ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0010943 **OFFICE** Design Policy & Support

Fulton County
GDOT District 7 - Metro Atlanta **DATE** 6/23/2014
SR 92 @ SR 14 ALT Intersection
Improvements

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

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

Attachment

DISTRIBUTION:

Glenn Bowman, Director of Engineering
Joe Carpenter, Director of P3/Program Delivery
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery
Albert Shelby, State Program Delivery Engineer
Bobby Hilliard, Program Control Administrator
Cindy VanDyke, State Transportation Planning Administrator
Hiral Patel, State Environmental Administrator
Kathy Zahul, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Mike Bolden, State Utilities Engineer
Jeff Fletcher, Statewide Location Bureau Chief
Andy Casey, State Roadway Design Engineer
Attn: Mac Cranford, Design Group Manager
Rachel Brown, District Engineer
Scott Lee, District Preconstruction Engineer
Patrick Allen, District Utilities Engineer
Peter Emmanuel, Project Manager
BOARD MEMBER - 13th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
LIMITED SCOPE PROJECT CONCEPT REPORT

Project Type: Reconstruction
GDOT District: 7
Federal Route Number: N/A
P.I. Number: 0010943
County: Fulton
State Route Number: 92,14 ALT

The project proposes to install a right turn lane, dual left turn lane, and a 4' median by widening symmetrically on existing right of way southbound on SR 92/Cambellton Fairbun Rd at SR 14 ALT/South Fulton Parkway.

Submitted for approval:

Rachel S. Brown — District Engineer — 04-02-2014 — DATE

Albert Shelby — State Program Delivery Engineer — 4-3-14 — DATE

[illegible] B. Emmanuel — GDOT Project Manager — 4-3-2014 — DATE

Recommendation for approval:

HIRAL PATEL*/EKP — State Environmental Administrator — 4/25/2014 — DATE

State Traffic 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

CINDY VANDYKE*/EKP — State Transportation Planning Administrator — 4/8/2014 — DATE

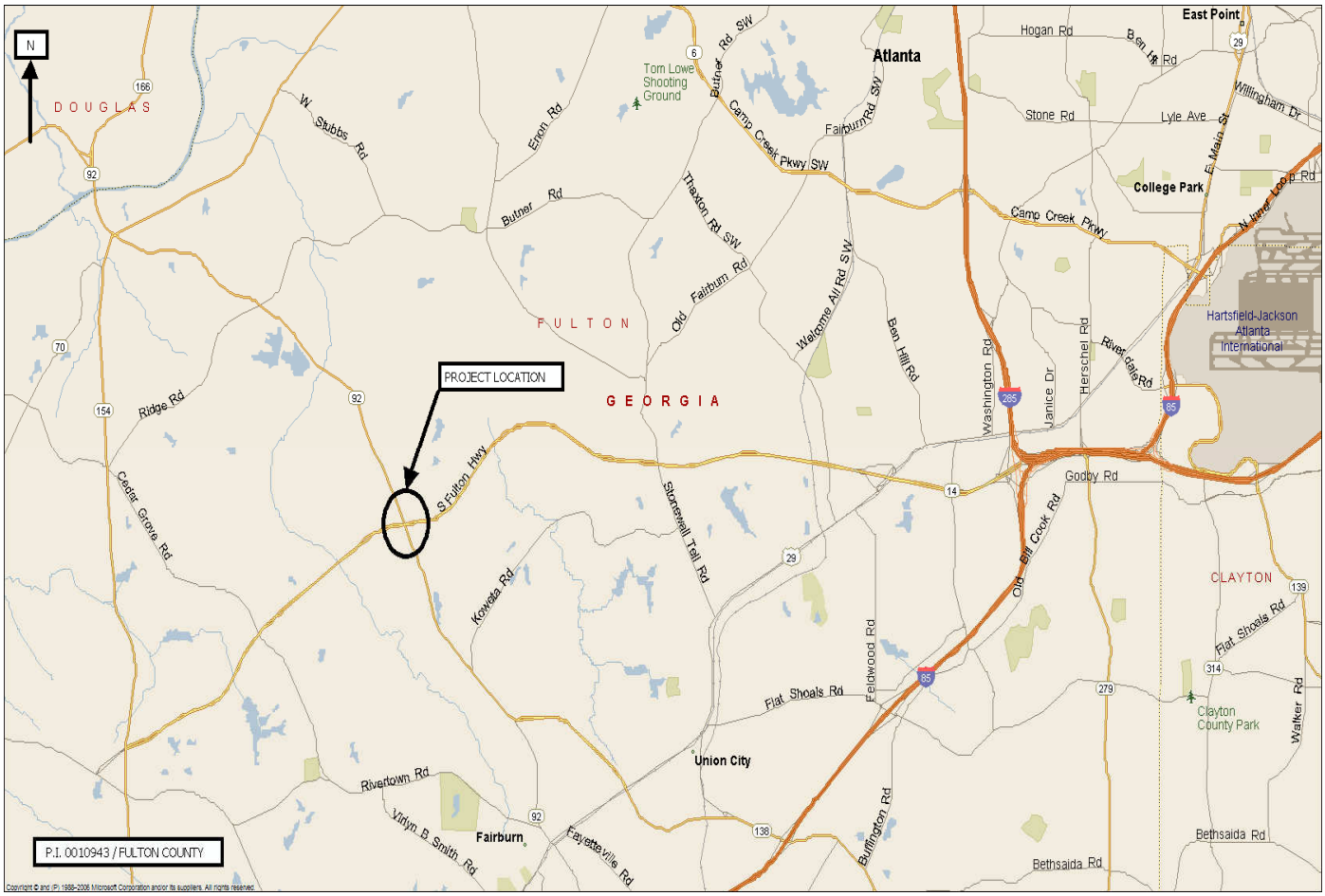
Approval:

Concur: [illegible] — GDOT Director of Engineering — 6/16/14 — DATE

Approve: [illegible] — GDOT Chief Engineer — 6/19/14 — DATE

*- RECOMMENDATION ON FILE

PROJECT LOCATION



SR 92 @ SR 14 ALT/South Fulton Pkwy
Intersection Improvement
PI # 0010943
Fulton County

PLANNING & BACKGROUND DATA

Project Justification Statement:

The intersection of State Route (SR) 92 and County Road (SR) 14 ALT/South Fulton Pkwy in Fulton County was proposed as a minor intersection improvement project. The proposed project is to be included in the GDOT Operational Improvement Lump Sum Program from the Office of Traffic Operations. This proposed project was presented to and approved by the Operational Improvement Committee as a QUICK project.

SR 92 is a 55 mph urban minor arterial that serves as a major thoroughfare and connector route for residential, business, and commercial areas in Fairburn/Union City and Douglas County. SR 92 is a 5 lane undivided highway with a two way left turn lane. At the intersection, the northbound approach has one through lane, a left turn lane, and a right turn lane and the southbound approach has two through lanes and one left turn lane. SR 14 ALT/South Fulton Pkwy is a 55 mph urban principal arterial connecting I-285 with residential and industrial areas southwest of Atlanta. At the intersection, South Fulton Pkwy is a four lane median divided highway with left turn and right turn lanes at each approach. The intersection is currently signalized and has a protected-permissive left turn phase on SR 92 southbound and protected only phases on both approaches of SR 14 ALT/South Fulton Pkwy. The project limits should not extend more than 800 feet from the center of the intersection along the SR 92 southbound and 150 feet on all other approaches.

This project was proposed by the District 7 Traffic Operations staff, which provided a brief summary of the intersection operations. Field observations from the District showed excessive congestion, with over 1000 feet of queuing on the southbound approach of SR 92 during the PM peak hour. An investigation showed nearly 390 vehicles turning left in the peak hour period, with only 360 feet of storage in one left turn lane. The project proposes to install a 300’ right turn lane, a second left turn lane, and a 4’ median by widening symmetrically on existing right of way. A high-level capacity analysis showed that proposed configuration will decrease the intersection delay from 68 seconds (LOS E) to 52 seconds (LOS D) during the PM peak hour. The proposed improvements will also increase the storage for left and right turning vehicles by 250 feet preventing queues from blocking the through travel lanes. This project will increase the capacity of the intersection during the heaviest peak periods with minimal impact to right-of-way and roadway geometry.

Due to the minor project scope, the right-of-way constraints, existing intersection features (existing median and signal operations) and the scope approved by the Operational Improvement Committee, a roundabout was not recommended for this location.

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

Description of the proposed project:

The intersection of State Route 92 Cambellton Fairburn Rd at SR 14 ALT/South Fulton Pkwy is located in Southwest Fulton County. This project proposes to install on on SR 92 SB a 300’ right turn lane with a 10’ paved shoulder, a second left turn lane, and 175’ - 4’ raised median. The 4’ raised median shall discourage drivers to make a left turn onto SR 92.

