ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0007494
CSSTP-0007-00(494)
Bartow County
GDOT District 6 - Cartersville
CS 1054/Douthit Ferry road from Old Alabama to
SR 61/SR 113

OFFICE Design Policy & Support

DATE 11/14/2013

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:

Bobby Hilliard, Program Control Administrator
Genetha Rice-Singleton, State Program Delivery Engineer
Glenn Bowman, State Environmental Administrator
Cindy VanDyke, State Transportation Planning Administrator
Ben Rabun, State Bridge Engineer
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
Paul Tanner, Asst. State Transportation Data Administrator
Attn: Systems & Classification Branch
Jeff Fletcher, Statewide Location Bureau Chief
DeWayne Comer, District Engineer
Michael Haithcock, District Preconstruction Engineer
Kerry Bonner, District Utilities Engineer
Lenora Leigh, Project Manager
BOARD MEMBER - 11th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
PROJECT CONCEPT REPORT

Project Type:	Reconstruction/Rehabilitation	**P.I. Number:**	0007494
		County:	Bartow
GDOT District:	6		
Federal Route Number:	NONE	**State Route Number:**	NONE
County Road:	343	**Project Number:**	CSSTP-0007-00 (494)

This project consists of 2.48 miles of improvements on Douthit Ferry Road (CR 343) in Cartersville, Bartow County that widens from 2-12' Lanes to 2-12'outside lanes and 2-11 ft inside lanes with a 20' raised median, with 12' urban shoulders from Old Alabama Road to Old Mill Road. Also it will add 2-12' outside and 2-11 ft inside lanes with a 14' flush median from Old Mill Road to SR 61/ SR 113. The project begins at Old Alabama Road and ends a SR 61/SR 113 (West Ave.).

Submitted for approval:

Southland Engineering Inc.	8/21/13 DATE
Thomas W. Sanders Jr. City of Cartersville	8/22/13 DATE
Office Head *(GDOT Project Manager's Office)*	8/27/2013 DATE
Leigh GDOT Project Manager Leonora Leigh	8/22/13 DATE AVS

Recommendation for approval:

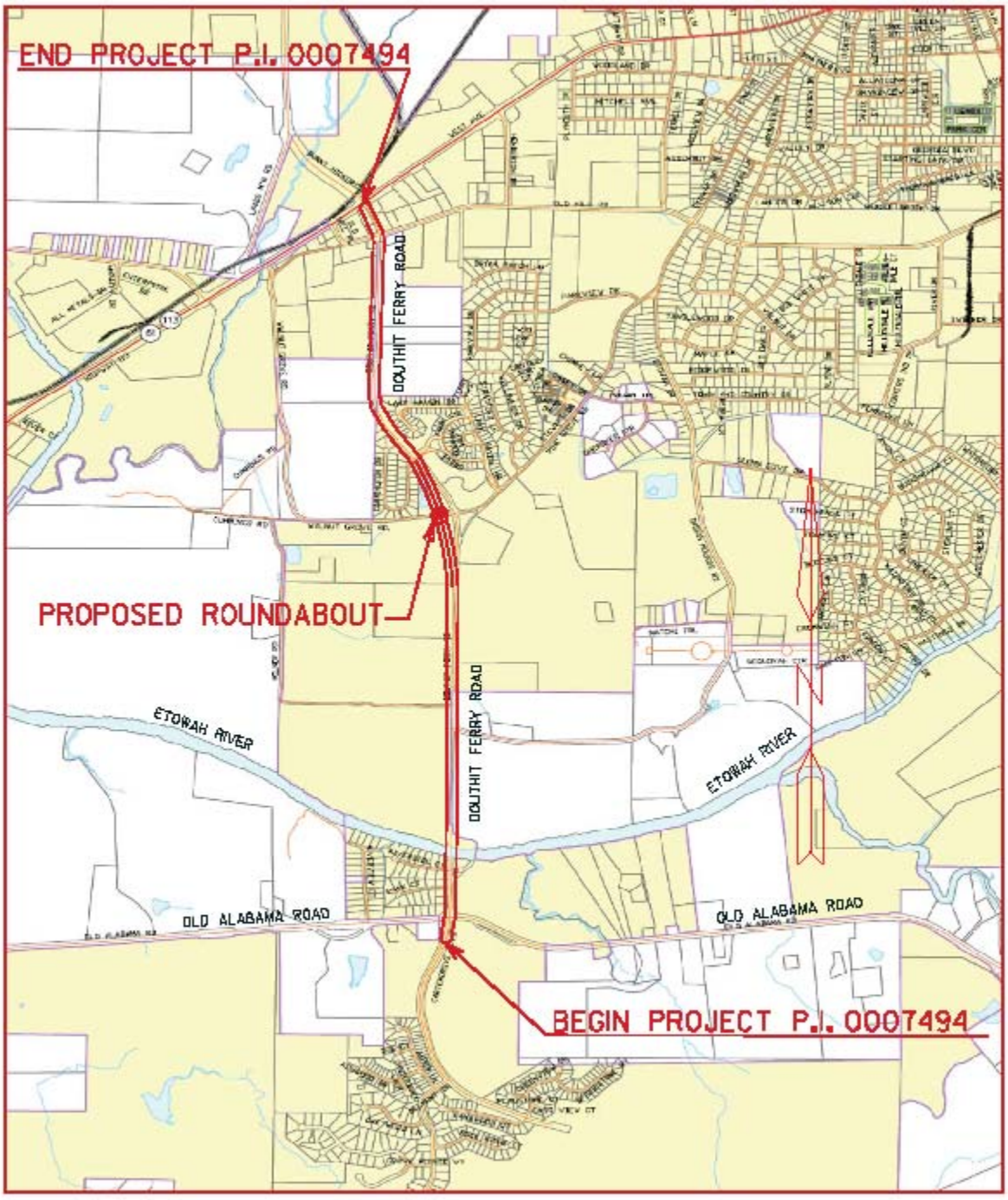
Program Control Administrator	DATE
* Glenn Bowman / KLP State Environmental Administrator	8-29-13 DATE
* Kathy Zahul / KLP State Traffic Engineer	9-13-13 DATE
* Lisa Myers / KLP Project Review Engineer	8-30-13 DATE
for * Jun Birnkammer / KLP State Utilities Engineer	9-6-13 DATE
* DeWayne Comer / KLP District Engineer	8-29-13 DATE
* Ben Rabun / KLP State Bridge Design Engineer	10-17-13 DATE
State Transportation Financial Management Administrator	DATE

* Recommendation on file

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. Kupke State Transportation Planning Administrator	9-3-13 DATE

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Project Justification Statement: Please see the attached Project Justification Statement

Description of the proposed project: This project consists of 2.48 miles of improvements on Douthit Ferry Road (CR 343 and CS 105403) in the City of Cartersville, Bartow County. The improvements will include roadway widening from 2-12' lanes to 4- lanes (2 -12 ft outside and 2-11 ft inside lanes) with 20' raised median and 10 to 12' urban shoulders. The project would begin at the intersection of S.R. 113 (Old Alabama Road) and would end at the intersection of S.R. 61 (West Avenue).

Federal Oversight: ☐ Full Oversight ☒ Exempt ☐ State Funded ☐ Other

MPO: N/A MPO Project ID

Regional Commission: NWGRC RC Project ID 0007494

Congressional District(s): 11

Projected Traffic:

Current Year (2011): 8,000 Open Year (2018): 12,950 Design Year (2038) 26,050
Traffic Projections Performed by: Robinson Transportation Consultants, LLC - Approved by GDOT Office of Planning - My 16, 2011

Functional Classification (Mainline): Urban Collector

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

Is this project on a designated Bike Route, Pedestrian Plan, or Transit Network?
☐ None ☒ Bike Route ☒ Pedestrian Plan ☐ Transit Network

CONTEXT SENSITIVE SOLUTIONS

Issues of Concern:

1. There has been and will be further coordination with the Eastern Band American Indian Tribe to determine the best way to mitigate or avoid an archeological site near the bridge.

2. The City of Cartersville has a recreation facility called Sam Smith Park (Formally Milam Farm Park) that funding was approved in a SPLOST passed by the voters of Bartow County.

3. A Roundabout will be a part of the project at the intersection of Douthit Ferry Road and Pine Grove Road/ Walnut Grove Road.

Context Sensitive Solutions:

1. The plans will be coordinated to avoid or minimize impacts to the area around the bridge. This may include walls, realignment, or other forms of mitigation. We are in coordination with the Eastern Band of tribes to decide the best course of action to avoid the archeology sites. A webinar was held on November 31, 2012. The decision of the tribes was to keep the East alignment and use an 8 ft median to avoid the mound site. No clearing and grubbing will be allowed on the sites during or after construction. This coordination and further coordination will be completed as a part of the environmental process and will be shown in the environmental document.

2. **The design has coordinated with the City of Cartersville to place the drives and access breaks where necessary to service the facility.**

3. The Roundabout design has been presented to the Local Officials and will be presented to the public at separate meetings as a part of the Checklist to design a roundabout. This will include design, landscaping, and lighting issues that the City officials will have the ability to comment on and have input into the design. The Roundabout has also been presented to the City of Cartersville School System. The drive to the Cartersville Middle School was redesigned to avoid a left turn movement that could have impacted the roundabout. This redesign provided a separation of the bus traffic with the car traffic. The City has submitted their approval letter in support of the roundabout to GDOT.

DESIGN AND STRUCTURAL DATA

Mainline Design Features: Douthit Ferry Road - Mainline

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**4**	**4**
- **Lane Width(s)***	**11'**	**11' to 12'**	**11' inside' - 12' outside**
- **Median Width & Type**	**None**	**14 ft Flush w purchase of ROW for 20 ft raised**	**20 ft Raised And 14 ft flush**
- **Outside Shoulder Width & Type**	**grass**	**10 – 16 ft Urban**	**10- 12 ft urban**
- **Outside Shoulder Slope**	**6.33%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**none**	**14 ft Flush**	**20 ft Raised**
- **Sidewalks**	**Off roadway**	**5 ft**	**5 ft**
- **Auxiliary Lanes**	**At some**	**RT Turns/ Lt**	**RT Turns/ Lt**

	intersections	Turns at intersections	Turns at intersections
- **Bike Lanes**	**Yes**	**Yes**	**Yes**
Posted Speed	**25 - 45**		**35**
Design Speed	**35**	**35**	**35**
Min Horizontal Curve Radius		**371'**	**700'**
Superelevation Rate	**Varies**	**4%**	**4%**
Grade		**9%**	**8.8%**
Access Control	**By permit**	**By Permit**	**By Permit**
Right-of-Way Width	**48' to 110'**	**Section - Cut = 7' – 10' beyond LOC Fill = 10' -15' Beyond LOC** **1' past Shldr Break point 2' past lat. Offset in areas with Obstructions**	**Section - Cut = 7' – 10' beyond LOC Fill = 10' -15' Beyond LOC** **1' past Shldr Break point 2' past lat. Offset in areas with obstructions** **Min 102' to Max 220'**
Maximum Grade – Crossroad		**2%**	**2%**
Design Vehicle	**WB 67**	**Bus-40 or SU**	**WB - 67**

*Per VE Study Recommendation.

Major Intersection - Old Alabama Road- Information based on GDOT project STP00-2946-00 (001) Bartow being completed before this project is let.

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**4**	**4**	**4**
- **Lane Width(s)**	**12**	**12**	**12**
- **Median Width & Type**	**44' Grass**	**44' Grass**	**44' Grass**
- **Outside Shoulder Width & Type**	**10' Paved**	**10' Paved**	**10' Paved**
- **Outside Shoulder Slope**	**2%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**6' Paved**	**6' Paved**	**6' Paved**
- **Sidewalks**	**None**	**None**	**None**
- **Auxiliary Lanes**	**Lt and Rt Turn**	**Lt and Rt Turn**	**Lt and Rt Turn**
- **Bike Lanes**	**Yes**	**Yes**	**Yes**
Posted Speed	**55**		**55**
Design Speed	**55**	**55**	**55**
Min Horizontal Curve Radius *	**1200**	**1190**	**1200**
Superelevation Rate *	**6%**	**6%**	**6%**
Grade *	**5.97%**	**5% ****	**5.97%**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**100' STP00-2946-00(001), PI#621410 proposes 235'**	**Section - Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**	**Section - Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40 /SU**	**BUS-40/SU**	**WB-67**

*** There are no changes to the horizontal or vertical alignments to Old Alabama Road as a part of the intersection tie in.**

**** 5% based on the "Rolling Category" in the Green Book. The designer of the Old Alabama Road project may have used the "Mountainous Category". Either could be correct based on opinion.**

Major Intersection - SR 61/SR 113
Tying into intersection – no changes to the existing layout of the intersection.

Side Road – Old Mill Road

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**11 ft**	**11 ft - 12 ft**	**12 ft**
- **Median Width & Type**	**N/A**	**none**	**none**
- **Outside Shoulder Width & Type**	**C&G w/ s/w south and no s/w north**	**10'-12' urban**	**10'-12' urban**
- **Outside Shoulder Slope**	**¾ in/Ft**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**5 ft**	**5 ft**	**5 ft**
- **Auxiliary Lanes**	**Lt & Rt turn lanes**	**Lt & Rt turn lanes**	**Lt & Rt turn lanes**
- **Bike Lanes**	**no**	**4' On street bike lanes**	**4' On Street Bike Lanes**
Posted Speed	**35 mph**		**35 mph**
Design Speed	**35 mph**	**35 mph**	**35 mph**
Min Horizontal Curve Radius		**371'**	**1000'**
Superelevation Rate	**Varies**	**4%**	**4%**
Grade		**9%**	**3.5**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**80'**	**1' past Shldr Break point 2' past lat. Offset in areas with Obstructions**	**1' past Shldr Break point 2' past lat. Offset in areas with obstructions or better Min 80' to Max 131'**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40/SU**	**BUS-40/SU**	**WB-67**

Side Road – Park Court/ Riverside Court Combined into one Road

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**11**	**11 - 12**	**12**
- **Median Width & Type**	**N/A**	**N/A**	**N/A**
- **Outside Shoulder Width & Type**	**3'-5 ' Graded**	**12' Urban**	**12' Urban**
- **Outside Shoulder Slope**	**6%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5 ft**	**None**
- **Auxiliary Lanes**	**None**	**Lt / Rt. Turns**	**Lt / Rt. Turns**
- **Bike Lanes**	**No**	**No**	**No**
Posted Speed	**25**		**25**
Design Speed	**25**	**25**	**25**
Min Horizontal Curve Radius		**154'**	**155'**
Superelevation Rate	**Varies**	**4%**	**4%**
Grade		**9%**	**2%**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**50'**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC Min 65' to Max 80'**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40/SU**	**BUS-40/SU**	**BUS-40/SU**

Side Road – Indian Mound Road

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**10-11**	**11 - 12**	**12**
- **Median Width & Type**	**N/A**	**N/A**	**N/A**
- **Outside Shoulder Width & Type**	**3'-5 ' Graded**	**12' Urban**	**12' Urban**
- **Outside Shoulder Slope**	**6%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5 ft**	**None**
- **Auxiliary Lanes**	**None**	**Lt/Rt Turn**	**Lt/Rt Turn**
- **Bike Lanes**	**No**	**No**	**No**
Posted Speed	**35**		**35**
Design Speed	**35**	**35**	**35**
Min Horizontal Curve Radius		**371'**	**375'**
Superelevation Rate	**Varies**	**4%**	**4%**
Grade		**9%**	**2%**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**80'**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC Min 110' to Max 140'**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40/SU**	**BUS-40/SU**	**BUS-40/SU**

Side Road - Milner Road – CR 342*

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**10**	**11 - 12**	**12**
- **Median Width & Type**	**N/A**	**N/A**	**N/A**
- **Outside Shoulder Width & Type**	**3'-5 ' Graded**	**12' Urban**	**12' Urban**
- **Outside Shoulder Slope**	**6%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5 ft**	**None**
- **Auxiliary Lanes**	**None**	**None**	**None**
- **Bike Lanes**	**No**	**No**	**No**
Posted Speed	**25**		**25**
Design Speed	**25**	**25**	**25**
Min Horizontal Curve Radius		**371'**	**1000'**
Superelevation Rate	**Varies**	**4%**	**4%**
Grade		**9%**	**9%**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**50'**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC 50' (Existing)**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40/SU**	**BUS-40/SU**	**BUS-40/SU**

* This is a gravel road with gated access.

Side Road – Pine Grove Road –CS 96103 / Walnut Grove Road – CR 347

	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**11**	**11 - 12**	**12**
- **Median Width & Type**	**N/A**	**N/A**	**N/A**
- **Outside Shoulder Width & Type**	**3'-5 ' Graded**	**12' Urban**	**12' Urban**
- **Outside Shoulder Slope**	**6%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5 ft**	**5 ft**
- **Auxiliary Lanes**	**Rt Turn**	**Roundabou t**	**Roundabou t**
- **Bike Lanes**	**No**	**No**	**No**
Posted Speed	**35/30**		**35**
Design Speed	**35**	**20 - 25**	**20 - 25**
Min Horizontal Curve Radius		**371'**	**480'**
Superelevation Rate	**Varies**	**2%**	**2%**
Grade		**9%**	**2%**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**50'**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC Min 85' to Max 250'**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40/SU**	**WB-67**	**WB-67**

Side Road – Carrington Drive – CS 98403 / Grove Park Circle – CS 101903

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**11**	**11 - 12**	**12**
- **Median Width & Type**	**N/A**	**N/A**	**N/A**
- **Outside Shoulder Width & Type**	**3'-5' Graded**	**12' Urban**	**12' Urban**
- **Outside Shoulder Slope**	**6%**	**2%**	**2%**
- **Inside Shoulder Width & Type**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5 ft**	**None**
- **Auxiliary Lanes**	**None**	**None**	**None**
- **Bike Lanes**	**No**	**No**	**No**
Posted Speed	**25**		**25**
Design Speed	**25**	**25**	**25**
Min Horizontal Curve Radius		**154'**	**125'**
Superelevation Rate	**Varies**	**4%**	**4%**
Grade		**9%**	**8%**
Access Control	**By Permit**	**By Permit**	**By Permit**
Right-of-Way Width	**Min 40' to Max 117'**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC**	**Cut = 7' – 10' beyond LOC Fill = 10' - 15' Beyond LOC Min 62' to Max 130'**
Maximum Grade – Crossroad	**2%**	**2%**	**2%**
Design Vehicle	**BUS-40/SU**	**BUS-40/SU**	**BUS-40/SU**

*According to current GDOT design policy if applicable

Major Structures:

Structure	Existing	Proposed
Bridge ID # 015-5061-0	280' X 28' bridge (deck width 31.20') with 10' lanes and 4 ft shoulders Sufficiency Rating = 76.29	280' X 37.50' bridges. The existing Bridge will be widened to accommodate the roadway. Typical section and to meet current standards. Typical section is 2' inside shoulder 1- 11 ft lane – 1 12 ft lane – 4 'bike lane – 2 ft outside shoulder – 5.5' sidewalk on each side of an 8 ft median.
Retaining walls	None	May be required – not yet determined
Other	None	None

Major Interchanges/Intersections: Douthit Ferry Road @ Old Alabama Road – Project is under design by GDOT 4 –Lane divided median; Douthit Ferry Road @ SR 61/SR 113 – Project completed recently by GDOT - 4-Lane with 20 Raised median – Urban Shoulders

Utility Involvements:
AT&T Georgia – Telecommunication
City Of Cartersville – Gas
City Of Cartersville - Water
City Of Cartersville – Electric
Georgia Power Co.
Comcast – Cable TV
Bartow County Water & Sewer

Public Interest Determination Policy and Procedure recommended (Utilities)? ☒ No ☐ Yes
See attached Risk Summary

SUE Required: ☒ No ☐ Yes
An E-mail was received from the District Utility Office Date 12-1-2011 States that SUE is not required on this project.

