

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

**OFFICE OF DESIGN POLICY & SUPPORT  
INTERDEPARTMENTAL CORRESPONDENCE**

**FILE** P.I. # 0010944

**OFFICE** Design Policy & Support

DeKalb County  
GDOT District 7 - Metro Atlanta  
SR 236/La Vista Road @ CR 1359/Biltmore  
Drive Intersection Improvements

**DATE** March 24, 2014

**FROM**  for Brent Story, State Design Policy Engineer

**TO** SEE DISTRIBUTION

**SUBJECT** APPROVED CONCEPT REPORT

Attached is the approved Concept Report for the above subject project.

Attachment

**DISTRIBUTION:**

Glenn Bowman, Director of Engineering  
Joe Carpenter, Director of P3/Program Delivery  
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery  
Albert Shelby, State Program Delivery Engineer  
Bobby Hilliard, Program Control Administrator  
Cindy VanDyke, State Transportation Planning Administrator  
Hiral Patel, State Environmental Administrator  
Kathy Zahul, State Traffic Engineer  
Angela Robinson, Financial Management Administrator  
Lisa Myers, State Project Review Engineer  
Charles "Chuck" Hasty, State Materials Engineer  
Mike Bolden, State Utilities Engineer  
Jeff Fletcher, Statewide Location Bureau Chief  
Andy Casey, State Roadway Design Engineer  
Attn: Mac Cranford, District Design Engineer  
Rachel Brown, District Engineer  
Scott Lee, District Preconstruction Engineer  
Patrick Allen, District Utilities Engineer  
Peter Emmanuel, Project Manager  
BOARD MEMBER - 5th Congressional District

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  
LIMITED SCOPE PROJECT CONCEPT REPORT**

Project Type:	<u>Operational Improvement</u>	P.I. Number:	<u>0010944</u>
GDOT District:	<u>Seven</u>	County:	<u>DeKalb</u>
Federal Route Number:	<u>N/A</u>	State Route Number:	<u>236</u>

The project proposes minor improvements to install left turn lanes and an eastbound right turn lane on SR 236/Lavista Road @ Biltmore Drive.

**Submitted for approval:**

<u><i>Mac Crawford</i></u> District Seven Design Engineer	<u>12-11-13</u> DATE
<u><i>A. B. Emmanuel</i></u> GDOT Project Manager	<u>12-11-13</u> DATE
<u><i>Monika Pire-Spit</i></u> State Program Delivery Engineer	<u>12/13/2013</u> DATE

**Recommendation for approval:**

<u><i>GLENN BOWMAN*/EKP</i></u> State Environmental Administrator	<u>2/10/2014</u> DATE
<u><i>KATHY ZAHUL*/EKP</i></u> State Traffic Engineer	<u>12/30/2013</u> DATE

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

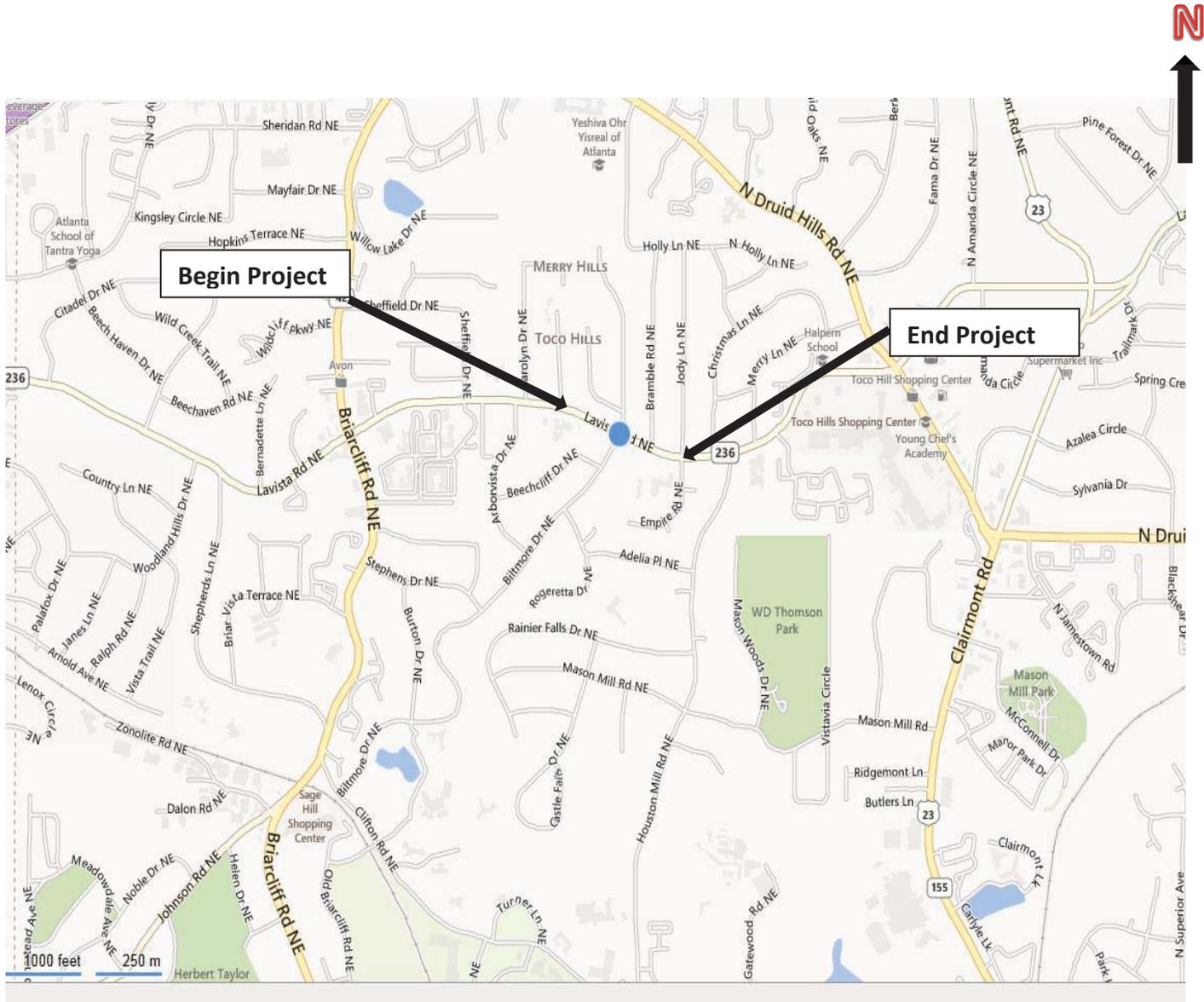
<u><i>CINDY VANDUYKE*/EKP</i></u> State Transportation Planning Administrator	<u>1/2/2014</u> DATE
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**Approval:**

Concur: <u><i>Shawn Brown</i></u> GDOT Director of Engineering	<u>3/17/14</u> DATE
Approve: <u><i>Bill R.M.M.</i></u> GDOT Chief Engineer	<u>3/19/14</u> DATE

*\* - RECOMMENDATION ON FILE*

### PROJECT LOCATION



**SR 236/Lavista Rd. @ CR 1359 Biltmore Drive**  
**Intersection Improvement**  
**PI# 0010944**  
**DeKalb County**

County: DeKalb

## PLANNING & BACKGROUND DATA

### Project Justification Statement:

State Route 236/Lavista Road at County Road 1359/Biltmore Drive in DeKalb County was identified for intersection improvements. The proposed project is to be included in the GDOT Operational Improvement Lump Sum Program from the Office of Traffic Operations. This proposed project was presented to and approved by the Operational Improvement Committee as a QUICK project.

SR 236 is a 35mph urban minor arterial that serves many residential communities in the Lindbergh, North Druid Hills, and Tucker areas north of Atlanta. At the intersection, SR 236 is an east-west two lane, two-way undivided roadway with no turn lanes. Biltmore Drive is a 25mph urban local road that connects Emory University with residential areas near Lavista Road. At the intersection, Biltmore Drive is a two lane, two-way undivided roadway with no turn lanes. The intersection is currently signalized with no protected phases

This project was proposed by District 7 Traffic Operations staff, which provided a brief summary of the intersection operations. Field observation and analysis showed long queues and significant delay along SR 236 due to the turning traffic traveling to Emory and other destinations south of the intersection. There are also extensive queues that form eastbound and westbound along SR 236 during the AM peak hour period due to the lack of turn lanes for left and right turning vehicles. The project proposes minor improvements to install left turn lanes and an eastbound right turn lane on SR 236. The addition of the turn lanes is expected to reduce the delay at the intersection from 26 seconds (LOS C) to 7.4 seconds (LOS A) during the AM peak hour period. An alternative would be installing a roundabout to improve capacity and operation through this routine bottleneck. The additional capacity at this intersection with either alternative will also relieve the routine delay for through moving vehicles at all times of the day.

This project lies within the boundaries of the Atlanta Regional Commission (ARC) Atlanta's Metropolitan Planning Organization (MPO). As an operational improvement project, this project is categorized under the "operational improvement lump sum category" in the MPO's RTP or TIP.

### Description of the proposed project:

The project proposes minor improvements to install left turn lanes and an eastbound right turn lane on SR 236.

**Federal Oversight:**  Exempt  State Funded  Other

**MPO:** Atlanta Regional Commission (ARC)

MPO Project ID N/A

**Regional Commission:** Atlanta Regional Commission (ARC)

RC Project ID N/A

**Congressional District(s):** 5

**Projected Traffic:** AADT

Current Year (2013): 18190 Open Year (2017): 18930 Design Year (2027): 20910

Traffic Projections Performed by: GDOT District 7 Design

**Functional Classification (Mainline):** Urban Minor Arterial Street

**Is this a 3R (Resurfacing, Restoration, & Rehabilitation) Project?**  No  Yes

**Will Context Sensitive Solutions procedures be utilized?**  No  Yes

Context Sensitive solutions will be used to insure the needs of the community are met and also to enhance the safety and operation capacity of the intersection.

