MOUNTAIN BROOK CITY COUNCIL
PRE-MEETING AGENDA

PRE-COUNCIL ROOM (A-106) CITY HALL
56 CHURCH STREET
MOUNTAIN BROOK, AL 35213

OCTOBER 27, 2014 – 6:15 P.M.

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1. Oakdale Drive/Overton Road/River Run Drive traffic study-Richard Caudle of Skipper Consultants. (See attached information. This item may be added to the formal agenda.)

2. Overhill Road traffic concerns (back-up to Laurel Lane) - Alison Ingram and residents requesting stop sign at this intersection. (See attached information.)

3. Proposal to review traffic signals modifications on Cahaba Road at Little Hardware exit – Richard Caudle of Skipper Consultants. (See attached information. This item may be added to the formal agenda.)

4. Organizational meeting committee and liaison assignments carried-over from last meeting. (See attached information.)

5. Review and discussion of the 7 p.m. City Council formal meeting agenda topics.

6. Adjournment.

Traffic Study

Overton Road at Oakdale Drive/River Run Drive

Jefferson County, Alabama

Prepared for:

The City of Mountain Brook
56 Church Street
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ALABAMA REGISTERED No. 20061 PROFESSIONAL ENGINEER RICHARD LYN CAUDLE

SIGNED:

DATE: 10/22/14

SKIPPER CONSULTING INC.

October 22, 2014

Introduction

This report documents a traffic study performed for the intersection of Overton Road at Oakdale Drive/River Run Drive, conducted as a part of an on-going project by the City of Mountain Brook to construct Cahaba River Park. An element of the park is to construct a pedestrian walkway underneath the existing River Run Drive bridge and provide a signalized pedestrian crossing of Overton Road to tie this walkway to existing sidewalks on Oakdale Drive and Overton Road. The walkway and crosswalk plans were prepared for the City of Mountain Brook by Nimrod Long and Associates, and are excerpted in Figure 1.

Figure 1. Proposed Walkways and Crosswalk

In May, 2014, the City of Mountain Brook contracted with Skipper Consulting, Inc. to prepare traffic signal modifications plans to provide actuated pedestrian signals for the crosswalk crossing Overton Road. These plans were completed in July, 2014 and submitted to the City of Mountain Brook, the City of Vestavia Hills, and Jefferson County Roads and Transportation for review and comments. The existing traffic signal at the intersection of Overton Road at Oakdale Drive/River Run Drive is owned and maintained by Jefferson County, as are Oakdale Drive and River Run Drive themselves, due to the location of the City Limits between the City of Mountain Brook and the City of Vestavia Hills, as shown on Figure 2. At the current time, the City of Mountain Brook has responsibility for Overton Road south of the intersection and the City of Vestavia Hills has responsibility for Overton Road north of the intersection.

Figure 2. City Limits Lines

Jefferson County Roads and Transportation made comments concerning the proposed traffic signal modification plans during a meeting held on-site on September 9, 2014. Their comments included a request to add additional crosswalks to the intersection and make modifications to curb radii, as depicted in the sketch shown in Figure 3.

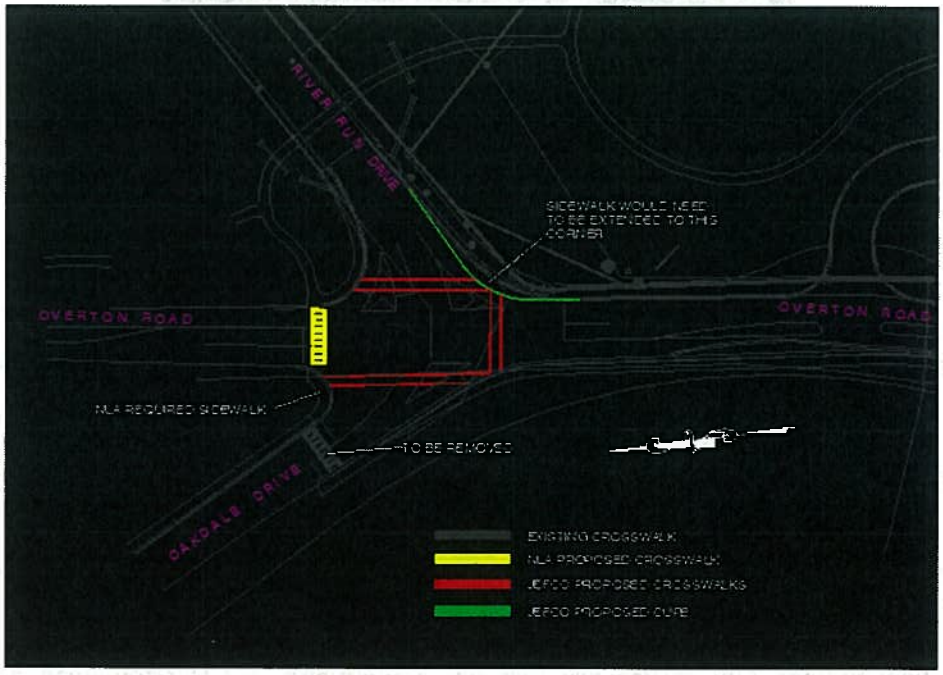

Figure 3. Improvements Proposed by Jefferson County Roads and Transportation

During the on-site review of Jefferson County Roads and Transportation's comments, it was noted that the proposed crosswalks extending away from the southwest corner of Overton Road at Oakdale Drive could potentially create a safety hazard to pedestrians since drivers eastbound on Oakdale Drive are generally looking over their left shoulder for gaps in the southbound traffic flow on Overton Road and not to the right where pedestrians may have just entered the crosswalks from the southwest corner of the intersection. It was noted that modification to the curb radius in the southeast corner of the intersection may mitigate this concern by forcing the drivers approaching on Oakdale Drive into a more perpendicular approach, as illustrated in Figure 4.

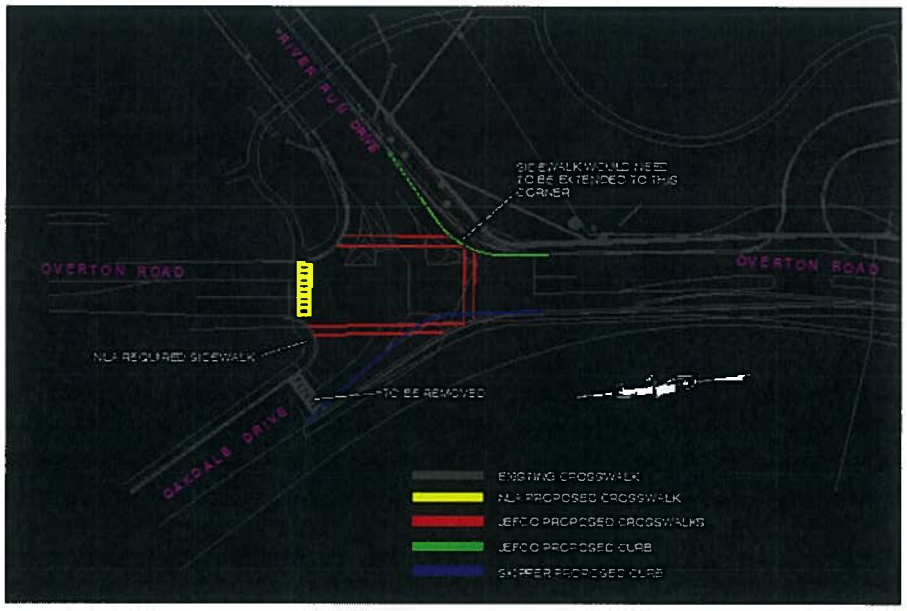

Figure 4. Additional Improvements Proposed by Skipper Consulting, Inc.

Subsequent meetings were held with various parties regarding these proposed additional changes to the intersection on September 22, 2014 and October 1, 2014. During the October 1, 2014 meeting between Jefferson County Roads and Transportation and Skipper Consulting, Inc., there was a discussion regarding the impact to intersection capacity, delay, and level of service which would result from the proposed changes. At this point, Jefferson County Roads and Transportation recommended that a traffic study be performed in order to measure the impacts of the proposed changes on traffic flow. In response, the City of Mountain Brook retained Skipper Consulting, Inc. to prepare a traffic study on October 13, 2014. This document is a direct result of that work.

