

January 29, 2021  
**Via Fed-Ex**

Township of Lawrence Zoning Board of Adjustment  
2207 Lawrence Road, P.O. Box 6006  
Township of Lawrence, NJ 08648

Attn: Brenda Kraemer, Secretary to the Zoning Board

**Re: Supplemental Traffic Analysis  
Proposed Residential Development  
Block 2001 – Lots 3, 60-66 & 68  
2495 Brunswick Pike (Route 1 Alt)  
Township of Lawrence, Mercer County, NJ  
DT # 1279-99-010T**

Dear Zoning Board Members:

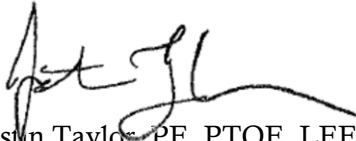
Dynamic Traffic is in receipt of the Arora and Associates, P.C. for the above referenced project, dated December 7, 2020 (“Report”). In response to Comment 3, Page 3, we have prepared a supplemental analysis to identify possible mitigation measures that the Township could implement to address the existing deficiencies. As mentioned within the Report, at the intersection of Texas Avenue and Route 1 the eastbound approach of Texas Avenue operates with a level of service “F” under the No Build conditions. In addition, the queues extend approximately 549 feet back from the intersection which extends beyond the Lawrence Shopping Center driveway.

In order to address these existing issues, possible modifications to the existing signal timings were investigated. It was determined that with the reallocation of 6 seconds of green time from the northbound/southbound ROW phase of Route 1 to the eastbound approach phase the delay for the eastbound approach could be reduced from 276.2 seconds in the No Build condition to 117.1 seconds in the Build condition. Further, with this modification the 95th percentile queues would be reduced to approximately 479 feet, whereas the existing shopping center driveway is approximately 490 feet from the intersection. The capacity analysis worksheets associated with these updated analyses are attached to this letter.

As noted within the Report, as well as within the previous analyses prepared by this office, this intersection does not meet the criteria for traffic analysis provided by the NJDOT. However, should the Township wish to coordinate with NJDOT, the identified reallocation of 6 seconds of green time would help alleviate some of the existing deficiencies at the intersection.

Sincerely,

**Dynamic Traffic, LLC**



Justin Taylor, PE, PTOE, LEED AP  
Principal  
NJ PE License 45988



Nick Verderese, PE  
Senior Principal  
NJ PE License 38991

JPT

- c: Kevin Kavanaugh (via email w/encl.)  
Ryan Kennedy (via email w/encl.)  
Tom Muller/Ryan McDermott/Luiza Guazzelli (via email w/encl.)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	0	80	183	147	0	0	457	0	0	1015	0
Future Volume (vph)	349	0	80	183	147	0	0	457	0	0	1015	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Grade (%)		8%			0%			0%			0%	
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									
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1744	0	1545	1852	1875	0	0	3668	0	0	3668	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1744	0	1545	1852	1875	0	0	3668	0	0	3668	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			114									
Link Speed (mph)		25			25			45				45
Link Distance (ft)		185			240			1149				1782
Travel Time (s)		5.0			6.5			17.4				27.0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	0%	3%	0%	4%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	397	0	91	208	167	0	0	519	0	0	1153	0
Turn Type	Prot		Prot	Split	NA			NA			NA	
Protected Phases	7		7	8	8			2			6	
Permitted Phases												
Detector Phase	7		7	8	8			2			6	
Switch Phase												
Minimum Initial (s)	7.0		7.0	7.0	7.0			33.0			33.0	
Minimum Split (s)	13.0		13.0	14.0	14.0			40.0			40.0	
Total Split (s)	22.0		22.0	43.0	43.0			40.0			40.0	
Total Split (%)	21.0%		21.0%	41.0%	41.0%			38.1%			38.1%	
Yellow Time (s)	3.0		3.0	3.0	3.0			5.0			5.0	
All-Red Time (s)	3.0		3.0	4.0	4.0			2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0		6.0	7.0	7.0			7.0			7.0	
Lead/Lag	Lead		Lead	Lag	Lag							
Lead-Lag Optimize?	Yes		Yes	Yes	Yes							
Recall Mode	None		None	None	None			C-Max			C-Max	
Act Effct Green (s)	16.0		16.0	16.6	16.6			52.4			52.4	
Actuated g/C Ratio	0.15		0.15	0.16	0.16			0.50			0.50	
v/c Ratio	1.50		0.27	0.71	0.56			0.28			0.63	
Control Delay	276.2		6.7	54.7	47.4			16.7			22.0	
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0	
Total Delay	276.2		6.7	54.7	47.4			16.7			22.0	
LOS	F		A	D	D			B			C	
Approach Delay		225.9			51.5			16.7			22.0	
Approach LOS		F			D			B			C	
Queue Length 50th (ft)	~371		0	134	105			103			286	
Queue Length 95th (ft)	#541		28	193	157			152			390	
Internal Link Dist (ft)		105			160			1069			1702	
Turn Bay Length (ft)												