Federal Oversight: ☒ Exempt ☐ State Funded ☐ Other

MPO: Atlanta Regional Commission (ARC) MPO Project ID: N/A

Regional Commission: Atlanta Regional Commission RC Project ID: N/A

Congressional District(s): 13

Projected Traffic: ADT
Current Year (2014): 17,390 Open Year (2016): 17,564 Design Year (2036): 19,310
Traffic Projections Performed by: District 7 Design

Functional Classification: State Route 92/Campbellton-Fairburn Rd - Urban Principal Arterial
SR 14 ALT/South Fulton Pkwy - Urban Principal Arterial

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

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

DESIGN AND STRUCTURAL DATA

Features: State Route 92/Campbellton-Fairburn Rd

Feature	Existing	Standard*	Proposed
Typical Section	**Rural / Urban**	**Rural / Urban**	**Rural / Urban**
- **Number of Lanes**	**5**	**5**	**5 - 8**
- **Lane Width(s)**	**12**	**12**	**12**
- **Median Width & Type**	**Flush**	**Flush**	**Flush**
- **Outside Shoulder or Border Area Width**	**10-12 Feet**	**10-16 Feet**	**10-12 Feet**
- **Outside Shoulder Slope**	**2 - 6%**	**2 - 6%**	**2 - 6%**
- **Sidewalks**	**5 Feet**	**5 Feet**	**5 Feet**
Posted Speed	**55**		**55**
Design Speed	**55**	**55**	**55**
Min Horizontal Curve Radius	**N/A**	**N/A**	**N/A**
Superelevation Rate	**2%**	**6%**	**2%**
Grade	**2%**	**6%**	**2%**
Access Control	**Permitted**	**Permitted**	**Permitted**
Right-of-Way Width	**Varies**	**Varies**	**Varies**
Maximum Grade – Crossroad	**2%**	**6%**	**2%**
Design Vehicle	**WB-40**	**WB-40**	**WB-40**

*According to current GDOT design policy if applicable

Major Structures: N/A

Major Interchanges/Intersections: SR 92/Campbellton-Fairburn and SR 14 ALT/South Fulton Pkwy

Utility Involvements: GA Power – Electric Distribution, AGL – Gas, AT&T – Telephone, Fulton County - Water & Sewer, & Comcast – Cable TV

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

SUE Required: ☒ No ☐ Yes

Railroad Involvement: None

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:		2
Displacements anticipated:	Total:	0
	Businesses:	0
	Residences:	0
	Other:	0

Transportation Management Plan [TMP] Required: ☐ No ☒ Yes

If Yes: Project classified as: ☒ Non-Significant ☐ Significant

TMP Components Anticipated: ☒ TTC/SP 150 ☐ TO ☐ PI

Design Exceptions to FHWA/AASHTO controlling criteria anticipated: None

Design Variances to GDOT Standard Criteria anticipated: Anticipate a design variance shall be needed due to the skew angle of the intersection being 66.24 degrees.

ENVIRONMENTAL DATA

Anticipated Environmental Document:

GEPA: ☐ **NEPA:** ☒ CE ☐ PCE

Project Air Quality:

Is the project located in a PM 2.5 Non-attainment area?	☐ No	☒ Yes
Is the project located in an Ozone Non-attainment area?	☐ No	☒ Yes
Is a Carbon Monoxide hotspot analysis required?	☒ No	☐ Yes

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

Environmental Permits/Variances/Commitments/Coordination anticipated:

Permit/ Variance/ Commitment/ Coordination Anticipated	YES	NO	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	☒	☐	Project will require an NOI for over 1 acre of disturbance.
8. FEMA	☐	☒	
9. Cemetery Permit	☐	☒	
10. Other Permits	☐	☒	
11. Other Commitments	☐	☒	
12. Other Coordination	☐	☒	

NEPA/GEPA Comments & Information:

Ecology: No adverse impacts anticipated.

History: No adverse impacts anticipated.

Archeology: No adverse impacts anticipated.

Air & Noise: No adverse impacts anticipated.

Public Involvement: None

Major Stakeholders: Traveling public, GDOT, & Fulton County

CONSTRUCTION

Issues potentially affectin constructability/construction schedule: The long eared bat potentially might be seen during construction that might affect the schedule.

Early Completion Incentives recommended for consideration: ☒ No ☐ Yes

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	GDOT
Design	GDOT
Right-of-Way Acquisition	GDOT
Utility Relocation	City of Atlanta Water/Fulton County Sewer/ Georgia Power Distribution/Atlanta Gas Light/Greystone Power/ AT&T
Letting to Contract	GDOT
Construction Supervision	GDOT
Providing Material Pits	Contractor
Providing Detours	N/A
Environmental Studies, Documents, and Permits	GDOT
Environmental Mitigation	GDOT
Construction Inspection & Materials Testing	GDOT

Lighting required: ☒ No ☐ Yes

Other projects in the area: None

Other coordination to date: None

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	ROW	Reimbursable Utility	CST*	Environmental Mitigation	Total Cost
By Whom	GDOT	GDOT	GA Power ATL Gas Light	GDOT	N/A	
$ Amount	$263,766.29	$316,000.00	$100,000.00	$734,174.57	N/A	$1,413,940.86
Date of Estimate	6/5/2012	7/24/2013	4/20/14	4/2/2014	N/A	

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

ALTERNATIVES

Preferred Alternative: The project proposes to install a right turn lane, dual left turn lane, and a 4' median by widening to the southbound side of SR 92/Cambellton Fairbun Rd.

Estimated Property Impacts:	**0**	**Estimated Total Cost:**	**$ 1,413,940.86**
Estimated ROW Cost:	**$316,000.00**	**Estimated CST Time:**	**8-12 months**

Rationale: This alternative was selected because the cost of this alternative was more favorable than the other alternatives listed below.

No-Build Alternative: Leave the existing intersection as is.			
Estimated Property Impacts:	**0**	**Estimated Total Cost:**	**$0.00**
Estimated ROW Cost:	**$0.00**	**Estimated CST Time:**	**0 Months**
Rationale: This alternative was not selected because it does not meet the goals outlined in the Project Justification Statement.			

Alternative 1: Add an additional 350' left turn lane on both approached SR 14 ALT/South Fulton Pkwy.			
Estimated Property Impacts:	**3**	**Estimated Total Cost:**	**$1,8000,000.00**
Estimated ROW Cost:	**$500,000.00**	**Estimated CST Time:**	**8-12 months**
Rationale*:* This option will increase the property impacts, and increase the ROW cost by $184,000.00. This alternative doesn't meet the project justification statement, budget, and Traffic Engineering study.			

Comments/additional information: None

Attachments:

1. Concept Layout
2. Typical sections
3. Cost Estimates
4. Crash summaries
5. Utility Cost Estimate
6. Traffic Engineering Study

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GPLOT-V8
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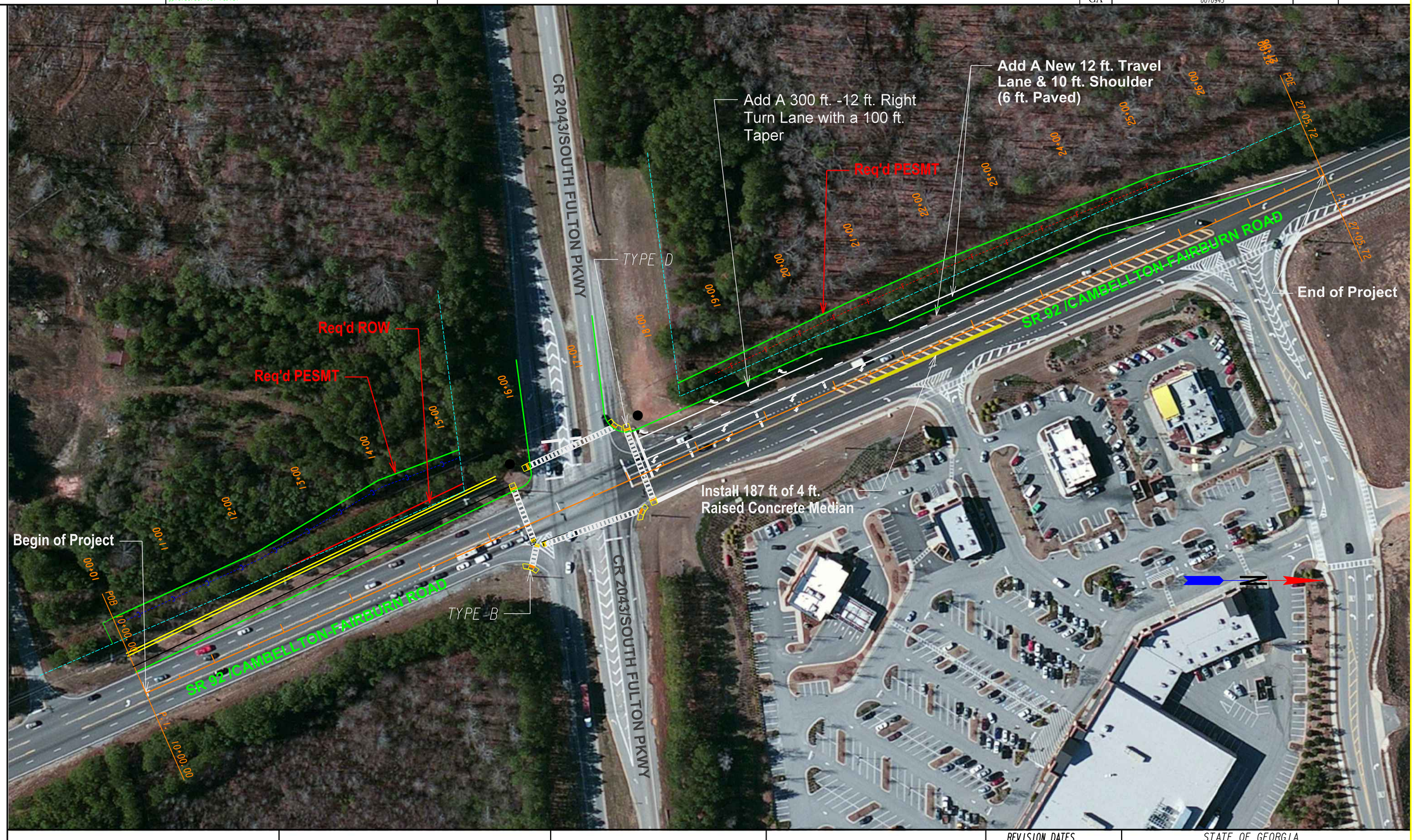
T:\DT DESIGN PROJECTS\0010943 - 92 @ S Fulton Pkwy\Concept\Design Files\10943 Concept Layout 2.dgn

