A&R Engineering, Inc.

Memorandum

To: Yanni Spanoudakis, P.E.
Engineering & Stormwater Services Director,
City of Powder Springs
From: Abdul Amer, PE
Date: December 03, 2024
Subject: Retail Development at 4391 Brownsville Road, Powder Springs, GA | A&R 24-204

The purpose of this memorandum is to provide a response to your comments dated November 25, 2024, on the traffic impact study dated October 30, 2024, for the above development. The location of the development is shown below in figure 1.

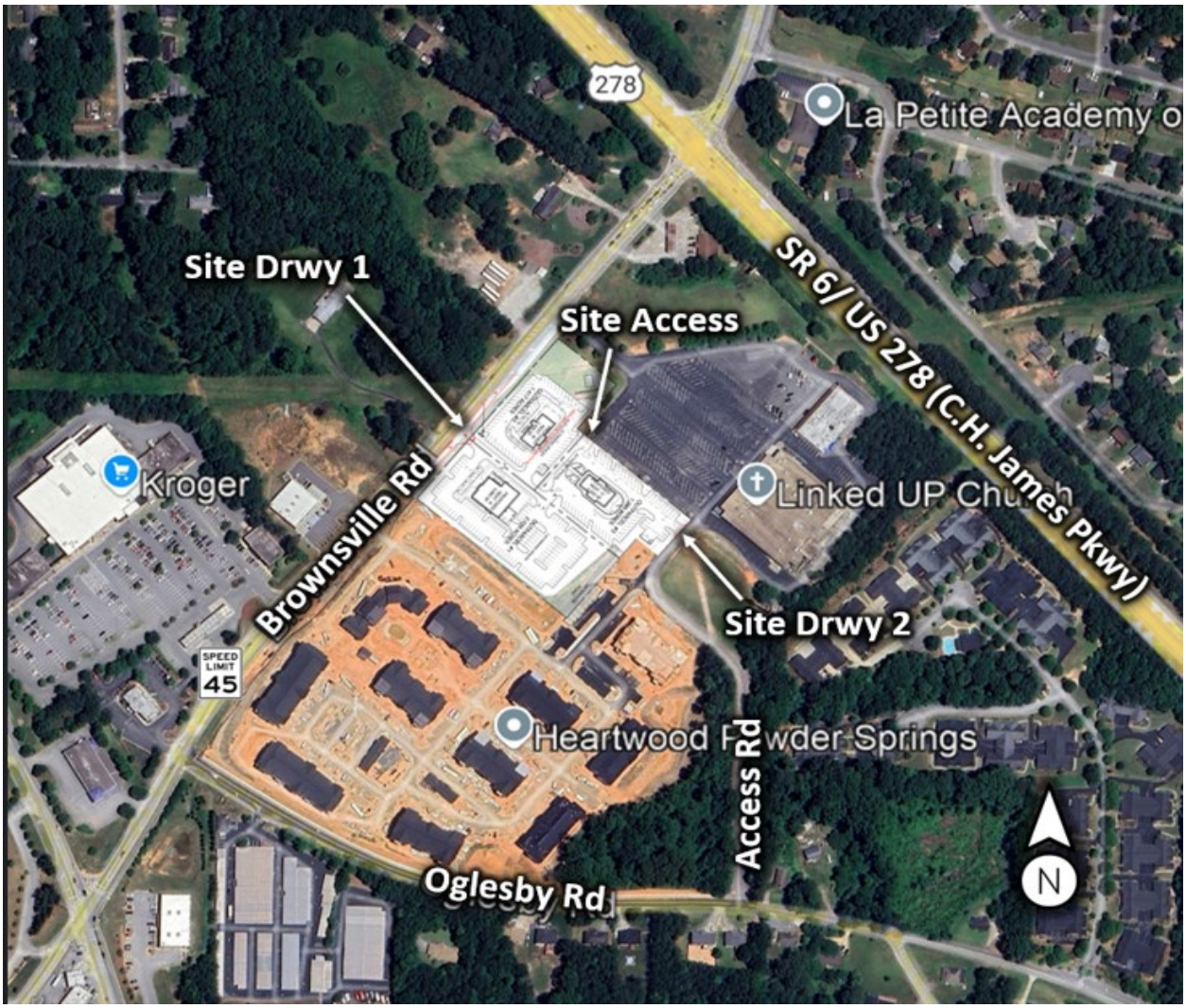

Figure 1 – Site Location

RESPONSES TO THE COMMENTS:

COMMENT 1: No evaluation of Site Driveway 1 with a traffic signal provided for comparison.

