

TRAFFIC STUDY FOR

CHATEAU ELAN RESIDENTIAL DEVELOPMENT

DATE:

November 5, 2018

LOCATION:

Braselton, Georgia

PREPARED FOR:

Rochester & Associates

PREPARED BY:

CALYX Engineers & Consultants, an NV5 Company



www.calyxengineers.com

nv5.com

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A. Introduction

A new residential development consisting of 115 townhomes and 16 single-family homes is proposed for construction on three tracts of land totaling approximately 5 acres in Braselton, Georgia. The development will contain multiple access points—one along Golf Club Dr. for Tract 1 and two along Pinot Noir Drive for Tracts 2 & 3.

The traffic analyses in this report are for a single phase of construction. The purpose of this report is to identify the traffic expected to be generated by new vehicular trips when the development is completed. This study includes analysis of the No-Build and Build conditions at the following intersections for the year 2023:

1. Tour De France at SR 211 (Old Winder Hwy)
2. Pinot Noir Drive at SR 211 (Old Winder Hwy)

The report summarizes background and projected traffic at the study locations, analysis of traffic impacts including level of service (LOS) and conclusions and recommendations from the analysis.

Figure 1. Vicinity Map

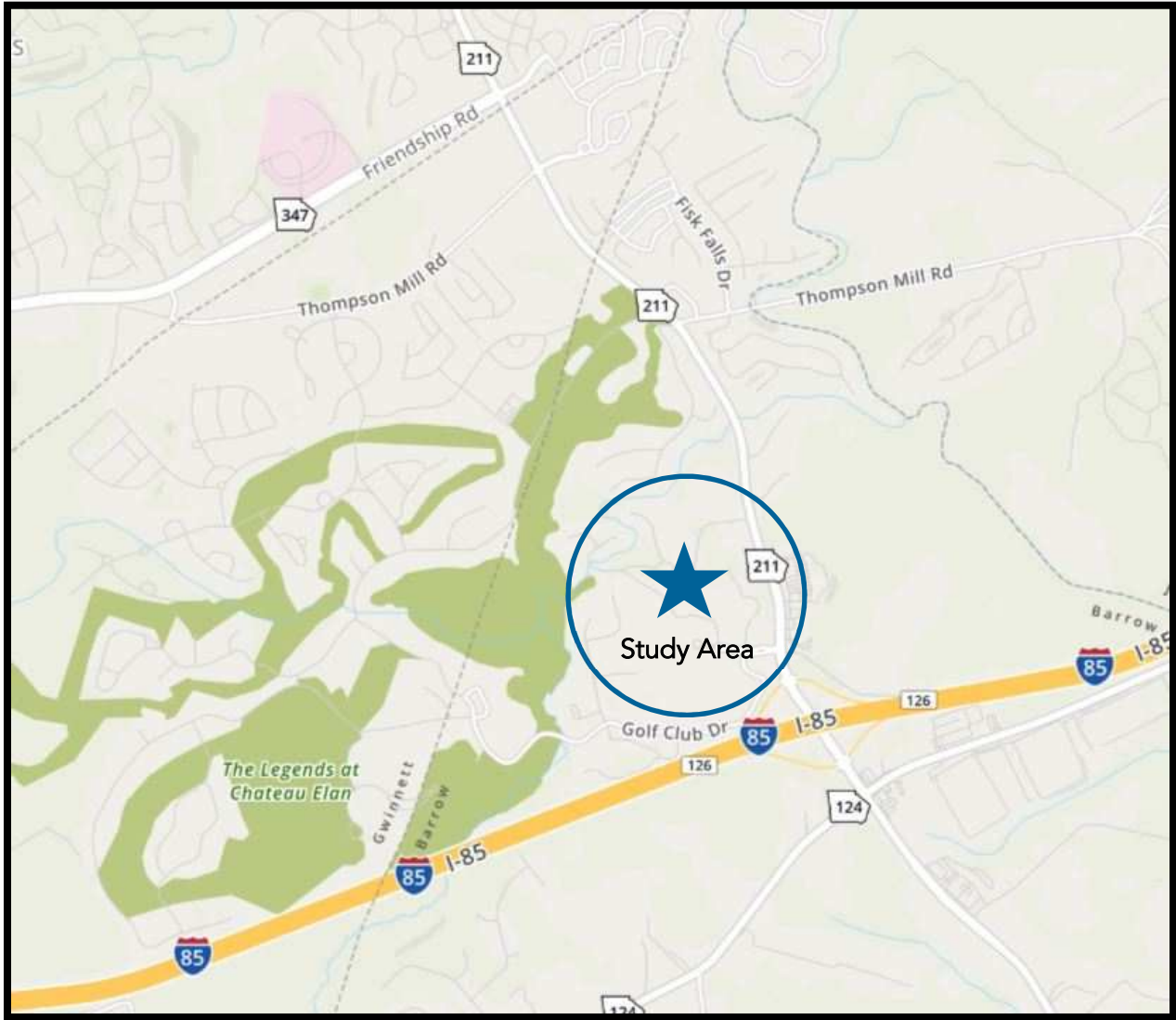
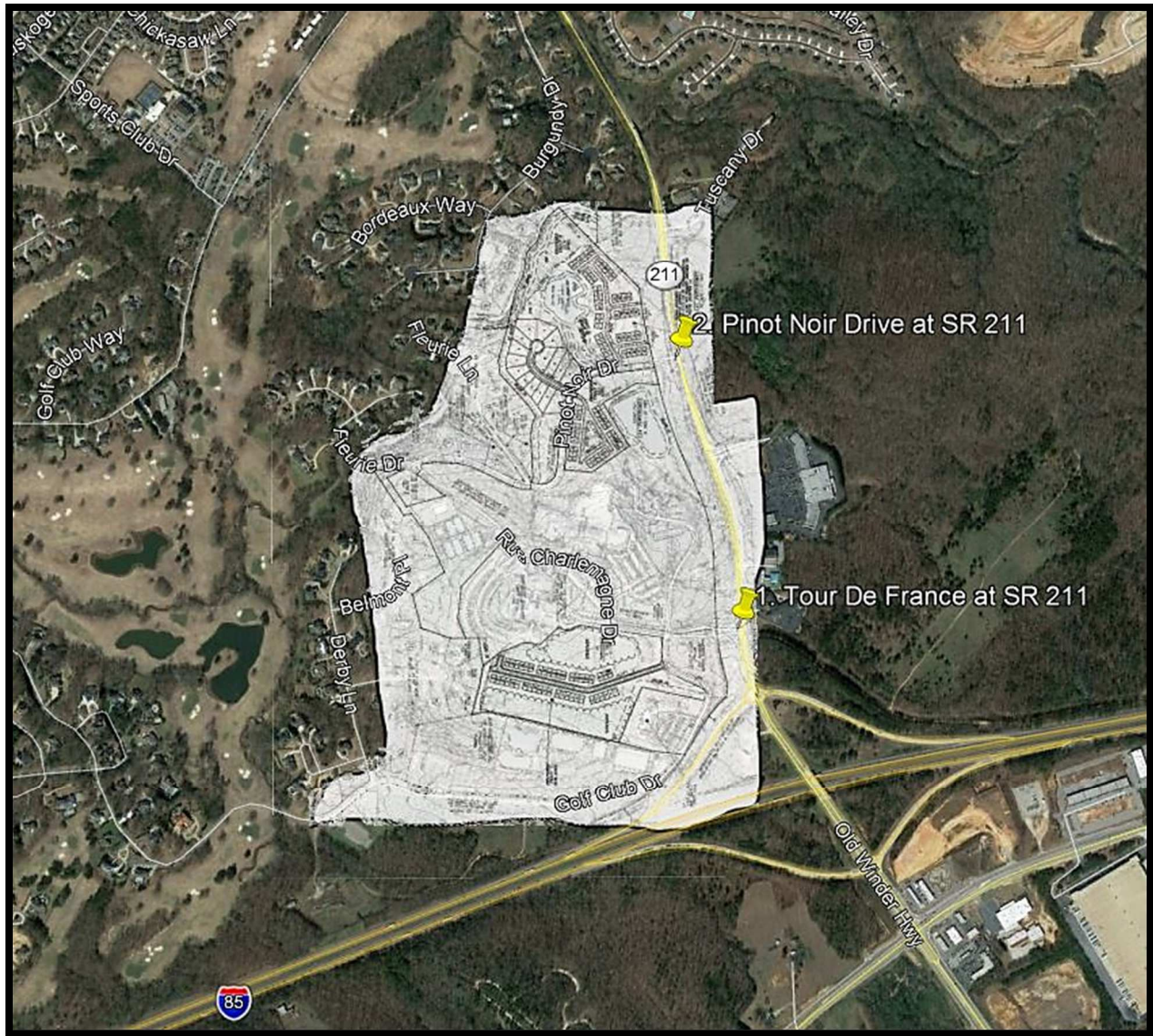