Scope of Analysis

In general, the following is the order of analyses performed for this study:

1. **Existing** - The first level of analysis was for existing conditions in order to provide a benchmark for determining the impacts of all other improvements.
2. **Alternative A** - Second, an analysis was performed to determine the impact of the proposed Nimrod Long and Associates crossing of Overton Road.
3. **Alternative B** - Third, an analysis was performed to determine the impact of the proposed curb radius improvement on the southeast corner of the intersection, turning from Overton Road northbound onto River Run Drive. This proposal would not change intersection capacity, levels of service, or delays, but will impact the right turning traffic speed from Overton Road northbound onto River Run Drive.
4. **Alternative C** - Fourth, an analysis was performed to determine the impact of the additional crosswalks as proposed by Jefferson County Roads and Transportation.
5. **Alternative D** - Fifth, an analysis was performed to determine the impact of the proposed curb radius improvement on the southwest corner of the intersection, turning from Oakdale Drive onto Overton Road southbound. This proposal would not change intersection capacity, levels of service, or delays, but will impact the right turning traffic speed from Oakdale Drive onto Overton Road southbound.

The results of these analyses are documented in the following sections of this report.

Existing Analysis

An existing intersection turning movement traffic count was performed at the intersection of Overton Road at Oakdale Drive/River Run Drive on Tuesday, October 7, 2014 from 7:00 to 9:00 a.m., 2:30 to 3:30 p.m., and 4:00 to 6:00 p.m. by Traffic Data, LLC on behalf of Skipper Consulting, Inc. The traffic count data is included in Appendix A and are summarized in Figure 5.

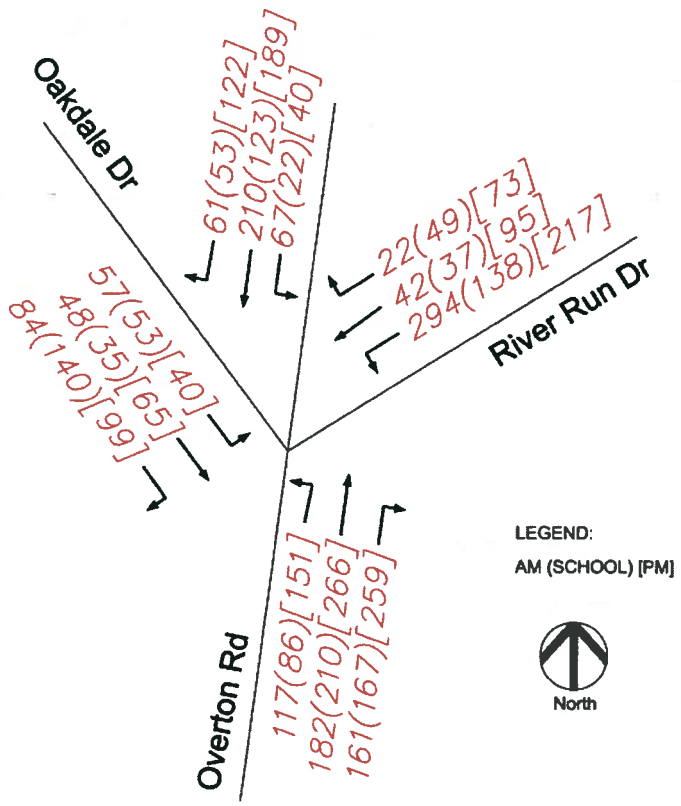

Figure 5. Existing Traffic Counts

Existing peak hour intersection capacity analyses were performed for the intersection of Overton Road at Oakdale Drive/River Run Drive according to the methodology of analysis included in the 2000 *Highway Capacity Manual*, published by the Transportation Research Board. Capacities are expressed as levels of service, and range from a level of service "A" (highest quality of service) to a level of service "F" (jammed conditions). As a general rule, operation at a level of service "C" or better is desirable, with operation at a level of service "D" considered acceptable during peak hours of traffic flow. The results of the existing peak hour intersection capacity analyses are included in Appendix B and are summarized in Table 1, included in a later section of this report.

Alternative A Analysis

Alternative A includes only the proposed signalized crossing of Overton Road as designed by Nimrod Long and Associates. The changes to the intersection which would affect intersection capacity, delay, and level of service would be the pedestrian traffic flow crossing the north leg of the intersection. This crossing would be signalized in conjunction with Phase 3 of the traffic signal operating plan (the phase which serves River Run Drive). The existing maximum green time for phase 3 (28 seconds) is sufficient to cover the proposed walk + flashing don't walk time (17 seconds), so no reallocation of effective green time would be required.

The results of the peak hour intersection capacity analyses are included in Appendix C and are summarized in Table 1. As shown, construction of the proposed signalized crosswalk shown in the Nimrod Long and Associates plan has no effect on level of service and a miniscule effect on delay for the right turn from River Run Drive onto Overton Road northbound.

The cost estimate to implement Alternative A is approximately as follows:

Sidewalk Extension and Crosswalk		$10,500
Traffic Signal Modifications		$28,300
	Total	$38,800

Alternative B Analysis

Alternative B is a modification to the curb line for the right turn from Overton Road northbound onto River Run Drive. The current plan prepared by Nimrod Long and Associates shows an 85 foot curb radius for this turn. Jefferson County suggested that a decreased curb radius would help slow traffic making this turn, which would improve traffic safety and make the potential pedestrian crossing of River Run Drive shorter. Skipper Consulting, Inc. performed a sketch design of a decreased curb radius based on the turning template of a WB-50 tractor trailer truck. This sketch is shown in Figure 6.

The curb radius in the sketch prepared by Skipper Consulting, Inc. is 40 feet. In general, the maximum safe speed of a simple curve is expressed by the formula

$$v^2=14.9\mu r$$

where

v=speed in mph
μ=coefficient of friction
r=radius in feet

Assuming a μ of .9, the maximum safe speed for the right turn with an 85 foot radius would be 33 to 34 miles per hour, which is greater than the posted speed limit on Overton Road (30 miles per hour). With the proposed 40 foot radius, the maximum safe speed for the right turn would be 23 miles per hour.

The cost estimate to implement Alternative B is approximately $1,750.

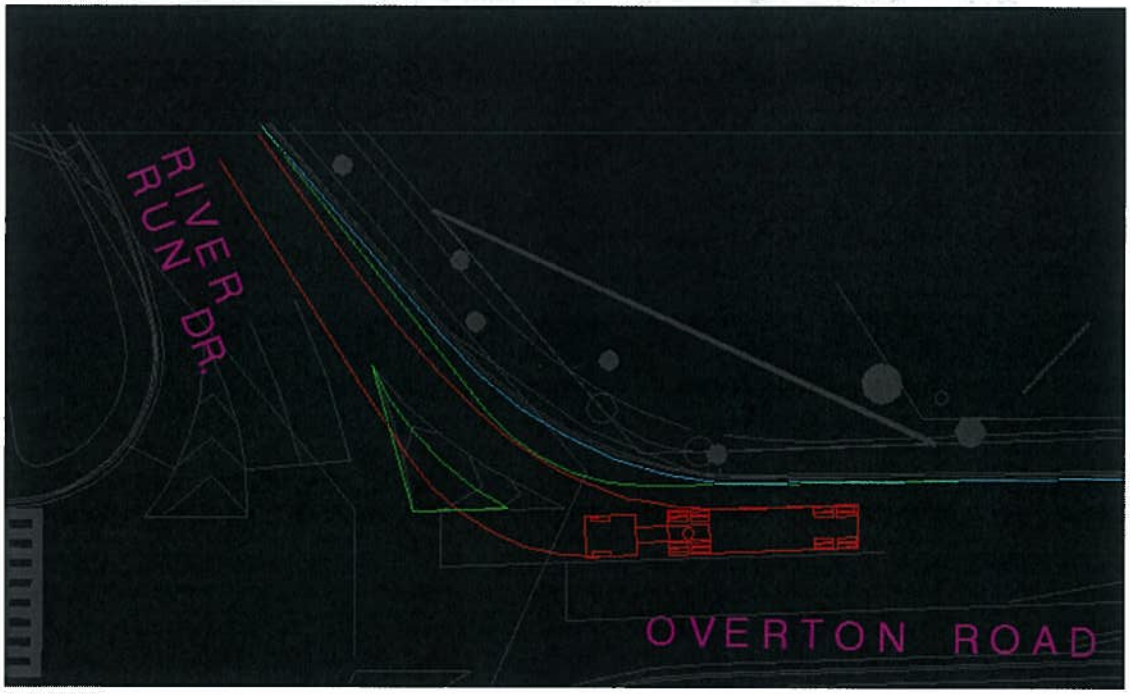

Figure 6. Curb Radius Modification with Truck Turning Template

Alternative C Analysis

Alternative C includes three additional crosswalks as proposed by Jefferson County Roads and Transportation beyond the single crosswalk of Overton Road as proposed by Nimrod Long and Associates. This improvement would impact intersection capacity, delay, and level of service due to additional pedestrian crossing conflicts and loss of access to the right turn lane on Oakdale Drive. As shown in Figure 7, a single vehicle which is stacked on Oakdale Drive to turn left or go straight across Overton Road will effectively prevent vehicles from using the right turn lane.