RESPONSE: The stop-controlled approach of site driveway 1 at Brownsville Road will operate at satisfactory level of service "C" in the AM peak and level of service "E" in the PM peak with delays of 45.1 seconds. It is not unusual for stop-controlled side-streets along arterial roadways to have delays of this magnitude during peak periods. The results of the preliminary signal warrant analysis we conducted based on the available traffic volumes for the four peak hours, showed that none of the signal warrants were met. We therefore did not recommend installation of a traffic signal or evaluate the site driveway 1 with a traffic signal configuration. If a traffic signal were to be installed, it will cause unnecessary delays to the through traffic on Brownsville Road.

Georgia Code OCGA 32-6-50 mandates installation of traffic control devices even by local municipalities be done in a manner that is consistent with State Adopted Uniform standards. The State Transportation Board's resolution dated September 18, 2024, has adopted the 11th edition of the Manual of Uniform Control Devices (MUTCD) as the uniform standard for installation of traffic control devices per state law.

Chapter 4 of MUTCD discusses the criteria for installation of traffic signal. Our engineering study shows that none of the signal warrants are met based on the projected future peak hour traffic volumes, and therefore, a traffic signal is not the best solution to improve operations and safety at this intersection. As a matter of fact, a traffic signal at a location where traffic volumes do not warrant, may cause rear end accidents and negatively impact safety and operations.

A copy of Georgia code, State Transportation Board's resolution and relevant sections of MUTCD are attached.

The proposed development generates much smaller trip compared to Kroger shopping center or the traffic on Oglesby Road. AS you know Oglesby Road and Kroger Shopping Center driveways on Brownsville Road do not have a traffic signal.

We analysed the intersection with a traffic signal now. A comparison of the delays is given below:

TABLE 1 – FUTURE INTERSECTION OPERATIONS

Intersection		LOS (Delay)			
		Stop Control		Traffic Signal	
		AM Peak	PM Peak	AM Peak	PM Peak
4	**Brownsville Road @ Site Driveway 1**			**B (15.2)**	**B (9.6)**
	-Westbound Approach	C (21.0)	E (45.1)	E (67.3)	E (68.1)
	-Northbound Approach	-	-	B (14.9)	B (9.9)
	-Southbound *Left*/Approach	*A (9.6)*	*A (8.7)*	A (3.9)	A (5.0)

A review of the delays in both conditions shows that the traffic signal not only introduces delays of 14.5 seconds and 9.9 seconds respectively for AM and PM peak hours for the northbound traffic which will otherwise be free flow without delays in 'Stop' control option, but also increases the delays for the driveway approach from 45.1 seconds to 67.3 and 68.1 seconds in AM and PM peak hours respectively. Synchro reports of the signalized scenario are attached.

COMMENT 2: No factor added to pass-by trips due to high existing traffic on Brownsville Road.

RESPONSE: The pass-by trips percentages we used in the traffic study are based on the National Database compiled by The Institute of Transportation Engineers in their latest Trip Generation Manual. This data already factors in high traffic volumes on the main road. If the traffic volumes on the road are not high, the pass-by trips have to be actually limited to no more than 10% of total trip generation. ITE Manual does not recommend any further adjustment factor to pass-by trips.

COMMENT 3: No factor added for trip generation of interconnected parcels.

RESPONSE: The site has one inter-parcel connection to Linked-Up Church. The Church programs are typically on weekends or an off-peak hour. Since our study was based on the weekday peak hour conditions, we did not include the church's inter-parcel access trips in our study. Also, the church has its own full access driveway.

COMMENT 4: No factor added to control delay of left turns out due to competing drives in close proximity to the proposed drive.

RESPONSE: The proposed driveway intersection is a T-intersection. Other than a residential driveway on the other side of the road, adjacent commercial driveways are spaced adequately far enough to not impact delays on the proposed driveway. The O'Reily/Residential driveway to the south is 325 feet away and the driveway to the church driveway to the north is 375 feet away. The spacing of these driveways is much better than the spacing between O'Reily Auto Parts, the two existing Kroger Shopping Center driveways and Oglesby Road which are all between 200 and 250 feet.

COMMENT 5: No consideration of safety benefit of traffic signal vs free-flow intersection.

RESPONSE: A traffic signal at a location where traffic volumes or safety considerations do not warrant it, may cause rear end accidents and negatively impact safety and operations. The proposed site driveway has adequate sight distance in both directions and the projected delays are moderate in nature indicating that side street traffic can enter the main street volume safely without a traffic signal. We do not anticipate an unusual safety situation at this intersection, if controlled by 'stop' sign.

