

Traffic Impact Study

Provence Estates Subdivision
Cobb County, Georgia

March 18, 2018

MARC R. ACAMPORA, PE, LLC
TRAFFIC ENGINEERING



Traffic Impact Study
Provence Estates Subdivision
Cobb County, Georgia

study prepared for:

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Introduction

This study assesses the traffic impact of a proposed single-family residential subdivision in Cobb County, Georgia. The site is located at the northern terminus of Wigley Road, north of its intersection with Jamerson Road, as shown in the location map in Figure 1. The property will be developed in two phases, with a maximum of 84 homes in Phase 1 and a maximum of 15 homes in Phase 2. Vehicular access will be provided at one access point, which will be a continuation of Wigley Road into the property.

The purpose of this traffic impact study is to determine existing traffic operating conditions in the vicinity of the proposed development, project future traffic volumes, assess the impact of the subject development, then develop conclusions and recommendations to mitigate the project traffic impact and ensure safe and efficient existing and future traffic conditions in the vicinity of the project.

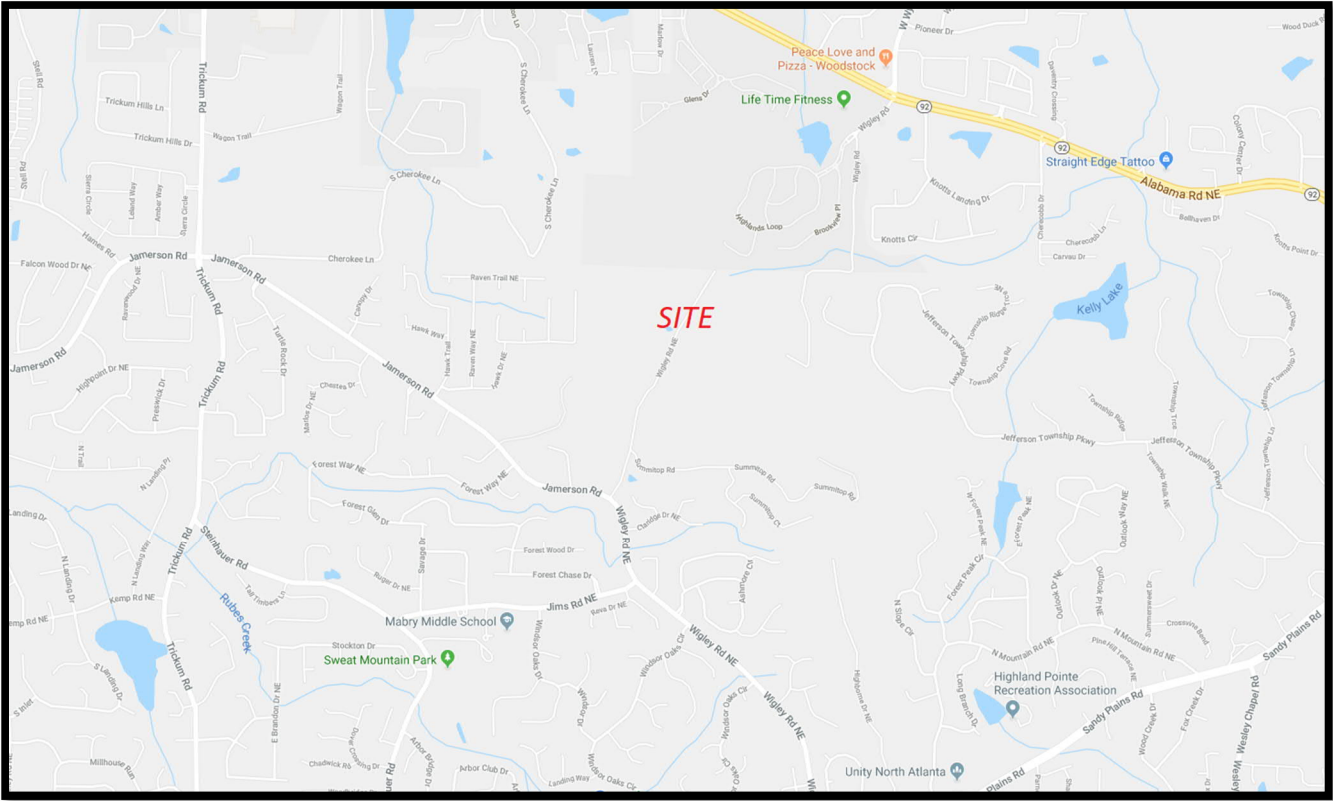


Figure 1 – Provence Estates Site Location Map

Existing Traffic Conditions

Existing traffic operating conditions in the vicinity of the proposed subdivision were assessed. The following is a description of existing transportation facilities, traffic volumes, and intersection operations.

Description of Existing Roadways

Wigley Road is a two lane, north/south local roadway north of Jamerson Road that begins at Jamerson Road and terminates near the Cobb/Cherokee County boundary. This local street is developed with low-density single family homes and is primarily undeveloped at its northern end. The terrain along this segment of Wigley Road is rolling and the posted speed limit is 25 mph. This segment of Wigley Road is side street stop sign controlled at its intersection with Jamerson Road. At this intersection, the intersection sight distance to the east is clear for a substantial distance. To the west, the available intersection sight distance was measured on-site to be 593 feet. The major street (Jamerson/Wigley) posted speed limit is 45 mph. The Cobb County minimum intersection sight distance, according to the Cobb County Development Standards, Standard 401B, is 560 feet for a three lane road. Therefore, sufficient intersection sight distance is available in both directions for the side street approach of Wigley Road.

Jamerson Road is a two-through-lane (there is a center two-way left turn lane through most of the study area) east/west arterial that bears the name Shallowford Road to the west, crosses I-575 (with no interchange) and Canton Road, has a signalized intersection in the vicinity of the site at Trickum Road, then takes the name of Wigley Road at their intersection, has a signalized intersection at Jims Road, to the southeast, then continues to its terminus at a signalized intersection at Sandy Plains Road. Near the site, the terrain is rolling and the posted speed limit is 45 mph. There is a school zone to the west, for Davis Elementary School, with a speed limit of 25 mph. There is an exclusive eastbound left turn lane and westbound right turn lane on Jamerson / Wigley Road at Wigley Road.

Jims Road is a two lane east/west minor collector that connects Steinhauer Road to Wigley Road. The terrain is rolling and the posted speed limit is 35 mph.

Trickum Road is a two lane north/south major collector that begins north of Arnold Mill Road and ends at Sandy Plains Road. The terrain along Trickum Road in the vicinity of Jamerson Road is rolling, with a posted speed limit of 35 mph south of Jamerson Road and 40 mph north of Jamerson Road.

Pedestrian, Bicycle, and Transit Accessibility

There are no sidewalks along the local section of Wigley Road north of Jamerson Road. There is sidewalk along the south side of Jamerson Road / Wigley Road at the local Wigley Road intersection, and then sidewalk along one side or both sides of the road, varying from location to location. There are no crosswalks at the Jamerson / Wigley intersection, but there are crosswalks, pedestrian signals, and ADA ramps on all approaches at the intersections of Wigley Road / Jims Road and Jamerson Road / Trickum Road.

There are no striped designated bicycle lanes on the roadways in this study area. CobbLinc provides public bus service to portions of Cobb County. However, there is no regularly-scheduled mass transit service in the immediate vicinity of the subject site.

Photographs 1 through 5 depict roadway conditions in the vicinity of the site.



Photograph 1 – Jamerson Road Facing East at Trickum Road



Photograph 2 – Wigley Road Facing South Toward Jamerson Road



Photograph 3 – Wigley Road Facing North Toward Site



Photograph 4 – View from Wigley Road Toward West Along Jamerson Road



Photograph 5 – Jims Road Looking East Toward Wigley Road

Crash Data

Crash data was obtained in the study area from Cobb County DOT. The data covers two locations – the intersection of Jamerson Road / Wigley Road and the intersection of Wigley Road / Jims Road. The data is for the three year period from September 1, 2014 to August 31, 2017 and is summarized in Table 1. The crash reports are included in Appendix F.

Table 1 – Summary of Crash Data – Totals for Three Years

Intersection	Crash Type						
	Rear End	Right Angle	Side Swipe	Fixed Object	Total Crashes	Total Injuries	Total Fatalities
Jamerson Rd at Wigley Rd	0	3	1	2	6	2	0
Wigley Rd at Jims Rd	3	0	0	1	4	1	0

The crash data at the Jamerson / Wigley intersection reveals a total of six crashes in a three year period, or an average of two crashes per year. The two fixed object crashes and the one side swipe crash are unlikely to be correctable by signalization. The three right angle crashes could be potentially correctable by signalization. It is noted that the Crash Experience signal warrant in the Federal Highway Administration's Manual On Uniform Traffic Control Devices (MUTCD) requires five or more crashes of the type that might be correctable by a signal, within a one year period, to satisfy this warrant. Therefore, the Crash Experience warrant would not be satisfied based on this data. At the Wigley / Jims intersection, a total of four crashes occurred in the three year period.

Existing Traffic Volumes

Existing full turning movement traffic volume counts were collected at the following intersections in the vicinity of the proposed development:

1. Jamerson Road / Trickum Road
2. Jamerson Road / Wigley Road
3. Wigley Road / Jims Road

The counts were collected on Wednesday, February 28, 2018, from 7:00 a.m. to 9:00 a.m. and from 4:30 p.m. to 6:30 p.m. Area schools were in standard session on the day on which the counts were recorded. From the count data, the highest four consecutive 15-minute interval volumes at each intersection, during each time period, were determined. These volumes make up the typical weekday a.m. and p.m. peak hour traffic volumes at that intersection. The existing a.m. and p.m. peak hour turning movement volumes are shown in Figure 2. The intersection raw count data is found in Appendix A.

In addition to the intersection turning movement counts, Georgia Department of Transportation (Georgia DOT) and Cobb County DOT annual average daily traffic (AADT) volume counts were obtained on nearby roadways for 2016 (the latest year for which volumes are available). Table 3, presented later in this report, shows the historic

Georgia DOT counts and the annual growth rates between the counts. The 2016 Georgia DOT count on Wigley Road just south of the Wigley/Jamerson intersection was 7,590 vehicles per day (vpd). The February 2016 Cobb County DOT count on Jamerson Road east of Rushing Road was 10,700 vpd.

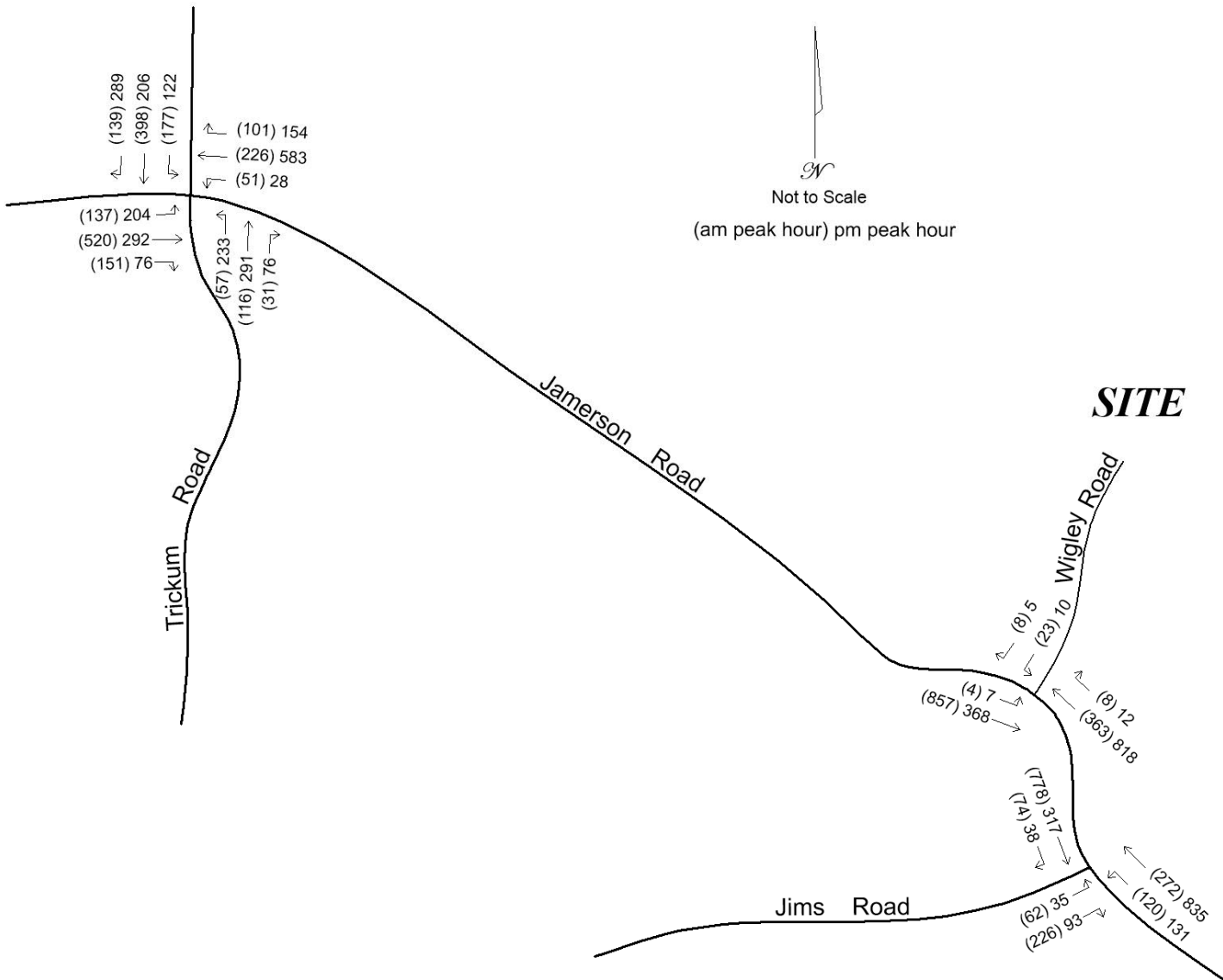


Figure 2 – Existing Weekday A.M. and P.M. Peak Hour Traffic Volumes

Existing Intersection Operations

Existing traffic operations were analyzed at the counted intersections using Synchro software, version 10, in accordance with the methodology presented in the Transportation Research Board's 2016 Highway Capacity Manual (HCM 6). The results of the analysis are shown in Table 2. Computer printouts containing detailed results of the analysis are located in Appendix C. Levels of service and delays are provided for the overall intersection and for each approach or controlled movement. Intersections or approaches that "fail" (operate at LOS F) are shown in bold type.

Table 2 – Existing Intersection Operations

Intersection / Approach	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. Jamerson Road at Trickum Road	C	25.9	D	40.8
northbound approach	C	20.9	C	34.5
southbound approach	C	22.3	D	53.7
eastbound approach	C	27.2	C	28.7
westbound approach	C	32.6	D	44.2
2. Jamerson Road / Wigley Road at Wigley Road	A	0.8	A	0.3
southbound left turn (Wigley side street)	D	32.5	D	26.4
southbound right turn (Wigley side street)	B	11.1	C	15.1
eastbound left turn	A	8.3	A	9.7
3. Wigley Road at Jims Road	C	25.0	B	10.4
northbound approach	A	8.8	A	8.3
southbound approach	C	24.2	A	8.9
eastbound approach (Jims Road)	D	43.6	C	23.0

The analysis of the three counted intersections shows acceptable traffic operations, both overall at each intersection, and on each approach. No mitigation or changes are recommended in the existing condition.

