ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0010879
Cobb County
GDOT District 7 - Metro Atlanta
SR 120 @ SR 5/SR 360

OFFICE Design Policy & Support

DATE 4/9/2013

FROM Keith Posey 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:

Bobby Hilliard, Program Control Administrator
Genetha Rice-Singleton, State Program Delivery Engineer
Glenn Bowman, State Environmental Administrator
Cindy VanDyke, State Transportation Planning 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
Ken Thompson, Statewide Location Bureau Chief
Rachel Brown, District Engineer
Scott Lee, District Preconstruction Engineer
Jonathan Walker, District Utilities Engineer
Peter Emmanuel, Project Manager
BOARD MEMBER - 11th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
PROJECT CONCEPT REPORT

Project Type:	**Traffic Operations Improvement**	**P.I. Number:**	**0010879**
GDOT District:	**District 7**	**County:**	**Cobb**
Federal Route Number:	**NA**	**State Route Number:**	**SR 5/SR 120 & SR 360**

The project is located in the City of Marietta at the intersection of SR 360/Powder Spring Street and SR 5/ SR 120/South Marietta Parkway. The intersection of SR 360/Powder Spring Street and SR 5/SR 120/ South Marietta Parkway is experiencing significant delays during both AM and PM peak hour. Also, the current capacity of the two northbound left turning lanes at SR 5/Atlanta Road and SR 120/South Marietta Parkway is not fully utilized as the majority of this traffic makes a westbound right turn at SR 360/Powder Spring Street, through a single right turn lane. The addition of an additional westbound right turn lane on SR 5/SR 120/South Marietta Parkway at SR 360/Powder Spring Street will help to alleviate the immediate need for a major intersection reconstruction.

Submitted for approval:

Local Government	2/7/13 **DATE**
Consultant Designer & Firm	02/07/2013 **DATE**
GDOT Project Manager	02/11/2013 **DATE**
State Program Delivery Engineer	2/19/2013 **DATE**

Recommendation for approval:

GLENN BOWMAN * T.J. **State Environmental Administrator**	2/27/2013 **DATE**
KATHY ZAHUL **State Traffic Engineer**	3/11/2013 **DATE**
ABDULWAHID MUNSHI * T.J. **State Utilities Engineer**	3/15/2013 **DATE**
District Engineer	**DATE**

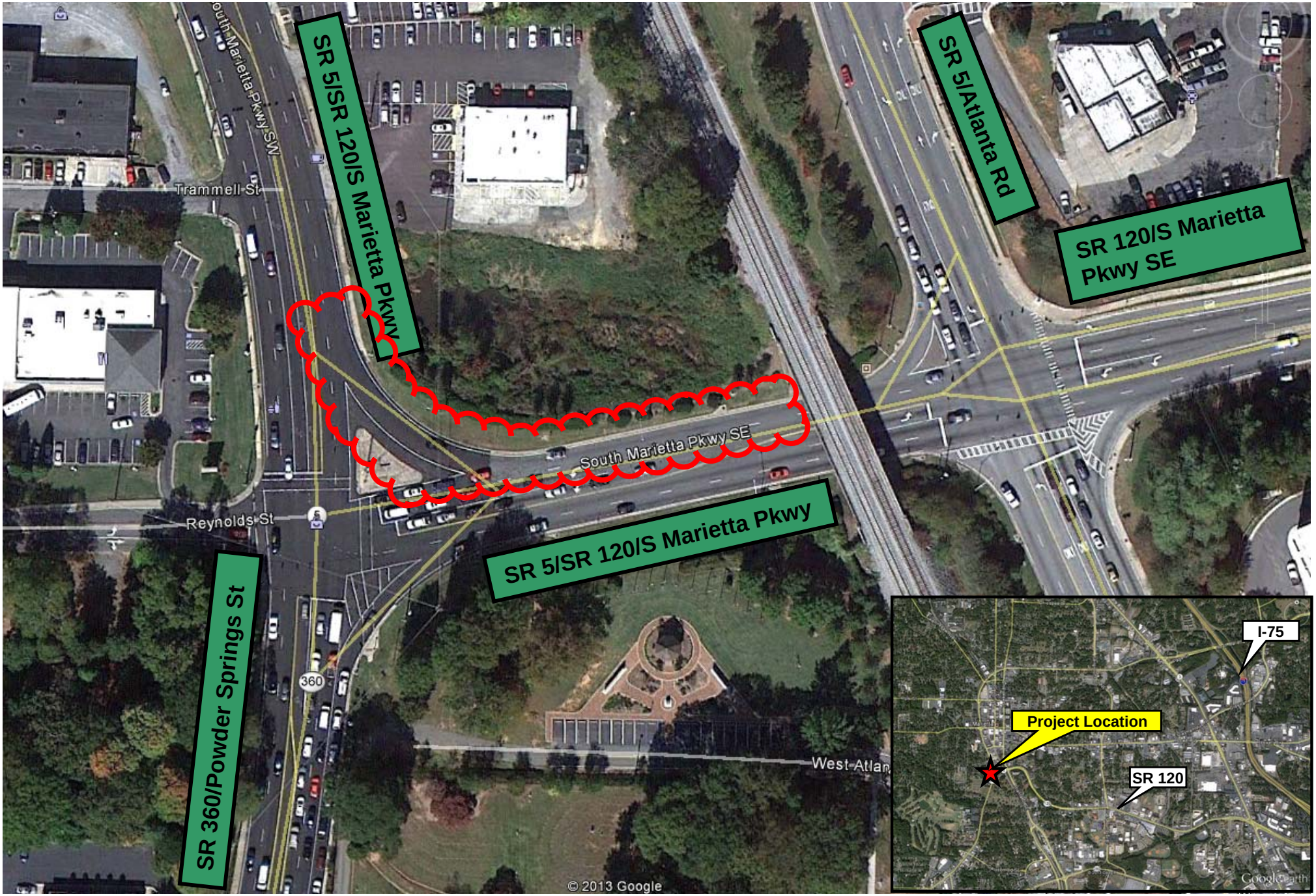
The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

Cynthia L. Vanhoe **State Transportation Planning Administrator** *(recommendation required)*	2-21-13 **DATE**

Approval:

Concur: **GDOT Director of Engineering**	4/3/2013 **DATE**
Approve **GDOT Chief Engineer**	4/5/2013 **DATE**

* RECOMMENDATION ON FILE



PROJECT LOCATION MAP

PLANNING & BACKGROUND DATA

Project Justification Statement: The intersection of SR 360/Powder Spring Street and SR 5/SR 120/ South Marietta Parkway is experiencing significant delays during both AM and PM peak hour. The addition of an additional westbound right turn lane on SR 5/SR 120/South Marietta Parkway at SR 360/Powder Spring Street will help to alleviate the immediate need for a major intersection reconstruction.

- The City of Marietta and LAI Engineering prepared the project Justification report to be approved by GDOT.

- The City of Marietta initiated the intersection improvement project at SR 360/Powder Spring Street and SR 5/SR 120/South Marietta Parkway to improve the capacity and operational efficiency at the intersection. The City also initiated the project to improve the current capacity of the two northbound left turning lanes at SR 5/Atlanta Street and SR 120/South Marietta Parkway as the majority of this traffic makes a westbound right turn at SR 360/Powder Spring Street, through a single right turn lane. Meeting Minutes for the project kickoff is attached to the document.

- The traffic study by LAI showed significant traffic accessing the northbound SR 5/SR 120/South Marietta Parkway from the adjacent intersection at SR 5/Atlanta Street and SR 120/South Marietta Parkway and vice versa. With the existing and the future projected traffic, the intersection is failing from the capacity standpoint. The study intersection has also observed crashes at the intersection. Approximately, 36 percent of the crashes at the intersection were observed to be rear-end along the westbound right turning lane during 2011.

- The City of Marietta requests an additional westbound right turn lane on SR 5/SR 120/South Marietta Parkway at SR 360/Powder Spring Street to improve the capacity and eliminate the immediate need for a major intersection reconstruction.

- The current length of the proposed project is 400 feet with the limits extending from the existing CSX right of way to the east and SR 5/SR 120/S. Marietta Parkway to the west. Location map shows the approximate limits of the project.

Description of the proposed project: The project is located in the City of Marietta at the intersection of SR 360/Powder Spring Street and SR 5/ SR 120/South Marietta Parkway. The proposed project will add an additional westbound right turn lane on SR 5/SR 120/South Marietta Parkway at SR 360/Powder Spring Street to alleviate the capacity issues at the intersection. The current length of the proposed project is 400 feet with a speed limit of 40 MPH. The existing section of the roadway has 5 lanes and is functionally classified as an Urban Principal Arterial Street. The proposed section of the roadway will provide an additional westbound right turning lane with 200 feet of deceleration and 100 of taper length.

Federal Oversight: ☒ Exempt ☐ State Funded ☐ Other

MPO: Atlanta MPO Project ID: N/A

Regional Commission: Atlanta Regional Commission RC Project ID
Congressional District(s): # 011

Projected Traffic: *ADT or AADT*

Current Year (2013): 23,920 Open Year (2014): 24,160 Design Year (2034): 29,480
Traffic Projections Performed by: LAI Engineering

Functional Classification (Mainline): Urban Principal Arterial

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

Will Context Sensitive Solutions procedure be utilized? ☒ No ☐ Yes

DESIGN AND STRUCTURAL DATA

South Marietta Parkway Mainline Design Features:

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	5	NA	6
- **Lane Width(s)**	11’	12’	11'
- **Median Width & Type**	Painted	Painted	Painted
- **Outside Shoulder or Border Area Width**	12	NA	9.5
- **Outside Shoulder Slope**	2%	NA	2%
- **Inside Shoulder Width**	NA	NA	NA
- **Sidewalks**	There are 5’ wide sidewalks on both sides of South Marietta Parkway north of Powder Spring Street. No sidewalks on South Marietta Parkway between Powder Spring Street and Atlanta Street.	-	Existing 5’ wide Sidewalk on the northbound S. Marietta Parkway will be extended to the proposed pedestrian ramp at the NE corner of the intersection.
- **Auxiliary Lanes**	NA	NA	NA
- **Bike Lanes**	NA	NA	NA
Posted Speed	40 MPH	40 MPH	40 MPH
Design Speed	55 MPH	55 MPH	55 MPH
Min Horizontal Curve Radius	N/A	5,230	N/A

Superelevation Rate	NA	NA	NA
Grade	4.36%	NA	4.36%
Access Control	NA	NA	NA
Right-of-Way Width	Variable	Variable	Variable
Maximum Grade – Crossroad	3.75	NA	3.75
Design Vehicle	WB-40	WB-40	WB-40
Additional Items as needed			

*According to current GDOT design policy if applicable

Major Interchanges/Intersections:

SR 5/SR 120/S. Marietta Pkwy & SR 360/Powder Springs Street.

Utility Involvements:

Marietta Power Minor Pole Relocation, Marietta Traffic-Red Light Running Camera Pole Relocation

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

The City of Marietta will organize a public hearing for the project with necessary advertisements. Utility Risk Management Plan will not be required as the utility relocations are minimum.

SUE Required: ☐ No ☒ Yes

Railroad Involvement:

Two CSX railroad tracks run along an overpass above S. Marietta Pkwy parallel to SR 360/Powder Spring Street and Atlanta Street. Plans will be submitted to CSX for review, but will not require any permits.

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:		N/A
Displacements anticipated:	Total:	N/A
	Businesses:	N/A
	Residences:	N/A
	Other:	N/A

Transportation Management Plan [TMP] Required: ☐ No ☒ Yes
If Yes: Project classified as: ☒ Non-Significant ☐ Significant
TMP Components Anticipated: ☒ TTC ☒ TO ☒ PI

Design Exceptions to FHWA/AASHTO controlling criteria anticipated:

FHWA/AASHTO Controlling Criteria	No	Undeter-mined	Yes	Appvl Date (if applicable)
1. Design Speed	☒	☐	☐	
2. Lane Width	☒	☐	☐	
3. Shoulder Width	☒	☐	☐	
4. Bridge Width	☒	☐	☐	
5. Horizontal Alignment	☒	☐	☐	
6. Superelevation	☒	☐	☐	
7. Vertical Alignment	☒	☐	☐	
8. Grade	☒	☐	☐	
9. Stopping Sight Distance	☒	☐	☐	
10. Cross Slope	☒	☐	☐	
11. Vertical Clearance	☒	☐	☐	
12. Lateral Offset to Obstruction	☒	☐	☐	
13. Bridge Structural Capacity	☒	☐	☐	

Design Variances to GDOT Standard Criteria anticipated:

GDOT Standard Criteria	Reviewing Office	No	Undeter--mined	Yes	Appvl Date (if applicable)
1. Access Control - *Median Opening Spacing*	DP&S	☒	☐	☐	
2. Median Usage & Width	DP&S	☒	☐	☐	
3. Intersection Skew Angle	DP&S	☒	☐	☐	
4. Lateral Offset to Obstruction	DP&S	☒	☐	☐	
5. Intersection Sight Distance	DP&S	☒	☐	☐	
6. Bike, Pedestrian & Transit Accommodations	DP&S	☒	☐	☐	
7. GDOT Drainage Manual	DP&S	☒	☐	☐	
8. Georgia Standard Drawings	DP&S	☒	☐	☐	
9. GDOT Bridge & Structural Manual	Bridge Design	☒	☐	☐	
10. Roundabout Illumination	DP&S	☒	☐	☐	
11. Rumble Strips	DP&S	☒	☐	☐	
12. Safety Edge	DP&S	☒	☐	☐	

VE Study anticipated: ☒ No ☐ Yes ☐ Completed – Date:

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

A concept design is attached to the report. CO Hotspot Analysis will be submitted along with the PCE.

Project Length: 400 feet
Open to Traffic Year: 2014
Design Year: 2034

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

Environmental Permits/Variances/Commitments/Coordination anticipated:

Permit/ Variance/ Commitment/ Coordination Anticipated	No	Yes	Remarks
1. U.S. Coast Guard Permit	☒	☐	
2. Forest Service/Corps Land	☒	☐	
3. CWA Section 404 Permit	☒	☐	
4. Tennessee Valley Authority Permit	☒	☐	
5. Buffer Variance	☒	☐	
6. Coastal Zone Management Coordination	☒	☐	
7. NPDES	☒	☐	
8. FEMA	☒	☐	
9. Cemetery Permit	☒	☐	
10. Other Permits	☒	☐	
11. Other Commitments	☒	☐	
12. Other Coordination	☒	☐	

NEPA/GEPA Comments & Information: N/A

Ecology: N/A

History: N/A

Archeology:

Confederate Cemetery is located to the South of S. Marietta Pkwy but will not be impacted with the current project.

Air & Noise: N/A

Public Involvement: A public outreach is expected for the project with citizens committee, public information meetings, etc.

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	LAI
Design	LAI
Right-of-Way Acquisition	NA
Utility Relocation	Marietta Power Minor Pole Relocation, Marietta Traffic-Red Light Running Camera Pole Relocation
Letting to Contract	Marietta
Construction Supervision	LAI
Providing Material Pits	N/A
Providing Detours	N/A
Environmental Studies, Documents, and Permits	Edwards Pitman Environmental
Environmental Mitigation	N/A
Construction Inspection & Materials Testing	LAI & Geo-Hydro Engineers

Lighting required: ☒ No ☐ Yes

Other projects in the area:

CO – 442 This project includes pedestrian mobility and safety improvements, improved vehicular movements, mast arm signals and improved access to existing transit facilities at SR 5/Atlanta Street and SR 120/S. Marietta Pkwy.

CO-AR-BP120
PI 0006873. Kennesaw Mountain to Chattahoochee River Trail - Includes Pedestrian Bridge over South Marietta Parkway East of Powder Springs Street from Tower Road at Roselane Street to West Atlanta Street at S. Cobb Drive.

Other coordination to date:

LAI is the lead designer for the intersection improvement project at the SR 5/Atlanta Street. LAI will coordinate in-house for both the projects.

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	**ROW**	**Reimbursable Utility**	**CST***	**Environmental Mitigation**	**Total Cost**
By Whom	LAI	LAI	LAI	LAI	LAI	LAI
$ Amount Alternative 1	$ 90,000	N/A	$ 15,000	$ 92,786	N/A	$ 197,786.12
$ Amount Alternative 2 (Preferred)	$ 90,000	N/A	$ 15,000	$ 107,176	N/A	**$ 212,176.66**
Date of Estimate	March 13 2013	March 13 2013	March 13 2013	March 13 2013	March 13 2013	March 13 2013

ALTERNATIVES DISCUSSION

Alternative selection:

Preferred Alternative (Alternative 2): Addition of an exclusive right turning lane with yield movement at the intersection. The existing right turning lane will be a protected right divided by an island from the yield movement right turning lane.			
Estimated Property Impacts:	**$0.00**	**Estimated Total Cost:**	**$212,176.66**
Estimated ROW Cost:	**$0.00**	**Estimated CST Time:**	**3 Months**
Rationale: The intersection of SR 360/Powder Spring Street and SR 5/SR 120/ South Marietta Parkway provided less delays and queue lengths with the preferred alternative.			

No-Build Alternative: *No-Build*			
Estimated Property Impacts:	**$0.00**	**Estimated Total Cost:**	**$0.00**
Estimated ROW Cost:	**$0.00**	**Estimated CST Time:**	**0 Months**
Rationale: The intersection of SR 360/Powder Spring Street and SR 5/SR 120/ South Marietta Parkway is experiencing significant delays during both AM and PM peak hour with no improvements.			

Alternative 1: Addition of an exclusive right turning lane with protected movement. The existing right turning lane will also be transformed into a protected right turning movement.			
Estimated Property Impacts:	**$0.00**	**Estimated Total Cost:**	**$197,786.12**
Estimated ROW Cost:	**$0.00**	**Estimated CST Time:**	**3 Months**
Rationale: The intersection of SR 360/Powder Spring Street and SR 5/SR 120/ South Marietta Parkway provided less delays and queue lengths, but the preferred alternative provided better results.			

Comments/additional information: N/A

Attachments:

1. Concept Layout
2. Typical sections
3. Cost Estimates
    a. Alternative 1 Construction Cost Estimate
    b. Alternative 2 Construction Cost Estimate
    c. Liquid AC / Fuel Price Adjustment
    d. Utility Cost Estimate
4. Crash summaries
5. Traffic diagrams or projections
6. Capacity analysis summary *(tabular format)*
7. Summary of TE Study and/or Signal Warrant Analysis
8. Pavement Evaluation
9. Meeting Minutes
10. Signed Agreements
11. Other items referred to in the body of the report.

ATTACHMENT

Concept Layout

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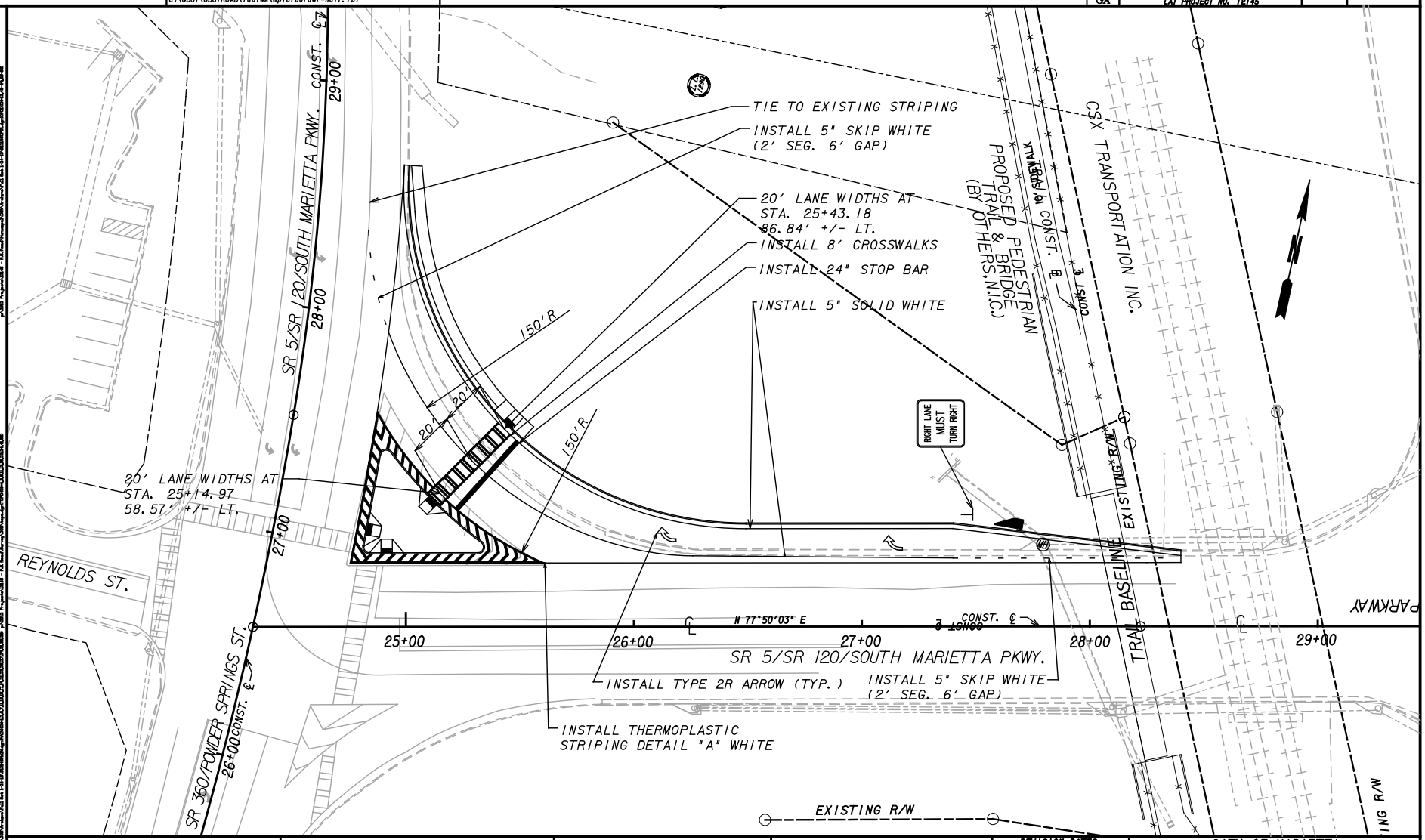
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	LAI PROJECT NO. 12145		



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS

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ALTERNATIVE I

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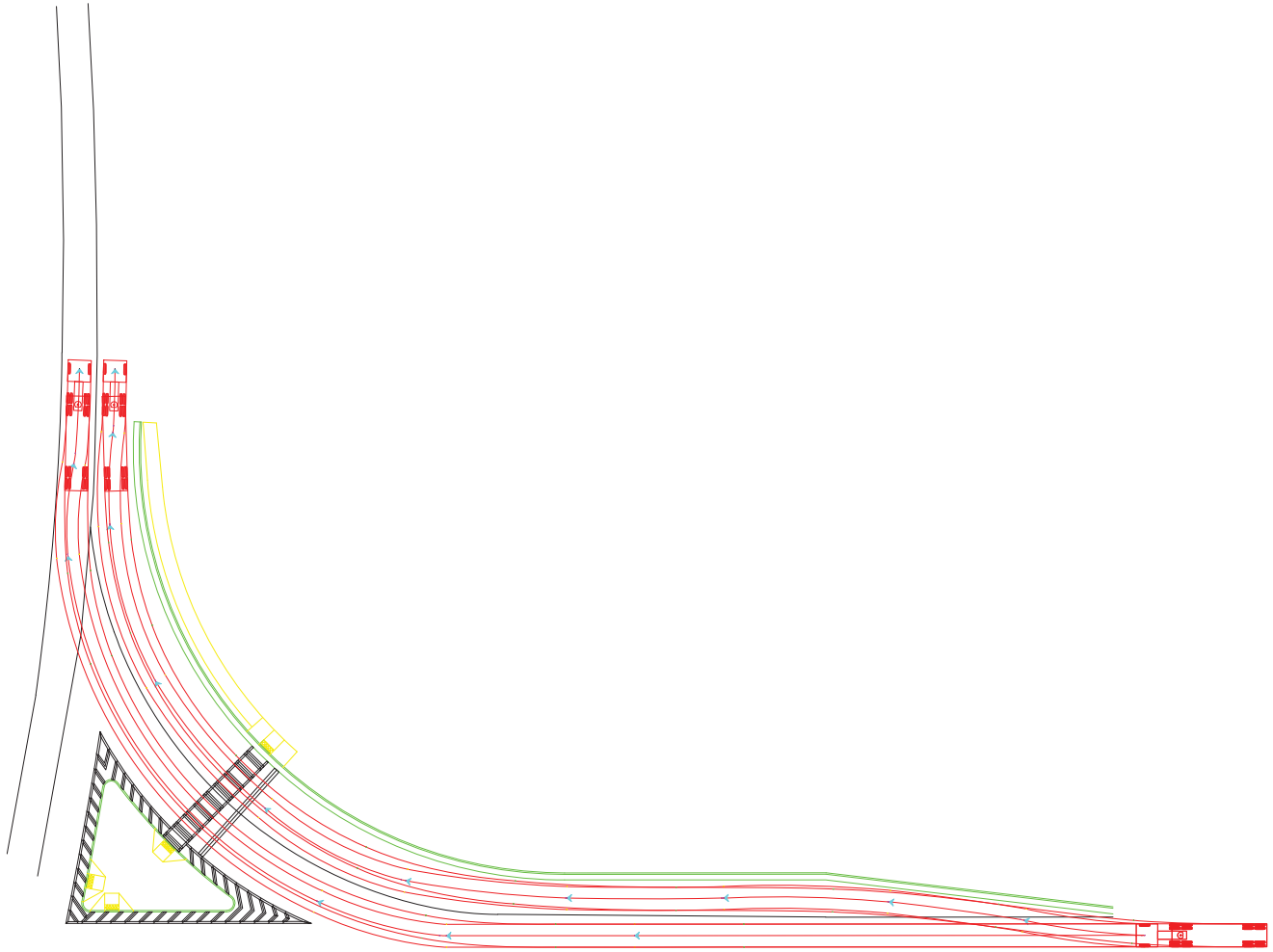
REVISION DATES

CITY OF MARIETTA
COBB COUNTY, GEORGIA
OFFICE: DEPARTMENT OF PUBLIC WORKS
SIGNING AND MARKING PLANS

S MARIETTA PKWY AT POWDER SPRINGS ST INTERSECTION IMPROVEMENTS

DRAWING No. 26-001

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	LAI PROJECT NO. 12145		



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N. T. S.

