
ADDENDUM TO DRI 2867 TRAFFIC IMPACT STUDY

To: Emily Estes, GRTA, Andrew Smith, ARC
From: Randy Parker
Date: February 26, 2018
Re: Revised SR 42 at Bill Gardner Parkway Analyses

The original January 22, 2019 DRI 2867 Traffic Impact Study for the 75 South Logistics Center reported inadequate 2023 No Build (E, 56.9 sec), 2021 Build (E, 59.1 sec), and 2023 Build (F, 81.8 sec) AM peak hour expected operations for the signalized intersection of SR 42 and Bill Gardner Parkway (in Tables 4, 5 & 6), but inadvertently did not identify improvements to provided adequate service.

Restriping pavement to provide Bill Gardner Pkwy eastbound dual left turn lanes to SR 42 northbound with two receiving lanes in the existing gore striped areas would be expected to provide adequate operations for 2023 No Build, 2021 Build, and 2023 No Build AM peak hour projected volumes. This improvement would provide LOS C for 2023 No Build and 2021 Build AM peak hour volumes, and LOS D for 2023 Build AM peak hour volumes (33.4 sec, 33.8 sec, 45.5 sec, respectively). Intersection capacity analyses worksheets showing the results of this change are attached.

It should be noted that the traffic control of this intersection is being considered for change to a modern design roundabout and that the new project trip assignment reflects approximately three times more new personal vehicle eastbound left turns toward the site than southbound site exiting trips at this intersection with the difference assigned to the currently unsignalized Market Place Blvd at SR 42 intersection. Installation of a traffic signal at the Market Place Blvd and SR 42 intersection is currently being pursued. It is reasonable to assume that if either or both of these intersection changes occur, the dual eastbound left turn lanes would probably not be needed.

HCM 6th Signalized Intersection Summary DRI 2867 75 South Logistics Center, Locust Grove

4: SR 42 & Bill Gardner Pkwy

Synchro 10 Report

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 					
Traffic Volume (veh/h)	300	478	950	351	248	150
Future Volume (veh/h)	300	478	950	351	248	150
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	312	0	990	366	258	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	413		1003	1369	305	
Arrive On Green	0.12	0.00	0.49	0.73	0.16	0.00
Sat Flow, veh/h	3456	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	312	0	990	366	258	0
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1870	1870	1585
Q Serve(g_s), s	7.1	0.0	38.7	5.3	10.8	0.0
Cycle Q Clear(g_c), s	7.1	0.0	38.7	5.3	10.8	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	413		1003	1369	305	
V/C Ratio(X)	0.76		0.99	0.27	0.85	
Avail Cap(c_a), veh/h	684		1003	1434	370	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	34.5	0.0	14.5	3.6	32.8	0.0
Incr Delay (d2), s/veh	2.8	0.0	25.1	0.1	14.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	18.3	1.1	5.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.3	0.0	39.6	3.7	46.9	0.0
LnGrp LOS	D		D	A	D	
Approach Vol, veh/h	312	A		1356	258	A
Approach Delay, s/veh	37.3			29.9	46.9	
Approach LOS	D			C	D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.2		15.7	46.0	19.2
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		62.0		16.0	40.0	16.0
Max Q Clear Time (g_c+I1), s		7.3		9.1	40.7	12.8
Green Ext Time (p_c), s		2.1		0.6	0.0	0.4

Intersection Summary

HCM 6th Ctrl Delay 33.4
HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary DRI 2867 75 South Logistics Center, Locust Grove

4: SR 42 & Bill Gardner Pkwy

Synchro 10 Report

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	319	949	663	305	396	209
Future Volume (veh/h)	319	949	663	305	396	209
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	326	0	677	311	404	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	474		748	1269	483	
Arrive On Green	0.14	0.00	0.33	0.68	0.26	0.00
Sat Flow, veh/h	3456	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	326	0	677	311	404	0
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1870	1870	1585
Q Serve(g_s), s	5.9	0.0	17.2	4.2	13.3	0.0
Cycle Q Clear(g_c), s	5.9	0.0	17.2	4.2	13.3	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	474		748	1269	483	
V/C Ratio(X)	0.69		0.90	0.25	0.84	
Avail Cap(c_a), veh/h	2069		1203	1981	718	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	26.8	0.0	12.2	4.0	22.9	0.0
Incr Delay (d2), s/veh	1.8	0.0	6.3	0.1	5.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	5.9	0.9	5.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.6	0.0	18.5	4.1	28.4	0.0
LnGrp LOS	C		B	A	C	
Approach Vol, veh/h	326	A		988	404	A
Approach Delay, s/veh	28.6			14.0	28.4	
Approach LOS	C			B	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		50.2		14.9	27.4	22.8
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		69.0		39.0	38.0	25.0
Max Q Clear Time (g_c+l1), s		6.2		7.9	19.2	15.3
Green Ext Time (p_c), s		1.8		1.1	2.2	1.5

Intersection Summary

HCM 6th Ctrl Delay 20.1
 HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary DRI 2867 75 South Logistics Center, Locust Grove