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	0010943		



GEORGIA
DEPARTMENT OF TRANSPORTATION

SCALE IN FEET
0 60 120 240

REVISION DATES		

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: DISTRICT 7 DESIGN

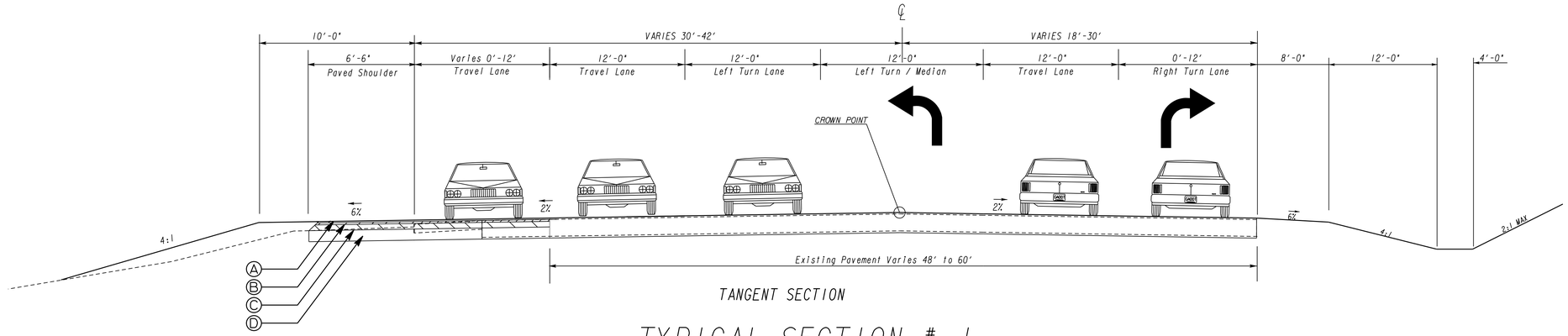
MAINLINE PLAN

SR 92 @ S FULTON PKWY

DRAWING No.
13-000

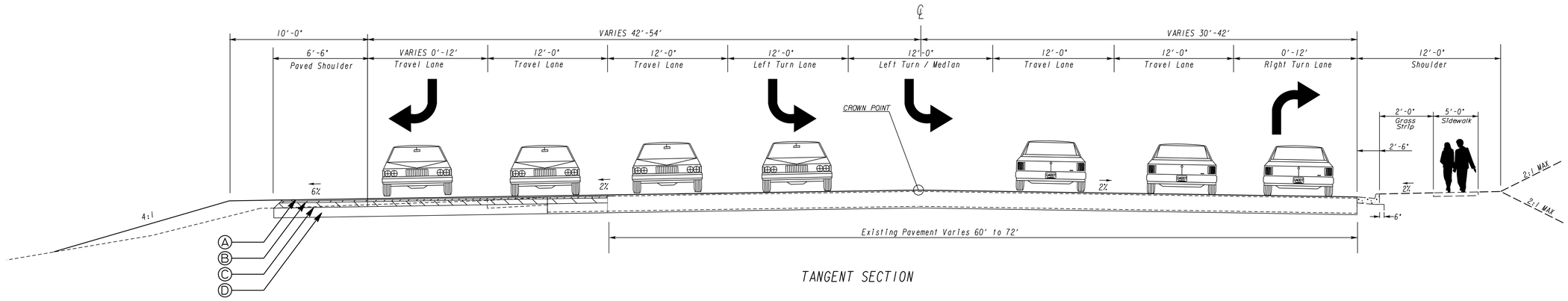
4/27/2012 GPLN

5/21/2014 2:52:52 PM USER:jethompson	GPLOT-V8 gplotborder-v81-P0.tbl	T:\07 DESIGN PROJECTS\0010943 - 92 @ S Fulton Pkwy\Design\DGN\0010943_05-001.dgn	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
			GA	0010943		



TANGENT SECTION

TYPICAL SECTION # 1
STA 10+00 TO STA. 17+00
SR 92/CAMBELLTON-FAIRBURN ROAD



TANGENT SECTION

TYPICAL SECTION # 2
STA 17+00 TO STA. 20+40

SR 92/CAMBELLTON-FAIRBURN ROAD

REQUIRED PAVEMENT

Ⓐ RECYCLED ASHPALT CONCRETE, 9.5mm, 137.5 lb/sy
Ⓑ RECYCLED ASHPALT CONCRETE, 19 mm, 220 lb/sy
Ⓒ RECYCLED ASHPALT CONCRETE, 25 mm, 880 lb/sy
Ⓓ 12" GRADED AGGREGATE BASE

GEORGIA
DEPARTMENT OF TRANSPORTATION

NOT TO SCALE

REVISION DATES

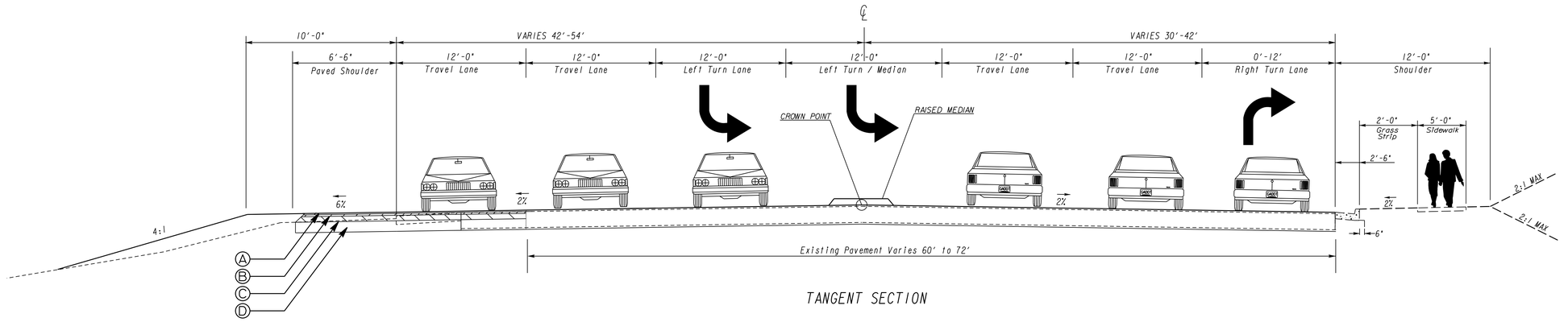
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: DISTRICT 7 PRECONSTRUCTION

TYPICAL SECTIONS

SR 92 @ CR 2043 / SOUTH FULTON PKWY

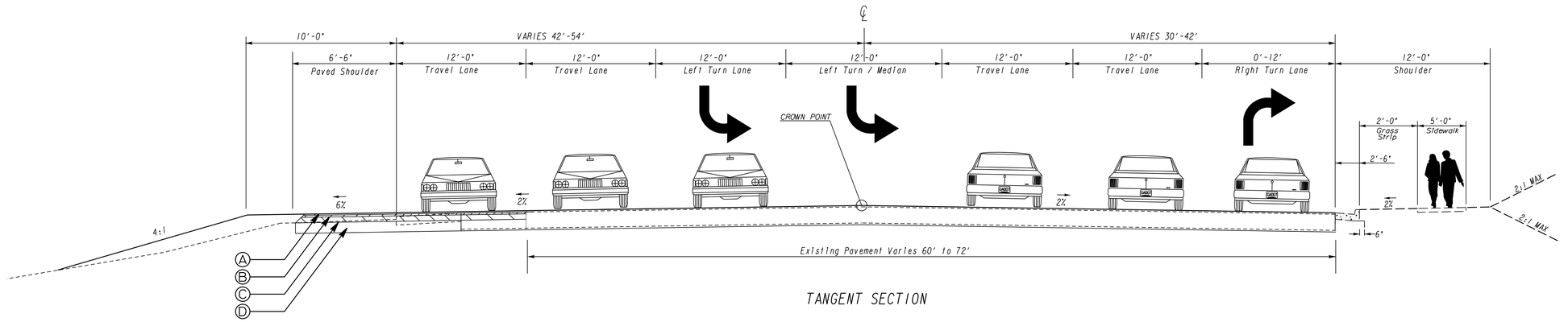
DRAWING No. 05-001

12/14/2012 GPLN



TANGENT SECTION

TYPICAL SECTION # 3
STA 20+40 TO STA. 22+27
SR 92/CAMBELLTON-FAIRBURN ROAD



TANGENT SECTION

TYPICAL SECTION # 3
STA 22+27 TO STA. 27+05.72
SR 92/CAMBELLTON-FAIRBURN ROAD

REQUIRED PAVEMENT

Ⓐ RECYCLED ASHPALT CONCRETE, 9.5mm, 137.5 lb/sy
Ⓑ RECYCLED ASHPALT CONCRETE, 19 mm, 220 lb/sy
Ⓒ RECYCLED ASHPALT CONCRETE, 25 mm, 880 lb/sy
Ⓓ 12" GRADED AGGREGATE BASE