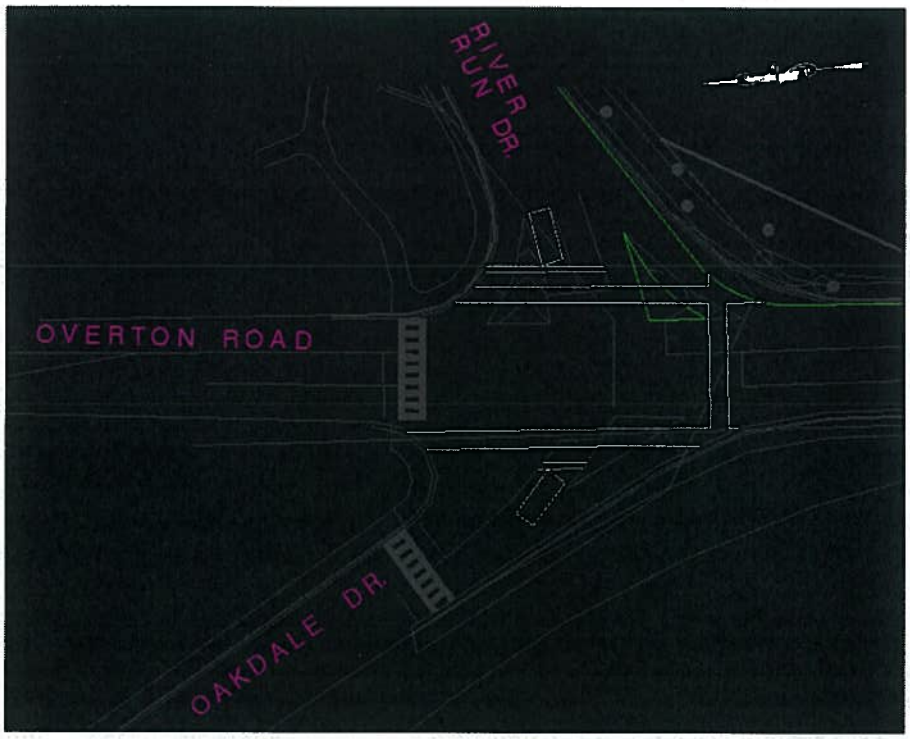

Figure 7. Impact on Oakdale Drive Right Turn Lane Caused by Crosswalk

The results of the peak hour intersection capacity analyses are included in Appendix D and are summarized in Table 1. As shown, construction of the three proposed additional signalized crosswalks as proposed by Jefferson County would have a significant impact on delay on Oakdale Drive due to the restricted access to the right turn lane on Oakdale Drive, particularly during the afternoon school and p.m. peak hours.

In order to construct Alternative C, a sidewalk would need to be extended from within the park to the southeast corner of the intersection of Overton Road and River Run Drive. This would involve a minimum of 135 feet of sidewalk and two ADA curb ramps. In addition, appropriate ADA curb ramps on the other corners, crosswalk striping and actuated pedestrian signals would need to be added to the other three approaches to the intersection. The cost estimate to construct Alternative C (over and above Alternatives A and B) is as follows:

6' Sidewalk (135')	$15,200
ADA Curb Ramps (6)	$13,200
Crosswalk Striping	$ 2,100
Traffic Signal Modifications	$16,600
Total	$47,100

Alternative D Analysis

Alternative D is a proposed curb radius improvement on the southwest corner of the intersection of Overton Road at Oakdale Drive/River Run Drive, turning right from Oakdale Drive onto Overton Road southbound. During the on-site review of Jefferson County Roads and Transportation's comments (Alternatives B and C), it was noted that the proposed crosswalks extending away from the southwest corner of Overton Road at Oakdale Drive could potentially create a safety hazard to pedestrians since drivers eastbound on Oakdale Drive are generally looking over their left shoulder for gaps in the southbound traffic flow on Overton Road and not to the right where pedestrians may have just entered the crosswalks from the southwest corner of the intersection. It was noted that modification to the curb radius in the southeast corner of the intersection may mitigate this concern by forcing the drivers approaching on Oakdale Drive into a more perpendicular approach, as illustrated in Figure 8.

The impact to intersection capacity, delay, and level of service resulting from Alternative D would be the same Alternative C. The most significant impact would be the removal of the right turn movement from Oakdale Drive onto Overton Road southbound, which results in levels of service "E" and "F" on Oakdale Drive during the afternoon school and p.m. peak hours.

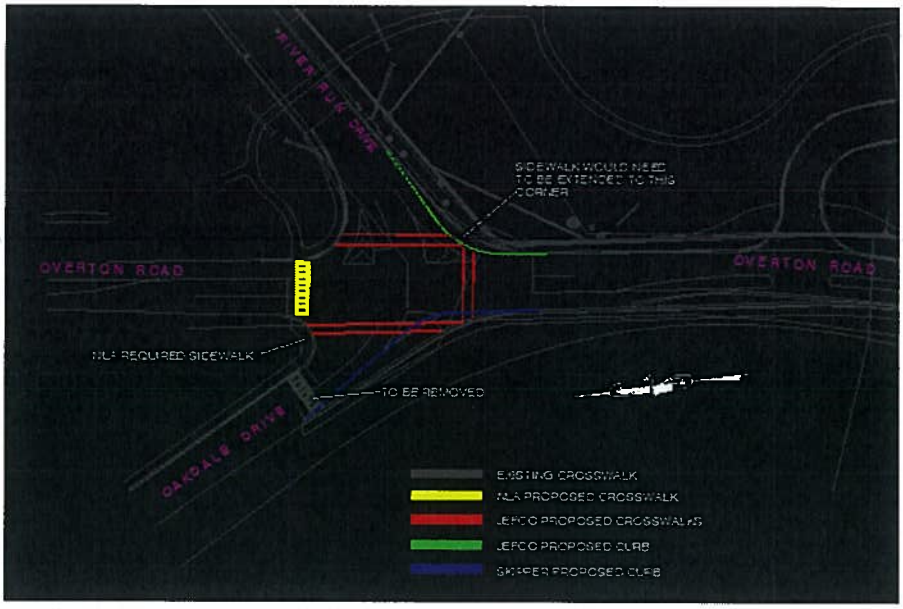

Figure 8. Additional Improvements Proposed by Skipper Consulting, Inc.

In addition to the sight line improvements for traffic on Oakdale Drive, Alternative D would also slow traffic on Oakdale Drive turning right onto Overton Road southbound. The existing curb radius for this right turn is approximately 110 feet. The curb radius in sketch prepared by Skipper Consulting, Inc. is 50 feet. In general, the maximum safe speed of a simple curve is expressed by the formula

$$v^2=14.9\mu r$$

where

v=speed in mph
μ=coefficient of friction
r=radius in feet

Assuming a μ of .9, the maximum safe speed for the right turn with a 110 foot radius would be 38 miles per hour. With the proposed 50 foot radius, the maximum safe speed for the right turn would be 26 miles per hour.

The work which would be required to implement Alternative D, over and above Alternatives A, B, and C, includes construction of approximately 175 feet of curb and gutter, 850 square feet of slope paved island, and modification to the intersection striping and signalization. The cost estimate to implement Alternative D, over and above Alternatives A, B, and C is as follows:

Curb and Gutter (175')		$ 8,800
Slope Paving (850 sq.ft.)		$ 4,700
Striping Modifications		$ 2,000
Signal Modifications		$ 2,000
	Total	$17,500

Recommendations

It is the recommendation of Skipper Consulting, Inc. that the City of Mountain Brook proceed with construction of Alternatives A and B as part of the Cahaba River Park project. This includes the following work items:

- Extension of the existing sidewalk on the north side of Oakdale Drive to Overton Road
- Installation of a marked crosswalk crossing the north leg of Overton Road
- Modifying the traffic signal at the intersection of Overton Road at Oakdale Drive/River Run Drive to provide an actuated signalized pedestrian crossing of Overton Road
- Modifying the curb radius for the movement from Overton Road northbound turning right onto River Run Drive. The design should accommodate a WB-50 design vehicle.

The work items includes as Alternative A are part of the Cahaba River Park plan and included in City budgets. Work items included as Alternative B are low cost and would be beneficial to the intersection. The estimated cost to construct the improvements listed above is $40,550.

It is recommended that Alternatives C and D not be pursued at this time, due to the following considerations:

- Implementation of these alternatives would result in deficient capacity and excessive delays on Oakdale Drive during the afternoon school and p.m. peak periods.