Railroad Involvement: There is no railroad involvement expected.

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

Warrants met: ☐ None ☒ Bicycle ☒ Pedestrian ☐ Transit

Bicycle – Douthit Ferry Road has two Designated Bike Paths along the corridor. Trail 125 and 145 are local designated bike trails. Also traffic generators such as a school, churches, shopping centers and recreational parks are along Douthit Ferry Road. Bicycle and Pedestrian Action Items included in Table 6.1

of Bartow/Cartersville Long Range Transportation Plan, there are also maps and recommended pedestrian goals and projects identified in the Bartow/Cartersville Short Term Transportation Study.

Pedestrian - Traffic generators such as a school, churches, shopping centers and recreational parks are along Douthit Ferry Road. Bicycle and Pedestrian Action Items included in Table 6.1 of Bartow/Cartersville Long Range Transportation Plan, there are also maps and recommended pedestrian goals and projects identified in the Bartow/Cartersville Short Term Transportation Study.

Right-of-Way

Required Right-of-Way anticipated: ☒ YES ☐ NO ☐ Undetermined
Easements anticipated: ☐ Temporary ☒ Permanent ☐ Utility ☐ Other

Anticipated number of impacted parcels:	54
Anticipated number of displacements (Total):	8
Businesses:	0
Residences:	8
Other:	0

Location and Design approval: ☐ Not Required ☒ Required

Off-site Detours Anticipated: ☒ No ☐ Undetermined ☐ Yes

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

The Policy has been reviewed along with Appendix C which is the Significant Project Flow Chart (DOT5240-4). Based on the concept layout, traffic will not be impacted at a sustained 30 minutes or more when the project is under construction. This project will go from two lanes to four lanes and two lanes will remain open at all times during the staging of the project. Therefore this project will not rise to the level of "Significant" as defined in Appendix C.

Design Exceptions to FHWA/AASHTO controlling criteria anticipated:

FHWA/AASHTO Controlling Criteria	YES	Appvl Date (if applicable)	NO	Undetermined
1. Design Speed	☒	Propose 30 mph from begin project to bridge due to terrain - Vertical Alignment.	☐	☐
2. Lane Width	☐	.	☒	☐
3. Shoulder Width	☐	.	☒	☐
4. Bridge Width	☐	.	☒	☐
5. Horizontal Alignment	☒	Curve on Carrington Drive – Min = 154' Proposed= 125'	☐	☐
6. Superelevation	☐		☒	☐
7. Vertical Alignment	☒	Crest Curve between Begin project to bridge. Min K =29 (35 mph) – Design = 20.93 (30mph)	☒	☐
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	YES	Appvl Date (if applicable)	NO	Undetermined
1. Access Control - *Median Opening Spacing*	DP&S	☒	There is a one-way break that will require a variance at Sta. 175+10.	☐	☐
2. Median Usage & Width	DP&S	☒	An 8 ft median will be required to avoid a mound site at Sta. 116+00 Rt.	☐	☐
3. Intersection Skew Angle	DP&S	☐		☒	☐
4. Lateral Offset to Obstruction	DP&S	☐		☒	☐
5. Intersection Sight Distance	DP&S	☐		☒	☐
6. Bike & Pedestrian 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 - *(if applicable)*	DP&S	☐		☒	☐
11. Rumble Strips/Safety Edge	DP&S	☐		☒	☐

VE Study anticipated: ☐ No ☒ Yes ☒ Completed – Date: 2/05/2013
VE Implementation Letter is attached

ENVIRONMENTAL DATA

Anticipated Environmental Document:
GEPA: ☐ **NEPA:** ☐ CE ☒ EA/FONSI ☐ EIS

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

The ARC 2020 network indicates a 4-lane road way that begins at Old Alabama Road and ends art SR 61 / SR 113. This matches the proposed concept. The open to traffic year for this project is 2016.

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

The project is located in an MS4 area, however it will be maintained by Locals and is therefore not covered under the GDOT MS4 permit. Both Bartow County and the City of Cartersville have accepted the Georgia Stormwater Management Manual (Blue Book) for their MS4 Guidelines. See Appendix 15 for concept hydrology calculations and drainage map.

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	☒	☐	Required for Open Water 3
6. Coastal Zone Management Coordination	☐	☒	
7. NPDES	☒	☐	
8. FEMA	☒	☐	Project in floodplain near Etowah River and at northern section
9. Cemetery Permit	☐	☒	
10. Other Permits	☐	☐	TBD
11. Other Commitments	☐	☐	TBD
12. Other Coordination	☒	☐	Potential USFWS coordination for informal Section 7

Is a PAR required? ☒ No ☐ Yes ☐ Completed – Date:

NEPA/GEPA:

A NEPA Environmental Assessment is currently underway. Section 4(f) resources are present along the corridor, including Sam Smith Park and potentially significant cultural resources. The area at the northern end of the corridor will need to be further investigated for UST/Hazardous Waste. Farm land is present along the project corridor. The project area is in a flood plain in the areas near the Etowah River and the northern edge of the project corridor.

Ecology:
An Ecology Assessment is currently underway. Waters of the U.S. and the state are present within the project limits. Impacts are not known at this time. Potentially suitable habitat exists for the Etowah Darter and Cherokee Darter in the Etowah River. An aquatic survey will be conducted during the appropriate time of year (April-October). Section 7 consultation with US Fish & Wildlife may be needed.

History:
Historic resources include one eligible and one listed historic resource. The eligible resource is the Douthit Ferry Truss Bridge, east of the current Douthit Ferry road bridge over the Etowah River. The listed resource is the Etowah River Indian Weir located further east of the current Douthit Ferry Road bridge over the Etowah River. SHPO concurrence has not been received.

Archeology:
Three archeological sites are present. A Phase I report has been completed. A site plan for Phase II work has been submitted to GDOT. Tribal consultation is in process. The Phase II site plan will be approved once tribal consultation is complete.

Air & Noise:
An Air Assessment and Noise Impact Assessment will be necessary for the proposed project. Field work (noise readings) has already been completed, and the assessments are currently underway. Possible mitigation requirements will not be known until after the assessments (and the models associated with them) are completed.

Public Involvement:
A PHOH will need to occur.

Major stakeholders:

Traveling Public.

ROUNDABOUTS

Roundabout Lighting agreement/commitment letter received: ☐ No ☒ Yes

Planning Level assessment:
A Planning Level Assessment has been prepared using the GDOT Roundabout checklists. The Percent traffic on Douthit Ferry Road at at the intersection with Pine Grove Road/ Walnut Grove Road is 66.42% which indicates a roundabout should be considered. The Roundabout layout has been determined to be two circulatory lanes north/south. The West to East leg will have a left thru/Right turn only and the East to West leg will have a left turn only/ right thru. This was determined using the GDOT Roundabout Tool.

A roundabout was considered at the intersection of Douthit Ferry Road and Old Mill Road. A dual lane roundabout would be required. The design of a roundabout at this intersection would cause the purchase of 2 businesses on the NW and SE quadrants and damage a business on the NE quadrant. Several attempts at relocating the 185 ft inscribed at different points at the intersection did not improve the loss of businesses at the intersection. Therefore a signal is the best option.

Feasibility Study: Peer Review required: ☐ No ☒ Yes ☒ Completed – Date: Sept 2012

CONSTRUCTION

Issues potentially affecting constructability/construction schedule:

1. The Roundabout is near Cartersville Middle School. The Construction of the project would benefit from a special provision to require construction of the roundabout while school is out during the summer months as traffic in this area would be less during that time.
2. A Special provision for Restrictive Working Hours is suggested. 7:00 am – 8:30 am and 3:00 pm – 5:00 pm. School begins at 7:55 am and ends at 3:15 pm.
3. A Special Provision will be required to prohibit any clearing and grubbing at the Archeology sites at Station 114+00 Rt. to Station 122+00 Rt. These sites are referred to as 9BR7 – Grid 1 and Grid 2 and 9BR821 – Grid 4 and Grid 5 on GDOTS environmental documentation.

Early Completion Incentives recommended for consideration: ☒ No ☐ Yes

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	City of Cartersville – PFA
Design	City of Cartersville - PFA
Right-of-Way Acquisition	City of Cartersville - PFA
Utility Relocation	Utility Owners

Letting to Contract	GDOT
Construction Supervision	GDOT
Providing Material Pits	CONTRACTOR
Providing Detours	City of Cartersville - PFA
Environmental Studies, Documents, and Permits	City of Cartersville - PFA
Environmental Mitigation	City of Cartersville - PFA
Construction Inspection & Materials Testing	GDOT

Lighting required: ☐ No ☒ Yes
The Roundabout will require lighting. The commitment letter is attached.

Initial Concept Meeting: : Held October 22, 2008 Meeting was held a District 6 Items discussed were Speed Design, Utilities, History, Archeology, Sidewalks, and Bridge and whether to widen, reconstruct or get a Design Exception on the existing bridge. Minutes are attached.

Concept Meeting: The Concept Team Meeting was held on June 8, 2012. The meeting minutes are attached. The project geometrics were discussed. A WB-67 will be used in the design of the Roundabout and project. The Archeology sites and coordination with the Easter Band of the Tribes will be completed to avoid a mound site. The Public Interest Determination (PID) was determined to be Risk Acceptance.

Other projects in the area: Project STP00-2946-00 (001) Bartow – P.I. No. 621410 Old Alabama Road Phase 3 is under design. The project is currently in the ROW Phase and has a let date of April 2013.

The City of Cartersville has been awarded a Transportation Enhancement Grant. Project 00010700 the Pettit Creek Trail Connectivity project in under design that will be near the end of the Douthit Ferry Road Project. Also, 0008067 the Leake Mounds Trail Riverwalk project is under design and is in the vicinity of the project.

Other coordination to date:

A Meeting was held January 17, 2012 with Local Officials to discuss the roundabout at the intersection of Pine Grove Road/Walnut Grove Road with Douthit Ferry Road. The following offices were represented at the meeting. City of Cartersville, City of Cartersville Schools and Board Members, GDOT Board Member Jeff Lewis, Rep. Paul Battles, Sam Grove – City Manager, Tommy Sanders – City Engineer, Dee Corson – GDOT D6, Scott Zehngraff and Paul Denard – GDOT Traffic Operations, and Southland Engineers.

Summary of the January 17, 2012 meeting: The local school Officials had concerns about the students crossing Douthit Ferry Road and then Pine Grove Road to get to waiting parents at the shopping center. Scott Zehngraff noted that the students will have a refuge in the splitter island to only cross 2 lanes at a time. If there is a signal they will cross all four lanes at once. The school officials were in support of the roundabout at the end of the meeting. Also it was pointed out that serious accidents and fatalities drop dramatically at Roundabouts. The City has sent the Letter of Support based on the results of the meeting.

A meeting was held on April 19, 2012 at the request of the City of Cartersville and the City School Board. This meeting was to present the design of the proposed roundabout to the parents and officials of Cartersville Middle School and the two City Elementary Schools that feed the Middle School. Three Thousand flyers were sent out to parents to advertise the meeting and announcements were made over the loudspeaker at the schools.

Summary of the Meeting: Parents and officials that attended generally supported the roundabout. The FHWA video and the VISSIM run that were on display were an invaluable tool in educating the public and officials on the benefits of the roundabout. The meeting was not attended well with only about fifteen attendees.

Project Cost Estimate and Funding Responsibilities: *Add additional rows as necessary; Attach current cost estimates to report.*

	Breakdown of PE	ROW	Utility	CST*	Environmental Mitigation	Total Cost
By Whom	City/State**	City	City	Fed/State	City	
$ Amount	$913,094.01	$3,728,000	$820,000	~~$10,132,300.00~~ 11,473,017.18 KLP	N/A	~~$14,774,214.01~~ 16,934,111.19 KLP
Date of Estimate	10/22/2013	10/23/2013	9/18/2013	10/23/2013 KLP		

*CST Cost includes: Construction, Engineering and Inspection, and Liquid AC Cost Adjustment.
** Includes $56,308.12 in GDOT Oversight funding.

ALTERNATIVES DISCUSSION

Alternative selection: ,

Preferred Alternative: 20 ft Raised grass median with 10' to 12' urban shoulders			
Estimated Property Impacts:	**Same**	**Estimated ~~Total~~ Cost:**	**$517,329.35**
Estimated ROW Cost:	**Same**	**Estimated CST Time:**	**24 Months**
Rationale: Will provide an acceptable Level of Service ("C" or "D") along the corridor and at the intersections. This project will also supply an alternative route for trucks to avoid the downtown Cartersville area on SR61/SR113 where there are many businesses and on street parking. The cost shown is only to compare the 20 ft raised median cost compared to the 14 ft flush median costs. The total project cost is shown above in the estimate section.			

20 ft. grass median cost KLP

No-Build Alternative: 2 lane roadway with 2' to 3' shoulders			
Estimated Property Impacts:	**N/A**	**Estimated ~~Total~~ Cost:**	**N/A**
Estimated ROW Cost:	**N/A**	**Estimated CST Time:**	**N/A**
Rationale: Level of Service will become "F" along the corridor. Some intersections are failing now. Old Mill Road @ DFR and Pine Grove Road @ DFR are at a LOS of "F".			

no-build median KLP

Alternative 3: 14 ft Flush median with purchase of ROW for 20 ft raised median			
Estimated Property Impacts:	**Same**	**Estimated ~~Total~~ Cost:**	**$669,691.18**
Estimated ROW Cost:	**Same**	**Estimated CST Time:**	**24 Months**
Rationale: This alternative is $152,361.83 more than the 20 ft raised option. Property impacts, Environmental impacts, will be the same. The cost shown is only to compare the 20 ft raised median cost compared to the 14 ft flush costs. The total project cost is shown above in the estimate section.			

14 ft. flush median KLP

Alternative 4: 20 ft Concrete median with 10' to 12' urban shoulders			
Estimated Property Impacts:	**Same**	**Estimated ~~Total~~ Cost:**	**$797,162.43**
Estimated ROW Cost:	**Same**	**Estimated CST Time:**	**24 months**
Rationale: This alternative is $279,822.08 more than the 20 ft grassed raised option. Property impacts, Environmental impacts, will be the same. The cost shown is only to compare the 20 ft raised median cost compared to the 14 ft flush costs. The total project cost is shown above in the estimate section.			

20 ft raised concrete median KLP

Comments: The estimate for the above Alternates is attached. – Attachment ~~15~~ 14 KLP.

Attachments:

1. Concept Layout
2. Typical sections
3. Detailed Cost Estimates:
    a. Construction including Engineering and Inspection
    b. Completed Fuel & Asphalt Price Adjustment forms
    c. Right-of-Way

   d. Utilities
4. Project Justification Statement – Includes crash summaries , capacity analysis and B/C Ratio
5. Traffic Study – Includes Signal Warrant Analysis and Traffic Diagrams
6. Roundabout Data
   a. Planning level assessment included in Roundabout Checklist
   b. Roundabout feasibility study
   c. Lighting agreement or commitment letter
   d. Peer Review
7. Bridge inventory
8. Pavement studies *(e.g. Preliminary Pavement Type Selection Report, etc.)*
9. Utility Risk Management Plan
10. Conforming plan's network schematics showing thru lanes.
11. Minutes of Concept meetings
12. Minutes of any meetings that shows support or objection to the concept
13. PFA
14. Cost Comparison of 20 ft Raised Median to a 14 ft Flush Median
15. Hydrology Study for MS4 Permit
16. VE Implementation Letter

