



December 19, 2024

Mr. Paul Hyde
 CEO
 Hyde Development
 250 Nicollet Mall, Suite 920
 Minneapolis, MN 55401

**RE: Forgotten Star Brewery at Hyde – Traffic Conformance
 FHU Project No. 124453-01**

Dear Mr. Hyde:

Felsburg Holt & Ullevig (FHU) prepared a traffic impact study (TIS) for the Hyde Industrial development in August 2021. Those reports used the Institute of Transportation Engineers’ (ITE) publication *Trip Generation Manual, 10th Edition* (2017) to forecast vehicle-trips based on the land use types and sizes. Subsequent to this submittal ITE has released *Trip Generation Manual, 12th Edition* (2021) which has updated rates and equations with newer data. The 2021 TIS indicated that Hyde Industrial was anticipated to be a six-building industrial park totaling 1,861,500 square feet. After that analysis a trip generation letter was prepared for Buildings 2 and 3 in July 2021, one of which is the Whole Foods distribution center that is located at the northwest corner of Denali Street and 60th Avenue. That letter indicated a reduction of those two buildings from 912,500 square feet as analyzed in the TIS down to 718,200 square feet which is a reduction of 194,300 square feet. Currently the Forgotten Star Brewery is proposing a 12,500 square foot brewing facility and tasting room which is intended to replace one of the previously proposed 64,000 square foot buildings. Forgotten Star Brewery is planned to be located at the southwest corner of the intersection of 63rd Avenue and Gun Club Road. **Figure 1** illustrates the current brewery site plan. In all it is now anticipated that that the entire Hyde Industrial development with the previous and current reductions will result in 1,603,200 square feet of industrial park with plus the proposed 12,500 square foot brewery and tasting room for Forgotten Star Brewery.

Trip Generation

The currently proposed site has also been analyzed using the ITE *Trip Generation Manual, 11th Edition* (2021) as it remains the most current publication while values from the ITE *Trip Generation Manual, 10th Edition* (2017) are shown to analyze the previously assumed trip generation from the approved TIS. **Table 1** shows the equation and rates utilized in this analysis. **Table 2** shows the estimated trip generation for the current proposed site and a comparison to what was projected in the Hyde Industrial TIS from August 2021.

Table 1. ITE Trip Generation Rates and Equations

Land Use	ITE Code	Unit	Daily	Peak	Equations & Rates	Distributions	
						In	Out
Industrial Park (10 th Edition)	130	KSF	T=3.37*X	AM	T=0.40*X	81%	19%
				PM	T=0.40*X	21%	79%
Industrial Park (11 th Edition)	130	KSF	T=3.37*X	AM	T=0.34*X	81%	19%
				PM	T=0.34*X	22%	78%
Brewery Tap Room	971	KSF	T=61.39 *X	AM	T=0.68*X	88%	12%
				PM	T=9.83*X	59%	41%