- The additional cost to implement Alternatives C and D ($64,600) is beyond the City's current budget for work at Cahaba River Park.

The results of the analysis performed for this report show that the right turn movement from Oakdale Drive onto Overton Road southbound is a critical movement and requires and exclusive lane. If, at some point in time the City wishes to pursue additional pedestrian crossings of the intersection as proposed by Jefferson County, then it is recommended that additional study and conceptual design be performed to provide both the exclusive right turn movement and a safe environment for pedestrians.

Table 1. Intersection Capacity Analysis

Approach	Movement	Existing						Alternatives A and B						Alternatives C and D					
		AM		Aft. School		PM		AM		Aft. School		PM		AM		Aft. School		PM	
Oakdale Drive Eastbound	Left-Through	D	39.6	D	39.5	D	42.1	D	39.6	D	39.5	D	42.1	D	43.8	E	68.3	F	89.2
	Right	D	39.1	D	41.6	D	42.2	D	39.1	D	41.6	D	42.2	--	--	--	--	--	--
	Overall approach	*D*	*39.4*	*D*	*40.7*	*D*	*42.2*	*D*	*39.4*	*D*	*40.7*	*D*	*42.2*	*D*	*43.8*	*E*	*68.3*	*F*	*89.2*
River Run Drive Westbound	Left	D	53.9	D	41.8	D	39.5	D	53.9	D	41.8	D	39.5	D	53.9	D	41.8	D	39.5
	Through	D	37.8	D	37.2	D	34.8	D	37.8	D	37.2	D	34.8	D	37.8	D	37.2	C	34.8
	Right	D	37.3	D	38.3	C	34.3	D	37.4	D	38.6	C	34.7	D	37.4	D	38.6	C	34.7
	Overall approach	*D*	*51.0*	*D*	*40.4*	*D*	*37.4*	*D*	*51.1*	*D*	*40.5*	*D*	*37.5*	*D*	*51.1*	*D*	*40.5*	*D*	*37.5*
Overton Road Northbound	Left	C	22.0	C	20.1	B	19.6	C	22.0	C	20.1	B	19.6	C	22.2	C	20.2	B	19.8
	Through-Right	D	48.1	D	45.9	D	52.3	D	48.1	D	45.9	D	52.3	D	52.5	D	49.6	E	60.5
	Overall approach	*D*	*41.5*	*D*	*41.7*	*D*	*45.0*	*D*	*41.5*	*D*	*41.7*	*D*	*45.0*	*D*	*44.8*	*D*	*44.7*	*D*	*51.4*
Overton Road Southbound	Left	C	23.2	C	22.2	C	27.4	C	23.2	C	22.2	C	27.4	C	23.3	C	22.2	C	21.4
	Through-Right	C	34.6	C	31.6	C	31.2	C	34.6	C	31.6	C	31.2	C	34.9	C	31.7	C	31.7
	Overall approach	*C*	*32.4*	*C*	*30.4*	*C*	*30.1*	*C*	*32.4*	*C*	*30.4*	*C*	*30.1*	*C*	*32.6*	*C*	*30.6*	*C*	*30.5*
	Overall intersection	***D***	***41.3***	***D***	***39.3***	***D***	***39.5***	***D***	***41.3***	***D***	***39.3***	***D***	***39.5***	***D***	***43.2***	***D***	***46.9***	***D***	***49.6***

Altnerative A - construciton of the pedestrian crossing of Overton Road as designed by Nimrod Long and Associates
Alternative B - construction of improved curb radius from Overton Road northbound onto River Run Drive as proposed by Jefferson County
Alternative C - construction of three additional crosswalks as proposed by Jefferson County
Alternative D - construction of improved curb radius from Oakdale Drive onto Overton Road southbound as proposed by Skipper Consulting, Inc.

Appendix A

Existing Intersection Turning Movement Traffic Count

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

Mountain Brook, AL

File Name : mbrook01
Site Code : 00000000
Start Date : 10/07/2014
Page No : 1

Groups Printed- Unshifted

	OVERTON RD Southbound			RIVER RUN DR Westbound			OVERTON RD Northbound			OAKDALE DR Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	17	33	7	49	9	5	27	21	36	14	5	10	233
07:15 AM	14	49	18	67	11	10	20	44	28	16	9	24	310
07:30 AM	18	54	16	76	14	2	44	47	33	17	13	22	356
07:45 AM	17	58	20	81	11	3	44	61	51	12	12	18	388
Total	66	194	61	273	45	20	135	173	148	59	39	74	1287
08:00 AM	18	49	7	70	6	7	9	30	49	12	14	20	291
08:15 AM	21	39	10	50	4	5	17	26	43	9	9	8	241
08:30 AM	21	37	3	40	9	6	7	26	28	14	9	11	211
08:45 AM	16	35	11	53	14	10	11	21	38	15	14	17	255
Total	76	160	31	213	33	28	44	103	158	50	46	56	998
02:30 PM	7	35	15	18	10	5	21	38	51	9	7	48	264
02:45 PM	5	33	9	34	9	13	23	63	39	14	14	25	281
Total	12	68	24	52	19	18	44	101	90	23	21	73	545
03:00 PM	6	27	13	36	9	20	20	45	41	19	4	24	264
03:15 PM	4	28	16	50	9	11	22	64	36	11	10	43	304
Total	10	55	29	86	18	31	42	109	77	30	14	67	568
04:00 PM	10	42	14	36	9	24	23	59	52	9	13	27	318
04:15 PM	14	41	15	45	11	22	29	49	54	14	16	26	336
04:30 PM	13	23	16	68	16	26	30	82	57	11	11	21	374
04:45 PM	12	46	24	52	20	14	39	54	61	9	12	19	362
Total	49	152	69	201	56	86	121	244	224	43	52	93	1390
05:00 PM	13	41	26	68	21	21	26	75	66	10	9	18	394
05:15 PM	12	50	36	58	25	17	33	60	68	5	11	36	411
05:30 PM	9	56	26	49	30	17	47	54	76	7	18	18	407
05:45 PM	6	42	34	42	19	18	45	77	49	18	27	27	404
Total	40	189	122	217	95	73	151	266	259	40	65	99	1616
Grand Total	253	818	336	1042	266	256	537	996	956	245	237	462	6404
Apprch %	18.0	58.1	23.9	66.6	17.0	16.4	21.6	40.0	38.4	26.0	25.1	48.9	
Total %	4.0	12.8	5.2	16.3	4.2	4.0	8.4	15.6	14.9	3.8	3.7	7.2	

	OVERTON RD Southbound				RIVER RUN DR Westbound				OVERTON RD Northbound				OAKDALE DR Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection	07:15 AM																
Volume	67	210	61	338	294	42	22	358	117	182	161	460	57	48	84	189	1345
Percent	19.8	62.1	18.0		82.1	11.7	6.1		25.4	39.6	35.0		30.2	25.4	44.4		
07:45 Volume	17	58	20	95	81	11	3	95	44	61	51	156	12	12	18	42	388
Peak Factor																	0.867
High Int.	07:45 AM				07:45 AM				07:45 AM				07:30 AM				
Volume	17	58	20	95	81	11	3	95	44	61	51	156	17	13	22	52	
Peak Factor				0.889				0.942				0.737				0.909	

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

File Name : mbrook01
Site Code : 00000000
Start Date : 10/07/2014
Page No : 2

	OVERTON RD Southbound				RIVER RUN DR Westbound				OVERTON RD Northbound				OAKDALE DR Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
By Approach	07:15 AM				07:15 AM				07:15 AM				07:15 AM				
Volume	67	210	61	338	294	42	22	358	117	182	161	460	57	48	84	189	
Percent	19.8	62.1	18.0		82.1	11.7	6.1		25.4	39.6	35.0		30.2	25.4	44.4		
High Int.	07:45 AM				07:45 AM				07:45 AM				07:30 AM				
Volume	17	58	20	95	81	11	3	95	44	61	51	156	17	13	22	52	
Peak Factor				0.889				0.942				0.737				0.909	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	40	189	122	351	217	95	73	385	151	266	259	676	40	65	99	204	1616
Percent	11.4	53.8	34.8		56.4	24.7	19.0		22.3	39.3	38.3		19.6	31.9	48.5		
05:15 Volume	12	50	36	98	58	25	17	100	33	60	68	161	5	11	36	52	411
Peak Factor																	0.983
High Int.	05:15 PM				05:00 PM				05:30 PM				05:45 PM				
Volume	12	50	36	98	68	21	21	110	47	54	76	177	18	27	27	72	
Peak Factor				0.895				0.875				0.955				0.708	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
By Approach	04:45 PM				04:30 PM				05:00 PM				05:00 PM				
Volume	46	193	112	351	246	82	78	406	151	266	259	676	40	65	99	204	
Percent	13.1	55.0	31.9		60.6	20.2	19.2		22.3	39.3	38.3		19.6	31.9	48.5		
High Int.	05:15 PM				04:30 PM				05:30 PM				05:45 PM				
Volume	12	50	36	98	68	16	26	110	47	54	76	177	18	27	27	72	
Peak Factor				0.895				0.923				0.955				0.708	