**DESIGN AND STRUCTURAL DATA –**

**Mainline Design Features:** SR236/Lavista Rd. @ CR 1359/Biltmore Dr.

Feature	Existing	Standard*	Proposed
<b>Typical Section</b>	<b>Urban</b>	<b>Urban</b>	<b>Urban</b>
- Number of Lanes	2	2	2-3
- Lane Width(s)	12	12	12
- Median Width & Type	N/A	N/A	N/A
- Outside Shoulder or Border Area Width	6'	10'-16'	10'
- Outside Shoulder Slope	6%	2%	2%
- Sidewalks	4' Typical	4' Minimum	5' Typical
- Auxiliary Lanes	0	0	1
- Bike Lanes	0	0	0
Posted Speed	35	35	35
Design Speed	35	35	35
Min Horizontal Curve Radius	1525-ft	371	1525-ft
Superelevation Rate	2%	4%	4%
Grade	0%-4%	7%	0%-7%
Access Control	Permit	Permit	Permit
Right-of-Way Width	70'	N/A	70'-100'
Maximum Grade – Crossroad	0%-4%	7%	0%-7%
Design Vehicle	NA	WB-40	WB-40

\*According to current GDOT design policy if applicable

**Major Structures:** None

**Major Interchanges/Intersections:** SR236/Lavista Rd. @ CR 1359/Biltmore Dr.

County: DeKalb

**Utility Involvements:** GA Power, Atlanta, Gas & Light (AGL), DeKalb Water and Sewer, AT&T and Comcast.

**Public Interest Determination Policy and Procedure recommended (Utilities)?**  No  Yes

**SUE Required:**  No  Yes

**Railroad Involvement:** N/A

**Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:**

Warrants met:  None  Bicycle  Pedestrian  Transit

**Right-of-Way:**

Required Right-of-Way anticipated:  No  Yes  Undetermined

Easements anticipated:  None  Temporary  Permanent  Utility  Other

Anticipated number of impacted parcels:	14
Displacements anticipated:	Total: 0
	Businesses: 0
	Residences: 14
	Other: 0

**Transportation Management Plan [TMP] Required:**  No  Yes

If Yes: Project classified as:  Non-Significant  Significant

TMP Components Anticipated:  TTC/SP150  TO  PI

**Design Exceptions to FHWA/AASHTO controlling criteria anticipated:** None

**Design Variances to GDOT Standard Criteria anticipated:** None

**ENVIRONMENTAL DATA**

**Anticipated Environmental Document:**

GEPA:  NEPA:  CE  PCE

**Project Air Quality:**

Is the project located in a PM 2.5 Non-attainment area?  No  Yes

Is the project located in an Ozone Non-attainment area?  No  Yes

Is a Carbon Monoxide hotspot analysis required?  No  Yes

**MS4 Compliance – Is the project located in an MS4 area?**  No  Yes

County: DeKalb

**Environmental Permits/Variances/Commitments/Coordination anticipated:** NPDES permit will be needed due to the disturbed area being over one acre. There is also a potential chance that this is an residential historical area.

**NEPA/GEPA Comments & Information: Historical Impacts will be anticipated.**

## PROJECT RESPONSIBILITIES

### Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	GDOT/District 7
Design	GDOT/District 7
Right-of-Way Acquisition	GDOT
Utility Relocation	Utility Companies
Letting to Contract	GDOT
Construction Supervision	GDOT/District 7
Providing Material Pits	N/A
Providing Detours	N/A
Environmental Studies, Documents, and Permits	GDOT
Environmental Mitigation	N/A
Construction Inspection & Materials Testing	GDOT/District 7

**Lighting required:**  No  Yes

**Other projects in the area:** M004912, SR 236 from Fulton County Line to I-285

**Other coordination to date:** None

### Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	ROW	Reimbursable Utility	CST*	Environmental Mitigation	Total Cost
By Whom	GDOT	GDOT	GDOT	GDOT	N/A	
Amount	\$264,304.11	\$556,575.00	\$64,000.00	\$986,763.40	\$0	\$,1,871,642.51
Date of Estimate	5/18/2012	9/19/2013	9/19/2013	1/7/2014		

\*CST Cost includes: Construction, Engineering and Inspection, and Liquid AC Cost Adjustment.

## ALTERNATIVES

<b>Preferred Alternative: Westbound Left Turn</b>			
<b>Estimated Property Impacts:</b>	<b>14</b>	<b>Estimated Total Cost:</b>	<b>\$1,871,642.51</b>
<b>Estimated ROW Cost:</b>	<b>\$556,575.00</b>	<b>Estimated CST Time:</b>	<b>12 Months</b>
<b>Rationale:</b>			

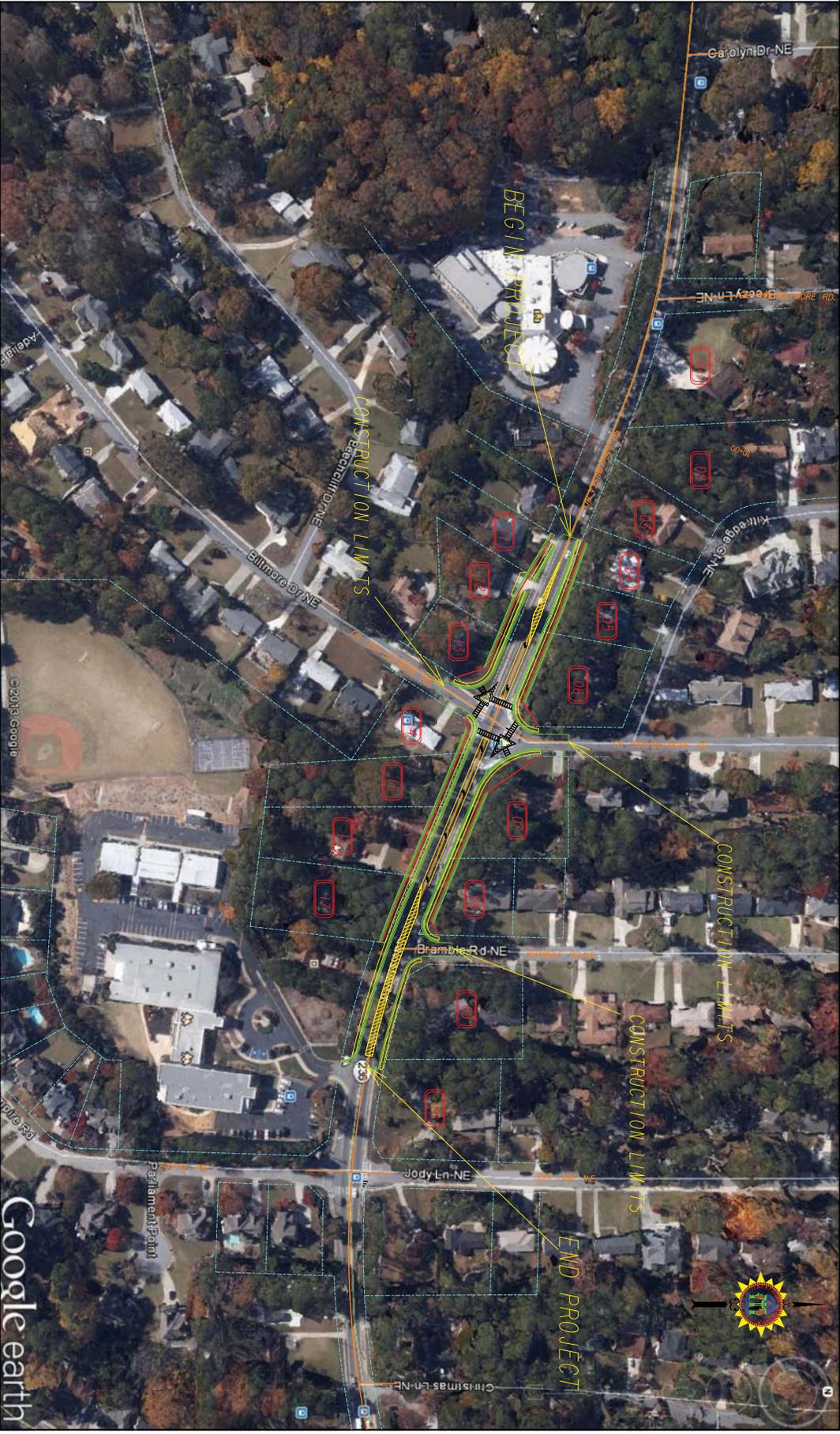
<b>No-Build Alternative: No Build</b>			
<b>Estimated Property Impacts:</b>	<b>0</b>	<b>Estimated Total Cost:</b>	<b>0</b>
<b>Estimated ROW Cost:</b>	<b>0</b>	<b>Estimated CST Time:</b>	<b>0</b>
<b>Rationale:</b> This alternative was not chosen because it does not fulfill the project justification as set forth by The office of Planning.			

<b>Alternative 1: Round about</b>			
<b>Estimated Property Impacts:</b>	<b>6</b>	<b>Estimated Total Cost:</b>	<b>\$2,504,762.44</b>
<b>Estimated ROW Cost:</b>	<b>\$1,000,000.00</b>	<b>Estimated CST Time:</b>	<b>12 Months</b>
<b>Rationale:</b> Construction cost will be about \$100k more for the Roundabout option over the signal left turn lane option and will require the relocation of the house in the SE quadrant of the intersection which would add several hundred thousand to the ROW estimate.			

**Comments/additional information:** None

### Attachments:

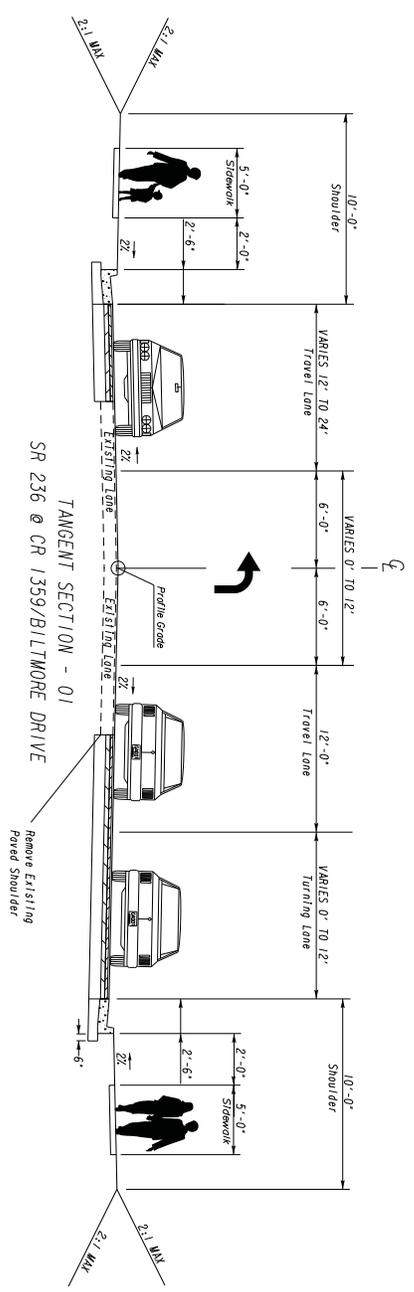
1. Concept Layout
2. Typical sections
3. Cost Estimates
4. Crash Summaries
5. Capacity analysis summary
6. TE Report
7. HSM Analysis
8. Roundabout Analysis



Google earth  
 STATE OF GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
 OFFICE: CONSTRUCTION LAYOUT  
 REVISION DATES:

NO.	DATE	DESCRIPTION

DRAWING NO. 11-



<p><b>GEORGIA</b> DEPARTMENT OF TRANSPORTATION</p>	<p><b>N.T.S</b></p>	<p>STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: DISTRICT 7 PRECONSTRUCTION</p> <p><b>TYPICAL SECTION</b> <b>SR 236/AVISTA RD.</b> <b>@ BILTMORE DR.</b></p>																						
		<p>REVISION DATES</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td></tr> </table>																						
		<p>DRAWING NO. <b>05-01</b></p>																						