COMMENT 6: No consideration of negative impact on interconnected parcels as a whole from adding an additional free-flow intersection.

RESPONSE: The proposed site driveway primarily serves the proposed development. The adjacent Linked-Up Church has its own full access driveway. The inter-parcel connection is primarily to connect the two properties so any church users can visit the restaurants without having to go on the main road.

Universal Citation:

GA Code § 32-6-50 (2023)

- **(a)** The department shall promulgate uniform regulations governing the erection and maintenance on the public roads of Georgia of signs, signals, markings, or other traffic-control devices, such uniform regulations to supplement and be consistent with the laws of this state. Insofar as practical, with due regard to the needs of the public roads of Georgia, such uniform regulations shall conform to the recommended regulations as approved by the American Association of State Highway and Transportation Officials.
- **(b)** In conformity with its uniform regulations, the department shall place and maintain, or cause to be placed and maintained, such traffic-control devices upon the public roads of the state highway system as it shall deem necessary to regulate, warn, or guide traffic, except that the department shall place and maintain a sign for each railroad crossing at grade on the state highway system, warning motorists of such crossing, provided that each railroad company shall also erect and maintain a railroad crossbuck sign on its right of way at every such crossing. The department may remove or direct removal of all traffic-control devices and signs which are erected on the state highway system by any governing authority without the permission of the department.
- **(c)** In conformity with the uniform regulations of the department:
    - **(1)** Counties and municipalities shall place and maintain upon the public roads of their respective public road systems such traffic-control devices as are necessary to regulate, warn, or guide traffic except that counties and municipalities also shall erect and maintain a sign for each railroad crossing at grade on their respective county road or municipal street systems, warning motorists of such crossing. Furthermore, each railroad company shall erect and maintain a railroad crossbuck sign on its right of way at all such crossings; and
    - **(2)** Counties, on their respective road systems, shall place and maintain on each county road which is authorized as a designated local truck route, pursuant to official resolution of the county, at each intersection of such road with a state highway signs identifying such county road as a designated local truck route and giving notice of the maximum weight limits for such designated local truck route in accordance with subsection (f) of Code Section 32-6-26.
- **(d)** It shall be unlawful for any person to remove, deface, or damage in any way any official traffic-control device lawfully erected or maintained pursuant to this Code section or any other law.
- **(e)** No person, firm, corporation, or other entity shall offer for sale any sign, signal, marking, or other device intended to regulate, warn, or guide traffic upon the public roads of this state, unless it conforms with the uniform regulations promulgated under subsection (a) of this Code section. Any person, firm, corporation, or other entity who sells any sign, signal, marking, or other device intended to regulate, warn, or guide traffic upon the public roads of this state in violation of this Code section shall make restitution to the purchaser in an

amount equal to the entire sum, plus interest, originally paid for the sign, signal, marking, or other device. Any person, firm, corporation, or other entity who knowingly sells any sign, signal, marking, or other device intended to regulate, warn, or guide traffic upon the public roads of this state in violation of subsection (a) of this Code section shall be guilty of a misdemeanor.

Georgia Department of Transportation

Interoffice Memo

DATE: September 18, 2024

FROM: Meg B. Pirkle, PE, Chief Engineer

TO: GDOT Divisions, Offices and Districts
GPTQ Consultant Relations Committee

SUBJECT: Formal Adoption of the 11th Edition of the Manual on Uniform Traffic Control Devices (MUTCD)

On June 20, 2024, the State Transportation Board voted unanimously to adopt the 11th edition of the Manual on Uniform Traffic Control Devices (MUTCD).

The adoption of the 11th edition of the MUTCD reflects GDOT's ongoing commitment to enhancing road safety, ensuring uniformity in traffic control devices, and aligning with the latest federal standards.

Effective June 20, 2024, all design, construction, maintenance, and operations within GDOT will transition to using the 11th edition of the MUTCD. Standard drawings, specifications, and guidelines are in the process of being updated to ensure conformance with the new manual.

Any project that has a let date prior to January 2025 will still follow the 10th edition (2009) of the MUTCD; projects with let dates after January 2025 shall follow the 11th edition of the MUTCD. No *Use on Construction* revisions will be issued for any projects currently under construction.