4: SR 42 & Bill Gardner Pkwy

Synchro 10 Report

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	369	464	922	353	244	156
Future Volume (veh/h)	369	464	922	353	244	156
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	384	0	960	368	254	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	482		979	1339	300	
Arrive On Green	0.14	0.00	0.48	0.72	0.16	0.00
Sat Flow, veh/h	3456	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	384	0	960	368	254	0
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1870	1870	1585
Q Serve(g_s), s	8.9	0.0	38.1	5.8	10.9	0.0
Cycle Q Clear(g_c), s	8.9	0.0	38.1	5.8	10.9	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	482		979	1339	300	
V/C Ratio(X)	0.80		0.98	0.27	0.85	
Avail Cap(c_a), veh/h	668		979	1400	361	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	34.5	0.0	15.1	4.2	33.8	0.0
Incr Delay (d2), s/veh	4.7	0.0	24.0	0.1	14.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	18.0	1.4	5.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.2	0.0	39.1	4.3	48.4	0.0
LnGrp LOS	D		D	A	D	
Approach Vol, veh/h	384	A		1328	254	A
Approach Delay, s/veh	39.2			29.4	48.4	
Approach LOS	D			C	D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.3		17.5	46.0	19.3
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		62.0		16.0	40.0	16.0
Max Q Clear Time (g_c+l1), s		7.8		10.9	40.1	12.9
Green Ext Time (p_c), s		2.2		0.6	0.0	0.4

Intersection Summary

HCM 6th Ctrl Delay 33.8
 HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary DRI 2867 75 South Logistics Center, Locust Grove

4: SR 42 & Bill Gardner Pkwy

Synchro 10 Report

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	339	921	643	301	396	256
Future Volume (veh/h)	339	921	643	301	396	256
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	346	0	656	307	404	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	499		727	1248	483	
Arrive On Green	0.14	0.00	0.31	0.67	0.26	0.00
Sat Flow, veh/h	3456	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	346	0	656	307	404	0
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1870	1870	1585
Q Serve(g_s), s	6.1	0.0	16.1	4.2	13.0	0.0
Cycle Q Clear(g_c), s	6.1	0.0	16.1	4.2	13.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	499		727	1248	483	
V/C Ratio(X)	0.69		0.90	0.25	0.84	
Avail Cap(c_a), veh/h	1843		1116	1877	704	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	25.9	0.0	11.9	4.2	22.4	0.0
Incr Delay (d2), s/veh	1.7	0.0	7.0	0.1	5.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	5.7	0.9	5.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.7	0.0	18.9	4.3	28.2	0.0
LnGrp LOS	C		B	A	C	
Approach Vol, veh/h	346	A		963	404	A
Approach Delay, s/veh	27.7			14.3	28.2	
Approach LOS	C			B	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		48.6		15.2	26.1	22.5
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		64.0		34.0	34.0	24.0
Max Q Clear Time (g_c+l1), s		6.2		8.1	18.1	15.0
Green Ext Time (p_c), s		1.8		1.2	2.0	1.5

Intersection Summary

HCM 6th Ctrl Delay 20.3
 HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary DRI 2867 75 South Logistics Center, Locust Grove

4: SR 42 & Bill Gardner Pkwy

Synchro 10 Report

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	446	478	950	374	255	167
Future Volume (veh/h)	446	478	950	374	255	167
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	465	0	990	390	266	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	552		943	1310	308	
Arrive On Green	0.16	0.00	0.47	0.70	0.16	0.00
Sat Flow, veh/h	3456	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	465	0	990	390	266	0
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1870	1870	1585
Q Serve(g_s), s	11.2	0.0	40.0	6.8	11.9	0.0
Cycle Q Clear(g_c), s	11.2	0.0	40.0	6.8	11.9	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	552		943	1310	308	
V/C Ratio(X)	0.84		1.05	0.30	0.86	
Avail Cap(c_a), veh/h	644		943	1350	348	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	35.0	0.0	16.9	4.9	34.9	0.0
Incr Delay (d2), s/veh	8.7	0.0	43.3	0.1	17.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	24.0	1.8	6.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.8	0.0	60.2	5.0	52.8	0.0
LnGrp LOS	D		F	A	D	
Approach Vol, veh/h	465	A		1380	266	A
Approach Delay, s/veh	43.8			44.6	52.8	
Approach LOS	D			D	D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.2		19.7	46.0	20.2
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		62.0		16.0	40.0	16.0
Max Q Clear Time (g_c+I1), s		8.8		13.2	42.0	13.9
Green Ext Time (p_c), s		2.3		0.5	0.0	0.3

Intersection Summary

HCM 6th Ctrl Delay 45.5
 HCM 6th LOS D

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary DRI 2867 75 South Logistics Center, Locust Grove

4: SR 42 & Bill Gardner Pkwy

Synchro 10 Report

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 					
Traffic Volume (veh/h)	387	949	663	308	417	302
Future Volume (veh/h)	387	949	663	308	417	302
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	395	0	677	314	426	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	535		740	1275	501	
Arrive On Green	0.15	0.00	0.33	0.68	0.27	0.00
Sat Flow, veh/h	3456	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	395	0	677	314	426	0
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1870	1870	1585
Q Serve(g_s), s	8.0	0.0	20.2	4.7	15.9	0.0
Cycle Q Clear(g_c), s	8.0	0.0	20.2	4.7	15.9	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	535		740	1275	501	
V/C Ratio(X)	0.74		0.91	0.25	0.85	
Avail Cap(c_a), veh/h	1927		1142	1959	763	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	29.6	0.0	14.8	4.5	25.5	0.0
Incr Delay (d2), s/veh	2.0	0.0	7.9	0.1	5.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	7.7	1.1	7.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.7	0.0	22.7	4.6	31.2	0.0
LnGrp LOS	C		C	A	C	
Approach Vol, veh/h	395	A		991	426	A
Approach Delay, s/veh	31.7			16.9	31.2	
Approach LOS	C			B	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		56.1		17.4	30.4	25.7
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		77.0		41.0	41.0	30.0
Max Q Clear Time (g_c+I1), s		6.7		10.0	22.2	17.9
Green Ext Time (p_c), s		1.8		1.4	2.2	1.8

Intersection Summary

HCM 6th Ctrl Delay 23.5
 HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.