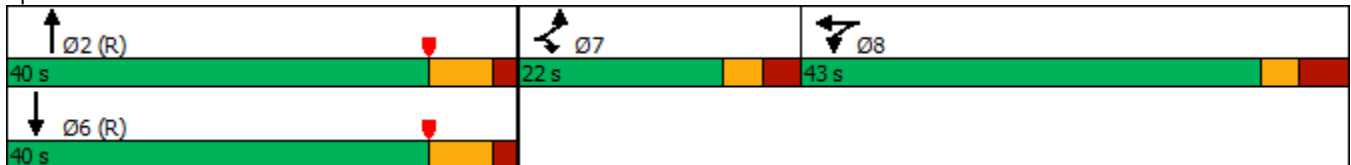


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	265		332	634	642			1829			1829	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		0	0	0			0			0	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	1.50		0.27	0.33	0.26			0.28			0.63	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	105
Offset:	18 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.50
Intersection Signal Delay:	64.5
Intersection LOS:	E
Intersection Capacity Utilization	70.5%
ICU Level of Service	C
Analysis Period (min)	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 10: Texas Avenue & US Route 1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	354	0	85	183	155	0	0	457	0	0	1015	0
Future Volume (vph)	354	0	85	183	155	0	0	457	0	0	1015	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Grade (%)		8%			0%			0%			0%	
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									
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1744	0	1545	1852	1875	0	0	3668	0	0	3668	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1744	0	1545	1852	1875	0	0	3668	0	0	3668	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			114									
Link Speed (mph)		25			25			45				45
Link Distance (ft)		185			240			1149				1782
Travel Time (s)		5.0			6.5			17.4				27.0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	0%	3%	0%	4%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	402	0	97	208	176	0	0	519	0	0	1153	0
Turn Type	Prot		Prot	Split	NA			NA			NA	
Protected Phases	7		7	8	8			2			6	
Permitted Phases												
Detector Phase	7		7	8	8			2			6	
Switch Phase												
Minimum Initial (s)	7.0		7.0	7.0	7.0			33.0			33.0	
Minimum Split (s)	13.0		13.0	14.0	14.0			40.0			40.0	
Total Split (s)	22.0		22.0	43.0	43.0			40.0			40.0	
Total Split (%)	21.0%		21.0%	41.0%	41.0%			38.1%			38.1%	
Yellow Time (s)	3.0		3.0	3.0	3.0			5.0			5.0	
All-Red Time (s)	3.0		3.0	4.0	4.0			2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0		6.0	7.0	7.0			7.0			7.0	
Lead/Lag	Lead		Lead	Lag	Lag							
Lead-Lag Optimize?	Yes		Yes	Yes	Yes							
Recall Mode	None		None	None	None			C-Max			C-Max	
Act Effct Green (s)	16.0		16.0	16.6	16.6			52.4			52.4	
Actuated g/C Ratio	0.15		0.15	0.16	0.16			0.50			0.50	
v/c Ratio	1.52		0.29	0.71	0.59			0.28			0.63	
Control Delay	283.9		7.9	54.7	48.6			16.7			22.0	
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0	
Total Delay	283.9		7.9	54.7	48.6			16.7			22.0	
LOS	F		A	D	D			B			C	
Approach Delay		230.3			51.9			16.7			22.0	
Approach LOS		F			D			B			C	
Queue Length 50th (ft)	~378		0	134	111			103			286	
Queue Length 95th (ft)	#549		33	193	165			152			390	
Internal Link Dist (ft)		105			160			1069			1702	
Turn Bay Length (ft)												