GEORGIA
DEPARTMENT OF TRANSPORTATION

NOT TO SCALE

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: DISTRICT 7 PRECONSTRUCTION

TYPICAL SECTIONS

SR 92 @ CR 2043 / SOUTH FULTON PKWY

DRAWING No. 05-002

12/14/2012 GPLN

Processed Date: 4/2/14

DETAILED COST ESTIMATE

Georgia Department of Transportation

Job: 0010943_JT

JOB NUMBER *0010943_JT* **FED/STATE PROJECT NUMBER**

SPEC YEAR: *13*

DESCRIPTION: *SR 92 @ CR 2043/SOUTH FULTON PKWY*

ITEMS FOR JOB 0010943_JT

0010 - ROADWAY

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0005	150-1000	1.000	LS	$75,000.00000	TRAFFIC CONTROL - P.I # 0010943	$75,000.00
0010	210-0100	1.000	LS	$150,000.00000	GRADING COMPLETE - P.I # 0010943	$150,000.00
0015	310-1101	1749.000	TN	$23.95483	GR AGGR BASE CRS, INCL MATL	$41,897.00
0020	402-3121	842.000	TN	$78.43954	RECYL AC 25MM SP,GP1/2,BM&HL	$66,046.09
0025	402-3130	273.000	TN	$110.39410	RECYL AC 12.5MM SP,GP2,BM&HL	$30,137.59
0030	402-3190	518.000	TN	$83.46163	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	$43,233.12
0035	413-1000	125.000	GL	$5.01365	BITUM TACK COAT	$626.71
0215	441-0104	131.000	SY	$20.09417	CONC SIDEWALK, 4 IN	$2,632.34
0180	446-3500	1400.000	LF	$6.00000	HIGH STRENGTH PVMT REINF FABRIC - P.I # 0010943	$8,400.00
0165	641-1200	65.000	LF	$22.27802	GUARDRAIL, TP W	$1,448.07
0155	641-5001	1.000	EA	$873.65414	GUARDRAIL ANCHORAGE, TP 1	$873.65
0075	641-5012	1.000	EA	$1,803.85863	GUARDRAIL ANCHORAGE, TP 12	$1,803.86
					SUBTOTAL FOR ROADWAY:	**$422,098.43**

0020 - SIGNING AND MARKING

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0210	610-9001	2.000	EA	$174.20363	REM SIGN	$348.41
0040	636-1020	36.000	SF	$16.39540	HWY SGN,TP1MAT,REFL SH TP3	$590.23
0160	636-1033	72.000	SF	$19.78758	HWY SIGNS, TP1MAT,REFL SH TP 9	$1,424.71
0045	636-2070	60.000	LF	$9.31007	GALV STEEL POSTS, TP 7	$558.60
0220	639-4001	2.000	EA	$30,000.00000	STRAIN POLE, TP I	$60,000.00
0225	647-1000	1.000	LS	$150,000.00000	TRAF SIGNAL INSTALLATION NO - P.I # 0010943	$150,000.00
0245	652-9002	204.000	SY	$3.10690	TRAFFIC STRIPE, YELLOW	$633.81
0230	653-0120	7.000	EA	$71.54367	THERM PVMT MARK, ARROW, TP 2	$500.81
0235	653-0210	5.000	EA	$48.00000	THERM PVMT MARK, WORD , TP 1	$240.00
0050	653-1501	2310.000	LF	$0.58343	THERMO SOLID TRAF ST 5 IN, WHI	$1,347.72
0145	653-1502	1400.000	LF	$0.60296	THERMO SOLID TRAF ST, 5 IN YEL	$844.14
0060	653-1504	100.000	LF	$3.08511	THERM SOLID TRAF STRIPE,12,WH	$308.51
0250	653-1804	1944.000	LF	$1.83646	THERM SOLID TRAF STRIPE, 8,WH	$3,570.08
0170	653-3501	2000.000	GLF	$0.63695	THERMO SKIP TRAF ST, 5 IN, WHI	$1,273.90
0175	653-6004	323.000	SY	$4.00873	THERM TRAF STRIPING, WHITE	$1,294.82
0240	654-1001	24.000	EA	$4.33261	RAISED PVMT MARKERS TP 1	$103.98
0065	654-1003	75.000	EA	$3.29855	RAISED PVMT MARKERS TP 3	$247.39
0255	654-1003	49.000	EA	$4.18776	RAISED PVMT MARKERS TP 3	$205.20
					SUBTOTAL FOR SIGNING AND MARKING:	**$223,492.31**

File Location: Div of Preconstruction > CES

DETAILED COST ESTIMATE

Georgia Department of Transportation

Job: 0010943_JT

0030 - EROSION CONTROL

Line Number	ITEM	QUANTITY	UNITS	PRICE	DESCRIPTION	AMOUNT
0080	163-0240	15.000	TN	$306.88459	MULCH	$4,603.27
0085	163-0300	2.000	EA	$1,231.67356	CONSTRUCTION EXIT	$2,463.35
0090	163-0528	200.000	LF	$3.45677	CONSTR AND REM FAB CK DAM -TP C SLT FN	$691.35
0095	165-0030	1500.000	LF	$0.69731	MAINT OF TEMP SILT FENCE, TP C	$1,045.97
0100	165-0041	100.000	LF	$1.48996	MAINT OF CHECK DAMS - ALL TYPES	$149.00
0105	167-1000	2.000	EA	$156.54476	WATER QUALITY MONITORING AND SAMPLING	$313.09
0110	167-1500	12.000	MO	$327.90874	WATER QUALITY INSPECTIONS	$3,934.90
0115	171-0030	3000.000	LF	$3.31495	TEMPORARY SILT FENCE, TYPE C	$9,944.85
0120	700-6910	1.000	AC	$614.48493	PERMANENT GRASSING	$614.48
0125	700-7000	5.000	TN	$98.15104	AGRICULTURAL LIME	$490.76
0130	700-8000	2.000	TN	$499.99489	FERTILIZER MIXED GRADE	$999.99
0135	700-8100	29.000	LB	$2.81101	FERTILIZER NITROGEN CONTENT	$81.52
0140	716-2000	1500.000	SY	$1.16893	EROSION CONTROL MATS, SLOPES	$1,753.40
					SUBTOTAL FOR EROSION CONTROL:	**$27,085.93**

TOTALS FOR JOB 0010943_JT

ITEMS COST:	**$672,676.67**
COST GROUP COST:	**$0.00**
ESTIMATED COST:	**$672,676.67**
CONTINGENCY PERCENT:	**0.00**
ENGINEERING AND INSPECTION:	**0.05**
ESTIMATED COST WITH CONTINGENCY AND E&I:	**$706,310.50**

CRASH REPORT SUMMARY TABLE

Crash Report Summary Table: FULTON COUNTY, SR 92 @ CR 2043 / South Fulton Pkwy				
Collision Type	Year of Accident			
	2009	2010	2011	2012
Rear End	11	14	16	16
Angle	2	1	3	3
Sideswipe	2	3	3	1
Not A Collision With A Motor Vehicle	1	2	5	4
Injuries	5	13	16	12
Fatalities	0	0	0	0

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTER-DEPARTMENT CORRESPONDENCE

FROM: Patrick Allen, P.E.
District Utilities Engineer

DATE: May 20, 2014

TO: Peter Emmanuel, Project Manager

SUBJECT: PRELIMINARY UTILITY COST ESTIMATE

As requested by your office, we are furnishing you with a Preliminary Cost Estimate for each utility with facilities potentially located with the project limits.

FACILITY OWNER	REIMBURSABLE	NON-REIMBURSABLE	TOTAL
City of Atlanta Water	$0.00	$0.00	$0.00
Fulton County Sewer	$0.00	$0.00	$0.00
Georgia Power Distribution	$0.00	$44,000.00	$44,000.00
Atlanta Gas Light	$0.00	$56,000.00	$56,000.00
Greystone Power	$0.00	$0.00	$0.00
AT&T	$0.00	$0.00	$0.00
			$0.00
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			$0.00
			$0.00
TOTAL	**$0.00**	$100,000.00	$100,000.00

This estimate is based upon the current information. We will provide an updated estimate when the plans are further developed.