KSF = 1,000 SF

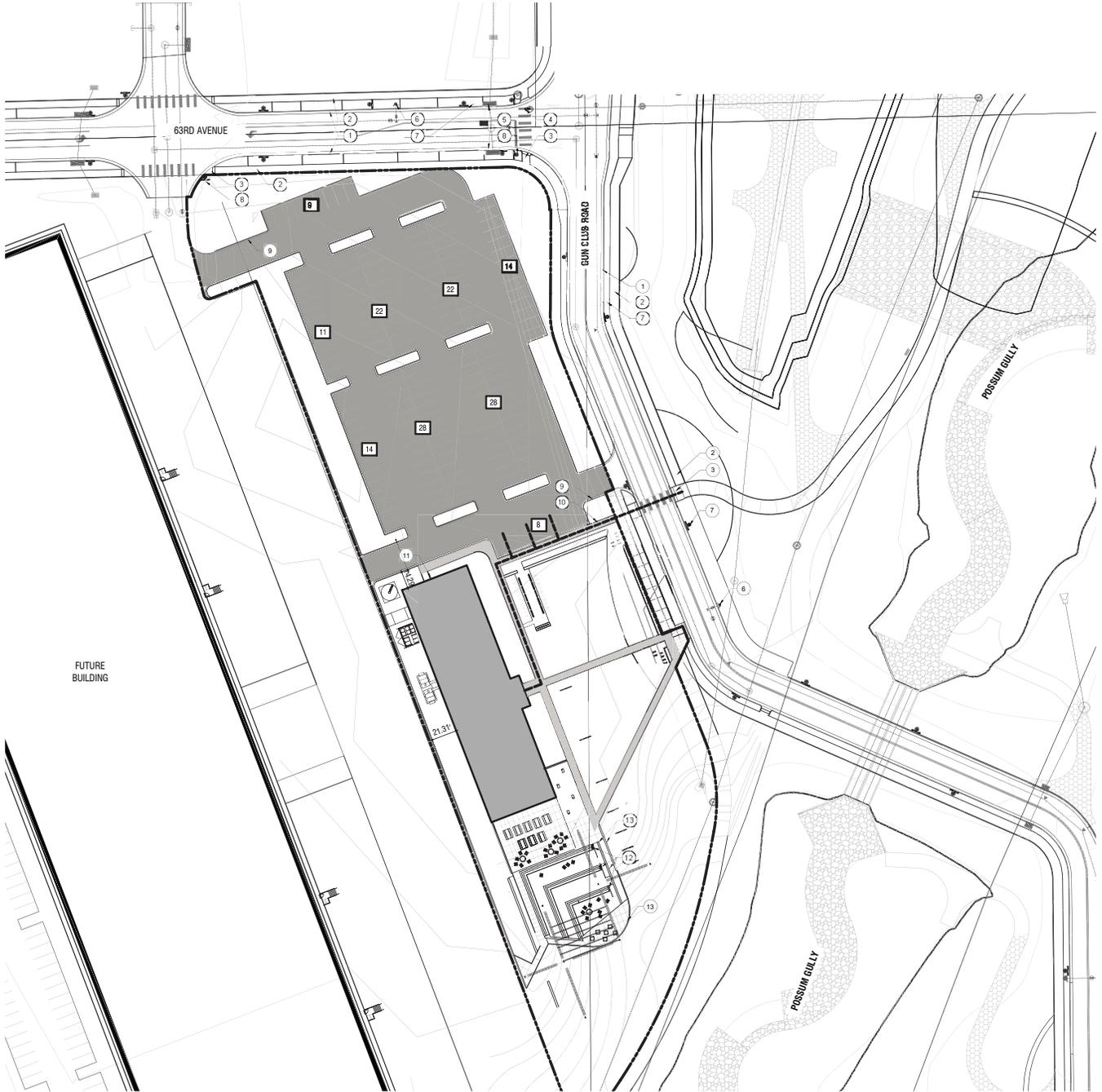


Table 2. Forgotten Star Brewery at Hyde Trip Generation

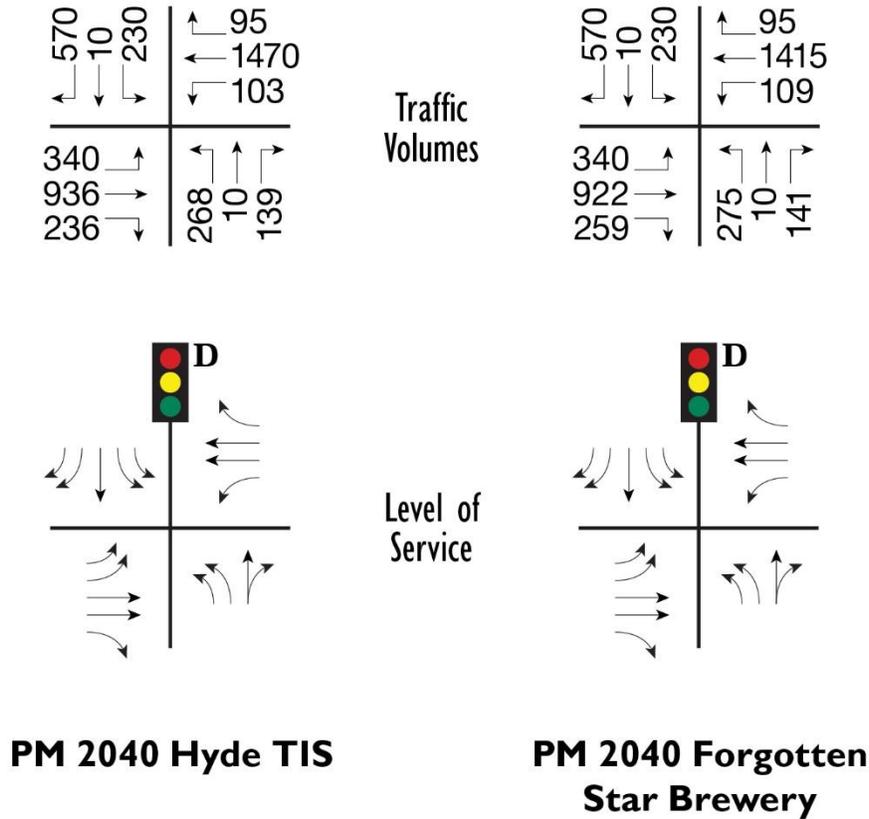
Land Use (Trip Generation Category)	Quantity	Daily Vehicle Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
Current Midtown Neighborhood Proposal								
Industrial Park (#130 11 th Edition)	1,603.2 KSF	5,403	442	103	545	120	425	545
Brewery Tap Room (#971)	12.5 KSF	771	7	2	9	72	51	123
Subtotal		6,174	449	105	554	192	476	668
2021 Hyde Industrial TIS								
Industrial Park (#130 10 th Edition)	1,861.5 KSF	6,274	603	142	745	156	589	745
Subtotal		6,274	603	142	745	156	589	745
Change from Previous Plan		-100	-154	-37	-191	+36	-113	-77
Percent Change		-1.6%	--	--	-25.6%	--	--	-10.3%

The comparison of trip generation indicates a decrease of 191 AM peak hour trips 77 PM peak hour trips. These correspond to percentage decreases of 25.6 in the AM peak hour and 10.3 in the PM peak hour. City of Aurora typically indicates that sites are in conformance as long as increases do not exceed 20 percent which is met with the current proposal based on changes proposed since the Hyde Industrial TIS was completed in August 2021.

Operational Analysis

Despite general conformance with the Hyde Industrial TIS, City of Aurora staff has requested operational analysis of the intersection of 64th Avenue and Gun Club Road to determine if the change in use necessitates any modification to that intersection. 64th Avenue and Gun Club Road is anticipated to be the signalized access that will provide primary access for the western half of the industrial park including the proposed Forgotten Star Brewery. With brewery operations being minimal in the peak hour only the PM peak hour is critical to this analysis.

