic (%)												
Lane Group Flow (vph)	365	193	57	63	145	0	0	1996	76	0	1923	413
Number of Detectors	1	1	1	1	1			5	1		5	1
Detector Template			Right						Right			Right
Leading Detector (ft)	35	68	30	35	68			490	30		490	30
Trailing Detector (ft)	-5	-1	-10	-5	-1			-10	-10		-10	-10
Detector 1 Position(ft)	-5	-1	-10	-5	-1			-10	-10		-10	-10
Detector 1 Size(ft)	40	69	40	40	69			40	40		40	40
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Detector 2 Position(ft)								113			113	
Detector 2 Size(ft)								40			40	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Detector 3 Position(ft)								237			237	
Detector 3 Size(ft)								6			6	
Detector 3 Type								Cl+Ex			Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)								0.0			0.0	
Detector 4 Position(ft)								360			360	
Detector 4 Size(ft)								6			6	
Detector 4 Type								Cl+Ex			Cl+Ex	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 4 Channel												
Detector 4 Extend (s)								0.0			0.0	
Detector 5 Position(ft)								484			484	
Detector 5 Size(ft)								6			6	
Detector 5 Type								Cl+Ex			Cl+Ex	
Detector 5 Channel												
Detector 5 Extend (s)								0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA			NA	Perm		NA	Perm
Protected Phases		8			4			6			2	
Permitted Phases	8		8	4					6			2
Detector Phase	8	8	8	4	4			6	6		2	2
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0			15.0	15.0		15.0	15.0
Minimum Split (s)	15.0	15.0	15.0	15.0	15.0			22.0	22.0		22.0	22.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0			82.0	82.0		82.0	82.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	31.7%			68.3%	68.3%		68.3%	68.3%
Maximum Green (s)	30.0	30.0	30.0	30.0	30.0			75.0	75.0		75.0	75.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0			5.0	5.0		5.0	5.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0			2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0	-4.0	-3.0	-3.0			-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0			5.0	5.0		5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			6.0	6.0		6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0			48.0	48.0		48.0	48.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0			24.0	24.0		24.0	24.0
Recall Mode	None	None	None	None	None			C-Max	C-Max		C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 84 (70%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Description: Signal	

Splits and Phases: 12: Rt 202 & Stetson School Dr/Skiles Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	347	183	54	60	95	43	0	1896	72	0	1827	392
Future Volume (veh/h)	347	183	54	60	95	43	0	1896	72	0	1827	392
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	1958	2066	2036	1679	1849	1849	0	1707	1849	0	1855	1973
Adj Flow Rate, veh/h	365	193	57	63	100	45	0	1996	76	0	1923	413
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, %	2	0	2	7	0	0	0	5	0	0	4	1
Cap, veh/h	353	568	489	274	332	149	0	2082	1005	0	2261	1073
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.25	0.00	0.64	0.64	0.00	0.64	0.64
Sat Flow, veh/h	1374	2066	1726	1071	1208	543	0	3330	1567	0	3617	1672
Grp Volume(v), veh/h	365	193	57	63	0	145	0	1996	76	0	1923	413
Grp Sat Flow(s),veh/h/ln	1374	2066	1726	1071	0	1751	0	1622	1567	0	1762	1672
Q Serve(g_s), s	25.6	9.0	2.9	6.0	0.0	7.9	0.0	68.8	2.2	0.0	51.6	14.1
Cycle Q Clear(g_c), s	33.0	9.0	2.9	15.0	0.0	7.9	0.0	68.8	2.2	0.0	51.6	14.1
Prop In Lane	1.00		1.00	1.00		0.31	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	353	568	489	274	0	482	0	2082	1005	0	2261	1073
V/C Ratio(X)	1.03	0.34	0.12	0.23	0.00	0.30	0.00	0.96	0.08	0.00	0.85	0.38
Avail Cap(c_a), veh/h	353	568	489	274	0	482	0	2082	1005	0	2261	1073
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	49.4	34.8	31.9	40.8	0.0	34.8	0.0	20.0	8.1	0.0	17.0	10.2
Incr Delay (d2), s/veh	57.1	0.4	0.1	0.4	0.0	0.3	0.0	12.2	0.1	0.0	4.3	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	23.5	8.2	2.3	2.9	0.0	6.3	0.0	33.5	1.3	0.0	26.2	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	106.5	35.1	32.0	41.2	0.0	35.1	0.0	32.2	8.2	0.0	21.2	11.3
LnGrp LOS	F	D	C	D	A	D	A	C	A	A	C	B
Approach Vol, veh/h		615			208			2072			2336	
Approach Delay, s/veh		77.2			37.0			31.3			19.5	
Approach LOS		E			D			C			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	82.0	38.0	82.0	38.0
Change Period (Y+Rc), s	7.0	8.0	7.0	8.0
Max Green Setting (Gmax), s	75.0	30.0	75.0	30.0
Max Q Clear Time (g_c+I1), s	54.1	17.5	71.3	35.5
Green Ext Time (p_c), s	20.8	0.7	3.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	347	183	54	60	95	43	0	1896	72	0	1827	392
Future Volume (vph)	347	183	54	60	95	43	0	1896	72	0	1827	392
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	13	13	12	14	14	12	12	14	12	12	16
Grade (%)		-5%			2%			2%			-3%	
Storage Length (ft)	200		200	125		150	0		220	0		200
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.966				0.850			0.850			0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	3223	1833	0	1582	1901	1616	0	3225	1616	0	3338	1743
Flt Permitted	0.950			0.604								
Satd. Flow (perm)	3223	1833	0	1006	1901	1616	0	3225	1616	0	3338	1743
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		637			560			1356			940	
Travel Time (s)		17.4			15.3			20.5			14.2	
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%	0%	2%	7%	0%	0%	0%	5%	0%	0%	4%	1%
Adj. Flow (vph)	365	193	57	63	100	45	0	1996	76	0	1923	413
Shared Lane Traffic (%)												
Lane Group Flow (vph)	365	250	0	63	100	45	0	1996	76	0	1923	413
Number of Detectors	1	1		1	1	1		5	1		5	1
Detector Template						Right			Right			Right
Leading Detector (ft)	35	68		35	68	30		490	30		490	30
Trailing Detector (ft)	-5	-1		-5	-1	-10		-10	-10		-10	-10
Detector 1 Position(ft)	-5	-1		-5	-1	-10		-10	-10		-10	-10
Detector 1 Size(ft)	40	69		40	69	40		40	40		40	40
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Detector 2 Position(ft)								113			113	
Detector 2 Size(ft)								40			40	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Detector 3 Position(ft)								237			237	
Detector 3 Size(ft)								6			6	
Detector 3 Type								Cl+Ex			Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)								0.0			0.0	
Detector 4 Position(ft)								360			360	
Detector 4 Size(ft)								6			6	
Detector 4 Type								Cl+Ex			Cl+Ex	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 4 Channel												
Detector 4 Extend (s)								0.0			0.0	
Detector 5 Position(ft)								484			484	
Detector 5 Size(ft)								6			6	
Detector 5 Type								Cl+Ex			Cl+Ex	
Detector 5 Channel												
Detector 5 Extend (s)								0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases	3	8			4			6			2	
Permitted Phases				4		4			6			2
Detector Phase	3	8		4	4	4		6	6		2	2
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0	3.0		15.0	15.0		15.0	15.0
Minimum Split (s)	9.0	15.0		15.0	15.0	15.0		22.0	22.0		22.0	22.0
Total Split (s)	30.0	50.0		20.0	20.0	20.0		70.0	70.0		70.0	70.0
Total Split (%)	25.0%	41.7%		16.7%	16.7%	16.7%		58.3%	58.3%		58.3%	58.3%
Maximum Green (s)	24.0	42.0		12.0	12.0	12.0		63.0	63.0		63.0	63.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	4.0		4.0	4.0	4.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	0.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	3.0	5.0		5.0	5.0	8.0		5.0	5.0		5.0	5.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		6.0	6.0		6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0		48.0	48.0		48.0	48.0
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0		24.0	24.0		24.0	24.0
Recall Mode	None	None		None	None	None		C-Max	C-Max		C-Max	C-Max