Figure 2. Site Location Aerial



B. Existing Conditions

B.1. Transportation Facilities

SR 211 (Old Winder Hwy) is a two-lane, north-south roadway classified as a minor arterial. SR 211 traverses three counties (Hall, Gwinnett, and Barrow) from SR 53 in the north through downtown Winder and Statham to the southeast to SR 316. The posted speed limit along the majority of the roadway is 45 MPH. Land uses along the corridor are mixed and include residential, commercial, and office uses. SR 211 is planned for widening from SR 124/ Braselton Hwy to SR 347/ Friendship Road. Both intersections within the study area are included in the analysis for the planned widening. Widening of the roadway will include the addition of one lane in each direction, where the cross section will be a four-lane road with a raised median. The widening seeks to mitigate increasing congestion and improve operation and safety along the corridor.

Tour De France is a two-lane, median-divided, east-west, local roadway that provides access to Chateau Elan – a winery, spa and resort development, as well as a golf course and residential development. Tour De France is intersected by Haven Harbour Drive to the north and Golf Club Drive to the south, where the driveway for access to 44 of the 115 townhomes will be located. The roadway's intersection with SR 211 is approximately 525 feet from the southbound ramp for I-85.

Pinot Noir Drive is an east-west local roadway that provides access to the Par 3 golf course and residential development. Access from SR 211 is gate controlled. The roadway's intersection with SR 211 is currently an unsignalized T-intersection.

C. Future Conditions

C.1. Background Data Collection

CALYX Engineers and Consultants, an NV5 Company is designing the widening of SR 211 (GDOT, PI 0013988; PI 0016089). The intersections within this study are included within the project limits of the widening. Thus, the traffic data for the widening project (volumes, growth rates, etc.) were used in the analysis of the study intersections impacted by the proposed development. The data includes proposed intersection and roadway alignments as part of a “No-Build” scenario analyzing impacts without the development and a “Build” scenario analyzing the impacts with the development. This study is consistent with the 2023 (opening year) analysis for both the proposed improvements and a full-build out of the development.

Expected changes to the road network by 2023 include:

- Braselton Parkway Extension will intersect SR 211 at a proposed roundabout with Tour De France
- A fourth and a traffic signal will be constructed opposite Pinot Noir Drive at SR 211

C.2. Project Trip Generation

Table 1 summarizes the project trip generation calculated using the Institute of Transportation Engineers’ (ITE) Trip Generation Manual, 10th Edition, 2017.

Table 1: Project Trip Generation

Land Use	Code	Project Density		Total	Inbound	Outbound
Single-Family Housing	210	Dwelling Units (16)	Daily	192	96	96
			AM	16	4	12
			PM	17	11	6
Multi-Family Housing (Low-Rise)	220	Dwelling Units (115)	Daily	496	248	248
			AM	34	8	26
			PM	44	28	16
TOTAL	220	Dwelling Units (131)	Daily	980	490	490
			AM	72	17	55
			PM	89	57	32

C.3. Trip Distribution and Assignment

Trip Distribution for the site is based on an evaluation of the traffic patterns evidenced by the existing counts and typical traffic patterns in the area. Approximately 25% of trips will be dispersed to/from northwest of the site towards I-985 via SR 211. The remaining 75% of the trips will be dispersed to/from the northeast (25%), south (35%), and southwest (15%) of the site towards cities in Gwinnett and Barrow County via SR 211 and I-85. Figure 3 depicts the applied trip distribution to the peak hour traffic volumes generated to/from the development. Figure 4 depicts the project trips distributed using the trip distribution in Figure 3. Figure 5 depicts the No-Build volumes plus the project volumes; it is representative of traffic volumes expected once the project is completed and occupied.