# DETAILED COST ESTIMATE



**Job: 0010944**

**JOB NUMBER** 0010944

**FED/STATE PROJECT NUMBER** 0010944

**SPEC YEAR:** 01

**DESCRIPTION:** SR 236 @ CR 1359/BILTMORE DRIVE

ITEMS FOR JOB 0010944

**0010 - ROADWAY**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0025	150-1000	1.000	LS	\$140,000.00000	TRAFFIC CONTROL - 00010944	\$140,000.00
0030	210-0100	1.000	LS	\$200,000.00000	GRADING COMPLETE - 00010944	\$200,000.00
0035	310-1101	3714.000	TN	\$21.93419	GR AGGR BASE CRS, INCL MATL	\$81,463.58
0209	402-3103	421.000	TN	\$66.66000	REC AC 9.5 MM SP,TPII,GP2, INCL BM & H L	\$28,063.86
0015	402-3121	740.000	TN	\$80.94390	RECYL AC 25MM SP,GP1/2,BM&HL	\$59,898.49
0010	402-3190	592.000	TN	\$91.16968	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	\$53,972.45
0040	413-1000	431.000	GL	\$4.31575	BITUM TACK COAT	\$1,860.09
0045	432-5010	5380.000	SY	\$3.52194	MILL ASPH CONC PVMT,VARB DEPTH	\$18,948.04
0219	441-0104	1055.000	SY	\$33.32046	CONC SIDEWALK, 4 IN	\$35,153.09
0283	441-0108	60.000	SY	\$57.30406	CONC SIDEWALK, 8 IN	\$3,438.24
0308	441-0748	110.000	SY	\$52.50344	CONC MEDIAN, 6 IN TYP 7 FACE	\$5,775.38
0224	441-6022	1920.000	LF	\$12.27212	CONC CURB & GUTTER, 6"X30"TP2	\$23,562.47
0269	446-1100	1400.000	LF	\$6.18224	PVMT REF FAB STRIPS, TP2,18 INCH WIDTH	\$8,655.14
0214	500-9999	500.000	CY	\$171.13704	CL B CONC,BASE OR PVMT WIDEN	\$85,568.52
0244	550-1180	700.000	LF	\$46.59718	STM DR PIPE 18",H 1-10	\$32,618.03
0249	611-5550	1.000	LS	\$608.31000	RESET SIGN, STA - 00010944	\$608.31
0259	611-8050	2.000	EA	\$839.54877	ADJUST MANHOLE TO GRADE	\$1,679.10
0124	634-1200	23.000	EA	\$139.75476	RIGHT OF WAY MARKERS	\$3,214.36
0229	654-1003	8.000	EA	\$4.86236	RAISED PVMT MARKERS TP 3	\$38.90
0239	668-1100	5.000	EA	\$2,210.38768	CATCH BASIN, GP 1	\$11,051.94
0264	670-9710	1.000	EA	\$2,616.09860	RELOCATE EXIST FIRE HYDRANT	\$2,616.10
<b>SUBTOTAL FOR ROADWAY:</b>						<b>\$798,186.09</b>

**0020 - EROSION CONTROL**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0085	163-0232	1.000	AC	\$307.89302	TEMPORARY GRASSING	\$307.89
0080	163-0240	15.000	TN	\$316.49030	MULCH	\$4,747.35
0313	163-0550	4.000	EA	\$147.40088	CONS & REM INLET SEDIMENT TRAP	\$589.60
0095	165-0030	750.000	LF	\$0.75117	MAINT OF TEMP SILT FENCE, TP C	\$563.38
0318	165-0105	4.000	EA	\$39.53580	MAINT OF INLET SEDIMENT TRAP	\$158.14
0090	171-0030	1550.000	LF	\$2.91878	TEMPORARY SILT FENCE, TYPE C	\$4,524.11
0060	700-6910	1.000	AC	\$767.02464	PERMANENT GRASSING	\$767.02
0065	700-7000	2.000	TN	\$147.94858	AGRICULTURAL LIME	\$295.90
0070	700-8000	1.000	TN	\$562.76490	FERTILIZER MIXED GRADE	\$562.76
0075	700-8100	50.000	LB	\$3.12253	FERTILIZER NITROGEN CONTENT	\$156.13
<b>SUBTOTAL FOR EROSION CONTROL:</b>						<b>\$12,672.28</b>

# DETAILED COST ESTIMATE



**Job: 0010944**

**0030 - SIGNS AND MARKING**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0303	636-1020	122.000	SF	\$14.16124	HWY SGN,TP1MAT,REFL SH TP3	\$1,727.67
0286	636-1033	40.000	SF	\$23.37986	HWY SIGNS, TP1MAT,REFL SH TP 9	\$935.19
0298	636-2070	390.000	LF	\$8.07291	GALV STEEL POSTS, TP 7	\$3,148.43
0273	652-0120	6.000	EA	\$44.25000	PAVEMENT MARKING, ARROW, TP 2	\$265.50
0100	653-1501	2305.000	LF	\$0.80297	THERMO SOLID TRAF ST 5 IN, WHI	\$1,850.85
0110	653-1704	120.000	LF	\$5.31370	THERM SOLID TRAF STRIPE,24",WH	\$637.64
0278	653-1804	670.000	LF	\$2.40995	THERM SOLID TRAF STRIPE, 8",WH	\$1,614.67
0293	653-6004	265.000	SY	\$4.08827	THERM TRAF STRIPING, WHITE	\$1,083.39
0105	653-6006	4180.000	SY	\$3.31149	THERM TRAF STRIPING, YELLOW	\$13,842.03
0149	654-1001	24.000	EA	\$4.97510	RAISED PVMT MARKERS TP 1	\$119.40
<b>SUBTOTAL FOR SIGNS AND MARKING:</b>						<b>\$25,224.77</b>

**0040 - SIGNAL**

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0338	647-1000	1.000	LS	\$75,000.00000	TRAF SIGNAL INSTALLATION NO - 00010944	\$75,000.00
<b>SUBTOTAL FOR SIGNAL:</b>						<b>\$75,000.00</b>

**TOTALS FOR JOB 0010944**

<b>ITEMS COST:</b>	<b>\$911,083.14</b>
<b>COST GROUP COST:</b>	<b>\$0.00</b>
<b>ESTIMATED COST:</b>	<b>\$911,083.14</b>
<b>CONTINGENCY PERCENT:</b>	<b>0.00</b>
<b>ENGINEERING AND INSPECTION:</b>	<b>0.05</b>
<b>ESTIMATED COST WITH CONTINGENCY AND E&amp;I:</b>	<b>\$956,637.30</b>



GEORGIA DEPARTMENT OF TRANSPORTATION  
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 9/19/2013 Project: 0010944  
 Revised: County: Dekalb  
 PI: 0010944

Description: SR 236 @ CR 1359/Biltmore Drive  
 Project Termini: SR 236 @ CR 1359/Biltmore Drive

Existing ROW: Varies  
 Required ROW: Varies  
 Parcels: 14

Land and Improvements \_\_\_\_\_ \$203,625.00

Proximity Damage	\$0.00
Consequential Damage	\$0.00
Cost to Cures	\$0.00
Trade Fixtures	\$0.00
Improvements	\$22,000.00

Valuation Services \_\_\_\_\_ \$17,500.00

Legal Services \_\_\_\_\_ \$121,950.00

Relocation \_\_\_\_\_ \$28,000.00

Demolition \_\_\_\_\_ \$50,000.00

Administrative \_\_\_\_\_ \$135,500.00

TOTAL ESTIMATED COSTS \_\_\_\_\_ \$556,575.00

**TOTAL ESTIMATED COSTS (ROUNDED) \_\_\_\_\_ \$557,000.00**

Preparation Credits	Hours	Signature

Prepared By: Dashone Alexander CG#: 286999 09/19/2013(E)

Approved By: Dashone Alexander CG#: 286999 09/19/2013(E)

**NOTE: No Market Appreciation is included in this Preliminary Cost Estimate**

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI      0010944              Dekalb              0010944

	A	B	C	D
<b>Land and Improvements</b>	<b>Agriculture</b>	<b>Residential</b>	<b>Commercial</b>	<b>Industrial</b>
1      Estimate Low (ac)	\$0.00	\$85,000.00	\$200,000.00	\$0.00
2      Estimate High (ac)	\$0.00	\$120,000.00	\$500,000.00	\$0.00
3      Estimate Used (ac)	\$0.00	\$65,000.00	\$200,000.00	\$0.00
4      Fee Simple Area (ac)	0.00	1.75	0.00	0.00
5      Fee Simple Estimate	\$0.00	\$113,750.00	\$0.00	\$0.00
6      Perm Esmt Area (ac)	0.00	0.00	0.00	0.00
7      Perm Esmt Factor	0%	50%	50%	0%
8      Perm Esmt Estimate	\$0.00	\$0.00	\$0.00	\$0.00
9      Temp Esmt Area (ac)	0.00	0.00	0.00	0.00
10     Temp East Factor	0%	0%	0%	0%
11     Temp Esmt Estimate	\$0.00	\$0.00	\$0.00	\$0.00
12     Proximity Damages	\$0.00	\$0.00	\$0.00	\$0.00
13     Consequential Damages	\$0.00	\$0.00	\$0.00	\$0.00
14     Cost to Cures	\$0.00	\$0.00	\$0.00	\$0.00
15     Improvements	\$0.00	\$22,000.00	\$0.00	\$0.00
16     Trade Fixtures	\$0.00	\$0.00	\$0.00	\$0.00
17				
18     PROPERTY TYPE TOTALS	\$0.00	\$135,750.00	\$0.00	\$0.00
19	SUB TOTAL PROPERTY TYPES			\$135,750.00
20	Counter Offers and Condemnation Increases			\$67,875.00
21				
22	<b>GRAND TOTAL LANDS AND IMPROVEMENTS</b>			<b>\$203,625.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI      0010944              Dekalb              0010944

		A	B	C	D
Valuation Services		Agriculture	Residential	Commercial	Industrial
1	Appraisals (# of Parcels)	0	14	0	0
2	Estimated Fees (per Parcel)	\$0.00	\$1,000.00	\$2,000.00	\$0.00
3	TOTAL APPRAISALS	\$0.00	\$14,000.00	\$0.00	\$0.00
4	Sign Estimates	0	0	0	0
5	Estimated Fees	\$0.00	\$0.00	\$0.00	\$0.00
6	TOTAL SIGN ESTIMATES	\$0.00	\$0.00	\$0.00	\$0.00
7	Specialty Reports	0	0	0	0
8	Estimated Fees	\$0.00	\$0.00	\$0.00	\$0.00
9	TOTAL SPECIALTY REPORTS	\$0.00	\$0.00	\$0.00	\$0.00
10	Septic/Well Reports	0	0	0	0
11	Estimated Fees	\$0.00	\$0.00	\$0.00	\$0.00
12	TOTAL SEPTIC/WELL REPORTS	\$0.00	\$0.00	\$0.00	\$0.00
13					
14					
15					
16	TOTAL VALUATION FEES	\$0.00	\$14,000.00	\$0.00	\$0.00
17	SUB TOTAL VALUATION SERVICES				\$14,000.00
18	Updates and Incidentals (Min \$2,500 or 25%)				\$3,500.00
19	<b>GRAND TOTAL VALUATION SERVICES</b>				<b>\$17,500.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI      0010944              Dekalb              0010944

	A	B	C	D
	Parcels	Estimated Fees		TOTALS
1	Meeting with Attorney	14	\$125.00	\$1,750.00
2	Preliminary Titles	14	\$200.00	\$2,800.00
3	Closing and Final Title	14	\$300.00	\$4,200.00
4	Recording Fees	14	\$50.00	\$700.00
5	Condemnation Filing	3	\$5,000.00	\$15,000.00
6	Litigation Costs	3	\$25,000.00	\$75,000.00
7	Updates and Incidentals	3	\$7,500.00	\$22,500.00
8				
9				
10				
11				
12				
13				
14				
15				
16				
17	<b>GRAND TOTAL LEGAL SERVICES</b>			<b>\$121,950.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI    0010944            Dekalb            0010944