Appendix B

Existing Intersection Capacity Analysis Worksheets

SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	AM Peak Hour	Analysis Year	Existing 2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	57	48	84	294	42	22	117	182	161	67	210	61
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.74	0.74	0.74	0.89	0.89	0.89
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	8	0	0	2	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time												

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 28.0	G =	G =	G = 11.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 123.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		116	84	313	45	21	158	464		75	305	
Lane Group Capacity		419	366	403	424	360	403	562		280	585	
v/c Ratio		0.28	0.23	0.78	0.11	0.06	0.39	0.83		0.27	0.52	
Green Ratio		0.23	0.23	0.23	0.23	0.23	0.46	0.32		0.46	0.32	
Uniform Delay d_1		39.2	38.8	44.6	37.6	37.2	21.4	38.3		22.7	33.8	
Delay Factor k		0.11	0.11	0.33	0.11	0.11	0.11	0.36		0.11	0.13	
Incremental Delay d_2		0.4	0.3	9.3	0.1	0.1	0.6	9.8		0.5	0.8	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		39.6	39.1	53.9	37.8	37.3	22.0	48.1		23.2	34.6	
Lane Group LOS		D	D	D	D	D	C	D		C	C	
Approach Delay	39.4			51.0			41.5			32.4		
Approach LOS	D			D			D			C		
Intersection Delay	41.3			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	Aft. School Peak Hour	Analysis Year	Existing 2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	53	35	140	138	37	49	86	210	167	22	123	53
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.70	0.63	0.73	0.69	0.93	0.61	0.94	0.82	0.82	0.79	0.88	0.83
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	14	0	0	5	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time												

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 28.0	G =	G =	G = 10.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =

Duration of Analysis (hrs) = 0.25 Cycle Length C = 122.1

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		132	173	200	40	72	91	460		28	204	
Lane Group Capacity		421	369	406	427	363	477	570		274	581	
v/c Ratio		0.31	0.47	0.49	0.09	0.20	0.19	0.81		0.10	0.35	
Green Ratio		0.23	0.23	0.23	0.23	0.23	0.45	0.33		0.45	0.33	
Uniform Delay d_1		39.1	40.6	40.9	37.1	38.0	19.9	37.5		22.0	31.2	
Delay Factor k		0.11	0.11	0.11	0.11	0.11	0.11	0.35		0.11	0.11	
Incremental Delay d_2		0.4	0.9	0.9	0.1	0.3	0.2	8.4		0.2	0.4	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		39.5	41.6	41.8	37.2	38.3	20.1	45.9		22.2	31.6	
Lane Group LOS		D	D	D	D	D	C	D		C	C	
Approach Delay	40.7			40.4			41.7			30.4		
Approach LOS	D			D			D			C		
Intersection Delay	39.3			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	PM Peak Hour	Analysis Year	Existing 2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	40	65	99	217	95	73	151	266	259	40	189	122
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.71	0.71	0.71	0.88	0.88	0.88	0.96	0.96	0.96	0.90	0.90	0.90
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	10	0	0	7	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time												

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 21.0	G =	G =	G = 9.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 114.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		148	125	247	108	75	157	547		44	346	
Lane Group Capacity		342	296	434	457	388	388	605		236	615	
v/c Ratio		0.43	0.42	0.57	0.24	0.19	0.40	0.90		0.19	0.56	
Green Ratio		0.18	0.18	0.25	0.25	0.25	0.47	0.35		0.47	0.35	
Uniform Delay d_1		41.3	41.2	37.8	34.5	34.1	18.9	35.2		21.0	30.0	
Delay Factor k		0.11	0.11	0.16	0.11	0.11	0.11	0.43		0.11	0.16	
Incremental Delay d_2		0.9	1.0	1.8	0.3	0.2	0.7	17.1		0.4	1.2	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		42.1	42.2	39.5	34.8	34.3	19.6	52.3		21.4	31.2	
Lane Group LOS		D	D	D	C	C	B	D		C	C	
Approach Delay	42.2			37.4			45.0			30.1		
Approach LOS	D			D			D			C		
Intersection Delay	39.5			Intersection LOS						D		

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Appendix C

Intersection Capacity Analysis Worksheets – Alternative A

SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	AM Peak Hour	Analysis Year	Alternatve A

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	57	48	84	294	42	22	117	182	161	67	210	61
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.74	0.74	0.74	0.89	0.89	0.89
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	8	60	0	2	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time					15.2							

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 28.0	G =	G =	G = 11.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 123.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		116	84	313	45	21	158	464		75	305	
Lane Group Capacity		419	366	403	424	313	403	562		280	585	
v/c Ratio		0.28	0.23	0.78	0.11	0.07	0.39	0.83		0.27	0.52	
Green Ratio		0.23	0.23	0.23	0.23	0.23	0.46	0.32		0.46	0.32	
Uniform Delay d_1		39.2	38.8	44.6	37.6	37.3	21.4	38.3		22.7	33.8	
Delay Factor k		0.11	0.11	0.33	0.11	0.11	0.11	0.36		0.11	0.13	
Incremental Delay d_2		0.4	0.3	9.3	0.1	0.1	0.6	9.8		0.5	0.8	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		39.6	39.1	53.9	37.8	37.4	22.0	48.1		23.2	34.6	
Lane Group LOS		D	D	D	D	D	C	D		C	C	
Approach Delay	39.4			51.1			41.5			32.4		
Approach LOS	D			D			D			C		
Intersection Delay	41.3			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	Aft. School Peak Hour	Analysis Year	Alternative A

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	53	35	140	138	37	49	86	210	167	22	123	53
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.70	0.63	0.73	0.69	0.93	0.61	0.94	0.82	0.82	0.79	0.88	0.83
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	14	60	0	5	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time					15.2							

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 28.0	G =	G =	G = 10.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 122.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		132	173	200	40	72	91	460		28	204	
Lane Group Capacity		421	369	406	427	316	477	570		274	581	
v/c Ratio		0.31	0.47	0.49	0.09	0.23	0.19	0.81		0.10	0.35	
Green Ratio		0.23	0.23	0.23	0.23	0.23	0.45	0.33		0.45	0.33	
Uniform Delay d_1		39.1	40.6	40.9	37.1	38.3	19.9	37.5		22.0	31.2	
Delay Factor k		0.11	0.11	0.11	0.11	0.11	0.11	0.35		0.11	0.11	
Incremental Delay d_2		0.4	0.9	0.9	0.1	0.4	0.2	8.4		0.2	0.4	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		39.5	41.6	41.8	37.2	38.6	20.1	45.9		22.2	31.6	
Lane Group LOS		D	D	D	D	D	C	D		C	C	
Approach Delay	40.7			40.5			41.7			30.4		
Approach LOS	D			D			D			C		
Intersection Delay	39.3			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	PM Peak Hour	Analysis Year	Alternative A

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	40	65	99	217	95	73	151	266	259	40	189	122
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.71	0.71	0.71	0.88	0.88	0.88	0.96	0.96	0.96	0.90	0.90	0.90
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	10	60	0	7	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time					15.1							

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 21.0	G =	G =	G = 9.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 114.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		148	125	247	108	75	157	547		44	346	
Lane Group Capacity		342	296	434	457	341	388	605		236	615	
v/c Ratio		0.43	0.42	0.57	0.24	0.22	0.40	0.90		0.19	0.56	
Green Ratio		0.18	0.18	0.25	0.25	0.25	0.47	0.35		0.47	0.35	
Uniform Delay d_1		41.3	41.2	37.8	34.5	34.3	18.9	35.2		21.0	30.0	
Delay Factor k		0.11	0.11	0.16	0.11	0.11	0.11	0.43		0.11	0.16	
Incremental Delay d_2		0.9	1.0	1.8	0.3	0.3	0.7	17.1		0.4	1.2	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		42.1	42.2	39.5	34.8	34.7	19.6	52.3		21.4	31.2	
Lane Group LOS		D	D	D	C	C	B	D		C	C	
Approach Delay	42.2			37.5			45.0			30.1		
Approach LOS	D			D			D			C		
Intersection Delay	39.5			Intersection LOS						D		

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Appendix D

Intersection Capacity Analysis Worksheets – Alternative C

SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	AM Peak Hour	Analysis Year	Alternatve C