Figure 3: Trip Distribution

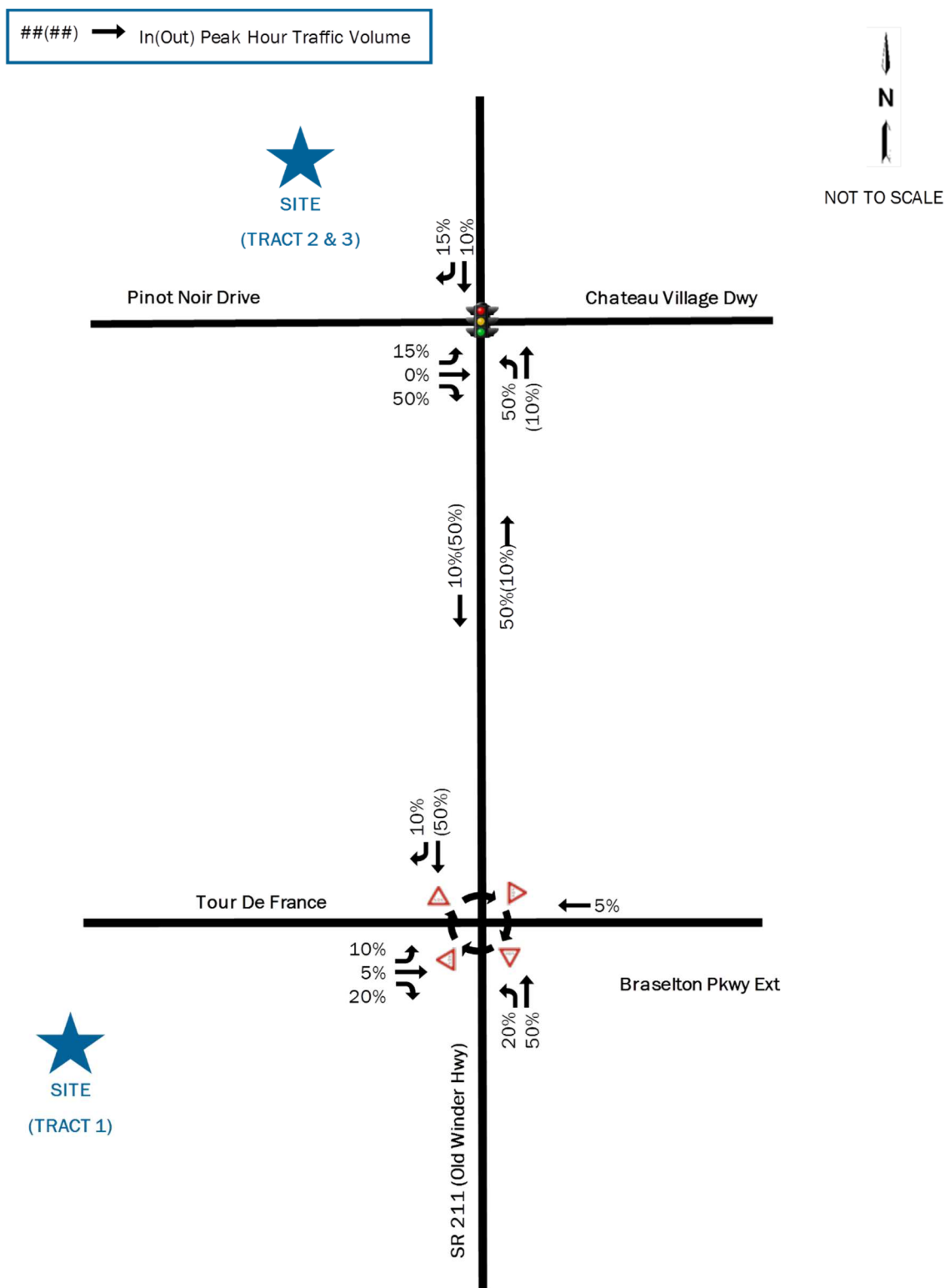


Figure 4: Project Development Trips

Trip Generation	Total	IN	OUT
Daily	980	490	490
AM Peak Hour	72	17	55
PM Peak Hour	89	57	32