	A	B	C	D
	<b>Relocation</b>	<b>Displacements</b>	<b>Estimated Costs</b>	<b>TOTALS</b>
1	Business Displacement	0	\$15,000.00	\$0.00
2	Residential Tenant		\$20,000.00	\$0.00
3	Residential Owner	0	\$40,000.00	\$0.00
4	Pro-Rata Taxes	14	\$1,000.00	\$14,000.00
5	Property Pin Replacement	14	\$1,000.00	\$14,000.00
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17	<b>GRAND TOTAL RELOCATION</b>			<b>\$28,000.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI    0010944                      Dekalb                      0010944

	A	B	C	D
	<b>Demolition</b>	<b>Items/Improvements</b>	<b>Estimated Costs</b>	<b>TOTALS</b>
1	Residential Structures	0	\$15,000.00	\$0.00
2	Commercial Structures	2	\$25,000.00	\$50,000.00
3	Hotels/Apartments		\$60,000.00	\$0.00
4	UST's - Dispensers		\$50,000.00	\$0.00
5	Billboards		\$8,000.00	\$0.00
6	Signs - Light Standards		\$1,500.00	\$0.00
7	Water Vaults		\$15,000.00	\$0.00
8	Gas/Water Service Separation		\$2,500.00	\$0.00
9				
10				
11				
12				
13				
14				
15				
16				
17	<b>GRAND TOTAL DEMOLITION</b>			<b>\$50,000.00</b>

Georgia Department of Transportation  
Preliminary ROW Cost Estimate Worksheet

Project/County/PI    0010944                    Dekalb                    0010944

	A	B	C	D
	Parcels	Man hours per Parcel		TOTALS
1	14	40		\$28,000.00
2	14	100		\$70,000.00
3	5	50		\$12,500.00
4	4	50		\$10,000.00
5	3	100		\$15,000.00
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17	<b>GRAND TOTAL INHOUSE</b>			<b>\$135,500.00</b>

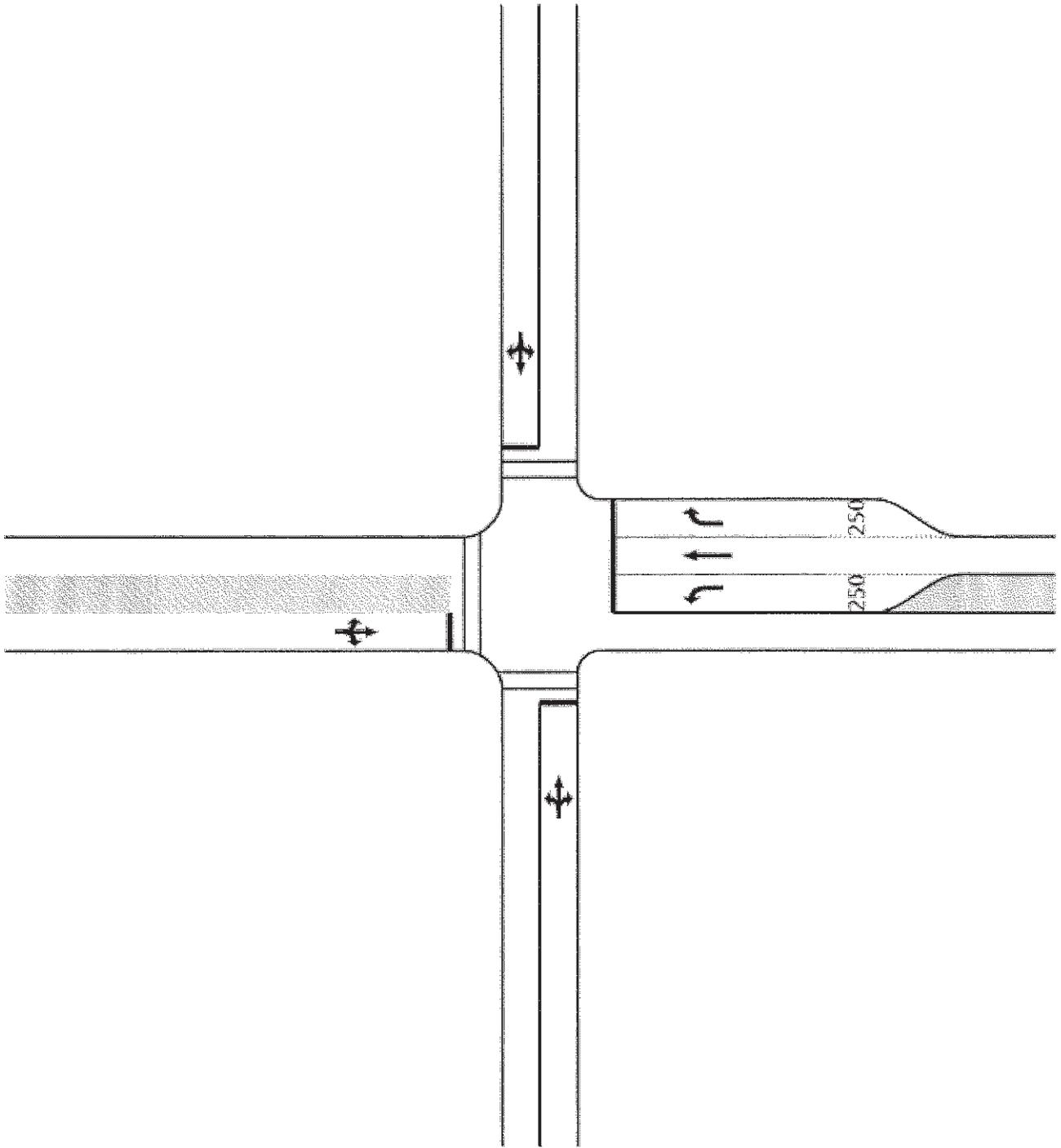


<b>Crash Report Summary Table: DEKALB COUNTY, SR 236/Lavista Road @ Biltmore Drive.</b>				
<b>Collision Type</b>	<b>Year of Accident</b>			
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>Rear End</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>8</b>
<b>Angle</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>
<b>Sideswipe</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Not A Collision With A Motor Vehicle</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Injuries</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>6</b>
<b>Fatalities</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



Biltmore

LaVista



LaVista

Biltmore

# Lanes, Volumes, Timings

3:

9/27/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↙	↘			↕			↕	
Volume (vph)	1	351	23	172	568	2	9	1	42	2	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.94				0.87			0.85	
Frt		0.992						0.891			0.932	
Flt Protected				0.950				0.991			0.984	
Satd. Flow (prot)	0	1828	0	1770	1863	0	0	1494	0	0	1497	0
Flt Permitted		0.999		0.485				0.961			0.946	
Satd. Flow (perm)	0	1826	0	846	1863	0	0	1390	0	0	1400	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5						46			3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1059			1424			701			726	
Travel Time (s)		24.1			32.4			15.9			16.5	
Confl. Peds. (#/hr)			40	40			57		25	25		57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	382	25	187	617	2	10	1	46	2	1	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	408	0	187	619	0	0	57	0	0	6	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Minimum Split (s)	90.0	90.0		8.0	88.0		25.0	25.0		25.0	25.0	
Total Split (s)	90.0	90.0		15.0	105.0		25.0	25.0		25.0	25.0	
Total Split (%)	69.2%	69.2%		11.5%	80.8%		19.2%	19.2%		19.2%	19.2%	
Maximum Green (s)	83.1	83.1		11.0	98.1		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		3.5	4.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.9	2.9		0.5	2.9		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.9		4.0	6.9		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	9.0	9.0			10.0		10.0	10.0		9.0	9.0	
Pedestrian Calls (#/hr)	10	10		0			10	10		10	10	
Act Effct Green (s)		83.1		101.0	98.1			20.0			20.0	
Actuated g/C Ratio		0.64		0.78	0.75			0.15			0.15	
v/c Ratio		0.35		0.25	0.44			0.23			0.03	
Control Delay		11.8		4.5	7.0			19.8			37.2	
Queue Delay		0.0		0.0	0.0			0.0			0.0	

Lanes, Volumes, Timings

3:

9/27/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		11.8		4.5	7.0			19.8			37.2	
LOS		B		A	A			B			D	
Approach Delay		11.8			6.4			19.8			37.2	
Approach LOS		B			A			B			D	
Queue Length 50th (ft)		147		33	167			8			2	
Queue Length 95th (ft)		207		52	227			49			15	
Internal Link Dist (ft)		979			1344			621			646	
Turn Bay Length (ft)												
Base Capacity (vph)		1169		735	1405			252			217	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.35		0.25	0.44			0.23			0.03	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.44  
 Intersection Signal Delay: 8.9  
 Intersection Capacity Utilization 80.0%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service D

Splits and Phases: 3:

02 (R)	04
105 s	25 s
05	06 (R)
15 s	90 s
	08
	25 s

# INTERSECTION SUMMARY

Site: New Site - 1 - Copy -  
Conversion

SR 236 at Biltore  
Signals - Pretimed Cycle Time = 40 seconds (Practical Cycle Time)

Intersection Performance - Hourly Values			
Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total)	1480 veh/h	132 ped/h	1909 pers/h
Percent Heavy Vehicles	3.0 %		
Degree of Saturation	0.781	0.016	
Practical Spare Capacity	15.2 %		
Effective Intersection Capacity	1895 veh/h		
Control Delay (Total)	6.52 veh-h/h	0.37 ped-h/h	8.19 pers-h/h
Control Delay (Average)	15.8 sec	10.1 sec	15.4 sec
Control Delay (Worst Lane)	38.9 sec		
Control Delay (Worst Movement)	38.9 sec	12.0 sec	38.9 sec
Geometric Delay (Average)	2.1 sec		
Stop-Line Delay (Average)	15.8 sec		
Intersection Level of Service (LOS)	LOS B	LOS B	
95% Back of Queue - Vehicles (Worst Lane)	11.4 veh		
95% Back of Queue - Distance (Worst Lane)	291.0 ft		
Total Effective Stops	1218 veh/h	93 ped/h	1555 pers/h
Effective Stop Rate	0.82 per veh	0.71 per ped	0.81 per pers
Proportion Queued	0.89	0.71	0.88
Performance Index	44.9	1.7	46.6
Travel Distance (Total)	547.8 veh-mi/h	2.3 ped-mi/h	659.7 pers-mi/h
Travel Distance (Average)	1954 ft	93 ft	1825 ft
Travel Time (Total)	23.5 veh-h/h	1.2 ped-h/h	29.4 pers-h/h
Travel Time (Average)	57.1 sec	31.6 sec	55.4 sec
Travel Speed	23.3 mph	2.0 mph	22.5 mph
Cost (Total)	445.86 \$/h	10.65 \$/h	456.51 \$/h
Fuel Consumption (Total)	30.4 gal/h		
Carbon Dioxide (Total)	288.0 kg/h		
Hydrocarbons (Total)	0.477 kg/h		
Carbon Monoxide (Total)	22.31 kg/h		
NOx (Total)	0.681 kg/h		

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

HCM Delay Model used. Geometric Delay not included.