No-Build Traffic Conditions

A future “no-build” condition was developed to identify future traffic operations with other growth and development in the area, but not including the proposed Provence Estates subdivision. This allows the traffic impact of the proposed development to be isolated from the future conditions that will exist whether or not the project is developed.

No Build Traffic Volumes

The no build traffic volumes are comprised of the existing counted traffic volumes, increased by a background growth factor, plus the specific trips that will be generated by a small nearby development of single-family homes.

The background growth factor was developed based on historic traffic volume counts in the area. Georgia DOT Annual Average Daily Traffic (AADT) volume counts are presented in Table 3.

Table 3 – Georgia DOT Historic AADT Volumes and Growth Rates

Year	Wigley S of Wigley	Annual Growth	Trickum S of Steinhauer	Annual Growth	Steinhauer S of Jims	Annual Growth
Station ID	0677130		0678744		0678746	
2012	590		7420		3620	
2013	7590	1186.4%	7590	2.3%	3700	2.2%
2014	7590	0.0%	8560	12.8%	3700	0.0%
2015	7590	0.0%	8910	4.1%	3850	4.1%
2016	7590	0.0%	9120	2.4%	3940	2.3%
Average		0.0%		6.3%		2.1%

Table 1 in this report identified historic traffic volume trends on roadway segments in the study area. The data for Trickum Road is in the magnitude of 600 vpd for each of the years prior to 2013, then jumps to 7,590 and remains at that level through 2016. It is uncertain what is being documented here. Based on the growth trends in Table 3, an annual growth rate of 2% was selected and applied to the counted volumes for a period of five years during which the proposed homes are anticipated to be built and occupied. The overall growth rate of 2% for five years equates to a 10.4% growth rate applied to the counted volumes.

In addition to the growth factor, the trips from an approved single-family subdivision planned to be constructed on the south side of Jamerson and Wigley Roads near Jims Road, were also included. This project will include 16 homes with an entrance-only access on Jamerson Road and a full-movement access on Wigley Road between

Wigley and Jims Roads. Three additional lots will have access along Jims Road. The site plan for this subdivision is included in Appendix F and the trips are shown in the traffic volume worksheets in Appendix A.

No-Build Intersection Operations

The study intersections were re-evaluated for the no-build condition, using the counted volumes, increased by the 10.4% growth factor plus the trips from the nearby subdivision. The lanes and control at each study intersection were kept the same as existing. The results of the analysis are shown in Table 4. Computer printouts containing detailed results of the analysis are located in Appendix D. Levels of service and delays are provided for the overall intersection and for each approach or controlled movement. Intersections or approaches that “fail” (operate at LOS F) are shown in bold type.

Table 4 – No-Build Intersection Operations

Intersection / Approach	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. Jamerson Road at Trickum Road	C	28.7	D	53.8
northbound approach	C	25.6	D	47.4
southbound approach	C	28.1	E	61.2
eastbound approach	C	28.3	D	42.7
westbound approach	C	32.1	E	61.0
2. Jamerson Road / Wigley Road at Wigley Road	A	1.0	A	0.4
southbound left turn (Wigley side street)	E	41.5	D	31.6
southbound right turn (Wigley side street)	B	11.5	C	16.5
eastbound left turn	A	8.4	B	10.0
3. Wigley Road at Jims Road	C	34.4	B	11.9
northbound approach	B	13.8	A	9.7
southbound approach	D	44.2	A	8.8
eastbound approach (Jims Road)	C	33.8	C	28.3

As would be expected, delays will increase at most locations due to the increases in background traffic volumes. Generally, each intersection will continue to operate acceptably. However, in the p.m., certain approach delays at the Jamerson / Trickum intersection will drop to LOS E. The addition of a southbound right turn overlap phase would improve the signal efficiency for that heavy-volume movement. This phase would provide a green arrow for the southbound right turners on Trickum, which would operate concurrently with the protected portion of the westbound left turn phasing on Jamerson. The addition of this phase would eliminate all LOS E at this intersection and allow all approaches to operate at LOS D or better. The southbound left turn from Wigley at Jamerson will drop to LOS E in the a.m. This is not unusual for a side street stop controlled approach at a busy thoroughfare such as Jamerson. The volume incurring this LOS E is a moderate 25 vehicles. In order to eliminate the LOS E, this intersection would require signalization. However, based on the low side street volumes, this intersection is considered a weak candidate for signalization.

Project Traffic Characteristics

This section describes the anticipated traffic characteristics of the proposed development, including a site description, how much traffic the project will generate, and where that traffic will travel.

Project Description

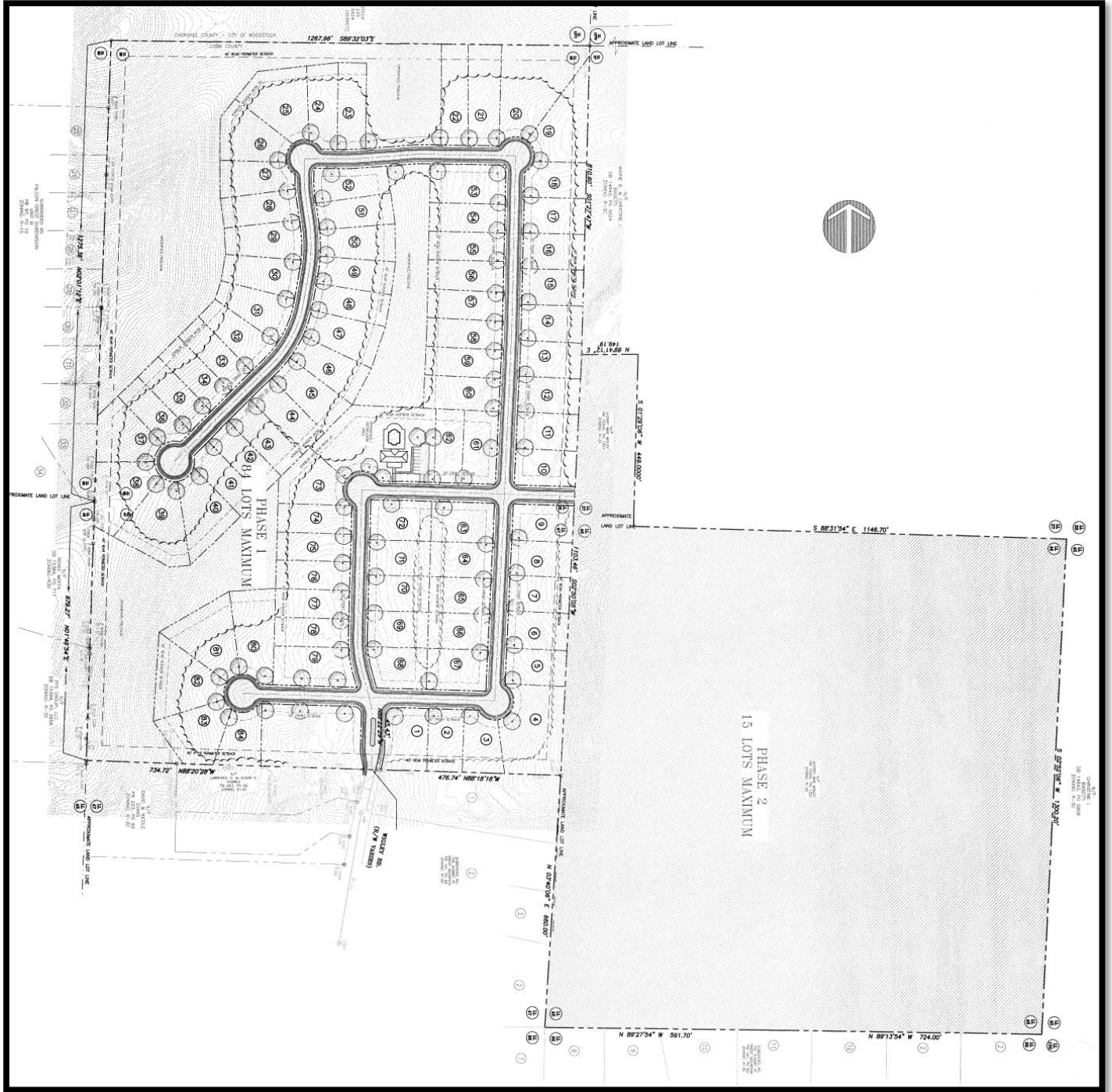
The proposed development will consist of single family residential lots to be developed in two phases, with a maximum of 84 homes in Phase 1 and a maximum of 15 homes in Phase 2. Vehicular access will be provided at one access point, which will be a continuation of Wigley Road into the property. The site plan is presented in Figure 3.

Trip Generation

Trip generation is an estimate of the number of entering and exiting vehicular trips that will be generated by the proposed development. The volume of traffic that will be generated by the proposed subdivision was calculated using the equations in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. ITE Land Use 210 – Single Family Detached Housing was selected as representative of the project. The trip generation for the proposed development is shown in Table 5.

Table 5 – Provence Estates Trip Generation

Land Use	ITE Code	Size	A.M. Peak Hour			P.M. Peak Hour			24-Hour
			In	Out	Total	In	Out	Total	2-Way
Single Family Detached Housing	210	99 homes	19	56	75	64	37	101	1,030



site plan by McFarland Dyer & Associates

Figure 3 – Provence Estates Subdivision Site Plan

Trip Distribution and Assignment

The trip distribution percentages indicate what proportion of the project's trips will travel to and from various directions. The trip distribution percentages were developed for the residential subdivision based on the locations and proximity of area trip attractors, such as employment centers, schools, retail, and restaurants. It is expected that the trips from the site will travel in approximately the same directions as the prevailing flows of traffic on the adjacent streets. The site trips, shown in Table 5, were assigned to the roadway network based on these trip distribution percentages. The project trip distribution percentages, and the a.m. and p.m. peak hour trips expected to be generated solely by the project, are shown in Figure 4.

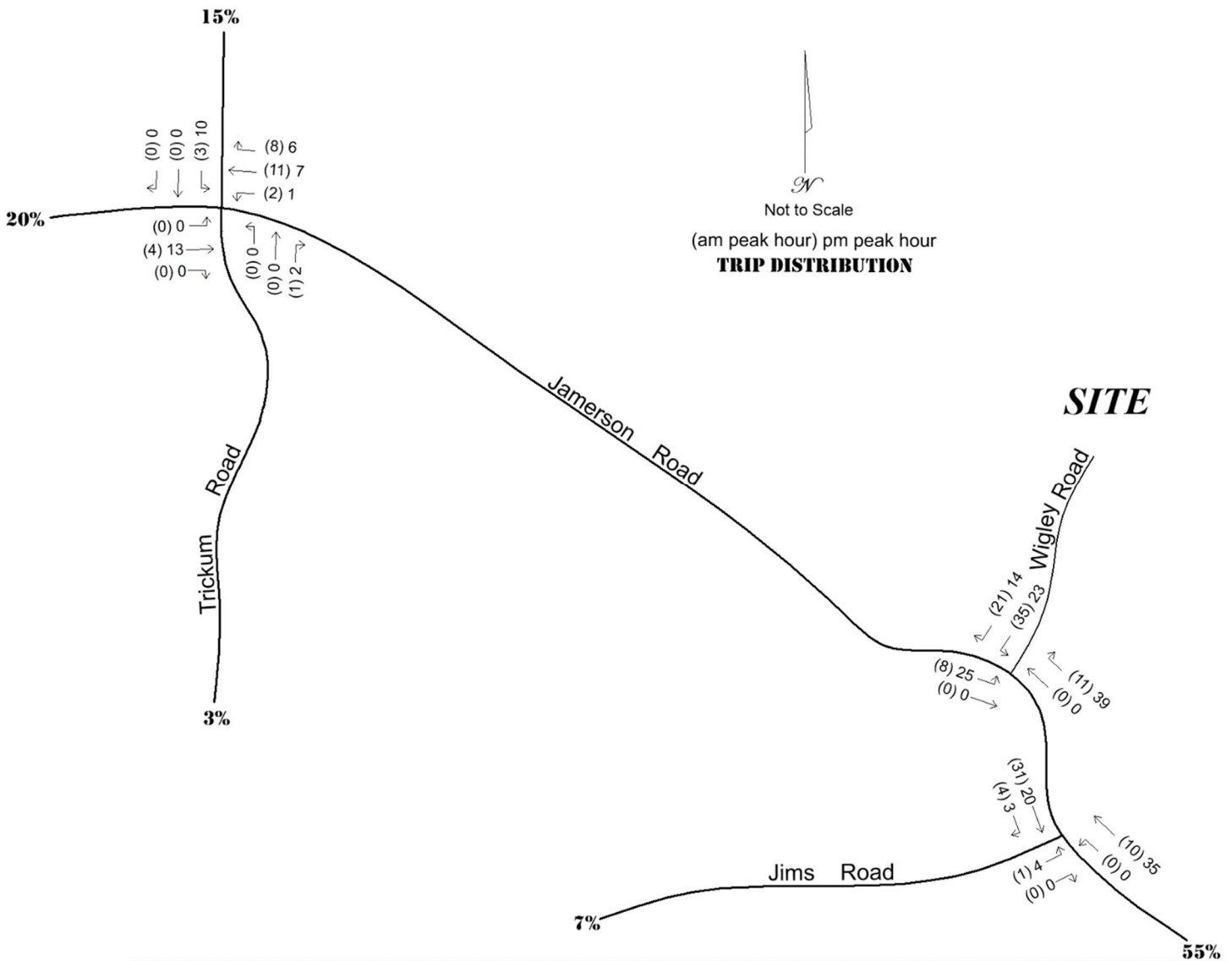


Figure 4 – Project Trip Distribution Percentages and Weekday A.M. and P.M. Peak Hour Site Trips

Future Traffic Conditions

The future traffic conditions provide a measure of the operations that will exist in the future after the full build-out of the Provence Estates subdivision. The future volumes consist of the no-build volumes plus the site-generated trips that will be produced by Provence Estates. These future volumes are shown in Figure 5.