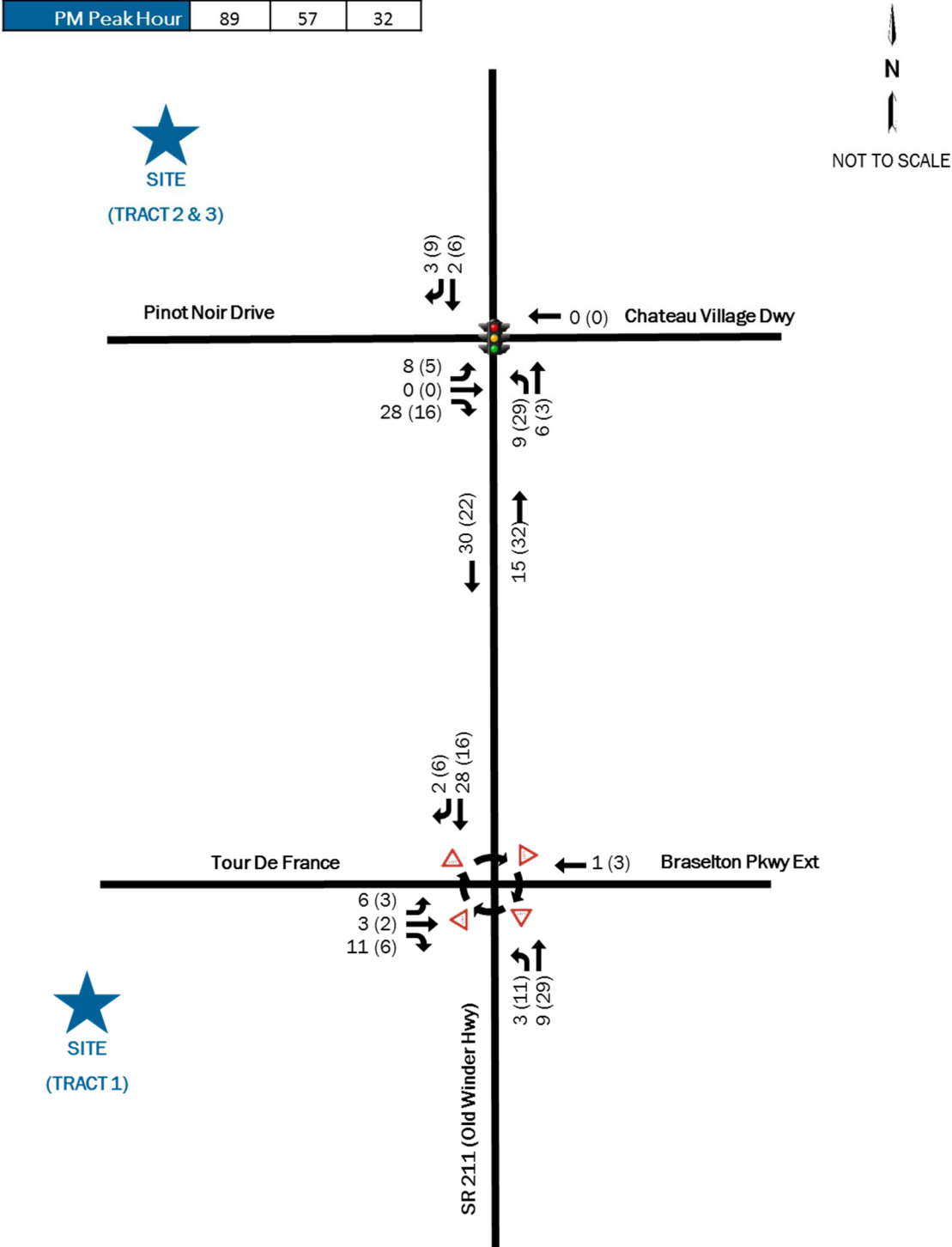


Figure 5: 2023 No-Build Traffic Volumes

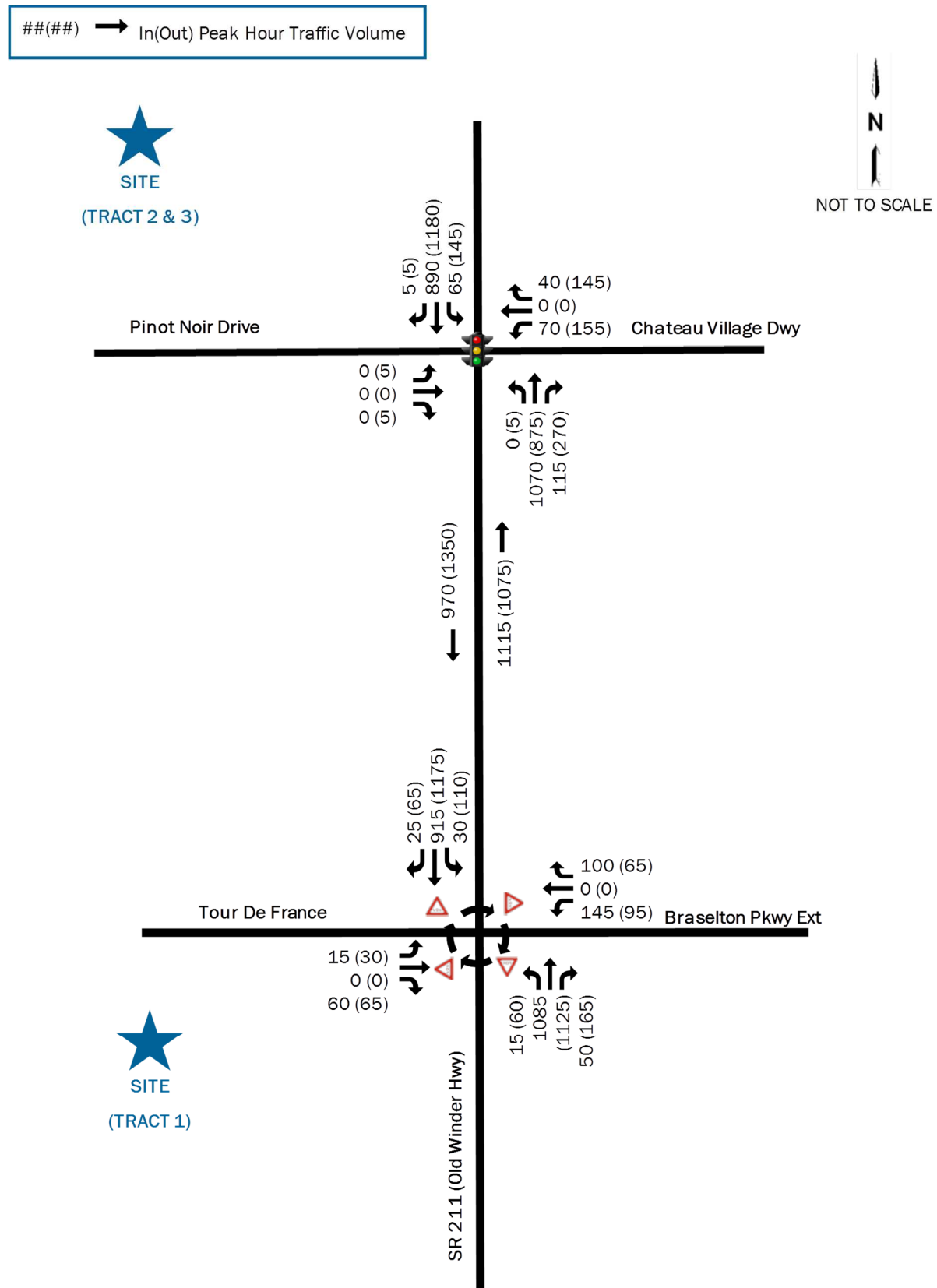
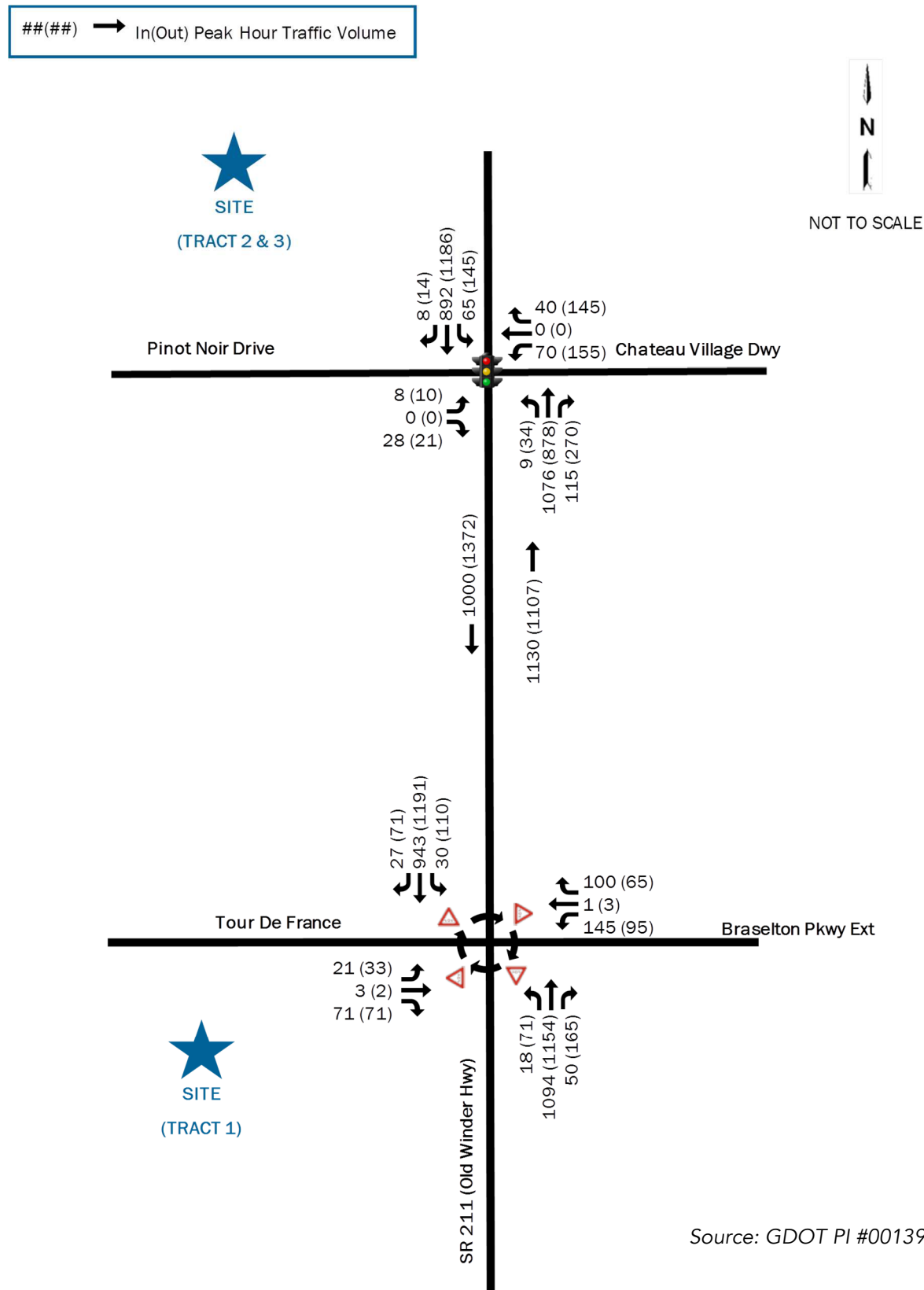


Figure 6: 2023 Build Traffic Volumes



Source: GDOT PI #0013988

D. Traffic Impact Analyses

The analysis in each of the scenarios for the study was performed using the traffic analysis software Synchro® 10 and SIDRA Intersection 8.0. Average vehicular delays are calculated and reported as Levels of Service (LOS) as defined by the Highway Capacity Manual (HCM). Synchro® and SIDRA output reports are included in the Appendix.

D.1. 2023 No-Build Capacity Analysis

The results of the No-Build capacity analysis are shown in Table 2 and include analysis of the volumes presented in Figure 5.

Table 2: 2023 No-Build Capacity Analysis

Intersection	Control	Movement	AM		PM	
			Delay (s)	LOS	Delay (s)	LOS
1. SR 211 at Tour de France	*Roundabout	NB	7.9	A	11.3	B
		WB	20.3	C	16.4	C
		SB	7.9	A	10.4	B
		EB	9.2	A	13.4	B
		Overall	9.1	A	11.3	B
2. SR 211 at Pinot Noir Dr	Signalized	EB	0	A	35.4	D
		WB	46.1	D	38.5	D
		NB	7.7	A	11.9	B
		SB	3.6	A	11.6	B
		Overall	8.0	A	15.3	B

* Roundabout analysis performed using SIDRA Intersection 8.0

Both intersections are expected operate adequately during both the AM and PM peak hours with the implementation of proposed improvements for the SR 211 widening. It should be noted that the No-Build volumes are estimates developed using GDOT rounding standards for forecasting and thus do not account for the small amount of traffic (considered "minimal movement") currently seen in the AM for Pinot Noir Drive. The rounding method also would not account for the small amount of through traffic that would be seen at Pinot Noir Drive.

D.2. 2023 Build Conditions Capacity Analysis

The results of the 2023 Build conditions intersection capacity analysis are shown in Table 3 for No-Build plus project volumes (Figure 6).