If you have any questions, please contact Patrick Allen at 770-986-1117

RSB/PA

Cc: Michael J. Bolden, State Utilities Engineer

GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 7/24/2013
Revised:

Project: 0010943
County: Dekalb/Fulton
PI: 0010943

Description: SR 92 @ S. Fulton PKWY
Project Termini: SR 92 @ S. Fulton PKWY

Existing ROW: Varies
Parcels: 2
Required ROW: Varies

Land and Improvements		$184,500.00
Proximity Damage	*$0.00*	
Consequential Damage	*$0.00*	
Cost to Cures	*$0.00*	
Trade Fixtures	*$0.00*	
Improvements	*$50,000.00*	
Valuation Services		$4,000.00
Legal Services		$38,850.00
Relocation		$4,000.00
Demolition		$50,000.00
Administrative		$34,000.00
TOTAL ESTIMATED COSTS		$315,350.00
TOTAL ESTIMATED COSTS (ROUNDED)		***$316,000.00***

Preparation Credits	Hours	Signature

Prepared By: LaShone Alexander CG#: 286999 07/24/2013 (DATE)
Approved By: LaShone Alexander CG#: 286999 07/24/2013 (DATE)

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

PROJ. NO.	** QUICK PROJECT **	CALL NO.
P.I. NO.	0010943	
DATE	4/2/2014	

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Mar-14	$ 3.293
DIESEL		$ 3.909
LIQUID AC		$ 563.00

Link to Fuel and AC Index:
http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

LIQUID AC ADJUSTMENTS

PA=[((APM-APL)/APL)]xTMTxAPL

Asphalt

Price Adjustment (PA)				**27682.71**	**$ 27,682.71**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	900.80	
Monthly Asphalt Cement Price month project let (APL)			$	563.00	
Total Monthly Tonnage of asphalt cement (TMT)				81.95	

ASPHALT	Tons	%AC	AC ton
Leveling		5.0%	0
12.5 OGFC		5.0%	0
12.5 mm	273	5.0%	13.65
9.5 mm SP		5.0%	0
25 mm SP	848	5.0%	42.4
19 mm SP	518	5.0%	25.9
	1639		**81.95**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$**	**181.36**	**$ 181.36**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	900.80	
Monthly Asphalt Cement Price month project let (APL)			$	563.00	
Total Monthly Tonnage of asphalt cement (TMT)				0.536887615	

Bitum Tack Gals	gals/ton	tons
125	232.8234	0.53688762

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				**0**	**$ -**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	900.80	
Monthly Asphalt Cement Price month project let (APL)			$	563.00	
Total Monthly Tonnage of asphalt cement (TMT)				0	

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.		0.20	0	232.8234	0
Double Surf.Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT	**$ 27,864.07**

PROJ. NO.	** QUICK PROJECT **
P.I. NO.	0010943
DATE	1/24/2014

CALL NO.

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Jan-14	$ 3.240
DIESEL		$ 3.828
LIQUID AC		$ 557.00

Link to Fuel and AC Index:
http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

LIQUID AC ADJUSTMENTS

PA=[((APM-APL)/APL)]xTMTxAPL

Asphalt

Price Adjustment (PA)				**21873.39**	**$ 21,873.39**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	891.20	
Monthly Asphalt Cement Price month project let (APL)			$	557.00	
Total Monthly Tonnage of asphalt cement (TMT)				65.45	

ASPHALT	Tons	%AC	AC ton
Leveling		5.0%	0
12.5 OGFC		5.0%	0
12.5 mm	231	5.0%	11.55
9.5 mm SP		5.0%	0
25 mm SP	616	5.0%	30.8
19 mm SP	462	5.0%	23.1
	1309		**65.45**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$**	**140.67**	**$ 140.67**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	891.20	
Monthly Asphalt Cement Price month project let (APL)			$	557.00	
Total Monthly Tonnage of asphalt cement (TMT)				0.42091989	

Bitum Tack Gals	gals/ton	tons
98	232.8234	0.42091989

PROJ. NO.	** QUICK PROJECT **		CALL NO.
P.I. NO.	0010943		
DATE	1/24/2014		

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				**0**	**$ -**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	891.20	
Monthly Asphalt Cement Price month project let (APL)			$	557.00	
Total Monthly Tonnage of asphalt cement (TMT)				0	

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.		0.20	0	232.8234	0
Double Surf.Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT	**$**	**22,014.06**

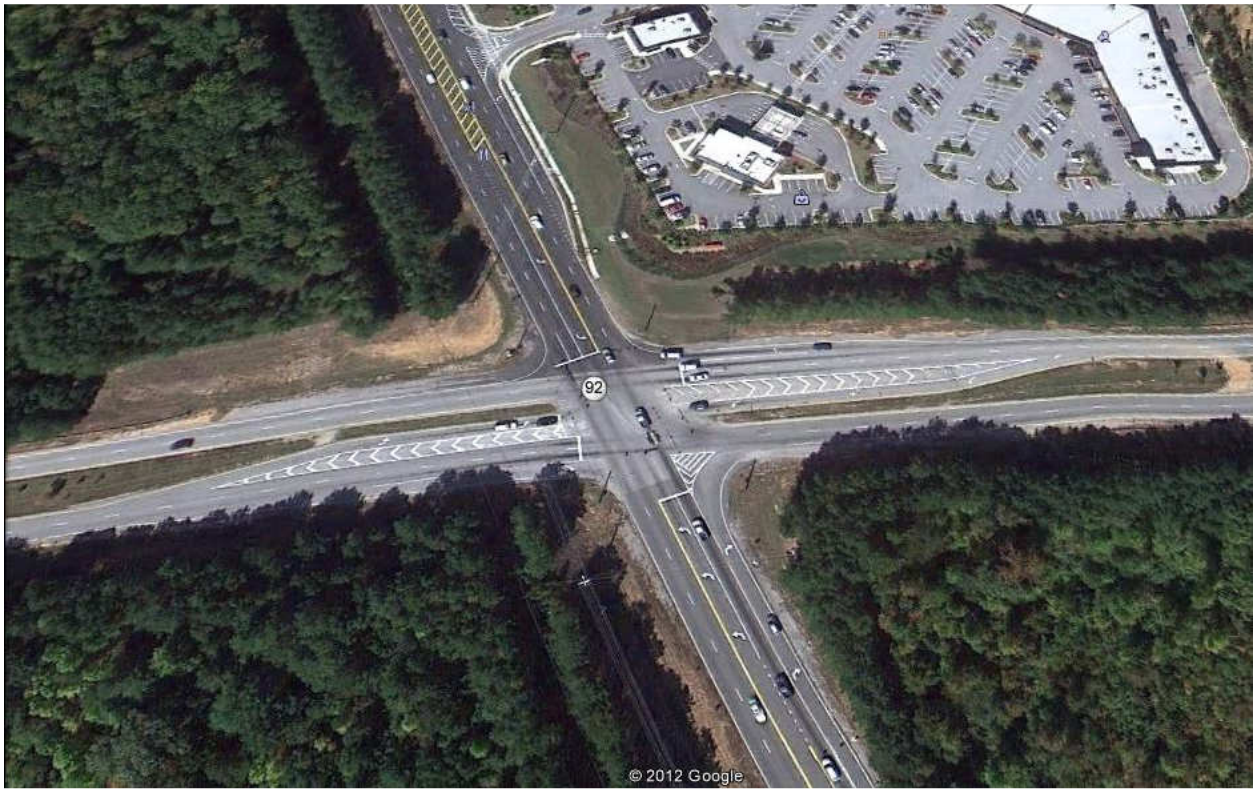
DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

TRAFFIC ENGINEERING REPORT

For the intersection of:
STATE ROUTE 92/CAMPBELLTON-FAIRBURN ROAD @ SR 14 ALT/SOUTH FULTON PKWY

COUNTY of FULTON
At Mile log: 7.90



Report prepared by:
Edlin Regis
Traffic Operations Engineer
5025 New Peachtree Rd
Chamblee, GA 30341

Telephone Number: *(770)986-1775*
FAX Number: *770)770-986-1407*
E-mail Address: *eregis*@dot.ga.gov

Date prepared: 2/16/2012

LOCATION:
This study was performed at the intersection of State Route 92/Campbellton-Fairburn Road and SR 14 ALT/South Fulton Pkwy in Fulton County.

REASON FOR INVESTIGATION:
This traffic study was requested by a Georgia Citizen to determine the cause of crashes on SR92/Campbellton-Fairburn Road and SR 14 ALT/South Fulton Pkwy.

DESCRIPTION OF THE INTERSECTION:

State Route 14ALT/South Fulton Pkwy is a four- lane Principal Arterial that runs east/west in Fulton County between City of Atlanta, Union City and the City of Chattahoochee Hill in Fulton County. State Route 14 Alt/South Fulton Pkwy intersects SR92/Campbellton-Fairburn at a four-legged signalized intersection. The eastbound approach consists of an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. The westbound approach consists of an exclusive left-turn lane, two through lanes and an exclusive right-turn lane. Data obtained from the Department Road Information System comprised that the current ADT is 15,290. State Route 14 Alt serves significant amounts of commuter traffic during the weekday AM and PM peak periods, as well as the regional and local trips throughout the day.

The land use along State Route 14 Alt/South Fulton Pkwy in the study area consists mainly of residential developments with access to retail. There are three Fulton County Schools within 1 miles radius of the intersection. The adjacent land uses at the study intersection include a multi-use Shopping Center with a Publix Supermarket Restaurants, and a Bank. There also an Apartment Complex behind the Shopping Center. There are several undeveloped parcels at the southeast, southwest, and the northeast.

SR92/Campbellton-Fairburn is a two lane Urban Principal Arterial that runs north/south between Cobb County, Fulton County, and Fayette County connecting the City of Acworth Hiram, Douglasville, and Union City. Fairburn road at the intersection with SR14 Alt/South Fulton Pkwy has an exclusive left-turn lane, one through lane, and one exclusive channelized right-turn lane northbound the southbound leg has one exclusive left-turn lane one through lane and one through-right lane. Data obtained from the Department Road Information System comprised that the current ADT is 30,430. SR 92 serves substantial amount of commuter traffic during the AM and PM peak periods, as well as regional local trips throughout the day.