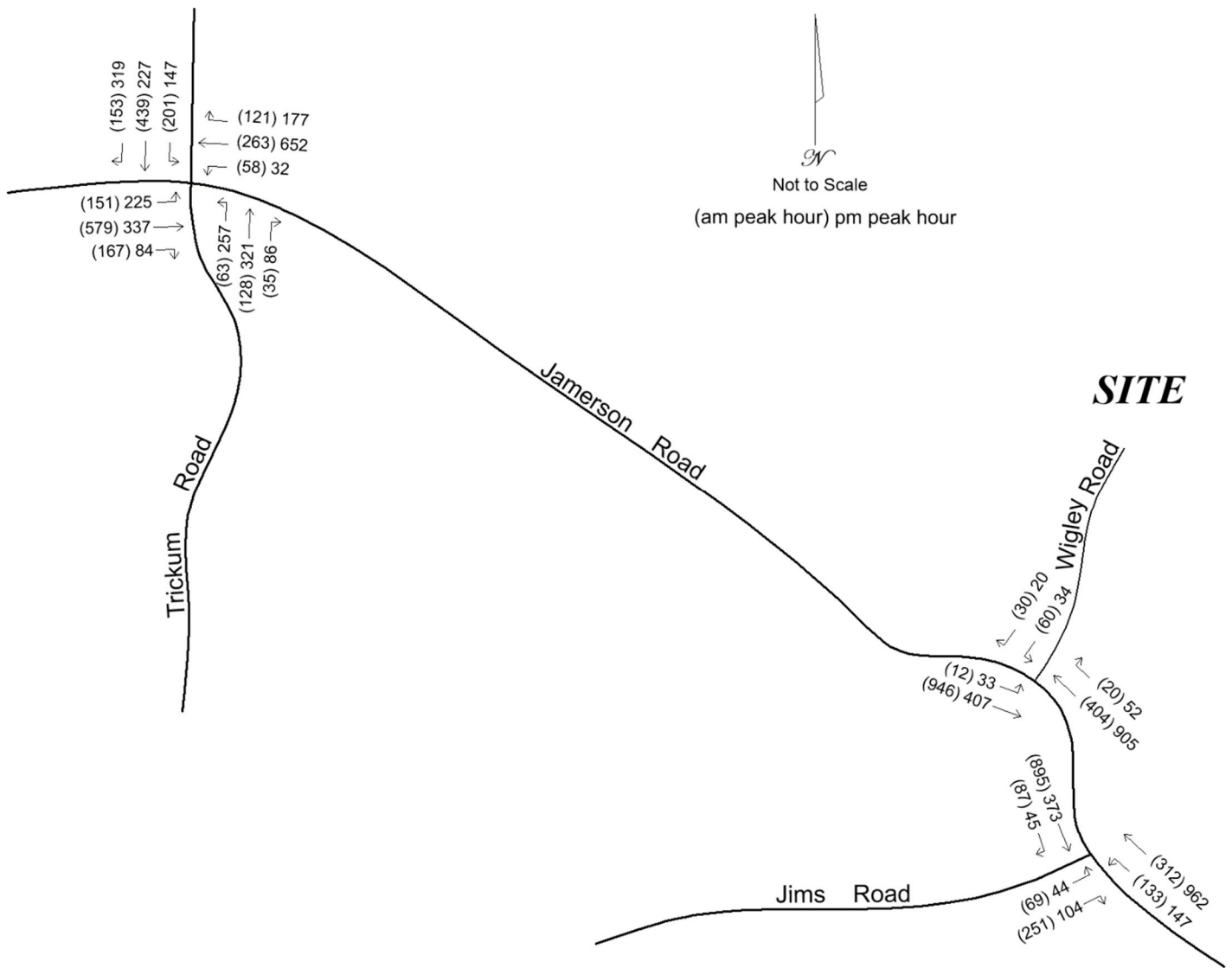


Figure 5 – Future Weekday A.M and P.M. Peak Hour Traffic Volume Projections

Future Intersection Operations

An operational analysis was performed for the anticipated 2023 future build-out year at each study intersection. Table 6 presents the results of this analysis. Computer printouts containing detailed results of the analysis are located in Appendix E.

Table 6 – Future Intersection Operations

Intersection / Approach	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
1. Jamerson Road at Trickum Road	C	28.7	D	54.5
northbound approach	C	26.3	D	47.3
southbound approach	C	29.0	E	61.5
eastbound approach	C	27.4	D	42.2
westbound approach	C	31.7	E	63.4
2. Jamerson Road / Wigley Road at Wigley Road	A	3.3	A	1.5
southbound left turn (Wigley side street)	F	65.9	E	42.4
southbound right turn (Wigley side street)	B	11.8	C	17.0
eastbound left turn	A	8.5	B	10.5
3. Wigley Road at Jims Road	D	36.0	B	12.4
northbound approach	B	15.3	B	10.0
southbound approach	D	42.7	A	8.6
eastbound approach (Jims Road)	D	42.5	C	31.0

The analysis of the future condition reveals minimal changes in operations at the Jamerson / Trickum and Wigley / Jims intersections. The southbound right turn overlap phase identified in the no-build condition for Trickum at Jamerson is still applicable. No mitigation is identified for the Wigley / Jims intersection.

At the Jamerson / Wigley intersection, the southbound left turn will drop to LOS F. As noted in the no-build condition, this is not atypical for a side street stop controlled approach at a busy major street such as Jamerson. The volume making this left turn will increase to 60 in the a.m. peak hour. As identified in the no-build condition, signalization would be required to eliminate this side street LOS F. It should be noted that signalization would introduce new delays to the major street. A signal warrant analysis based on the Federal Highway Administration's Manual On Uniform Traffic Control Devices (MUTCD) would be necessary to determine if signalization of this intersection is appropriate. Due to the modest side street volumes and the limited time in which the side street left turn is expected to fail, this intersection is expected to be a weak candidate for signalization.

Findings and Recommendations

The following is a summary of the findings and recommendations of this traffic impact study:

1. The three counted intersections evaluated in this study currently operate acceptably during peak times.
2. Crash data at the Jamerson / Wigley intersection reveals a total of six crashes in a three year period, or an average of two crashes per year. It was noted that the crash frequency and crash types would be insufficient to satisfy the Crash Experience warrant for signalization. Four crashes were reported at the Wigley / Jims intersection in the three year period.
3. In the no-build condition, delays at the Jamerson / Trickum intersection merit consideration of the addition of a southbound right-turn overlap phase on the signal.
4. The proposed subdivision will consist of two phases, with ultimate build-out of 99 single-family homes. The project will generate 75 new trips in the a.m. peak hour and 101 new trips in the p.m. peak hour.
5. The project impact at the Jamerson / Trickum and Wigley / Jims intersections will be small and operations at those two intersections will be comparable between the no-build and future conditions.
6. The southbound left turn from the side street stop controlled local leg of Wigley Road will drop to LOS E in the no-build and LOS F with the addition of the proposed Provence Estates subdivision. This is not unusual for a side street stop controlled left turn movement. The LOS F can be mitigated by signalizing the intersection. However, signalization would introduce new delays to the major street. A signal warrant analysis based on the MUTCD would determine if signalization is appropriate. However, this intersection is expected to be a weak candidate for signalization.

Appendix A

Traffic Count Data and Volume Worksheets

Wigley Road Subdivision Traffic Impact Study
Cobb County, Georgia

March 2018

Intersection: 1. Jamerson Road at Trickum Road

Weekday A.M. Peak Hour

	Northbound Trickum Road				Southbound Trickum Road				Eastbound Jamerson Road				Westbound Jamerson Road			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Counted Volumes (Wednesday, February 28, 2018)	57	116	31	204	177	398	139	714	137	520	151	808	51	226	101	378
Total Annual Background Growth	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
Jamerson Tract	0	0	0	0	3	0	0	3	0	1	0	1	0	2	1	3
No-Build Volumes	63	128	34	225	198	439	153	791	151	575	167	893	56	252	113	420
Wigley Road Subdivision	0	0	1	1	3	0	0	3	0	4	0	4	2	11	8	21
Build Volumes	63	128	35	226	201	439	153	794	151	579	167	897	58	263	121	441

Weekday P.M. Peak Hour

	Northbound Trickum Road				Southbound Trickum Road				Eastbound Jamerson Road				Westbound Jamerson Road			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Counted Volumes (Wednesday, February 28, 2018)	233	291	76	600	122	206	289	617	204	292	76	572	28	583	154	765
Total Annual Background Growth	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
Jamerson Tract	0	0	0	0	2	0	0	2	0	2	0	2	0	1	1	2
No-Build Volumes	257	321	84	662	137	227	319	683	225	324	84	633	31	645	171	847
Wigley Road Subdivision	0	0	2	2	10	0	0	10	0	13	0	13	1	7	6	14
Build Volumes	257	321	86	664	147	227	319	693	225	337	84	646	32	652	177	861

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Wigley Road Subdivision Traffic Impact Study
Cobb County, Georgia

March 2018

Intersection: 2. Jamerson Road at Wigley Road

Weekday A.M. Peak Hour		Southbound Wigley Road			Eastbound Jamerson Road			Westbound Wigley Road		
		L	R	Tot	L	T	Tot	T	R	Tot
Counted Volumes (Wednesday, February 28, 2018)		23	8	31	4	857	861	363	8	371
Total Annual Background Growth		10.4%	10.4%	10.4%	10.4%	10.4%	9.3%	10.4%	10.4%	10.4%
Jamerson Tract		0	0	0	0	0	0	3	0	3
No-Build Volumes		25	9	34	4	946	951	404	9	413
Wigley Road Subdivision		35	21	56	8	0	8	0	11	11
Build Volumes		60	30	90	12	946	959	404	20	424

Weekday P.M. Peak Hour		Southbound Wigley Road			Eastbound Jamerson Road			Westbound Wigley Road		
		L	R	Tot	L	T	Tot	T	R	Tot
Counted Volumes (Wednesday, February 28, 2018)		10	5	15	7	368	375	818	12	830
Total Annual Background Growth		10.4%	10.4%	10.4%	10.4%	10.4%	9.3%	10.4%	10.4%	10.4%
Jamerson Tract		0	0	0	0	1	1	2	0	2
No-Build Volumes		11	6	17	8	407	415	905	13	918
Wigley Road Subdivision		23	14	37	25	0	25	0	39	39
Build Volumes		34	20	54	33	407	440	905	52	957

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Wigley Road Subdivision Traffic Impact Study

Cobb County, Georgia

March 2018

Intersection: 3. Wigley Road at Jims Road

Weekday A.M. Peak Hour

	Northbound Wigley Road			Southbound Wigley Road			Eastbound Jims Road		
	L	T	Tot	T	R	Tot	L	R	Tot
Counted Volumes (Wednesday, February 28, 2018)	120	272	392	778	74	852	62	226	288
Total Annual Background Growth	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
Jamerson Tract	1	2	3	5	1	6	0	1	1
No-Build Volumes	133	302	436	864	83	947	68	251	319
Wigley Road Subdivision	0	10	10	31	4	35	1	0	1
Build Volumes	133	312	446	895	87	982	69	251	320

Weekday P.M. Peak Hour

	Northbound Wigley Road			Southbound Wigley Road			Eastbound Jims Road		
	L	T	Tot	T	R	Tot	L	R	Tot
Counted Volumes (Wednesday, February 28, 2018)	131	835	966	317	38	355	35	93	128
Total Annual Background Growth	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%
Jamerson Tract	2	5	7	3	0	3	1	1	2
No-Build Volumes	147	927	1073	353	42	395	40	104	143
Wigley Road Subdivision	0	35	35	20	3	23	4	0	4
Build Volumes	147	962	1108	373	45	418	44	104	147

MARC R. ACAMPORA, PE, LLC

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TMC Data
 Jamerson Rd @ Trickum Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800001
 Site Code : 41800001
 Start Date : 2/28/2018
 Page No : 1

Groups Printed- Cars, Trucks, Buses

Start Time	Trickum Rd Northbound					Trickum Rd Southbound					Jamerson Rd Eastbound					Jamerson Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	13	14	11	0	38	48	102	33	0	183	28	142	37	0	207	6	36	17	0	59	487
07:15 AM	13	22	8	0	43	50	104	42	0	196	31	134	38	0	203	16	59	19	0	94	536
07:30 AM	15	34	8	0	57	28	96	24	0	148	27	130	40	0	197	13	66	30	0	109	511
07:45 AM	16	46	4	0	66	51	96	40	0	187	51	114	36	0	201	16	65	35	0	116	570
Total	57	116	31	0	204	177	398	139	0	714	137	520	151	0	808	51	226	101	0	378	2104
08:00 AM	18	31	4	0	53	30	68	28	0	126	27	107	28	0	162	0	37	13	0	50	391
08:15 AM	10	32	6	0	48	43	79	31	0	153	44	105	28	0	177	4	39	20	0	63	441
08:30 AM	13	27	4	0	44	37	79	45	0	161	32	76	39	0	147	5	49	38	0	92	444
08:45 AM	19	41	10	0	70	34	69	24	0	127	50	84	22	0	156	9	30	22	0	61	414
Total	60	131	24	0	215	144	295	128	0	567	153	372	117	0	642	18	155	93	0	266	1690
*** BREAK ***																					
04:30 PM	44	77	17	0	138	29	46	79	0	154	45	64	15	0	124	5	84	35	0	124	540
04:45 PM	55	73	16	0	144	36	37	68	0	141	38	53	15	0	106	9	121	42	0	172	563
Total	99	150	33	0	282	65	83	147	0	295	83	117	30	0	230	14	205	77	0	296	1103
05:00 PM	51	72	10	0	133	32	43	73	0	148	56	82	25	0	163	6	104	42	0	152	596
05:15 PM	65	68	18	0	151	37	56	66	0	159	48	80	22	0	150	11	151	41	0	203	663
05:30 PM	62	76	13	0	151	20	45	70	0	135	59	74	14	0	147	7	156	33	0	196	629
05:45 PM	54	61	29	0	144	35	55	72	0	162	41	76	17	0	134	3	146	40	0	189	629
Total	232	277	70	0	579	124	199	281	0	604	204	312	78	0	594	27	557	156	0	740	2517
06:00 PM	52	86	16	0	154	30	50	81	0	161	56	62	23	0	141	7	130	40	0	177	633
06:15 PM	49	67	7	0	123	20	30	50	0	100	34	42	22	0	98	5	157	41	0	203	524
Grand Total	549	827	181	0	1557	560	1055	826	0	2441	667	1425	421	0	2513	122	1430	508	0	2060	8571
Apprch %	35.3	53.1	11.6	0		22.9	43.2	33.8	0		26.5	56.7	16.8	0		5.9	69.4	24.7	0		
Total %	6.4	9.6	2.1	0	18.2	6.5	12.3	9.6	0	28.5	7.8	16.6	4.9	0	29.3	1.4	16.7	5.9	0	24	

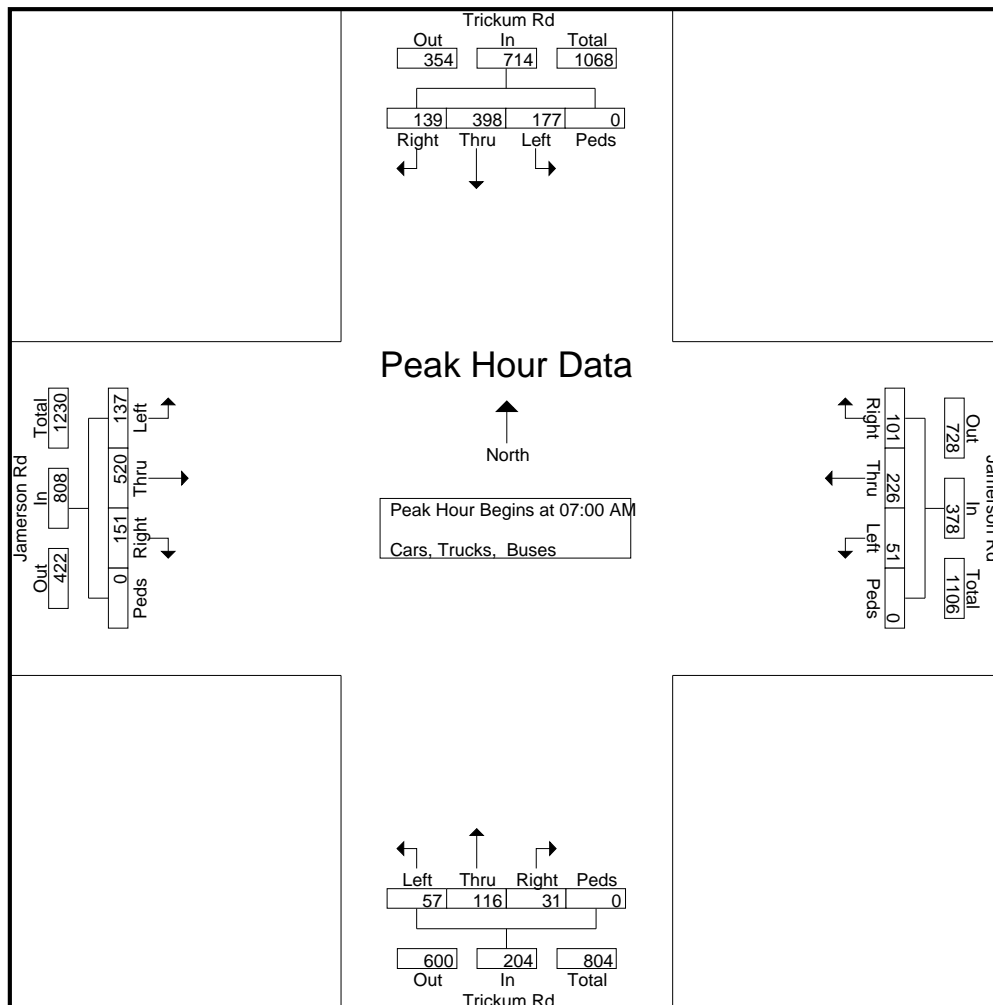
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TMC Data
 Jamerson Rd @ Trickum Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800001
 Site Code : 41800001
 Start Date : 2/28/2018
 Page No : 2