Table 3: 2023 Build Capacity Analysis

Intersection	Control	Movement	AM		PM	
			Delay (s)	LOS	Delay (s)	LOS
1. SR 211 at Tour de France	*Roundabout	NB	8.0	A	11.9	B
		WB	21.1	C	17.5	C
		SB	7.9	A	10.8	B
		EB	9.9	A	13.9	B
		Overall	9.4	A	11.8	B
2. SR 211 at Pinot Noir Dr	Signalized	EB	43.9	D	38.4	D
		WB	45.5	D	49.0	D
		NB	10.2	B	15.5	B
		SB	8.0	A	17.1	B
		Overall	11.7	B	20.8	C

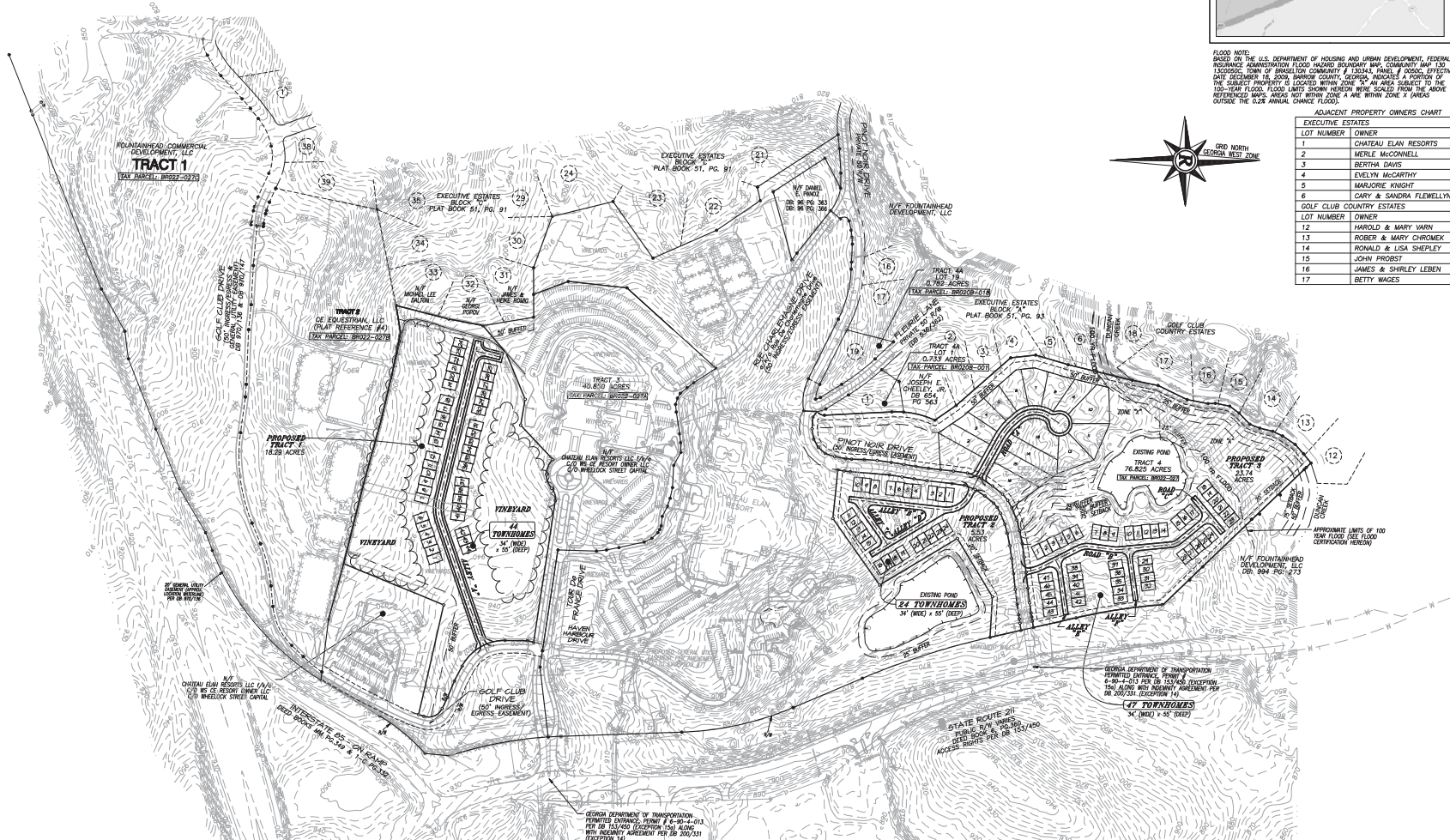
The addition of project traffic to the traffic volumes from the No-Build scenario results in expected increases in delay/ LOS at the study intersections. Amidst increases, both intersections are expected to operate adequately.

E. Conclusions

A new development of 115 townhomes and 16 single-family homes is planned for construction in Braselton, Georgia. The development will generate 17 entering trips and 55 exiting trips during the AM peak hour, and 57 entering trips and 32 exiting trips during the PM peak hour. The study intersections, Tour De France at SR 211 and Pinot Noir Drive at 211 serve as secondary access points to the development.

This study considers the planned widening of SR 211 and associated proposed improvements as a baseline No-Build scenario with an opening year of 2023. With the addition of project-generated traffic to the No-Build scenario, the study intersections are expected to operate acceptably in both the AM and PM peak hours.

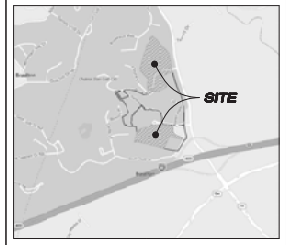
APPENDIX



OVERALL SITE TABULATION

LAND DESCRIPTION	LAND AREA
SINGLE FAMILY RESIDENTIAL TRACT	47.78 ACRES
ATTACHED TOWNHOMES	4.94 ACRES
FUTURE R.O.W. DEDICATION AREA	0.67 ACRES
TOTAL STREAM BUFFER AREA	5.20 ACRES
TOTAL OPEN SPACE AREA	31.97 ACRES
TOTAL SITE AREA	47.56 ACRES

VICINITY MAP



SCALE: NTS

FLOOD NOTE:
 BASED ON THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, FEDERAL INSURANCE ADMINISTRATION FLOOD HAZARD BOUNDARY MAP, COMMUNITY MAP 13030, LOCUSVILLE TOWN OF BRACKLEY COMMUNITY # 12345, DATED 1/2008. ELEVATIONS OF THE SUBJECT PROPERTY IS LOCATED WITHIN ZONE X AN AREA SUBJECT TO THE 100-YEAR FLOOD. 100-YEAR FLOOD HEIGHTS WERE SCALED FROM THE ABOVE REFERENCED MAPS. AREAS NOT WITHIN ZONE X ARE WITHIN ZONE X (AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD).



ADJACENT PROPERTY OWNERS CHART

EXECUTIVE ESTATES	
LOT NUMBER	OWNER
1	CHATEAU ELAN RESORTS
2	MERLE MCCONNELL
3	BERTHA DAVIS
4	EVELYN MCCARTHY
5	MARJORIE KNIGHT
6	CARY & SANDRA FLEMELLYN
GOLF CLUB COUNTRY ESTATES	
LOT NUMBER	OWNER
12	HAROLD & MARY VARN
13	ROSE & MARY CHROMEK
14	RONALD & LISA SHEPLEY
15	JOHN PROBST
16	JAMES & SHIRLEY LEBEN
17	BETTY WAGES