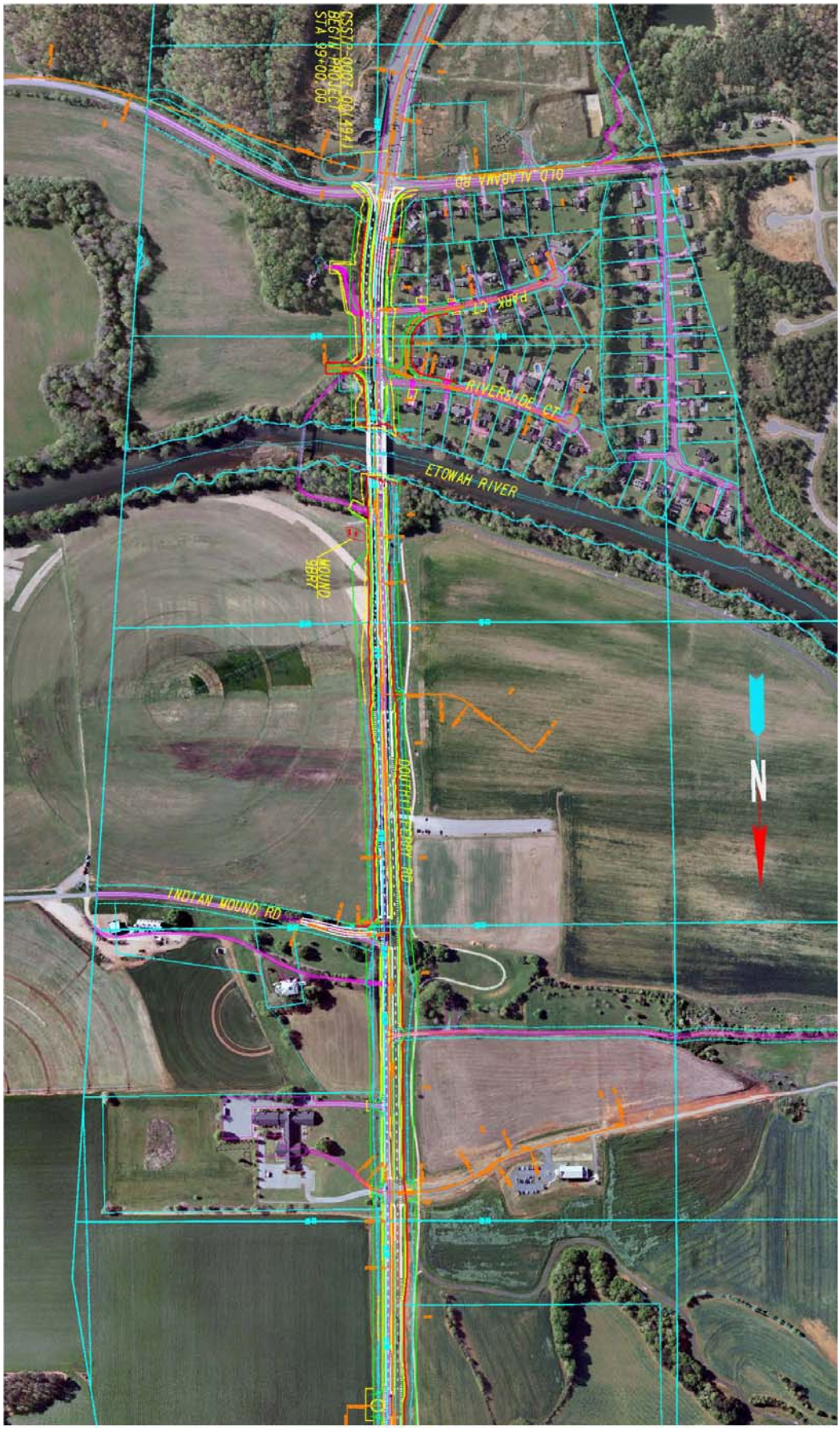
APPROVALS

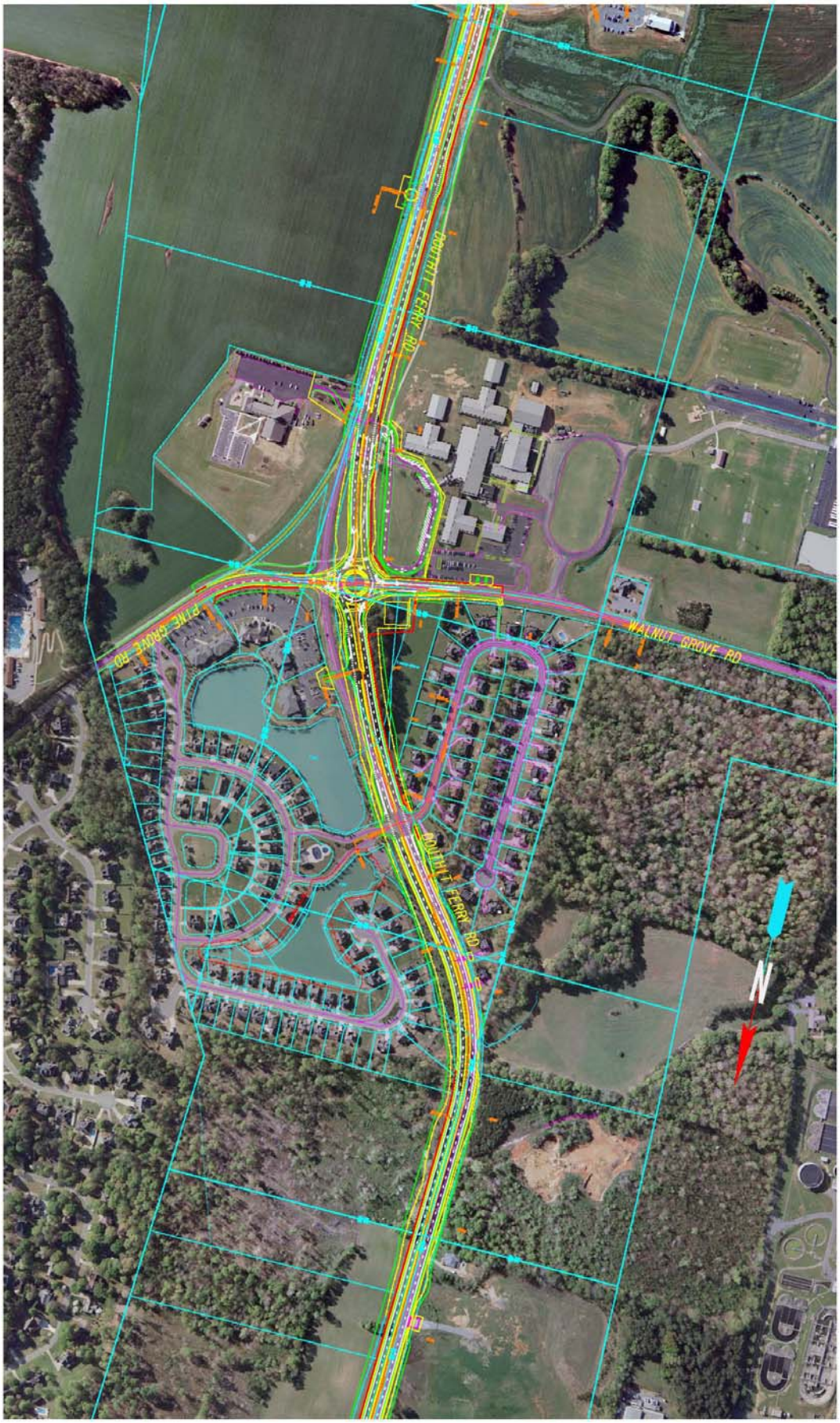
Concur: _____ 11/4/2013
Director of Engineering Date

Approve: _____ 11/11/13
Chief Engineer Date

ATTACHMENT 1

CONCEPT LAYOUT


BEGIN PROJECT 0007494
STA 99+00.00
OLD ALABAMA RD
PARK CT
RIVERSIDE CT
ETOWAH RIVER
MOUND 9BR7
SOUTH TERRY RD
INDIAN MOUND RD
N


POWELL FERRY RD
PINE GROVE RD
WALNUT GROVE RD
POWELL FERRY RD
N


SOUTH ELEVEN FERRY RD
OLD MILL RD
SR 61/SR 113
CSSTP-0007-00(494)
END PROJECT
STA 229+00.00
N

ATTACHMENT 2

TYPICAL SECTIONS

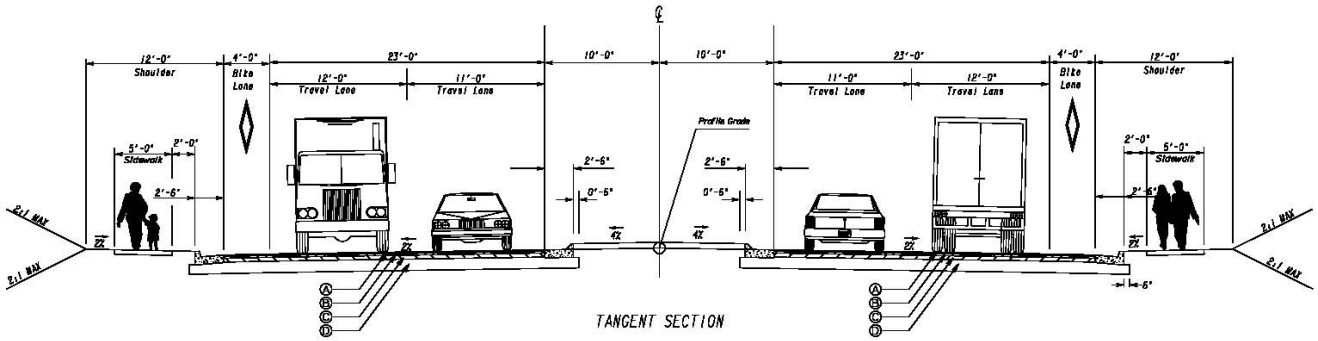
Typical Section Depths

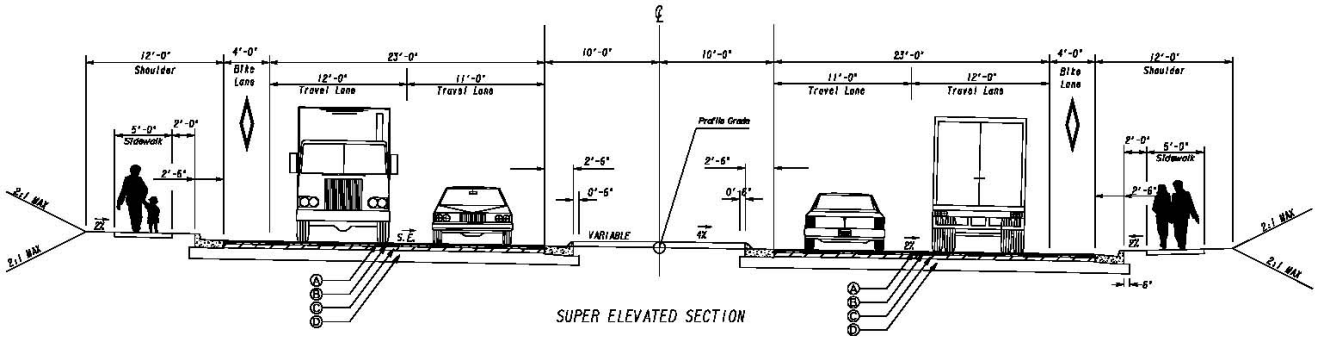
REQUIRED PAVEMENT:

Ⓐ - ASPHALTIC CONCRETE 12.5 mm SUPERPAVE, 165 LB/YD²
Ⓑ - ASPHALTIC CONCRETE 19 mm SUPERPAVE, 220 LB/YD²
Ⓒ - ASPHALTIC CONCRETE 25 mm SUPERPAVE, 440 LB/YD²
Ⓓ - GRADED AGGREGATE BASE 12 INCHES
Ⓔ - ASPHALTIC CONCRETE LEVELING, AS REQ'D

REQUIRED PAVEMENT:

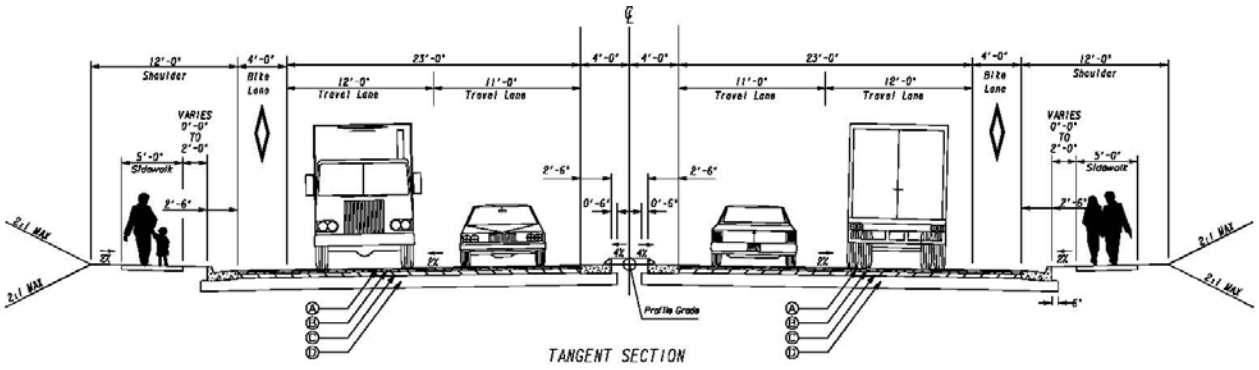
Ⓕ - ASPHALTIC CONCRETE 9.5 mm SUPERPAVE, TP 11, 138 LB/YD²
Ⓖ - ASPHALTIC CONCRETE 19 mm SUPERPAVE, 220 LB/YD²
Ⓗ - ASPHALTIC CONCRETE 25 mm SUPERPAVE, 385 LB/YD²
Ⓘ - GRADED AGGREGATE BASE 10 INCHES

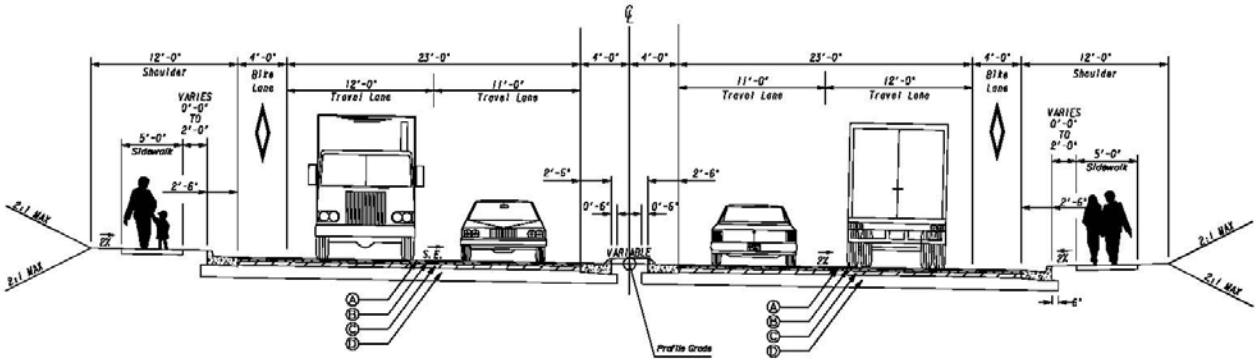




TYPICAL SECTION #1

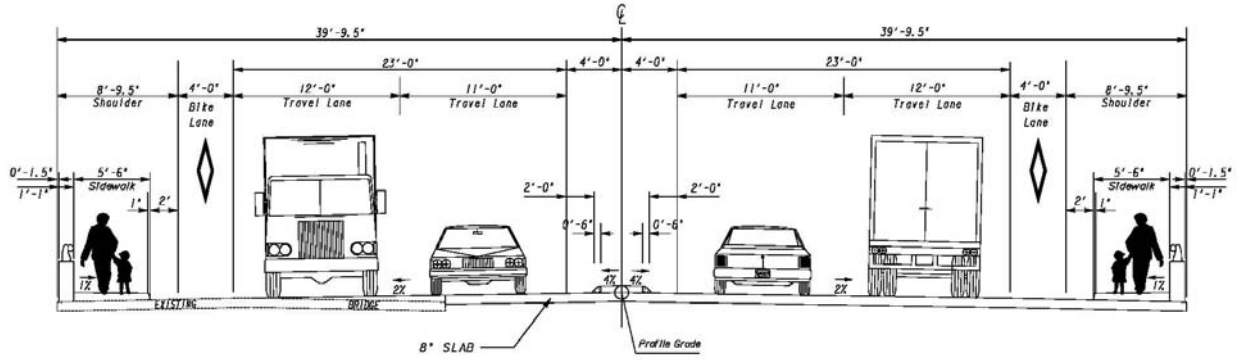
DOUTHIT FERRY ROAD
4 LANE WITH BIKES - 20' RAISED MEDIAN
STA. 100+00.00 TO 109+06.80
STA. 122+29.00 TO 164+00.00
STA. 175+00.00 TO 214+98.30



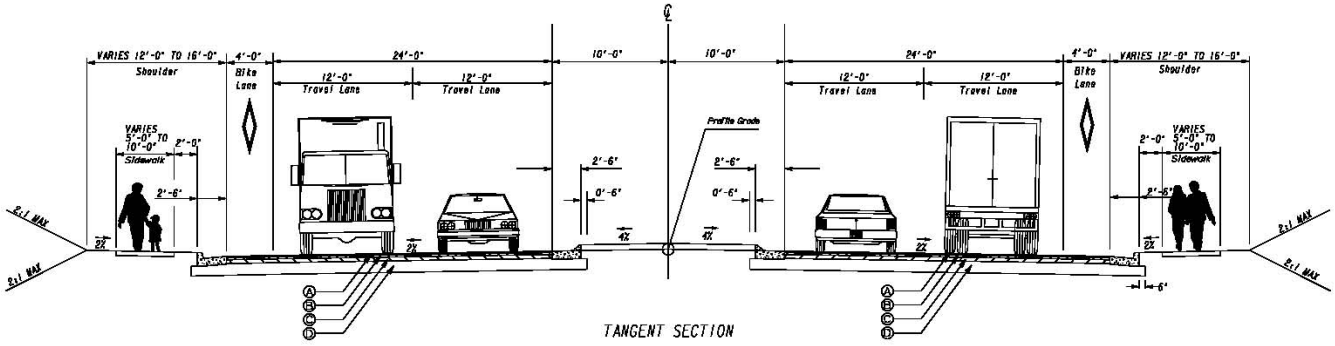


TYPICAL SECTION #2

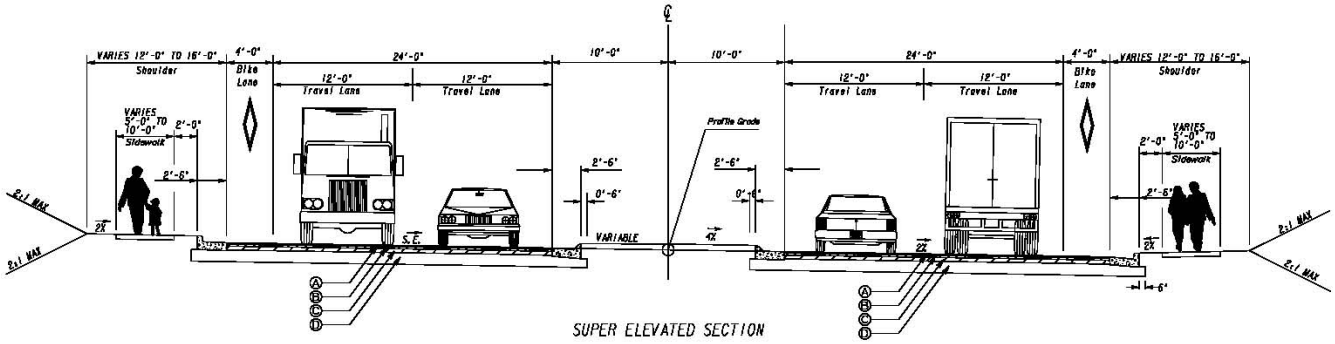
DOUTHIT FERRY ROAD
4 LANE WITH BIKES - 8' RAISED MEDIAN
STA. 109+06.80 TO 110+89.64
STA. 113+69.64 TO 122+29.00