Site traffic has been reassigned to the network using the revised trip generation presented above in based upon the distribution from the prior Hyde Industrial TIS. **Figure 2** below illustrates the modest increases in traffic at the intersection of 64th Avenue and Gun Club Road that result from the change in use from typical industrial park uses to the proposed brewery and tap room. Minor modifications to signal timing have been made to accommodate shifts in volume and it is not anticipated to affect overall LOS at the intersection. Modest increases to eastbound and westbound 95th percentile queuing is anticipated for through movements, but northbound queuing remains unchanged at 225 feet for the northbound left and 150 feet for the northbound right. Synchro analysis worksheets for both scenarios are attached to this letter for review by city staff.



LEGEND

- XXX = PM Peak Hour Traffic Volumes
- X = PM Peak Hour Signalized Intersection Level of Service
-  = Traffic Signal

Figure 2. LOS Comparison

Signal Warrant

City of Aurora staff have requested the evaluation of volume based signal warrants as part of the site plan submittal for Forgotten Star Brewery. However, due to the proximity of the site to DEN Airport city staff has requested that analysis occur in January after the conclusion of the holiday travel season. It is anticipated that a daily count will be collected along 64th Avenue just west of the intersection of 64th Avenue and Gun Club Road to determine when the PM peak hours occur. A turning movement count from the same date will also be collected for the two hours determined to be the height of the PM peak period. No AM analysis will occur as the brewery operation generates minimal traffic during the morning hours. This analysis will be provided in a resubmission of this letter report in early 2025.