REVISION DATES

CITY OF MARIETTA
COBB COUNTY, GEORGIA

OFFICE: DEPARTMENT OF PUBLIC WORKS

ALTERNATIVE I
AUTOTURN

S MARIETTA PKWY AT POWDER SPRINGS
ST INTERSECTION IMPROVEMENTS

DRAWING No.

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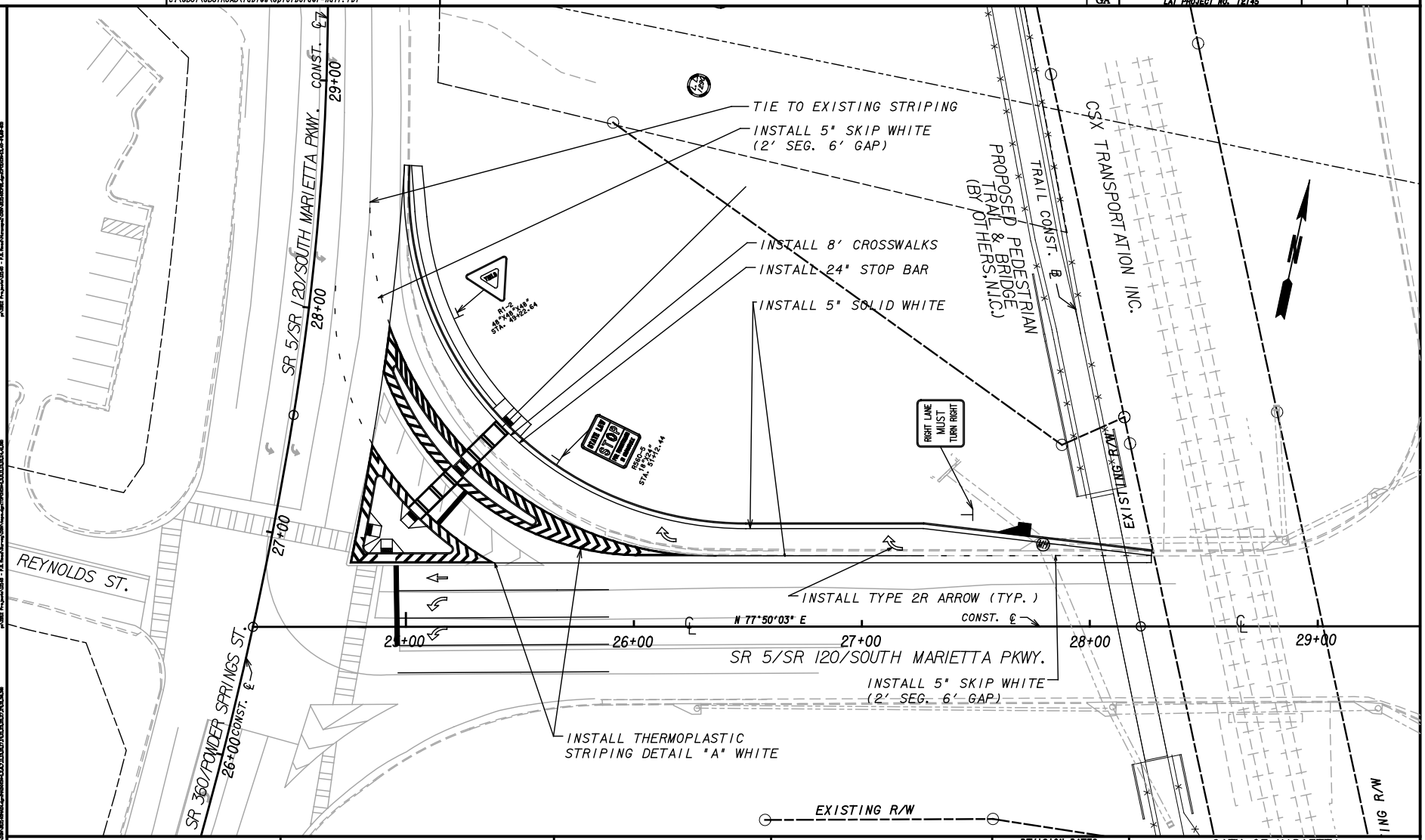
GA	LAI PROJECT NO. 12145		



PROPERTY AND EXISTING R/W LINE
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END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS

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ALTERATIVE 2

SCALE IN FEET
0 20 40 80

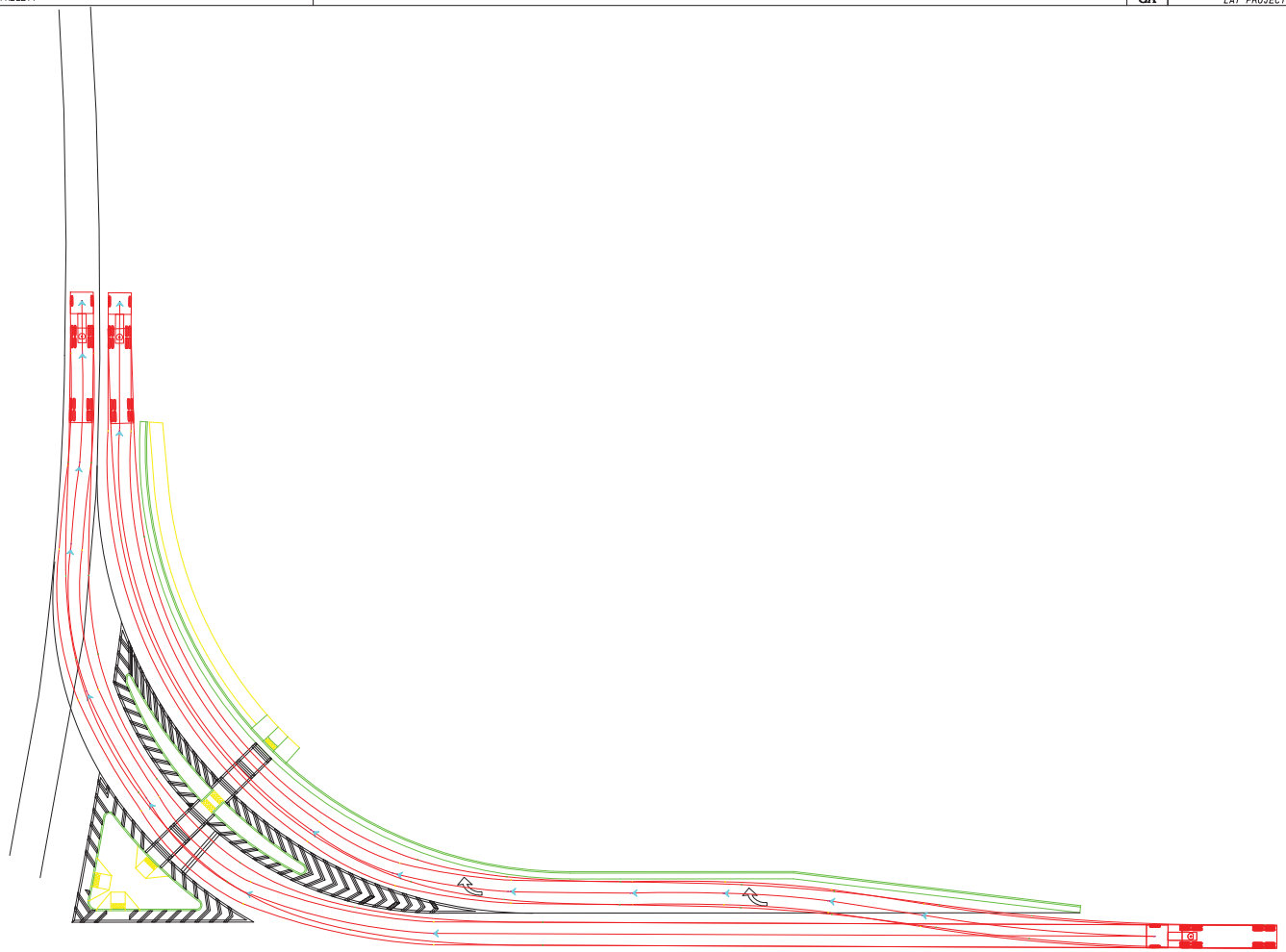
REVISION DATES

CITY OF MARIETTA
COBB COUNTY, GEORGIA
OFFICE: DEPARTMENT OF PUBLIC WORKS
SIGNING AND MARKING PLANS

S MARIETTA PKWY AT POWDER SPRINGS ST INTERSECTION IMPROVEMENTS

DRAWING No. 26-001

DATE$$$	TIME$$$	PRF	DGN	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
$USER$		$$PENTABLE$$		GA	LAI PROJECT NO. 12145		



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N. T. S.

REVISION DATES

CITY OF MARIETTA
COBB COUNTY, GEORGIA

OFFICE: DEPARTMENT OF PUBLIC WORKS

ALTERNATIVE 2
AUTOTURN

S MARIETTA PKWY AT POWDER SPRINGS
ST INTERSECTION IMPROVEMENTS

DRAWING No.

1/5/2009 GPLM

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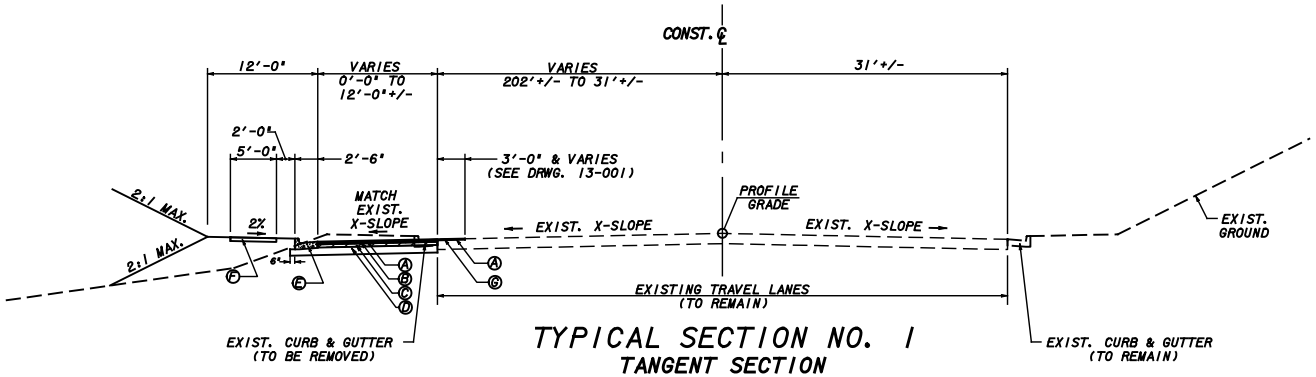
ATTACHMENT

Typical Sections



TYPICAL SECTION NO. 1

TANGENT SECTION

APPLICABLE TO SR 5/SR 120/SOUTH MARIETTA PKWY.

FROM STA. 24+75.56 TO . STA. 28+25.00

- (A) ASPH. CONC. 12.5 mm SUPERPAVE GROUP 2 ONLY, INCL. BITUM. MAT'L & H. LIME, 165LB./S.Y.
- (B) ASPH. CONC. 19 mm SUPERPAVE GROUP 2 ONLY, INCL. BITUM. MAT'L & H.LIME, 330 LB./S.Y.
- (C) ASPH. CONC. 25 mm SUPERPAVE GROUP 2 ONLY, INCL. BITUM. MAT'T. & H. LIME, 880 LB./S.Y.
- (D) 12" GRADED AGGREGATE BASE COURSE
- (E) 8" x 30" GDOT STD. 9032B, TYP. 2 CONCRETE CURB & GUTTER
- (F) 8" CONCRETE SIDEWALK
- (G) MILL 1.5"

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NO SCALE

REVISION DATES

CITY OF MARIETTA
COBB COUNTY, GEORGIA
OFFICE: DEPARTMENT OF PUBLIC WORKS

TYPICAL SECTIONS

S MARIETTA PKWY AT POWDER SPRINGS ST INTERSECTION IMPROVEMENTS

DRAWING No. 5-001

1/5/2009 GPLM

ATTACHMENT

Cost Estimates

JOB DETAIL ESTIMATE

JOB NUMBER : 12145 SPEC YEAR: 01
DESCRIPTION: S. MARIETTA PKWY @ POWDER SPRINGS ST.
ALTERNATIVE 1

ITEMS FOR JOB 12145

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - DAILY LANE CLOSURES	1.000	5000.00	5000.00
0010	163-0001		LS	EROSION CONTROL, NON-REFUNDABLE DEDUCT	1.000	2500.00	2500.00
0015	210-0100		LS	GRADING COMPLETE - GENERAL SITE WORK	1.000	60000.00	60000.00
0020	310-1101		TN	GR AGGR BASE CRS, INCL MATL	288.000	22.03	6346.25
0025	402-3113		TN	RECYL AC 12.5MM SP,GP1/2,BM&HL	83.000	94.82	7870.12
0030	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	65.000	86.98	5653.71
0035	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	173.000	74.35	12863.20
0040	413-1000		GL	BITUM TACK COAT	130.000	3.52	457.86
0045	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	421.000	18.42	7755.14
0050	441-5007		LF	CONC HEADER CURB, 8 IN, TP 7	165.000	15.00	2475.00
0055	441-0104		SY	CONC SIDEWALK, 4 IN	139.000	36.96	5138.61
0060	441-0106		SY	CONC SIDEWALK, 6 IN	71.000	52.29	3712.71
0065	500-9999		CY	CL B CONC,BASE OR PVMT WIDEN	14.000	184.66	2585.31
0070	432-0206		SY	MILL ASPH CONC PVMT/ 1.50" DEP	542.000	7.20	3904.86
0075	611-4003		EA	RECONSTR MISC DRAINAGE STR	1.000	1402.99	1403.00
0080	668-1100		EA	CATCH BASIN, GP 1	1.000	2723.73	2723.74
0085	653-1501		LF	THERMO SOLID TRAF ST 5 IN, WHI	690.000	0.55	383.85
0090	653-3501		GLF	THERMO SKIP TRAF ST, 5 IN, WHI	146.000	0.34	50.98
0095	655-5000		EA	PVMT ARROW THERM W/R REFLECTOR	2.000	305.84	611.68
0100	653-1704		LF	THERM SOLID TRAF STRIPE,24",WH	40.000	3.70	148.17
0105	653-1504		LF	THERM SOLID TRAF STRIPE,12",WH	266.000	1.78	474.53
0110	653-1804		LF	THERM SOLID TRAF STRIPE, 8",WH	487.000	1.95	953.43
0115	647-1000		LS	TRAF SIGNAL INSTALLATION NO - 1	1.000	50000.00	50000.00
0120	900-0039		SF	BRICK PAVERS	119.000	12.04	1433.43
0125	900-0039		SF	BRICK PAVERS - TRUNCATED DOMES (DETECTABLE WARNING)	40.000	12.04	481.83
0130	163-0550		EA	CONS & REM INLET SEDIMENT TRAP	1.000	172.39	172.40
0135	171-0030		LF	TEMPORARY SILT FENCE, TYPE C	1000.000	3.07	3071.96
0140	163-0232		AC	TEMPORARY GRASSING	0.500	389.92	194.96

ITEM TOTAL	188367.73
INFLATED ITEM TOTAL	188367.73
TOTALS FOR JOB 12145	
ESTIMATED COST:	188367.73
CONTINGENCY PERCENT (5.0):	9418.39
ESTIMATED TOTAL:	197786.12

STATE HIGHWAY AGENCY

DATE : 03/13/2013
PAGE : 1

JOB DETAIL ESTIMATE

JOB NUMBER : 12145 SPEC YEAR: 01
DESCRIPTION: S. MARIETTA PKWY @ POWDER SPRINGS ST.
ALTERNATIVE 2

ITEMS FOR JOB 12145

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - DAILY LANE CLOSURES	1.000	5000.00	5000.00
0010	163-0001		LS	EROSION CONTROL, NON-REFUNDABLE DEDUCT	1.000	2500.00	2500.00
0015	210-0100		LS	GRADING COMPLETE - GENERAL SITE WORK	1.000	65000.00	65000.00
0020	310-1101		TN	GR AGGR BASE CRS, INCL MATL	347.000	21.73	7541.48
0025	402-3113		TN	RECYL AC 12.5MM SP,GP1/2,BM&HL	86.000	94.55	8131.37
0030	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	65.000	86.98	5653.71
0035	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	173.000	74.35	12863.20
0040	413-1000		GL	BITUM TACK COAT	133.000	3.51	467.39
0045	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	421.000	18.42	7755.14
0050	441-5007		LF	CONC HEADER CURB, 8 IN, TP 7	319.000	15.00	4785.00
0055	441-0104		SY	CONC SIDEWALK, 4 IN	115.000	37.67	4332.82
0060	441-0106		SY	CONC SIDEWALK, 6 IN	71.000	52.29	3712.71
0065	500-9999		CY	CL B CONC,BASE OR PVMT WIDEN	41.500	173.15	7186.11
0070	432-0206		SY	MILL ASPH CONC PVMT/ 1.50" DEP	608.000	6.91	4206.25
0075	611-4003		EA	RECONSTR MISC DRAINAGE STR	1.000	1402.99	1403.00
0080	668-1100		EA	CATCH BASIN, GP 1	1.000	2723.73	2723.74
0085	653-1501		LF	THERMO SOLID TRAF ST 5 IN, WHI	488.000	0.58	287.85
0090	653-3501		GLF	THERMO SKIP TRAF ST, 5 IN, WHI	217.000	0.33	71.82
0095	655-5000		EA	PVMT ARROW THERM W/R REFLECTOR	2.000	305.84	611.68
0100	653-1704		LF	THERM SOLID TRAF STRIPE,24",WH	18.000	3.93	70.81
0105	653-1504		LF	THERM SOLID TRAF STRIPE,12",WH	584.000	1.78	1041.82
0110	653-1804		LF	THERM SOLID TRAF STRIPE, 8",WH	740.000	1.91	1420.72
0115	647-1000		LS	TRAF SIGNAL INSTALLATION NO - 1	1.000	50000.00	50000.00
0120	900-0039		SF	BRICK PAVERS	95.000	12.04	1144.33
0125	900-0039		SF	BRICK PAVERS - TRUNCATED DOMES (DETECTABLE WARNING)	60.000	12.04	722.74
0130	163-0550		EA	CONS & REM INLET SEDIMENT TRAP	1.000	172.39	172.40
0135	171-0030		LF	TEMPORARY SILT FENCE, TYPE C	1000.000	3.07	3071.96
0140	163-0232		AC	TEMPORARY GRASSING	0.500	389.92	194.96

ITEM TOTAL 202073.00
INFLATED ITEM TOTAL 202073.01

TOTALS FOR JOB 12145

ESTIMATED COST: 202073.01
CONTINGENCY PERCENT (5.0): 10103.65
ESTIMATED TOTAL: 212176.66

Date 3/14/2013

P.I. Number **10879** County **Cobb**

Project Number

Special Provision, Section 109-Measurement and Payment

FUEL PRICE ADJUSTMENT *(ENGLISH 125% MAX)*

ENTER FPL DIESEL	4.092
ENTER FPM DIESEL	9.207

ENTER FPL UNLEADED	3.683
ENTER FPM UNLEADED	8.28675

http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

INCREASE ADJUSTMENT
125.00%

INCREASE ADJUSTMENT
125.00%

ROADWAY ITEMS	QUANTITY	DIESEL FACTOR	GALLONS DIESEL	UNLEADED FACTOR	GALLONS UNLEADED	REMARKS
Excavations paid as specified by Sections 205 **(CUBIC YARD)**		0.29		0.15		
Excavations paid as specified by Sections 206 **(CUBIC YARD)**		0.29		0.15		
GAB paid as specified by the ton under Section 310 **(TON)**		0.29		0.24		
Hot Mix Asphalt paid as specified by the ton under Sections 400 **(TON)**		2.90		0.71		
Hot Mix Asphalt paid as specified by the ton under Sections 402 **(TON)**	321.000	2.90	930.90	0.71	227.91	
PCC Pavement paid as specified by the square yard under Section 430 **(SY)**		0.25		0.20		

BRIDGE ITEMS	Quantity	Unit Price	QF/1000	Diesel Factor	Gallons Diesel	Unleaded Factor	Gallons Unleaded	REMARKS
Bridge Excavation (CY) Section 211				8.00		1.50		
Class __Concrete (CY) Section 500				8.00		1.50		
Class __Concrete (CY) Section 500				8.00		1.50		
Class __Concrete (CY) Section 500				8.00		1.50		
Superstru Con Class__(CY) Section 500				8.00		1.50		
Superstru Con Class__(CY) Section 500				8.00		1.50		
Superstru Con Class__(CY) Section 500				8.00		1.50		
Concrete Handrail (LF) Section 500				8.00		1.50		
Concrete Barrier (LF) Section 500				8.00		1.50		

BRIDGE ITEMS	Quantity	Unit Price	QF/1000	Diesel Factor	Gallons Diesel	Unleaded Factor	Gallons Unleaded	REMARKS

Stru Steel Plan Quantity (LB) Section 501				8.00		1.50		
Stru Steel Plan Quantity (LB) Section 501				8.00		1.50		
PSC Beams_____ (LF) Section 507				8.00		1.50		
PSC Beams_____ (LF) Section 507				8.00		1.50		
PSC Beams_____ (LF) Section 507				8.00		1.50		
Stru Reinf Plan Quantity(LB) Section 511				8.00		1.50		
Stru Reinf Plan Quantity(LB) Section 511				8.00		1.50		
Bar Reinf Steel (LB) Section 511				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Piling___inch (LF) Section 520				8.00		1.50		
Drilled Caisson,___ (LF) Section 524				8.00		1.50		
Drilled Caisson,___ (LF) Section 524				8.00		1.50		
Drilled Caisson,___ (LF) Section 524				8.00		1.50		
Pile Encasement,___(LF) Section 547				8.00		1.50		
Pile Encasement,___(LF) Section 547				8.00		1.50		

SUM QF DIESEL=	**930.90**	**SUM QF UNLEADED=**	**227.91**

DIESEL PRICE ADJUSTMENT($)	**$4,380.63**
UNLEADED PRICE ADJUSTMENT($)	**$965.30**

ASPHALT CEMENT PRICE ADJUSTMENT
(BITUMINOUS TACK COAT 125% MAX)

APPLICABLE TO CONTRACTS/PROJECTS CONTAINING THE 413 SPECIFICATION, SECTION 413.5.01 ADJUSTMENTS
ASPHALT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT

http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

ENTER APL 567 **ENTER APM** 1275.75

125.00%	INCREASE ADJUSTMENT

L.I.N.	TYPE	TACK (GALLONS)	TACK (TONS)	REMARKS
		130	0.5584	

TMT = 0.5584

PRICE ADJUSTMENT($)	$379.91

400 / 402 ASPHALT CEMENT PRICE ADJUSTMENT 125% MAX

ENTER APL 567 **ENTER APM** 1275.75

http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

125.00%	INCREASE ADJUSTMENT

L.I.N. / Spec Number	MIX TYPE	HMA	JMF AC%	AC	REMARKS
402-3113	12.5 mm SP	85	5.00	4.25	
402-3190	19 mm SP	65	5.00	3.25	
402-1101	25 mm SP	173	5.00	8.65	
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			5.00		
			TMT =	16.15	

PRICE ADJUSTMENT($)	$10,988.46

ASPHALT CEMENT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT(Surface Treatment 125% MAX)

APPLICABLE TO CONTRACTS CONTAINING THE 413 SPEC. SECTION 413.5.01 ADJUSTMENTS ASPHALT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT

http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

ENTER APL 567

ENTER APM 1275.75

125.00%	INCREASE ADJUSTMENT

Use this side for Asphalt Emulsion Only

L.I.N.	TYPE	ASPHALT EMULSION (GALLONS)
413-1000	CRS-2h	130

TMT = 0.3629

REMARKS:

Use this side for Asphalt Cement Only

L.I.N.	TYPE	TACK (GALLONS)

TMT =

REMARKS:

MONTHLY PRICE ADJUSTMENT($)	$246.94

ADJUSTMENT SUMMARY

FUEL PRICE ADJUSTMENT *(ENGLISH 125% MAX)*

DIESEL PRICE ADJUSTMENT($)	$4,380.63
UNLEADED PRICE ADJUSTMENT($)	$965.30
ASPHALT CEMENT PRICE ADJUSTMENT (BITUMINOUS TACK COAT 125% MAX)	$379.91
400 / 402 ASPHALT CEMENT PRICE ADJUSTMENT 125% MAX	$10,988.46
ASPHALT CEMENT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT(Surface Treatment 125% MAX)	$246.94

REMARKS:

TOTAL ADJUSTMENTS	$16,961.24

DWM 10/08

Utility Cost Estimate

Project: PI No. 0010879 Cobb **Date:** 03/13/2013

Project Description: South Marietta Parkway at Powder Springs Street Intersection Improvements

Utility Owner/ Facility Description	**Cost**
1.) Marietta Power No actions are required.	$ 0.00
2.) AT&T Corp. No actions are required.	$0.00
3.) Atlanta Gas Light Company No actions are required.	$ 0.00
4.) Comcast Cable No actions are required.	$0.00
5.) Zayo Fiber Solutions No actions are required.	$ 0.00
6.) Marietta Water Raise water valves to grade	$ 2500.00
7.) Marietta Traffic Relocate existing Redlight Running Camera behind proposed curb.	$4000.00
Total:	**$6500.00**

- **Estimate based on preliminary plan information**
- **Utility investigation was performed at Quality Level D**

Prepared By: Dustin O'Quinn, P.E.
Project Manager
LAI Engineering

ATTACHMENT

Traffic Report

LAI ENGINEERING

Building Relationships Through Performance

SR 360/POWDER SPRINGS STREET AND SR 5/SR 120/SOUTH MARIETTA PARKWAY INTERSECTION IMPROVEMENTS STUDY
Marietta, GA

Civil, Survey & Transportation

1800 Parkway Place, Suite 720
Marietta, GA 30067
770-423-0807

www.LAIEngineering.com

LAI ENGINEERING

SR 360/POWDER SPRINGS STREET AND SR 5/SR 120/SOUTH MARIETTA PARKWAY INTERSECTION IMPROVEMENTS STUDY

City of Marietta, Georgia

Prepared for:

City of Marietta

Prepared by:

LAI ENGINEERING

February 04, 2013

Location:

The project is located in the City of Marietta at the intersection of SR 360/Powder Spring Street and SR 5/SR 120/South Marietta Parkway.