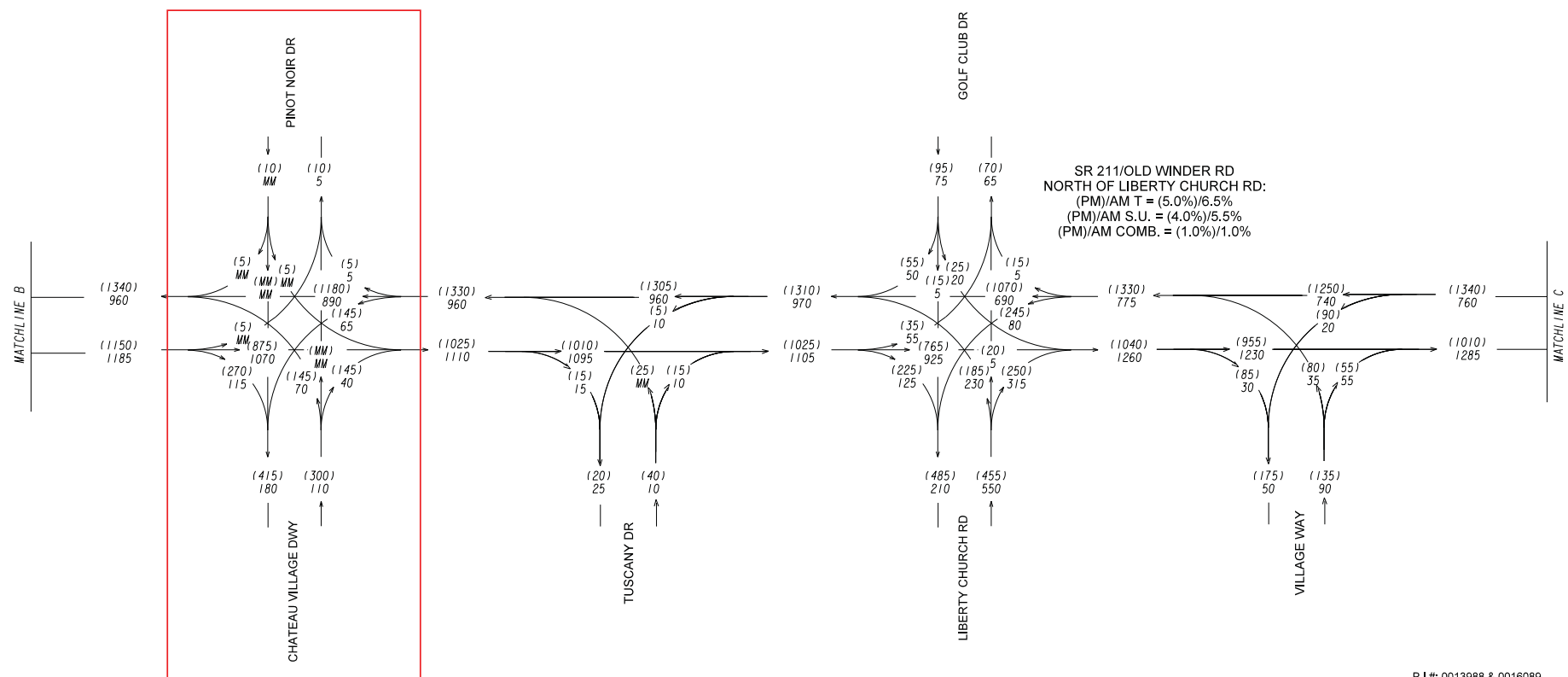
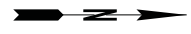
REZONING PLAN
CHATEAU ELAN
RESIDENTIAL SUBDIVISION
 LOCATED IN
 GAINESVILLE, GEORGIA
 BARROW COUNTY, GEORGIA

NO.	DATE	DESCRIPTION	REVISIONS

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DATE: 5/12/19
 JOB NO.: 1907104-002
 FILE NO.: 1907104-002
 DRAWN BY: SRS



P.I.#: 0013988 & 0016089
 BARROW, GWINNETT,
 & HALL COUNTY
 PM DHV = (00)
 AM DHV = 00



GEORGIA
 DEPARTMENT
 OF
 TRANSPORTATION

NOT TO SCALE

REVISION DATES

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION
 OFFICE: OFFICE OF PLANNING

TRAFFIC DIAGRAM

NO BUILD
 2023 DHV

MOVEMENT SUMMARY

 Site: 101 [SR 211 at Braselton Pkwy Ext]

AM Peak
Site Category: 2023 NB
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR 211/Old Winder Hwy												
1	L2	16	5.0	0.486	7.9	LOS A	3.2	82.4	0.26	0.11	0.26	16.0
6	T1	1179	5.0	0.486	7.9	LOS A	3.2	82.4	0.26	0.11	0.26	11.8
16	R2	54	5.0	0.486	7.9	LOS A	3.2	82.4	0.26	0.11	0.26	29.9
Approach		1250	5.0	0.486	7.9	LOS A	3.2	82.4	0.26	0.11	0.26	13.2
East: Braselton Pkwy Ext												
7	L2	158	2.0	0.576	20.3	LOS C	3.0	76.4	0.82	0.98	1.41	21.0
4	T1	5	2.0	0.576	20.3	LOS C	3.0	76.4	0.82	0.98	1.41	21.6
14	R2	109	2.0	0.576	20.3	LOS C	3.0	76.4	0.82	0.98	1.41	21.2
Approach		272	2.0	0.576	20.3	LOS C	3.0	76.4	0.82	0.98	1.41	21.1
North: SR 211/Old Winder Hwy												
5	L2	33	5.0	0.449	7.9	LOS A	2.5	65.8	0.44	0.30	0.44	31.5
2	T1	995	5.0	0.449	7.9	LOS A	2.5	65.8	0.44	0.30	0.44	16.4
12	R2	27	5.0	0.017	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	27.1
Approach		1054	5.0	0.449	7.7	LOS A	2.5	65.8	0.43	0.29	0.43	17.6
West: Tour de France Dr												
3	L2	16	2.0	0.051	9.2	LOS A	0.2	4.2	0.69	0.69	0.69	10.8
8	T1	5	2.0	0.051	9.2	LOS A	0.2	4.2	0.69	0.69	0.69	28.1
18	R2	65	2.0	0.134	9.2	LOS A	0.4	11.2	0.68	0.68	0.68	13.8
Approach		87	2.0	0.134	9.2	LOS A	0.4	11.2	0.68	0.68	0.68	14.8
All Vehicles		2663	4.6	0.576	9.1	LOS A	3.2	82.4	0.39	0.29	0.45	16.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.






















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Organisation: CALYX ENGINEERS + CONSULTANTS | Processed: Friday, November 02, 2018 3:33:22 PM

Project: F:\Project\2018\2018134.00\TRF\Analysis\Sidra\Base (AM).sip8

HCM 6th Signalized Intersection Summary
 9: SR 211 (Old Winder Hwy) & Pinot Noir/Chateau Village Dwy

Chateau Elan Residential TIS
 2023 No Build_AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	70	0	40	0	1070	115	65	890	5
Future Volume (veh/h)	0	0	0	70	0	40	0	1070	115	65	890	5
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	1870	1870	1870	1870	1870	1870	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	0	0	0	82	0	47	0	1189	0	71	967	5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	10	10	10	10	10	10
Cap, veh/h	0	145	0	180	0	190	454	2350		379	2737	14
Arrive On Green	0.00	0.00	0.00	0.08	0.00	0.08	0.00	0.71	0.00	0.04	0.81	0.81
Sat Flow, veh/h	0	1870	0	1418	0	1585	1668	3328	1485	1668	3395	18
Grp Volume(v), veh/h	0	0	0	82	0	47	0	1189	0	71	474	498
Grp Sat Flow(s),veh/h/ln	0	1870	0	1418	0	1585	1668	1664	1485	1668	1664	1749
Q Serve(g_s), s	0.0	0.0	0.0	5.9	0.0	2.8	0.0	16.9	0.0	1.1	8.0	8.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	5.9	0.0	2.8	0.0	16.9	0.0	1.1	8.0	8.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	145	0	180	0	190	454	2350		379	1342	1410
V/C Ratio(X)	0.00	0.00	0.00	0.46	0.00	0.25	0.00	0.51		0.19	0.35	0.35
Avail Cap(c_a), veh/h	0	380	0	358	0	389	533	2350		438	1342	1410
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)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	46.7	0.0	41.3	0.0	6.9	0.0	5.0	2.7	2.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.8	0.0	0.7	0.0	0.8	0.0	0.2	0.7	0.7
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(50%),veh/ln	0.0	0.0	0.0	2.1	0.0	1.1	0.0	4.6	0.0	0.3	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	48.5	0.0	41.9	0.0	7.7	0.0	5.2	3.4	3.4
LnGrp LOS	A	A	A	D	A	D	A	A		A	A	A
Approach Vol, veh/h		0			129			1189	A		1043	
Approach Delay, s/veh		0.0			46.1			7.7			3.6	
Approach LOS					D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.3	79.0		14.0	0.0	89.3		14.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	73.0		21.0	5.0	76.0		21.0				
Max Q Clear Time (g_c+I1), s	3.1	18.9		0.0	0.0	10.0		7.9				
Green Ext Time (p_c), s	0.0	10.2		0.0	0.0	6.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			8.0									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