Thank you for your dedication and support as we continue to improve the safety and mobility of Georgia's transportation network. The new manual may be found online at: https://mutcd.fhwa.dot.gov/kno_11th_Edition.htm

Attachment: GDOT Board Resolution on 11th Edition of the MUTCD

A Resolution

By the

State Transportation Board

Whereas, Section 32-6-50(a) of the Official Code of Georgia Annotated requires the Department to promulgate uniform regulations for the maintenance and erection of traffic control devices on the public roads of Georgia, and

Whereas, on April 15, 2010, the State Transportation Board Adopted the "Manual on Uniform Traffic Control Devices, 2009 Edition" as the uniform regulations governing the erection and maintenance of traffic control devices, as required by Section 32-6-50(a) of the Official Code of Georgia Annotated; and

Whereas, A new 11th edition of the Manual on Uniform Traffic Control Devices has been published which addresses specific areas of concern by the Georgia Department of Transportation including traffic controls for pedestrians, bicycles, vehicles, including those connected and automated, and transit; and

Whereas, it has been deemed expedient that said 11th edition of the Manual on Uniform Traffic Control Devices, insofar as practical, confirms with the new manual approved and adopted by the Federal Highway Administration, U.S. Department of Transportation in accordance with Title 23, United States Code, Sections 109(d) and Part 655.603, which is approved as the national standard for designing, applying, and planning traffic control devices.

Now, therefore, be it resolved that the "Manual on Uniform Traffic Control Devices, 11th Edition", is hereby adopted and declared by the State Transportation Board to be the uniform regulation governing the erection and maintenance of traffic control devices required by O.C.G.A. §32-6-50(a).

Adopted this 20th day of June, 2024.

Approved:

Russell R. McMurry, Commissioner
Department of Transportation

Robert Brown, Chairman
State Transportation Board

MUTCD 11th Edition CHAPTER 4B – TRAFFIC CONTROL SIGNALS

Section 4B.02

Traffic control signals are often considered a panacea for all traffic problems at intersections. This belief has led to traffic control signals being installed at many locations where they are not needed, adversely affecting the safety and efficiency of motor vehicle, bicycle, and pedestrian traffic.

Section 4B.04 Basis of Installation of Traffic Control Signals:

A careful analysis of traffic operations, pedestrian and bicyclist needs, and other factors at a large number of signalized and unsignalized locations, coupled with engineering judgment, has provided a series of signal warrants, described in Chapter 4C, that define the minimum conditions under which installing traffic control signals might be justified.

Section 4C.01 Studies and Factors for Justifying Traffic Control Signals Standard:

Except for a temporary traffic control signal (see Section 4D.11) installed in a temporary traffic control zone, before a traffic control signal is installed at a particular location, an engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at that location.

The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:

Warrant 1, Eight-Hour Vehicular Volume

Warrant 2, Four-Hour Vehicular Volume

Warrant 3, Peak Hour

Warrant 4, Pedestrian Volume

Warrant 5, School Crossing

Warrant 6, Coordinated Signal System

Warrant 7, Crash Experience

Warrant 8, Roadway Network

Warrant 9, Intersection Near a Grade Crossing

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

The safe and efficient movement of all road users is the primary consideration in the engineering study to determine whether to install a traffic control signal or to install some other type of control or roadway configuration. Installation of a traffic control signal does not necessarily result in

improved safety in every case. In some cases, the installation of a traffic control signal at an inappropriate location could adversely impact safety for one or more types of road users. The purpose of the engineering study is to evaluate all of the factors that are relevant to a specific location. The satisfaction of a warrant (or warrants) is one of the relevant factors in the engineering study, but it is not intended to be the only factor or even the overriding consideration. Agencies can install a traffic control signal at a location where no warrants are met, but only after conducting an engineering study that documents the rationale for deciding that the installation of a traffic control signal is the best solution for improving the overall safety and/or operation at the location.

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	23	672	39	53	334
Future Volume (vph)	23	672	39	53	334
Lane Group Flow (vph)	95	730	42	58	363
Turn Type	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	6		5	2
Permitted Phases			6	2	
Detector Phase	3	6	6	5	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.5	21.5	21.5	15.0	21.5
Total Split (s)	20.0	82.0	82.0	15.0	100.0
Total Split (%)	16.7%	68.3%	68.3%	12.5%	83.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag		Lead	Lead	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max
v/c Ratio	0.54	0.54	0.04	0.10	0.23
Control Delay	30.3	10.9	2.5	2.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	10.9	2.5	2.4	2.4
Queue Length 50th (ft)	19	253	1	5	39
Queue Length 95th (ft)	71	405	13	15	78
Internal Link Dist (ft)	143	233			879
Turn Bay Length (ft)			175	235	
Base Capacity (vph)	261	1344	1152	611	1567
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.54	0.04	0.09	0.23