TYPICAL SECTION #15 - BRIDGE
STA. 110+89.64 TO 113+69.64



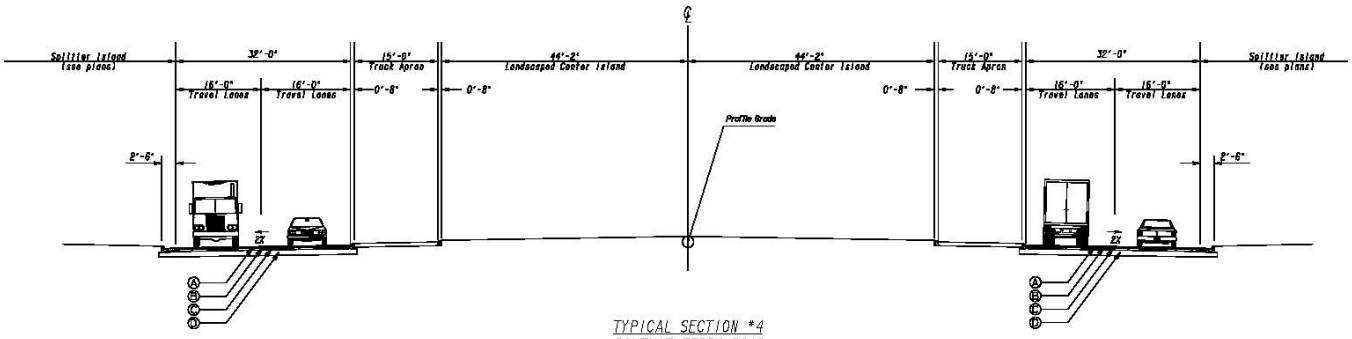
TANGENT SECTION



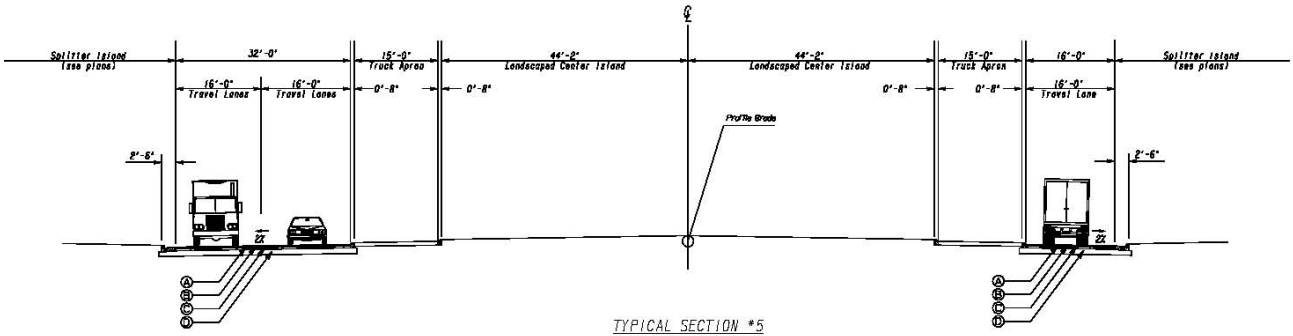
SUPER ELEVATED SECTION

TYPICAL SECTION #3

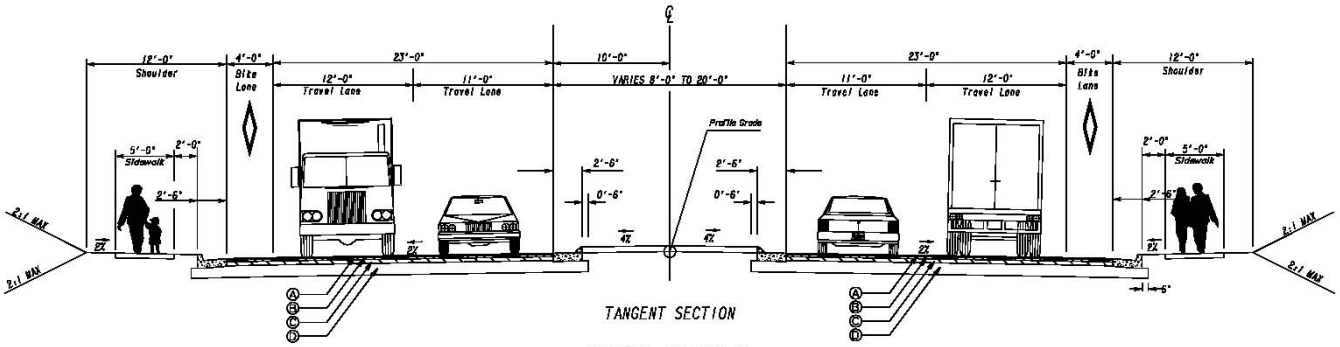
DOUTHIT FERRY ROAD
4 LANE WITH BIKES - 20' RAISED MEDIAN
STA. 164+00.00 TO 170+23.81
STA. 171+92.81 TO 175+00.00



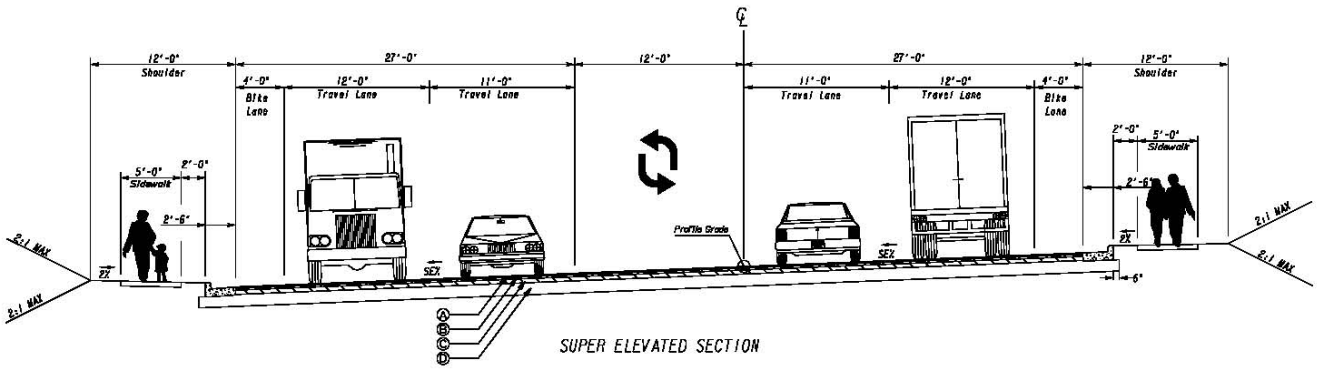
TYPICAL SECTION #4
DOUTHIT FERRY ROAD
MULTI-LANE ROUNDABOUT (NORTH-SOUTH)
STA. 170+23.81 TO 171+92.81

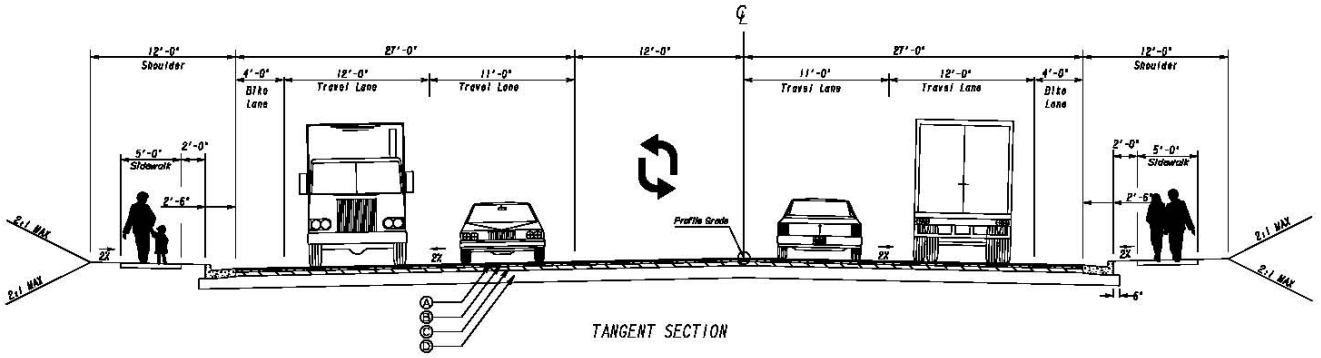


TYPICAL SECTION #5
WALNUT GROVE RD TO PINE GROVE RD
MULTI-LANE ROUNDABOUT (EAST-WEST)
STA. 19+07.50 TO 20+92.50

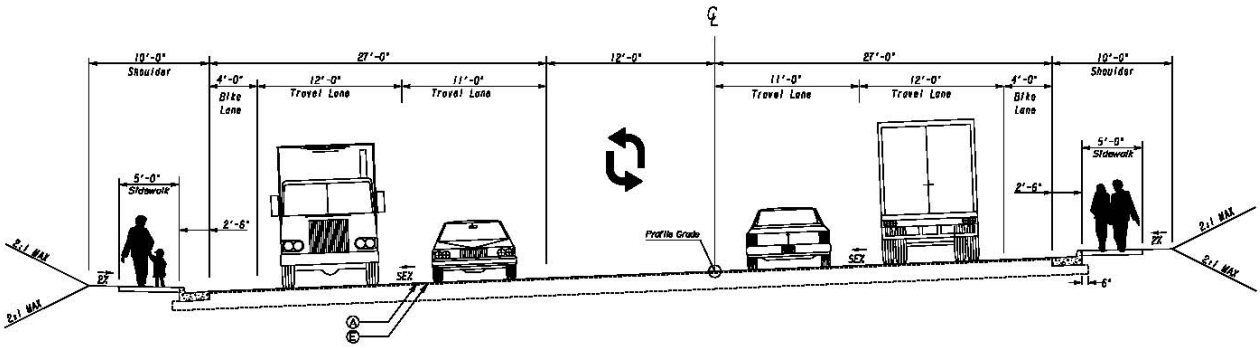


TYPICAL SECTION *6
DOUTHIT FERRY ROAD
4 LANE WITH BIKES
TRANSITION RAISED MEDIAN
STA. 214+98.30 TO 216+30.00





TYPICAL SECTION *7
DOUTHIT FERRY ROAD
4 LANE WITH 12 FT LEFT TURN LANE
STA. 216+30.00 TO 223+00.00



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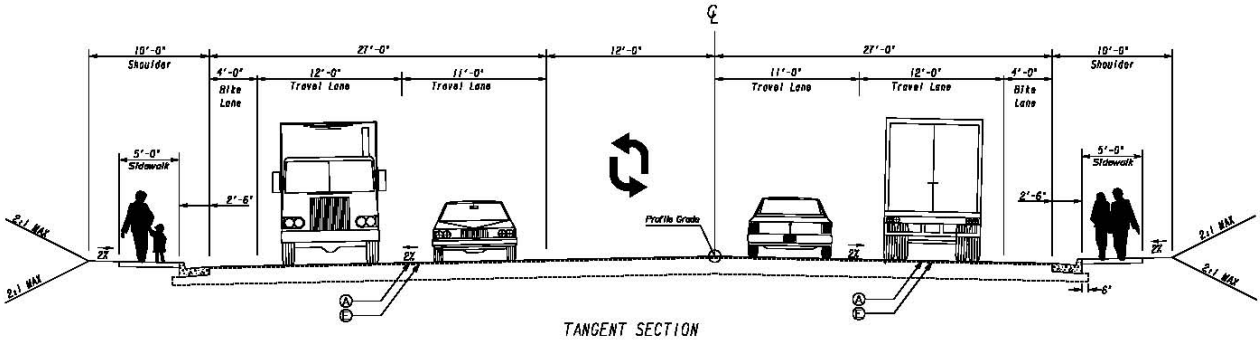
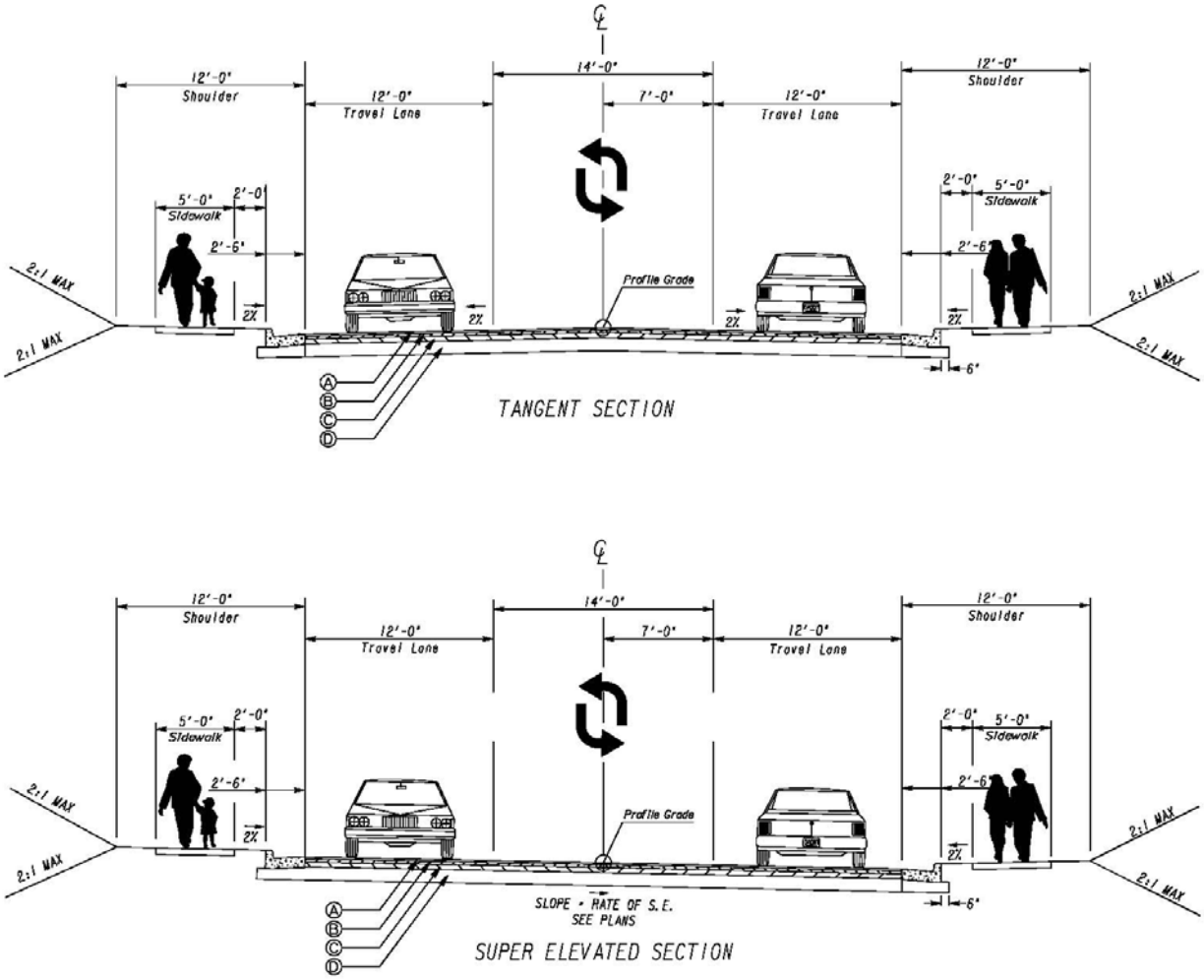


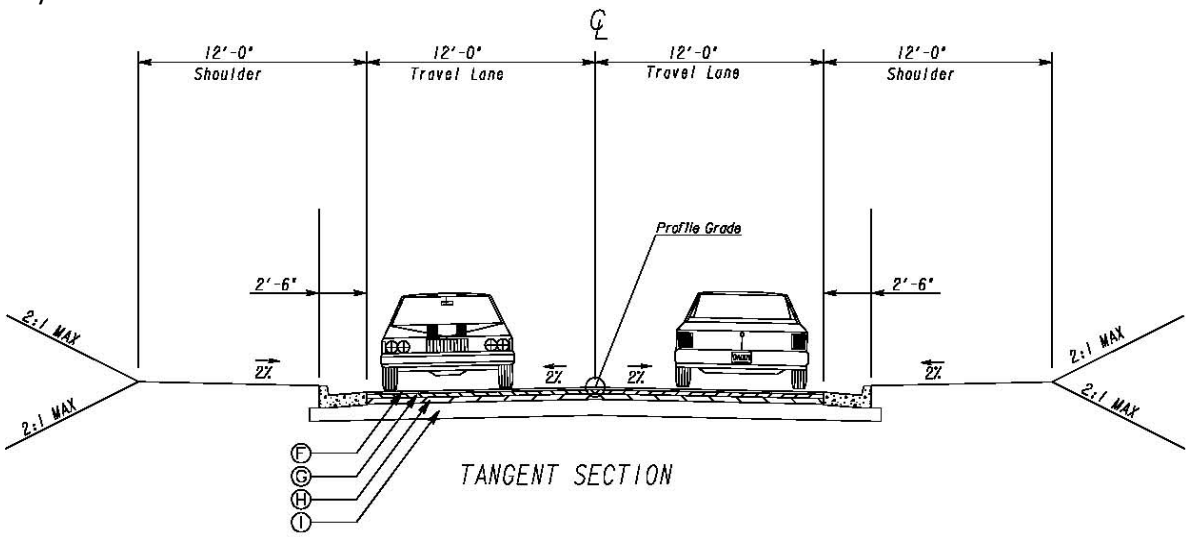
TANGENT SECTION

TYPICAL SECTION *8
DOUTHIT FERRY ROAD - OVERLAY
4 LANE WITH 12 FT LEFT TURN LANES
STA. 223+00.00 TO 227+75.00



TYPICAL SECTION #9

OLD MILL ROAD - STA. 16+19.68 TO 27+34.17



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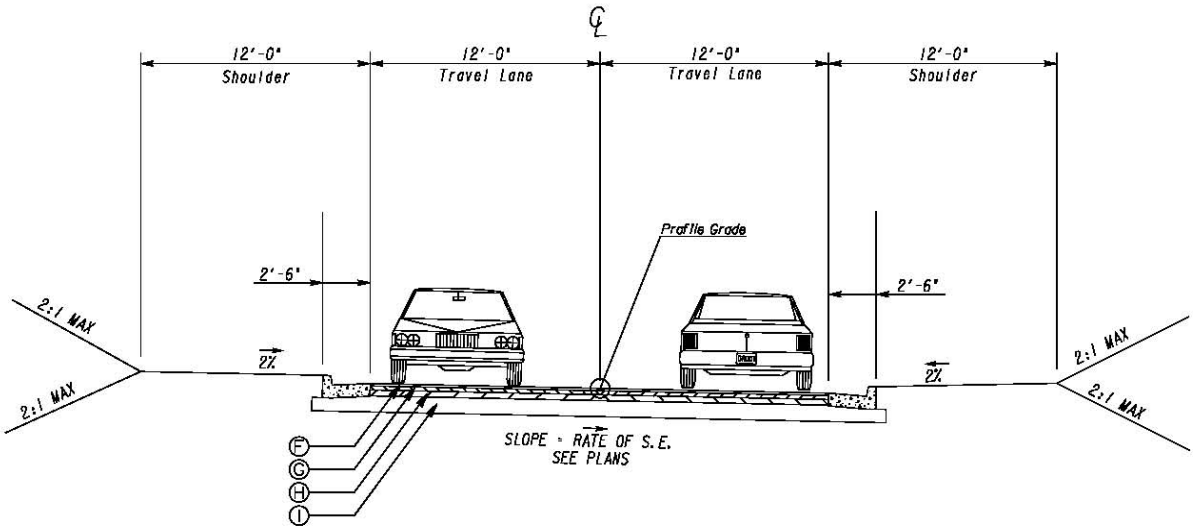
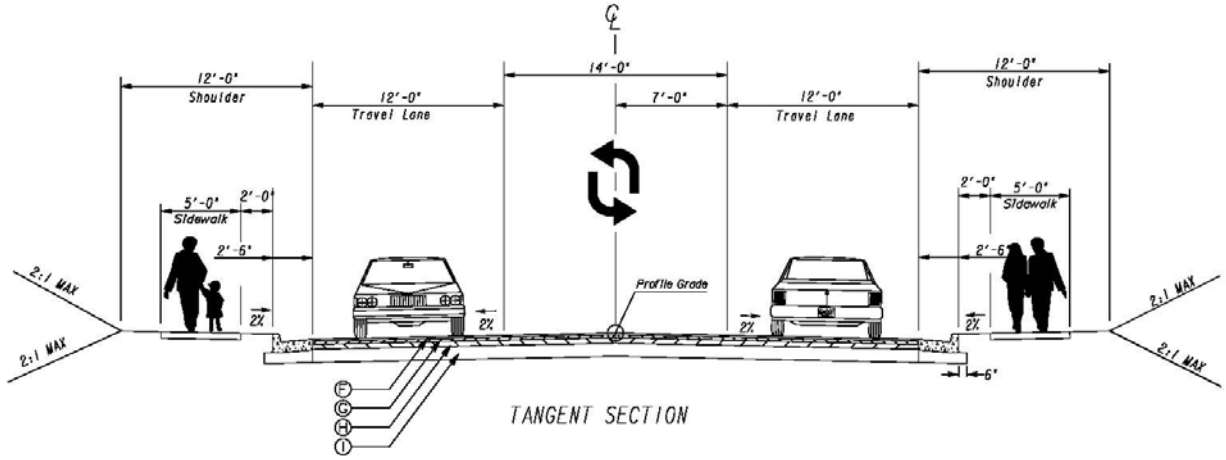