Start Time	Trickum Rd Northbound					Trickum Rd Southbound					Jamerson Rd Eastbound					Jamerson Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	13	14	11	0	38	48	102	33	0	183	28	142			207	6	36	17	0	59	487
07:15 AM	13	22	8	0	43	50	104	42	0	196	31	134	38	0	203	16	59	19	0	94	536
07:30 AM	15	34	8	0	57	28	96	24	0	148	27	130	40	0	197	13	66	30	0	109	511
07:45 AM	16	46	4	0	66	51	96	40	0	187	51	114	36	0	201	16	65	35	0	116	570
Total Volume	57	116	31	0	204	177	398	139	0	714	137	520	151	0	808	51	226	101	0	378	2104
% App. Total	27.9	56.9	15.2	0		24.8	55.7	19.5	0		17	64.4	18.7	0		13.5	59.8	26.7	0		
PHF	.891	.630	.705	.000	.773	.868	.957	.827	.000	.911	.672	.915	.944	.000	.976	.797	.856	.721	.000	.815	.923



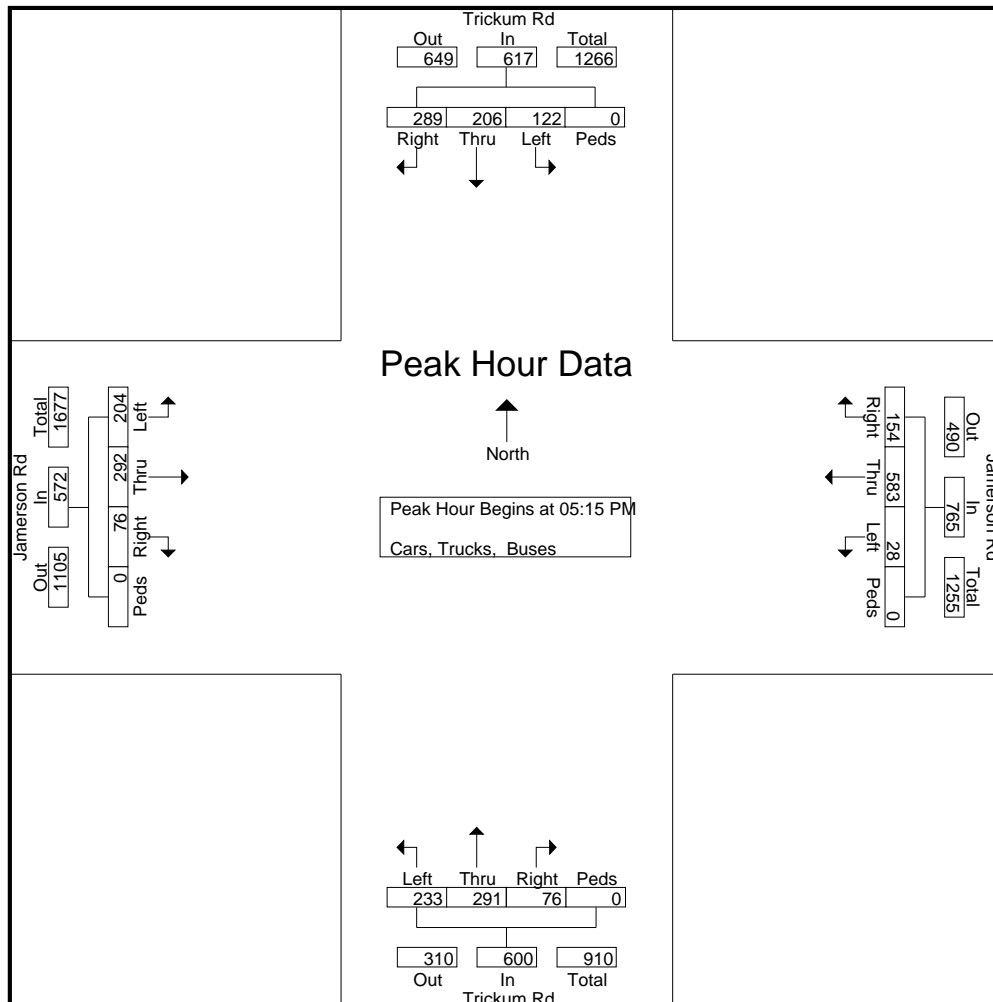
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TMC Data
 Jamerson Rd @ Trickum Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800001
 Site Code : 41800001
 Start Date : 2/28/2018
 Page No : 3

Start Time	Trickum Rd Northbound					Trickum Rd Southbound					Jamerson Rd Eastbound					Jamerson Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:30 PM to 06:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:15 PM																					
05:15 PM	65	68	18	0	151	37	56	66	0	159	48	80	22	0	150	11	151	41	0	203	663
05:30 PM	62	76	13	0	151	20	45	70	0	135	59	74	14	0	147	7	156	40	0	189	629
05:45 PM	54	61	29	0	144	35	55	72	0	162	41	76	17	0	134	3	146	40	0	189	629
06:00 PM	52	86	16	0	154	30	50	81	0	161	56	62	23	0	141	7	130	40	0	177	633
Total Volume	233	291	76	0	600	122	206	289	0	617	204	292	76	0	572	28	583	154	0	765	2554
% App. Total	38.8	48.5	12.7	0		19.8	33.4	46.8	0		35.7	51	13.3	0		3.7	76.2	20.1	0		
PHF	.896	.846	.655	.000	.974	.824	.920	.892	.000	.952	.864	.913	.826	.000	.953	.636	.934	.939	.000	.942	.963



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TMC Data
 Jamerson Rd @ Wigley Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800002
 Site Code : 41800002
 Start Date : 2/28/2018
 Page No : 1

Groups Printed- Cars, Trucks, Buses

Start Time	Northbound					Wigley Rd Southbound					Jamerson Rd Eastbound					Wigley Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	0	0	0	0	7	0	2	0	9	0	211	0	0	211	0	69	3	0	72	292
07:15 AM	0	0	0	0	0	0	0	2	0	2	2	223	0	0	225	0	117	1	0	118	345
07:30 AM	0	0	0	0	0	8	0	3	0	11	1	222	0	0	223	0	112	1	0	113	347
07:45 AM	0	0	0	0	0	8	0	1	0	9	1	201	0	0	202	0	65	3	0	68	279
Total	0	0	0	0	0	23	0	8	0	31	4	857	0	0	861	0	363	8	0	371	1263
08:00 AM	0	0	0	0	0	7	0	0	0	7	1	152	0	0	153	0	50	1	0	51	211
08:15 AM	0	0	0	0	0	1	0	0	0	1	0	167	0	0	167	0	70	0	0	70	238
08:30 AM	0	0	0	0	0	4	0	4	0	8	1	122	0	0	123	0	64	1	0	65	196
08:45 AM	0	0	0	0	0	2	0	2	0	4	1	140	0	0	141	0	58	0	0	58	203
Total	0	0	0	0	0	14	0	6	0	20	3	581	0	0	584	0	242	2	0	244	848
*** BREAK ***																					
04:30 PM	0	0	0	0	0	2	0	3	0	5	3	89	0	0	92	0	163	5	0	168	265
04:45 PM	0	0	0	0	0	5	0	2	0	7	2	69	0	0	71	0	196	5	0	201	279
Total	0	0	0	0	0	7	0	5	0	12	5	158	0	0	163	0	359	10	0	369	544
05:00 PM	0	0	0	0	0	4	0	0	0	4	0	101	0	0	101	0	174	2	0	176	281
05:15 PM	0	0	0	0	0	1	0	3	0	4	3	96	0	0	99	0	192	1	0	193	296
05:30 PM	0	0	0	0	0	4	0	0	0	4	2	86	0	0	88	0	206	4	0	210	302
05:45 PM	0	0	0	0	0	3	0	1	0	4	2	106	0	0	108	0	209	1	0	210	322
Total	0	0	0	0	0	12	0	4	0	16	7	389	0	0	396	0	781	8	0	789	1201
06:00 PM	0	0	0	0	0	2	0	1	0	3	0	80	0	0	80	0	211	6	0	217	300
06:15 PM	0	0	0	0	0	4	0	1	0	5	1	56	0	0	57	0	216	2	0	218	280
Grand Total	0	0	0	0	0	62	0	25	0	87	20	2121	0	0	2141	0	2172	36	0	2208	4436
Apprch %	0	0	0	0	0	71.3	0	28.7	0		0.9	99.1	0	0		0	98.4	1.6	0		
Total %	0	0	0	0	0	1.4	0	0.6	0	2	0.5	47.8	0	0	48.3	0	49	0.8	0	49.8	

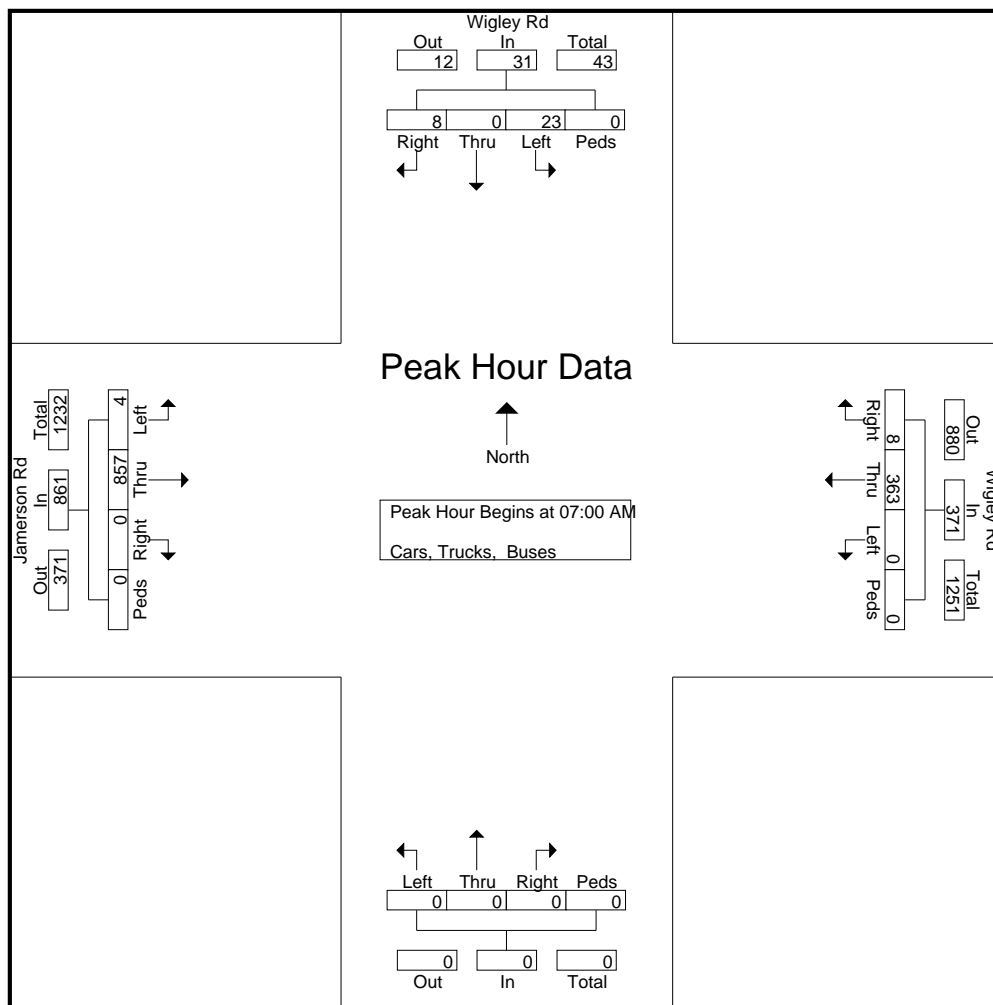
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TMC Data
 Jamerson Rd @ Wigley Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800002
 Site Code : 41800002
 Start Date : 2/28/2018
 Page No : 2

Start Time	Northbound					Wigley Rd Southbound					Jamerson Rd Eastbound					Wigley Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	7	0	2	0	9	0	211	0	0	211	0	69	3	0	72	292
07:15 AM	0	0	0	0	0	0	0	2	0	2	2	223	0	0	225	0	117	0	0	118	345
07:30 AM	0	0	0	0	0	8	0	3	0	11	1	222	0	0	223	0	112	1	0	113	347
07:45 AM	0	0	0	0	0	8	0	1	0	9	1	201	0	0	202	0	65	3	0	68	279
Total Volume	0	0	0	0	0	23	0	8	0	31	4	857	0	0	861	0	363	8	0	371	1263
% App. Total	0	0	0	0	0	74.2	0	25.8	0	0	0.5	99.5	0	0	0	0	97.8	2.2	0	0	
PHF	.000	.000	.000	.000	.000	.719	.000	.667	.000	.705	.500	.961	.000	.000	.957	.000	.776	.667	.000	.786	.910