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 4: Brownsville Rd & Site Drwy 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	64	672	39	53	334
Future Volume (veh/h)	23	64	672	39	53	334
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	25	70	730	42	58	363
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	31	86	1192	1010	603	1564
Arrive On Green	0.07	0.07	0.64	0.64	0.15	0.84
Sat Flow, veh/h	426	1192	1870	1585	1781	1870
Grp Volume(v), veh/h	96	0	730	42	58	363
Grp Sat Flow(s),veh/h/ln	1635	0	1870	1585	1781	1870
Q Serve(g_s), s	6.9	0.0	27.8	1.2	0.0	4.7
Cycle Q Clear(g_c), s	6.9	0.0	27.8	1.2	0.0	4.7
Prop In Lane	0.26	0.73		1.00	1.00	
Lane Grp Cap(c), veh/h	118	0	1192	1010	603	1564
V/C Ratio(X)	0.81	0.00	0.61	0.04	0.10	0.23
Avail Cap(c_a), veh/h	198	0	1192	1010	603	1564
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	0.93	0.93
Uniform Delay (d), s/veh	54.9	0.0	12.9	8.1	13.8	2.0
Incr Delay (d2), s/veh	12.4	0.0	2.4	0.1	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	11.0	0.4	0.8	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.3	0.0	15.3	8.2	13.8	2.3
LnGrp LOS	E	A	B	A	B	A
Approach Vol, veh/h	96		772			421
Approach Delay, s/veh	67.3		14.9			3.9
Approach LOS	E		B			A

Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		105.8			23.8	82.0	14.2
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		94.5			9.5	76.5	14.5
Max Q Clear Time (g_c+I1), s		6.7			2.0	29.8	8.9
Green Ext Time (p_c), s		2.1			0.0	5.5	0.1

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	37	443	28	75	955
Future Volume (vph)	37	443	28	75	955
Lane Group Flow (vph)	85	482	30	82	1038
Turn Type	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	6		5	2
Permitted Phases			6	2	
Detector Phase	3	6	6	5	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.5	21.5	21.5	15.0	21.5
Total Split (s)	20.0	85.0	85.0	15.0	100.0
Total Split (%)	16.7%	70.8%	70.8%	12.5%	83.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5
Lead/Lag		Lead	Lead	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	Max	C-Max
v/c Ratio	0.52	0.36	0.03	0.10	0.65
Control Delay	42.4	7.8	2.2	2.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.5
Total Delay	42.4	7.8	2.2	2.5	6.7
Queue Length 50th (ft)	35	130	0	8	225
Queue Length 95th (ft)	85	211	10	21	427
Internal Link Dist (ft)	143	233			879
Turn Bay Length (ft)			175	235	
Base Capacity (vph)	237	1352	1157	788	1603
Starvation Cap Reductn	0	0	0	0	196
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.03	0.10	0.74

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 4: Brownsville Rd & Site Drwy 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	41	443	28	75	955
Future Volume (veh/h)	37	41	443	28	75	955
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	40	45	482	30	82	1038
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	50	56	1239	1050	771	1579
Arrive On Green	0.06	0.06	0.66	0.66	0.14	0.84
Sat Flow, veh/h	779	876	1870	1585	1781	1870
Grp Volume(v), veh/h	86	0	482	30	82	1038
Grp Sat Flow(s),veh/h/ln	1674	0	1870	1585	1781	1870
Q Serve(g_s), s	6.1	0.0	14.1	0.8	0.0	23.3
Cycle Q Clear(g_c), s	6.1	0.0	14.1	0.8	0.0	23.3
Prop In Lane	0.47	0.52		1.00	1.00	
Lane Grp Cap(c), veh/h	108	0	1239	1050	771	1579
V/C Ratio(X)	0.80	0.00	0.39	0.03	0.11	0.66
Avail Cap(c_a), veh/h	202	0	1239	1050	771	1579
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	0.68	0.68
Uniform Delay (d), s/veh	55.4	0.0	9.2	7.0	7.4	3.3
Incr Delay (d2), s/veh	12.7	0.0	0.9	0.1	0.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	5.3	0.2	0.7	4.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.1	0.0	10.1	7.0	7.6	4.8
LnGrp LOS	E	A	B	A	A	A
Approach Vol, veh/h	86		512			1120
Approach Delay, s/veh	68.1		9.9			5.0
Approach LOS	E		A			A

Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		106.8			21.8	85.0	13.2
Change Period (Y+Rc), s		5.5			5.5	5.5	5.5
Max Green Setting (Gmax), s		94.5			9.5	79.5	14.5
Max Q Clear Time (g_c+I1), s		25.3			2.0	16.1	8.1
Green Ext Time (p_c), s		10.7			0.1	3.1	0.1

Intersection Summary	
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.