SUPER ELEVATED SECTION

TYPICAL SECTION #10

PARK COURT - STA. 20+12.78 TO 24+54.08
RIVERSIDE COURT - STA. 20+52.14 TO 24+00.00
SAM SMITH PARK ENT. - STA. 20+42.88 TO 21+00.00
CARTERSVILLE MIDDLE SCHOOL DRIVEWAY - STA. 20+43.48 TO 21+70.00
CARTERSVILLE MIDDLE SCHOOL DRIVEWAY - STA. 28+52.45 TO 34+32.63
CARRINGTON DRIVE - STA. 20+44.64 TO 22+34.51



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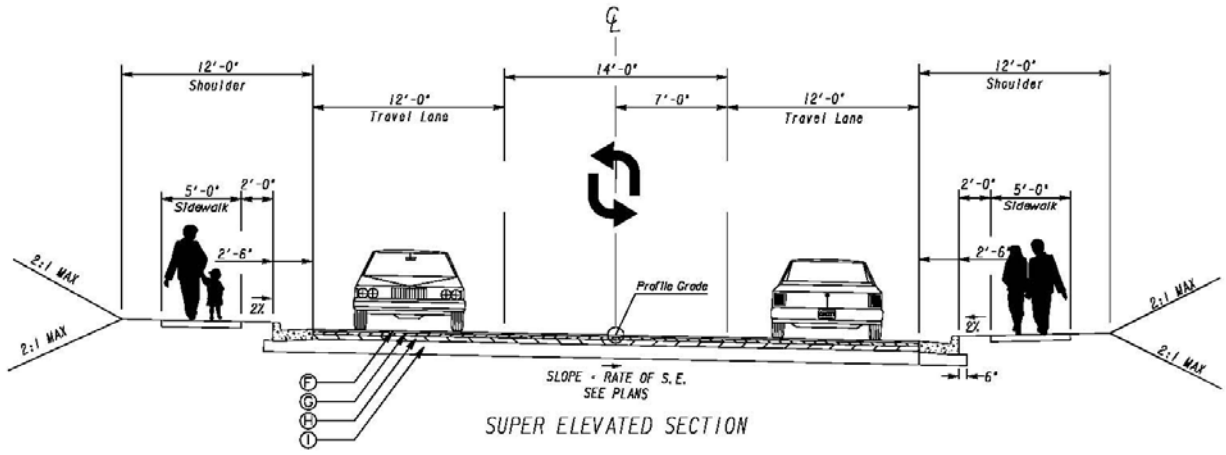
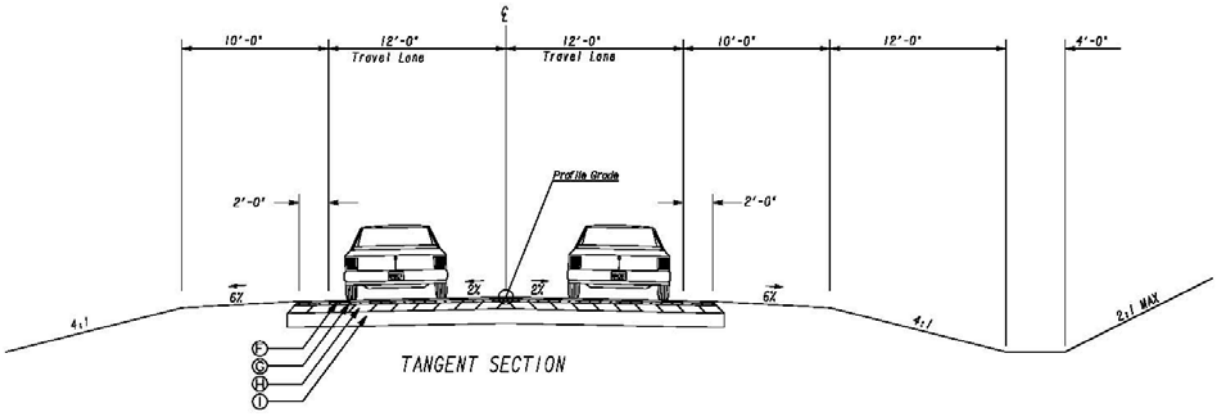


SUPER ELEVATED SECTION

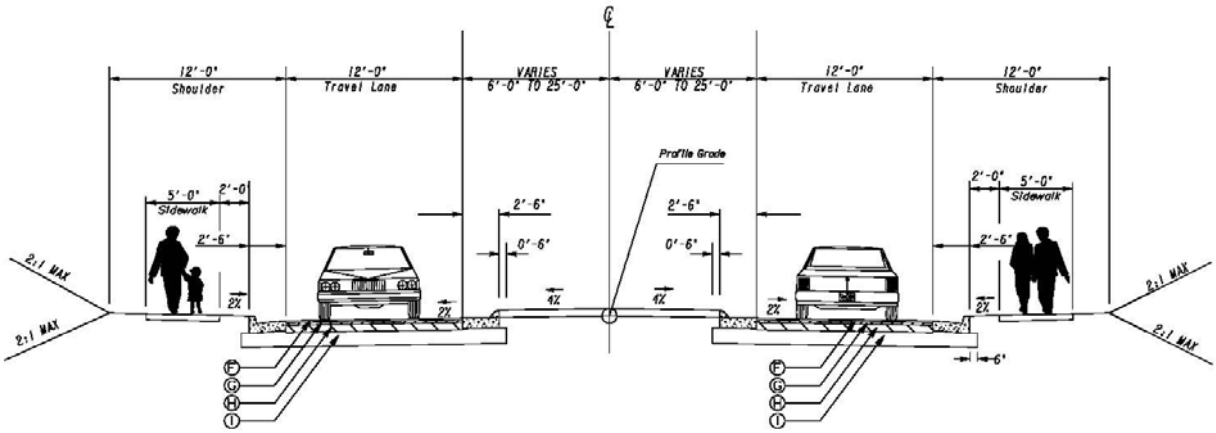
TYPICAL SECTION #11

INDIAN MOUND ROAD - STA. 20+43.00 TO 24+00.00
WALNUT GROVE ROAD - STA. 13+54.83 TO 19+07.50
PINE GROVE ROAD - STA. 20+92.50 TO 26+61.24
OLD MILL ROAD - STA. 16+19.68 TO 27+34.17



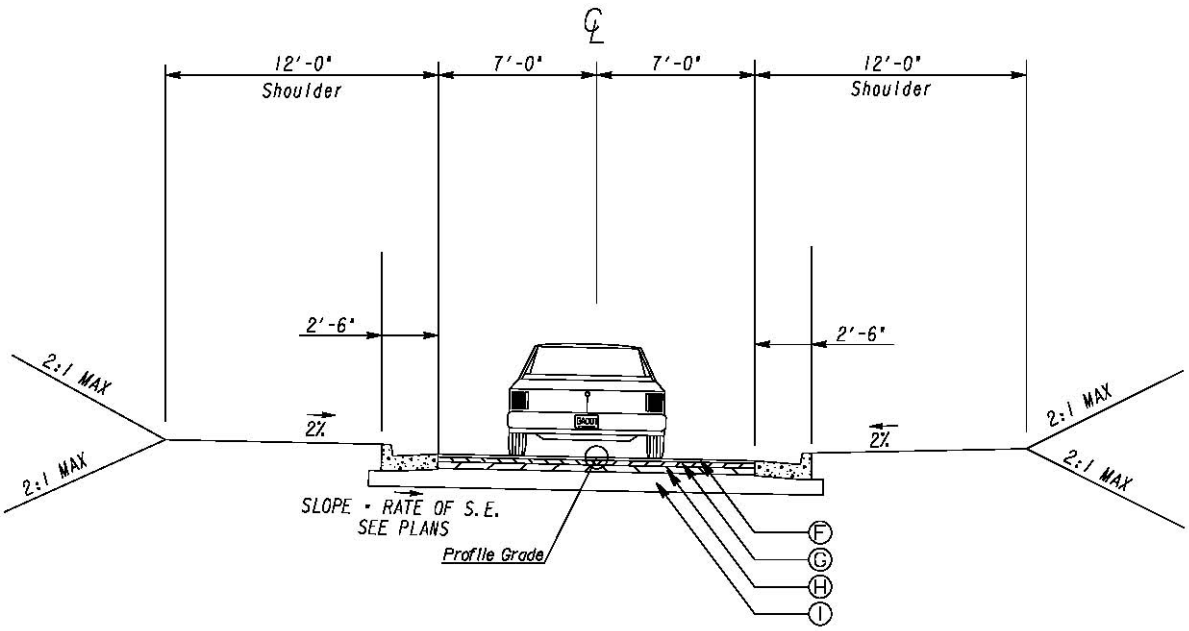
TYPICAL SECTION #12

CARTERSVILLE MIDDLE SCHOOL BUS DRIVEWAY - STA. 21+70.00 TO 28+52.45



TYPICAL SECTION #13

SAM SMITH PARK MAIN ENTRANCE - STA. 20+43.38 TO 21+25.00
PINE GROVE SHOPPING CENTER MAIN ENTRANCE - STA. 20+37.00 TO 22+00.00



SUPER ELEVATED SECTION

TYPICAL SECTION #14

GROVE PARK CIRCLE, EASTBOUND - STA. 20+00.00 TO 23+09.78
GROVE PARK CIRCLE, WESTBOUND - STA. 20+00.00 TO 23+05.00

ATTACHMENT 3

DETAILED COST ESTIMATE

Print Form

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE PROJECT No. CSSTP-0007-00(494) , Bartow **OFFICE** District Six

Douthit Ferry Road Widening in Cartersville, Bartow County **DATE** Oct. 22, 2013

P.I. No. 0007494

FROM Genetha Rice- Singleton, State Program Delivery Engineer

TO Lisa L. Myers, Project Review Engineer

SUBJECT REVISIONS TO PROGRAMMED COSTS

MNGT LET DATE N/A

PROJECT MANAGER Leonora Leigh

MNGT R/W DATE N/A

PROGRAMMED COST (TPro W/OUT INFLATION) **LAST ESTIMATE UPDATE**

CONSTRUCTION	$ 9,895,902.37	DATE 6/14/2012
RIGHT OF WAY	$ 8,623,000.00	DATE 6/5/2012
UTILITIES	$ 2,460,556.00	DATE 9/28/2011

REVISED COST ESTIMATES

CONSTRUCTION*	$ 10,132,300.00
RIGHT OF WAY	$ 3,728,000.00
UTILITIES	$ 2,658,000.00

* Costs contain 0 % Engineering and Inspection

REASON FOR COST INCREASE The estimate now includes lighting for the roundabout. The VE Study Team recommended sidewalks on both sides of Douthit Ferry Road for the length of the project adding to the previous quantity. The VE Study Team recommended a set-offset right-of-way, using easements to cover the construction limits of the project, thus reducing the right-of-way estimate.

Revised: March 14, 2012

CONTINGENCY SUMMARY

Construction Cost Estimate:	$ 10,132,300	(Base Estimate)
Engineering and Inspection:	$ 506,615.00	(Base Estimate x 5 %)
Total Liquid AC Adjustment	$ 834,102.18	(From attached worksheet)
Construction Total:	$ 11,473,017.18	

REIMBURSABLE UTILITY COST

Utility Owner	Reimbursable Cost
Georgia Power Co. - Dist.	$820,000.00

Attachments

STATE HIGHWAY AGENCY

DATE : 10/23/2013
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JOB DETAIL ESTIMATE

JOB NUMBER : 0007494 SPEC YEAR: 01
DESCRIPTION: DOUTHIT FERRY ROAD WIDENING

ITEMS FOR JOB 0007494

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - CSSTP-0007-00-(494)	1.000	250000.00	250000.00
0010	153-1300		EA	FIELD ENGINEERS OFFICE TP 3	1.000	73278.60	73278.60
0015	201-1500		LS	CLEARING & GRUBBING - CSSTP-0007-00(494)	1.000	200000.00	200000.00
0020	205-0001		CY	UNCLASS EXCAV	120100.000	2.18	261818.00
0024	206-0002		CY	BORROW EXCAV, INCL MATL	205900.000	1.68	345912.00
0025	641-1100		LF	GUARDRAIL, TP T	85.000	40.29	3424.65
0030	641-1200		LF	GUARDRAIL, TP W	2210.000	16.13	35647.30
0035	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	7.000	714.84	5003.88
0040	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	11.000	1970.36	21673.96
0045	634-1200		EA	RIGHT OF WAY MARKERS	106.000	101.56	10765.36
0049	643-8200		LF	BARRIER FENCE (ORANGE), 4 FT	5000.000	1.37	6850.00
0050	310-1101		TN	GR AGGR BASE CRS, INCL MATL	71203.000	15.12	1076589.36
0054	318-3000		TN	AGGR SURF CRS	1350.000	18.14	24489.00
0055	402-1812		TN	RECYL AC LEVELING,INC BM&HL	182.000	71.16	12951.12
0060	402-3113		TN	RECYL AC 12.5MM SP,GP1/2,BM&HL	10259.000	70.62	724490.58
0065	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	23858.000	60.65	1446987.70
0070	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	13199.000	65.05	858594.95
0075	413-1000		GL	BITUM TACK COAT	16899.000	2.46	41571.54
0079	433-1000		SY	REINF CONC APPROACH SLAB	375.000	168.51	63191.25
0080	441-0104		SY	CONC SIDEWALK, 4 IN	16876.000	22.07	372453.32
0084	441-0301		EA	CONC SPILLWAY, TP 1	4.000	1567.38	6269.52
0085	441-0754		SY	CONC MEDIAN, 7 1/2 IN	1066.000	42.31	45102.46
0089	441-0756		SY	CONC MEDIAN, 8 IN	1382.000	40.85	56454.70
0090	430-0180		SY	PLN PC CONC PVMT/CL1C/ 8" TK	576.000	25.35	14601.60
0095	441-4030		SY	CONC VALLEY GUTTER, 8 IN	473.000	40.85	19322.05
0100	441-5008		LF	CONC HEADER CURB, 6 IN, TP 7	1449.000	10.67	15460.83
0105	441-5025		LF	CONC HEADER CURB, 4", TP 9	662.000	12.33	8162.46
0110	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	33964.000	11.87	403152.68
0115	441-6740		LF	CONC CURB & GUTTER/ 8"X30" TP7	21196.000	10.56	223829.76
0120	444-1000		LF	SAWED JTS IN EXIST PVMTS - PCC	100.000	1.83	183.00
0125	500-9999		CY	CL B CONC,BASE OR PVMT WIDEN	12.000	150.90	1810.80
0129	500-3800		CY	CL A CONC, INCL REINF STEEL	5.000	879.31	4396.55
0130	550-1180		LF	STM DR PIPE 18",H 1-10	10787.000	29.78	321236.86
0140	550-1240		LF	STM DR PIPE 24",H 1-10	4935.000	37.01	182644.35
0150	550-1300		LF	STM DR PIPE 30",H 1-10	1924.000	47.12	90658.88
0155	550-1360		LF	STM DR PIPE 36",H 1-10	559.000	56.94	31829.46
0159	550-1480		LF	STM DR PIPE 48",H 1-10	134.000	90.99	12192.66
0160	550-2180		LF	SIDE DR PIPE 18",H 1-10	932.000	26.32	24530.24
0170	550-3618		EA	SAFETY END SECTION 18",SD,6:1	26.000	450.39	11710.14

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JOB DETAIL ESTIMATE

0180	550-4218	EA	FLARED END SECT 18 IN, ST DR	2.000	574.34	1148.68
0185	550-4224	EA	FLARED END SECT 24 IN, ST DR	4.000	636.01	2544.04
0190	550-4230	EA	FLARED END SECT 30 IN, ST DR	1.000	702.60	702.60
0195	550-4236	EA	FLARED END SECT 36 IN, ST DR	6.000	1029.99	6179.94
0199	573-2006	LF	UNDDR PIPE INCL DRAIN AGGR 6"	500.000	16.08	8040.00
0200	207-0203	CY	FOUND BKFILL MATL, TP II	4059.000	40.17	163050.03
0205	668-1100	EA	CATCH BASIN, GP 1	135.000	2053.90	277276.50
0215	668-2100	EA	DROP INLET, GP 1	2.000	1757.45	3514.90
0245	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	500.000	41.55	20775.00
0250	603-2181	SY	STN DUMPED RIP RAP, TP 3, 18"	200.000	40.79	8158.00
0255	603-7000	SY	PLASTIC FILTER FABRIC	700.000	3.29	2303.00
0260	700-6910	AC	PERMANENT GRASSING	32.000	752.93	24093.76
0265	700-7000	TN	AGRICULTURAL LIME	48.000	64.03	3073.44
0270	700-8000	TN	FERTILIZER MIXED GRADE	22.000	450.66	9914.52
0275	700-8100	LB	FERTILIZER NITROGEN CONTENT	1600.000	2.11	3376.00
0285	710-9000	SY	PERM SOIL REINFORCING MAT	3000.000	3.26	9780.00
0290	716-2000	SY	EROSION CONTROL MATS, SLOPES	67500.000	0.94	63450.00
0295	163-0232	AC	TEMPORARY GRASSING	16.000	242.36	3877.76
0300	163-0240	TN	MULCH	684.000	162.94	111450.96
0305	163-0300	EA	CONSTRUCTION EXIT	3.000	1193.53	3580.59
0320	163-0527	EA	CNST/REM RIP RAP CKDM,STN P RIPRAP/SN BG	10.000	261.91	2619.10
0325	163-0528	LF	CONSTR AND REM FAB CK DAM -TP C SLT FN	5550.000	3.20	17760.00
0329	163-0529	LF	CNST/REM TEMP SED BAR OR BLD STRW CK DM	1440.000	3.51	5054.40
0330	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- SEDIMENT BASIN 1	1.000	10526.39	10526.39
0332	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- SEDIMENT BASIN 2	1.000	10526.39	10526.39
0333	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- SEDIMENT BASIN 3	1.000	10526.39	10526.39
0334	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- SEDIMENT BASIN 4	1.000	10526.39	10526.39
0335	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- SEDIMENT BASIN 5	1.000	10526.39	10526.39
0339	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- SEDIMENT BASIN 6	1.000	10526.39	10526.39
0340	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	137.000	130.58	17889.46
0345	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	270.93	541.86
0350	167-1500	MO	WATER QUALITY INSPECTIONS	24.000	505.53	12132.72
0355	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	5500.000	2.09	11495.00
0360	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	7400.000	2.57	19018.00
0365	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	2750.000	0.51	1402.50
0370	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	3700.000	0.51	1887.00
0375	165-0041	LF	MAINT OF CHECK DAMS - ALL TYPES	2840.000	0.90	2556.00
0380	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN,STA NO -	6.000	1695.70	10174.20
0385	165-0071	LF	MAINT OF SEDIMENT BARRIER - BALED STRAW	720.000	0.93	669.60
0390	165-0101	EA	MAINT OF CONST EXIT	3.000	520.99	1562.97
0395	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	137.000	43.06	5899.22
0400	636-1020	SF	HWY SGN,TP1MAT,REFL SH TP3	830.000	12.68	10524.40