Reason for Investigation:

The intersection of SR 360/Powder Spring Street and SR 5/SR 120/South Marietta Parkway is experiencing significant delays during AM and PM peak hours. Significant traffic was observed to access northbound SR 5/SR 120/South Marietta Parkway from the adjacent intersection at SR 5/Atlanta Road and SR 120/South Marietta Parkway. Similarly, significant eastbound SR 5/SR 120/South Marietta Parkway traffic was observed from southbound SR 5/SR 120/South Marietta Parkway. Approximately, 649 vehicles make the westbound right turn at the study intersection through a single right turn lane along SR 5/SR 120/South Marietta Parkway during a typical PM peak hour. Similarly, 783 vehicles make the southbound left turn at the intersection through dual left turn lanes along SR 5/SR 120/South Marietta Parkway during a typical AM peak hour.

The study intersection also has a number of documented crashes. Approximately, 36 percent of the crashes at the intersection observed were rear-ending along the westbound right turning lane in 2011.

With the existing and the future projected traffic, the intersection is failing from the capacity standpoint. It is believed that adding an additional westbound right turn lane on SR 5/SR 120/South Marietta Parkway at SR 360/Powder Spring Street will help to alleviate the immediate need for a major intersection reconstruction. Also, the current capacity of the two northbound left turning lanes at SR 5/Atlanta Road and SR 120/South Marietta Parkway is not fully utilized as the majority of this traffic makes a westbound right turn at SR 360/Powder Spring Street, through a single right turn lane.

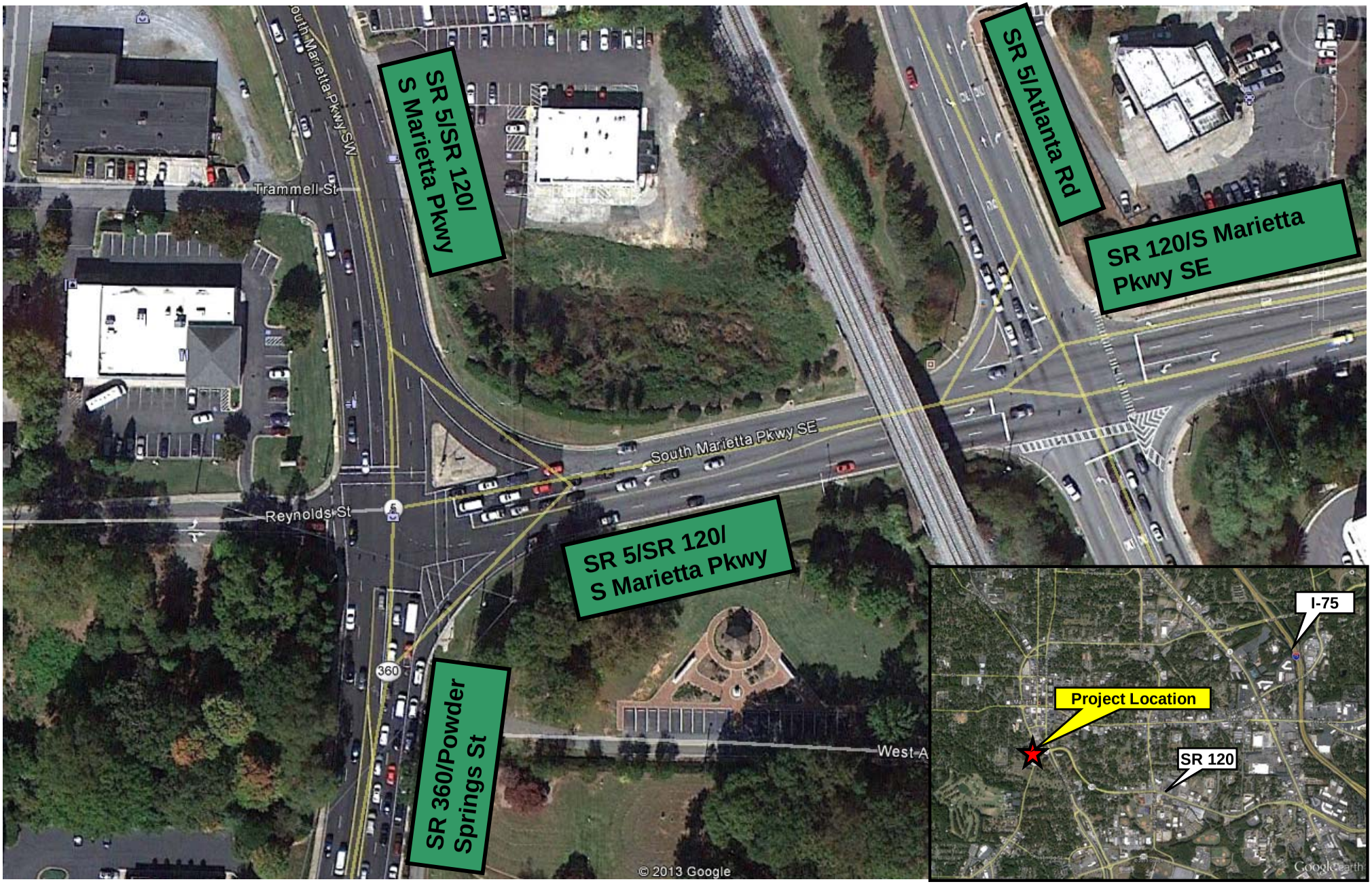
Different alternatives, including a No-Build Alternative have been studied and the results of the capacity analysis for the study intersection are presented in *Capacity Analysis* section.

Description of the Intersection:

SR 360/Powder Spring Street*:* SR 360/Powder Spring Street is a four-lane roadway with exclusive left turning lanes. According to GDOT Highway System Status Maps, SR 360/Powder Spring Street is functionally classified as an Urban Minor Arterial Street and runs south of SR 5/SR 120/South Marietta Parkway. SR 360/Powder Spring Street travels north-south with an average daily traffic of 40,650 vehicles per day. There are two pairs of CSX railroad tracks that run parallel to SR 360/Powder Springs Street. The railroad runs on an overpass over SR 5/SR 120/South Marietta Parkway to the east of the study intersection. The land uses along this route consists of commercial, restaurants, single-family and multi-family residential dwellings.

SR 5/SR 120/South Marietta Parkway*:* SR 5/SR 120/South Marietta Parkway is a four-lane roadway with exclusive left turning and right turning lanes. According to GDOT Highway System Status Maps, SR 5/SR 120/South Marietta Parkway is functionally classified as an Urban Principal Arterial Street. SR 5/SR 120/South Marietta Parkway travels east-west to the east of the study intersection, and north-south to the north of the study intersection. The average daily traffic along this section of the roadway is 23,920 vehicles per day and the land uses along this route consists of commercial, restaurants, single-family and multi-family residential dwellings.

Figure 1 shows the location map of the study intersection.



LAI ENGINEERING

FIGURE 1: LOCATION MAP

Traffic volumes in vehicles per day (vpd):

Twenty-four hour traffic counts and peak hour turning movement counts for the study intersection were collected on a Wednesday December 05th, 2012. Turning Movement Counts were collected during AM peak hour between 7:00 AM-9:00 AM and PM peak hour between 4:00 PM and 6:00 PM. Twenty-four hour intersection approach counts were collected on SR 360/Powder Spring Street and SR 5/SR 120/South Marietta Parkway during the same day. The AM and PM peak hour turning movement counts and 24-hour approach counts are included in Appendix B.

Existing Traffic Control:

The intersection of SR 360/ Powder Spring Street and SR 5/SR 120/South Marietta Parkway is currently operating as a signal control intersection. The existing signal installation is span-wire mounted with LED signal heads. The signal is a 6-phase fully actuated coordinated operation with pedestrian phases serving 2, 6 and 8 phases of the intersection. The westbound and southbound left-turns at the intersection are protected only while all other left-turns at the intersection are permissive. The signal operates in coordination along SR 360/ Powder Spring Street.

Vehicular Speeds:

The posted speed limit on SR 360/Powder Spring Street at the study intersection is 40 miles per hour.

The posted speed limit on SR 5/SR 120/South Marietta Parkway within the project limits is 40 miles per hour along the east-west and northbound section of the roadway. The speed limit for the southbound section of SR 5/SR 120/South Marietta Parkway is 35 Miles per hour.

Pedestrian Movement:

Sidewalks are located along both sides of SR 5/SR 120/South Marietta Parkway to the north of SR 360/Powder Springs Street. Sidewalks are also located along southbound SR 360/Powder Springs Street to the south of SR 5/SR 120/South Marietta Parkway.

Currently, there are no sidewalks along SR 5/SR 120/South Marietta Parkway between SR 360/Powder Spring Street and SR 5/Atlanta Road. The sidewalks along SR 5/SR 120/South Marietta Parkway to the north of SR 360/Powder Spring Street are 4 feet wide, while the sidewalks along SR 360/Powder Spring Street to the south of SR 5/SR 120/South Marietta Parkway is 5 feet wide.

A new sidewalk connecting the existing sidewalk will be added with ADA ramps at the north-east corner of the intersection.

Other Modes of Transportation:

Currently, Cobb Community Transit (CCT) System provides local service from Monday to Saturday along SR 360/Powder Spring Street and SR 5/SR 120/South Marietta Parkway. CCT “Route 15” runs from the Marietta Transfer Center located on South Marietta Parkway to Wildwood Parkway and vice versa.

CCT schedule for “Route 15” is included in Appendix C.

Parking:

No on-street parking is permitted along SR 360/Powder Springs Street and SR 5/SR 120/South Marietta Parkway.

Accident History:

LAI collected five (5) years of crash data that occurred at this intersection from 2007 to 2011. Table 1 summarizes the accident types at the study intersection. Accident details are included in Appendix D.

Table 1: Crash Summary for the Intersection of SR 360/Powder Springs Street and SR 5/SR 120/South Marietta Parkway

	Year					
Accident Type	**2007**	**2008**	**2009**	**2010**	**2011**	**Total**
Rear End	58	43	18	37	52	**208**
Angle	2	6	1	8	8	**25**
Side Swipe	3	3	2	4	4	**16**
Head On	0	1	0	1	0	**2**
Fixed Object	0	0	1	0	0	**1**
Total	**63**	**53**	**22**	**50**	**64**	**252**

Accident data obtained from Georgia Department of Transportation Office of Traffic and Safety

Adjacent Signalized Intersections:

There is an existing signal at the intersection of SR 5/Atlanta Road and SR 5/SR 120/South Marietta Parkway and is located approximately 560 feet east of SR 360/Powder Spring Street. The next existing signal is located approximately 1,440 feet north of SR 5/SR 120/South Marietta Parkway at the intersection of SR 5/SR 120/South Marietta Parkway and Waverly Way.

Capacity Analysis:

LAI utilized 2012 traffic counts for the purpose of this study. The traffic counts at the intersection were collected on December 05th 2012. Both AM and PM peak hour turning movement counts and 24-Hr approach counts were collected at the study intersection. Capacity analysis for three different alternatives including a No-Build alternative was studied and the results of the analysis along with the description of each alternative are presented in the following section:

<u>No-Build Alternative</u>

The no-build alternative does not provide any traffic operational improvements at the study intersection.

<u>Alternative 1</u>

Alternative 1 includes addition of an exclusive westbound right turning lane controlled by a traffic signal. The existing yield controlled westbound right turning lane along with the proposed lane will be controlled by a traffic signal and operated on a protected movement under Phase 8 (Westbound Through) and Phase 5 (Southbound Left).

With the existing controller phasing, the eastbound through/left (Phase 4) and westbound through (Phase 8) movements operate together and can create conflict with the proposed westbound right turns that operate with protected Phase 8. To avoid this traffic conflict, the existing eastbound left turns should be converted to Protected only to operate under a new Phase 7.

Also, the existing northbound left turns operating as a "permitted" movement will be converted to "protected only" movement with a new Phase 1. With the two new phases, the signal will operate on an 8-phase fully actuated coordinated operation with coordination along SR 120/S. Marietta Parkway.

Alternative 2 (Preferred Alternative)

Alternative 2 also includes addition of an exclusive westbound right turning lane, but the additional lane will be controlled by a yield sign at the intersection. The existing yield controlled westbound right turning lane will be controlled by a traffic signal and operated on a protected movement with Phase 8 (Westbound Through) and Phase 5 (Southbound Left).

With the existing controller phasing, the eastbound through/left (Phase 4) and westbound through (Phase 8) movements operate together and can create conflict with the proposed westbound right turns that operate with protected Phase 8. To avoid this traffic conflict, the existing eastbound left turns should be converted to Protected Only to operate under a new Phase 7.

Also, the existing northbound left turns operating as a "permitted" movement will be converted to "protected only" movement with a new Phase 1. With the two new phases, the signal will operate on an 8-phase fully actuated coordinated operation with coordination along SR 120/S. Marietta Parkway.

LAI utilized Synchro 7.0 to conduct the capacity analysis for Existing (2013), Opening Year (2014), and Design Year (2034) for No-Build, Alternative 1 and Alternative 2 (Preferred Alternative) conditions at the study intersection. Future traffic projections were estimated based on one percent (1 %) growth rate per year from the existing year. Table 2 summarizes the Level of Service (LOS) and average control delay for existing, opening year and design year traffic conditions. Table 3 summarizes the queue lengths for the eastbound and westbound traffic along the study intersection.

Table 2: LOS & Delay for Existing, Opening & Design Year Projected Conditions

Time Period	2013 (Existing)	No-Build 2014	Alternative 1 2014	Alternative 2 2014	No-Build 2034	Alternative 1 2034	Alternative 2 2034
AM Peak Hour	E (62.0)	E (56.7)	E (60.7)	E (60.1)	F (103.5)	F (109.6)	F (109.1)
PM Peak Hour	E (79.8)	E (67.3)	D (39.7)	D (38.6)	F (119.3)	E (66.6)	E (63.4)

LOS (Delay in Seconds)

Table 3: Queue Lengths for Existing, Opening & Design Year Projected Conditions

Time Period	2013 (Existing)		No-Build 2014		Alternative 1 2014		Alternative 2 2014		No-Build 2034		Alternative 1 2034		Alternative 2 2034	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
AM Peak Hour	327	282	363	219	316	254	316	254	473	320	428	277	428	277
PM Peak Hour	158	1572	125	1321	141	696	141	417	166	1463	205	667	174	667

Queue Length in Feet

With the existing lane configuration (No-Build), traffic at SR 360/Powder Spring Street and SR 5/SR 120/South Marietta Parkway operate at LOS E with the average queue length of 723 feet and delay of 67.3 seconds during a typical PM peak hour in 2014.

For Alternative 1 condition, the intersection operates at an LOS D with the average queue length of 418 feet and delay of 39.7 seconds during a typical PM peak hour in opening year (2014). For Alternative 2 condition, the intersection operates at an LOS D with the average queue length of 279 feet and delay of 38.6 seconds during a typical PM peak hour in opening year (2014).

With the addition of exclusive westbound right turn lane operated under yield condition (Alternative 2), the average controlled delays during PM peak hour in design year (2034) are reduced by 46.9 percent compared to No-Build condition. Similarly, with Alternative 2 condition, the average controlled delays during PM peak hour in opening year (2014) are reduced by 42.6 percent compared to No-Build condition.

Based on the results from the Capacity Analysis as shown in Table 2 and Table 3, Alternative 2 provided better results compared to No-Build and Alternative 1 conditions.

Also, based on the GDOT Design Policy Manual, the minimum right turn deceleration length required for the roadway with the posted speed limit of 40 MPH is 150 feet with a taper length of 50 feet. But based on the current and future traffic conditions at the intersection, the GDOT Construction Detail M-3A will be adopted for designing the additional right turn lane at the intersection. The GDOT Construction Detail M-3A requires a minimum storage length of 200 feet and a taper length of 100 feet along SR 5/SR 120/South Marietta Parkway.

Detailed Synchro analysis is included in Appendix E.

Recommendations:

The City of Marietta can improve the overall intersection operations, efficiency and safety by implementing the following:

- An additional exclusive right turn lane along westbound SR 5/SR 120/South Marietta Parkway with **Alternative 2** conditions and a minimum storage length of 200 feet and a taper length of 100 feet.
- Installation of sidewalk with ADA ramps at the north east corner of the intersection,
- Optimize signal timing at the intersection.
- Improving pedestrian mobility.

RECOMMENDED BY: _____ Date: _____
LAI Engineering

RECOMMENDED BY: _____ Date: _____
City Traffic Engineer

RECOMMENDED BY: _____ Date: _____
District Traffic Engineer

RECOMMENDED BY: _____ Date: _____
State Traffic Operations Engineer

RECOMMENDED BY: _____ Date: _____
Director of Operations

Appendix

Appendix: A Existing Intersection

Appendix: B Traffic Counts

Appendix: C CCT Bus Schedules

Appendix: D Crash Data

Appendix: E Capacity Analysis

APPENDIX A

Existing Intersection

N
S. Marietta Pkwy
(35 mph)
1
flare
Reynolds
St.
(25 mph)
S. Marietta
Pkwy
(40 mph)
Powder Springs St.
(40 mph)

APPENDIX B

Traffic Counts

Reliable Traffic Data Services, LLC
Tel: (770) 578-8158 | Fax: (770) 578-8159
info@reliabletraffic..org | www.reliabletraffic.org

TMC Data
S Marietta Pkwy @ Powder Springs St/
Reynolds St
7-9am | 4-6pm

File Name : 33080001
Site Code : 33080001
Start Date : 12/5/2012
Page No : 1

Groups Printed- Cars & Buses - Trucks - Bikes

	Powder Springs St Northbound					S Marietta Pkwy Southbound					Reynolds St Eastbound					S Marietta Pkwy Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	319	167	0	489	177	211	0	0	388	7	42	2	0	51	24	3	56	0	83	1011
07:15 AM	2	338	194	0	534	215	219	8	0	442	11	40	3	1	55	44	4	46	0	94	1125
07:30 AM	1	356	198	0	555	198	196	5	0	399	9	44	3	1	57	54	4	46	0	104	1115
07:45 AM	3	386	212	0	601	174	234	6	0	414	11	38	1	0	50	46	9	67	0	122	1187
Total	9	1399	771	0	2179	764	860	19	0	1643	38	164	9	2	213	168	20	215	0	403	4438
08:00 AM	3	352	189	0	544	214	213	4	0	431	5	45	2	0	52	51	5	57	0	113	1140
08:15 AM	3	339	185	0	527	200	268	4	0	472	4	43	3	0	50	44	12	67	0	123	1172
08:30 AM	0	379	176	0	555	195	236	4	0	435	6	29	4	1	40	45	5	73	0	123	1153
08:45 AM	4	352	164	0	520	184	249	7	1	441	6	35	2	1	44	48	2	73	0	123	1128
Total	10	1422	714	0	2146	793	966	19	1	1779	21	152	11	2	186	188	24	270	0	482	4593
*** BREAK ***																					
04:00 PM	5	265	92	0	362	85	305	6	0	396	8	10	5	0	23	152	53	147	11	363	1144
04:15 PM	5	273	97	0	375	69	315	8	0	392	2	12	6	0	20	153	47	155	7	362	1149
04:30 PM	6	284	105	0	395	64	297	7	0	368	3	8	4	0	15	168	42	150	4	364	1142
04:45 PM	2	290	107	0	399	73	303	4	0	380	9	13	3	1	26	175	46	160	0	381	1186
Total	18	1112	401	0	1531	291	1220	25	0	1536	22	43	18	1	84	648	188	612	22	1470	4621
05:00 PM	9	293	87	0	389	59	333	4	3	399	8	9	5	1	23	199	50	145	0	394	1205
05:15 PM	4	256	109	0	369	72	325	9	0	406	6	18	6	0	30	137	58	181	0	376	1181
05:30 PM	4	258	111	0	373	85	276	12	0	373	6	14	15	0	35	147	64	163	1	375	1156
05:45 PM	2	275	102	0	379	62	330	3	0	395	4	14	4	0	22	139	48	163	0	350	1146
Total	19	1082	409	0	1510	278	1264	28	3	1573	24	55	30	1	110	622	220	652	1	1495	4688
Grand Total	56	5015	2295	0	7366	2126	4310	91	4	6531	105	414	68	6	593	1626	452	1749	23	3850	18340
Apprch %	0.8	68.1	31.2	0		32.6	66	1.4	0.1		17.7	69.8	11.5	1		42.2	11.7	45.4	0.6		
Total %	0.3	27.3	12.5	0	40.2	11.6	23.5	0.5	0	35.6	0.6	2.3	0.4	0	3.2	8.9	2.5	9.5	0.1	21	
Cars & Buses	56	5009	2277	0	7342	2113	4300	91	4	6508	105	414	68	6	593	1607	451	1733	23	3814	18257
% Cars & Buses	100	99.9	99.2	0	99.7	99.4	99.8	100	100	99.6	100	100	100	100	100	98.8	99.8	99.1	100	99.1	99.5
Trucks	0	6	9	0	15	9	10	0	0	19	0	0	0	0	0	9	1	8	0	18	52
% Trucks	0	0.1	0.4	0	0.2	0.4	0.2	0	0	0.3	0	0	0	0	0	0.6	0.2	0.5	0	0.5	0.3
Bikes	0	0	9	0	9	4	0	0	0	4	0	0	0	0	0	10	0	8	0	18	31
% Bikes	0	0	0.4	0	0.1	0.2	0	0	0	0.1	0	0	0	0	0	0.6	0	0.5	0	0.5	0.2