Conclusions

The study resulted in the following conclusions:

- The newly proposed Forgotten Star Brewery and other previous conformance letters within Hyde Industrial generates slightly less traffic as compared to the values analyzed in the Hyde Industrial TIS on a daily basis and during the AM and PM peak hours. These decreases are approximately 100 daily trips, 191 in the AM peak hour, and 77 in the PM peak hour. This equates to a less than a two

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percent decrease in daily traffic, approximately 25 percent decrease during the AM peak hour, and approximately 10 percent decrease during the PM peak hour.

- While the development is in conformance, City staff requested 2040 PM analysis of the intersection of 64th Avenue and Gun Club Road to ensure operations do not degrade as a result of the change in use from industrial to brewery and taproom. This intersection will be the primary access point for the brewery which does see increased use during the PM as compared to typical industrial uses. It is not anticipated that the additional traffic associated with the brewery will negatively impact the intersection operations or result in additional northbound queuing at the intersection.
- A signal warrant has been requested by City staff, but due to the impacts of holiday travel season on traffic near the site this analysis will be deferred until January of 2025.

Please let me know if you have any questions about this letter or need any additional information.



Philip Dunham, PE, PTOE
Transportation Engineer

Timings
3: Gun Club Rd & E 64th Ave

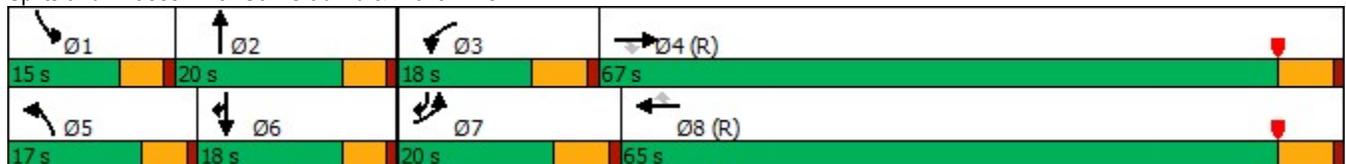


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↖	↑↑	↗	↔↔	↗	↔↔	↑	↔↔
Traffic Volume (vph)	340	936	236	103	1470	95	268	10	230	10	570
Future Volume (vph)	340	936	236	103	1470	95	268	10	230	10	570
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2	1	6	6 7
Permitted Phases			4			8					
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	15.0	31.0	31.0	15.0	31.0	31.0	15.0	15.0	15.0	15.0	
Total Split (s)	20.0	67.0	67.0	18.0	65.0	65.0	17.0	20.0	15.0	18.0	
Total Split (%)	16.7%	55.8%	55.8%	15.0%	54.2%	54.2%	14.2%	16.7%	12.5%	15.0%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes		Yes		Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	
Act Effct Green (s)	16.0	63.8	63.8	13.2	61.0	61.0	13.0	16.0	11.0	14.0	34.0
Actuated g/C Ratio	0.13	0.53	0.53	0.11	0.51	0.51	0.11	0.13	0.09	0.12	0.28
v/c Ratio	0.91	0.61	0.30	0.65	1.00	0.13	0.88	0.51	0.90	0.06	0.82
Control Delay	68.2	21.0	5.5	60.3	41.7	4.6	80.5	15.0	87.0	48.1	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	21.0	5.5	60.3	41.7	4.6	80.5	15.0	87.0	48.1	45.8
LOS	E	C	A	E	D	A	F	B	F	D	D
Approach Delay		29.2			40.7			57.1		57.5	
Approach LOS		C			D			E		E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 7 (6%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 41.4
 Intersection Capacity Utilization 79.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 3: Gun Club Rd & E 64th Ave