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	1	1	1	1	1	0	1	1	0
Lane Group		LTR		L	T	R	L	TR		L	TR	
Volume (vph)	57	48	84	294	42	22	117	182	161	67	210	61
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.74	0.74	0.74	0.89	0.89	0.89
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3		3	3	3	3	3		3	3	
Unit Extension		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	60	0	0	60	0	2	60	0	0	60	0	0
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		20.6			15.2			26.6			29.5	

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 28.0	G =	G =	G = 11.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 123.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		208		313	45	21	158	464		75	305	
Lane Group Capacity		375		403	424	313	384	538		271	573	
v/c Ratio		0.55		0.78	0.11	0.07	0.41	0.86		0.28	0.53	
Green Ratio		0.23		0.23	0.23	0.23	0.46	0.32		0.46	0.32	
Uniform Delay d_1		42.0		44.6	37.6	37.3	21.5	39.0		22.8	33.9	
Delay Factor k		0.15		0.33	0.11	0.11	0.11	0.39		0.11	0.14	
Incremental Delay d_2		1.8		9.3	0.1	0.1	0.7	13.5		0.6	1.0	
PF Factor		1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		43.8		53.9	37.8	37.4	22.2	52.5		23.3	34.9	
Lane Group LOS		D		D	D	D	C	D		C	C	
Approach Delay	43.8			51.1			44.8			32.6		
Approach LOS	D			D			D			C		
Intersection Delay	43.2			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	Aft. School Peak Hour	Analysis Year	Alternative C

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	1	1	1	1	1	0	1	1	0
Lane Group		LTR		L	T	R	L	TR		L	TR	
Volume (vph)	53	35	140	138	37	49	86	210	167	22	123	53
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.70	0.63	0.73	0.69	0.93	0.61	0.94	0.82	0.82	0.79	0.88	0.83
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3		3	3	3	3	3		3	3	
Unit Extension		3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	60	0	0	60	0	5	60	0	0	60	0	0
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		18.0			15.2			6.0			29.5	

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 28.0	G =	G =	G = 10.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 122.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		324		200	40	72	91	460		28	204	
Lane Group Capacity		364		406	427	316	448	546		264	565	
v/c Ratio		0.89		0.49	0.09	0.23	0.20	0.84		0.11	0.36	
Green Ratio		0.23		0.23	0.23	0.23	0.45	0.33		0.45	0.33	
Uniform Delay d_1		45.6		40.9	37.1	38.3	19.9	38.1		22.0	31.3	
Delay Factor k		0.41		0.11	0.11	0.11	0.11	0.38		0.11	0.11	
Incremental Delay d_2		22.7		0.9	0.1	0.4	0.2	11.5		0.2	0.4	
PF Factor		1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		68.3		41.8	37.2	38.6	20.2	49.6		22.2	31.7	
Lane Group LOS		E		D	D	D	C	D		C	C	
Approach Delay	68.3			40.5			44.7			30.6		
Approach LOS	E			D			D			C		
Intersection Delay	46.9			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	RLC	Intersection	Overton Rd at Oakdale/River Ru
Agency or Co.	Skipper Consulting	Area Type	All other areas
Date Performed	10/14/2014	Jurisdiction	Jefferson County
Time Period	PM Peak Hour	Analysis Year	Alternative C

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	1	1	1	1	1	1	0	1	1	0
Lane Group		LT	R	L	T	R	L	TR		L	TR	
Volume (vph)	40	65	99	217	95	73	151	266	259	40	189	122
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.71	0.71	0.71	0.88	0.88	0.88	0.96	0.96	0.96	0.90	0.90	0.90
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type		3	3	3	3	3	3	3		3	3	
Unit Extension		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	10	60	0	7	0	0	0	0	0	0
Lane Width		12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	-3	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0	0	0	0		0	0	
Minimum Pedestrian Time					15.1							

Phasing	WB Only	EB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 28.0	G = 21.0	G =	G =	G = 9.0	G = 40.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 3	Y = 5.1	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 114.1		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		148	125	247	108	75	157	547		44	346	
Lane Group Capacity		342	296	434	457	341	388	605		236	615	
v/c Ratio		0.43	0.42	0.57	0.24	0.22	0.40	0.90		0.19	0.56	
Green Ratio		0.18	0.18	0.25	0.25	0.25	0.47	0.35		0.47	0.35	
Uniform Delay d_1		41.3	41.2	37.8	34.5	34.3	18.9	35.2		21.0	30.0	
Delay Factor k		0.11	0.11	0.16	0.11	0.11	0.11	0.43		0.11	0.16	
Incremental Delay d_2		0.9	1.0	1.8	0.3	0.3	0.7	17.1		0.4	1.2	
PF Factor		1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay		42.1	42.2	39.5	34.8	34.7	19.6	52.3		21.4	31.2	
Lane Group LOS		D	D	D	C	C	B	D		C	C	
Approach Delay	42.2			37.5			45.0			30.1		
Approach LOS	D			D			D			C		
Intersection Delay	39.5			Intersection LOS						D		

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Memorandum

To: Lt. C. Clark
From: Sgt. J. Rhoads
Date: 9/25/14
Re: Traffic Count – Overhill Road at Laurel Lane

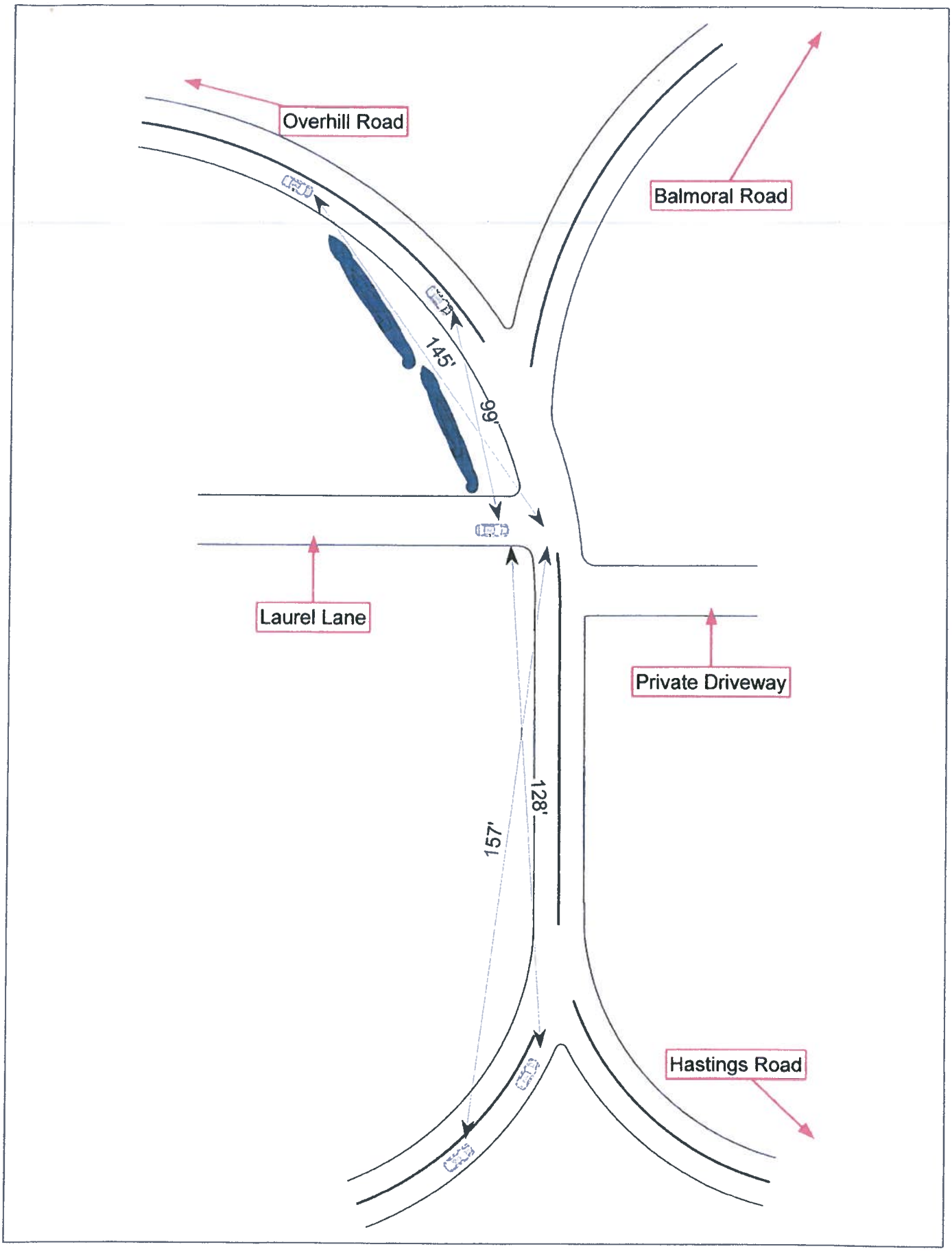
Per your request, I conducted a traffic count on Overhill Road at Laurel Lane. Data was gathered concerning speed and volume. The following data was gathered:

	Toward Balmoral		**Toward Hastings**		**Total**	
Vehicles counted	2,438		2,715		5,153	
Average speed	**22 mph**		**21 mph**		**21 mph**	
	#	**%**	**#**	**%**	**#**	**%**
00-25 mph	1,993	82	2,397	88	4,390	85
26-30 mph	431	17	300	11	731	14
31-35 mph	12	.5	16	.6	28	.5
36-40 mph	2	.1	2	.1	4	.1
41+ mph	0	0	0	0	0	0
Peak time	School traffic		School traffic		School traffic	

Conclusion: This study began Thursday September 18th and continued through Wednesday September 24th. Peak travel times for the weekdays included school drop off and pick up. During the two weekend days, traffic volume was heavier around lunchtime and 5:00pm.