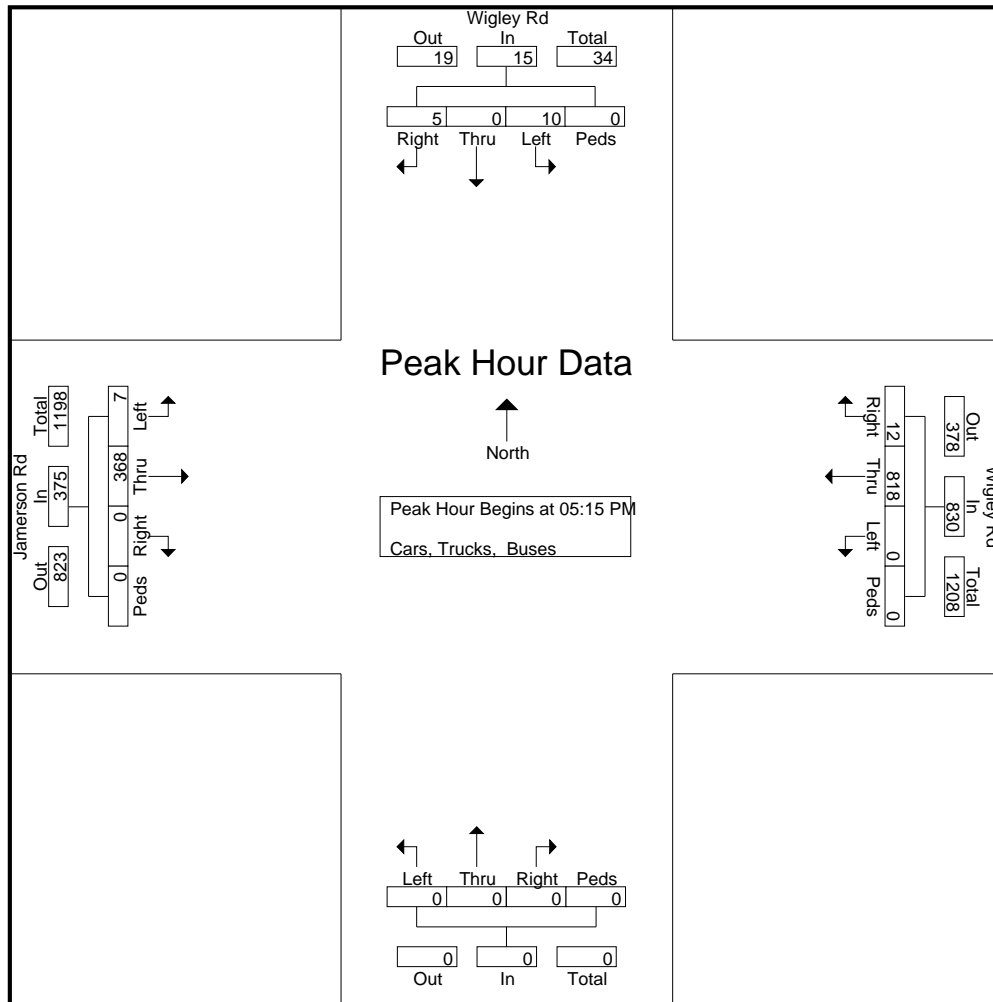
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TMC Data
 Jamerson Rd @ Wigley Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800002
 Site Code : 41800002
 Start Date : 2/28/2018
 Page No : 3

Start Time	Northbound					Wigley Rd Southbound					Jamerson Rd Eastbound					Wigley Rd Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:30 PM to 06:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:15 PM																					
05:15 PM	0	0	0	0	0	1	0	3	0	4	3	96	0	0	99	0	192	1	0	193	296
05:30 PM	0	0	0	0	0	4	0	0	0	4	2	86	0	0	88	0	206	4	0	210	302
05:45 PM	0	0	0	0	0	3	0	1	0	4	2	106	0	0	108	0	209	1	0	210	322
06:00 PM	0	0	0	0	0	2	0	1	0	3	0	80	0	0	80	0	211	6	0	217	300
Total Volume	0	0	0	0	0	10	0	5	0	15	7	368	0	0	375	0	818	12	0	830	1220
% App. Total	0	0	0	0	0	66.7	0	33.3	0		1.9	98.1	0	0		0	98.6	1.4	0		
PHF	.000	.000	.000	.000	.000	.625	.000	.417	.000	.938	.583	.868	.000	.000	.868	.000	.969	.500	.000	.956	.947



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TMC Data
 Wigley Rd @ Jims Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800003
 Site Code : 41800003
 Start Date : 2/28/2018
 Page No : 1

Groups Printed- Cars, Trucks, Buses

Start Time	Wigley Rd Northbound					Wigley Rd Southbound					Jims Rd Eastbound					Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	2	64	0	0	66	0	224	2	0	226	13	0	37	0	50	0	0	0	0	0	342
07:15 AM	10	95	0	0	105	0	219	15	0	234	20	0	28	0	48	0	0	0	0	0	387
07:30 AM	22	86	0	0	108	0	213	22	0	235	20	0	46	0	66	0	0	0	0	0	409
07:45 AM	54	53	0	0	107	0	184	24	0	208	9	0	62	0	71	0	0	0	0	0	386
Total	88	298	0	0	386	0	840	63	0	903	62	0	173	0	235	0	0	0	0	0	1524
08:00 AM	34	38	0	0	72	0	162	13	0	175	13	0	90	0	103	0	0	0	0	0	350
08:15 AM	27	57	0	0	84	0	167	10	0	177	13	0	48	0	61	0	0	0	0	0	322
08:30 AM	38	48	0	0	86	0	104	13	0	117	15	0	43	0	58	0	0	0	0	0	261
08:45 AM	90	32	0	0	122	0	132	23	0	155	20	0	77	0	97	0	0	0	0	0	374
Total	189	175	0	0	364	0	565	59	0	624	61	0	258	0	319	0	0	0	0	0	1307
*** BREAK ***																					
04:30 PM	30	148	0	0	178	0	87	12	0	99	24	0	33	0	57	0	0	0	0	0	334
04:45 PM	25	192	0	0	217	0	68	11	0	79	12	0	20	0	32	0	0	0	0	0	328
Total	55	340	0	0	395	0	155	23	0	178	36	0	53	0	89	0	0	0	0	0	662
05:00 PM	51	171	0	0	222	0	87	16	0	103	6	0	23	0	29	0	0	0	0	0	354
05:15 PM	21	194	0	0	215	0	95	10	0	105	8	0	16	0	24	0	0	0	0	0	344
05:30 PM	27	196	0	0	223	0	91	7	0	98	1	0	16	0	17	0	0	0	0	0	338
05:45 PM	42	224	0	0	266	0	89	18	0	107	10	0	17	0	27	0	0	0	0	0	400
Total	141	785	0	0	926	0	362	51	0	413	25	0	72	0	97	0	0	0	0	0	1436
06:00 PM	32	189	0	0	221	0	73	12	0	85	18	0	38	0	56	0	0	0	0	0	362
06:15 PM	30	226	0	0	256	0	64	1	0	65	6	0	22	0	28	0	0	0	0	0	349
Grand Total	535	2013	0	0	2548	0	2059	209	0	2268	208	0	616	0	824	0	0	0	0	0	5640
Apprch %	21	79	0	0		0	90.8	9.2	0		25.2	0	74.8	0		0	0	0	0		
Total %	9.5	35.7	0	0	45.2	0	36.5	3.7	0	40.2	3.7	0	10.9	0	14.6	0	0	0	0	0	

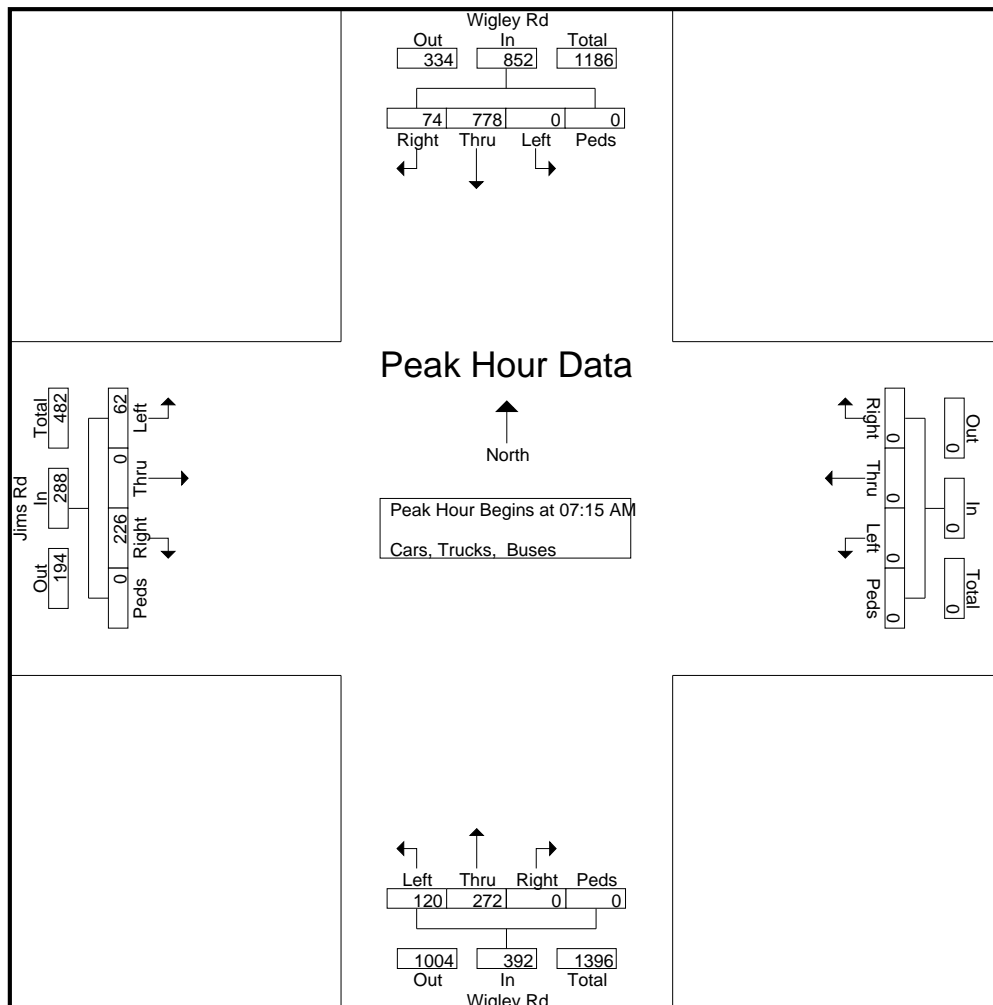
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TMC Data
 Wigley Rd @ Jims Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800003
 Site Code : 41800003
 Start Date : 2/28/2018
 Page No : 2

Start Time	Wigley Rd Northbound					Wigley Rd Southbound					Jims Rd Eastbound					Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	10	95	0	0	105	0	219				20	0	28	0	48	0	0	0	0	0	387
07:30 AM	22	86	0	0	108	0	213	22	0	235	20	0	46	0	66	0	0	0	0	0	409
07:45 AM	54	53	0	0	107	0	184	24	0	208	9	0	62	0	71	0	0	0	0	0	386
08:00 AM	34	38	0	0	72	0	162	13	0	175	13	0	90	0	103	0	0	0	0	0	350
Total Volume	120	272	0	0	392	0	778	74	0	852	62	0	226	0	288	0	0	0	0	0	1532
% App. Total	30.6	69.4	0	0		0	91.3	8.7	0		21.5	0	78.5	0		0	0	0	0		
PHF	.556	.716	.000	.000	.907	.000	.888	.771	.000	.906	.775	.000	.628	.000	.699	.000	.000	.000	.000	.000	.936



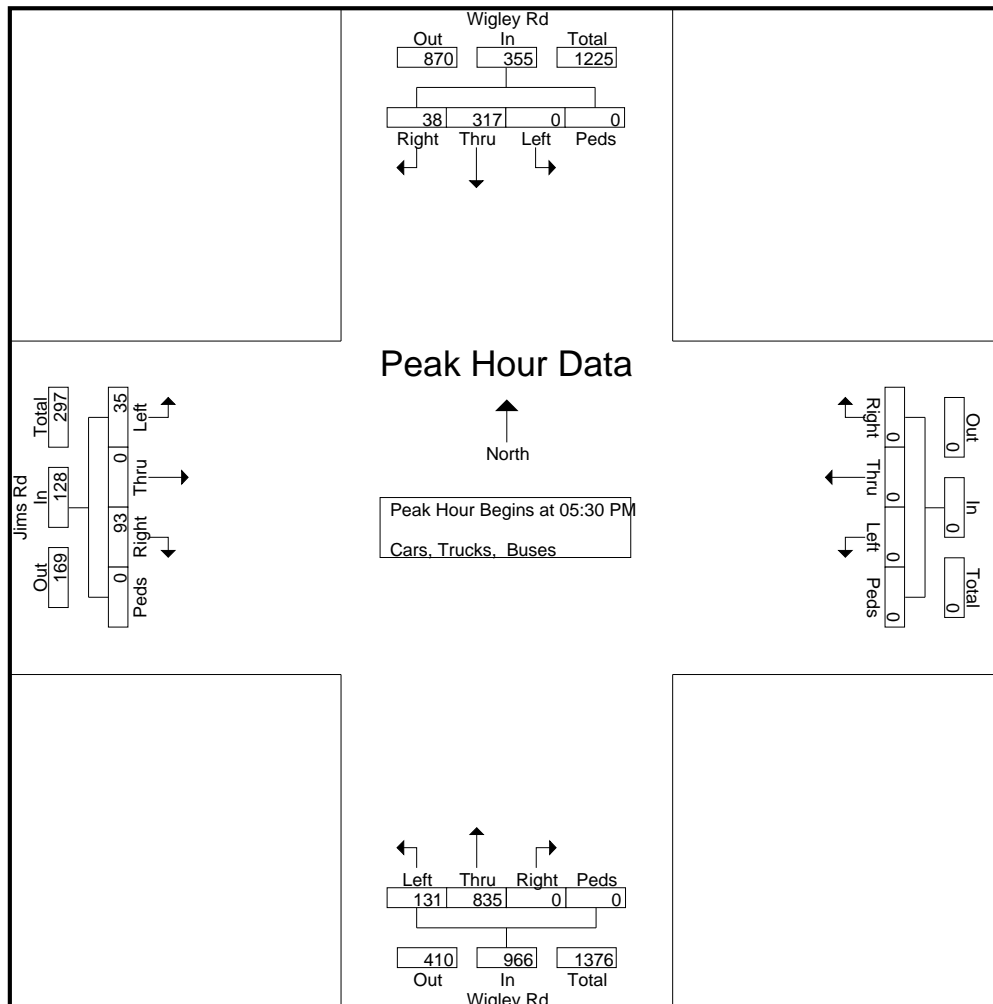
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TMC Data
 Wigley Rd @ Jims Rd
 Marietta, GA
 7-9am | 4.30-6.30pm

File Name : 41800003
 Site Code : 41800003
 Start Date : 2/28/2018
 Page No : 3

Start Time	Wigley Rd Northbound					Wigley Rd Southbound					Jims Rd Eastbound					Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:30 PM to 06:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:30 PM																					
05:30 PM	27	196	0	0	223	0	91	7	0	98	1	0	16	0	17	0	0	0	0	0	338
05:45 PM	42	224	0	0	266	0	89	18	0	107	10	0	17	0	27	0	0	0	0	0	400
06:00 PM	32	189	0	0	221	0	73	12	0	85	18	0	38	0	56	0	0	0	0	0	362
06:15 PM	30	226																			
Total Volume	131	835	0	0	966	0	317	38	0	355	35	0	93	0	128	0	0	0	0	0	1449
% App. Total	13.6	86.4	0	0		0	89.3	10.7	0		27.3	0	72.7	0		0	0	0	0		
PHF	.780	.924	.000	.000	.908	.000	.871	.528	.000	.829	.486	.000	.612	.000	.571	.000	.000	.000	.000	.000	.906



Appendix B

Intersection Analysis Methodology

Intersection Analysis Methodology

The methodology used for evaluating traffic operations at intersections is presented in the Transportation Research Board's Highway Capacity Manual, 2016 edition (HCM 6). Synchro 10 software, which emulates the HCM 6 methodology, was used for all analyses. The following is an overview of the methodology employed for the analysis of signalized intersections and roundabouts and stop-sign controlled (unsignalized) intersections. Levels of service (LOS) are assigned letters A through F. LOS A indicates operations with very low control delay while LOS F describes operations with high control delay. LOS F is considered to be unacceptable by most drivers, while LOS E is typically considered to be the limit of acceptable delay.