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JOB DETAIL ESTIMATE

0405	636-1033	SF	HWY SIGNS, TP1MAT,REFL SH TP 9	150.000	16.01	2401.50
0410	636-2070	LF	GALV STEEL POSTS, TP 7	1500.000	5.84	8760.00
0415	636-2090	LF	GALV STEEL POSTS, TP 9	270.000	6.21	1676.70
0416	647-1000	LS	TRAF SIGNAL INSTALLATION NO - SIGNAL NO. 1 - OLD AL RD @ DFR	1.000	125000.00	125000.00
0417	647-1000	LS	TRAF SIGNAL INSTALLATION NO - SIGNAL NO. 2 - SAM SMITH PARK @ DFR	1.000	116500.00	116500.00
0418	647-1000	LS	TRAF SIGNAL INSTALLATION NO - SIGNAL NO. 3 - OLD MILL RD @ DFR	1.000	116500.00	116500.00
0419	647-1000	LS	TRAF SIGNAL INSTALLATION NO - SIGNAL NO. 4 - SR 113 @ DFR	1.000	50000.00	50000.00
0420	652-0094	EA	PVMT MARKING, SYMBOL, TP 4	30.000	44.73	1341.90
0425	652-0110	EA	PAVEMENT MARKING, ARROW, TP 1	30.000	42.43	1272.90
0430	652-5451	LF	SOLID TRAF STRIPE, 5 IN, WHITE	55577.000	0.16	8892.32
0435	652-6501	GLF	SKIP TRAF STRIPE, 5 IN, WHITE	6750.000	0.10	675.00
0440	653-0110	EA	THERM PVMT MARK, ARROW, TP 1	43.000	70.54	3033.22
0445	653-0120	EA	THERM PVMT MARK, ARROW, TP 2	85.000	71.74	6097.90
0450	653-0130	EA	THERM PVMT MARK, ARROW, TP 3	9.000	97.85	880.65
0455	653-0160	EA	THERM PVMT MARK, ARROW, TP 6	3.000	108.39	325.17
0460	653-0170	EA	THERM PVMT MARK, ARROW, TP 7	6.000	84.15	504.90
0465	653-1501	LF	THERMO SOLID TRAF ST 5 IN, WHI	11787.000	0.42	4950.54
0470	653-1502	LF	THERMO SOLID TRAF ST, 5 IN YEL	30317.000	0.44	13339.48
0475	653-1704	LF	THERM SOLID TRAF STRIPE,24",WH	1046.000	5.52	5773.92
0480	653-1804	LF	THERM SOLID TRAF STRIPE, 8",WH	6765.000	2.01	13597.65
0485	653-3501	GLF	THERMO SKIP TRAF ST, 5 IN, WHI	25692.000	0.24	6166.08
0490	653-6004	SY	THERM TRAF STRIPING, WHITE	335.000	2.89	968.15
0495	653-6006	SY	THERM TRAF STRIPING, YELLOW	94.000	3.16	297.04
0500	654-1001	EA	RAISED PVMT MARKERS TP 1	4.000	2.99	11.96
0505	654-1002	EA	RAISED PVMT MARKERS TP 2	60.000	2.71	162.60
0510	654-1003	EA	RAISED PVMT MARKERS TP 3	600.000	3.38	2028.00
0513	657-9110	LF	WET REFL SOL PVMT MKGS,5", WH	560.000	3.19	1786.40
0514	657-9310	GLF	WET REFL SKP PVMT MKGS,5", WH	560.000	5.75	3220.00
0515	211-0300	CY	BR EXCAV, STREAM CROSSING	51.000	30.73	1567.23
0520	441-0106	SY	CONC SIDEWALK, 6 IN	172.000	30.02	5163.44
0525	603-7000	SY	PLASTIC FILTER FABRIC	540.000	3.29	1776.60
0530	500-0100	SY	GROOVED CONCRETE	872.000	4.37	3810.64
0535	500-1006	LS	SUPERSTR CONCRETE, CL AA, BR NO - BRIDGE NO. 1 - NORTHBOUND	1.000	206643.99	206643.99
0540	500-2100	LF	CONCRETE BARRIER	280.000	36.74	10287.20
0545	500-2110	LF	CONCRETE PARAPET, SPCL DES	280.000	150.82	42229.60
0550	500-3002	CY	CL AA CONCRETE	176.000	544.35	95805.60
0555	507-9003	LF	PSC BEAMS,AASHTO TP III,BR NO- BRIDGE NO. 1 - NORTHBOUND	1400.000	130.37	182518.00
0560	511-1000	LB	BAR REINF STEEL	40656.000	0.77	31305.12
0565	511-3000	LS	SUPERSTR REINF STEEL, BR NO - BRIDGE NO. 1 - NORTHBOUND	70364.000	0.80	56291.20
0570	520-0242	EA	H-PILE POINTS, HP 10 X 42	4.000	167.27	669.08
0575	520-0374	EA	H-PILE POINTS, HP 12 X 74	40.000	158.63	6345.20

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JOB DETAIL ESTIMATE

0580	520-1104	LF	PIL-IN-PL,STEEL H,HP 10 X 42	120.000	38.39	4606.80
0585	520-1127	LF	PIL-IN-PL,STEEL H,HP 12 X 74	1200.000	51.86	62232.00
0590	516-1100	LF	ALUM HANDRAIL, STD 3626	280.000	63.24	17707.20
0595	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	540.000	41.55	22437.00
0600	525-1000	EA	COFFERDAM	6.000	25868.61	155211.66
0605	211-0300	CY	BR EXCAV, STREAM CROSSING	20.000	30.73	614.60
0610	441-0106	SY	CONC SIDEWALK, 6 IN	172.000	30.02	5163.44
0615	603-7000	SY	PLASTIC FILTER FABRIC	141.000	3.29	463.89
0620	500-1006	LS	SUPERSTR CONCRETE, CL AA, BR NO - BRIDGE NO. 2 - SOUTHBOUND	1.000	63317.10	63317.10
0625	500-2110	LF	CONCRETE PARAPET, SPCL DES	280.000	150.82	42229.60
0630	500-3002	CY	CL AA CONCRETE	68.000	544.35	37015.80
0635	507-9003	LF	PSC BEAMS,AASHTO TP III,BR NO- BRIDGE NO. 2 - SOUTHBOUND	560.000	130.37	73007.20
0640	511-1000	LB	BAR REINF STEEL	15708.000	0.77	12095.16
0645	511-3000	LS	SUPERSTR REINF STEEL, BR NO - BRIDGE NO. 2 - SOUTHBOUND	21560.000	0.80	17248.00
0650	520-0242	EA	H-PILE POINTS, HP 10 X 42	18.000	167.27	3010.86
0655	520-1104	LF	PIL-IN-PL,STEEL H,HP 10 X 42	540.000	38.39	20730.60
0660	516-1100	LF	ALUM HANDRAIL, STD 3626	280.000	63.24	17707.20
0665	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	141.000	41.55	5858.55
0670	525-1000	EA	COFFERDAM	3.000	23808.00	71424.00
0675	441-0018	SY	DRIVEWAY CONCRETE, 8 IN TK	1173.000	42.34	49664.82
0680	681-4277	EA	LT STD, 25' MH, 6' ARM	17.000	2350.00	39950.00
0685	681-4300	EA	LT STD, 30' MH, 6' ARM	4.000	2700.00	10800.00
0690	681-6295	EA	LUMINAIRE, TP 3, 40 W, LED	5.000	720.00	3600.00
0695	681-6310	EA	LUMINAIRE,TP 3, 90 W, LED	2.000	750.00	1500.00
0700	681-6315	EA	LUMINAIRE,TP 3, 105 W, LED	3.000	750.00	2250.00
0705	681-6316	EA	LUMINAIRE,TP 3, 130 W, LED	2.000	970.00	1940.00
0710	681-6410	EA	LUMINAIRE,TP 4, 105 W, LED	9.000	750.00	6750.00
0715	682-1504	LF	CABLE, TP RHH/RHW, AWG NO 10	10937.000	0.45	4921.65
0720	682-6219	LF	CONDUIT, NONMETL, TP 2, 1 IN	2600.000	5.15	13390.00
0725	682-9000	LS	MAIN SVC PICK UP POINT	1.000	5000.00	5000.00
ITEM TOTAL						10132300.07
INFLATED ITEM TOTAL						10132300.07

TOTALS FOR JOB 0007494

ESTIMATED COST:	10132300.07
CONTINGENCY PERCENT (0.0):	0.00
ESTIMATED TOTAL:	10132300.07

PROJ. NO.	CSSTP-0007-00(494)	CALL NO.
P.I. NO.	0007494	
DATE	10/23/2013	

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Oct-13	$ 3.254
DIESEL		$ 3.869
LIQUID AC		$ 568.00

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)			**809365.92**	**$**	**809,365.92**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 908.80		
Monthly Asphalt Cement Price month project let (APL)			$ 568.00		
Total Monthly Tonnage of asphalt cement (TMT)			2374.9		

ASPHALT	Tons	%AC	AC ton
Leveling	182	5.0%	9.1
12.5 OGFC	0	5.0%	0
12.5 mm	10259	5.0%	512.95
9.5 mm SP	0	5.0%	0
25 mm SP	23858	5.0%	1192.9
19 mm SP	13199	5.0%	659.95
	47498		**2374.9**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$ 24,736.26**	**$**	**24,736.26**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 908.80		
Monthly Asphalt Cement Price month project let (APL)			$ 568.00		
Total Monthly Tonnage of asphalt cement (TMT)			72.58291048		

Bitum Tack Gals	gals/ton	tons
16899	232.8234	72.5829105

PROJ. NO.	CSSTP-0007-00(494)		CALL NO.
P.I. NO.	0007494		
DATE	10/23/2013		

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				0	$ -
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	908.80	
Monthly Asphalt Cement Price month project let (APL)			$	568.00	
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	**$**	**834,102.18**

GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 10/8/2012 Project: CCSTP-0007-00(494)
Revised: 10/8/2013 County: BARTOW
PI: 7494

Description: Widening and Reconstruction
Project Termini: Douthit Ferry Rd. from Old Alabama Rd. to SR 61/SR 113

Existing ROW: Varies
Parcels: 54 Required ROW: Varies

Land and Improvements		$2,338,173.00
Valuation Services		$85,000.00
Legal Services		$373,950.00
Relocation		$348,000.00
Demolition		$109,500.00
Administrative		$173,000.00
TOTAL ESTIMATED COSTS		$3,727,623.00
TOTAL ESTIMATED COSTS (ROUNDED)		***$3,728,000.00***

Preparation Credits	Hours	Signature

Prepared By: Virginia Deming GA 6159 10/24/13
Approved By: [signature] Cert. 286999 10/23/2013

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

This cost estimate does not include any city or county parcels.

631260DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: CSSTP-0007-00(494); Bartow County OFFICE: Cartersville
Douthit Ferry Rd. from Old Alabama to SR 61/113
P.I. No. 0007494

FROM: Kerry D. Bonner, District Utilities Engineer DATE: September 18, 2013

TO: Genetha Rice-Singleton, State Program Delivery Engineer
ATTN: Leonora Leigh

SUBJECT: PRELIMINARY UTILITY COST ESTIMATE

We are furnishing you with a Preliminary Utility Cost estimate for each utility with facilities potentially located within the project limits.

FACILITY OWNER	NON REIMBURSABLE	REIMBURSABLE*
AT&T – Georgia	$ 165,000.00	
City of Cartersville – Gas	$ 730,000.00	
City of Cartersville – Water	$ 690,000.00	
City of Cartersville – Electric	$ 110,000.00	
Georgia Power Co. – Dist		$ 820,000.00
Comcast	$ 33,000.00	
Bartow County Water & Sewer	$ 110,000.00	
Totals	$1,838,000.00	$ 820,000.00

Total cost for the above project is $ 2,658,000.00.

*The reimbursable cost for this project will be the responsibility of the City of Cartersville.

If you have any questions, please contact Stan McCarley at 678-721-5324.

KDB/sm

C: Mike Bolden, State Utilities Engineer
Angela Robinson, Transportation Accounts Administrator
File

ATTACHMENT 4

PROJECT JUSTIFICATION REPORT

Includes Crash Summaries, Capacity Analysis and B/C Ratio

Project Justification
Project Number CSSTP-0007-00 (494) Bartow
P.I. Number: P.I. # 0007494
CR 343/Douthit Ferry Road fm Old Alabama Road to SR 61/ SR 113

CR 343/ Douthit Ferry Road is a two-lane, north-south urban collector that connects Old Alabama Road, a future divided four-lane roadway, with SR 61/ SR 113, a divided four-lane roadway. Project 0007494 was added by the Project Nomination Review Committee (PNRC) in July 2005. The project is included in the Draft 12-15 STIP.

Existing Conditions

CR 343/ Douthit Ferry Road is classified as an Urban Collector. Currently, Douthit Ferry Road is a two-lane section for the entire length of the project.

The project corridor has two designated bike paths on the project. Trail 125 has a partial path along CR 343/ Douthit Ferry Road and trail 145 travels the entire length of the corridor. Bike lanes should be considered as a part of the project.

Existing and Projected Traffic Volumes

The current (2011) Average Annual Dailey Traffic (AADT) on Douthit Ferry Road Ranges between 4880 at the southern end to 8000 between Old Mill Road and SR 61/ SR 113. Douthit Ferry Road currently operates at a level of service (LOS) of "C" or better. However the 4-way Stop at Pine Grove Road operates at a LOS of "F". The (2038) design traffic volumes are projected to range between 22,900 on the south end to 21,400 at Old Mill Road and 17,500 between Old Mill Road and SR 61/ SR 113. Table 1 presents traffic volumes and LOS data for the corridor and major intersections for the existing year (2011) and Design Year (2038).

Table 1. Traffic Volumes and Level of Service for the Corridor and Level of Service for Major Intersection
Existing and Future No Build Conditions

GDOT P.I #	Location	2011 AADT	2011 LOS	2038 AADT	2038 LOS
0007494 Bartow Douthit Ferry Road Fm Old Alabama Road to SR 61/ SR 113	Corridor	8000	C	22,900	F
	DFR at SR 61/ SR 113	8000	C	17500	E
	DFR at Old Mill Road	5250	C	21400	E
	DFR at Pine Grove Road	4850	F	22700	F
	DFR at Old Alabama Road	4880	C	22900	E

CRASH DATA

A review of the crash history on Douthit Ferry Road was provided by the Georgia Department of Transportation for the years 2006, 2007, 2008, and 2009 and is summarized in Table 2. A crash rate (the total number of crashes in comparison with the

volume of traffic) was developed for each year. The crash rate for Douthit Ferry Road is greater than the statewide rate in 2006 and 2008. The 2007 year is 10.74 % and 2009 is 7.42% below the statewide crash rate. Given the two years exceeding the statewide crash rate and the two years within a small percentage of the statewide crash rate it would be beneficial to improve the safety along Douthit Ferry Road.

-Table 2
Douthit Ferry Road Crash Rates

Year	Crashes	Crash / Rate(1)	Statewide Crash Rate (1)	Injuries	Injury Rate (2)	Statewide Injury Rate(2)	Fatalities	Fatality Rate (3)	Statewide Fatality Rate (3)
2006	27	826	510	15	457	184	0	0	1.70
2007	23	424	475	2	37	166	1	18.42	1.33
2008	29	534	443	4	74	154	0	0	1.12
2009	21	399	431	7	133	149	0	0	1.11

(1) Number of Crashes per 100,000,000 vehicle miles/per year
(2) Number of Injuries per 100,000,000 vehicle miles/per year
(3) Number of Fatalities per 100,000,000 vehicle miles/per year

Project Limits

The present limits of the 2.48 mile project for the widening of Douthit Ferry Road are from Old Alabama Road to SR 61 / SR113. The AADT numbers referred to in this section are for the 2038 Build Condition. 80% of the southbound traffic [13,025 (2038)] on Douthit Ferry Road turns eastbound [4500 (2038)] or westbound [5900 (2038)] onto Old Alabama Road at the southern terminus. South of Old Alabama Road, Douthit Ferry Road becomes a residential collector and is presently four lanes wide entering a mixed-use development. The traffic on Douthit Ferry Road south of Old Alabama Road will be 13,200 (2038) vehicles per day and will increase to 26,050 (2038) north of Old Alabama Road. The northern end of the project is at the intersection Douthit Ferry Road with SR 61 / SR 113. At this intersection, the traffic on Douthit Ferry Road reduces by about 24% from 23,400 (2038) vehicles south of Old Mill Road to 17,900 (2038) vehicles north of Old Mill Road. Also, about 40% of the traffic from Douthit Ferry Road turns onto SR 61 / SR 113 and 60% of the traffic continues north to Burnt Hickory Road. 10,400 (2038) vehicles continue between Douthit Ferry Road and Burnt Hickory Road per day. This volume will be able to be served with only one lane northbound and one lane southbound and maintain a LOS D at the intersection.

Project Goal

This project is to relieve congestion, accommodate current and future travel demand, reduce crash frequency and severity, and improve the intersections to an acceptable level of service along CR 343/ Douthit Ferry Road. Crash rates along CR 343/ Douthit Ferry Road are above the statewide average for comparable route types for two of the four years shown and approach the statewide average for the remaining two years. The project has a LOS of "F" for the corridor for the 2038 Design Year. The intersections along CR 343/ Douthit Ferry Road range from LOS of "E" to LOS of "F" for the 2038 Design Year.

ATTACHMENT 5

TRAFFIC STUDY

Includes Traffic Diagrams and Signal Warrants

DOUTHIT FERRY ROAD

DESIGN TRAFFIC STUDY

OLD ALABAMA ROAD TO STATE ROUTE 61/113

PROJECT NO. CSSTP 0007-00(492)

CITY OF CARTERSVILLE, BARTOW COUNTY, GEORGIA

P.I. No. 0007494

Submitted June 28, 2011

Prepared By:
Robinson Transportation Consultants, LLC
3010 Andora Drive
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Cartersville, GA 30120
770-387-0440

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Introduction

The primary purpose of the Douthit Ferry Road project is to provide for future traffic growth through the corridor and to maintain an efficient route to the City of Cartersville from the southwest section of the City and Bartow County. With the continuous growth within the City of Cartersville and Bartow County it is important to maintain the roadway system. Douthit Ferry Road is a major urban collector in the City of Cartersville on the western boundary of the City. A map showing the location and Limits of Douthit Ferry Road is shown in Figure 1. This report is a modification of a similar report submitted in 2008. The traffic thorough the Douthit Ferry Corridor was recounted in February 2011.