Note: Speed limit is 25 mph.

Cc: Chief T. Cook
Captain G. Hagood


Overhill Road
Balmoral Road
145'
99'
Laurel Lane
Private Driveway
128'
157'
Hastings Road

Sam Gaston

From: Ted Cook
Sent: Thursday, October 16, 2014 8:35 AM
To: Allison Ingram
Cc: Sam Gaston; Chuck Clark
Subject: Re: stop sign

Ms. Ingram,

The next City Council meeting will be Monday October 27th. If you want to present your petition, you might want to call Sam's office to see about getting put on the agenda for either the Pre-meeting, or the regular agenda itself. Most real discussion and work gets done during the pre-meeting so I would think that would be what you want. If you choose to get on the agenda Sam will let you know closer to the date of the meeting when best to get here.
I will not be at that meeting as I am scheduled to be out of town at training that week.

Chief Ted Cook
Mountain Brook Police Department
101 Tibbett St.
Mountain Brook, AL 35213
(205) 802-3852

On Wed, Oct 15, 2014 at 10:10 PM, Allison Ingram <allisondixoningram@gmail.com> wrote:

Mr. Cook,
Thank you for your help initiating another study. There are numerous problems with the two intersections, it's not just a speeding issue. At the intersection where the alley ends, there are 5 roads converging. On only one side is a stop sign. I have driven through many intersections in Mt. Brook that have an excessive number of stop signs due to safety issues so I am curious why it is so difficult to put one in place here.
Please tell me the dates of the next city council meeting. I would like to attend with a petition from my neighbors in hand.
Sincerely,
Allison Ingram

Sent from my iPad

On Oct 10, 2014, at 3:42 PM, Ted Cook <cookt@mtnbrook.org> wrote:

Ms. Ingram,

Our traffic flow study has been completed and a memo with it's results is attached. I understand we did a similar study some years back. I am afraid, at least as far as the PD regards these results, that our response is much the same. Due to the relatively low traffic volume, the speeds indicated, and lack of documented incidents or accidents at this location we do not recommend the addition of a stop sign. The speed more than 5 mph over the posted speed limit is only .6% of the total traffic. We normally use the 10 mph over the posted speed threshold before we start making recommendations. The average speed of all the traffic is below the posted speed limit.

Chief Ted Cook
Mountain Brook Police Department
101 Tibbett St.
Mountain Brook, AL 35213
(205) 802-3852

On Wed, Sep 17, 2014 at 1:45 PM, Allison Ingram <allisondixoningram@gmail.com> wrote:

Thank you. Please contact me if you have any questions.

Sent from Allison's iPhone

> On Sep 17, 2014, at 9:08 AM, Sam Gaston <gastons@mtnbrook.org> wrote:
>
> I will ask our Police Dept to review , make a recommendation and get
> back with us.
>
> Sent from my iPhone
> Sam Gaston
>
>> On Sep 17, 2014, at 9:08 AM, allison ingram <allisondixoningram@gmail.com> wrote:
>>
>> Mr. Gaston,
>> The residents on Overhill Road that back up to Laurel Lane would like a stop sign erected at the column of Laurel Lane. The stop sign would be placed in my yard and stop traffic headed to Mountain Brook Parkway. I requested this years ago to no avail. However, more people have moved in since that time and we now have teenage drivers trying to pull out of the lane. Safety is our priority!
>> Thank you for your time. Please contact me with any questions.
>>
>> Sincerely,

>> Allison Ingram
>> 3032 overhill road
>> 205-746-4568

<3000 Blk Overhill Rd 9-25-14.doc>

PROFESSIONAL SERVICES AGREEMENT
Between
The City of Mountain Brook and Skipper Consulting, Inc.

This Agreement is made by and between **the City of Mountain Brook ("Client")**, doing business at P.O. Box 130009, Mountain Brook, Alabama 35213-0009 and, **Skipper Consulting, Inc.** ("**Consultant**"), doing business at 3644 Vann Road, Suite 100, Birmingham, Alabama 35235.

Who agree as follows: Client requires professional traffic engineering services to perform a traffic study and traffic signal modification design for the intersection of Cahaba Road at 21st Avenue South/Fairway Drive. The Consultant shall be authorized to start work on the services outlined in this agreement upon execution of this Agreement. The Client and Consultant agree this agreement, together with Exhibit A referred to herein; constitute the entire agreement between them relating to this assignment.

1. PROFESSIONAL SERVICES: The Consultant agrees to perform the following Services under this agreement:

SEE EXHIBIT "A"

2. CLIENT'S RESPONSIBILITIES: Client, at its expense, will provide the Consultant with all required site information, existing plans, reports, studies, project schedules and similar information that is contained in its files. The Consultant may rely on the information provided by the Client without verification.

The Client will designate a representative who shall have the authority to act on behalf of the Client for this project.

The Client shall participate with the Consultant by providing all information and criteria in a timely manner, review documents and make decisions on project alternatives to the extent necessary to allow the Consultant to perform the scope of work within established schedules.

3. COMPENSATION, BILLING, PAYMENT, AND PERFORMANCE SCHEDULE: Skipper Consulting Inc. would on behalf of the City of Mountain Brook, undertake the work outlined in Exhibit "A" for a fixed fee as follows:

Work Task		Fee
Traffic Study		$2,500.00
Traffic Signal Modification Design		$5,500.00
	Total	$8,000.00

The CLIENT would be billed monthly based on the work completed during the billing period. Invoices are payable within 30 days from the receipt by the CLIENT, and such payment shall not be contingent or dependent upon any conditions or any action or undertaking of the CLIENT other than those conditions, if any, specifically set forth in this agreement.

If complications or other unforeseen factors cause a change in the scope of work outlined in Section 1 and/or Exhibit "A", the Consultant will notify the Client in writing of the changes and any adjustments to the fee required by such change. If the Client wishes to undertake tasks that are identified as being outside the proposed scope of services, the Consultant is prepared to amend this Agreement or submit a proposal for the additional work.

If for any reason, payment for invoices reaches more than 15 days past the due date, the Consultant shall have the right to stop work on the assignment until such payment is made. All past due invoices shall accrue interest at the rate of 1.5% per month. The Consultant will not be liable for any delays to project schedules caused for such work stoppage. Furthermore, should the Consultant be required to take legal action including, but not limited to, suit to collect for services, the client shall be responsible for all costs and reasonable attorney fees in the collection of all amounts due for services rendered under this Agreement, or any amendment hereto.

This proposal has been prepared with the expressed understanding that the selection of our firm to perform these professional services is based upon the qualifications, experience and reputation of the staff of Skipper Consulting, Inc., and not solely upon the cost of the services proposed. We trust the fees outlined herein are acceptable and within your project budgetary plans. We look forward to commencement of the work and will be glad to address any questions regarding the technical scope and/or schedule of fees for this proposal. If the Client should request additional prices for the scope of work included herein from other consulting engineers, please consider our proposal withdrawn in order to comply with Alabama Administrative Code Chapter 330-X-14-.05(f).

4. STANDARD TERMS AND CONDITIONS

Services provided by the Consultant shall be performed based on standard professional practices exercised by the transportation engineering and planning profession and upon standards within the locality where the services are provided.

Consultant's relationship to Client shall at all times be that of an associate consultant, and at all times this relationship shall be governed by, and in strict accordance with, Client's contract with the consultant.

The Client shall, without limit, have final right of review and approval of all plans and specifications that shall be the essence of this agreement; however, review and approval shall not be withheld unreasonably.