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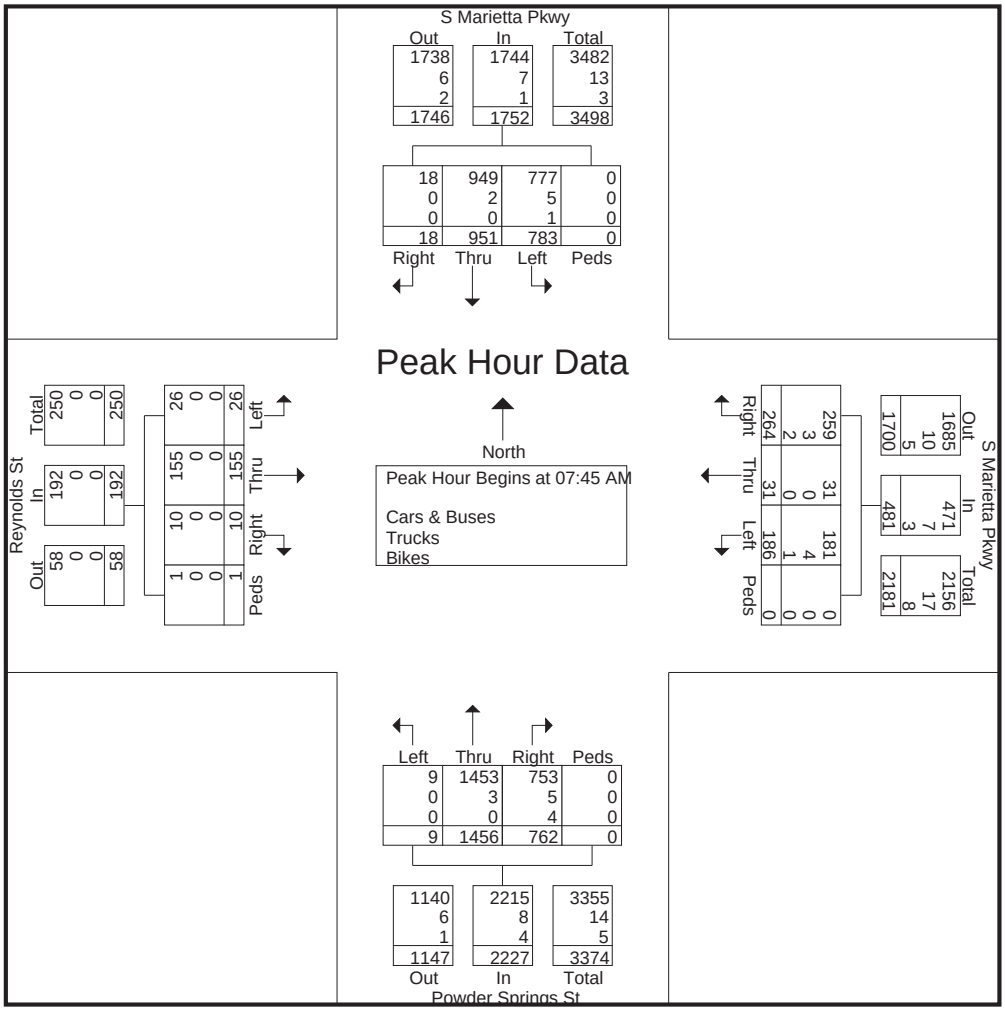
TMC Data
S Marietta Pkwy @ Powder Springs St/
Reynolds St
7-9am | 4-6pm

File Name : 33080001
Site Code : 33080001
Start Date : 12/5/2012
Page No : 2

	Powder Springs St Northbound					S Marietta Pkwy Southbound					Reynolds St Eastbound					S Marietta Pkwy Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	**3**	**386**	**212**	0	**601**	174	234	**6**	0	414	**11**	38	1	0	50	46	9	67	0	122	**1187**
08:00 AM	3	352	189	0	544	**214**	213	4	0	431	5	**45**	2	0	**52**	**51**	5	57	0	113	1140
08:15 AM	3	339	185	0	527	200	**268**	4	0	**472**	4	43	3	0	50	44	**12**	67	0	**123**	1172
08:30 AM	0	379	176	0	555	195	236	4	0	435	6	29	**4**	**1**	40	45	5	**73**	0	123	1153
Total Volume	9	1456	762	0	2227	783	951	18	0	1752	26	155	10	1	192	186	31	264	0	481	4652
% App. Total	0.4	65.4	34.2	0		44.7	54.3	1	0		13.5	80.7	5.2	0.5		38.7	6.4	54.9	0		
PHF	.750	.943	.899	.000	.926	.915	.887	.750	.000	.928	.591	.861	.625	.250	.923	.912	.646	.904	.000	.978	.980
Cars & Buses	9	1453	753	0	2215	777	949	18	0	1744	26	155	10	1	192	181	31	259	0	471	4622
% Cars & Buses	100	99.8	98.8	0	99.5	99.2	99.8	100	0	99.5	100	100	100	100	100	97.3	100	98.1	0	97.9	99.4
Trucks	0	3	5	0	8	5	2	0	0	7	0	0	0	0	0	4	0	3	0	7	22
% Trucks	0	0.2	0.7	0	0.4	0.6	0.2	0	0	0.4	0	0	0	0	0	2.2	0	1.1	0	1.5	0.5
Bikes	0	0	4	0	4	1	0	0	0	1	0	0	0	0	0	1	0	2	0	3	8
% Bikes	0	0	0.5	0	0.2	0.1	0	0	0	0.1	0	0	0	0	0	0.5	0	0.8	0	0.6	0.2



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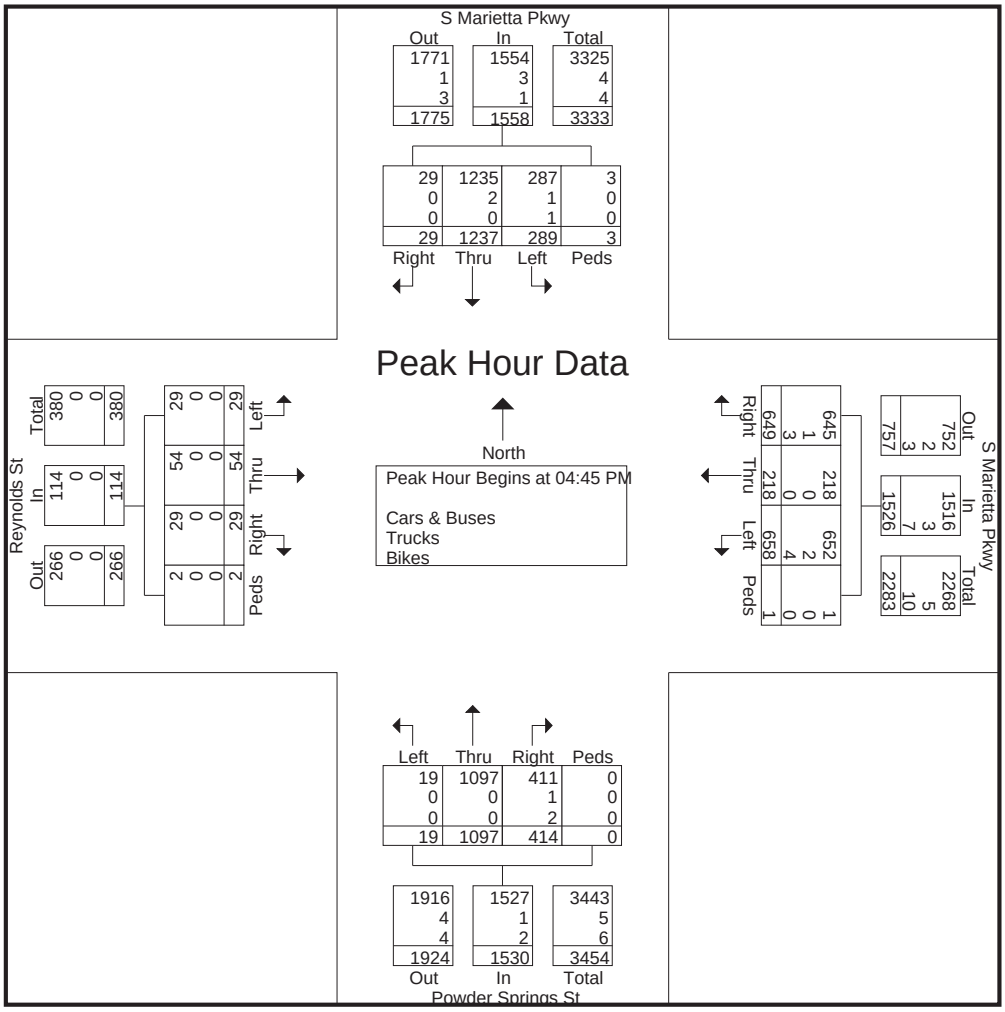
TMC Data
S Marietta Pkwy @ Powder Springs St/
Reynolds St
7-9am | 4-6pm

File Name : 33080001
Site Code : 33080001
Start Date : 12/5/2012
Page No : 3

	Powder Springs St Northbound					S Marietta Pkwy Southbound					Reynolds St Eastbound					S Marietta Pkwy Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	2	290	107	0	**399**	73	303	4	0	380	**9**	13	3	**1**	26	175	46	160	0	381	1186
05:00 PM	**9**	**293**	87	0	389	59	**333**	4	**3**	399	8	9	5	1	23	**199**	50	145	0	**394**	**1205**
05:15 PM	4	256	109	0	369	72	325	9	0	**406**	6	**18**	6	0	30	137	58	**181**	0	376	1181
05:30 PM	4	258	**111**	0	373	**85**	276	**12**	0	373	6	14	**15**	0	**35**	147	**64**	163	**1**	375	1156
Total Volume	19	1097	414	0	1530	289	1237	29	3	1558	29	54	29	2	114	658	218	649	1	1526	4728
% App. Total	1.2	71.7	27.1	0		18.5	79.4	1.9	0.2		25.4	47.4	25.4	1.8		43.1	14.3	42.5	0.1		
PHF	.528	.936	.932	.000	.959	.850	.929	.604	.250	.959	.806	.750	.483	.500	.814	.827	.852	.896	.250	.968	.981
Cars & Buses	19	1097	411	0	1527	287	1235	29	3	1554	29	54	29	2	114	652	218	645	1	1516	4711
% Cars & Buses	100	100	99.3	0	99.8	99.3	99.8	100	100	99.7	100	100	100	100	100	99.1	100	99.4	100	99.3	99.6
Trucks	0	0	1	0	1	1	2	0	0	3	0	0	0	0	0	2	0	1	0	3	7
% Trucks	0	0	0.2	0	0.1	0.3	0.2	0	0	0.2	0	0	0	0	0	0.3	0	0.2	0	0.2	0.1
Bikes	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	4	0	3	0	7	10
% Bikes	0	0	0.5	0	0.1	0.3	0	0	0	0.1	0	0	0	0	0	0.6	0	0.5	0	0.5	0.2



Approach Data

Reliable Traffic Data Services, LLC
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Site Code: 33080101
Powder Springs St South of
South Marietta Pkwy

Start Time	05-Dec-12 Wed	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		34	346		
12:15		29	317		
12:30		25	373		
12:45		24	358	112	1394
01:00		23	339		
01:15		22	424		
01:30		16	316		
01:45		17	347	78	1426
02:00		15	311		
02:15		28	317		
02:30		26	383		
02:45		12	330	81	1341
03:00		14	349		
03:15		14	336		
03:30		23	355		
03:45		21	407	72	1447
04:00		25	414		
04:15		36	366		
04:30		59	397		
04:45		76	406	196	1583
05:00		98	415		
05:15		136	377		
05:30		184	376		
05:45		222	351	640	1519
06:00		257	351		
06:15		352	371		
06:30		411	364		
06:45		496	295	1516	1381
07:00		495	252		
07:15		524	215		
07:30		578	199		
07:45		606	207	2203	873
08:00		567	183		
08:15		542	158		
08:30		548	119		
08:45		493	121	2150	581
09:00		439	119		
09:15		403	115		
09:30		381	151		
09:45		359	102	1582	487
10:00		348	92		
10:15		367	96		
10:30		353	82		
10:45		368	96	1436	366
11:00		318	59		
11:15		306	53		
11:30		333	33		
11:45		318	41	1275	186
Total		11341	12584		
Percent		47.4%	52.6%		
Grand Total		11341	12584		
Percent		47.4%	52.6%		
ADT		ADT 23,925			AADT 23,925

Approach Data

Reliable Traffic Data Services, LLC
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Site Code: 33080102
S Marietta Pkwy North of Reynolds St

Start Time	05-Dec-12 Wed	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		50	320		
12:15		31	334		
12:30		25	314		
12:45		26	325	132	1293
01:00		31	308		
01:15		23	300		
01:30		19	315		
01:45		11	287	84	1210
02:00		14	327		
02:15		13	358		
02:30		21	313		
02:45		26	336	74	1334
03:00		18	336		
03:15		14	375		
03:30		28	416		
03:45		27	379	87	1506
04:00		31	407		
04:15		35	393		
04:30		55	359		
04:45		82	397	203	1556
05:00		119	408		
05:15		158	381		
05:30		199	383		
05:45		276	401	752	1573
06:00		322	365		
06:15		347	349		
06:30		378	301		
06:45		387	324	1434	1339
07:00		408	270		
07:15		430	261		
07:30		416	214		
07:45		405	201	1659	946
08:00		437	184		
08:15		454	195		
08:30		429	198		
08:45		413	204	1733	781
09:00		374	167		
09:15		356	166		
09:30		322	146		
09:45		310	142	1362	621
10:00		323	103		
10:15		315	138		
10:30		298	98		
10:45		311	89	1247	428
11:00		322	95		
11:15		302	75		
11:30		293	83		
11:45		344	50	1261	303
Total		10028	12890		
Percent		43.8%	56.2%		
Grand Total		10028	12890		
Percent		43.8%	56.2%		
ADT		ADT 22,918			AADT 22,918

Approach Data

Reliable Traffic Data Services, LLC
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Site Code: 33080103
Reynolds St West of Powder Springs St

Start Time	05-Dec-12 Wed	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		2	25		
12:15		0	24		
12:30		5	29		
12:45		1	15	8	93
01:00		1	36		
01:15		1	22		
01:30		1	24		
01:45		0	25	3	107
02:00		1	21		
02:15		2	28		
02:30		1	36		
02:45		1	55	5	140
03:00		2	36		
03:15		1	28		
03:30		0	22		
03:45		2	33	5	119
04:00		2	20		
04:15		1	20		
04:30		1	22		
04:45		3	20	7	82
05:00		3	23		
05:15		4	29		
05:30		5	33		
05:45		12	24	24	109
06:00		14	26		
06:15		15	19		
06:30		25	21		
06:45		39	13	93	79
07:00		50	17		
07:15		58	11		
07:30		51	14		
07:45		55	7	214	49
08:00		52	11		
08:15		50	15		
08:30		47	7		
08:45		39	14	188	47
09:00		44	9		
09:15		29	9		
09:30		38	12		
09:45		32	6	143	36
10:00		23	2		
10:15		16	4		
10:30		24	8		
10:45		23	10	86	24
11:00		22	2		
11:15		26	3		
11:30		24	5		
11:45		26	2	98	12
Total		874	897		
Percent		49.4%	50.6%		
Grand Total		874	897		
Percent		49.4%	50.6%		
ADT		ADT 1,771			AADT 1,771

Approach Data

Reliable Traffic Data Services, LLC
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Site Code: 33080104
S Marietta Pkwy East of
Powder Springs St

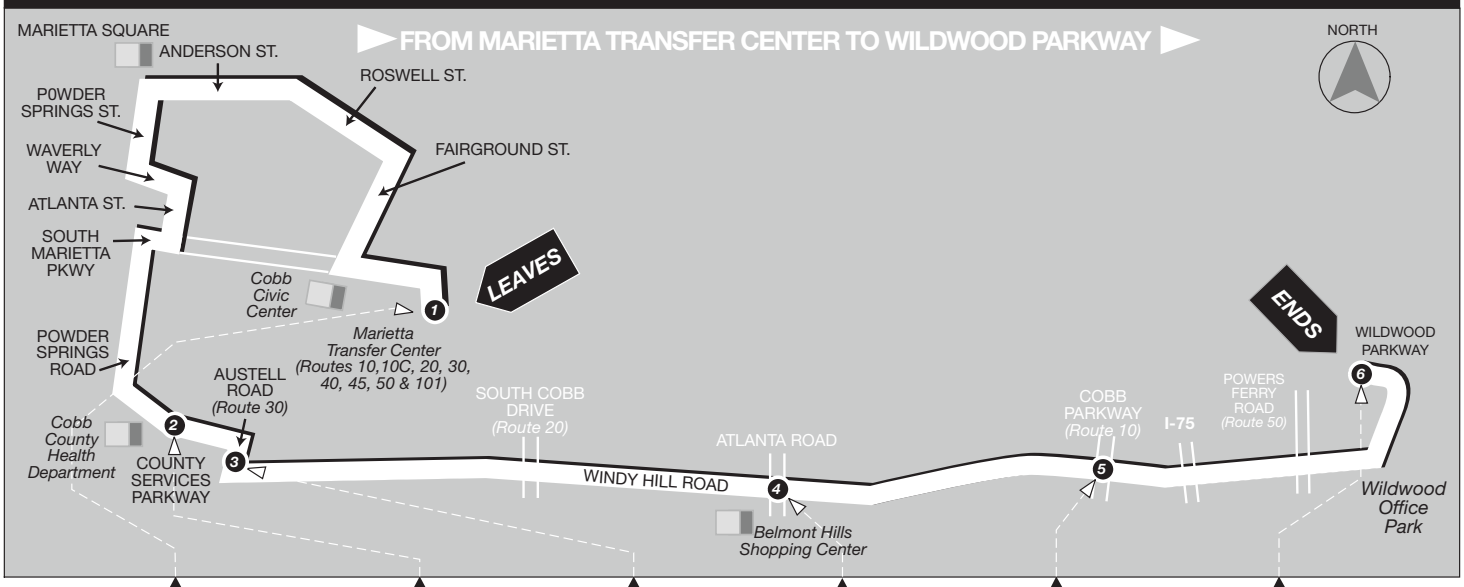
Start Time	05-Dec-12 Wed	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon
12:00		32	177		
12:15		35	177		
12:30		16	193		
12:45		26	190	109	737
01:00		34	191		
01:15		20	193		
01:30		33	213		
01:45		16	212	103	809
02:00		14	227		
02:15		19	190		
02:30		11	180		
02:45		7	207	51	804
03:00		6	233		
03:15		7	229		
03:30		7	240		
03:45		12	263	32	965
04:00		13	345		
04:15		3	351		
04:30		13	356		
04:45		12	387	41	1439
05:00		19	400		
05:15		17	368		
05:30		28	354		
05:45		31	348	95	1470
06:00		45	318		
06:15		51	326		
06:30		70	291		
06:45		90	253	256	1188
07:00		85	234		
07:15		96	225		
07:30		89	182		
07:45		120	132	390	773
08:00		117	157		
08:15		119	134		
08:30		123	183		
08:45		120	164	479	638
09:00		128	153		
09:15		123	113		
09:30		130	101		
09:45		117	97	498	464
10:00		121	80		
10:15		125	72		
10:30		144	63		
10:45		147	53	537	268
11:00		167	55		
11:15		170	46		
11:30		217	37		
11:45		172	37	726	175
Total		3317	9730		
Percent		25.4%	74.6%		
Grand Total		3317	9730		
Percent		25.4%	74.6%		
ADT		ADT 13,047			AADT 13,047

APPENDIX C
CCT Bus Schedules

ROUTE 15

Windy Hill Road

ROUTE 15

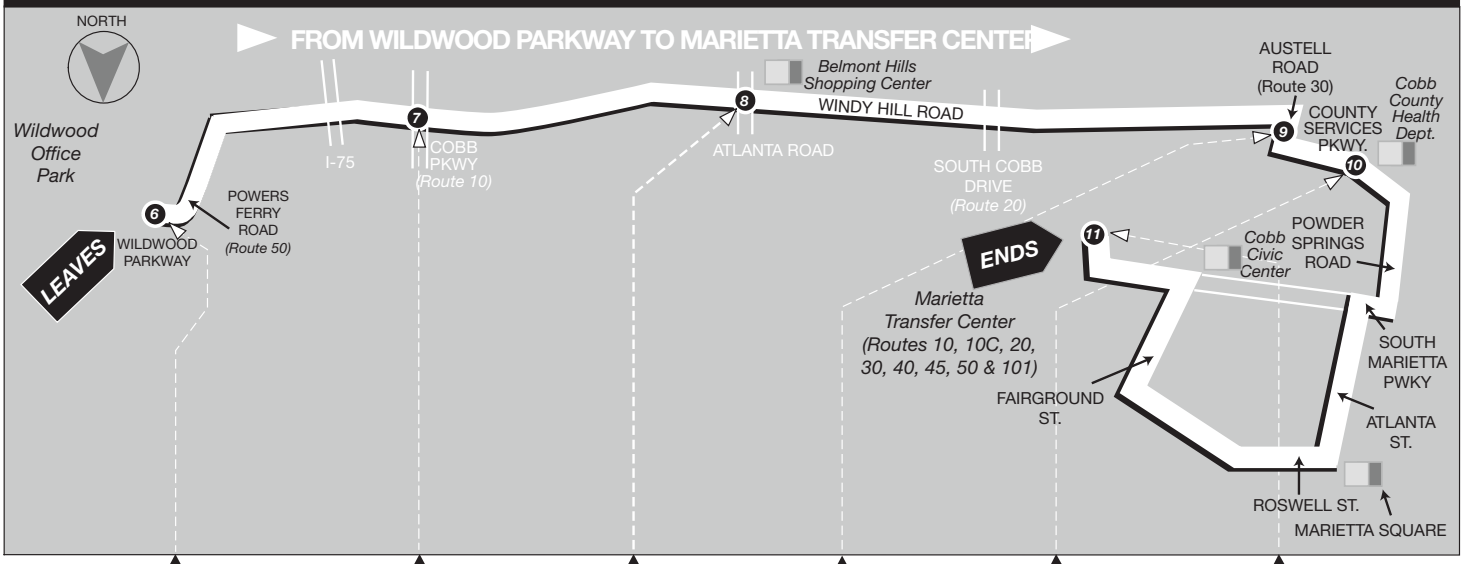


1	2	3	4	5	6
BUS LEAVES Marietta Transfer Center	***Bus Leaves*** Cobb County Health Department	***Bus Leaves*** Austell Road & Windy Hill Road	***Bus Leaves*** Windy Hill Road & Atlanta Road	***Bus Leaves*** Windy Hill Road & Cobb Parkway	***BUS ENDS*** Wildwood Parkway
WEEKDAY					
A.M. 5:00	5:21	5:28	5:38	5:46	5:55
6:00	6:21	6:28	6:38	6:46	6:55
6:30	6:51	6:58	7:08	7:16	7:25
7:00	7:21	7:28	7:38	7:46	7:55
7:30	7:51	7:58	8:08	8:16	8:25
8:00	8:21	8:28	8:38	8:46	8:55
8:30	8:51	8:58	9:08	9:16	9:25
9:00	9:22	9:27	9:37	9:43	9:51
10:00	10:22	10:27	10:37	10:43	10:51
11:00	11:22	11:27	11:37	11:43	11:51
P.M. 12:00	12:22	12:27	12:37	12:43	12:51
1:00	1:22	1:27	1:37	1:43	1:51
2:00	2:22	2:27	2:37	2:43	2:51
3:00	3:24	3:28	3:39	3:47	3:55
3:30	3:54	3:58	4:09	4:17	4:25
4:00	4:24	4:28	4:39	4:47	4:55
4:30	4:54	4:58	5:09	5:17	5:25
5:00	5:24	5:28	5:39	5:47	5:55
5:30	5:54	5:58	6:09	6:17	6:25
6:00	6:17	6:21	6:30	6:38	6:47
6:30	6:47	6:51	7:00	7:08	7:17
7:00	7:17	7:21	7:28	7:35	7:44
8:00	8:17	8:21	8:28	8:35	8:44
SATURDAY					
A.M. 7:00	7:17	7:21	7:29	7:33	7:40
8:00	8:17	8:21	8:29	8:33	8:40
9:00	9:17	9:21	9:29	9:33	9:40
10:00	10:17	10:21	10:29	10:33	10:40
11:00	11:17	11:21	11:29	11:33	11:40
P.M. 12:00	12:17	12:21	12:29	12:33	12:40
1:00	1:17	1:21	1:29	1:33	1:40
2:00	2:17	2:21	2:29	2:33	2:40
3:00	3:17	3:21	3:29	3:33	3:40
4:00	4:17	4:21	4:29	4:33	4:40
5:00	5:17	5:21	5:29	5:33	5:40
6:00	6:17	6:21	6:29	6:33	6:40
7:00	7:17	7:21	7:29	7:33	7:40

ROUTE 15

Windy Hill Road

ROUTE 15



6	7	8	9	10	11
BUS LEAVES Wildwood Parkway	***Bus Leaves*** Windy Hill Road & Cobb Parkway	***Bus Leaves*** Windy Hill Road & Atlanta Road	***Bus Leaves*** Austell Road & Windy Hill Road	***Bus Leaves*** Cobb County Health Department	***BUS ENDS*** Marietta Transfer Center