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Description: Signal	

Splits and Phases: 12: Rt 202 & Stetson School Dr/Skiles Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	347	183	54	60	95	43	0	1896	72	0	1827	392
Future Volume (veh/h)	347	183	54	60	95	43	0	1896	72	0	1827	392
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	1958	2066	2066	1679	1849	1849	0	1707	1849	0	1855	1973
Adj Flow Rate, veh/h	365	193	57	63	100	45	0	1996	76	0	1923	413
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, %	2	0	0	7	0	0	0	5	0	0	4	1
Cap, veh/h	544	428	126	171	192	123	0	2068	999	0	2247	1066
Arrive On Green	0.15	0.28	0.29	0.10	0.10	0.08	0.00	0.64	0.64	0.00	0.64	0.64
Sat Flow, veh/h	3617	1532	452	1071	1849	1567	0	3330	1567	0	3617	1672
Grp Volume(v), veh/h	365	0	250	63	100	45	0	1996	76	0	1923	413
Grp Sat Flow(s),veh/h/ln	1809	0	1984	1071	1849	1567	0	1622	1567	0	1762	1672
Q Serve(g_s), s	11.4	0.0	12.4	6.7	6.2	3.3	0.0	69.6	2.2	0.0	52.2	14.3
Cycle Q Clear(g_c), s	11.4	0.0	12.4	6.7	6.2	3.3	0.0	69.6	2.2	0.0	52.2	14.3
Prop In Lane	1.00		0.23	1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	544	0	554	171	192	123	0	2068	999	0	2247	1066
V/C Ratio(X)	0.67	0.00	0.45	0.37	0.52	0.36	0.00	0.97	0.08	0.00	0.86	0.39
Avail Cap(c_a), veh/h	814	0	744	194	231	157	0	2068	999	0	2247	1066
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	0.0	35.6	51.2	51.0	52.4	0.0	20.5	8.3	0.0	17.4	10.5
Incr Delay (d2), s/veh	1.4	0.0	0.6	1.3	2.2	1.8	0.0	13.1	0.1	0.0	4.5	1.1
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	9.1	0.0	10.3	3.4	5.4	2.4	0.0	34.2	1.3	0.0	26.6	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	0.0	36.1	52.5	53.1	54.2	0.0	33.6	8.4	0.0	21.8	11.5
LnGrp LOS	D	A	D	D	D	D	A	C	A	A	C	B
Approach Vol, veh/h		615			208			2072			2336	
Approach Delay, s/veh		44.1			53.2			32.7			20.0	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	2	3	4		6		8					
Phs Duration (G+Y+Rc), s	81.5	21.1	17.4		81.5		38.5					
Change Period (Y+Rc), s	7.0	6.0	8.0		7.0		8.0					
Max Green Setting (Gmax), s	63.0	24.0	12.0		63.0		42.0					
Max Q Clear Time (g_c+I1), s	54.7	13.9	9.2		72.1		14.4					
Green Ext Time (p_c), s	8.3	1.1	0.2		0.0		1.2					

Intersection Summary		
HCM 6th Ctrl Delay		29.2
HCM 6th LOS		C