Intersection Performance - Annual Values			
Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows (Total)	710,609 veh/y	63,360 ped/y	916,090 pers/y
Delay	3,128 veh-h/y	177 ped-h/y	3,931 pers-h/y
Effective Stops	584,714 veh/y	44,832 ped/y	746,489 pers/y
Travel Distance	262,940 veh-mi/y	1,111 ped-mi/y	316,639 pers-mi/y
Travel Time	11,278 veh-h/y	556 ped-h/y	14,089 pers-h/y
Cost	214,012 \$/y	5,114 \$/y	219,126 \$/y
Fuel Consumption	14,589 gal/y		
Carbon Dioxide	138,228 kg/y		
Hydrocarbons	229 kg/y		
Carbon Monoxide	10,707 kg/y		
NOx	327 kg/y		

# MOVEMENT SUMMARY

Site: New Site - 1 - Copy - Conversion

SR 236 at Biltore  
Signals - Pretimed Cycle Time = 40 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop Queued	Effective Stop Rate per veh	Average Speed mph
South: Biltmore											
3	L	213	3.0	0.426	12.2	LOS B	4.2	106.5	0.81	0.78	18.5
8	T	1	3.0	0.426	12.2	LOS B	4.2	106.5	0.81	0.68	19.5
18	R	46	3.0	0.426	12.2	LOS B	4.2	106.5	0.81	0.77	18.5
Approach		260	3.0	0.426	12.2	LOS B	4.2	106.5	0.81	0.78	18.5
East: LaVista											
1	L	187	3.0	0.781	38.9	LOS D	4.5	116.0	1.00	0.93	16.5
6	T	617	3.0	0.715	14.0	LOS B	11.4	291.0	0.87	0.81	26.6
16	R	2	3.0	0.002	0.4	LOS A	0.0	0.2	0.20	0.55	22.5
Approach		807	3.0	0.781	19.7	LOS B	11.4	291.0	0.90	0.84	23.3
North: Biltmore											
7	L	2	3.0	0.010	8.5	LOS A	0.1	2.2	0.67	0.61	19.8
4	T	1	3.0	0.010	8.5	LOS A	0.1	2.2	0.67	0.45	20.3
14	R	3	3.0	0.010	8.5	LOS A	0.1	2.2	0.67	0.63	19.8
Approach		7	3.0	0.010	8.5	LOS A	0.1	2.2	0.67	0.60	19.9
West: LaVista											
5	L	1	3.0	0.369	10.7	LOS B	6.8	173.0	0.94	0.88	27.6
2	T	382	3.0	0.369	10.7	LOS B	6.8	173.0	0.94	0.82	28.0
12	R	25	3.0	0.369	10.7	LOS B	6.8	173.0	0.94	0.88	20.3
Approach		408	3.0	0.369	10.7	LOS B	6.8	173.0	0.94	0.82	27.5
All Vehicles		1480	3.0	0.781	15.8	LOS B	11.4	291.0	0.89	0.82	23.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

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

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

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

HCM Delay Model used. Geometric Delay not included.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance ft	Prop. Queued	Effective Stop Rate per ped	
2P	Across S approach	27	9.1	LOS A	0.0	0.1	0.68	0.68	
6P	Across N approach	62	9.1	LOS A	0.0	0.1	0.68	0.68	
4P	Across W approach	43	12.0	LOS B	0.0	0.1	0.78	0.78	
All Pedestrians		132	10.1	LOS B			0.71	0.71	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# LANE SUMMARY

Site: New Site - 1 - Copy - Conversion

SR 236 at Biltore  
Signals - Pretimed Cycle Time = 40 seconds (Practical Cycle Time)

Lane Use and Performance																
	Demand Flows						Deg Satn	Lane Util	Average Delay	Level of Service	95% Back of Queue Vehicles	Back of Queue Distance	Lane Length	SL Type	Cap Adj	Prob Block
	L	T	R	Total	HV %	Cap veh/h										
<b>South: Biltmore</b>																
Lane 1	213	1	46	260	3.0	610	0.426	100	12.2	LOS B	4.2	106.5	1600	-	0.0	0.0
Approach	213	1	46	260	3.0		0.426		12.2	LOS B	4.2	106.5				
<b>East: LaVista</b>																
Lane 1	187	0	0	187	3.0	239	0.781	100	38.9	LOS D	4.5	116.0	250 Turn Bay	0.0	0.0	
Lane 2	0	617	0	617	3.0	863	0.715	100	14.0	LOS B	11.4	291.0	1600	-	0.0	0.0
Lane 3	0	0	2	2	3.0	1184	0.002	100	0.4	LOS A	0.0	0.2	250 Turn Bay	0.0	0.0	
Approach	187	617	2	807	3.0		0.781		19.7	LOS B	11.4	291.0				
<b>North: Biltmore</b>																
Lane 1	2	1	3	7	3.0	643	0.010	100	8.5	LOS A	0.1	2.2	1600	-	0.0	0.0
Approach	2	1	3	7	3.0		0.010		8.5	LOS A	0.1	2.2				
<b>West: LaVista</b>																
Lane 1	1	382	25	408	3.0	1104 <sup>1</sup>	0.369	100	10.7	LOS B	6.8	173.0	1600	-	0.0	0.0
Approach	1	382	25	408	3.0		0.369		10.7	LOS B	6.8	173.0				
Intersection				1480	3.0		0.781		15.8	LOS B	11.4	291.0				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

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

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

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

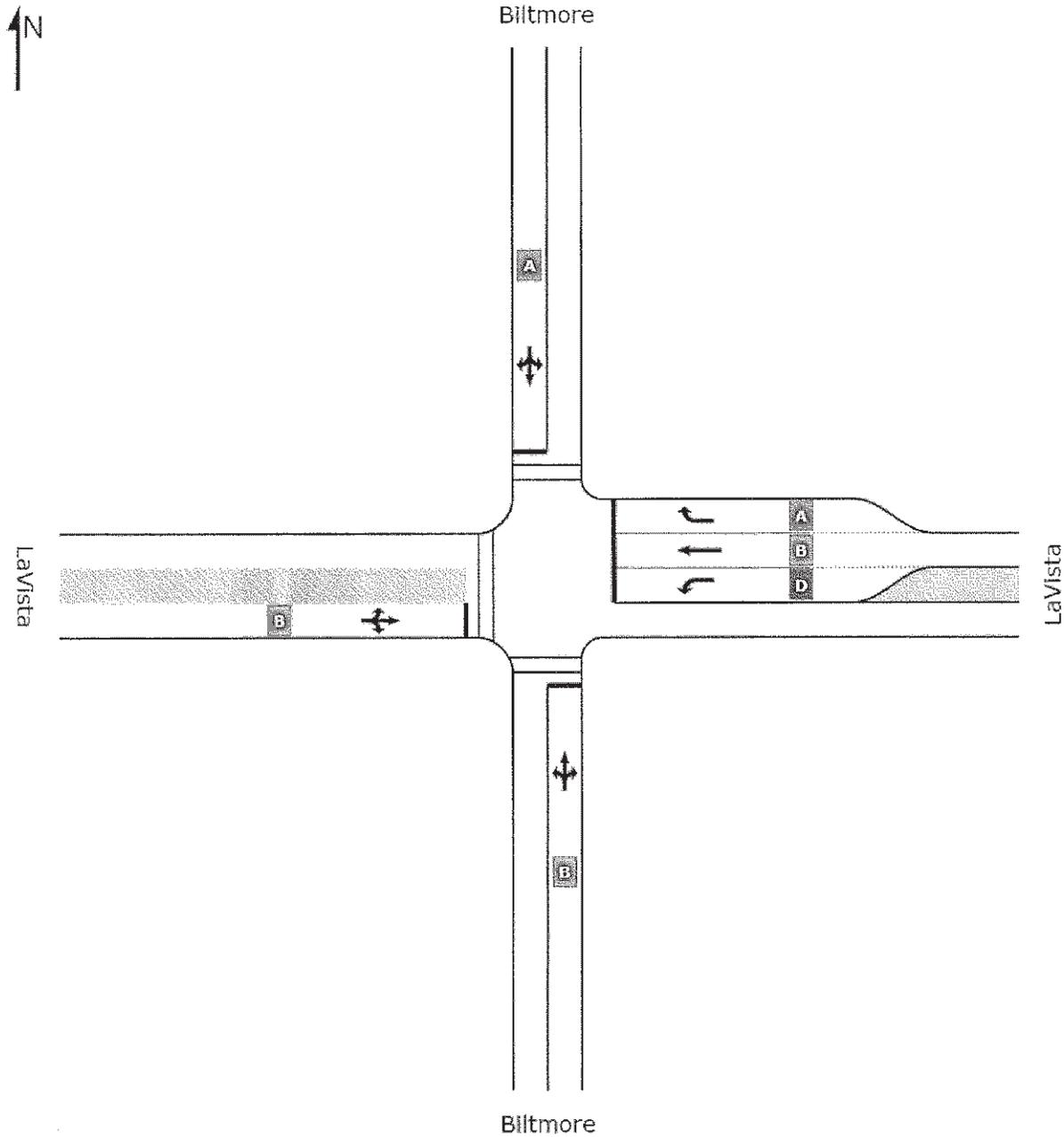
HCM Delay Model used. Geometric Delay not included.

1 Reduced capacity due to a short lane effect

# LEVEL OF SERVICE SUMMARY

Site: New Site - 1 - Copy - Conversion

SR 236 at Biltmore  
 Signals - Pretimed Cycle Time = 40 seconds (Practical Cycle Time)



	South	East	North	West	Intersection
LOS	B	B	A	B	B

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

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

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

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

HCM Delay Model used. Geometric Delay not included.

Project: W:\Chris Woods\Operations\SR 236\SR 236 at Biltmore\SR 236 at Biltmore.sip  
8001140, GEORGIA DEPARTMENT OF TRANSPORTATION, FLOATING

SIDRA  
INTERSECTION 

# Reliable Traffic Data Services, LLC

Tel: (770) 578-8158 | Fax: (770) 578-8159  
 reliabletraffic@msn.com | www.reliabletraffic.org

TMC Data  
 Lavista Rd @ Biltmore Dr

File Name : 31050002  
 Site Code : 31050002  
 Start Date : 10/13/2011  
 Page No : 1