PEAK HOUR VOLUMES: the table below gives the peak hour volumes movement and direction. These peak hour counts are found by using fifteen minute consecutive intervals within the period counted.

	SR 914ALT/South Fulton Pkwy - EB					SR 14ATL/South fulton Pkwy - WB			
Start Time	Left	Thru	Right	App. Total		Left	Thru	Right	App. Total
7:00 to 10:00 AM	215	1513	150	1878		77	277	516	870
3:00 to 6:00 PM	229	448	102	779		213	1319	1190	2722
		SR 92 NB					SR 92 SB		
Start Time	Left	Thru	Right	App. Total		Left	Thru	Right	App. Total
7:00 to 10:00 AM	62	1026	174	1262		817	1299	193	2309
3:00 to 6:00 PM	197	1514	102	1813		555	1364	293	2212

EXISTING TRAFFIC CONTROL:

- State Route 92 @ SR14 Alt Road is currently signalized.
- Adjacent signals are located at Cedar Grove Road 2.00 miles west of the intersection, and at Stonewall Tell Road 3.4 miles east of the intersection

VEHICLE SPEEDS:

- The posted speed limit on SR 14 Alt is 55 MPH.
- The posted speed limit on SR 92 is 55 MPH.

PEDESTRIAN MOVEMENTS:

Pedestrian activity observation was performed during traffic count. Observations indicate that there are no pedestrians

PARKING:

There is no on-street parking at this location. Off-street parking is permitted at the retail businesses in the area.

ACCIDENT HISTORY:

For the years 2006-2008, there were 43 crashes at this intersection (see attached crash list). Of the 43 reported crashes, it is estimated that at least 19 of the crashes are correctable by making minor adjustment in the traffic signal

The tables below summarize the crash history from 2006 to 2009 at the intersection.

2005 Crash Data					
Direction		Rear End	Side Swipe	Angle	Head On
SR14 Alt @ SR 92		3	1	2	0

2006 Crash Data					
		Rear End	Side Swipe	Angle	Head On
		7	0	6	1

SR14 Alt @ SR 92	2007 Crash Data				
		Rear End	Side Swipe	Angle	Head On
		7	1	6	2

SR14 Alt @ SR 92	2008 Crash Data			
Rear End	Side Swipe	Angle	Head On	
5	0	2	0	

SIGHT DISTANCE:
The Intersection has no sight distance issue

ROUNDABOUT ANALYSIS:

A multi lane roundabout analysis was performed using SIDRA for the morning and afternoon peak hour for the design year and design life of 20 years. The analysis shows that for the design year SR14 Alt/South Fulton Pkwy east and west bound will function at a LOS A for the thru and right movements and a LOS B for the thru and Left movements. SR92/Campbellton-Fairburn Road north bound will function at LOS A for the thru and right movements and a LOS B for the thru-left movements, and the south bound will function at LOS B for the thru and right movement and a LOS C for the thru-left movements.
The analysis shows that in year 20 SR14Alt/South Fulton Pkwy east bound will operate at a LOS a for the right turn, LOS F for the thru movement, and LOS F for the thru-left movements. West bound will operate at a LOS A for the right and thru movement and B for the thru-left movement. SR92/Campbellton-Fairburn Road north bound will operate at a LOS B for the right turn, LOS E for the thru movement, and LOS F for the thru-left movements. South bound will operate at a LOS A for the right turn LOS A for the thru movements and a LOS B for the thru-left movements. Overall, the intersection will operate at a LOS B and intersection delay of 20.1 sec for the design year and LOS D and an intersection delay of 61.9 sec for year 20.

CAPACITY ANALYSIS:

The capacity and level of service for the intersection were reevaluated using Synchro 7 traffic analysis software. Synchro software provides delay estimation and calculates level of service (LOS). The existing conditions capacity analysis using the highest peak hour (AM peak) indicates the intersection operates at LOS E, intersection delay of 68 sec, and v/c ratio of 1.25. However, the propose conditions capacity analysis using the same time period indicates the intersection will operate at LOS D, intersection delay of 52 sec, and v/c ratio of 0.78.

CONCLUSIONS:

The conclusion is based on the collected data, intersection capacity analysis, accident data, and filed observations:

This intersection was evaluated using Synchro 7 for capacity analysis and Sidra for a roundabout analysis for existing and proposed conditions to compare with the roundabout analysis for the design year and future growth. The analysis shows that modify the intersection and the existing by adding a dual left turn, an exclusive channelized right turn lane south bound, and convert the north and south bound left turn phase from protected permissive to protected only phase. This modification to the intersection will eliminate the right angle crashes. Furthermore, it would improve the overall operation of the intersection.

RECOMMENDATIONS:

Based on an analysis of traffic data, accident data, intersection operations and field observations, the following signal adjustment and operational improvements listed below are recommended.

1. It is recommended that SR 92/Campbellton-Fairburn Road south bound be widening for a dual left turn lanes and an exclusive channelized right turn lane.

2. It is recommended that protected only signal phase be added on SR92/Campbellton-Fairburn Road for the north and south bound left turn.

3. It is recommended that a 2 ft concrete median be installed on SR92/Campbellton-Fairburn Road from South Fulton Pkwy to Southwood Road on the north leg

PREPARED BY: _____ DATE: _____
District Traffic Operations Engineer

RECOMMENDED BY: _____ DATE: _____
District Traffic Operations Manager

RECOMMENDED BY: _____ DATE: _____
District Traffic Engineer

RECOMMENDED BY: _____ DATE: _____
State Traffic Engineer

RECOMMENDED BY: _____ DATE: _____
Director of Operations

cc: file

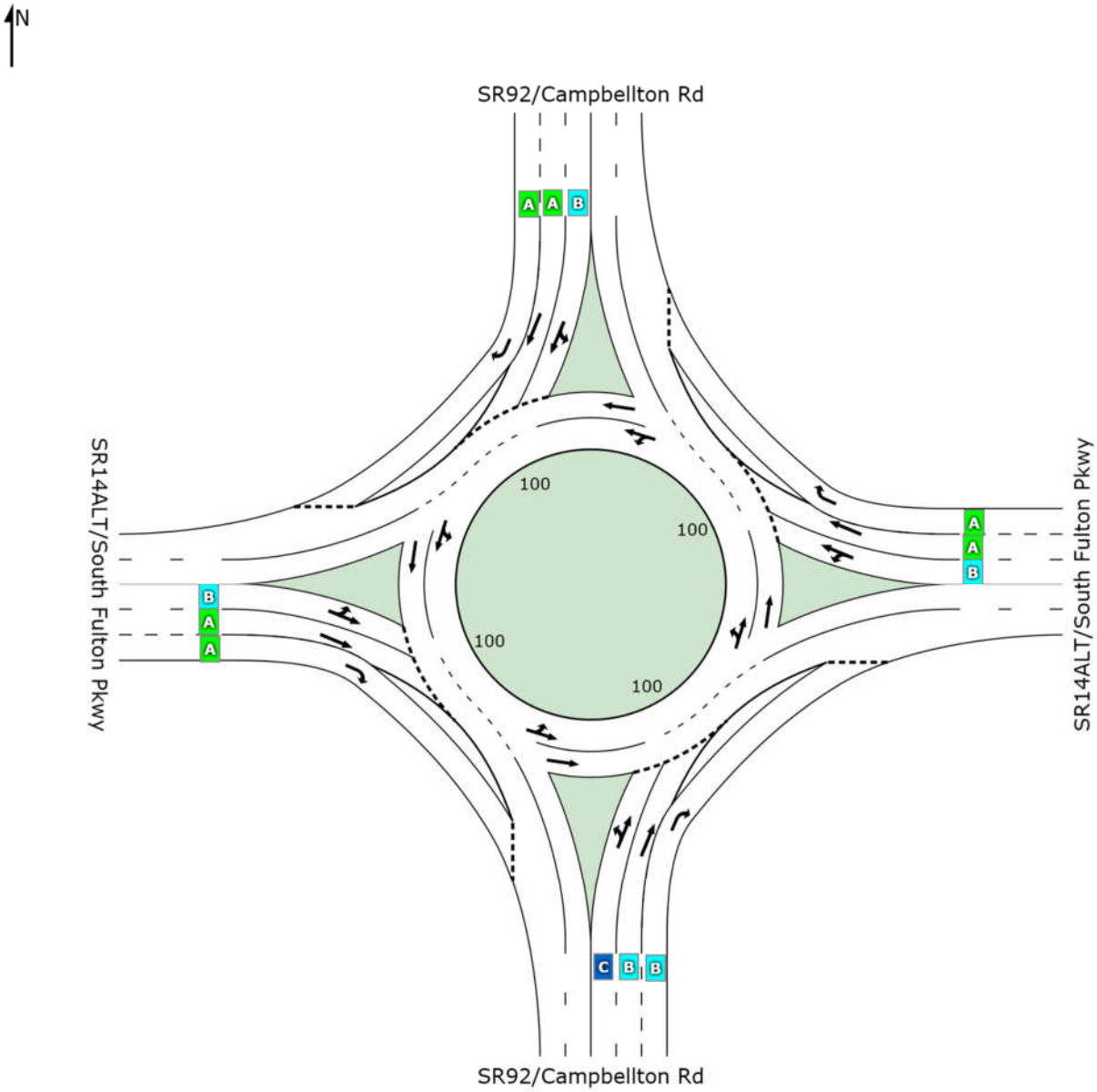
Traffic Engineering Report Appendix

- Traffic Count Summary Sheets.
- Synchro Analysis
- Sidra Roundabout Analysis
- Accident Diagram