Signalized Intersections and Roundabouts – Level of service for a signalized intersection and a roundabout is defined in terms of control delay per vehicle. For signalized intersections and roundabouts, a composite intersection level of service is determined. The thresholds for each level of service are higher for signalized intersections and roundabouts than for unsignalized intersections. This is attributable to a variety of factors including expectation and acceptance of higher delays at signals/roundabouts, and the fact that drivers can relax when waiting at a signal as opposed to having to remain attentive as they proceed through the unsignalized intersection. The level of service criteria for signalized intersections and roundabouts are shown in Table A.

Table A – Level of Service Criteria for Signalized Intersections and Roundabouts

Control Delay (s/veh)	LOS
≤ 10	A
> 10 and ≤ 20	B
> 20 and ≤ 35	C
> 35 and ≤ 55	D
> 55 and ≤ 80	E
> 80	F

Source: Highway Capacity Manual 6

Unsignalized Intersections – Level of service for an unsignalized intersection is defined in terms of control delay per vehicle. Control delay is that portion of delay attributable to the control device and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The delays at unsignalized intersections are based on gap acceptance theory, factoring in availability of gaps, usefulness of the gaps, and the priority of right-of-way given to each traffic stream. The level of service criteria for unsignalized intersections are presented in Table B.

Table B – Level of Service Criteria for Unsignalized Intersections

Control Delay (s/veh)	LOS
0 – 10	A
> 10 and ≤ 15	B
> 15 and ≤ 25	C
> 25 and ≤ 35	D
> 35 and ≤ 50	E
> 50	F

























Source: Highway Capacity Manual 6

Appendix C

Existing Intersection Operational Analysis

Provence Estates
1: Trickum Road & Jamerson Road

existing a.m.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	520	151	51	226	101	57	116	31	177	398	139
Future Volume (veh/h)	137	520	151	51	226	101	57	116	31	177	398	139
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	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	140	531	154	62	276	123	74	151	40	195	437	153
Peak Hour Factor	0.98	0.98	0.98	0.82	0.82	0.82	0.77	0.77	0.77	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	670	568	157	458	388	305	623	528	553	704	596
Arrive On Green	0.08	0.40	0.40	0.27	0.27	0.27	0.04	0.37	0.37	0.09	0.42	0.42
Sat Flow, veh/h	1603	1683	1427	681	1683	1427	1603	1683	1427	1603	1683	1427
Grp Volume(v), veh/h	140	531	154	62	276	123	74	151	40	195	437	153
Grp Sat Flow(s),veh/h/ln	1603	1683	1427	681	1683	1427	1603	1683	1427	1603	1683	1427
Q Serve(g_s), s	5.8	26.9	7.1	8.5	13.8	6.7	2.7	6.0	1.8	6.9	19.8	6.8
Cycle Q Clear(g_c), s	5.8	26.9	7.1	23.2	13.8	6.7	2.7	6.0	1.8	6.9	19.8	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	317	670	568	157	458	388	305	623	528	553	704	596
V/C Ratio(X)	0.44	0.79	0.27	0.40	0.60	0.32	0.24	0.24	0.08	0.35	0.62	0.26
Avail Cap(c_a), veh/h	356	791	670	188	537	455	324	623	528	578	704	596
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	25.6	19.7	41.2	30.7	28.1	18.7	21.1	19.8	15.1	22.2	18.4
Incr Delay (d2), s/veh	1.0	4.7	0.3	1.6	1.4	0.5	0.4	0.9	0.3	0.4	4.1	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	2.1	10.7	2.2	1.4	5.5	2.2	1.0	2.5	0.6	2.4	8.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	30.4	19.9	42.8	32.1	28.6	19.1	22.0	20.1	15.5	26.3	19.4
LnGrp LOS	C	C	B	D	C	C	B	C	C	B	C	B
Approach Vol, veh/h		825			461			265			785	
Approach Delay, s/veh		27.2			32.6			20.9			22.3	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	40.4		43.1	8.8	45.0	12.2	30.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.5	35.5		45.5	5.5	40.5	10.1	30.9				
Max Q Clear Time (g_c+I1), s	8.9	8.0		28.9	4.7	21.8	7.8	25.2				
Green Ext Time (p_c), s	0.1	0.9		3.3	0.0	2.9	0.1	1.2				
Intersection Summary												
HCM 6th Ctrl Delay				25.9								
HCM 6th LOS				C								

Provence Estates
2: Jamerson Road & Wigley Road

existing a.m.

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	4	857	363	8	23	8
Future Vol, veh/h	4	857	363	8	23	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	200	80	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	79	79	71	71
Heavy Vehicles, %	1	2	2	1	1	1
Mvmt Flow	4	893	459	10	32	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	469	0	-	0	1360 459
Stage 1	-	-	-	-	459 -
Stage 2	-	-	-	-	901 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1098	-	-	-	164 604
Stage 1	-	-	-	-	638 -
Stage 2	-	-	-	-	398 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1098	-	-	-	163 604
Mov Cap-2 Maneuver	-	-	-	-	163 -
Stage 1	-	-	-	-	635 -
Stage 2	-	-	-	-	398 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	27
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1098	-	-	-	163	604
HCM Lane V/C Ratio	0.004	-	-	-	0.199	0.019
HCM Control Delay (s)	8.3	-	-	-	32.5	11.1
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0.1

Provence Estates
3: Wigley Road & Jims Road

























existing a.m.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	226	120	272	778	74
Future Volume (veh/h)	62	226	120	272	778	74
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	89	323	132	299	855	81
Peak Hour Factor	0.70	0.70	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	406	361	286	1216	984	834
Arrive On Green	0.23	0.23	0.06	0.65	0.53	0.53
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	89	323	132	299	855	81
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	3.0	14.6	2.3	4.9	29.5	1.9
Cycle Q Clear(g_c), s	3.0	14.6	2.3	4.9	29.5	1.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	406	361	286	1216	984	834
V/C Ratio(X)	0.22	0.89	0.46	0.25	0.87	0.10
Avail Cap(c_a), veh/h	434	387	294	1216	984	834
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	27.6	14.5	5.4	15.3	8.7
Incr Delay (d2), s/veh	0.3	21.6	1.2	0.5	10.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.2	1.0	1.4	12.5	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.4	49.2	15.6	5.9	25.6	9.0
LnGrp LOS	C	D	B	A	C	A
Approach Vol, veh/h				431	936	
Approach Delay, s/veh				8.8	24.2	
Approach LOS				A	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		52.5		21.3	9.2	43.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		48.0		18.0	5.0	38.5
Max Q Clear Time (g_c+I1), s		6.9		16.6	4.3	31.5
Green Ext Time (p_c), s		1.7		0.2	0.0	3.3
Intersection Summary						
HCM 6th Ctrl Delay			25.0			
HCM 6th LOS			C			

Provence Estates
1: Trickum Road & Jamerson Road

existing p.m.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	292	76	28	583	154	233	291	76	122	206	289
Future Volume (veh/h)	204	292	76	28	583	154	233	291	76	122	206	289
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	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	215	307	80	30	620	164	240	300	78	128	217	304
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.97	0.97	0.97	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	886	751	420	657	557	342	483	409	278	388	329
Arrive On Green	0.09	0.53	0.53	0.39	0.39	0.39	0.11	0.29	0.29	0.06	0.23	0.23
Sat Flow, veh/h	1603	1683	1427	897	1683	1427	1603	1683	1427	1603	1683	1427
Grp Volume(v), veh/h	215	307	80	30	620	164	240	300	78	128	217	304
Grp Sat Flow(s),veh/h/ln	1603	1683	1427	897	1683	1427	1603	1683	1427	1603	1683	1427
Q Serve(g_s), s	7.9	10.9	2.9	2.2	36.6	8.1	11.5	15.9	4.2	5.7	11.7	21.4
Cycle Q Clear(g_c), s	7.9	10.9	2.9	2.2	36.6	8.1	11.5	15.9	4.2	5.7	11.7	21.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	886	751	420	657	557	342	483	409	278	388	329
V/C Ratio(X)	0.90	0.35	0.11	0.07	0.94	0.29	0.70	0.62	0.19	0.46	0.56	0.92
Avail Cap(c_a), veh/h	240	921	781	439	692	587	342	483	409	278	388	329
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	14.1	12.2	19.8	30.3	21.6	26.0	31.8	27.7	30.0	35.0	38.7
Incr Delay (d2), s/veh	32.3	0.2	0.1	0.1	21.0	0.3	6.3	5.9	1.0	1.2	5.7	33.7
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	4.8	3.8	0.9	0.4	17.4	0.0	4.9	7.1	1.5	2.5	5.3	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	14.3	12.3	19.8	51.2	21.9	32.3	37.7	28.7	31.2	40.7	72.4
LnGrp LOS	E	B	B	B	D	C	C	D	C	C	D	E
Approach Vol, veh/h		602			814			618			649	
Approach Delay, s/veh		28.7			44.2			34.5			53.7	
Approach LOS		C			D			C			D	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	34.0		58.6	16.0	28.2	14.0	44.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.7	29.5		56.3	11.5	23.7	9.5	42.3				
Max Q Clear Time (g_c+I1), s	7.7	17.9		12.9	13.5	23.4	9.9	38.6				
Green Ext Time (p_c), s	0.0	1.5		2.0	0.0	0.1	0.0	1.6				
Intersection Summary												
HCM 6th Ctrl Delay				40.8								
HCM 6th LOS				D								

Provence Estates
2: Jamerson Road & Wigley Road

existing p.m.

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	7	368	818	12	10	5
Future Vol, veh/h	7	368	818	12	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	200	80	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	96	96	94	94
Heavy Vehicles, %	1	2	2	1	1	1
Mvmt Flow	8	423	852	13	11	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	865	0	-	0	1291 852
Stage 1	-	-	-	-	852 -
Stage 2	-	-	-	-	439 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	782	-	-	-	181 361
Stage 1	-	-	-	-	420 -
Stage 2	-	-	-	-	652 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	782	-	-	-	179 361
Mov Cap-2 Maneuver	-	-	-	-	179 -
Stage 1	-	-	-	-	416 -
Stage 2	-	-	-	-	652 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	22.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	782	-	-	-	179	361
HCM Lane V/C Ratio	0.01	-	-	-	0.059	0.015
HCM Control Delay (s)	9.7	-	-	-	26.4	15.1
HCM Lane LOS	A	-	-	-	D	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0

Provence Estates
3: Wigley Road & Jims Road

existing p.m.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	93	131	835	317	38
Future Volume (veh/h)	35	93	131	835	317	38
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	61	163	144	918	382	46
Peak Hour Factor	0.57	0.57	0.91	0.91	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	253	225	653	1261	925	784
Arrive On Green	0.14	0.14	0.09	0.67	0.49	0.49
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	61	163	144	918	382	46
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	1.5	4.8	1.6	15.4	6.4	0.7
Cycle Q Clear(g_c), s	1.5	4.8	1.6	15.4	6.4	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	253	225	653	1261	925	784
V/C Ratio(X)	0.24	0.72	0.22	0.73	0.41	0.06
Avail Cap(c_a), veh/h	655	583	726	1261	925	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	20.1	4.6	5.1	7.9	6.4
Incr Delay (d2), s/veh	0.5	4.4	0.2	3.7	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.4	0.3	2.9	1.9	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.1	24.4	4.8	8.8	9.2	6.6
LnGrp LOS	B	C	A	A	A	A
Approach Vol, veh/h	224			1062	428	
Approach Delay, s/veh	23.0			8.3	8.9	
Approach LOS	C			A	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		37.5		11.5	8.8	28.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		33.0		18.0	6.3	22.2
Max Q Clear Time (g_c+I1), s		17.4		6.8	3.6	8.4
Green Ext Time (p_c), s		5.8		0.5	0.1	1.9
Intersection Summary						
HCM 6th Ctrl Delay			10.4			
HCM 6th LOS			B			

Appendix D

No-Build Intersection Operational Analysis

Provence Estates
1: Trickum Road & Jamerson Road

no-build a.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	575	167	56	252	113	63	128	34	198	439	153
Future Volume (veh/h)	151	575	167	56	252	113	63	128	34	198	439	153
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	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	154	587	170	68	307	138	82	166	44	218	482	168
Peak Hour Factor	0.98	0.98	0.98	0.82	0.82	0.82	0.77	0.77	0.77	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	324	726	615	150	531	450	249	561	476	513	658	557
Arrive On Green	0.07	0.43	0.43	0.32	0.32	0.32	0.05	0.33	0.33	0.11	0.39	0.39
Sat Flow, veh/h	1603	1683	1427	637	1683	1427	1603	1683	1427	1603	1683	1427
Grp Volume(v), veh/h	154	587	170	68	307	138	82	166	44	218	482	168
Grp Sat Flow(s),veh/h/ln	1603	1683	1427	637	1683	1427	1603	1683	1427	1603	1683	1427
Q Serve(g_s), s	6.5	31.6	8.0	10.8	15.8	7.6	3.5	7.6	2.2	8.8	25.3	8.4
Cycle Q Clear(g_c), s	6.5	31.6	8.0	30.4	15.8	7.6	3.5	7.6	2.2	8.8	25.3	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	324	726	615	150	531	450	249	561	476	513	658	557
V/C Ratio(X)	0.48	0.81	0.28	0.45	0.58	0.31	0.33	0.30	0.09	0.43	0.73	0.30
Avail Cap(c_a), veh/h	324	739	626	155	544	461	257	561	476	528	658	557
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(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	25.7	19.0	44.2	29.7	26.9	23.0	25.6	23.8	18.2	27.0	21.8
Incr Delay (d2), s/veh	1.1	6.6	0.2	2.1	1.5	0.4	0.8	1.3	0.4	0.6	7.1	1.4
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	2.4	12.9	2.5	1.7	6.3	2.5	1.3	3.2	0.8	3.2	10.9	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	32.3	19.3	46.4	31.2	27.3	23.7	26.9	24.2	18.8	34.0	23.2
LnGrp LOS	C	C	B	D	C	C	C	C	C	B	C	C
Approach Vol, veh/h		911			513			292			868	
Approach Delay, s/veh		28.3			32.1			25.6			28.1	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.4	39.1		49.2	9.4	45.0	12.0	37.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.9	34.1		45.5	5.5	40.5	7.5	33.5				
Max Q Clear Time (g_c+I1), s	10.8	9.6		33.6	5.5	27.3	8.5	32.4				
Green Ext Time (p_c), s	0.1	1.0		3.2	0.0	2.8	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay				28.7								
HCM 6th LOS				C								

Provence Estates
2: Jamerson Road & Wigley Road

no-build a.m.