MOVEMENT SUMMARY

 Site: 101 [SR 211 at Braselton Pkwy Ext]

2023 NB PM Peak
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR 211/Old Winder Hwy												
1	L2	65	5.0	0.630	11.3	LOS B	4.7	122.2	0.54	0.37	0.54	13.7
6	T1	1223	5.0	0.630	11.3	LOS B	4.7	122.2	0.54	0.37	0.54	10.3
16	R2	179	5.0	0.630	11.3	LOS B	4.7	122.2	0.54	0.37	0.54	27.6
Approach		1467	5.0	0.630	11.3	LOS B	4.7	122.2	0.54	0.37	0.54	13.6
East: Braselton Pkwy Ext												
7	L2	103	2.0	0.418	16.4	LOS C	1.7	43.9	0.79	0.88	1.12	22.4
4	T1	5	2.0	0.418	16.4	LOS C	1.7	43.9	0.79	0.88	1.12	23.1
14	R2	71	2.0	0.418	16.4	LOS C	1.7	43.9	0.79	0.88	1.12	22.6
Approach		179	2.0	0.418	16.4	LOS C	1.7	43.9	0.79	0.88	1.12	22.5
North: SR 211/Old Winder Hwy												
5	L2	120	5.0	0.608	10.9	LOS B	4.3	112.0	0.54	0.38	0.54	29.0
2	T1	1277	5.0	0.608	10.9	LOS B	4.3	112.0	0.54	0.38	0.54	14.1
12	R2	71	5.0	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	27.1
Approach		1467	5.0	0.608	10.4	LOS B	4.3	112.0	0.52	0.36	0.52	16.7
West: Tour de France Dr												
3	L2	33	2.0	0.122	13.8	LOS B	0.4	9.7	0.79	0.79	0.79	9.6
8	T1	5	2.0	0.122	13.8	LOS B	0.4	9.7	0.79	0.79	0.79	25.5
18	R2	71	2.0	0.193	13.1	LOS B	0.6	15.6	0.78	0.78	0.78	11.6
Approach		109	2.0	0.193	13.4	LOS B	0.6	15.6	0.78	0.78	0.78	12.0
All Vehicles		3223	4.7	0.630	11.3	LOS B	4.7	122.2	0.55	0.41	0.57	15.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.






















HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM 6th Signalized Intersection Summary
 9: SR 211 (Old Winder Hwy) & Pinot Noir/Chateau Village Dwy

Chateau Elan Residential TIS
 2023 Build_PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	5	155	0	145	5	875	270	145	1180	5
Future Volume (veh/h)	5	0	5	155	0	145	5	875	270	145	1180	5
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	1870	1870	1870	1870	1870	1870	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	6	0	6	182	0	171	5	931	0	158	1283	5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	70	16	35	283	0	422	270	2112		431	2321	9
Arrive On Green	0.21	0.00	0.21	0.21	0.00	0.21	0.01	0.61	0.00	0.05	0.65	0.65
Sat Flow, veh/h	91	75	166	1012	0	1585	1739	3469	1547	1739	3544	14
Grp Volume(v), veh/h	12	0	0	182	0	171	5	931	0	158	628	660
Grp Sat Flow(s),veh/h/ln	331	0	0	1012	0	1585	1739	1735	1547	1739	1735	1823
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	9.6	0.1	15.5	0.0	3.4	21.1	21.1
Cycle Q Clear(g_c), s	20.1	0.0	0.0	19.9	0.0	9.6	0.1	15.5	0.0	3.4	21.1	21.1
Prop In Lane	0.50		0.50	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	121	0	0	283	0	422	270	2112		431	1136	1194
V/C Ratio(X)	0.10	0.00	0.00	0.64	0.00	0.41	0.02	0.44		0.37	0.55	0.55
Avail Cap(c_a), veh/h	217	0	0	381	0	532	348	2112		590	1136	1194
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	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	0.0	41.2	0.0	32.5	9.2	11.3	0.0	8.0	10.1	10.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	2.4	0.0	0.6	0.0	0.7	0.0	0.5	1.9	1.8
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(50%),veh/ln	0.3	0.0	0.0	4.8	0.0	3.7	0.0	5.2	0.0	1.1	7.3	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	0.0	0.0	43.6	0.0	33.1	9.2	11.9	0.0	8.5	12.0	11.9
LnGrp LOS	D	A	A	D	A	C	A	B		A	B	B
Approach Vol, veh/h		12			353			936	A		1446	
Approach Delay, s/veh		35.4			38.5			11.9			11.6	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	70.0		27.5	5.2	75.0		27.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.5	60.5		30.5	5.5	70.5		30.5				
Max Q Clear Time (g_c+I1), s	5.4	17.5		22.1	2.1	23.1		21.9				
Green Ext Time (p_c), s	0.3	6.9		0.0	0.0	10.5		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									
Notes												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

MOVEMENT SUMMARY

 Site: 101 [SR 211 at Braselton Pkwy Ext]

2023 B AM Peak
Site Category: -
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR 211/Old Winder Hwy												
1	L2	20	5.0	0.495	8.0	LOS A	3.2	84.4	0.27	0.13	0.27	15.9
6	T1	1189	5.0	0.495	8.0	LOS A	3.2	84.4	0.27	0.13	0.27	11.8
16	R2	54	5.0	0.495	8.0	LOS A	3.2	84.4	0.27	0.13	0.27	29.8
Approach		1263	5.0	0.495	8.0	LOS A	3.2	84.4	0.27	0.13	0.27	13.1
East: Braselton Pkwy Ext												
7	L2	158	2.0	0.586	21.1	LOS C	3.1	78.1	0.82	0.99	1.44	20.7
4	T1	5	2.0	0.586	21.1	LOS C	3.1	78.1	0.82	0.99	1.44	21.3
14	R2	109	2.0	0.586	21.1	LOS C	3.1	78.1	0.82	0.99	1.44	20.9
Approach		272	2.0	0.586	21.1	LOS C	3.1	78.1	0.82	0.99	1.44	20.8
North: SR 211/Old Winder Hwy												
5	L2	33	5.0	0.463	8.2	LOS A	2.7	69.1	0.45	0.31	0.45	31.3
2	T1	1025	5.0	0.463	8.2	LOS A	2.7	69.1	0.45	0.31	0.45	16.2
12	R2	29	5.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	27.1
Approach		1087	5.0	0.463	7.9	LOS A	2.7	69.1	0.44	0.30	0.44	17.3
West: Tour de France Dr												
3	L2	23	2.0	0.069	9.7	LOS A	0.2	5.6	0.70	0.70	0.70	10.6
8	T1	5	2.0	0.069	9.7	LOS A	0.2	5.6	0.70	0.70	0.70	27.7
18	R2	77	2.0	0.163	9.9	LOS A	0.5	13.7	0.70	0.70	0.70	13.4
Approach		105	2.0	0.163	9.9	LOS A	0.5	13.7	0.70	0.70	0.70	14.0
All Vehicles		2727	4.6	0.586	9.4	LOS A	3.2	84.4	0.41	0.30	0.47	16.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.