APENDIX A

PEAK HOUR SIDRA ANALYSIS LEVELS OF SERVICE AND MOVEMENT SUMMARY DESIGN YEAR

LEVEL OF SERVICE SUMMARY DESIGN YEAR



Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	ft		per veh	mph
South: SR92/Campbellton Rd											
3	L	24	3.0	0.431	20.1	LOS C	2.5	64.3	0.84	1.02	26.2
8	T	462	3.0	0.431	13.6	LOS B	2.8	71.2	0.85	0.98	28.6
18	R	107	3.0	0.161	10.5	LOS B	0.9	22.7	0.78	0.85	30.4
Approach		592	3.0	0.431	13.3	LOS B	2.8	71.2	0.84	0.96	28.8
East: SR14ALT/South Fulton Pkwy											
1	L	37	3.0	0.115	15.3	LOS C	0.5	12.4	0.58	0.88	28.7
6	T	105	3.0	0.115	8.2	LOS A	0.5	12.4	0.58	0.69	31.5
16	R	253	3.0	0.256	7.9	LOS A	1.3	33.8	0.59	0.65	31.2
Approach		396	3.0	0.256	8.7	LOS A	1.3	33.8	0.59	0.68	31.0
North: SR92/Campbellton Rd											
7	L	366	3.0	0.367	13.1	LOS B	2.1	53.9	0.39	0.71	29.2
4	T	561	3.0	0.367	5.9	LOS A	2.1	54.8	0.38	0.49	32.6
14	R	76	3.0	0.058	6.5	LOS A	0.3	6.6	0.26	0.49	32.7
Approach		1003	3.0	0.367	8.6	LOS A	2.1	54.8	0.37	0.57	31.2
West: SR14ALT/South Fulton Pkwy											
5	L	98	3.0	0.578	18.0	LOS C	3.6	92.0	0.76	1.06	27.6
2	T	836	3.0	0.578	10.2	LOS B	3.8	97.7	0.76	0.91	30.6
12	R	52	3.0	0.052	7.9	LOS A	0.2	5.9	0.51	0.62	31.6
Approach		986	3.0	0.578	10.8	LOS B	3.8	97.7	0.75	0.91	30.3
All Vehicles		2977	3.0	0.578	10.3	LOS B	3.8	97.7	0.62	0.77	30.4

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

Roundabout LOS Method: Same as Sign Control.

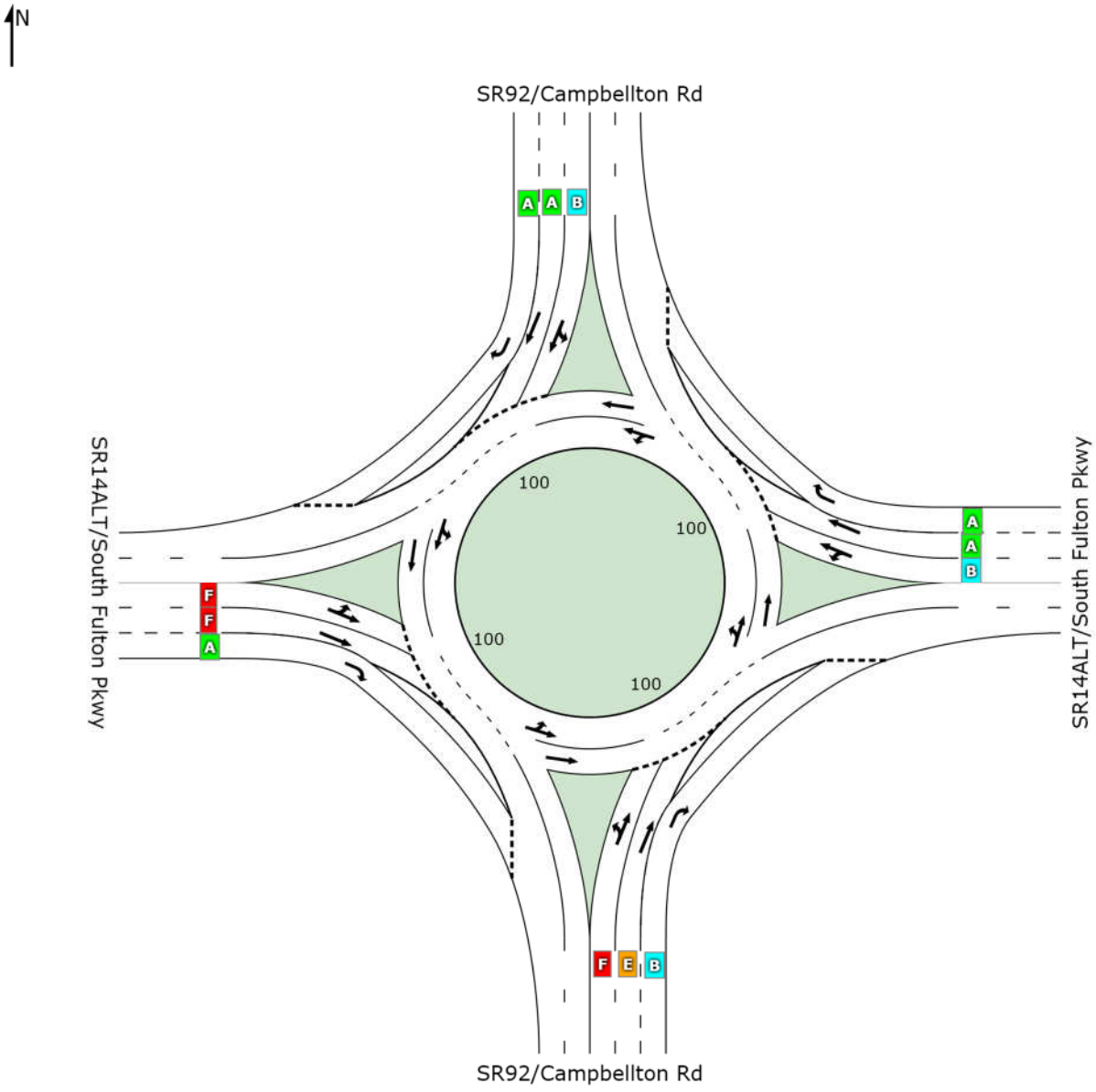
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

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

APENDIX B

PEAK HOUR SIDRA ANALYSIS LEVELS OF SERVICE AND MOVEMENT SUMMARY FOR (20 YEARS)

Roundabout
Design Life Analysis (Final Year): Results for 20 years



Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
							Vehicles	Distance			
		veh/h	%	v/c	sec		veh	ft		per veh	mph
South: SR92/Campbellton Rd											
3	L	33	3.0	0.899	61.4	LOS F	10.2	262.2	1.00	1.43	15.4
8	T	647	3.0	0.899	50.5	LOS F	13.7	351.3	1.00	1.49	16.2
18	R	149	3.0	0.314	14.7	LOS B	2.2	57.1	0.98	0.99	28.0
Approach		829	3.0	0.899	44.5	LOS E	13.7	351.3	1.00	1.39	17.5
East: SR14ALT/South Fulton Pkwy											
1	L	52	3.0	0.193	16.3	LOS C	0.9	22.5	0.69	0.95	28.2
6	T	148	3.0	0.193	9.3	LOS A	0.9	22.5	0.69	0.78	31.0
16	R	355	3.0	0.425	9.1	LOS A	2.6	67.8	0.76	0.77	30.5
Approach		554	3.0	0.425	9.8	LOS A	2.6	67.8	0.73	0.79	30.4
North: SR92/Campbellton Rd											
7	L	513	3.0	0.543	13.6	LOS B	3.7	95.1	0.55	0.75	28.8
4	T	785	3.0	0.543	6.4	LOS A	3.8	97.2	0.54	0.53	31.8
14	R	107	3.0	0.085	6.7	LOS A	0.4	10.0	0.32	0.51	32.5
Approach		1405	3.0	0.543	9.0	LOS A	3.8	97.2	0.52	0.61	30.6
West: SR14ALT/South Fulton Pkwy											
5	L	137	3.0	1.046	61.9	LOS F	22.0	562.3	1.00	1.94	15.2
2	T	1170	3.0	1.046	51.9	LOS F	27.0	690.8	1.00	2.03	15.9
12	R	73	3.0	0.086	8.9	LOS A	0.4	11.2	0.64	0.71	31.0
Approach		1380	3.0	1.046	50.6	LOS F	27.0	690.8	0.98	1.95	16.2
All Vehicles		4168	3.0	1.046	30.0	LOS D	27.0	690.8	0.80	1.23	21.2

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

Roundabout LOS Method: Same as Sign Control.