6.30-9.30am 11am-2pm 3-7pm

## Groups Printed- Cars & Buses - Trucks

Start Time	Biltmore Dr Northbound					Biltmore Dr Southbound					Lavista Rd Eastbound					Lavista 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	
06:30 AM	1	0	4	3	8	0	0	0	0	0	0	34	1	1	36	9	86	0	0	95	139
06:45 AM	0	0	5	4	9	0	0	0	0	0	0	48	1	0	49	11	98	0	0	109	167
Total	1	0	9	7	17	0	0	0	0	0	0	82	2	1	85	20	184	0	0	204	306
07:00 AM	2	0	9	1	12	0	0	0	2	2	0	65	4	0	69	12	115	0	0	127	210
07:15 AM	1	0	11	4	16	2	0	0	1	3	1	77	5	2	85	23	138	0	0	161	265
07:30 AM	4	0	10	4	18	0	0	2	1	3	1	88	6	1	96	39	142	2	0	183	300
07:45 AM	2	0	12	4	18	0	0	0	10	10	0	84	5	11	100	44	141	2	0	187	315
Total	9	0	42	13	64	2	0	2	14	18	2	314	20	14	350	118	536	4	0	658	1090
08:00 AM	1	0	15	6	22	0	1	0	6	7	0	89	4	7	100	45	145	1	0	191	320
08:15 AM	2	1	10	6	19	0	0	0	10	10	0	92	4	8	104	48	139	0	0	187	320
08:30 AM	3	0	6	6	15	1	0	2	12	15	0	87	7	14	108	41	146	1	0	188	326
08:45 AM	3	0	11	7	21	1	0	1	29	31	1	83	8	11	103	38	138	0	0	176	331
Total	9	1	42	25	77	2	1	3	57	63	1	351	23	40	415	172	568	2	0	742	1297
09:00 AM	3	0	10	17	30	2	0	3	9	14	0	74	2	18	94	35	135	0	0	170	308
09:15 AM	0	0	6	10	16	2	0	2	24	28	1	68	3	22	94	32	143	2	0	177	315
*** BREAK ***																					
Total	3	0	16	27	46	4	0	5	33	42	1	142	5	40	188	67	278	2	0	347	623
*** BREAK ***																					
11:00 AM	2	0	15	7	24	4	0	2	7	13	4	108	0	5	117	6	113	0	0	119	273
11:15 AM	0	0	12	6	18	3	0	2	11	16	0	115	1	13	129	8	109	2	0	119	282
11:30 AM	5	0	16	10	31	5	0	1	8	14	0	118	1	19	138	9	117	3	0	129	312
11:45 AM	3	4	14	15	36	3	1	1	53	58	0	120	3	48	171	11	112	1	0	124	389
Total	10	4	57	38	109	15	1	6	79	101	4	461	5	85	555	34	451	6	0	491	1256
12:00 PM	3	0	19	24	46	3	1	0	25	29	3	115	1	44	163	17	122	2	0	141	379
12:15 PM	4	0	14	38	56	1	0	0	44	45	1	118	1	69	189	5	125	1	0	131	421
12:30 PM	5	0	17	6	28	0	1	0	44	45	1	125	3	37	166	9	134	1	0	144	383
12:45 PM	2	1	15	5	23	2	0	1	11	14	0	127	1	9	137	10	139	1	0	150	324
Total	14	1	65	73	153	6	2	1	124	133	5	485	6	159	655	41	520	5	0	566	1507
01:00 PM	0	0	18	1	19	0	3	0	4	7	1	124	2	5	132	15	135	1	0	151	309
01:15 PM	2	0	19	8	29	1	0	0	0	1	0	122	1	0	123	16	128	0	0	144	297
01:30 PM	5	0	22	1	28	0	0	1	3	4	0	128	3	1	132	11	136	1	0	148	312
01:45 PM	1	0	20	0	21	1	0	0	1	2	1	122	6	0	129	6	133	1	0	140	292
Total	8	0	79	10	97	2	3	1	8	14	2	496	12	6	516	48	532	3	0	583	1210

\*\*\* BREAK \*\*\*

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TMC Data  
 Lavista Rd @ Biltmore Dr

File Name : 31050002  
 Site Code : 31050002  
 Start Date : 10/13/2011  
 Page No : 2

6.30-9.30am 11am-2pm 3-7pm

## Groups Printed- Cars & Buses - Trucks

Start Time	Biltmore Dr Northbound					Biltmore Dr Southbound					Lavista Rd Eastbound					Lavista 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	
03:00 PM	3	1	20	5	29	2	1	2	2	7	0	128	1	0	129	8	119	3	0	130	295
03:15 PM	4	0	23	6	33	2	0	1	2	5	0	131	0	2	133	6	128	1	0	135	306
03:30 PM	4	1	28	9	42	0	0	0	12	12	0	128	0	6	134	7	124	1	0	132	320
03:45 PM	8	0	30	9	47	1	0	0	4	5	0	139	0	10	149	4	121	0	0	125	326
<b>Total</b>	<b>19</b>	<b>2</b>	<b>101</b>	<b>29</b>	<b>151</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>20</b>	<b>29</b>	<b>0</b>	<b>526</b>	<b>1</b>	<b>18</b>	<b>545</b>	<b>25</b>	<b>492</b>	<b>5</b>	<b>0</b>	<b>522</b>	<b>1247</b>
04:00 PM	5	0	33	7	45	1	0	2	13	16	1	139	2	21	163	11	128	0	0	139	363
04:15 PM	9	1	36	7	53	0	0	2	10	12	0	142	0	14	156	11	142	1	0	154	375
04:30 PM	11	0	34	11	56	1	0	1	9	11	2	154	1	8	165	6	137	1	0	144	376
04:45 PM	8	3	38	2	51	1	0	2	10	13	0	138	0	14	152	7	134	1	0	142	358
<b>Total</b>	<b>33</b>	<b>4</b>	<b>141</b>	<b>27</b>	<b>205</b>	<b>3</b>	<b>0</b>	<b>7</b>	<b>42</b>	<b>52</b>	<b>3</b>	<b>573</b>	<b>3</b>	<b>57</b>	<b>636</b>	<b>35</b>	<b>541</b>	<b>3</b>	<b>0</b>	<b>579</b>	<b>1472</b>
05:00 PM	12	0	35	7	54	1	0	1	15	17	0	133	4	16	153	11	137	2	0	150	374
05:15 PM	17	0	54	9	80	0	0	0	8	8	0	184	2	10	196	9	132	2	0	143	427
05:30 PM	10	0	48	4	62	2	0	0	5	7	0	152	3	2	157	11	163	2	0	176	402
05:45 PM	6	0	37	8	51	0	0	0	2	2	1	153	2	5	161	8	143	0	0	151	365
<b>Total</b>	<b>45</b>	<b>0</b>	<b>174</b>	<b>28</b>	<b>247</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>30</b>	<b>34</b>	<b>1</b>	<b>622</b>	<b>11</b>	<b>33</b>	<b>667</b>	<b>39</b>	<b>575</b>	<b>6</b>	<b>0</b>	<b>620</b>	<b>1568</b>
06:00 PM	10	0	24	5	39	0	0	0	5	5	1	142	1	3	147	10	134	1	0	145	336
06:15 PM	6	0	19	13	38	0	0	1	10	11	0	153	2	1	156	15	127	0	0	142	347
06:30 PM	8	0	25	14	47	1	0	1	24	26	2	148	1	27	178	13	121	3	0	137	388
06:45 PM	1	0	20	20	41	1	0	0	22	23	0	143	0	26	169	10	119	1	0	130	363
<b>Total</b>	<b>25</b>	<b>0</b>	<b>88</b>	<b>52</b>	<b>165</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>61</b>	<b>65</b>	<b>3</b>	<b>586</b>	<b>4</b>	<b>57</b>	<b>650</b>	<b>48</b>	<b>501</b>	<b>5</b>	<b>0</b>	<b>554</b>	<b>1434</b>
<b>Grand Total</b>	<b>176</b>	<b>12</b>	<b>814</b>	<b>329</b>	<b>1331</b>	<b>44</b>	<b>8</b>	<b>31</b>	<b>468</b>	<b>551</b>	<b>22</b>	<b>4638</b>	<b>92</b>	<b>510</b>	<b>5262</b>	<b>647</b>	<b>5178</b>	<b>41</b>	<b>0</b>	<b>5866</b>	<b>13010</b>
<b>Apprch %</b>	<b>13.2</b>	<b>0.9</b>	<b>61.2</b>	<b>24.7</b>		<b>8</b>	<b>1.5</b>	<b>5.6</b>	<b>84.9</b>		<b>0.4</b>	<b>88.1</b>	<b>1.7</b>	<b>9.7</b>		<b>11</b>	<b>88.3</b>	<b>0.7</b>	<b>0</b>		
<b>Total %</b>	<b>1.4</b>	<b>0.1</b>	<b>6.3</b>	<b>2.5</b>	<b>10.2</b>	<b>0.3</b>	<b>0.1</b>	<b>0.2</b>	<b>3.6</b>	<b>4.2</b>	<b>0.2</b>	<b>35.6</b>	<b>0.7</b>	<b>3.9</b>	<b>40.4</b>	<b>5</b>	<b>39.8</b>	<b>0.3</b>	<b>0</b>	<b>45.1</b>	
<b>Cars &amp; Buses</b>	<b>176</b>	<b>12</b>	<b>814</b>	<b>329</b>	<b>1331</b>	<b>44</b>	<b>8</b>	<b>31</b>	<b>468</b>	<b>551</b>	<b>22</b>	<b>4632</b>	<b>92</b>	<b>510</b>	<b>5256</b>	<b>647</b>	<b>5173</b>	<b>41</b>	<b>0</b>	<b>5861</b>	<b>12999</b>
<b>% Cars &amp; Buses</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>99.9</b>	<b>100</b>	<b>100</b>	<b>99.9</b>	<b>100</b>	<b>99.9</b>	<b>100</b>	<b>0</b>	<b>99.9</b>	<b>99.9</b>
<b>Trucks</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>11</b>
<b>% Trucks</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0.1</b>

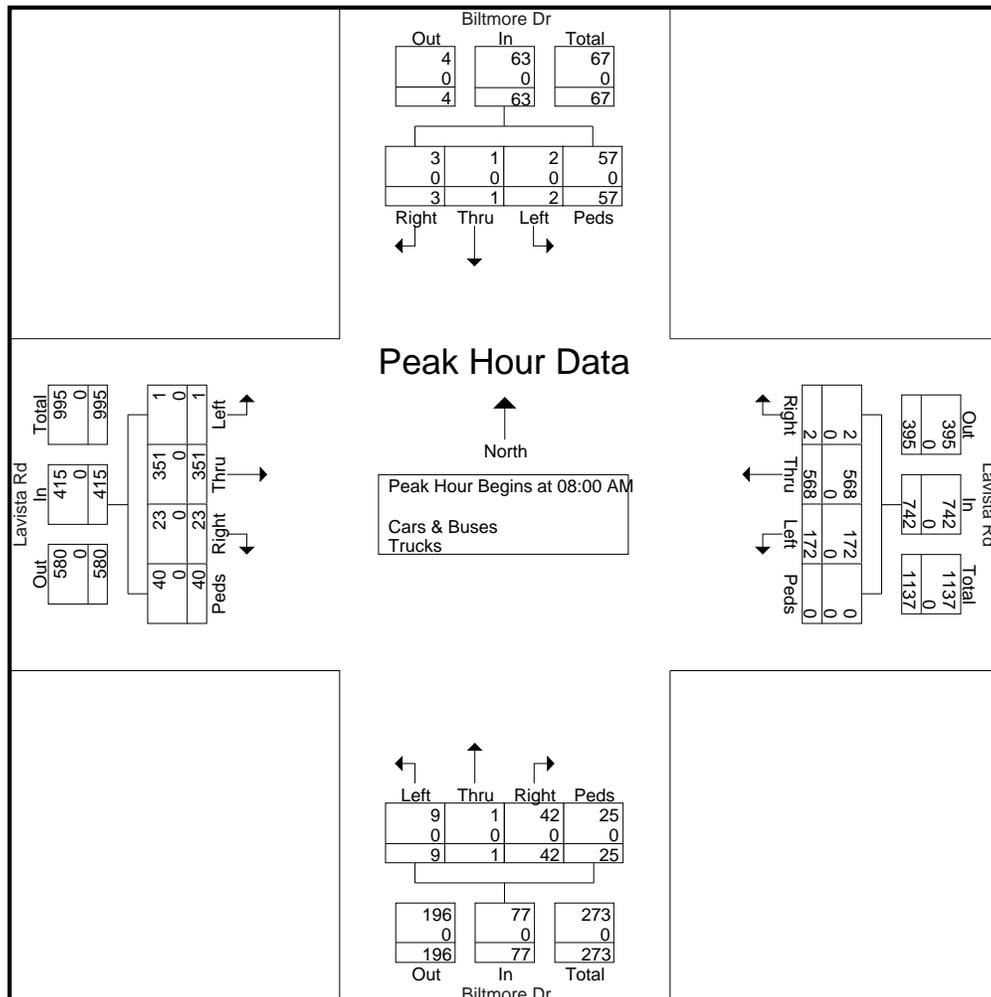
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TMC Data  
 Lavista Rd @ Biltmore Dr  
 6.30-9.30am 11am-2pm 3-7pm