WEEKDAY

	6	7	8	9	10	11
A.M.	6:00	6:10	6:15	6:22	6:26	6:52
	7:00	7:10	7:15	7:22	7:26	7:48
	7:30	7:40	7:45	7:52	7:56	8:18
	8:00	8:10	8:15	8:22	8:26	8:48
	8:30	8:40	8:45	8:52	8:56	9:18
	9:00	9:10	9:17	9:24	9:30	9:50
	9:30	9:40	9:47	9:54	10:00	10:20
	9:56	10:06	10:13	10:20	10:26	10:46
	10:56	11:06	11:13	11:20	11:26	11:46
P.M.	11:56	12:06	12:13	12:20	12:26	12:46
	12:56	1:06	1:13	1:20	1:26	1:46
	1:56	2:06	2:13	2:20	2:26	2:46
	2:56	3:06	3:13	3:20	3:26	3:46
	4:00	4:11	4:19	4:31	4:37	4:54
	4:30	4:41	4:49	5:01	5:07	5:24
	5:00	5:11	5:19	5:31	5:37	5:54
	5:30	5:41	5:49	6:01	6:07	6:24
	6:00	6:10	6:18	6:28	6:33	6:49
	6:30	6:40	6:48	6:58	7:03	7:19
	6:52	7:02	7:10	7:20	7:25	7:41
	7:22	7:32	7:40	7:50	7:55	8:11
	7:49	7:59	8:07	8:17	8:22	8:38
	9:05	9:15	9:21	9:31	9:36	9:52

SATURDAY

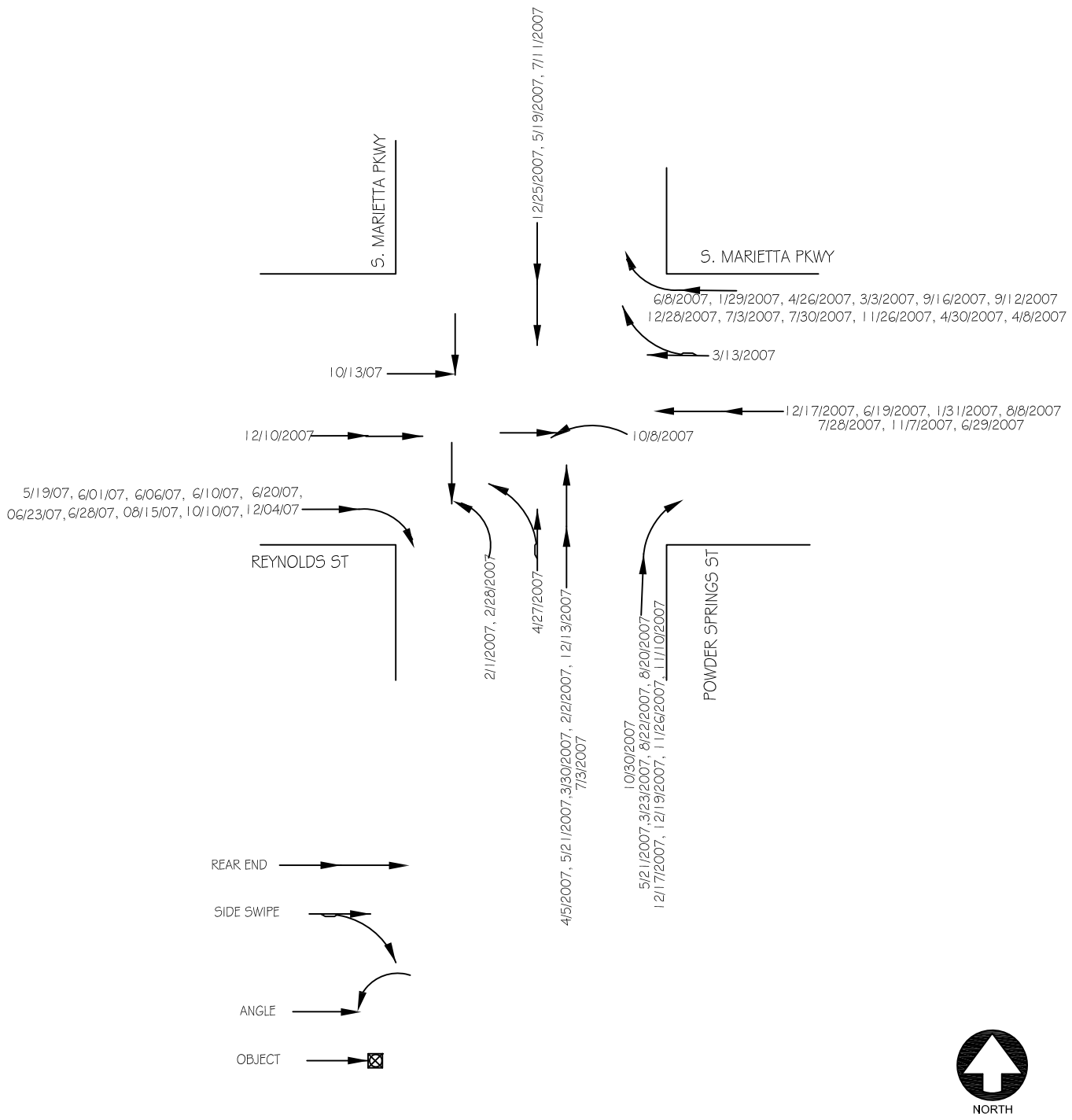
	6	7	8	9	10	11
A.M.	7:50	7:59	8:06	8:13	8:15	8:30
	8:50	8:59	9:06	9:13	9:15	9:30
	9:50	9:59	10:06	10:13	10:15	10:30
	10:50	10:59	11:06	11:13	11:15	11:30
P.M.	11:50	11:59	12:06	12:13	12:15	12:30
	12:50	12:59	1:06	1:13	1:15	1:30
	1:50	1:59	2:06	2:13	2:15	2:30
	2:50	2:59	3:06	3:13	3:15	3:30
	3:50	3:59	4:06	4:13	4:15	4:30
	4:50	4:59	5:06	5:13	5:15	5:30
	5:50	5:59	6:06	6:13	6:15	6:30
	6:50	6:59	7:06	7:13	7:15	7:30
	7:50	7:59	8:06	8:13	8:15	8:30

APPENDIX D

Crash Data

POWDER SPRINGS ST AT REYNOLDS ST

CRASH DIAGRAM - 2007



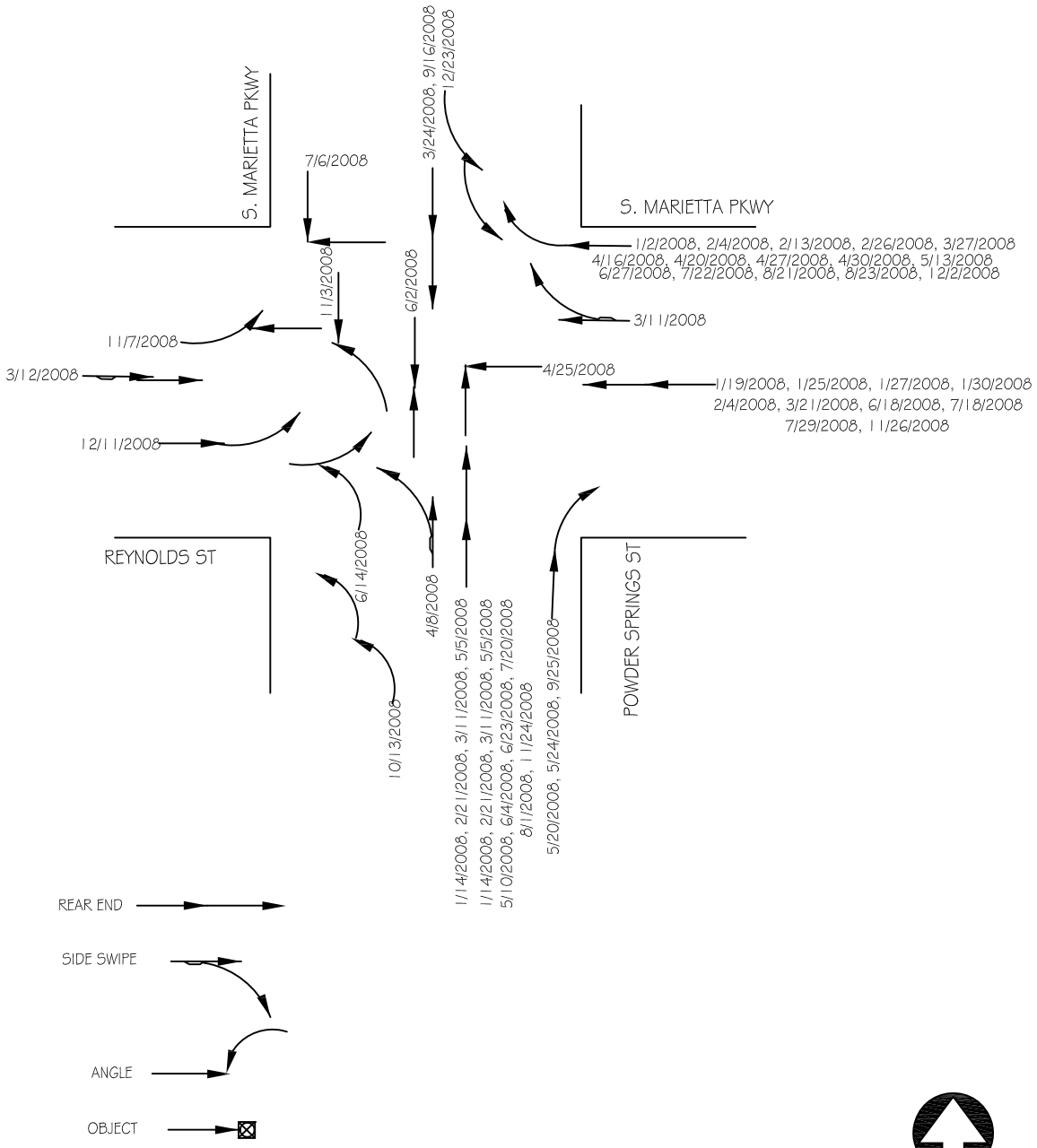
Georgia Department of Transportation

S. MARIETTA PKWY AT POWDER SPRINGS ST MARIETTA, GEORGIA	01/08/2013 CRASH DIAGRAM

LAI ENGINEERING
1800 PARKWAY PLACE, SUITE 720
MARIETTA, GA 30067
TEL: (770) 423-0807 FAX: (770) 423-1262

POWDER SPRINGS ST AT REYNOLDS ST

CRASH DIAGRAM - 2008



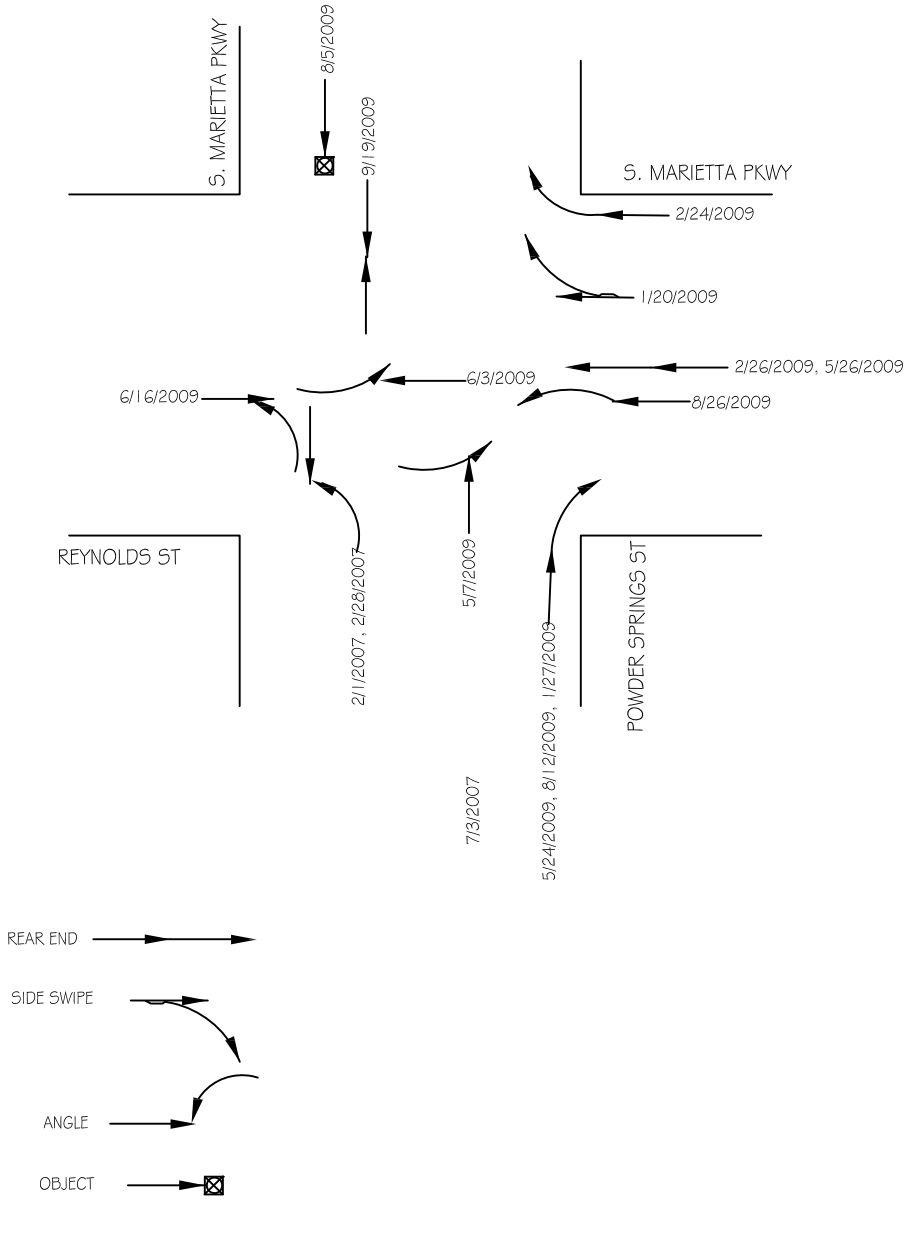
Georgia Department of Transportation

S. MARIETTA PKWY AT POWDER SPRINGS ST MARIETTA, GEORGIA	01/08/2013 CRASH DIAGRAM

LAI ENGINEERING
1800 PARKWAY PLACE, SUITE 720
MARIETTA, GA 30067
TEL: (770) 423-0807 FAX: (770) 423-1262

POWDER SPRINGS ST AT REYNOLDS ST

CRASH DIAGRAM - 2009



Georgia Department of Transportation

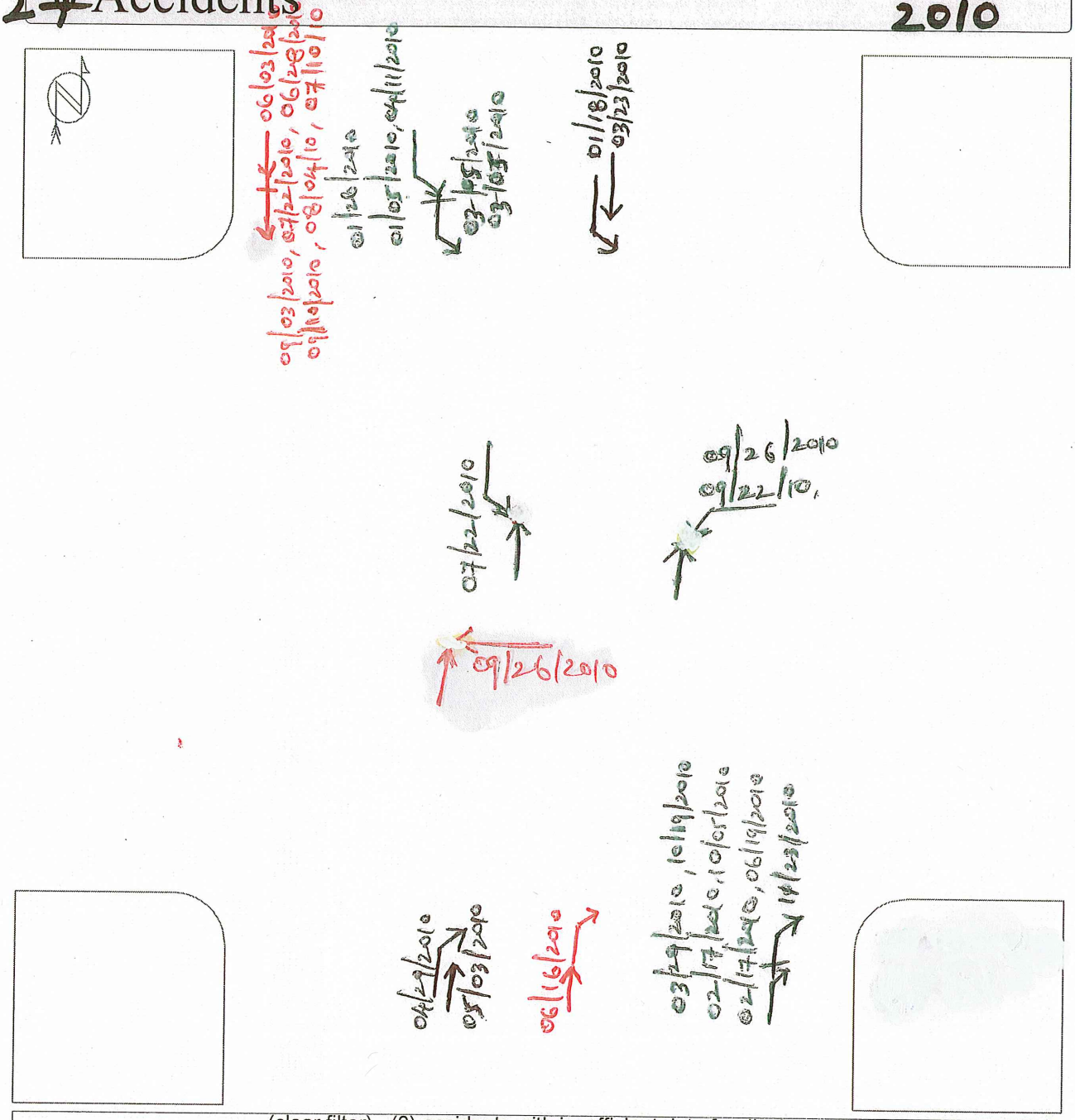
S. MARIETTA PKWY AT POWDER SPRINGS ST MARIETTA, GEORGIA	01/08/2013 CRASH DIAGRAM

LAI ENGINEERING
1800 PARKWAY PLACE, SUITE 720
MARIETTA, GA 30067
TEL: (770) 423-0807 FAX: (770) 423-1262

SR 120 & Powder Springs

27 Accidents

2010

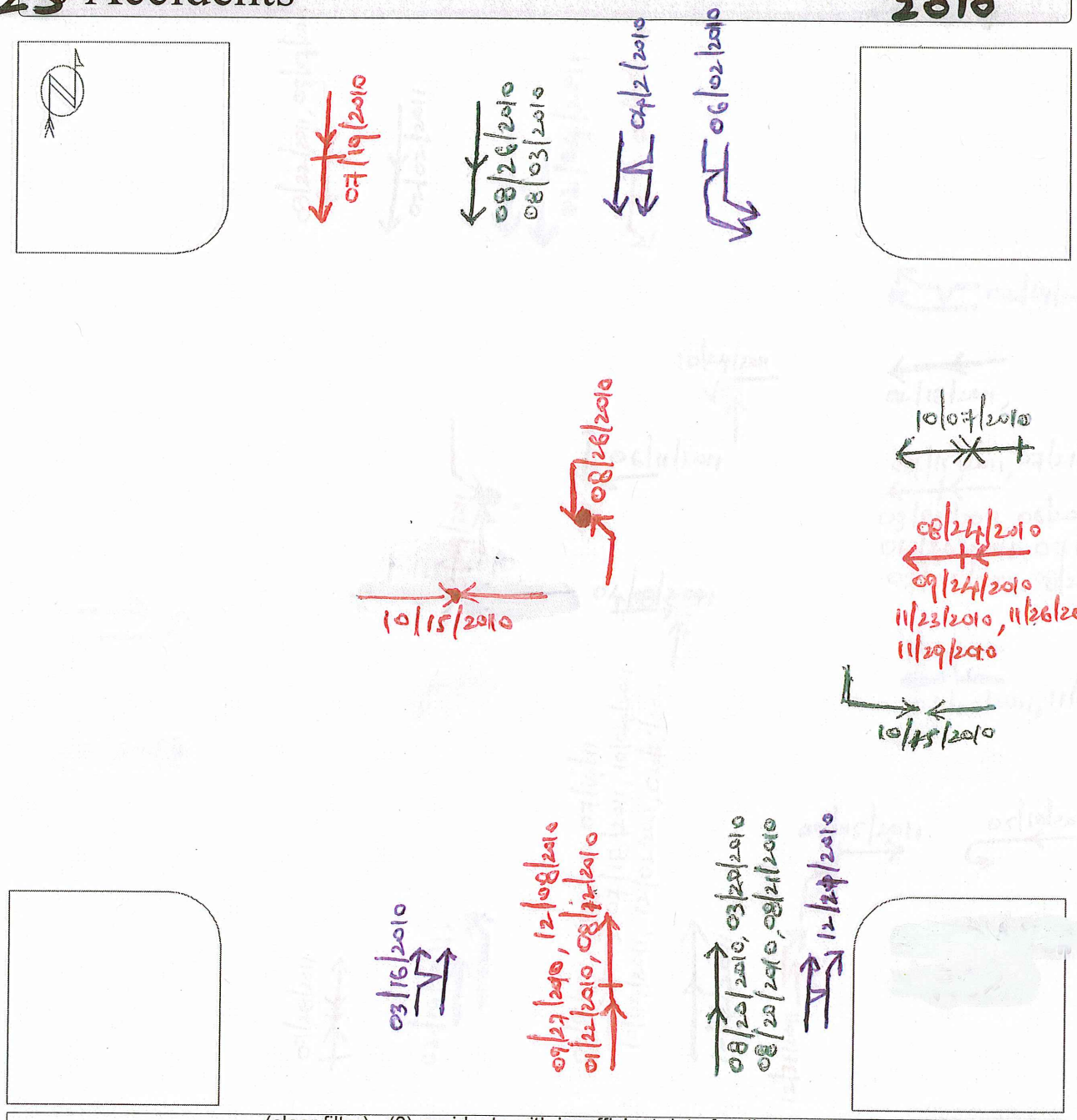


(clear filter), (0) accidents with insufficient data for display

Straight	Parked	Pedestrian	Fixed objects:
Stopped	Erratic	Bicycle	General / Pole
Unknown	Out of control	Injury	Signal / Curb
Backing	Right turn	Fatality	Tree / Animal
Overtaking	Left turn	Nighttime	3rd vehicle
Sideswipe	U-turn	DUI	Extra data