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

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

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

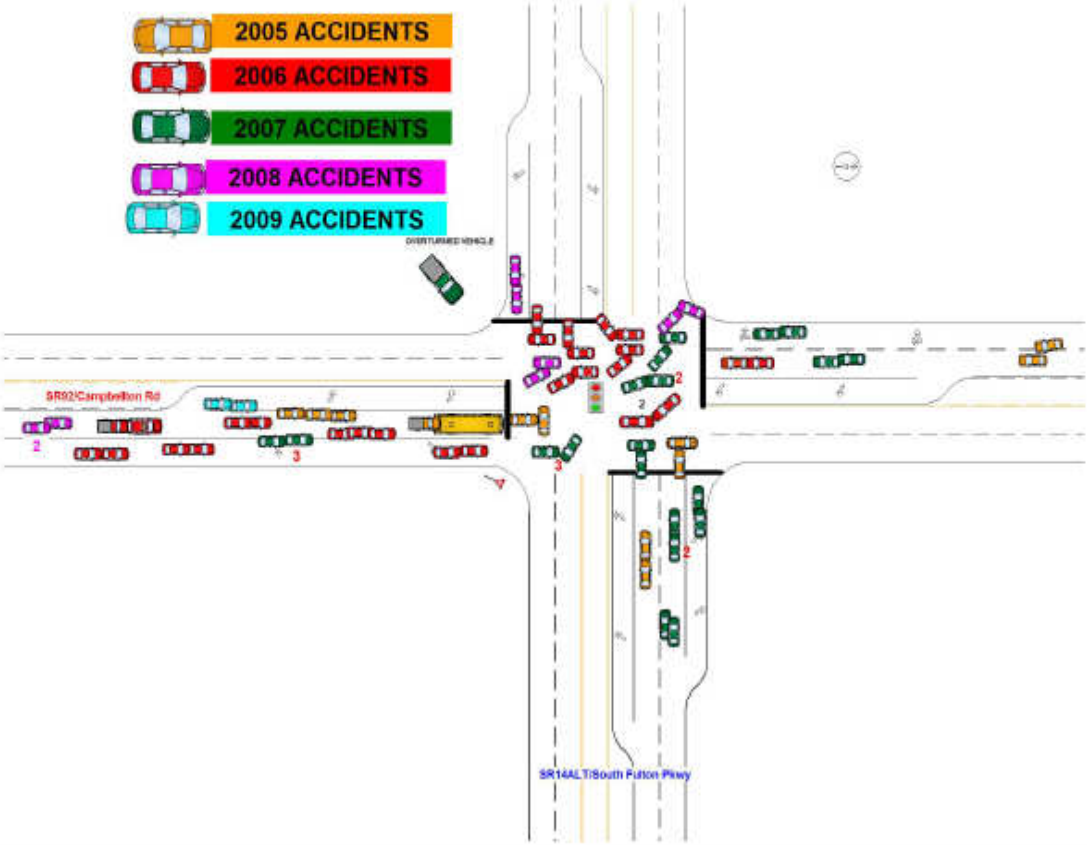
Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model used.

APENDIX C

ACCIDENT DIAGRAM 2006-2009

Case Number: T. E. Study	Date: 2/27/2012
Location: SR92/Campbellton-Fairburn Rd @ SR14ALT/South Fulton Pkwy	
Description: Accident Diagram for SR92/Campbellton-Fairburn Rd @ SR14ALT/South Fulton Pkwy. This Accident Diagram show Angle Accident, Rear End, Head-on, And Sideswipe.	



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Page 1 of 1

APENDIX D ATTACHED

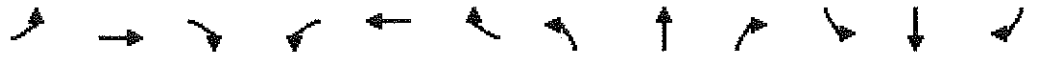
SYNCHRO ANALYSIS FOR EXISTING AND PROPOSED CONDITION

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	769	48	34	97	233	22	425	98	337	516	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1734	1734	1734	1767	1767	1767
Adj Flow Rate, veh/h	98	836	52	37	105	253	24	462	0	366	561	0
Adj No. of Lanes	1	2	1	1	2	1	1	2	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	9	9	9	7	7	7
Cap, veh/h	120	1442	645	76	1353	605	59	654	292	428	999	447
Arrive On Green	0.07	0.43	0.43	0.05	0.40	0.40	0.04	0.20	0.00	0.13	0.30	0.00
Sat Flow, veh/h	1683	3357	1502	1683	3357	1502	1652	3295	1474	3264	3357	1502
Grp Volume(v), veh/h	98	836	52	37	105	253	24	462	0	366	561	0
Grp Sat Flow(s),veh/h/ln	1683	1678	1502	1683	1678	1502	1652	1648	1474	1632	1678	1502
Q Serve(g_s), s	7.5	24.6	2.7	2.8	2.5	15.7	1.9	17.0	0.0	14.3	18.4	0.0
Cycle Q Clear(g_c), s	7.5	24.6	2.7	2.8	2.5	15.7	1.9	17.0	0.0	14.3	18.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	1442	645	76	1353	605	59	654	292	428	999	447
V/C Ratio(X)	0.81	0.58	0.08	0.49	0.08	0.42	0.41	0.71	0.00	0.86	0.56	0.00
Avail Cap(c_a), veh/h	245	1442	645	245	1353	605	311	1113	498	602	1134	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	59.6	28.2	22.0	60.7	23.9	27.9	61.4	48.7	0.0	55.4	38.6	0.0
Incr Delay (d2), s/veh	12.3	1.7	0.2	4.7	0.1	2.1	4.5	1.4	0.0	8.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	11.7	1.1	1.4	1.2	6.9	0.9	7.9	0.0	7.0	8.6	0.0
LnGrp Delay(d),s/veh	71.9	29.9	22.2	65.4	24.1	30.0	65.9	50.1	0.0	63.8	39.1	0.0
LnGrp LOS	E	C	C	E	C	C	E	D		E	D	
Approach Vol, veh/h		986			395			486			927	
Approach Delay, s/veh		33.7			31.7			50.9			48.8	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	63.4	10.1	44.8	15.3	60.0	23.1	31.8
Change Period (Y+Rc), s	6.0	7.5	5.5	6.0	6.0	7.5	6.0	6.0
Max Green Setting (Gmax), s	19.0	52.5	24.5	44.0	19.0	52.5	24.0	44.0
Max Q Clear Time (g_c+I1), s	4.8	26.6	3.9	20.4	9.5	17.7	16.3	19.0
Green Ext Time (p_c), s	0.0	7.3	0.0	6.7	0.1	7.8	0.8	6.8

Intersection Summary	
HCM 2010 Ctrl Delay	41.4
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	769	48	34	97	233	22	425	98	337	516	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			1%			1%			1%	
Storage Length (ft)	175		160	220		150	150		200	208		150
Storage Lanes	1		1	1		1	1		1	2		1
Taper Length (ft)	180			140			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	3357	1502	1678	3357	1502	1648	3295	1474	3256	3357	1502
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1678	3357	1502	1678	3357	1502	1648	3295	1474	3256	3357	1502
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99			253			109			109
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		775			785			828			540	
Travel Time (s)		9.6			9.7			12.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	9%	9%	9%	7%	7%	7%
Adj. Flow (vph)	98	836	52	37	105	253	24	462	107	366	561	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	836	52	37	105	253	24	462	107	366	561	76
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			14			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	15.0	50.0	50.0	15.0	50.0	50.0	25.0	45.0	45.0	25.0	45.0	45.0
Total Split (s)	25.0	60.0	60.0	25.0	60.0	60.0	30.0	50.0	50.0	30.0	50.0	50.0
Total Split (%)	15.2%	36.4%	36.4%	15.2%	36.4%	36.4%	18.2%	30.3%	30.3%	18.2%	30.3%	30.3%
Maximum Green (s)	19.0	52.5	52.5	19.0	52.5	52.5	24.5	44.0	44.0	24.0	44.0	44.0
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.5	7.5	6.0	7.5	7.5	5.5	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	13.3	60.3	60.3	9.3	53.0	53.0	8.6	25.3	25.3	20.2	43.4	43.4
Actuated g/C Ratio	0.10	0.44	0.44	0.07	0.39	0.39	0.06	0.18	0.18	0.15	0.32	0.32
v/c Ratio	0.60	0.57	0.07	0.33	0.08	0.35	0.23	0.76	0.30	0.77	0.53	0.14
Control Delay	77.3	33.3	0.2	73.2	30.2	5.2	71.7	62.6	10.2	68.9	42.0	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.3	33.3	0.2	73.2	30.2	5.2	71.7	62.6	10.2	68.9	42.0	2.6
LOS	E	C	A	E	C	A	E	E	B	E	D	A
Approach Delay		35.9			18.2			53.5			48.9	
Approach LOS		D			B			D			D	
Queue Length 50th (ft)	86	304	0	33	31	0	21	209	0	164	228	0
Queue Length 95th (ft)	158	441	0	77	62	63	57	288	51	243	311	16
Internal Link Dist (ft)		695			705			748			460	
Turn Bay Length (ft)	175		160	220		150	150		200	208		150
Base Capacity (vph)	234	1472	714	234	1292	733	296	1063	549	573	1116	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.57	0.07	0.16	0.08	0.35	0.08	0.43	0.19	0.64	0.50	0.13

Intersection Summary

Area Type: Other
Cycle Length: 165
Actuated Cycle Length: 137.6
Natural Cycle: 135
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 41.4 Intersection LOS: D
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: SR 92 & SR14 ALT