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	4	946	404	9	25	9
Future Vol, veh/h	4	946	404	9	25	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	200	80	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	79	79	71	71
Heavy Vehicles, %	1	2	2	1	1	1
Mvmt Flow	4	985	511	11	35	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	522	0	-	0	1504 511
Stage 1	-	-	-	-	511 -
Stage 2	-	-	-	-	993 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1050	-	-	-	134 565
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	360 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1050	-	-	-	133 565
Mov Cap-2 Maneuver	-	-	-	-	133 -
Stage 1	-	-	-	-	602 -
Stage 2	-	-	-	-	360 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	33.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1050	-	-	-	133	565
HCM Lane V/C Ratio	0.004	-	-	-	0.265	0.022
HCM Control Delay (s)	8.4	-	-	-	41.5	11.5
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	-	1	0.1

Provence Estates
3: Wigley Road & Jims Road

























no-build a.m.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	251	133	302	864	83
Future Volume (veh/h)	68	251	133	302	864	83
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	97	359	146	332	949	91
Peak Hour Factor	0.70	0.70	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	461	410	202	1173	953	808
Arrive On Green	0.26	0.26	0.06	0.63	0.51	0.51
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	97	359	146	332	949	91
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	3.4	17.1	2.8	6.3	39.9	2.4
Cycle Q Clear(g_c), s	3.4	17.1	2.8	6.3	39.9	2.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	461	410	202	1173	953	808
V/C Ratio(X)	0.21	0.88	0.72	0.28	1.00	0.11
Avail Cap(c_a), veh/h	711	633	218	1173	953	808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	28.0	18.3	6.7	19.3	10.1
Incr Delay (d2), s/veh	0.2	8.6	10.4	0.6	28.2	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	1.4	1.0	1.8	2.1	21.3	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.2	36.7	28.7	7.3	47.4	10.4
LnGrp LOS	C	D	C	A	D	B
Approach Vol, veh/h	456			478	1040	
Approach Delay, s/veh	33.8			13.8	44.2	
Approach LOS	C			B	D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		54.0		24.9	9.3	44.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		49.5		31.5	5.5	39.5
Max Q Clear Time (g_c+I1), s		8.3		19.1	4.8	41.9
Green Ext Time (p_c), s		1.9		1.3	0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			34.4			
HCM 6th LOS			C			

Provence Estates
1: Trickum Road & Jamerson Road

no-build p.m.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	324	84	31	645	171	257	321	84	137	227	319
Future Volume (veh/h)	225	324	84	31	645	171	257	321	84	137	227	319
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	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	237	341	88	33	686	182	265	331	87	144	239	336
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.97	0.97	0.97	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	912	773	411	669	567	299	470	398	239	402	341
Arrive On Green	0.10	0.54	0.54	0.40	0.40	0.40	0.09	0.28	0.28	0.05	0.24	0.24
Sat Flow, veh/h	1603	1683	1427	863	1683	1427	1603	1683	1427	1603	1683	1427
Grp Volume(v), veh/h	237	341	88	33	686	182	265	331	87	144	239	336
Grp Sat Flow(s),veh/h/ln	1603	1683	1427	863	1683	1427	1603	1683	1427	1603	1683	1427
Q Serve(g_s), s	10.7	12.2	3.2	2.5	41.7	9.3	9.5	18.5	4.9	5.3	13.2	24.6
Cycle Q Clear(g_c), s	10.7	12.2	3.2	2.5	41.7	9.3	9.5	18.5	4.9	5.3	13.2	24.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	912	773	411	669	567	299	470	398	239	402	341
V/C Ratio(X)	1.02	0.37	0.11	0.08	1.03	0.32	0.89	0.70	0.22	0.60	0.59	0.99
Avail Cap(c_a), veh/h	232	912	773	411	669	567	299	470	398	239	402	341
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	13.8	11.7	19.8	31.6	21.9	33.3	34.0	29.1	33.9	35.4	39.8
Incr Delay (d2), s/veh	64.8	0.3	0.1	0.1	41.6	0.3	25.7	8.6	1.3	4.2	6.3	45.2
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	7.0	4.2	0.9	0.5	23.3	3.0	4.8	8.5	1.8	1.4	6.0	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.5	14.1	11.8	19.9	73.3	22.2	59.0	42.6	30.3	38.1	41.8	85.0
LnGrp LOS	F	B	B	B	F	C	E	D	C	D	D	F
Approach Vol, veh/h		666			901			683			719	
Approach Delay, s/veh		42.7			61.0			47.4			61.2	
Approach LOS		D			E			D			E	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	33.8		61.4	14.0	29.6	15.2	46.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	29.3		56.9	9.5	25.1	10.7	41.7				
Max Q Clear Time (g_c+I1), s	7.3	20.5		14.2	11.5	26.6	12.7	43.7				
Green Ext Time (p_c), s	0.0	1.4		2.2	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			53.8									
HCM 6th LOS			D									

Provence Estates
2: Jamerson Road & Wigley Road

no-build p.m.

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↕	↕	↙	↙	↙
Traffic Vol, veh/h	8	407	905	13	11	6
Future Vol, veh/h	8	407	905	13	11	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	200	80	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	96	96	94	94
Heavy Vehicles, %	1	2	2	1	1	1
Mvmt Flow	9	468	943	14	12	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	957	0	-	0	1429 943
Stage 1	-	-	-	-	943 -
Stage 2	-	-	-	-	486 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	723	-	-	-	149 320
Stage 1	-	-	-	-	380 -
Stage 2	-	-	-	-	621 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	723	-	-	-	147 320
Mov Cap-2 Maneuver	-	-	-	-	147 -
Stage 1	-	-	-	-	375 -
Stage 2	-	-	-	-	621 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	26.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	723	-	-	-	147	320
HCM Lane V/C Ratio	0.013	-	-	-	0.08	0.02
HCM Control Delay (s)	10	-	-	-	31.6	16.5
HCM Lane LOS	B	-	-	-	D	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.1

Provence Estates
3: Wigley Road & Jims Road

no-build p.m.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	104	147	927	353	42
Future Volume (veh/h)	40	104	147	927	353	42
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	70	182	162	1019	425	51
Peak Hour Factor	0.57	0.57	0.91	0.91	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	266	237	641	1316	1035	877
Arrive On Green	0.15	0.15	0.08	0.70	0.55	0.55
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	70	182	162	1019	425	51
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	2.1	6.7	2.1	21.7	8.0	0.9
Cycle Q Clear(g_c), s	2.1	6.7	2.1	21.7	8.0	0.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	266	237	641	1316	1035	877
V/C Ratio(X)	0.26	0.77	0.25	0.77	0.41	0.06
Avail Cap(c_a), veh/h	524	467	700	1316	1035	877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	25.0	4.8	5.9	7.9	6.3
Incr Delay (d2), s/veh	0.5	5.2	0.2	4.5	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.4	5.0	2.6	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.5	30.2	5.0	10.4	9.1	6.4
LnGrp LOS	C	C	A	B	A	A
Approach Vol, veh/h	252			1181	476	
Approach Delay, s/veh	28.3			9.7	8.8	
Approach LOS	C			A	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		47.5		13.6	9.2	38.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		43.0		18.0	6.7	31.8
Max Q Clear Time (g_c+I1), s		23.7		8.7	4.1	10.0
Green Ext Time (p_c), s		7.5		0.5	0.1	2.5
Intersection Summary						
HCM 6th Ctrl Delay			11.9			
HCM 6th LOS			B			

Appendix E

Future Intersection Operational Analysis

Provence Estates
1: Trickum Road & Jamerson Road

future a.m.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	579	167	58	263	121	63	128	35	201	439	153
Future Volume (veh/h)	151	579	167	58	263	121	63	128	35	201	439	153
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	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	154	591	170	71	321	148	82	166	45	221	482	168
Peak Hour Factor	0.98	0.98	0.98	0.82	0.82	0.82	0.77	0.77	0.77	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	737	625	155	542	459	242	543	461	505	645	546
Arrive On Green	0.07	0.44	0.44	0.32	0.32	0.32	0.05	0.32	0.32	0.11	0.38	0.38
Sat Flow, veh/h	1603	1683	1427	634	1683	1427	1603	1683	1427	1603	1683	1427
Grp Volume(v), veh/h	154	591	170	71	321	148	82	166	45	221	482	168
Grp Sat Flow(s),veh/h/ln	1603	1683	1427	634	1683	1427	1603	1683	1427	1603	1683	1427
Q Serve(g_s), s	6.4	31.4	7.8	11.3	16.5	8.1	3.5	7.6	2.3	9.1	25.5	8.5
Cycle Q Clear(g_c), s	6.4	31.4	7.8	30.6	16.5	8.1	3.5	7.6	2.3	9.1	25.5	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	737	625	155	542	459	242	543	461	505	645	546
V/C Ratio(X)	0.48	0.80	0.27	0.46	0.59	0.32	0.34	0.31	0.10	0.44	0.75	0.31
Avail Cap(c_a), veh/h	321	759	643	163	563	477	250	543	461	535	645	546
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	25.1	18.5	43.6	29.3	26.5	23.6	26.2	24.4	18.6	27.5	22.3
Incr Delay (d2), s/veh	1.1	6.0	0.2	2.1	1.6	0.4	0.8	1.4	0.4	0.6	7.8	1.5
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	2.3	12.6	2.5	1.8	6.5	2.7	1.3	3.2	0.8	3.3	11.1	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	31.1	18.7	45.7	30.9	26.9	24.4	27.7	24.8	19.2	35.3	23.7
LnGrp LOS	C	C	B	D	C	C	C	C	C	B	D	C
Approach Vol, veh/h		915			540			293			871	
Approach Delay, s/veh		27.4			31.7			26.3			29.0	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.7	37.8		49.7	9.5	44.0	12.0	37.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	13.1	31.9		46.5	5.5	39.5	7.5	34.5				
Max Q Clear Time (g_c+I1), s	11.1	9.6		33.4	5.5	27.5	8.4	32.6				
Green Ext Time (p_c), s	0.1	1.0		3.4	0.0	2.7	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay				28.7								
HCM 6th LOS				C								

Provence Estates
2: Jamerson Road & Wigley Road

future a.m.

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	12	946	404	20	60	30
Future Vol, veh/h	12	946	404	20	60	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	200	80	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	79	79	80	80
Heavy Vehicles, %	1	2	2	1	1	1
Mvmt Flow	13	985	511	25	75	38

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	536	0	-	0	1522 511
Stage 1	-	-	-	-	511 -
Stage 2	-	-	-	-	1011 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1037	-	-	-	131 565
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	353 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1037	-	-	-	129 565
Mov Cap-2 Maneuver	-	-	-	-	129 -
Stage 1	-	-	-	-	596 -
Stage 2	-	-	-	-	353 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	47.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1037	-	-	-	129	565
HCM Lane V/C Ratio	0.012	-	-	-	0.581	0.066
HCM Control Delay (s)	8.5	-	-	-	65.9	11.8
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	-	2.9	0.2

Provence Estates
3: Wigley Road & Jims Road

























future a.m.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	251	133	312	895	87
Future Volume (veh/h)	69	251	133	312	895	87
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	99	359	146	343	984	96
Peak Hour Factor	0.70	0.70	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	450	400	192	1200	994	843
Arrive On Green	0.25	0.25	0.06	0.64	0.53	0.53
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	99	359	146	343	984	96
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	3.7	18.6	2.9	6.8	44.2	2.6
Cycle Q Clear(g_c), s	3.7	18.6	2.9	6.8	44.2	2.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	450	400	192	1200	994	843
V/C Ratio(X)	0.22	0.90	0.76	0.29	0.99	0.11
Avail Cap(c_a), veh/h	556	494	206	1200	994	843
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	30.7	20.0	6.7	19.7	9.9
Incr Delay (d2), s/veh	0.2	16.5	14.2	0.6	26.2	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	1.6	1.8	2.1	2.2	22.8	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.4	47.2	34.2	7.3	45.8	10.2
LnGrp LOS	C	D	C	A	D	B
Approach Vol, veh/h	458			489	1080	
Approach Delay, s/veh	42.5			15.3	42.7	
Approach LOS	D			B	D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		59.0		25.9	9.3	49.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		54.5		26.5	5.5	44.5
Max Q Clear Time (g_c+I1), s		8.8		20.6	4.9	46.2
Green Ext Time (p_c), s		2.0		0.9	0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			36.0			
HCM 6th LOS			D			

Provence Estates
1: Trickum Road & Jamerson Road

future p.m.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	337	84	32	652	177	257	321	86	147	227	319
Future Volume (veh/h)	225	337	84	32	652	177	257	321	86	147	227	319
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	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683	1683
Adj Flow Rate, veh/h	237	355	88	34	694	188	265	331	89	155	239	336
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.97	0.97	0.97	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	912	773	407	669	567	299	470	398	239	402	341
Arrive On Green	0.10	0.54	0.54	0.40	0.40	0.40	0.09	0.28	0.28	0.05	0.24	0.24
Sat Flow, veh/h	1603	1683	1427	852	1683	1427	1603	1683	1427	1603	1683	1427
Grp Volume(v), veh/h	237	355	88	34	694	188	265	331	89	155	239	336
Grp Sat Flow(s),veh/h/ln	1603	1683	1427	852	1683	1427	1603	1683	1427	1603	1683	1427
Q Serve(g_s), s	10.7	12.9	3.2	2.6	41.7	9.6	9.5	18.5	5.0	5.3	13.2	24.6
Cycle Q Clear(g_c), s	10.7	12.9	3.2	2.6	41.7	9.6	9.5	18.5	5.0	5.3	13.2	24.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	912	773	407	669	567	299	470	398	239	402	341
V/C Ratio(X)	1.02	0.39	0.11	0.08	1.04	0.33	0.89	0.70	0.22	0.65	0.59	0.99
Avail Cap(c_a), veh/h	232	912	773	407	669	567	299	470	398	239	402	341
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	14.0	11.7	19.9	31.6	22.0	33.3	34.0	29.1	35.0	35.4	39.8
Incr Delay (d2), s/veh	64.8	0.3	0.1	0.1	45.1	0.3	25.7	8.6	1.3	6.0	6.3	45.2
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	7.0	4.5	0.9	0.5	23.9	3.1	4.8	8.5	1.8	1.8	6.0	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.5	14.2	11.8	20.0	76.7	22.3	59.0	42.6	30.4	41.1	41.8	85.0
LnGrp LOS	F	B	B	B	F	C	E	D	C	D	D	F
Approach Vol, veh/h		680			916			685			730	
Approach Delay, s/veh		42.2			63.4			47.3			61.5	
Approach LOS		D			E			D			E	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	33.8		61.4	14.0	29.6	15.2	46.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	29.3		56.9	9.5	25.1	10.7	41.7				
Max Q Clear Time (g_c+I1), s	7.3	20.5		14.9	11.5	26.6	12.7	43.7				
Green Ext Time (p_c), s	0.0	1.4		2.3	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			54.5									
HCM 6th LOS			D									

Provence Estates
2: Jamerson Road & Wigley Road

future p.m.