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Project: F:\Project\2018\2018134.00\TRF\Analysis\Sidra\Build (AM).sip8

HCM 6th Signalized Intersection Summary
 9: SR 211 (Old Winder Hwy) & Pinot Noir/Chateau Village Dwy

Chateau Elan Residential TIS
 2023 Build_AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↘	↕	↗	↘	↕	↕
Traffic Volume (veh/h)	8	0	28	70	0	40	9	1076	115	65	892	8
Future Volume (veh/h)	8	0	28	70	0	40	9	1076	115	65	892	8
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	1870	1870	1870	1870	1870	1870	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	9	0	33	82	0	47	10	1196	0	71	970	9
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.90	0.90	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	10	10	10	10	10	10
Cap, veh/h	46	19	92	171	0	263	396	2226		346	2357	22
Arrive On Green	0.13	0.00	0.13	0.13	0.00	0.13	0.01	0.67	0.00	0.04	0.70	0.70
Sat Flow, veh/h	49	152	735	832	0	1585	1668	3328	1485	1668	3379	31
Grp Volume(v), veh/h	42	0	0	82	0	47	10	1196	0	71	478	501
Grp Sat Flow(s),veh/h/ln	936	0	0	832	0	1585	1668	1664	1485	1668	1664	1746
Q Serve(g_s), s	0.2	0.0	0.0	0.1	0.0	2.8	0.2	20.3	0.0	1.4	13.3	13.3
Cycle Q Clear(g_c), s	11.8	0.0	0.0	11.8	0.0	2.8	0.2	20.3	0.0	1.4	13.3	13.3
Prop In Lane	0.21		0.79	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	158	0	0	171	0	263	396	2226		346	1161	1218
V/C Ratio(X)	0.27	0.00	0.00	0.48	0.00	0.18	0.03	0.54		0.21	0.41	0.41
Avail Cap(c_a), veh/h	260	0	0	262	0	369	483	2226		401	1161	1218
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	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	0.0	0.0	46.9	0.0	39.1	6.1	9.3	0.0	7.0	7.0	7.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	2.1	0.0	0.3	0.0	0.9	0.0	0.3	1.1	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(50%),veh/ln	1.1	0.0	0.0	2.3	0.0	1.1	0.1	6.1	0.0	0.4	4.1	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	0.0	0.0	49.0	0.0	39.4	6.1	10.3	0.0	7.3	8.1	8.0
LnGrp LOS	D	A	A	D	A	D	A	B		A	A	A
Approach Vol, veh/h		42			129			1206	A		1050	
Approach Delay, s/veh		43.9			45.5			10.2			8.0	
Approach LOS		D			D			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.4	79.0		19.9	7.3	82.1		19.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	73.0		21.0	7.0	74.0		21.0				
Max Q Clear Time (g_c+I1), s	3.4	22.3		13.8	2.2	15.3		13.8				
Green Ext Time (p_c), s	0.0	10.3		0.1	0.0	6.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				11.7								
HCM 6th LOS				B								
Notes												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

MOVEMENT SUMMARY

 Site: 101 [SR 211 at Braselton Pkwy Ext]

2023 B PM Peak
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR 211/Old Winder Hwy												
1	L2	77	5.0	0.651	11.9	LOS B	5.0	130.3	0.57	0.39	0.57	13.3
6	T1	1254	5.0	0.651	11.9	LOS B	5.0	130.3	0.57	0.39	0.57	10.1
16	R2	179	5.0	0.651	11.9	LOS B	5.0	130.3	0.57	0.39	0.57	27.2
Approach		1511	5.0	0.651	11.9	LOS B	5.0	130.3	0.57	0.39	0.57	13.3
East: Braselton Pkwy Ext												
7	L2	103	2.0	0.436	17.5	LOS C	1.8	46.0	0.81	0.90	1.17	22.0
4	T1	5	2.0	0.436	17.5	LOS C	1.8	46.0	0.81	0.90	1.17	22.6
14	R2	71	2.0	0.436	17.5	LOS C	1.8	46.0	0.81	0.90	1.17	22.2
Approach		179	2.0	0.436	17.5	LOS C	1.8	46.0	0.81	0.90	1.17	22.1
North: SR 211/Old Winder Hwy												
5	L2	120	5.0	0.623	11.4	LOS B	4.5	116.4	0.57	0.41	0.57	28.7
2	T1	1295	5.0	0.623	11.4	LOS B	4.5	116.4	0.57	0.41	0.57	13.8
12	R2	77	5.0	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	27.1
Approach		1491	5.0	0.623	10.8	LOS B	4.5	116.4	0.54	0.39	0.54	16.4
West: Tour de France Dr												
3	L2	36	2.0	0.135	14.2	LOS B	0.4	10.7	0.79	0.79	0.79	9.5
8	T1	5	2.0	0.135	14.2	LOS B	0.4	10.7	0.79	0.79	0.79	25.2
18	R2	77	2.0	0.214	13.8	LOS B	0.7	17.4	0.78	0.78	0.78	11.3
Approach		118	2.0	0.214	13.9	LOS B	0.7	17.4	0.79	0.79	0.79	11.7
All Vehicles		3300	4.7	0.651	11.8	LOS B	5.0	130.3	0.58	0.43	0.60	15.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM 6th Signalized Intersection Summary
 9: SR 211 (Old Winder Hwy) & Pinot Noir/Chateau Village Dwy

Chateau Elan Residential TIS
 2023 Build_PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↕	↗	↖	↕	↕
Traffic Volume (veh/h)	10	0	21	155	0	145	34	878	270	145	1186	14
Future Volume (veh/h)	10	0	21	155	0	145	34	878	270	145	1186	14
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	1870	1870	1870	1870	1870	1870	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	12	0	25	182	0	171	36	934	0	158	1289	15
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.94	0.94	0.94	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	40	19	40	224	0	498	262	1983		399	2099	24
Arrive On Green	0.26	0.00	0.26	0.26	0.00	0.26	0.03	0.57	0.00	0.06	0.60	0.60
Sat Flow, veh/h	0	74	154	629	0	1585	1739	3469	1547	1739	3512	41
Grp Volume(v), veh/h	37	0	0	182	0	171	36	934	0	158	636	668
Grp Sat Flow(s),veh/h/ln	227	0	0	629	0	1585	1739	1735	1547	1739	1735	1819
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	9.8	1.0	18.6	0.0	4.3	27.5	27.5
Cycle Q Clear(g_c), s	30.5	0.0	0.0	30.5	0.0	9.8	1.0	18.6	0.0	4.3	27.5	27.5
Prop In Lane	0.32		0.68	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	99	0	0	224	0	498	262	1983		399	1037	1087
V/C Ratio(X)	0.37	0.00	0.00	0.81	0.00	0.34	0.14	0.47		0.40	0.61	0.61
Avail Cap(c_a), veh/h	99	0	0	224	0	498	292	1983		517	1037	1087
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	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	0.0	0.0	45.3	0.0	31.1	12.4	14.8	0.0	10.9	15.1	15.1
Incr Delay (d2), s/veh	2.3	0.0	0.0	20.0	0.0	0.4	0.2	0.8	0.0	0.6	2.7	2.6
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(50%),veh/ln	0.9	0.0	0.0	6.7	0.0	3.8	0.4	6.8	0.0	1.5	10.5	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	0.0	0.0	65.4	0.0	31.5	12.6	15.6	0.0	11.6	17.8	17.7
LnGrp LOS	D	A	A	E	A	C	B	B		B	B	B
Approach Vol, veh/h		37			353			970	A		1462	
Approach Delay, s/veh		38.4			49.0			15.5			17.1	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	71.9		35.0	8.0	75.0		35.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	14.5	61.5		30.5	5.5	70.5		30.5				
Max Q Clear Time (g_c+I1), s	6.3	20.6		32.5	3.0	29.5		32.5				
Green Ext Time (p_c), s	0.2	6.9		0.0	0.0	10.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			20.8									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												