SR 120 & Powder Springs

23 Accidents 2010

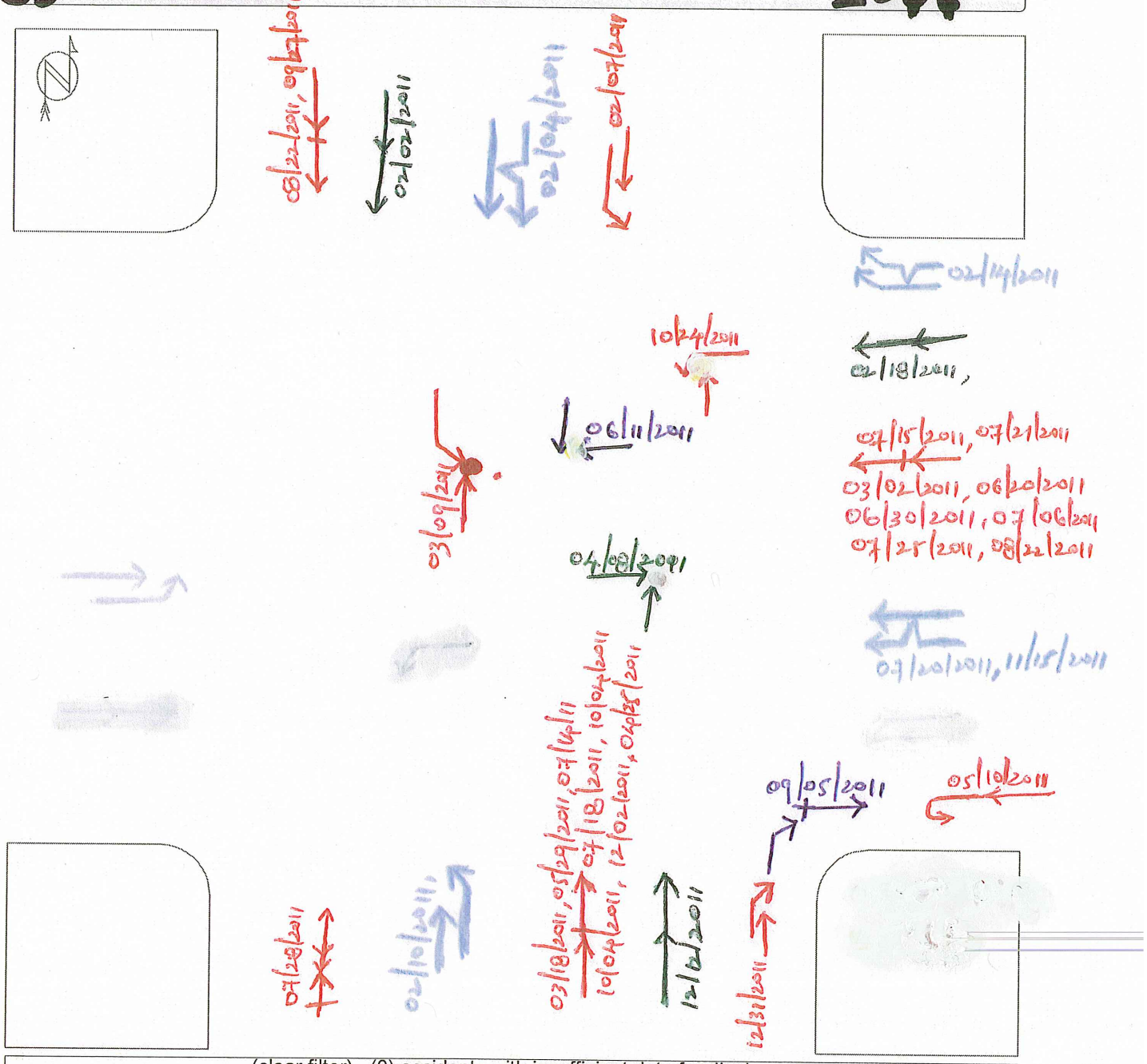


(clear filter), (0) accidents with insufficient data for display

Straight	Parked	Pedestrian	Fixed objects:
Stopped	Erratic	Bicycle	General, Pole
Unknown	Out of control	Injury	Signal, Curb
Backing	Right turn	Fatality	Tree, Animal
Overtaking	Left turn	Nighttime	3rd vehicle
Sideswipe	U-turn	DUI	Extra data

SR 120 & Powder Springs

35 Accidents 2011



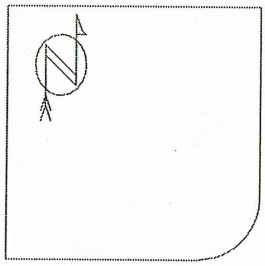
(clear filter), (0) accidents with insufficient data for display

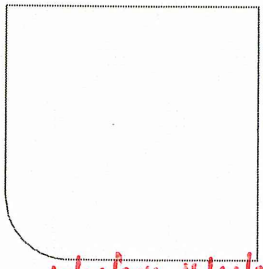
Straight	Parked	Pedestrian	Fixed objects:
Stopped	Erratic	Bicycle	General / Pole
Unknown	Out of control	Injury	Signal / Curb
Backing	Right turn	Fatality	Tree / Animal
Overtaking	Left turn	Nighttime	3rd vehicle
Sideswipe	U-turn	DUI	Extra data

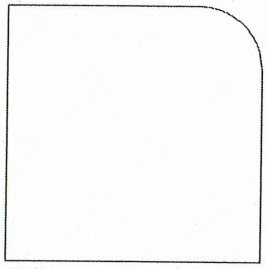
SR 120 & Powder Springs

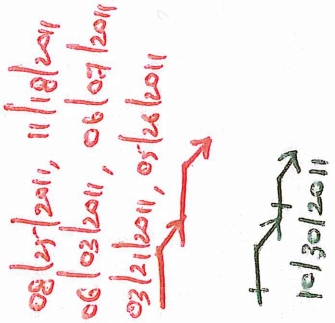
29 Accidents

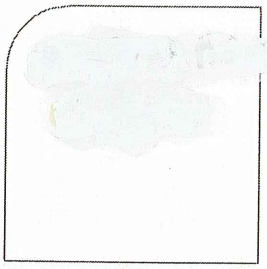
2011











(clear filter), (0) accidents with insufficient data for display

Straight	Parked	Pedestrian	Fixed objects:
Stopped	Erratic	Bicycle	General / Pole
Unknown	Out of control	Injury	Signal / Curb
Backing	Right turn	Fatality	Tree / Animal
Overtaking	Left turn	Nighttime	3rd vehicle
Sideswipe	U-turn	DUI	Extra data

COBB COUNTY																				
Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Injuries	Fatalities	Harmful Event	Collision	Location of Impact	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
'70350484	1/29/2007	4:10 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'70350499	1/31/2007	3:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'70350424	2/1/2007	8:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-Lighted	Wet	S	N	Straight	Turning Left
'70350417	2/1/2007	12:11 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	W	W	Turning Right	Turning Right
'70350450	2/2/2007	7:24 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'70910171	2/28/2007	9:55 PM	Cobb	State Route	'000500	12.31	1	'036000	2	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-Lighted	Dry	N	S	Turning Left	Straight
'70910206	3/3/2007	9:50 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'71100396	3/13/2007	1:15 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Direction	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'71320520	3/23/2007	1:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'71320606	3/30/2007	10:23 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	N	N	Straight	Stopped
'71450521	4/5/2007	6:34 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'71450551	4/8/2007	6:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Making U-Turn
'71450575	4/10/2007	1:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Negotiating a Curve	Stopped
'71700095	4/26/2007	12:10 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	W	W	Turning Right	Stopped
'71700113	4/27/2007	4:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Direction	On Roadway	Daylight	Dry	N	N	Changing Lanes	Straight
'71840138	4/30/2007	12:10 PM	Cobb	State Route	'000500	12.31	1	'036000	2	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'72290484	5/19/2007	1:15 PM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Stopped
'72290494	5/21/2007	9:25 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'72290498	5/21/2007	7:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'72520283	6/5/2007	12:50 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Turning Right
'72520320	6/8/2007	3:41 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'72520380	6/13/2007	2:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Straight
'72600241	6/14/2007	9:50 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	W	W	Negotiating a Curve	Negotiating a Curve
'72600290	6/19/2007	8:20 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'72600312	6/20/2007	1:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'72600355	6/24/2007	7:35 PM	Cobb	State Route	'000500	12.31	1	'036000	2	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Stopped
'72770122	6/29/2007	3:15 PM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'72770163	7/3/2007	5:25 AM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Dawn	Dry	N	N	Straight	Straight
'72770169	7/3/2007	2:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'72920179	7/10/2007	6:17 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	W	W	Turning Right	Stopped
'72920171	7/10/2007	11:40 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'72920196	7/11/2007	12:30 PM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	S	S	Straight	Stopped
'72990286	7/22/2007	6:28 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Straight	Stopped
'73260152	7/28/2007	6:24 PM	Cobb	State Route	'000500	12.32	3	'122413	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Turning Right
'73370003	7/30/2007	9:45 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'73370103	8/8/2007	3:10 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Straight
'73510566	8/20/2007	1:15 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'73590631	8/22/2007	9:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Not Lighted	Dry	N	N	Turning Right	Stopped
'73780605	8/31/2007	2:36 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Straight
'73910565	9/7/2007	9:50 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Stopped
'73970034	9/9/2007	5:10 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'73970073	9/12/2007	11:41 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'74190193	9/16/2007	1:00 AM	Cobb	State Route	'000500	12.31	1	'036000	3	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'74410314	10/8/2007	9:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Direction	On Roadway	Dark-Lighted	Dry	W	E	Turning Left	Straight
'74480385	10/13/2007	2:45 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Straight
'74690101	10/25/2007	11:45 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	N	Turning Right	Stopped
'74690137	10/27/2007	11:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	S	S	Backing	Stopped
'74620273	10/27/2007	3:07 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	E	Turning Right	Stopped
'74910282	10/30/2007	7:04 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Dawn	Dry	N	N	Straight	Stopped
'74910289	10/30/2007	6:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'74910288	10/31/2007	9:35 AM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'74910284	10/31/2007	8:10 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'74910388	11/7/2007	9:50 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'74910426	11/10/2007	6:52 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	N	N	Turning Right	Turning Right
'75230156	11/26/2007	8:15 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	N	N	Turning Right	Stopped
'75230153	11/26/2007	8:00 AM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'75490605	12/10/2007	6:11 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	E	E	Straight	Stopped
'75490015	12/13/2007	12:37 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'75640142	12/17/2007	1:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Straight
'75640136	12/17/2007	3:25 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'75640028	12/19/2007	1:45 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Stopped
'75820064	12/25/2007	4:15 PM	Cobb	State Route	'000500	12.32	3	'122413	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	S	S	Straight	Straight
'75820084	12/28/2007	11:40 AM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	W	W	Turning Right	Turning Right
'80030500	1/2/2008	3:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'80090176	1/9/2008	3:22 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'80090220	1/14/2008	1:45 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'80230536	1/25/2008	3:43 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'80230542	1/27/2008	1:10 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'80410505	1/30/2008	3:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Straight
'80410554	2/4/2008	10:03 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Negotiating a Curve	Stopped
'80570276	2/13/2008	11:17 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	W	W	Turning Right	Stopped
'80610041	2/21/2008	2:45 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	N	N	Straight	Stopped
'80810559	2/26/2008	7:25 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dark-Lighted	Dry	W	W	Turning Right	Stopped
'81110351	3/11/2008	12:05 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Direction	On Roadway	Daylight	Dry	W	W	Changing Lanes	Turning Right
'80930315	3/11/2008	1:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	N	N	Negotiating a Curve	Stopped
'81300420	3/12/2008	2:15 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Direction	On Roadway	Daylight	Dry	E	E	Straight	Straight
'81110364	3/21/2008	3:15 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Straight
'81110379	3/24/2008	7:05 AM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Dawn	Dry	S	S	Straight	Stopped
'81110418	3/27/2008	6:45 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right

Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Injuries	Fatalities	Harmful Event	Collision	Location of Impact	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
'81570191	4/8/2008	2:15 PM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Direction	On Roadway	Daylight	Dry	N	N	Changing Lanes	Straight
'81450059	4/16/2008	12:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'81450098	4/20/2008	10:45 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'81570253	4/25/2008	2:40 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	N	Straight	Straight
'81570282	4/27/2008	3:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	W	W	Turning Right	Turning Right
'81570302	4/30/2008	2:00 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'81840266	5/5/2008	6:26 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'81840328	5/10/2008	4:07 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'81970091	5/13/2008	8:15 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'81970157	5/20/2008	7:15 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Negotiating a Curve
'82070333	5/24/2008	6:12 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Stopped
'82070403	6/2/2008	11:15 AM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Head On	On Roadway	Daylight	Dry	N	S	Straight	Straight
'82160227	6/4/2008	3:50 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'82350305	6/14/2008	12:50 PM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	E	N	Turning Left	Turning Left
'82350414	6/17/2008	3:30 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'82350431	6/18/2008	7:41 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'82710086	6/23/2008	11:30 AM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Negotiating a Curve	Negotiating a Curve
'82710215	6/27/2008	9:30 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'83760233	7/6/2008	2:38 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	S	W	Straight	Straight
'82750374	7/8/2008	8:45 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'83080412	7/18/2008	11:15 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Stopped
'83080432	7/20/2008	4:35 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'83360532	7/22/2008	4:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Turning Right
'83370039	7/29/2008	6:30 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Angle	Off Roadway	Dusk	Dry	W	W	Straight	Stopped
'83370084	8/1/2008	4:15 PM	Cobb	State Route	'000500	12.32	3	'122413	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Straight	Stopped
'83250197	8/21/2008	1:40 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'83560084	8/30/2008	5:40 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'83760169	9/16/2008	7:37 AM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	S	S	Straight	Stopped
'83960064	9/25/2008	9:00 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Right	Turning Right
'84110406	10/13/2008	4:50 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	N	N	Turning Left	Turning Left
'84450124	11/3/2008	5:05 PM	Cobb	State Route	'000500	12.32	3	'122413	0	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Dry	N	S	Turning Left	Straight
'84620468	11/7/2008	11:20 AM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Angle	On Roadway	Daylight	Wet	E	W	Turning Left	Straight
'84860162	11/24/2008	12:14 PM	Cobb	State Route	'000500	12.31	1	'036000	1	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	N	N	Straight	Stopped
'84860187	11/26/2008	3:15 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Straight	Stopped
'84940411	12/2/2008	4:00 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Dry	W	W	Turning Right	Stopped
'85250127	12/11/2008	12:20 PM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Rear End	On Roadway	Daylight	Wet	E	E	Turning Left	Straight
'85330389	12/23/2008	1:35 AM	Cobb	State Route	'000500	12.31	1	'036000	0	0	Motor Vehicle in Motion	Angle	On Roadway	Dark-Lighted	Dry	S	S	Turning Left	Turning Left
266757	6/5/09	6:55 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Straight	Stopped
268242	6/8/09	1:38 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
339575	8/24/09	9:10 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
332725	8/26/09	10:45 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Left	Stopped
357684	9/25/09	3:45 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Dry	Northeast	Northeast	Changing Lanes	Straight
368418	10/12/09	9:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Wet	Southeast	Southeast	Turning Left	Stopped
370859	10/12/09	6:06 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dusk	Dry	Southeast	Southeast	Turning Left	Stopped
372881	10/13/09	7:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Turning Right
368079	10/14/09	10:00 AM	COBB		POWDER SPRINGS RD	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Wet	East	East	Straight	Straight
364728	10/14/09	5:23 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Wet	Northeast	Northeast	Turning Left	Turning Left
370909	10/14/09	8:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Wet	North	North	Straight	Stopped
370477	10/14/09	9:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Wet	Northeast	Northeast	Straight	Straight
413035	10/25/09	11:50 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
390734	11/3/09	10:30 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Straight	Stopped
384330	11/5/09	8:36 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	Ramp	Daylight	Dry	Southeast	Southeast	Negotiating A Curve	Negotiating A Curve
386339	11/6/09	3:15 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
1787070	11/24/09	12:10 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
1776416	12/2/09	4:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Curb	Not A Collision with Mot	On Roadway	Daylight	Dry	Southeast		Straight	
1776494	12/5/09	3:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Northeast	Southeast	Turning Right	Turning Right
2601830	12/15/09	7:25 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Wet	Southeast	Southeast	Turning Right	Turning Right
2601702	12/17/09	9:00 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
2601655	12/21/09	11:15 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	Southeast	East	Turning Left	Straight
405717	1/5/10	12:55 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Left	Stopped
1776446	1/18/10	2:46 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	East	East	Straight	Straight
1776462	1/22/10	1:40 PM	COBB		POWDER SPRINGS RD	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
1789848	1/26/10	7:53 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3447516	2/17/10	9:00 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Stopped
3460357	2/17/10	9:00 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Stopped
3460423	3/5/10	1:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3467327	3/5/10	1:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3460303	3/16/10	3:03 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	2	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Dry	North	North	Changing Lanes	Straight
3460437	3/20/10	2:07 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Northeast	Northeast	Straight	Straight
3465131	3/23/10	3:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	East	Southeast	Turning Left	Straight
3465160	3/29/10	1:10 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Stopped
3500623	4/2/10	10:50 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Dry	Southeast	Southeast	Changing Lanes	Straight
3477320	4/11/10	8:54 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	Southeast	Southeast	Turning Left	Turning Right
3419015	4/29/10	4:40 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Angle	On Roadway	Dark-Lighted	Dry	Northeast	North	Straight	Turning Right
3433881	5/3/10	6:35 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Angle	On Roadway	Dusk	Wet	North	North	Changing Lanes	Straight
3563086	6/2/10	3:50 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Left	Turning Left
3540451	6/3/10	4:40 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3594433	6/16/10	9:28 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Not Lighted	Dry	North	North	Turning Right	Turning Right
3578999	6/19/10	7:30 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Stopped
3627207	6/28/10	2:12 PM	COBB		S. MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Turning Right

Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Injuries	Fatalities	Harmful Event	Collision	Location of Impact	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
3561952	7/10/10	8:20 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Turning Right
3626701	7/19/10	8:20 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Straight	Stopped
3531061	7/22/10	12:17 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3531824	7/22/10	10:00 AM	COBB		S MARIETTA PWKY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	North	Southeast	Straight	Turning Left
3579094	8/3/10	8:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Straight	Straight
3579381	8/4/10	2:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3533664	8/12/10	6:45 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3531016	8/20/10	11:30 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Straight
3555852	8/20/10	11:30 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Straight
3690526	8/21/10	2:10 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Straight
3555264	8/24/10	5:57 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3558158	8/26/10	1:40 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	South	South	Straight	Straight
3554995	8/26/10	3:15 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	North	South	Turning Left	Straight
3531112	9/3/10	10:15 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Stopped
3532027	9/10/10	3:55 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	Southeast	Southeast	Turning Right	Turning Right
3779236	9/22/10	2:30 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	North	West	Straight	Turning Left
3737098	9/24/10	3:25 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3779218	9/26/10	10:31 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Wet	North	West	Straight	Straight
3736518	9/27/10	3:10 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3778766	10/5/10	1:35 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Stopped
3737110	10/7/10	12:15 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Backing	Stopped
3720056	10/15/10	4:25 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Head On	On Roadway	Daylight	Dry	East	West	Backing	Stopped
3685819	10/19/10	6:00 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	North	North	Turning Right	Turning Right
3781254	11/23/10	3:56 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Wet	West	West	Straight	Stopped
3781257	11/23/10	10:00 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3781226	11/26/10	7:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	West	West	Straight	Stopped
3722968	11/29/10	7:52 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Wet	West	West	Straight	Stopped
3723478	12/8/10	2:48 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3719092	12/21/10	8:51 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Wet	North	North	Turning Right	Straight
3606501	1/5/11	6:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Wet	West	West	Turning Right	Turning Right
3610927	1/26/11	7:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	West	West	Turning Right	Turning Right
3617224	2/2/11	4:40 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	South	South	Straight	Straight
3617637	2/4/11	2:35 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Wet	South	South	Changing Lanes	Changing Lanes
3633815	2/7/11	3:50 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Wet	South	South	Changing Lanes	Straight
3633822	2/8/11	11:19 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3635143	2/10/11	3:45 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Angle	Off Roadway	Daylight	Dry	North	North	Straight	Stopped
3635184	2/14/11	12:50 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3641063	2/18/11	6:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	West	West	Straight	Straight
3652283	3/2/11	8:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	West	West	Straight	Stopped
3657093	3/7/11	1:15 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3657091	3/9/11	10:30 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	2	0	Motor Vehicle In Motion	Angle	On Roadway	Dark-Lighted	Wet	North	South	Straight	Turning Left
3657075	3/12/11	3:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3663856	3/18/11	8:43 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3663845	3/21/11	9:50 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3693347	4/6/11	7:35 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3702850	4/8/11	5:45 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Angle	On Roadway	Dark-Lighted	Dry	North	East	Straight	Straight
3702859	4/8/11	8:53 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	West	West	Turning Right	Turning Right
3738832	4/25/11	2:10 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North		Stopped
3799934	5/10/11	12:17 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Making U-turn	Making U-turn
3789340	5/26/11	12:00 PM	COBB		S MARIETTA PKWY	0		POWDERSPRINGS ST	2	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3789305	5/29/11	10:15 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3796035	6/3/11	2:44 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3796032	6/3/11	12:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3799966	6/7/11	4:55 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3799927	6/11/11	11:40 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	3	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	South	West	Straight	Straight
3809066	6/20/11	7:15 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3816534	6/30/11	5:45 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3821555	7/6/11	12:17 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3835992	7/14/11	9:42 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3835971	7/14/11	7:44 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3835952	7/15/11	4:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3835934	7/18/11	7:05 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3835968	7/18/11	2:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3835977	7/18/11	8:50 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3835918	7/20/11	4:50 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Sideswipe-Same Direction	On Roadway	Daylight	Wet	West	West	Straight	Straight
3836699	7/21/11	10:21 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	West	West	Straight	Stopped
3836793	7/25/11	12:50 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3842425	7/28/11	5:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Backing	Stopped
3842421	8/5/11	1:52 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3857889	8/22/11	1:22 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Straight	Stopped
3857892	8/22/11	1:15 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	South	South	Straight	Stopped
3859290	8/25/11	7:25 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3878446	9/5/11	9:10 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Angle	On Roadway	Dark-Lighted	Wet	North	West	Turning Right	Stopped
3868662	9/6/11	2:17 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Wet	West	West	Turning Right	Stopped
3900611	9/27/11	4:30 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	South	South	Straight	Stopped
3976825	10/3/11	6:50 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3976817	10/4/11	8:30 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3976829	10/4/11	7:20 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Dark-Lighted	Dry	North	North	Straight	Stopped
3976816	10/4/11	9:50 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3897311	10/7/11	2:10 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped

Accident No	Date	Time	County	Route Type	Route	Milelog	Intersecting Rt Type	Intersecting Rt	Injuries	Fatalities	Harmful Event	Collision	Location of Impact	Light	Surface	DirVeh1	DirVeh2	MnvrVeh1	MnvrVeh2
3897368	10/16/11	3:45 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3911350	10/21/11	6:00 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3911334	10/24/11	5:05 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	West	North	Turning Left	Straight
3914697	10/30/11	3:11 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3914698	10/30/11	4:07 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Stopped
3930637	11/10/11	3:25 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	1	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3930619	11/12/11	7:15 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Stopped
3938304	11/15/11	5:20 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Sideswipe-Same Directior	On Roadway	Dark-Lighted	Wet	West	West	Changing Lanes	Turning Left
3938257	11/18/11	8:28 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right
3938272	11/22/11	3:33 PM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	West	West	Turning Right	Turning Right
3946962	12/2/11	11:45 AM	COBB		S MARIETTA PKWY	0		POWDER SPRINGS ST	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Stopped
3958251	12/12/11	6:45 AM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	0	0	Motor Vehicle In Motion	Rear End	On Roadway	Daylight	Dry	North	North	Straight	Straight
3989904	12/31/11	4:21 PM	COBB		POWDER SPRINGS ST	0		S MARIETTA PKWY	1	0	Motor Vehicle In Motion	Angle	On Roadway	Daylight	Dry	North	North	Turning Right	Turning Right

APPENDIX E

Capacity Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	178	202	321	10	1583	828	851	1054
v/c Ratio	0.36	0.90	0.95	0.62	0.04	1.00	0.46	1.07	0.42
Control Delay	79.8	110.8	128.5	47.9	26.3	66.9	0.8	110.6	10.2
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	57.5	0.0
Total Delay	79.8	110.8	128.5	48.3	26.3	66.9	0.9	168.1	10.2
Queue Length 50th (ft)	28	184	113	116	6	~866	0	~515	224
Queue Length 95th (ft)	64	#327	m#197	m282	20	#1041	0	#650	263
Internal Link Dist (ft)		261		454		395			540
Turn Bay Length (ft)	120		200		90		330	345	
Base Capacity (vph)	81	206	213	527	227	1581	1812	792	2529
Starvation Cap Reductn	0	0	0	31	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	46	89	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.86	0.95	0.65	0.04	1.00	0.47	1.21	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	155	10	186	31	264	9	1456	762	783	951	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	6.5	6.5		6.0	6.5		7.2	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.87		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1865		3400	1613		1787	3574	1812	3467	3564	
Flt Permitted	0.39	1.00		0.95	1.00		0.27	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	741	1865		3400	1613		511	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	168	10	202	34	287	10	1583	828	851	1034	20
RTOR Reduction (vph)	0	2	0	0	191	0	0	0	0	0	1	0
Lane Group Flow (vph)	28	176	0	202	130	0	10	1583	828	851	1053	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Prot			Perm		Free	Prot		
Protected Phases		4		3	8			6		5	2	
Permitted Phases	4						6		Free			
Actuated Green, G (s)	16.8	16.8		10.0	32.8		70.8	70.8	160.0	36.6	113.5	
Effective Green, g (s)	16.8	16.8		10.0	32.8		70.8	70.8	160.0	36.6	113.5	
Actuated g/C Ratio	0.11	0.11		0.06	0.20		0.44	0.44	1.00	0.23	0.71	
Clearance Time (s)	6.5	6.5		6.0	6.5		7.2	7.2		6.1	7.2	
Vehicle Extension (s)	2.0	2.0		4.0	2.0		5.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	78	196		213	331		226	1581	1812	793	2528	
v/s Ratio Prot		c0.09		c0.06	0.08			c0.44		c0.25	0.30	
v/s Ratio Perm	0.04						0.02		0.46			
v/c Ratio	0.36	0.90		0.95	0.39		0.04	1.00	0.46	1.07	0.42	
Uniform Delay, d1	66.6	70.8		74.7	55.0		25.4	44.6	0.0	61.7	9.6	
Progression Factor	1.00	1.00		1.09	2.84		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	36.4		46.6	0.3		0.4	22.9	0.8	53.4	0.2	
Delay (s)	67.6	107.2		128.5	156.4		25.7	67.5	0.8	115.1	9.8	
Level of Service	E	F		F	F		C	E	A	F	A	
Approach Delay (s)		101.8			145.6			44.6			56.9	
Approach LOS		F			F			D			E	