The rights of each party under this agreement are personal to that party and may not be assigned or transferred to any other person, firm, corporation, or other entity without the prior, express, and written consent of the other party.

This agreement may be terminated by either party upon 10 days' written notice should the other party fail substantially to perform in accordance with its terms through no fault of the other. In the event of termination of this agreement, due to the fault of someone other than the Consultant, Consultant shall be paid for services performed to termination date, including reimbursements then due.

The Consultant agrees to furnish consulting services only, as may be required for any and all of Client's work. Consultant shall be responsible for coordination of his work with that of Client.

This agreement shall constitute the entire agreement between the parties and any prior understanding or representation of any kind preceding the date of this agreement shall not be binding upon either party except to the extent incorporated in this agreement.

Any modification of this agreement or additional obligation assumed by either party in connection with this agreement shall be binding only if placed in writing and signed by each party or an authorized representative of each party.

It is agreed that this agreement shall be governed by, construed, and enforced in accordance with the laws of the State of Alabama.

The failure of either party to this agreement to insist upon the performance of any of the terms and conditions of this agreement, or the waiver of any breach of any of the terms and conditions of this agreement, shall not be construed as thereafter waiving any such terms and conditions but the same shall continue and remain in full force and effect as if no such forbearance or waiver had occurred.

The invalidity of any portion of this agreement will not and shall not be deemed to affect the validity of any other provision. In the event that any provision of this agreement is held to be invalid, the parties agree that the remaining provisions shall be deemed to be in full force and effect.

Neither party to this agreement shall be liable to the other for any loss, cost, or damages, arising out from or resulting from, any failure to perform in accordance with the terms of this agreement where the causes of such failure shall include, but not limited to, acts of God, strikes, lockouts, or other industrial disturbances, wars, whether declared or undeclared, blockades, insurrections, riots, governmental action, explosions, fire, floods, or any other cause not within the reasonable control of either party.

Consultant shall secure and maintain such insurance as will protect him from claims under the workers' compensation acts and form claims for bodily injury, death, or property damage that may arise from the performance of his services under and pursuant to this agreement. Certificates of such coverage will be provided to Client upon request.

To the fullest extent permitted by law, the Client and Consultant agree that, except for claims of indemnification, the time period for claims under this agreement shall expire one year following completion of the project.

Client shall provide Consultant access to the project site necessary for the Consultant to provide the services outlined.

Reuse of any documents or other deliverables pertaining to the project by the Client other than for the project for which documents or deliverables were prepared without written verification by the Consultant shall be at the Client's risk.

No employee or agent of the Consultant shall have individual liability to the Client.

The persons signing this agreement warrant that they have the authority to sign on behalf of the Client and Consultant.

APPROVED FOR CLIENT	**APPROVED FOR SKIPPER Consulting, Inc.**
By: _____	By: Darrell B. Skipper
Printed Name: _____	Printed Name: Darrell B. Skipper
Title: _____	Title: President
Date: _____	Date: 10/24/14

Exhibit "A"
Scope of Work

The City of Mountain Brook has requested a proposal to perform a traffic study and develop traffic signal modification plans for the intersection of Cahaba Road at 21st Avenue South/Fairway Drive. The need for the study and potential traffic signal modification design comes from the impending occupancy by Little Hardware of an existing vacant building on the east side of Cahaba Road. The parking lot access is within the limits of the intersection of Cahaba Road and 21st Avenue South, but is currently provided no signal indication or detection. It should be noted that the existing traffic signal which controls the intersection of Cahaba Road at 21st Avenue South also controls the intersection of Cahaba Road at Fairway Drive, and therefore the two intersections have to be studied and designed jointly.

Traffic Study

The purposes of the traffic study are to:

- Determine if the traffic signal should be modified to account for the driveway for Little Hardware
- If the signal needs to be modified, determine the appropriate signal operating plan and detection needs
- Develop a conceptual sketch plan for the proposed signal modifications
- Estimate the cost of the proposed signal modifications

The Consultant shall perform all required field work to perform a traffic study of the intersections of Cahaba Road at 21st Avenue South and Fairway Drive. This shall include a turning movement traffic count at the intersections from 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. The Consultant shall determine the existing levels of service of operation of the intersections. The trip generation and directional distribution of traffic generated by Little Hardware will be estimated, and future traffic conditions will be determined. Based on future traffic conditions, the Consultant shall develop a recommendation on whether or not the existing signal should be modified, and if it needs to be modified, determine the appropriate signal operating plan and detection. A schematic sketch of the proposed modifications will be prepared. A cost estimate of the proposed modifications will be prepared. The findings of the study will be documented in a report. This report shall be delivered to the City in .pdf format. The Consultant shall attend a meeting with the City Council to present the findings of the study.

Traffic Signal Modification Design

Traffic signal design efforts for the project will be undertaken using procedures and specifications as established by the City of Mountain Brook. Design efforts would include:

- Traffic signal phasing and timings;
- Research applicable City standards and specifications;
- Determine appropriate traffic signal construction notes;
- Determine traffic signal equipment and installation details; and
- Develop traffic control plans for the construction required in the plan assembly.

The Consultant shall prepare a base map for the traffic signal modification design using aerial photography and field review.

Preliminary traffic signal construction plans will be transmitted to the City for review and comment. It is anticipated a field inspection will be conducted where specifics of the design concept are reviewed by the City and the design team. Upon receipt of comments from the City, the Consultant will make necessary modifications to the construction plans and provide the City with copies of the final construction plans.

Once the final construction plans are transmitted by the Consultant, the selection of a contractor is assumed to be the responsibility of the City. The Consultant would be available to assist the City in cost estimating and bidding efforts for the project.

Services not included in this scope of work would be undertaken based on the written authorization by the Client. Once additional services are identified, they would be undertaken on a time and materials basis following approval of a scope of work and related labor rates by the City.

The Consultant shall prepare for and attend as many meetings of the Mountain Brook City Council as needed to finalize recommendations and design elements.

The Consultant shall perform the scope of work as documented in Exhibit "A", up to and including issuing of the preliminary plans for review by the City, within a period of six (6) calendar weeks following notice to proceed, barring unforeseen circumstances outside of the control of the Consultant.

MOUNTAIN BROOK CITY COUNCIL
ORGANIZATIONAL MEETING AGENDA

TEMPORARY CITY HALL
3928 MONTCLAIR ROAD, SUITE 230
MOUNTAIN BROOK, AL 35213

NOVEMBER 5, 2012, 8:00 A.M.

---

1. Introduction: City Manager to introduce Pete Johnson, municipal judge, who will administer the oaths of office.

2. Inauguration of the three elected members of the City Council.

3. Election of the City Council President (Virginia C. Smith).

4. Election of the City Council President Pro Tempore (Jesse S. Vogtle, Jr.)

5. Adoption of the rules of order and procedure.

6. Consideration: Ordinance appointing the City Manager (Sam S. Gaston).

7. Consideration: Ordinance appointing the City Clerk (Steven Boone).

8. Consideration: Ordinance appointing the City Treasurer (William F. "Billy" Angel).

9. Consideration: Ordinance appointing the Assistant City Treasurer (John H. "Jack" Martin).

10. Consideration: Resolution appointing the City Attorney(s) (Bishop, Colvin, Johnson & Kent and Starnes, Davis & Florie, LLP).

11. Inauguration of the City Manager, City Clerk, City Treasurer, and Assistant City Treasurer.

12. Consideration: Motion appointing Council representatives to the:

Planning Commission (voting member)	-	Jack D. Carl
Board of Zoning Adjustment (liaison)	-	Amy G. Carter
Parks and Recreation Board (liaison)	-	Virginia C. Smith
Emmet O'Neal Library Board (liaison)	-	Jesse S. Vogtle, Jr.
Board of Education (liaison)	-	William S. Pritchard, III
Finance Committee (voting member)	-	Jesse S. Vogtle, Jr.
Villages Design Review Committee (liaison)	-	Virginia C. Smith
Editorial Board	-	Amy G. Carter and Virginia C. Smith
Tree Commission (liaison)	-	Virginia C. Smith
Chamber of Commerce (liaison)	-	Amy G. Carter
Parking Committee	-	Jack D. Carl and Amy G. Carter
Municipal judges	-	Mayor Oden
Public safety departments	-	Mayor Oden
Anti-Drug Coalition (voting member)	-	William S. Pritchard, III

13. Consideration: Motion appointing the Mayor and City Council as the Board of Commissioners of the Mountain Brook Emergency Communication District and nomination of the Chairman of the Emergency Communication District Board.

14. Announcement: The next regular meeting of the City Council is Monday, November 12, 2012, at 7 p.m.

15. Other business.

16. Adjourn.