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	33	407	905	52	34	20
Future Vol, veh/h	33	407	905	52	34	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	200	80	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	96	96	96	96
Heavy Vehicles, %	1	2	2	1	1	1
Mvmt Flow	38	468	943	54	35	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	997	0	-	0	1487 943
Stage 1	-	-	-	-	943 -
Stage 2	-	-	-	-	544 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	698	-	-	-	138 320
Stage 1	-	-	-	-	380 -
Stage 2	-	-	-	-	584 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	698	-	-	-	131 320
Mov Cap-2 Maneuver	-	-	-	-	131 -
Stage 1	-	-	-	-	359 -
Stage 2	-	-	-	-	584 -

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	33
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	698	-	-	-	131	320
HCM Lane V/C Ratio	0.054	-	-	-	0.27	0.065
HCM Control Delay (s)	10.5	-	-	-	42.4	17
HCM Lane LOS	B	-	-	-	E	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1	0.2

Provence Estates
3: Wigley Road & Jims Road

future p.m.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	104	147	962	373	45
Future Volume (veh/h)	44	104	147	962	373	45
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	77	182	162	1057	449	54
Peak Hour Factor	0.57	0.57	0.91	0.91	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	262	233	635	1343	1084	919
Arrive On Green	0.15	0.15	0.07	0.72	0.58	0.58
Sat Flow, veh/h	1781	1585	1781	1870	1870	1585
Grp Volume(v), veh/h	77	182	162	1057	449	54
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1870	1585
Q Serve(g_s), s	2.6	7.4	2.1	24.5	8.9	1.0
Cycle Q Clear(g_c), s	2.6	7.4	2.1	24.5	8.9	1.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	262	233	635	1343	1084	919
V/C Ratio(X)	0.29	0.78	0.26	0.79	0.41	0.06
Avail Cap(c_a), veh/h	480	427	687	1343	1084	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	27.5	4.8	6.1	7.8	6.1
Incr Delay (d2), s/veh	0.6	5.6	0.2	4.7	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.4	0.5	5.8	2.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.0	33.1	5.0	10.8	8.9	6.2
LnGrp LOS	C	C	A	B	A	A
Approach Vol, veh/h				1219	503	
Approach Delay, s/veh				10.0	8.6	
Approach LOS				B	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		52.5		14.3	9.3	43.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		48.0		18.0	6.7	36.8
Max Q Clear Time (g_c+I1), s		26.5		9.4	4.1	10.9
Green Ext Time (p_c), s		8.4		0.5	0.1	2.7
Intersection Summary						
HCM 6th Ctrl Delay			12.4			
HCM 6th LOS			B			

Appendix F

Miscellaneous



CHRISTOPHER PLANNING & ENGINEERING
 12460 CHAMPAGNE ROAD
 ALPHARETTA, GEORGIA 30004
 PHONE: 770.331.7303

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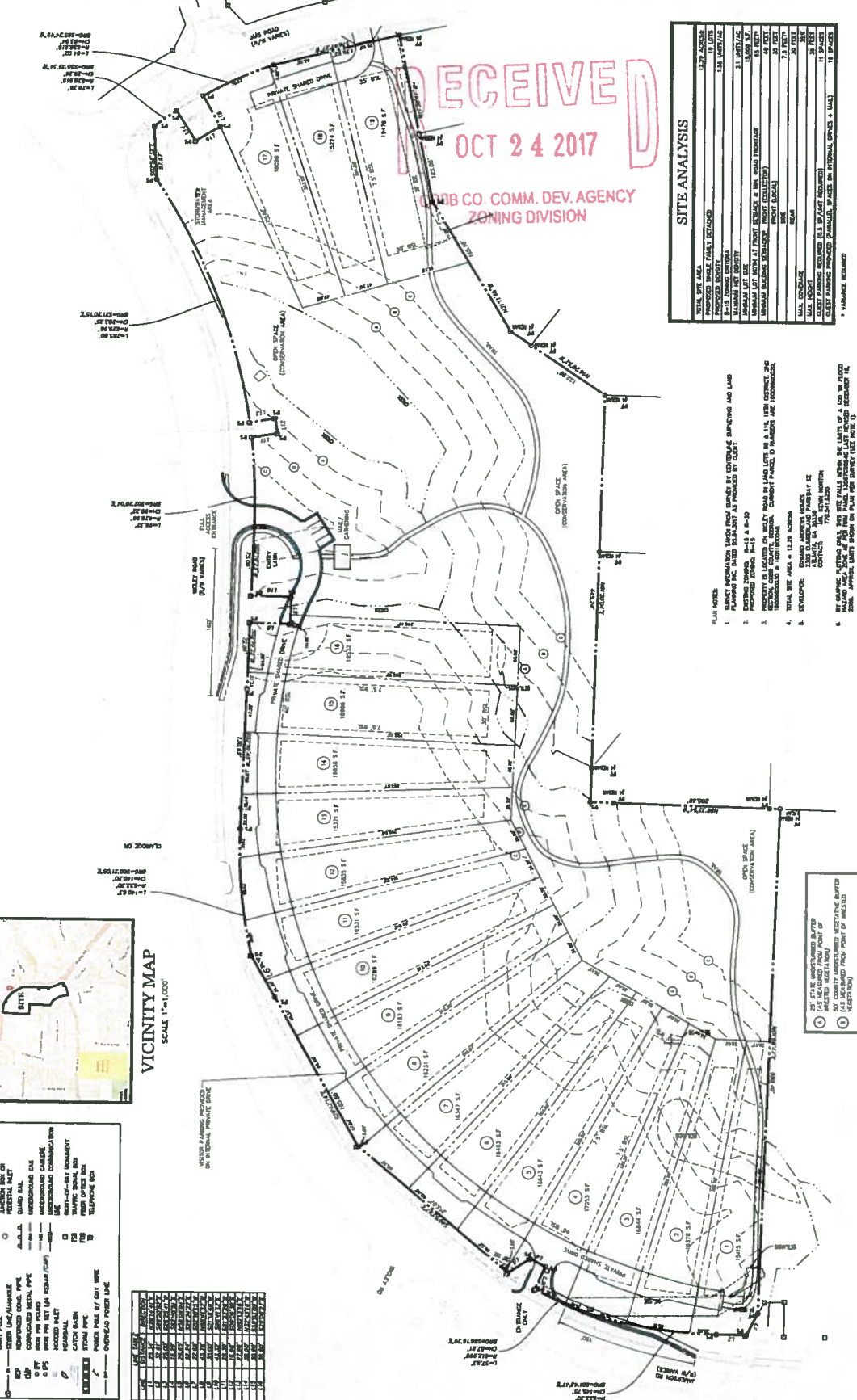
ZONING SITE PLAN
 FOR
WIGLEY ROAD TRACT
 LAND LOTS 98 & 119
 18TH DISTRICT, 2ND SECTION
 COBB COUNTY, GEORGIA

FOR
EDWARD ANDREWS
 2303 CUMBERLAND PARKWAY SE
 ATLANTA, GEORGIA 30339
 (770) 341-5250

REVISIONS
 CLIENT COMMENTS

NO.	DATE	DESCRIPTION
1	09.28.2017	CLIENT COMMENTS

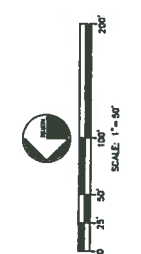
DATE: AUGUST 28, 2017
 SHEET NO. **Z.1**
 ZONING SITE PLAN
 CRME DRAWING NO. 20171131.dwg



RECEIVED
 OCT 24 2017
 COBB CO. COMM. DEV. AGENCY
 ZONING DIVISION

SITE ANALYSIS

ITEM	DESCRIPTION	STATUS
1	TOTAL SITE AREA	13.29 ACRES
2	PROPOSED LOTS	18 LOTS
3	PROPOSED LOT AREA	13.29 ACRES
4	PROPOSED LOT WIDTH	21.14 FT
5	PROPOSED LOT DEPTH	163.00 FT
6	PROPOSED LOT FRONT YARD SETBACK	20 FT
7	PROPOSED LOT SIDE YARD SETBACK	5 FT
8	PROPOSED LOT REAR YARD SETBACK	5 FT
9	PROPOSED LOT FRONT PORCH	10 FT
10	PROPOSED LOT SIDE PORCH	5 FT
11	PROPOSED LOT REAR PORCH	5 FT
12	PROPOSED LOT DRIVEWAY	10 FT
13	PROPOSED LOT GARAGE	10 FT
14	PROPOSED LOT DRIVEWAY	10 FT
15	PROPOSED LOT DRIVEWAY	10 FT
16	PROPOSED LOT DRIVEWAY	10 FT
17	PROPOSED LOT DRIVEWAY	10 FT
18	PROPOSED LOT DRIVEWAY	10 FT
19	PROPOSED LOT DRIVEWAY	10 FT
20	PROPOSED LOT DRIVEWAY	10 FT



SYMBOL LEGEND

—	WATER LINE	—	CONCRETE W/OUT FINISH
—	PIPE HYDRANT	—	CONCRETE W/ FINISH
—	SEWER	—	ASBESTOS CEMENT PIPE
—	WATER VALVE	—	CAST IRON PIPE
—	LIGHT POLE	—	STEEL PIPE
—	CONCRETE W/ FINISH	—	STEEL PIPE (4" DIA)
—	ASBESTOS CEMENT PIPE	—	STEEL PIPE (6" DIA)
—	CAST IRON PIPE	—	STEEL PIPE (8" DIA)
—	STEEL PIPE	—	STEEL PIPE (10" DIA)
—	STEEL PIPE (4" DIA)	—	STEEL PIPE (12" DIA)
—	STEEL PIPE (6" DIA)	—	STEEL PIPE (14" DIA)
—	STEEL PIPE (8" DIA)	—	STEEL PIPE (16" DIA)
—	STEEL PIPE (10" DIA)	—	STEEL PIPE (18" DIA)
—	STEEL PIPE (12" DIA)	—	STEEL PIPE (20" DIA)
—	STEEL PIPE (14" DIA)	—	STEEL PIPE (22" DIA)
—	STEEL PIPE (16" DIA)	—	STEEL PIPE (24" DIA)
—	STEEL PIPE (18" DIA)	—	STEEL PIPE (26" DIA)
—	STEEL PIPE (20" DIA)	—	STEEL PIPE (28" DIA)
—	STEEL PIPE (22" DIA)	—	STEEL PIPE (30" DIA)
—	STEEL PIPE (24" DIA)	—	STEEL PIPE (32" DIA)
—	STEEL PIPE (26" DIA)	—	STEEL PIPE (34" DIA)
—	STEEL PIPE (28" DIA)	—	STEEL PIPE (36" DIA)
—	STEEL PIPE (30" DIA)	—	STEEL PIPE (38" DIA)
—	STEEL PIPE (32" DIA)	—	STEEL PIPE (40" DIA)
—	STEEL PIPE (34" DIA)	—	STEEL PIPE (42" DIA)
—	STEEL PIPE (36" DIA)	—	STEEL PIPE (44" DIA)
—	STEEL PIPE (38" DIA)	—	STEEL PIPE (46" DIA)
—	STEEL PIPE (40" DIA)	—	STEEL PIPE (48" DIA)
—	STEEL PIPE (42" DIA)	—	STEEL PIPE (50" DIA)
—	STEEL PIPE (44" DIA)	—	STEEL PIPE (52" DIA)
—	STEEL PIPE (46" DIA)	—	STEEL PIPE (54" DIA)
—	STEEL PIPE (48" DIA)	—	STEEL PIPE (56" DIA)
—	STEEL PIPE (50" DIA)	—	STEEL PIPE (58" DIA)
—	STEEL PIPE (52" DIA)	—	STEEL PIPE (60" DIA)
—	STEEL PIPE (54" DIA)	—	STEEL PIPE (62" DIA)
—	STEEL PIPE (56" DIA)	—	STEEL PIPE (64" DIA)
—	STEEL PIPE (58" DIA)	—	STEEL PIPE (66" DIA)
—	STEEL PIPE (60" DIA)	—	STEEL PIPE (68" DIA)
—	STEEL PIPE (62" DIA)	—	STEEL PIPE (70" DIA)
—	STEEL PIPE (64" DIA)	—	STEEL PIPE (72" DIA)
—	STEEL PIPE (66" DIA)	—	STEEL PIPE (74" DIA)
—	STEEL PIPE (68" DIA)	—	STEEL PIPE (76" DIA)
—	STEEL PIPE (70" DIA)	—	STEEL PIPE (78" DIA)
—	STEEL PIPE (72" DIA)	—	STEEL PIPE (80" DIA)
—	STEEL PIPE (74" DIA)	—	STEEL PIPE (82" DIA)
—	STEEL PIPE (76" DIA)	—	STEEL PIPE (84" DIA)
—	STEEL PIPE (78" DIA)	—	STEEL PIPE (86" DIA)
—	STEEL PIPE (80" DIA)	—	STEEL PIPE (88" DIA)
—	STEEL PIPE (82" DIA)	—	STEEL PIPE (90" DIA)
—	STEEL PIPE (84" DIA)	—	STEEL PIPE (92" DIA)
—	STEEL PIPE (86" DIA)	—	STEEL PIPE (94" DIA)
—	STEEL PIPE (88" DIA)	—	STEEL PIPE (96" DIA)
—	STEEL PIPE (90" DIA)	—	STEEL PIPE (98" DIA)
—	STEEL PIPE (92" DIA)	—	STEEL PIPE (100" DIA)

- PLAN NOTES:**
1. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 2. PROPOSED LOT AREA: 13.29 ACRES.
 3. PROPERTY IS LOCATED ON WIGLEY ROAD IN LAND LOTS 98 & 119, 18TH DISTRICT, 2ND SECTION, COBB COUNTY, GEORGIA. CLIENT HAS TO VERIFY THE LEGAL DESCRIPTION OF THE PROPERTY WITH THE COUNTY CLERK'S OFFICE.
 4. TOTAL SITE AREA = 13.29 ACRES.
 5. DEVELOPER: EDWARD ANDREWS.
 6. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 7. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 8. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 9. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 10. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 11. COUNTY BARRIER AND/OR SIGNAGE REQUIRED.
 12. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 13. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
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 19. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.
 20. ALL DIMENSIONS TAKEN FROM SURVEY BY CHRISTOPHER PLANNING AND LAND SURVEYING, INC. UNLESS OTHERWISE NOTED BY CLIENT.

JAMERSON RD @ WIGLEY RD

09/01/2014 - 08/31/2017

Total Crashes 6

<i>DATE_ACC</i>	<i>ROAD_ON</i>	<i>DIR_DIST</i>	<i>ROAD_AT</i>	<i>TIME_ACC</i>	<i>ACCNO</i>	<i>VEH</i>	<i>INJ</i>	<i>FATAL</i>	<i>DIR_1</i>	<i>DIR_2</i>	<i>MOVT_1</i>	<i>MOVT_2</i>	<i>LC</i>	<i>SURFACE</i>	<i>DESCRIP</i>
11/22/2014	JAMERSON RD		WIGLEY RD	1:05	14100655r	1	1	0	W		10		4	1	6
02/24/2015	WIGLEY RD		JAMERSON RD	8:25	15017074r	1	0	0	W		10		1	8	6
02/25/2015	WIGLEY RD		JAMERSON RD	8:26	15017337r	2	0	0	W	E	10	10	1	4	4
02/27/2015	WIGLEY RD		JAMERSON RD	8:53	15017885r	2	1	0	S	W	1	2	1	4	1
05/21/2015	JAMERSON RD		WIGLEY RD	6:40	15046349r	2	0	0	S	E	1	5	3	1	1
08/02/2017	JAMERSON RD		WIGLEY RD	8:00	17072084r	2	0	0	S	W	1	5	1	1	1

6 *total crashes*

WIGLEY RD @ JIMS RD
09/01/2014 - 08/31/2017
Total Crashes 4

<i>DATE_ACC</i>	<i>ROAD ON</i>	<i>DIR_DIST</i>	<i>ROAD AT</i>	<i>TIME_ACC</i>	<i>ACCNO</i>	<i>VEH</i>	<i>INJ</i>	<i>FATAL</i>	<i>DIR_1</i>	<i>DIR_2</i>	<i>MOVT_1</i>	<i>MOVT_2</i>	<i>LC</i>	<i>SURFACE</i>	<i>DESCRIP</i>
01/05/2015	WIGLEY RD		JIMS RD	16:44	15001168r	2	0	0	N	N	5	4	1	1	3
01/15/2015	WIGLEY RD		JIMS RD	16:33	15004048r	2	0	0	N	N	5	5	1	2	3
01/21/2016	WIGLEY RD		JIMS RD	19:01	16006903r	3	1	0	N	N	5	5	5	2	3
11/11/2016	WIGLEY RD	S30	JIMS RD	16:50	16109614r	1	0	0	N		5		1	1	6

4 *total crashes*