Intersection Summary			
HCM Average Control Delay	62.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	107.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	32	91	715	942	21	1192	450	314	1377
v/c Ratio	0.68	0.51	0.90	1.41	0.19	0.83	0.25	0.78	0.70
Control Delay	128.1	71.0	55.7	220.9	37.1	49.6	0.3	83.0	28.0
Queue Delay	0.0	0.0	0.3	87.2	0.0	0.0	0.0	0.0	0.0
Total Delay	128.1	71.0	56.0	308.1	37.1	49.6	0.3	83.0	28.0
Queue Length 50th (ft)	34	81	383	~1281	14	575	0	167	517
Queue Length 95th (ft)	#109	#158	m#456	m#1572	40	693	0	218	597
Internal Link Dist (ft)		261		454		395			540
Turn Bay Length (ft)	120		200		90		330	345	
Base Capacity (vph)	47	180	823	668	110	1435	1812	475	2023
Starvation Cap Reductn	0	0	7	81	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.51	0.88	1.60	0.19	0.83	0.25	0.66	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	54	29	658	218	649	19	1097	414	289	1237	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	6.5	6.5		6.0	6.5		7.2	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.89		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1782		3467	1670		1787	3574	1812	3467	3562	
Flt Permitted	0.26	1.00		0.95	1.00		0.15	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	495	1782		3467	1670		274	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	32	59	32	715	237	705	21	1192	450	314	1345	32
RTOR Reduction (vph)	0	12	0	0	65	0	0	0	0	0	1	0
Lane Group Flow (vph)	32	79	0	715	877	0	21	1192	450	314	1376	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Prot			Perm		Free	Prot		
Protected Phases		4		3	8			6		5	2	
Permitted Phases	4						6		Free			
Actuated Green, G (s)	15.2	15.2		36.6	57.8		64.0	64.0	160.0	18.4	88.5	
Effective Green, g (s)	15.2	15.2		36.6	57.8		64.0	64.0	160.0	18.4	88.5	
Actuated g/C Ratio	0.10	0.10		0.23	0.36		0.40	0.40	1.00	0.12	0.55	
Clearance Time (s)	6.5	6.5		6.0	6.5		7.2	7.2		6.1	7.2	
Vehicle Extension (s)	2.0	2.0		4.0	2.0		5.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	169		793	603		110	1430	1812	399	1970	
v/s Ratio Prot		0.04		0.21	c0.53			c0.33		0.09	c0.39	
v/s Ratio Perm	0.06						0.08		0.25			
v/c Ratio	0.68	0.47		0.90	1.45		0.19	0.83	0.25	0.79	0.70	
Uniform Delay, d1	70.1	68.6		60.0	51.1		31.2	43.2	0.0	68.9	26.0	
Progression Factor	1.00	1.00		0.75	0.85		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.7	0.7		9.4	210.2		3.8	5.8	0.3	9.1	2.1	
Delay (s)	97.7	69.3		54.5	253.5		35.0	49.1	0.3	78.0	28.1	
Level of Service	F	E		D	F		D	D	A	E	C	
Approach Delay (s)		76.7			167.6			35.7			37.4	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	79.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	112.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	181	204	324	10	1599	837	860	1065
v/c Ratio	0.60	1.00	0.96	0.64	0.06	1.02	0.46	1.02	0.42
Control Delay	115.0	136.6	123.5	27.0	27.3	73.0	0.8	94.7	9.6
Queue Delay	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Total Delay	115.0	136.6	123.5	28.5	27.3	73.0	0.8	94.7	9.6
Queue Length 50th (ft)	29	~193	113	136	6	~933	0	~490	216
Queue Length 95th (ft)	#83	#363	m#198	219	20	#1071	0	#624	253
Internal Link Dist (ft)		261		454		395			540
Turn Bay Length (ft)	120		200		90		330	345	
Base Capacity (vph)	47	181	213	509	179	1561	1812	843	2560
Starvation Cap Reductn	0	0	0	68	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.00	0.96	0.73	0.06	1.02	0.46	1.02	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	157	10	188	31	267	9	1471	770	791	961	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	6.5	6.5		6.0	6.5		7.2	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.87		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1866		3400	1613		1787	3574	1812	3467	3564	
Flt Permitted	0.26	1.00		0.95	1.00		0.22	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	489	1866		3400	1613		410	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	171	10	204	34	290	10	1599	837	860	1045	20
RTOR Reduction (vph)	0	1	0	0	192	0	0	0	0	0	1	0
Lane Group Flow (vph)	28	180	0	204	132	0	10	1599	837	860	1064	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Prot			Perm		Free	Prot		
Protected Phases		4		3	8			6		5	2	
Permitted Phases	4						6		Free			
Actuated Green, G (s)	15.4	15.4		10.0	31.4		69.9	69.9	160.0	38.9	114.9	
Effective Green, g (s)	15.4	15.4		10.0	31.4		69.9	69.9	160.0	38.9	114.9	
Actuated g/C Ratio	0.10	0.10		0.06	0.20		0.44	0.44	1.00	0.24	0.72	
Clearance Time (s)	6.5	6.5		6.0	6.5		7.2	7.2		6.1	7.2	
Vehicle Extension (s)	2.0	2.0		4.0	2.0		5.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	180		213	317		179	1561	1812	843	2559	
v/s Ratio Prot		c0.10		c0.06	0.08			c0.45		c0.25	0.30	
v/s Ratio Perm	0.06						0.02		0.46			
v/c Ratio	0.60	1.00		0.96	0.42		0.06	1.02	0.46	1.02	0.42	
Uniform Delay, d1	69.3	72.3		74.8	56.3		26.0	45.0	0.0	60.6	9.1	
Progression Factor	1.00	1.00		1.00	1.33		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.8	67.2		48.7	0.3		0.6	29.2	0.8	36.2	0.2	
Delay (s)	82.1	139.5		123.2	75.0		26.6	74.2	0.8	96.7	9.3	
Level of Service	F	F		F	E		C	E	A	F	A	
Approach Delay (s)		131.8			93.6			48.9			48.4	
Approach LOS		F			F			D			D	

Intersection Summary			
HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	32	92	723	951	21	1204	454	317	1390
v/c Ratio	0.68	0.33	0.74	1.12	0.45	1.06	0.25	1.01	0.87
Control Delay	120.6	51.4	39.7	85.1	77.0	95.8	0.3	123.5	47.5
Queue Delay	0.0	0.0	0.2	12.1	0.0	0.0	0.0	0.0	0.0
Total Delay	120.6	51.4	40.0	97.2	77.0	95.8	0.3	123.5	47.5
Queue Length 50th (ft)	31	70	385	~371	18	~726	0	~176	686
Queue Length 95th (ft)	#82	125	m#445	m#1321	#59	#867	0	#282	792
Internal Link Dist (ft)		261		454		395			540
Turn Bay Length (ft)	120		200		90		330	345	
Base Capacity (vph)	61	356	974	849	47	1135	1812	314	1592
Starvation Cap Reductn	0	0	25	21	0	0	0	0	0
Spillback Cap Reductn	0	8	0	0	0	0	8	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.26	0.76	1.15	0.45	1.06	0.25	1.01	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	55	29	665	220	655	19	1108	418	292	1249	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	6.5	6.5		6.0	6.5		7.2	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.89		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1783		3467	1670		1787	3574	1812	3467	3562	
Flt Permitted	0.17	1.00		0.95	1.00		0.08	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	315	1783		3467	1670		148	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	32	60	32	723	239	712	21	1204	454	317	1358	32
RTOR Reduction (vph)	0	13	0	0	67	0	0	0	0	0	1	0
Lane Group Flow (vph)	32	79	0	723	884	0	21	1204	454	317	1389	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Prot			Perm		Free	Prot		
Protected Phases		4		3	8			6		5	2	
Permitted Phases	4						6		Free			
Actuated Green, G (s)	23.9	23.9		45.0	74.9		50.8	50.8	160.0	14.5	71.4	
Effective Green, g (s)	23.9	23.9		45.0	74.9		50.8	50.8	160.0	14.5	71.4	
Actuated g/C Ratio	0.15	0.15		0.28	0.47		0.32	0.32	1.00	0.09	0.45	
Clearance Time (s)	6.5	6.5		6.0	6.5		7.2	7.2		6.1	7.2	
Vehicle Extension (s)	2.0	2.0		4.0	2.0		5.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	266		975	782		47	1135	1812	314	1590	
v/s Ratio Prot		0.04		0.21	c0.53			c0.34		c0.09	0.39	
v/s Ratio Perm	0.10						0.14		0.25			
v/c Ratio	0.68	0.30		0.74	1.13		0.45	1.06	0.25	1.01	0.87	
Uniform Delay, d1	64.4	60.6		52.2	42.6		43.4	54.6	0.0	72.8	40.2	
Progression Factor	1.00	1.00		0.68	0.55		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.7	0.2		1.8	67.9		27.8	44.4	0.3	53.2	7.0	
Delay (s)	92.1	60.8		37.3	91.3		71.2	99.0	0.3	126.0	47.2	
Level of Service	F	E		D	F		E	F	A	F	D	
Approach Delay (s)		68.9			68.0			72.0			61.8	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM Average Control Delay	67.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	113.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	35	220	249	394	12	1950	1021	1049	1298
v/c Ratio	0.74	1.29	1.30	0.80	0.09	1.17	0.56	1.35	0.50
Control Delay	139.5	222.1	223.2	41.9	25.9	120.7	1.3	210.9	9.9
Queue Delay	0.0	0.0	0.0	6.3	0.0	0.0	0.9	0.0	0.0
Total Delay	139.5	222.1	223.2	48.2	25.9	120.7	2.2	210.9	9.9
Queue Length 50th (ft)	36	~293	~173	195	7	~1271	0	~737	276
Queue Length 95th (ft)	#107	#473	m#258	m320	22	#1403	0	#874	320
Internal Link Dist (ft)		261		454		395			540
Turn Bay Length (ft)	120		200		90		330	345	
Base Capacity (vph)	47	170	191	492	139	1671	1812	778	2603
Starvation Cap Reductn	0	0	0	61	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	483	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.29	1.30	0.91	0.09	1.17	0.77	1.35	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	191	12	229	38	325	11	1794	939	965	1172	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	6.5	6.5		6.0	6.5		7.2	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.87		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1866		3400	1612		1787	3574	1812	3467	3564	
Flt Permitted	0.28	1.00		0.95	1.00		0.16	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	519	1866		3400	1612		297	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	208	12	249	41	353	12	1950	1021	1049	1274	24
RTOR Reduction (vph)	0	1	0	0	194	0	0	0	0	0	1	0
Lane Group Flow (vph)	35	219	0	249	200	0	12	1950	1021	1049	1297	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Prot			Perm		Free	Prot		
Protected Phases		4		3	8			6		5	2	
Permitted Phases	4						6		Free			
Actuated Green, G (s)	14.5	14.5		9.0	29.5		74.8	74.8	160.0	35.9	116.8	
Effective Green, g (s)	14.5	14.5		9.0	29.5		74.8	74.8	160.0	35.9	116.8	
Actuated g/C Ratio	0.09	0.09		0.06	0.18		0.47	0.47	1.00	0.22	0.73	
Clearance Time (s)	6.5	6.5		6.0	6.5		7.2	7.2		6.1	7.2	
Vehicle Extension (s)	2.0	2.0		4.0	2.0		5.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	169		191	297		139	1671	1812	778	2602	
v/s Ratio Prot		c0.12		c0.07	0.12			c0.55		c0.30	0.36	
v/s Ratio Perm	0.07						0.04		0.56			
v/c Ratio	0.74	1.30		1.30	0.67		0.09	1.17	0.56	1.35	0.50	
Uniform Delay, d1	70.9	72.8		75.5	60.8		23.6	42.6	0.0	62.0	9.2	
Progression Factor	1.00	1.00		1.02	1.22		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	42.4	169.9		167.8	4.4		1.2	82.0	1.3	165.2	0.3	
Delay (s)	113.4	242.7		244.5	78.4		24.9	124.6	1.3	227.3	9.5	
Level of Service	F	F		F	E		C	F	A	F	A	
Approach Delay (s)		224.9			142.7			82.0			106.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	103.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	126.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	112	882	1162	25	1470	554	387	1696
v/c Ratio	0.83	0.44	0.92	1.41	0.53	1.20	0.31	1.38	1.03
Control Delay	153.6	62.9	38.1	206.2	85.2	143.3	0.4	243.1	72.4
Queue Delay	0.0	4.4	5.6	18.1	0.0	0.0	0.0	0.0	0.0
Total Delay	153.6	67.3	43.6	224.3	85.2	143.3	0.5	243.1	72.4
Queue Length 50th (ft)	40	98	430	~1547	21	~978	0	~276	~996
Queue Length 95th (ft)	#115	166	m403	m#1463	#75	#1117	0	#388	#1134
Internal Link Dist (ft)		261		454		395			540
Turn Bay Length (ft)	120		200		90		330	345	
Base Capacity (vph)	52	281	963	824	47	1224	1812	280	1645
Starvation Cap Reductn	0	0	55	23	0	0	0	0	0
Spillback Cap Reductn	0	109	0	0	0	0	130	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.65	0.97	1.45	0.53	1.20	0.33	1.38	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	67	36	811	269	800	23	1352	510	356	1524	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	6.5	6.5		6.0	6.5		7.2	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.89		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1783		3467	1670		1787	3574	1812	3467	3562	
Flt Permitted	0.18	1.00		0.95	1.00		0.07	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	340	1783		3467	1670		137	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	39	73	39	882	292	870	25	1470	554	387	1657	39
RTOR Reduction (vph)	0	8	0	0	67	0	0	0	0	0	1	0
Lane Group Flow (vph)	39	104	0	882	1095	0	25	1470	554	387	1695	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Prot			Perm		Free	Prot		
Protected Phases		4		3	8			6		5	2	
Permitted Phases	4						6		Free			
Actuated Green, G (s)	22.1	22.1		44.4	72.5		54.8	54.8	160.0	12.9	73.8	
Effective Green, g (s)	22.1	22.1		44.4	72.5		54.8	54.8	160.0	12.9	73.8	
Actuated g/C Ratio	0.14	0.14		0.28	0.45		0.34	0.34	1.00	0.08	0.46	
Clearance Time (s)	6.5	6.5		6.0	6.5		7.2	7.2		6.1	7.2	
Vehicle Extension (s)	2.0	2.0		4.0	2.0		5.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	246		962	757		47	1224	1812	280	1643	
v/s Ratio Prot		0.06		0.25	c0.66			c0.41		c0.11	0.48	
v/s Ratio Perm	0.11						0.18		0.31			
v/c Ratio	0.83	0.42		0.92	1.45		0.53	1.20	0.31	1.38	1.03	
Uniform Delay, d1	67.1	63.1		56.0	43.8		42.3	52.6	0.0	73.6	43.1	
Progression Factor	1.00	1.00		0.63	0.46		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	67.2	0.4		1.6	201.5		37.0	98.5	0.4	192.7	30.8	
Delay (s)	134.3	63.6		36.8	221.5		79.3	151.1	0.4	266.3	73.9	
Level of Service	F	E		D	F		E	F	A	F	E	
Approach Delay (s)		81.8			141.8			109.5			109.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	119.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	132.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	181	204	165	159	10	1599	837	860	1065
v/c Ratio	0.62	0.87	0.86	0.60	0.23	0.21	1.04	0.46	1.08	0.44
Control Delay	126.5	105.6	92.9	63.1	17.0	86.8	79.6	0.8	110.6	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	105.6	92.9	63.1	17.0	86.8	79.6	0.8	110.6	13.0
Queue Length 50th (ft)	30	187	101	161	36	11	~953	0	~513	236
Queue Length 95th (ft)	#86	#316	m#188	m254	m107	34	#1092	0	#648	330
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	45	222	236	276	705	47	1531	1812	800	2414
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.82	0.86	0.60	0.23	0.21	1.04	0.46	1.08	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	157	10	188	31	267	9	1471	770	791	961	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.88	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	171	10	204	34	290	10	1599	837	860	1045	20
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	28	180	0	204	165	159	10	1599	837	860	1064	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		pt+ov	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases									Free			
Actuated Green, G (s)	3.2	17.7		11.9	28.4	67.7	1.6	65.3	160.0	39.3	105.1	
Effective Green, g (s)	3.2	17.7		11.9	28.4	67.7	1.6	65.3	160.0	39.3	105.1	
Actuated g/C Ratio	0.02	0.11		0.07	0.18	0.42	0.01	0.41	1.00	0.25	0.66	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	36	206		253	277	721	18	1459	1812	852	2341	
v/s Ratio Prot	0.02	c0.10		c0.06	0.11	0.09	0.01	c0.45		c0.25	0.30	
v/s Ratio Perm									0.46			
v/c Ratio	0.78	0.87		0.81	0.60	0.22	0.56	1.10	0.46	1.01	0.45	
Uniform Delay, d1	78.0	70.1		72.9	60.5	29.4	78.8	47.4	0.0	60.4	13.4	
Progression Factor	1.00	1.00		0.84	0.87	0.67	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	66.9	30.3		17.3	2.2	0.1	32.3	54.4	0.8	33.2	0.3	
Delay (s)	144.9	100.4		78.3	55.0	19.9	111.1	101.7	0.8	93.5	13.7	
Level of Service	F	F		E	E	B	F	F	A	F	B	
Approach Delay (s)		106.3			53.4			67.2			49.4	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	60.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	32	92	723	495	456	21	1204	454	317	1390
v/c Ratio	0.64	0.66	0.82	0.93	0.60	0.40	0.84	0.25	0.80	0.75
Control Delay	125.5	81.8	38.2	45.4	10.7	97.0	50.8	0.3	84.6	34.9
Queue Delay	0.0	0.0	1.8	14.3	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	125.5	81.8	40.0	59.7	11.2	97.0	50.8	0.3	84.6	34.9
Queue Length 50th (ft)	34	81	332	470	131	22	618	0	171	650
Queue Length 95th (ft)	#99	141	m417	m#696	m146	#62	720	0	#253	750
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	50	219	904	561	793	53	1426	1812	397	1859
Starvation Cap Reductn	0	0	75	63	95	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.87	0.99	0.65	0.40	0.84	0.25	0.80	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	55	29	665	220	655	19	1108	418	292	1249	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	32	60	32	723	239	712	21	1204	454	317	1358	32
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	32	79	0	723	495	456	21	1204	454	317	1389	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		pt+ov	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases									Free			
Actuated Green, G (s)	3.2	11.4		41.5	51.7	71.6	2.4	61.4	160.0	19.9	81.0	
Effective Green, g (s)	3.2	11.4		41.5	51.7	71.6	2.4	61.4	160.0	19.9	81.0	
Actuated g/C Ratio	0.02	0.07		0.26	0.32	0.45	0.02	0.38	1.00	0.12	0.51	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	36	127		899	533	771	27	1372	1812	431	1803	
v/s Ratio Prot	0.02	c0.04		0.21	c0.30	0.26	0.01	c0.34		0.09	c0.39	
v/s Ratio Perm									0.25			
v/c Ratio	0.89	0.62		0.80	0.93	0.59	0.78	0.88	0.25	0.74	0.77	
Uniform Delay, d1	78.2	72.2		55.4	52.4	33.2	78.5	45.8	0.0	67.5	32.0	
Progression Factor	1.00	1.00		0.59	0.56	0.30	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	104.6	6.6		3.0	13.6	0.4	81.9	8.2	0.3	5.5	3.2	
Delay (s)	182.8	78.9		35.9	42.8	10.2	160.4	54.0	0.3	73.1	35.2	
Level of Service	F	E		D	D	B	F	D	A	E	D	
Approach Delay (s)		105.7			31.0			40.8			42.2	
Approach LOS		F			C			D			D	

Intersection Summary			
HCM Average Control Delay	39.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	35	220	249	200	194	12	1950	1021	1049	1298
v/c Ratio	0.78	1.04	1.06	0.72	0.28	0.21	1.24	0.56	1.39	0.54
Control Delay	153.1	139.3	128.8	62.6	14.6	84.6	153.0	1.3	227.1	14.9
Queue Delay	0.0	13.9	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Total Delay	153.1	153.3	128.8	62.6	14.6	84.6	153.0	2.3	227.1	14.9
Queue Length 50th (ft)	37	~248	~127	191	123	13	~1328	0	~749	318
Queue Length 95th (ft)	#110	#428	m#216	m#277	m127	37	#1461	0	#887	446
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	45	211	234	279	686	56	1570	1812	756	2400
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	8	0	0	0	0	0	505	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.08	1.06	0.72	0.28	0.21	1.24	0.78	1.39	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	191	12	229	38	325	11	1794	939	965	1172	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.88	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	208	12	249	41	353	12	1950	1021	1049	1274	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	35	219	0	249	200	194	12	1950	1021	1049	1297	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		pt+ov	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases									Free			
Actuated Green, G (s)	3.2	18.0		11.8	28.6	65.9	2.0	67.1	160.0	37.3	104.5	
Effective Green, g (s)	3.2	18.0		11.8	28.6	65.9	2.0	67.1	160.0	37.3	104.5	
Actuated g/C Ratio	0.02	0.11		0.07	0.18	0.41	0.01	0.42	1.00	0.23	0.65	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	36	210		251	279	702	22	1499	1812	808	2328	
v/s Ratio Prot	0.02	c0.12		c0.07	0.13	0.11	0.01	c0.55		c0.30	0.36	
v/s Ratio Perm									0.56			
v/c Ratio	0.97	1.04		0.99	0.72	0.28	0.55	1.30	0.56	1.30	0.56	
Uniform Delay, d1	78.4	71.0		74.1	61.9	31.2	78.5	46.4	0.0	61.4	15.1	
Progression Factor	1.00	1.00		0.76	0.77	0.53	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	138.2	73.9		52.8	6.7	0.1	24.9	140.4	1.3	143.3	0.5	
Delay (s)	216.5	144.9		109.4	54.2	16.5	103.4	186.8	1.3	204.7	15.6	
Level of Service	F	F		F	D	B	F	F	A	F	B	
Approach Delay (s)		154.8			64.2			123.0			100.1	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	109.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	112	882	605	557	25	1470	554	387	1696
v/c Ratio	0.87	0.74	0.99	1.09	0.78	0.56	1.04	0.31	1.04	0.93
Control Delay	172.4	91.1	72.7	83.7	22.6	117.6	80.4	0.4	123.8	46.5
Queue Delay	0.0	0.3	14.7	47.2	16.5	0.0	0.0	0.0	0.0	0.0
Total Delay	172.4	91.4	87.4	130.8	39.1	117.6	80.4	0.5	123.8	46.5
Queue Length 50th (ft)	42	103	439	~392	186	26	~867	0	~224	888
Queue Length 95th (ft)	#123	#205	m401	m#292	m172	#77	#1006	0	#336	#1068
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	45	151	888	555	712	45	1418	1812	373	1827
Starvation Cap Reductn	0	0	43	52	151	0	0	0	0	0
Spillback Cap Reductn	0	1	0	0	0	0	0	130	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.75	1.04	1.20	0.99	0.56	1.04	0.33	1.04	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	67	36	811	269	800	23	1352	510	356	1524	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	39	73	39	882	292	870	25	1470	554	387	1657	39
RTOR Reduction (vph)	0	12	0	0	24	158	0	0	0	0	1	0
Lane Group Flow (vph)	39	100	0	882	581	399	25	1470	554	387	1695	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Prot	Prot		Free	Prot		
Protected Phases	7	4		3	8	8	1	6		5	2	
Permitted Phases									Free			
Actuated Green, G (s)	4.0	12.5		41.0	51.5	51.5	2.4	61.9	160.0	18.8	80.4	
Effective Green, g (s)	4.0	12.5		41.0	51.5	51.5	2.4	61.9	160.0	18.8	80.4	
Actuated g/C Ratio	0.02	0.08		0.26	0.32	0.32	0.02	0.39	1.00	0.12	0.50	
Clearance Time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0	2.0	3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	45	139		888	530	554	27	1383	1812	407	1790	
v/s Ratio Prot	0.02	0.06		c0.25	c0.35	0.23	0.01	c0.41		0.11	c0.48	
v/s Ratio Perm									0.31			
v/c Ratio	0.87	0.72		0.99	1.10	0.72	0.93	1.06	0.31	0.95	0.95	
Uniform Delay, d1	77.7	72.0		59.4	54.2	47.9	78.7	49.1	0.0	70.1	37.8	
Progression Factor	1.00	1.00		1.12	0.83	0.77	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	84.0	13.8		7.6	46.2	0.4	139.9	42.8	0.4	31.9	12.0	
Delay (s)	161.8	85.8		74.0	91.1	37.2	218.6	91.9	0.4	102.0	49.7	
Level of Service	F	F		E	F	D	F	F	A	F	D	
Approach Delay (s)		105.4			69.0			68.7			59.4	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM Average Control Delay	66.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	181	204	165	159	10	1599	837	860	1065
v/c Ratio	0.62	0.87	0.86	0.60	0.09	0.21	1.04	0.46	1.08	0.44
Control Delay	126.5	105.6	92.9	63.1	0.1	86.8	79.6	0.8	110.6	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	105.6	92.9	63.1	0.1	86.8	79.6	0.8	110.6	13.0
Queue Length 50th (ft)	30	187	101	161	0	11	~953	0	~513	236
Queue Length 95th (ft)	#86	#316	m#188	m254	m0	34	#1092	0	#648	330
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	45	222	236	276	1705	47	1531	1812	800	2414
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.82	0.86	0.60	0.09	0.21	1.04	0.46	1.08	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	157	10	188	31	267	9	1471	770	791	961	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.88	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	171	10	204	34	290	10	1599	837	860	1045	20
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	28	180	0	204	165	159	10	1599	837	860	1064	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		custom	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases						3 7 6			Free			
Actuated Green, G (s)	3.2	17.7		11.9	28.4	142.7	1.6	65.3	160.0	39.3	105.1	
Effective Green, g (s)	3.2	17.7		11.9	28.4	136.7	1.6	65.3	160.0	39.3	105.1	
Actuated g/C Ratio	0.02	0.11		0.07	0.18	0.85	0.01	0.41	1.00	0.25	0.66	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	36	206		253	277	1457	18	1459	1812	852	2341	
v/s Ratio Prot	0.02	c0.10		c0.06	0.11	0.05	0.01	c0.45		c0.25	0.30	
v/s Ratio Perm						0.05			0.46			
v/c Ratio	0.78	0.87		0.81	0.60	0.11	0.56	1.10	0.46	1.01	0.45	
Uniform Delay, d1	78.0	70.1		72.9	60.5	1.9	78.8	47.4	0.0	60.4	13.4	
Progression Factor	1.00	1.00		0.84	0.87	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	66.9	30.3		17.3	2.2	0.0	32.3	54.4	0.8	33.2	0.3	
Delay (s)	144.9	100.4		78.3	55.0	1.9	111.1	101.7	0.8	93.5	13.7	
Level of Service	F	F		E	E	A	F	F	A	F	B	
Approach Delay (s)		106.3			48.0			67.2			49.4	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	60.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	32	92	723	495	456	21	1204	454	317	1390
v/c Ratio	0.64	0.66	0.82	0.93	0.26	0.40	0.82	0.25	0.89	0.75
Control Delay	125.5	81.8	37.7	45.0	0.2	97.0	48.7	0.3	96.6	34.9
Queue Delay	0.0	0.0	1.8	14.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	125.5	81.8	39.6	59.3	0.2	97.0	48.7	0.3	96.6	34.9
Queue Length 50th (ft)	34	81	332	470	0	22	618	0	171	650
Queue Length 95th (ft)	#99	141	m417	m#696	m0	#62	720	0	#253	750
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	50	219	904	561	1708	53	1467	1812	366	1859
Starvation Cap Reductn	0	0	75	63	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.87	0.99	0.27	0.40	0.82	0.25	0.87	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	55	29	665	220	655	19	1108	418	292	1249	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	32	60	32	723	239	712	21	1204	454	317	1358	32
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	32	79	0	723	495	456	21	1204	454	317	1389	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		custom	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases						3 7 6			Free			
Actuated Green, G (s)	3.2	11.4		41.5	51.7	142.7	2.4	63.3	160.0	18.0	81.0	
Effective Green, g (s)	3.2	11.4		41.5	51.7	136.7	2.4	63.3	160.0	18.0	81.0	
Actuated g/C Ratio	0.02	0.07		0.26	0.32	0.85	0.02	0.40	1.00	0.11	0.51	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	36	127		899	533	1471	27	1414	1812	390	1803	
v/s Ratio Prot	0.02	c0.04		0.21	c0.30	0.14	0.01	c0.34		c0.09	0.39	
v/s Ratio Perm						0.13			0.25			
v/c Ratio	0.89	0.62		0.80	0.93	0.31	0.78	0.85	0.25	0.81	0.77	
Uniform Delay, d1	78.2	72.2		55.4	52.4	2.3	78.5	44.1	0.0	69.4	32.0	
Progression Factor	1.00	1.00		0.59	0.55	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	104.6	6.6		3.0	13.6	0.0	81.9	6.6	0.3	11.6	3.2	
Delay (s)	182.8	78.9		35.5	42.4	2.3	160.4	50.7	0.3	80.9	35.2	
Level of Service	F	E		D	D	A	F	D	A	F	D	
Approach Delay (s)		105.7			28.5			38.5			43.7	
Approach LOS		F			C			D			D	