Existing Conditions

Douthit Ferry Road is a 2.48-mile two lane urban collector extending north-south from Old Alabama Road to SR 61 / SR 113 and northward as Burnt Hickory Road providing access to US 41 north of the City of Cartersville. SR 61 / SR 113 provides access to the City of Cartersville CBD and to I-75. Old Alabama Road at Douthit Ferry Road is a 2-lane roadway and widens to four-lanes to the east of Douthit Ferry Road as it approaches I-75. This area of Cartersville has been and is still growing rapidly with residential development and commercial development. A major intersecting road with Douthit Ferry Road is Old Mill Road which provides access to one of the City's major industrial areas and the city's elementary schools. The city's middle school is located in the southwest corner of the intersection of Douthit Ferry Road and Pine Grove Road.

During both the a.m. peak and p.m. peak the congestion on Douthit Ferry Road is minimal except at two key locations, which are the intersection of Douthit Ferry Road and Pine Grove Road, and on Douthit Ferry Road between Old Mill Road and SR 61 / SR 113. The intersection of Pine Grove Road and Douthit Ferry Road is a four-way stop controlled intersection and the entrance to the Cartersville Middle School is located in the southwest corner of the intersection. The traffic accessing the school creates long queues of traffic on the approaches to the intersection at the beginning and end of the school day. The congestion between SR 61 / SR 113 is due to the short distance between the two intersection about 600 feet and the heavy traffic flow from southbound Douthit Ferry Road to westbound Old Mill Road during the a.m. peak going to the elementary schools and the industrial areas and the opposite flow in the p.m. peak.

Safety Analysis

A review of the crash history on Douthit Ferry Road was provided by the Georgia Department of Transportation (GDOT) for the years 2006, 2007, 2008 and 2009 and is summarized in Table 1. A collision rate (the total number of crashes in comparison with the volume of traffic) was developed for each year. The collision rate for Douthit Ferry is greater than the statewide rate, which indicates that it would be beneficial to improve the safety along Douthit Ferry Road. The majority of the collisions occurred at the intersection of Douthit Ferry Road and SR 61 / SR 113 in 2006, 2007and 2008. A large number of these collisions can probably be attributed to construction at the intersection with the widening of SR 61 and SR 113 during that period. The collision rate along Douthit Ferry Road without the collisions at SR 61 /SR 113 exceeded the statewide rate in both 2006 and 2008. In 2007 and 2009 the accident rate was just below the statewide rate.

Douthit Ferry Road Study Limits **Figure 1**

The injury rate is also over the statewide average with the total number of injuries including the injuries at SR 61 / SR 113. The injury rate without SR 61 / SR 113 exceeded the statewide rate for injuries in 2006. In addition, there was one fatality on Douthit Ferry Road in 2007. The fatality collision was a single vehicle collision with an animal and occurred about a half mile south of Old Mill Road.

Table 3 shows a breakdown of the collisions by location and type**.** The majority of the intersections are angle and rear end collisions. A large number of the angle collision at SR 61 3/ SR 113 and Douthit Ferry Road are between left turn vehicles and the opposing

through traffic which can be attributed to the lack of gaps in the opposing through traffic which was improved with the widening of SR 61 / SR 113. At the intersection of Douthit Ferry Road the number of collisions greatly reduced from 2007 to 2009 which could be attributed to the completion of construction at the intersection of Douthit Ferry Road and SR 61 / SR 113.

Table 1
Douthit Ferry Road Crash Rates
With SR 61 / SR 113

Year	Crashes	Crash / Rate(1)	Statewide Crash Rate (1)	Injuries	Injury Rate (2)	Statewide Injury Rate (2)	Fatalities	Fatality Rate (3)	Statewide Fatality Rate (3)
2006	59	1804	510	33	1009	184	0	0	1.70
2007	76	1400	475	17	314	166	1	18.42	1.33
2008	62	1142	443	27	497	154	0	0	1.12
2009	38	722	431	10	190	149	0	0	1.11

(1) Number of Crashes per 100,000,000 vehicle miles/per year
(2) Number of Injuries per 100,000,000 vehicle miles per year
(3) Number of Fatalities per 100,000,000 vehicle miles per year

Table 2
Douthit Ferry Road Crash Rates
Without SR 61 / SR 113

Year	Crashes	Crash / Rate(1)	Statewide Crash Rate (1)	Injuries	Injury Rate (2)	Statewide Injury Rate (2)	Fatalities	Fatality Rate (3)	Statewide Fatality Rate (3)
2006	27	826	510	15	457	184	0	0	1.70
2007	23	424	475	2	37	166	1	18.42	1.33
2008	29	534	443	4	74	154	0	0	1.12
2009	21	399	431	7	133	149	0	0	1.11

(1) Number of Crashes per 100,000,000 vehicle miles/per year
(2) Number of Injuries per 100,000,000 vehicle miles per year
(3) Number of Fatalities per 100,000,000 vehicle miles per year

Table 3
Douthit Ferry Collision Locations and Type

SR 61/ SR 113	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*32*	*13*	*14*	*0*	*1*	*3*	*1*
2007	*54*	*25*	*23*	*2*	*0*	*2*	*2*
2008	*33*	*20*	*9*	*2*	*0*	*2*	*1*
2009	*17*	*8*	*7*	*0*	*1*	*1*	*0*

Old Mill Road	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*11*	*8*	*2*			*1*	
2007	*9*	*3*	*4*			*1*	*3*
2008	*9*	*4*	*3*	*1*			*3*
2009	*3*	*1*	*2*				

Carrington Drive	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*0*						
2007	*0*						
2008	*1*						*1*
2009	*0*						

Pine Grove Road	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*2*		*2*				
2007	*1*		*1*				
2008	*6*	*2*	*2*		*1*		*1*
2009	*4*	*2*			*1*		*1*

Indian Mound Road	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*1*	*1*					
2007	*0*		*2*				
2008	*0*						
3009	*2*				*1*		*1*

Old Alabama Road	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*6*	*3*	*1*			*1*	*1*
2007	*6*	*2*	*3*				*1*
2008	*0*						
2009	*2*		*1*				*1*

Mid-Block	*Total Collisions*	*Angle*	*Rear End*	*Sideswipe - Same Direction*	*Sideswipe - Opposite Direction*	*Head On*	*Other*
2006	*6*	*2*	*2*		*1*		*1*
2007	*6*	*2*	*2*				*2*
2008	*13*	*0*	*3*				*10*
2009	*10*	*3*	*4*				*3*

Traffic Analysis Methodology

To measure the existing traffic flow condition along Douthit Ferry roadway and determine what improvements maybe required in the future, the traffic operational behavior needs to be determined. The traffic operations along a road is measured by Level of Service (LOS) a qualitative measure of performance of an intersection based on delay or a corridor based on travel speed . LOS is determined based on procedures in the 2000 Highway Capacity Manual (HCM) published by the Transportation Research Board. Level of Service is measured from LOS A, free flow conditions with little or no delay to LOS F a total breakdown in the system with long delays and long queue lengths. The operation of a roadway or an intersection in an urbanized area is generally acceptable if it is LOS D or better based on the Georgia Department of Transportation Design Manual. For a

signalized intersection LOS E occurs at an average delay of over 55 seconds per vehicle. At LOS E there are generally long queues and it takes at least two or more traffic cycles for a vehicle to clear the intersection. The range of LOS for a signalized and an unsignalized intersection is provided in Table 4. In addition an arterial LOS can also be determined based on the type of arterial and the travel speed along the arterial. The arterial LOS Criteria is shown in Table 5 for a suburban minor arterial which represents the Douthit Ferry Road corridor.

The HCM analysis procedures are followed by the SYNCRO traffic analysis software, which can be used to determine the LOS of an intersection. An advantage of the SYNCHRO software is that it will take into consideration the interaction between traffic signals within a signal system. In addition the software has procedures for determining the 95th percentile queue for each lane of traffic.

Table 4
Intersection Level of Service Criteria

Level Of Service (LOS)	Control Delay Per Vehicle (sec)	
	Stop-Sign Control	Signal Control
A	< 10	< 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Table 5
Minor Arterial Type II Level of Service Criteria

Level Of Service (LOS)	Average Travel Speed (mph)
A	>35
B	> 28 and ≤ 35
C	> 22 and ≤ 28
D	> 17 and ≤ 22
E	> 13 and ≤ 17
F	≤ 13

Future Development

Douthit Ferry Road has several large parcels of land that are presently vacant with the area rapidly being developed. A major impact to the roadway will be the development three

different Developments of Regional Impact (DRI) size development projects that has been approved by the Georgia Department of Community Affairs. The first project to start building is the Carter Grove Plantation development, which is being built south of Old Alabama Road. The extension of Douthit Ferry Road is one of two major entrances into the planned development. The Carter Grove Plantation project at completion will consist of 3,100 single family detached residential units and 214,000 square feet of retail.

The next DRI development proposed to be begin construction is Park Village Community located in the southeast quadrant of the intersection of Douthit Ferry Road and Pine Grove Road. The development as planned will include 230,000 square feet of commercial, 40 townhouses, 156 single-family houses, 115 multi-tenant senior living units and a very large church.

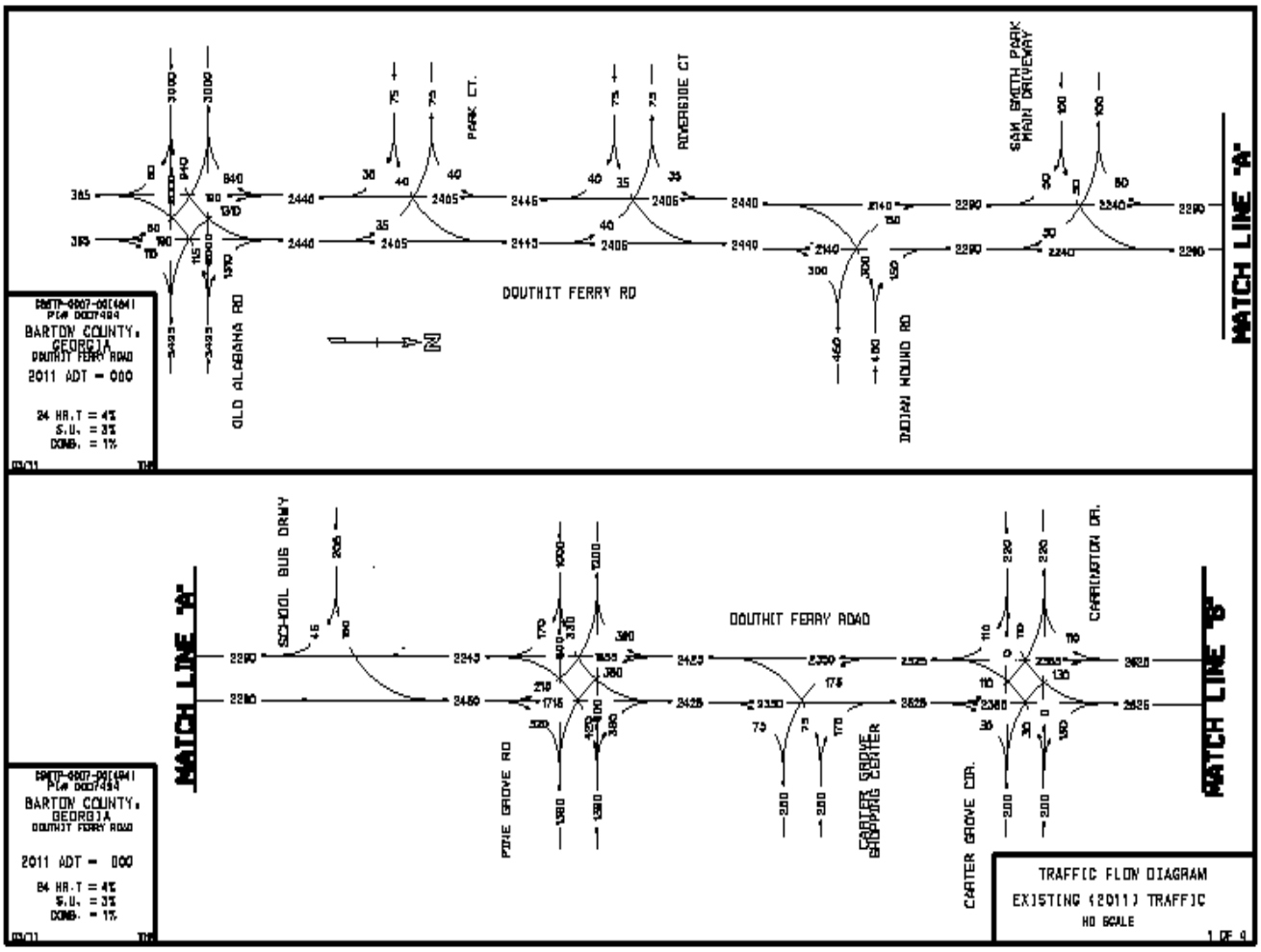
The third DRI development Dillinger Property which is located along Old Alabama Road west of Douthit Ferry Road is still in the planning stages. The proposed development plan for this site is to include 757 single-family detached residential units, 100 townhomes and 250,000 square feet of commercial development.

In addition there are several smaller developments that are being planned for construction along Douthit Ferry Road including a city park.

Design Traffic Development

The need for improvements to Douthit Ferry Road is based on the future traffic flow through the corridor as mentioned previously this is measured using the qualitative measurement LOS. To project the future traffic operations along a roadway the future traffic along the road must be developed. The future traffic along Douthit Ferry Road was projected based on the anticipated population growth rate in the Bartow County based on a historical rate of approximately 3% per year and the proposed developments within the area.

Existing traffic counts were collected in January and February 2011 along Douthit Ferry Road. With the growth in population and proposed developments within the Douthit Ferry Road Corridor the existing volumes were increased to represent the projected traffic volumes in the opening year of improvements along Douthit Ferry Road and the 20-year design life of the project. The proposed project is presently in long range for construction which is 5-years out, therefore it is anticipate that construction will begin in the 2016 and two years for construction making opening year to traffic 2018. With an opening year of 2018 the 20-year design year is 2038. The existing daily traffic is shown in Figure 2 and the opening year 2018 traffic and design year traffic 2038 is shown in Figure 3. These volumes were approved by GDOT in May 2011.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INDIAN MOUND RD
PARK CT.
RIVERSIDE CT
SAM SMITH PARK MAIN DRIVEWAY
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2011 ADT = 000
24 HR.T = 4%
S.U. = 3%
COMB. = 1%
MATCH LINE "A"
MATCH LINE "B"
SCHOOL BUS DRWY
DOUTHIT FERRY ROAD
PINE GROVE RD
CARTER GROVE CTR.
CARRINGTON DR.
CARTER GROVE CIR.
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2011 ADT = 000
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COMB. = 1%
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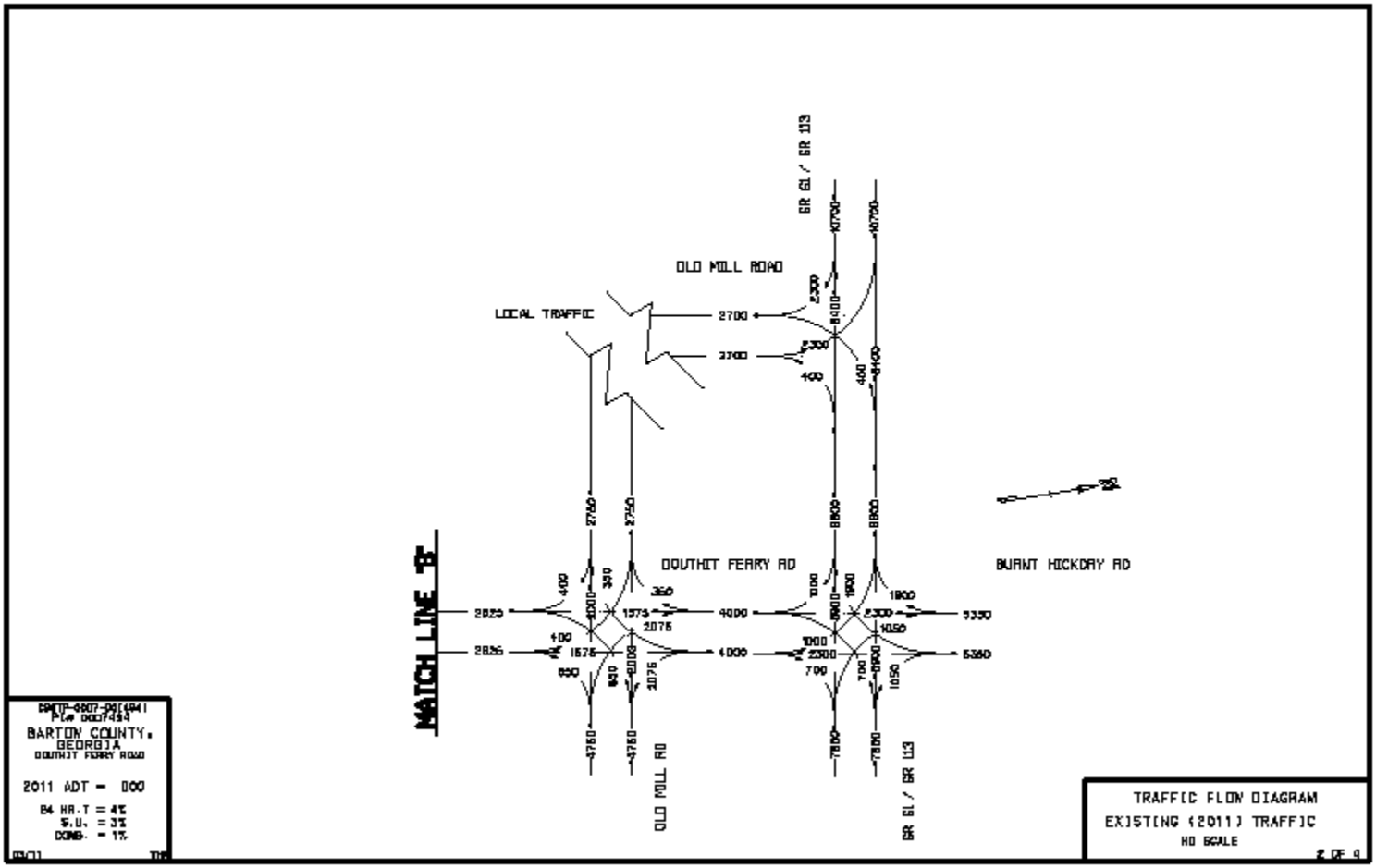
EXISTING (2011) TRAFFIC
NO SCALE
1 OF 1