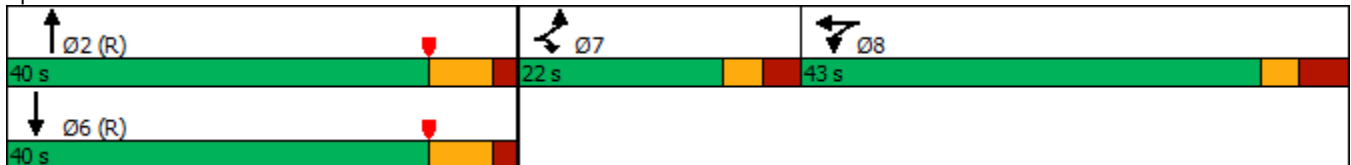


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	265		332	634	642			1829			1829	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		0	0	0			0			0	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	1.52		0.29	0.33	0.27			0.28			0.63	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	105
Offset:	18 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.52
Intersection Signal Delay:	66.1
Intersection LOS:	E
Intersection Capacity Utilization	71.2%
ICU Level of Service	C
Analysis Period (min)	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 10: Texas Avenue & US Route 1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	354	0	85	183	155	0	0	457	0	0	1015	0
Future Volume (vph)	354	0	85	183	155	0	0	457	0	0	1015	0
Ideal Flow (vphpl)	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
Grade (%)		8%			0%			0%			0%	
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									
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1744	0	1545	1852	1875	0	0	3668	0	0	3668	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1744	0	1545	1852	1875	0	0	3668	0	0	3668	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			114									
Link Speed (mph)		25			25			45				45
Link Distance (ft)		185			240			1149				1782
Travel Time (s)		5.0			6.5			17.4				27.0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	0%	3%	0%	4%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	402	0	97	208	176	0	0	519	0	0	1153	0
Turn Type	Prot		Prot	Split	NA			NA			NA	
Protected Phases	7		7	8	8			2			6	
Permitted Phases												
Detector Phase	7		7	8	8			2			6	
Switch Phase												
Minimum Initial (s)	7.0		7.0	7.0	7.0			33.0			33.0	
Minimum Split (s)	13.0		13.0	14.0	14.0			40.0			40.0	
Total Split (s)	28.0		28.0	43.0	43.0			34.0			34.0	
Total Split (%)	26.7%		26.7%	41.0%	41.0%			32.4%			32.4%	
Yellow Time (s)	3.0		3.0	3.0	3.0			5.0			5.0	
All-Red Time (s)	3.0		3.0	4.0	4.0			2.0			2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0		6.0	7.0	7.0			7.0			7.0	
Lead/Lag	Lead		Lead	Lag	Lag							
Lead-Lag Optimize?	Yes		Yes	Yes	Yes							
Recall Mode	None		None	None	None			C-Max			C-Max	
Act Effct Green (s)	22.0		22.0	16.6	16.6			46.4			46.4	
Actuated g/C Ratio	0.21		0.21	0.16	0.16			0.44			0.44	
v/c Ratio	1.10		0.23	0.71	0.59			0.32			0.71	
Control Delay	117.1		6.2	54.7	48.6			20.6			27.8	
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0	
Total Delay	117.1		6.2	54.7	48.6			20.6			27.8	
LOS	F		A	D	D			C			C	
Approach Delay		95.6			51.9			20.6			27.8	
Approach LOS		F			D			C			C	
Queue Length 50th (ft)	~308		0	134	111			116			323	
Queue Length 95th (ft)	#479		30	193	165			170			434	
Internal Link Dist (ft)		105			160			1069			1702	
Turn Bay Length (ft)												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	365		413	634	642			1619			1619	
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	1.10		0.23	0.33	0.27			0.32			0.71	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	105
Offset:	18 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.10
Intersection Signal Delay:	43.2
Intersection LOS:	D
Intersection Capacity Utilization	71.2%
ICU Level of Service	C
Analysis Period (min)	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 10: Texas Avenue & US Route 1