File Name : 31050002  
 Site Code : 31050002  
 Start Date : 10/13/2011  
 Page No : 3

Start Time	Biltmore Dr Northbound					Biltmore Dr Southbound					Lavista Rd Eastbound					Lavista 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 06:30 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	0	15	6	22	0	1	0	6	7	0	89	4	7	100	45	145	1	0	191	320
08:15 AM	2	1	10	6	19	0	0	0	10	10	0	92	4	8	104	48	139	0	0	187	320
08:30 AM	3	0	6	6	15	1	0	2	12	15	0	87	7	14	108	41	146	1	0	188	326
08:45 AM	3	0	11	7	21	1	0	1	29	31	1	83	8	11	103	38	138	0	0	176	331
Total Volume	9	1	42	25	77	2	1	3	57	63	1	351	23	40	415	172	568	2	0	742	1297
% App. Total	11.7	1.3	54.5	32.5		3.2	1.6	4.8	90.5		0.2	84.6	5.5	9.6		23.2	76.5	0.3	0		
PHF	.750	.250	.700	.893	.875	.500	.250	.375	.491	.508	.250	.954	.719	.714	.961	.896	.973	.500	.000	.971	.980
Cars & Buses	9	1	42	25	77	2	1	3	57	63	1	351	23	40	415	172	568	2	0	742	1297
% Cars & Buses																					
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



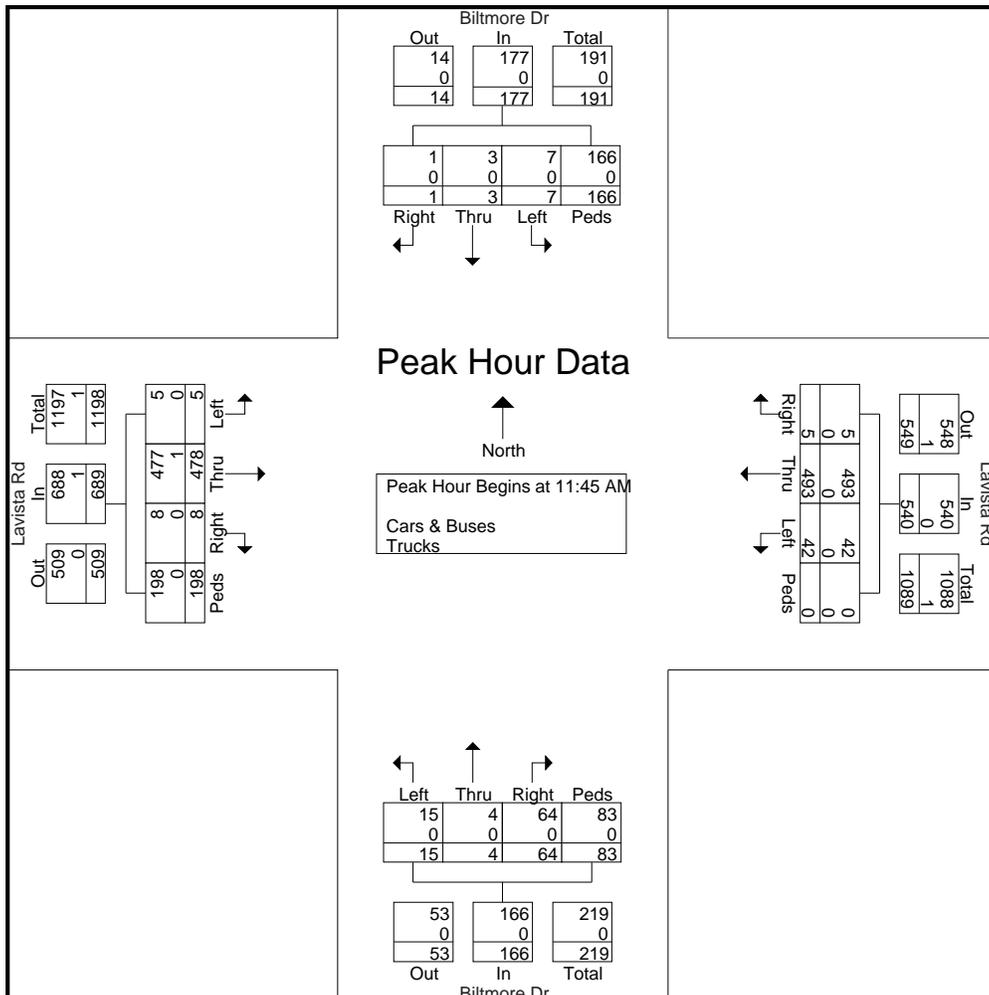
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TMC Data  
 Lavista Rd @ Biltmore Dr  
 6.30-9.30am 11am-2pm 3-7pm

File Name : 31050002  
 Site Code : 31050002  
 Start Date : 10/13/2011  
 Page No : 4

Start Time	Biltmore Dr Northbound					Biltmore Dr Southbound					Lavista Rd Eastbound					Lavista 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 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	3	4	14	15	36	3	1	1	53	58	0	120	3	48	171	11	112	1	0	124	389
12:00 PM	3	0	19	24	46	3	1	0	25	29	3	115	1	44	163	17	122	2	0	141	379
12:15 PM	4	0	14	38	56	1	0	0	44	45	1	118	1	69	189	5	125	1	0	131	421
12:30 PM	5	0	17	6	28	0	1	0	44	45	1	125	3	37	166	9	134	1	0	144	383
Total Volume	15	4	64	83	166	7	3	1	166	177	5	478	8	198	689	42	493	5	0	540	1572
% App. Total	9	2.4	38.6	50		4	1.7	0.6	93.8		0.7	69.4	1.2	28.7		7.8	91.3	0.9	0		
PHF	.750	.250	.842	.546	.741	.583	.750	.250	.783	.763	.417	.956	.667	.717	.911	.618	.920	.625	.000	.938	.933
Cars & Buses	15	4	64	83	166	7	3	1	166	177	5	477	8	198	688	42	493	5	0	540	1571
% Cars & Buses	99.8																				
Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.1	0	0	0	0	0	0.1



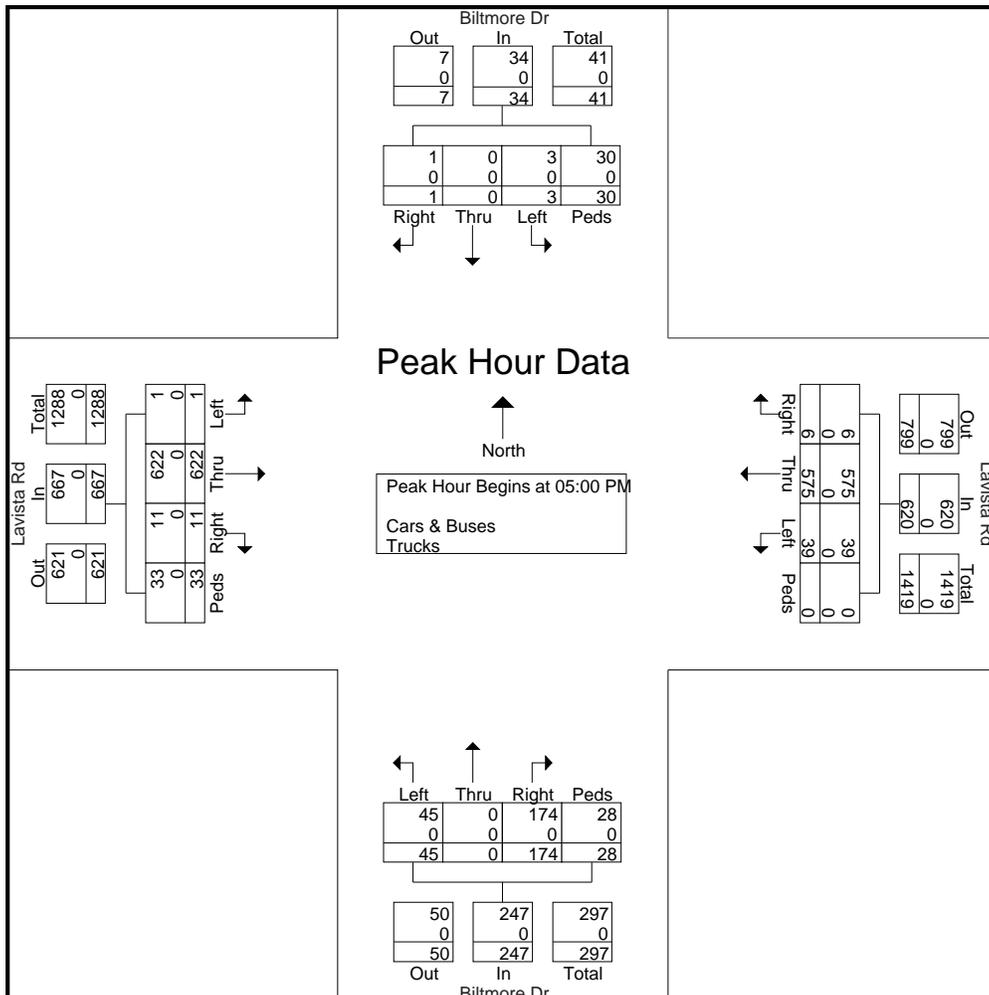
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TMC Data  
 Lavista Rd @ Biltmore Dr  
 6.30-9.30am 11am-2pm 3-7pm

File Name : 31050002  
 Site Code : 31050002  
 Start Date : 10/13/2011  
 Page No : 5

Start Time	Biltmore Dr Northbound					Biltmore Dr Southbound					Lavista Rd Eastbound					Lavista 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 03:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	12	0	35	7	54	1	0	1	15	17	0	133	4	16	153	11	137	2	0	150	374
05:15 PM	17	0	54	9	80	0	0	0	8	8	0	184	2	10	196	9	132	2	0	143	427
05:30 PM	10	0	48	4	62	2	0	0	5	7	0	152	3	2	157	11	163	2	0	176	402
05:45 PM	6	0	37	8	51	0	0	0	2	2	1	153	2	5	161	8	143	0	0	151	365
Total Volume	45	0	174	28	247	3	0	1	30	34	1	622	11	33	667	39	575	6	0	620	1568
% App. Total	18.2	0	70.4	11.3		8.8	0	2.9	88.2		0.1	93.3	1.6	4.9		6.3	92.7	1	0		
PHF	.662	.000	.806	.778	.772	.375	.000	.250	.500	.500	.250	.845	.688	.516	.851	.886	.882	.750	.000	.881	.918
Cars & Buses	45	0	174	28	247	3	0	1	30	34	1	622	11	33	667	39	575	6	0	620	1568
% Cars & Buses																					
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## TRAFFIC ENGINEERING REPORT

State Route 236 @ Biltmore Drive  
DeKalb County  
(SR 236 MP 1.54)

### REASON FOR INVESTIGATION:

To determine the viability of adding a dedicated left turn lane on SR 236 westbound at this intersection.