Intersection Summary			
HCM Average Control Delay	38.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	35	220	249	200	194	12	1950	1021	1049	1298
v/c Ratio	0.78	1.04	1.06	0.72	0.11	0.21	1.24	0.56	1.39	0.54
Control Delay	153.1	139.3	128.8	62.6	0.1	84.6	153.0	1.3	227.1	14.9
Queue Delay	0.0	13.9	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Total Delay	153.1	153.3	128.8	62.6	0.1	84.6	153.0	2.3	227.1	14.9
Queue Length 50th (ft)	37	~248	~127	191	0	13	~1328	0	~749	318
Queue Length 95th (ft)	#110	#428	m#216	m#277	m0	37	#1461	0	#887	446
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	45	211	234	279	1705	56	1570	1812	756	2400
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	8	0	0	0	0	0	505	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.08	1.06	0.72	0.11	0.21	1.24	0.78	1.39	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	191	12	229	38	325	11	1794	939	965	1172	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	0.88	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1866		3400	1559	1705	1787	3574	1812	3467	3564	
Peak-hour factor, PHF	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	208	12	249	41	353	12	1950	1021	1049	1274	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	35	219	0	249	200	194	12	1950	1021	1049	1297	0
Heavy Vehicles (%)	1%	1%	1%	3%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		custom	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases						3 7 6			Free			
Actuated Green, G (s)	3.2	18.0		11.8	28.6	142.7	2.0	67.1	160.0	37.3	104.5	
Effective Green, g (s)	3.2	18.0		11.8	28.6	136.7	2.0	67.1	160.0	37.3	104.5	
Actuated g/C Ratio	0.02	0.11		0.07	0.18	0.85	0.01	0.42	1.00	0.23	0.65	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	36	210		251	279	1457	22	1499	1812	808	2328	
v/s Ratio Prot	0.02	c0.12		c0.07	0.13	0.05	0.01	c0.55		c0.30	0.36	
v/s Ratio Perm						0.06			0.56			
v/c Ratio	0.97	1.04		0.99	0.72	0.13	0.55	1.30	0.56	1.30	0.56	
Uniform Delay, d1	78.4	71.0		74.1	61.9	1.9	78.5	46.4	0.0	61.4	15.1	
Progression Factor	1.00	1.00		0.76	0.77	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	138.2	73.9		52.8	6.7	0.0	24.9	140.4	1.3	143.3	0.5	
Delay (s)	216.5	144.9		109.4	54.2	1.9	103.4	186.8	1.3	204.7	15.6	
Level of Service	F	F		F	D	A	F	F	A	F	B	
Approach Delay (s)		154.8			59.8			123.0			100.1	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	109.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	112	882	605	557	25	1470	554	387	1696
v/c Ratio	0.87	0.75	0.93	1.09	0.32	0.56	1.08	0.31	1.04	0.96
Control Delay	172.4	92.1	39.1	79.9	0.0	117.6	93.7	0.4	125.2	51.9
Queue Delay	0.0	80.7	8.6	48.2	0.0	0.0	0.0	0.0	11.1	0.0
Total Delay	172.4	172.9	47.7	128.1	0.0	117.6	93.7	0.5	136.3	51.9
Queue Length 50th (ft)	42	103	422	~733	0	26	~897	0	~225	917
Queue Length 95th (ft)	#123	174	m401	m#667	m0	#77	#1036	0	#337	#1100
Internal Link Dist (ft)		261		454			395			540
Turn Bay Length (ft)	120		200		200	90		330	345	
Base Capacity (vph)	45	178	944	555	1722	45	1367	1812	371	1774
Starvation Cap Reductn	0	0	57	53	0	0	0	0	0	0
Spillback Cap Reductn	0	78	0	0	0	0	0	108	11	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	1.12	0.99	1.21	0.32	0.56	1.08	0.33	1.08	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	67	36	811	269	800	23	1352	510	356	1524	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	16	12	12	16	12	12	12
Total Lost time (s)	4.0	6.5		6.0	6.5	6.5	4.0	7.2	4.0	6.1	7.2	
Lane Util. Factor	1.00	1.00		0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.95		1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1783		3467	1648	1722	1787	3574	1812	3467	3562	
Peak-hour factor, PHF	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)	39	73	39	882	292	870	25	1470	554	387	1657	39
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	39	100	0	882	605	557	25	1470	554	387	1695	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		custom	Prot		Free	Prot		
Protected Phases	7	4		3	8	8 5	1	6		5	2	
Permitted Phases						3 7 6			Free			
Actuated Green, G (s)	4.0	12.3		43.6	53.9	152.8	2.4	59.6	160.0	18.7	78.0	
Effective Green, g (s)	4.0	12.3		43.6	53.9	142.7	2.4	59.6	160.0	18.7	78.0	
Actuated g/C Ratio	0.02	0.08		0.27	0.34	0.89	0.02	0.37	1.00	0.12	0.49	
Clearance Time (s)	4.0	6.5		6.0	6.5		4.0	7.2		6.1	7.2	
Vehicle Extension (s)	3.0	2.0		4.0	2.0		3.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	45	137		945	555	1536	27	1331	1812	405	1736	
v/s Ratio Prot	0.02	0.06		c0.25	c0.37	0.16	0.01	c0.41		0.11	c0.48	
v/s Ratio Perm						0.16			0.31			
v/c Ratio	0.87	0.73		0.93	1.09	0.36	0.93	1.10	0.31	0.96	0.98	
Uniform Delay, d1	77.7	72.2		56.8	53.0	1.4	78.7	50.2	0.0	70.2	40.1	
Progression Factor	1.00	1.00		0.63	0.70	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	84.0	15.2		2.0	43.8	0.0	139.9	58.5	0.4	32.9	16.7	
Delay (s)	161.8	87.4		37.8	81.0	1.4	218.6	108.7	0.4	103.1	56.8	
Level of Service	F	F		D	F	A	F	F	A	F	E	
Approach Delay (s)		106.6			40.7			80.8			65.4	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM Average Control Delay	63.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT

Pavement Evaluation

Mr. Dustin O'Quinn
Project Manager
LAI Engineering
1800 Parkway Place, Suite 720
Marietta, Georgia 30067

January 31, 2013

Report of
Pavement Exploration Services
South Marietta Parkway and Powder Springs Street
Marietta, Georgia
Geo-Hydro Project Number 130050.00

Dear Mr. O'Quinn:

Geo-Hydro Engineers, Inc. has completed the work for the above referenced project. Our exploration was performed within South Marietta Parkway between Atlanta Street and Powder Springs Street. The exploration consisted of determining the thickness of the existing asphalt layers, as well as the thickness of graded aggregate base (GAB). The results of our findings have been summarized in a table included with this report. A coring location plan is also included with this report.

* * * * * * *

We appreciate the opportunity to work with you on this project. Please contact us if you have any questions.

Sincerely,

GEO-HYDRO ENGINEERS, INC.

Thomas M. Baglivo, E.I.T.
Project Manager
tbaglivo@geohydro.com

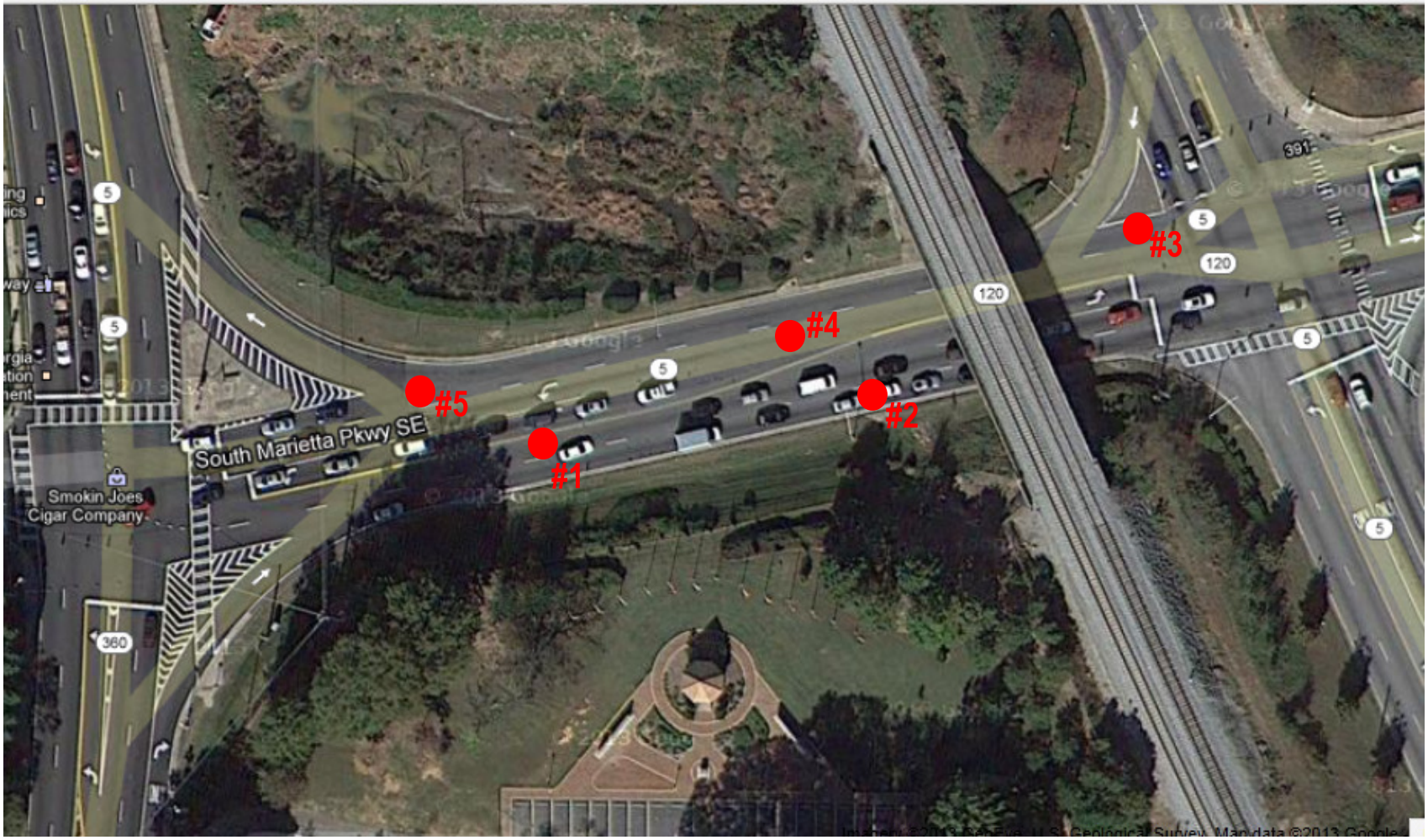
Michael C. Woody, P.E.
Senior Project Manager
mwoody@geohydro.com

130050.00 S. Marietta Parkway Pavement Exploration Report

Core Number	Total Asphalt Thickness, Inches	Asphalt Layer Thickness, Inches/Mix Type (Top to Bottom)	GAB Thickness, Inches
1*	14½	5¾ 9.5 mm 3½ 19 mm	10+
2	11½	2 12.5 mm 3¾ 19 mm 5¾ 25 mm	10+
3	11¾	1¾ 12.5 mm 1¼ 9.5 mm 8¾ 19 mm	10+
4	14	2½ 12.5 mm 3 9.5 mm 5¼ 19 mm 3¼ 25 mm	10+
5	15	2½ 12.5 mm 1½ 9.5 mm 5¼ 19 mm 5¾ 25 mm	10+

***Core #1 not fully recovered**

CORE LOCATION PLAN



GEO HYDRO ENGINEERS

Flexible Pavement Design Analysis

PI Number	0010879	**County(s)**	Cobb
Project Number	N/A	**Design Name**	SOUTH MARIETTA PARKWAY (EXISTING)
Project Description	SR 360/POWDER SPRINGS ST AT SR120/ SOUTH MARIETTA PKWY. INTERSECTION		

Traffic Data (AADTs are one-way)						**Miscellaneous Data**	
Initial Design Year	2014	**Initial AADT, VPD**	24,160	**24 Hour Truck %**	3.00	**Lanes in one direction**	2
Final Design Year	2034	**Final AADT, VPD**	29,480	**SU Truck %**	3.00	**Curb & Gutter/Barrier**	Yes
		Mean AADT, VPD	26,820	**MU Truck %**	0.00		

Design Data					
Lane Distribution Factor (%)	80.00	**Soil Support Value**	2.00	**Single Unit ESAL**	0.40
Terminal Serviceability Index	2.50	**Regional Factor**	1.80	**Multiple Unit ESAL**	1.50
		User Defined 18-KIP ESAL	1.06	**Calculated 18-KIP ESAL**	0.40
Non-Standard Value Comment					

Design Loading (User Provided 18-KIP ESAL Factor)					
Mean AADT, VPD	**LDF (%)**	**Vehicle Type**	**Volume (%)**	**ESAL Factor**	**Daily ESAL**
26,820	80.00	24 Hour Truck	3.00	1.06	683
				Total Design Period ESALs	4,985,900

Proposed Flexible Full Depth Pavement Structure				
Course	**Material**	**Thickness (inches)**	**Structural Coefficient**	**Structural Value**
Course 1	12.5 mm Superpave	2.50	0.4400	1.10
Course 2	9.5 mm Type I Superpave	1.50	0.4400	0.66
Course 3	19 mm Superpave	0.50	0.4400	0.22
		4.75	0.3000	1.43
Course 4	25 mm Superpave	5.75	0.3000	1.73
Course 5	Graded Aggregate Base	10.00	0.1600	1.60

Required SN	6.13	**Proposed pavement is 9.83% Overdesigned**	**Proposed SN**	6.73

Design Remarks	

Prepared By 2/1/2013 12:50 PM

DUSTIN O'QUINN **Date**

Recommended By

District Engineer **Date**

Approved By

State Pavement Engineer **Date**

Filename: C:\Users\Dustino\Desktop\GDOT Pavement Design v1.0.xlsm

GDOT Flexible and Rigid Pavement Design - Version 1.0 August 2012

Flexible Pavement Design Analysis

PI Number	0010879	**County(s)**	Cobb
Project Number	N/A	**Design Name**	SOUTH MARIETTA PARKWAY (EXISTING)
Project Description	SR 360/POWDER SPRINGS ST AT SR120/ SOUTH MARIETTA PKWY. INTERSECTION		

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Final Design Year	2034	**Final AADT, VPD**	29,480	**SU Truck %**	3.00	**Curb & Gutter/Barrier**	Yes
		Mean AADT, VPD	26,820	**MU Truck %**	0.00		

Design Data					
Lane Distribution Factor (%)	80.00	**Soil Support Value**	2.00	**Single Unit ESAL**	0.40
Terminal Serviceability Index	2.50	**Regional Factor**	1.80	**Multiple Unit ESAL**	1.50
		User Defined 18-KIP ESAL	1.06	**Calculated 18-KIP ESAL**	0.40
Non-Standard Value Comment					

Design Loading (User Provided 18-KIP ESAL Factor)					
Mean AADT, VPD	**LDF (%)**	**Vehicle Type**	**Volume (%)**	**ESAL Factor**	**Daily ESAL**
26,820	80.00	24 Hour Truck	3.00	1.06	683
				Total Design Period ESALs	4,985,900

Proposed Flexible Full Depth Pavement Structure				
Course	**Material**	**Thickness (inches)**	**Structural Coefficient**	**Structural Value**
Course 1	12.5 mm Superpave	2.50	0.4400	1.10
Course 2	9.5 mm Type I Superpave	2.00	0.4400	0.88
		1.00	0.3000	0.30
Course 3	19 mm Superpave	5.25	0.3000	1.58
Course 4	25 mm Superpave	3.25	0.3000	0.98
Course 5	Graded Aggregate Base	10.00	0.1600	1.60

Required SN	6.13	**Proposed pavement is 4.93% Overdesigned**	**Proposed SN**	6.43

Design Remarks	

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DUSTIN O'QUINN **Date**

Recommended By

District Engineer **Date**

Approved By

State Pavement Engineer **Date**

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Flexible Pavement Design Analysis

PI Number	0010879	**County(s)**	Cobb
Project Number	N/A	**Design Name**	SOUTH MARIETTA PARKWAY
Project Description	SR 360/POWDER SPRINGS ST AT SR120/ SOUTH MARIETTA PKWY. INTERSECTION		

Traffic Data (AADTs are one-way)						**Miscellaneous Data**	
Initial Design Year	2014	**Initial AADT, VPD**	24,160	**24 Hour Truck %**	3.00	**Lanes in one direction**	2
Final Design Year	2034	**Final AADT, VPD**	29,480	**SU Truck %**		**Curb & Gutter/Barrier**	Yes
		Mean AADT, VPD	26,820	**MU Truck %**			

Design Data					
Lane Distribution Factor (%)	80.00	**Soil Support Value**	2.00	**Single Unit ESAL**	0.40
Terminal Serviceability Index	2.50	**Regional Factor**	1.80	**Multiple Unit ESAL**	1.50
		User Defined 18-KIP ESAL	1.06	**Calculated 18-KIP ESAL**	0.00
Non-Standard Value Comment					

Design Loading (User Provided 18-KIP ESAL Factor)					
Mean AADT, VPD	**LDF (%)**	**Vehicle Type**	**Volume (%)**	**ESAL Factor**	**Daily ESAL**
26,820	80.00	24 Hour Truck	3.00	1.06	683
				Total Design Period ESALs	4,985,900

Proposed Flexible Full Depth Pavement Structure				
Course	**Material**	**Thickness (inches)**	**Structural Coefficient**	**Structural Value**
Course 1	12.5 mm Superpave	1.50	0.4400	0.66
Course 2	19 mm Superpave	3.00	0.4400	1.32
Course 3	25 mm Superpave	3.00	0.3000	0.90
Course 4	25 mm Superpave	5.00	0.3000	1.50
Course 5	Graded Aggregate Base	12.00	0.1600	1.92
Required SN	6.13	**Proposed pavement is 2.81% Overdesigned**	**Proposed SN**	6.30

Design Remarks	

Prepared By 1/31/2013 4:47 PM

DUSTIN O'QUINN **Date**

Recommended By

District Engineer **Date**

Approved By

State Pavement Engineer **Date**

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GDOT Flexible and Rigid Pavement Design - Version 1.0 August 2012

ATTACHMENT

Meeting Minutes

P.I. # 0010879 – SR 120/South Marietta Parkway at SR 360/Powder Springs Street

Project Kick off Meeting – January 23, 2013

Meeting Summary

- Notice to proceed date is the date of Project Framework Agreement (PFA): January 7, 2013.
- City of Marietta to submit schedule for Project Management Plan including duration of activities and begin and end dates to be used as baseline schedule. Project completion date should have contingency of at least six months within the same fiscal year.
- The schedule should include concept report, environmental report as well the need for railroad coordination.
- The concept report is expected to be streamlined version with limited scopes.
- The consultant should use Preliminary Field Plan Review (PFPR) and Final Field Plan Review (FFPR) checklists. Plan on including FFPR checklists in the PFPR so that FFPR may not be needed if everything is accounted for in the PFPR.
- Assess environmental impact and screen items under Categorical Exclusion (CE) to be used as justification for PCE. However, build schedule as if it is full CE
- Consultant should follow GDOT's Design Policy Manual as a frame in project delivery.
- Evaluation of existing pavement and pavement design for new lane in the widening should be included. If GDOT's area office has report on existing pavement at this location, that can be used as well. The next meeting for GDOT's pavement team is around March 27, 2013 and the meeting takes place quarterly.
- Public involvement will be required on this project. Discussion of this project as agenda item on a city council meeting open to the public will suffice for this purpose.
- Meet project's DBE goals

Action Items

Item #	Descriptions	Responsible Person
1	Submit Project Schedule	Challa Bonja (Marietta)
2	Provide sample cover letter for invoice	Peter Emmanuel (GDOT)
3	Provide sample railroad coordination form, PFPR & FFPR Checklists	Peter Emmanuel (GDOT)
4	Ensure Environmental Document is submitted	Challa Bonja (via consultant)
5	Evaluation of existing pavement and design of new pavement	Challa Bonja (via consultant)
6	Make sure there is public involvement for the project	Jim Wilgus (Marietta)
7	DBE goals for the project (percentage)	Peter Emmanuel (GDOT)