HCM 6th Signalized Intersection Summary
3: Gun Club Rd & E 64th Ave

High Point Hyde Industrial
12/19/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	936	236	103	1470	95	268	10	139	230	10	570
Future Volume (veh/h)	340	936	236	103	1470	95	268	10	139	230	10	570
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	1678	1678	1678	1678	1678	1678	1678	1678	1678	1678	1678	1678
Adj Flow Rate, veh/h	370	1017	110	112	1598	-6	291	11	97	250	11	593
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	15	15	15	15	15	15	15	15	15	15	15	15
Cap, veh/h	413	1730	772	158	1620	723	336	20	173	284	196	605
Arrive On Green	0.13	0.54	0.54	0.13	0.68	0.00	0.11	0.13	0.13	0.09	0.12	0.12
Sat Flow, veh/h	3100	3188	1422	1598	3188	1422	3100	147	1297	3100	1678	2502
Grp Volume(v), veh/h	370	1017	110	112	1598	-6	291	0	108	250	11	593
Grp Sat Flow(s),veh/h/ln	1550	1594	1422	1598	1594	1422	1550	0	1444	1550	1678	1251
Q Serve(g_s), s	14.1	25.7	4.6	8.1	58.5	0.0	11.1	0.0	8.4	9.6	0.7	14.0
Cycle Q Clear(g_c), s	14.1	25.7	4.6	8.1	58.5	0.0	11.1	0.0	8.4	9.6	0.7	14.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	413	1730	772	158	1620	723	336	0	193	284	196	605
V/C Ratio(X)	0.90	0.59	0.14	0.71	0.99	-0.01	0.87	0.00	0.56	0.88	0.06	0.98
Avail Cap(c_a), veh/h	413	1730	772	186	1620	723	336	0	193	284	196	605
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	0.47	0.47	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	18.4	13.6	50.5	19.0	0.0	52.6	0.0	49.1	53.8	47.1	45.2
Incr Delay (d2), s/veh	15.6	1.0	0.3	4.7	12.4	0.0	20.5	0.0	3.7	25.6	0.1	31.6
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	9.6	13.0	2.6	5.3	22.0	0.0	9.0	0.0	5.8	8.3	0.5	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	19.4	13.9	55.2	31.5	0.0	73.2	0.0	52.8	79.4	47.2	76.8
LnGrp LOS	E	B	B	E	C	A	E	A	D	E	D	E
Approach Vol, veh/h		1497			1704			399			854	
Approach Delay, s/veh		30.7			33.1			67.7			77.2	
Approach LOS		C			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	20.0	15.9	69.1	17.0	18.0	20.0	65.0				
Change Period (Y+Rc), s	5.0	5.0	6.0	6.0	5.0	5.0	6.0	6.0				
Max Green Setting (Gmax), s	10.0	15.0	12.0	61.0	12.0	13.0	14.0	59.0				
Max Q Clear Time (g_c+I1), s	11.6	10.4	10.1	27.7	13.1	16.0	16.1	60.5				
Green Ext Time (p_c), s	0.0	0.1	0.0	8.4	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	43.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Timings
3: Gun Club Rd & E 64th Ave

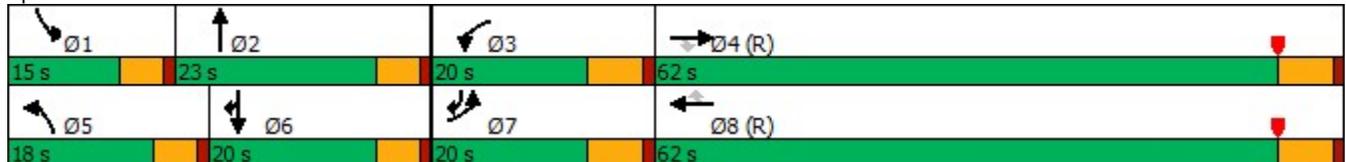


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖	↑↑	↖	↖↗	↑	↖↗	↑	↖↗
Traffic Volume (vph)	340	922	259	109	1415	95	275	10	230	10	570
Future Volume (vph)	340	922	259	109	1415	95	275	10	230	10	570
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2	1	6	6 7
Permitted Phases			4			8					
Detector Phase	7	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	15.0	31.0	31.0	15.0	31.0	31.0	15.0	15.0	15.0	15.0	
Total Split (s)	20.0	62.0	62.0	20.0	62.0	62.0	18.0	23.0	15.0	20.0	
Total Split (%)	16.7%	51.7%	51.7%	16.7%	51.7%	51.7%	15.0%	19.2%	12.5%	16.7%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes		Yes		Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	
Act Effct Green (s)	16.0	59.5	59.5	14.5	58.0	58.0	14.0	19.0	11.0	16.0	36.0
Actuated g/C Ratio	0.13	0.50	0.50	0.12	0.48	0.48	0.12	0.16	0.09	0.13	0.30
v/c Ratio	0.91	0.64	0.34	0.62	1.01	0.14	0.84	0.46	0.90	0.05	0.78
Control Delay	69.3	23.8	6.3	62.3	49.8	5.0	73.2	13.2	87.0	46.2	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	23.8	6.3	62.3	49.8	5.0	73.2	13.2	87.0	46.2	41.8
LOS	E	C	A	E	D	A	E	B	F	D	D
Approach Delay		31.0			48.0			52.0		54.7	
Approach LOS		C			D			D		D	