### TOPOGRAPHY:

SR 236 (Lavista Road) is classified as an Urban Minor Collector. Data obtained from the Department Road Information System comprised that the ADT in 2010 was approximately 15570. This intersection is part of a coordinated system.

Biltmore Drive is classified as an Urban Local Road. Data obtained from the Department Road Information System comprised that the ADT in 2011 was approximately 2400.

### VEHICLE SPEEDS:

The posted speed limit on SR 236 is 35 MPH.

The posted speed limit on Biltmore Drive is 25 MPH.

### PEDESTRIAN MOVEMENTS:

There are heavy pedestrian movements during the AM peak hour due to a nearby day school.

### EXISTING TRAFFIC CONTROL:

This intersection is currently controlled by a stop-and-go traffic signal.

### CRASH HISTORY:

No crashes were reported at this intersection in the last 3 years of records.

### FUTURE PROJECTS:

There are no long-range or current projects in the area of focus at this present time.

### LEFT TURN PHASE ANALYSIS:

Based on the current traffic volumes, a westbound left turn phase is warranted with a cross-product of 60372.

TIME	WB LT Volume	EB Thru Volume	#Thru Lanes	LT Product Analysis	LT Product Analysis 50000 or Greater?	LT VPH 125 or Greater?	Correctable Crashes Equals or Exceeds 4 in 1 YR or 6 in 2 YR?
8:00am-9:00am	172	351	1	60372	Yes	Yes	No

**OPERATIONAL ANALYSIS:**

Below is a chart detailing the potential improvements of the proposed operational project:

AM Peak	WB SR 236		EB SR 236		NB Biltmore Drive		SB Biltmore Drive	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
App. Delay (s)	13.7	6.4	5.6	11.8	19.8	19.8	37.2	37.2
LOS	B	A	A	B	B	B	D	D
Back of Queue (ft)	1250	227	131	207	49	49	15	15
Overall Change in Delay (s)	-7.3		+6.2		0		0	
v/c ratio	0.73	0.44	0.30	0.35	0.23	0.23	0.03	0.03

**CONCLUSIONS:**

During field visits, 1250 ft. queue lengths were observed. Based on this operational analysis, it is evident that adding a westbound left turn lane would reduce the approach queues by 82% while at the same time not significantly affecting the operations of the other approaches.



**HIGHWAY SAFETY MANUAL (HSM) ANALYSIS for CONCEPT REPORTS**

This Concept Report includes an HSM predicted average crash frequency analysis for the design year ADT using the Manual’s Predictive Method. The HSM uses AADT with the Predictive Method while this analysis uses ADT since AADT is typically not available for GDOT projects. The Predictive Method analysis is based on Safety Performance Functions (SPF) for individual roadway segments and intersections that provide the crash frequency. The HSM often provides information on crash frequency distribution by collision type and severity. Crash severities include Fatality, Incapacitating Injury, Non-Incapacitating Injury, Possible Injury and Property Damage Only. Some SPFs include HSM Crash Modification Factors (CMF) that adjust the SPF crash frequency to account for difference between HSM base conditions and project specific conditions such as geometric design features. The HSM includes local calibration factors to further refine predictive average crash frequency. These local factors have not yet been developed by GDOT.

Two Predictive Method analyses of the proposed Concept design are provided below. One analysis provides the Total predicted average crash frequency which includes all crash severities. The second analysis is for Fatal & Injury severities which includes all crash severities except Property Damage Only.

**Project Roadway Segment and Intersection Types analyzed**

Roadway Segment				Intersection	
ID #	Type	Sta. Begin	Sta. End	ID #	Type
1	2-Lane Undivided Urban/Suburban Arterial	10+00.00	19+64.78	1	4 Leg Signalized-Urban/Suburban Arterial

**The intersections remaining will not be included in this analysis due to the fact there are no SPF’s available in the HSM for an Urban Two Lane roadway divided:.**

**HSM Predictive Method for Urban/Suburban Arterial Roadway Intersections – Total Crashes**

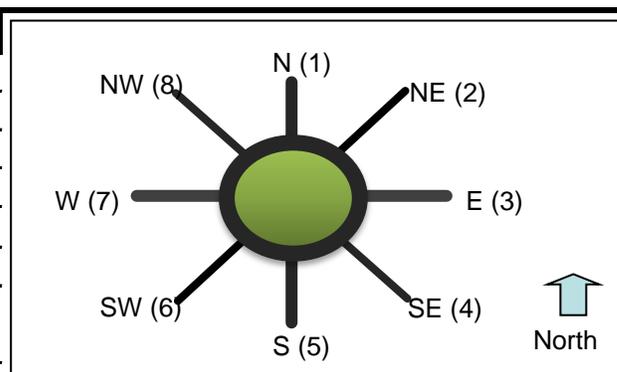
		Urban Intersection Base Crash Frequency – Excluding Vehicle and Pedestrian/Bicycle (total crashes/year)	Left Turn Lanes	Unsignalized – $CMF_{2i} = 1.00$ Signalized Permissive Left Turn	Right Turn Lanes	Unsignalized – $CMF_{4i} = 1.00$ Signalized Right Turn On Red	Lighting	Red Light Cameras	Urban Intersection Adjusted Crash frequency – Excluding Vehicle and Pedestrian/Bicycle (total crashes/year)	Vehicle-Pedestrian (total crashes/year)	Vehicle-Bike (total crashes/year)	Total Predicted Average Crash Frequency for Roadway Intersections (total crashes/year)
Intersection ID #	Analysis Condition	$N_{spf\ int}$	$CMF_{1i}$	$CMF_{2i}$	$CMF_{3i}$	$CMF_{4i}$	$CMF_{5i}$	$CMF_{6i}$	$N_{bi}$	$N_{pedi}$	$N_{bikei}$	$N_{predicted\ int}$
SR 236/Lavista Rd. @ Biltmore Rd.	Proposed	3.6980	0.81	0.94	0.96	1.00	0.91	1.00	2.461	0.268	0.037	2.767

**HSM Predictive Method for Urban/Suburban Arterial Roadway Intersections – Fatal & Injury Crashes**

		Urban Intersection Base Crash Frequency – Excluding Vehicle and Pedestrian/Bicycle (fatal & injury crashes/year)	Left Turn Lanes	Unsignalized – $CMF_{2i} = 1.00$ Signalized Permissive Left Turn	Right Turn Lanes	Unsignalized – $CMF_{4i} = 1.00$ Signalized Right Turn On Red	Lighting	Red Light Cameras	Urban Intersection Adjusted Crash frequency – Excluding Vehicle and Pedestrian/Bicycle (fatal & injury crashes/year)	Vehicle-Pedestrian (fatal & injury crashes/year)	Vehicle-Bike (fatal & injury crashes/year)	Total Predicted Average Crash Frequency for Roadway Intersections (fatal & injury crashes/year)
Intersection ID #	Analysis Condition	$N_{spf\ int}$	$CMF_{1i}$	$CMF_{2i}$	$CMF_{3i}$	$CMF_{4i}$	$CMF_{5i}$	$CMF_{6i}$	$N_{bi}$	$N_{pedi}$	$N_{bikei}$	$N_{predicted\ int}$
SR 236/Lavista Rd. @ Biltmore Rd	Proposed	1.163	0.81	0.94	0.96	1.00	0.91	1.00	.792	0.268	0.050	1.110

**General & Site Information**

Analyst: chris  
 Agency/Company: gdot  
 Date: 11/10/2011  
 Project Name or PI#: \_\_\_\_\_  
 Year, Peak Hour: \_\_\_\_\_  
 County/District: DeKalb/7  
 Intersection: SR 236 at Biltmore



**Volumes** Entry Legs (FROM)

		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
<b>Exit Legs (TO)</b>	N (1), vph			2		1		1	
	NE (2), vph								
	E (3), vph	2				42		351	
	SE (4), vph								
	S (5), vph	1		172				23	
	SW (6), vph								
	W (7), vph	3		568		9			
	NW (8), vph								
Output	Total Vehicles	6	0	742	0	52	0	375	0

**Volume Characteristics**

	N	NE	E	SE	S	SW	W	NW
% Cars	100%	100%	100%	100%	100%	100%	100%	100%
% SU/ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	0%	0%	0%	0%	0%	0%	0%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F <sub>HV</sub>	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

**Entry/Conflicting Flows**

	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	2	0	1	0	1	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	2	0	0	0	46	0	382	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	1	0	187	0	0	0	25	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	3	0	617	0	10	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	7	0	807	0	57	0	408	0
Conflicting flow, pcu/h	814	0	12	0	385	0	190	0

**Roundabout Type** Standard Single Lane or Urban Compact

Enter type here... Standard Single Lane

<b>Results: Approach Measures of Effectiveness</b>								
<b>NCHRP-572 Model</b>	<b>N</b>	<b>NE</b>	<b>E</b>	<b>SE</b>	<b>S</b>	<b>SW</b>	<b>W</b>	<b>NW</b>
Entry Capacity, pcu/h	501	NA	1117	NA	769	NA	934	NA
V/C ratio	0.01		0.72		0.07		0.44	
Control Delay, sec/pcu	7		11		5		7	
LOS	A		B		A		A	
95th % Queue (ft)	1		166		6		56	
<b>UK Model**</b>	<b>N</b>	<b>NE</b>	<b>E</b>	<b>SE</b>	<b>S</b>	<b>SW</b>	<b>W</b>	<b>NW</b>
Entry Capacity, pcu/h	769	NA	1205	NA	1002	NA	1108	NA
V/C ratio	0.01		0.67		0.06		0.37	
Control Delay, sec/pcu	5		9		4		5	
LOS	A		A		A		A	
95th % Queue (ft)	1		137		4		43	

Notes:

Unit Legend:

vph = vehicles per hour

PHF = peak hour factor

F<sub>HV</sub> = heavy vehicle factor

pcu = passenger car unit

<b>Bypass Lane Merge Point Analysis (if applicable)</b>						
<b>Bypass Characteristics</b>	<b>Bypass #1</b>	<b>Bypass #2</b>	<b>Bypass #3</b>	<b>Bypass #4</b>	<b>Bypass #5</b>	<b>Bypass #6</b>
Select Entry Leg from Bypass (FROM)	N (1)	W (7)				
Select Exit Leg for Bypass (TO)	W (7)	S (5)				
<i>Volumes</i>						
Right Turn Volume removed from Entry Leg	73	688				
<i>Volume Characteristics (for entry leg)</i>						
PHF	0.92	0.92				
F <sub>HV</sub>	1.00	1.00				
<b>NOTE: Volume Characteristics for Exit Leg are already taken into account</b>						
<i>Entry/Conflicting Flows</i>						
Entry Flow	79	748				
Conflicting Flow	630	213				
<b>Bypass Lane Results (NCHRP-572 Model)</b>						
Entry Capacity at bypass mergepoint, pcu/hr	602	913				
V/C ratio	0.13	0.82				
Control Delay, sec/pcu	6.9	19.0				
LOS	A	C				
95th % Queue (ft)	11	234				