Intersection Summary

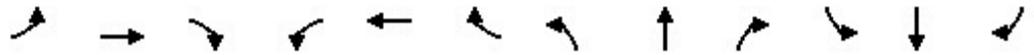
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 8 (7%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 43.7
 Intersection Capacity Utilization 78.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service D

Splits and Phases: 3: Gun Club Rd & E 64th Ave



HCM 6th Signalized Intersection Summary
3: Gun Club Rd & E 64th Ave

High Point Hyde Industrial
12/19/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↗	↑↑	↖	↖↗	↖		↖↗	↑	↖↗
Traffic Volume (veh/h)	340	922	259	109	1415	95	275	10	141	230	10	570
Future Volume (veh/h)	340	922	259	109	1415	95	275	10	141	230	10	570
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	1678	1678	1678	1678	1678	1678	1678	1678	1678	1678	1678	1678
Adj Flow Rate, veh/h	370	1002	135	118	1538	-6	299	11	99	250	11	593
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	15	15	15	15	15	15	15	15	15	15	15	15
Cap, veh/h	413	1638	730	164	1541	687	362	23	206	284	224	646
Arrive On Green	0.09	0.34	0.34	0.14	0.64	0.00	0.12	0.16	0.15	0.09	0.13	0.13
Sat Flow, veh/h	3100	3188	1422	1598	3188	1422	3100	144	1299	3100	1678	2502
Grp Volume(v), veh/h	370	1002	135	118	1538	-6	299	0	110	250	11	593
Grp Sat Flow(s),veh/h/ln	1550	1594	1422	1598	1594	1422	1550	0	1444	1550	1678	1251
Q Serve(g_s), s	14.2	31.3	8.0	8.5	57.7	0.0	11.3	0.0	8.4	9.6	0.7	16.0
Cycle Q Clear(g_c), s	14.2	31.3	8.0	8.5	57.7	0.0	11.3	0.0	8.4	9.6	0.7	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	413	1638	730	164	1541	687	362	0	229	284	224	646
V/C Ratio(X)	0.90	0.61	0.18	0.72	1.00	-0.01	0.83	0.00	0.48	0.88	0.05	0.92
Avail Cap(c_a), veh/h	413	1638	730	213	1541	687	362	0	229	284	224	646
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	0.64	0.64	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	29.4	21.8	50.1	21.4	0.0	51.8	0.0	46.4	53.8	45.4	43.3
Incr Delay (d2), s/veh	16.2	1.2	0.4	5.1	17.9	0.0	14.6	0.0	1.6	25.6	0.1	18.1
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	10.1	17.5	4.9	5.9	25.0	0.0	8.8	0.0	5.6	8.3	0.5	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	30.6	22.1	55.3	39.3	0.0	66.4	0.0	48.0	79.4	45.5	61.3
LnGrp LOS	E	C	C	E	D	A	E	A	D	E	D	E
Approach Vol, veh/h		1507			1650			409			854	
Approach Delay, s/veh		39.5			40.6			61.4			66.4	
Approach LOS		D			D			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	23.0	16.4	65.6	18.0	20.0	20.0	62.0				
Change Period (Y+Rc), s	5.0	5.0	6.0	6.0	5.0	5.0	6.0	6.0				
Max Green Setting (Gmax), s	10.0	18.0	14.0	56.0	13.0	15.0	14.0	56.0				
Max Q Clear Time (g_c+I1), s	11.6	10.4	10.5	33.3	13.3	18.0	16.2	59.7				
Green Ext Time (p_c), s	0.0	0.2	0.1	7.5	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.