OLD MILL ROAD
LOCAL TRAFFIC
DOUTHIT FERRY RD
BURNT HICKORY RD
SR 61 / SR 113
OLD MILL RD
SR 61 / SR 113
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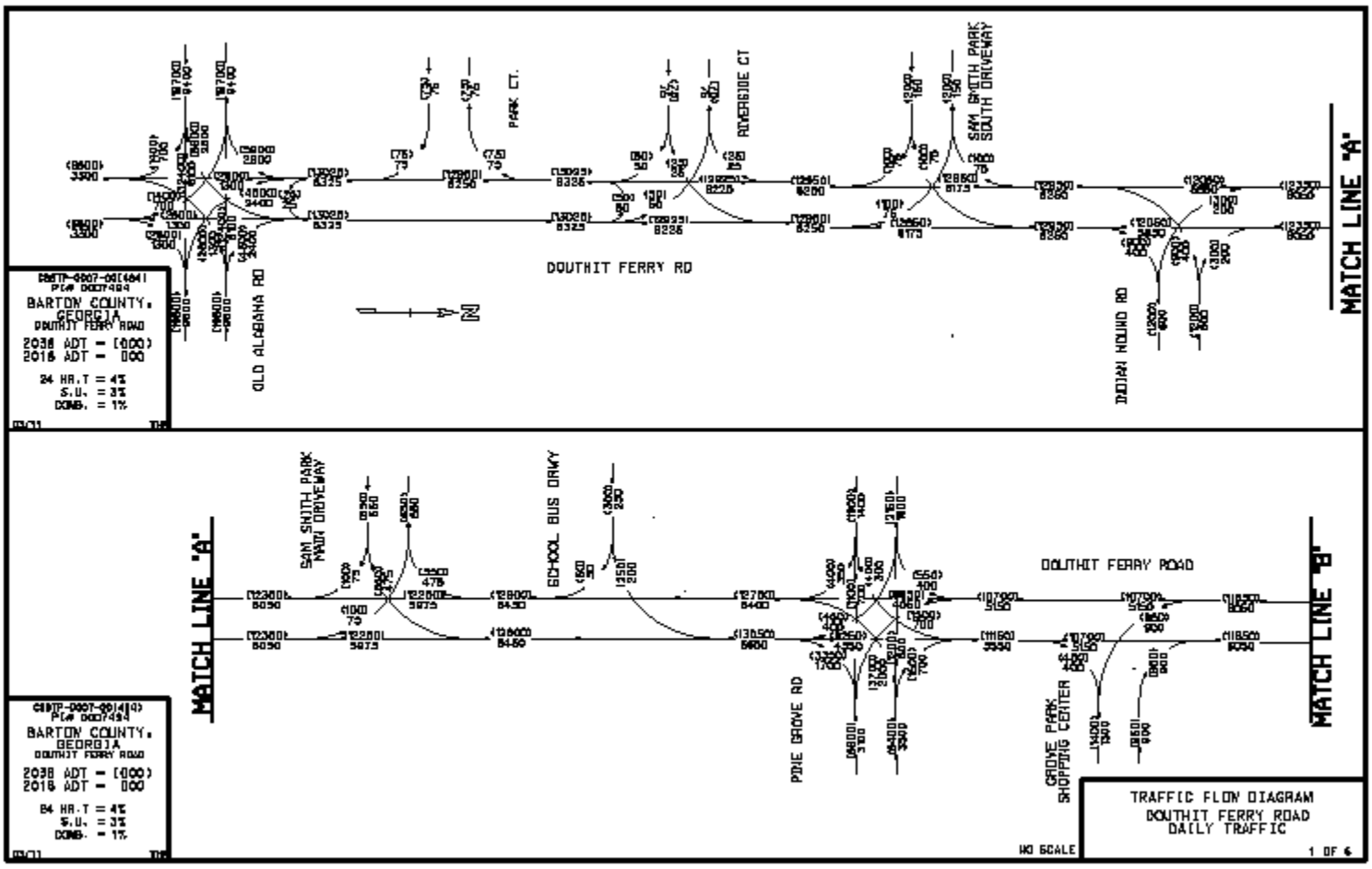
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2011 ADT = 000
K = 4%
S.U. = 3%
DOHS. = 1%
TRAFFIC FLOW DIAGRAM
EXISTING (2011) TRAFFIC
NO SCALE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PARK CT.
RIVERSIDE CT
SAM SMITH PARK SOUTH DRIVEWAY
INDIAN HOUND RD
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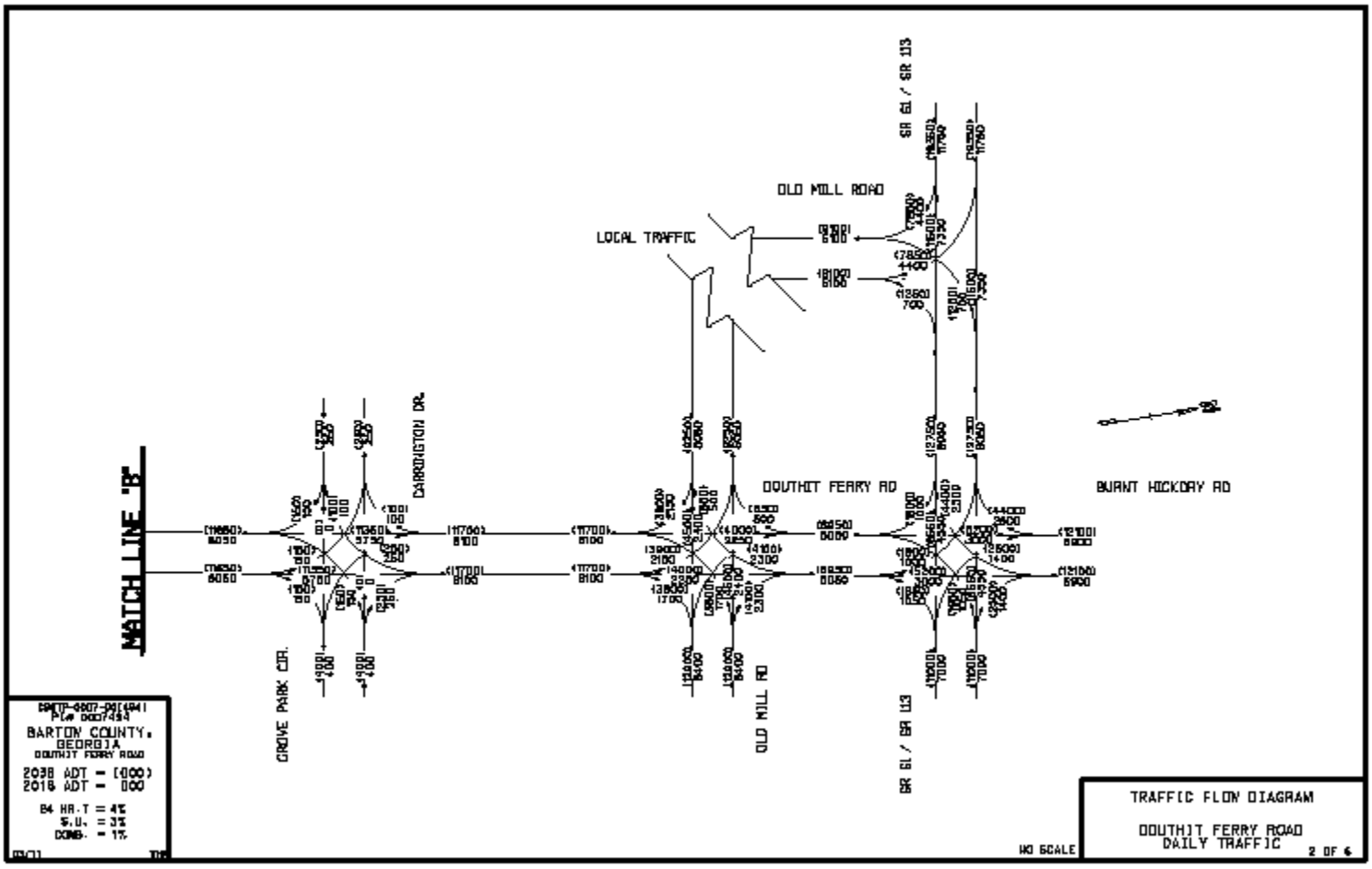
SCHOOL BUS DRWY
DOUTHIT FERRY ROAD
PINE GROVE RD
GROVE PARK SHOPPING CENTER
MATCH LINE "A"
MATCH LINE "B"
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2038 ADT = (000)
2018 ADT = 000
24 HR.T = 4%
S.U. = 3%
COMB. = 1%
NO SCALE
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
DAILY TRAFFIC
1 OF 6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DARRINGTON DR.
GROVE PARK CIR.
OLD MILL ROAD
LOCAL TRAFFIC
SR 61 / SR 113
DOUTHIT FERRY RD
OLD MILL RD
SR 61 / SR 113
BURNT HICKORY RD
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2038 ADT = (000)
2018 ADT = 000
K4 HR. T = 4%
S.U. = 3%
COMB. = 1%
NO SCALE
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
DAILY TRAFFIC
2 OF 6

Peak Hour Design Traffic

The peak hour design traffic for the design year was based on both turning movement counts and existing bi-directional counts that were collected and the projected peak hour trips from the planned development. This data was used to determine the peak hour traffic factors that used in developing the design year hourly traffic. The results of the traffic counts indicated that presently the percentage of daily traffic arriving during the peak hour is 11% north of Old Mill Road and 15% south of Old Road. The directional split in traffic ranges from 53% just south of Old Mill Road to 63% north of Old Mill Road.

The projected peak traffic on Douthit Ferry Road will be influenced by the proposed development along Douthit Ferry Road and Old Alabama Road and the improvements to Old Alabama Road which will make it a direct route to I-75. With these changes to the traffic flow percentage of daily traffic in the peak hour will reduce to approximately 9.7% throughout the corridor with the directional split being more balanced with the peak direction being 53% south of Old Mill Road and 55% just north of Old Mill. The location of the most traffic will be shifted to just north of Old Alabama Road with a peak hour volume of 97% with a 51%-49% directional split. The existing (2011) peak hour traffic, projected (2018) opening year peak hour traffic and the projected (2038) design hour traffic are shown in Figures 4,5 and 6 respectively. The projected peak hour traffic was approved in May 2011.

Existing Conditions Traffic Analysis

An analysis of the existing traffic along Douthit Ferry Road was conducted based on Highway Capacity Manual Procedures using Synchro/SimTraffic software to model the existing conditions with existing traffic, opening year traffic (2018) and design year traffic (2038). Based on this analysis Douthit Ferry Road presently operates at LOS C or better. The three signalized intersections SR 61 / SR 113, Old Mill Road and Old Alabama Road operate at LOS C or better in both the a.m. and p.m. peak hours. The 4-way stop intersection of pine Grove Road; however, operates at LOS F.

In the proposed opening year (2018) if Douthit Ferry Road is not widened Douthit Ferry Road will operate at LOS F during the a.m. peak and LOS E during the p.m. peak. The 3

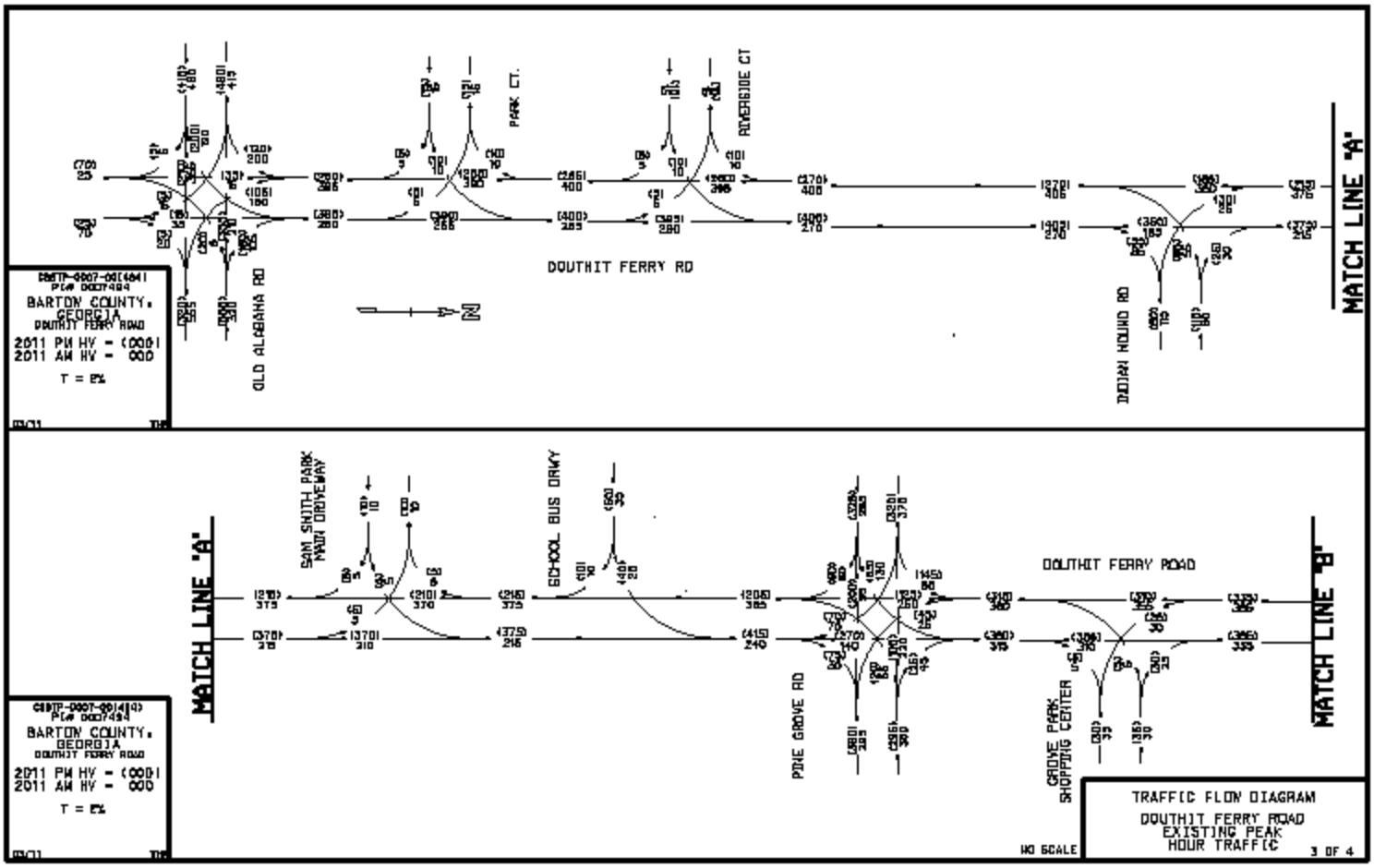
signalized intersections will remain at LOS C or better without any road improvements and the Douthit Ferry Road at Pine Grove Road intersection will remain LOS F.

With the majority of the traffic for the design year being generated by new development it most likely the proposed traffic on Douthit Ferry Road will remain the same whether the road is widened or not. Using the design year traffic and assuming no improvements on Douthit Ferry Road it is predicted that Douthit Ferry Road will operate at LOS F during both the a.m. and p.m. peak hours will be at LOS E or worst except for SR 61/ SR 113 during the a.m. peak hour

Table 6
Existing Conditions Level of Service

Douthit Ferry Road	2011 Existing	2018 Opening Year	2038 Design Year
at SR 61/ SR 113	C (C)	C (C)	D (E)
at Old Mill Road	C (C)	C (C)	E (E)
at Pine Grove Road	F (F)	F (F)	F (F)
at Old Alabama Road	C (B)	C (C)	E (E)
Corridor	C (B)	F (E)	F (F)

A.M. (P.M.) Peak Hour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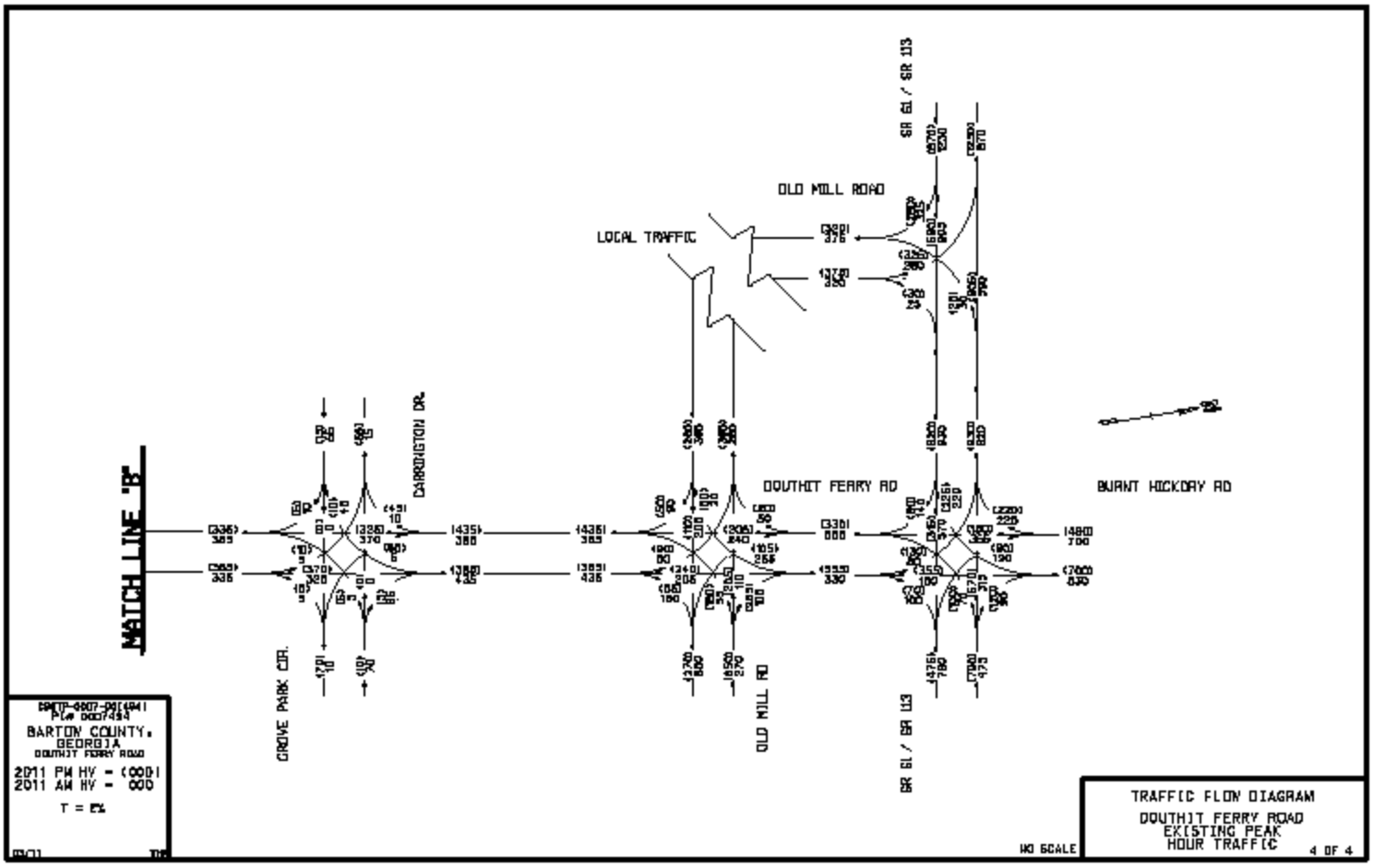
OLD ALABAMA RD
PEAK CT.
RIVERSIDE CT
INDIAN MOUND RD
MATCH LINE 'A'
MATCH LINE 'A'
SAM SMITH PARK MAIN DRIVEWAY
SCHOOL BUS DRWY
PINE GROVE RD
DOUTHIT FERRY ROAD
GROVE PARK SHOPPING CENTER
MATCH LINE 'B'
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2011 PM HV = (8%)
2011 AM HV = 8%
T = 5%
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2011 PM HV = (8%)
2011 AM HV = 8%
T = 5%
NO SCALE
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
EXISTING PEAK
HOUR TRAFFIC
3 OF 4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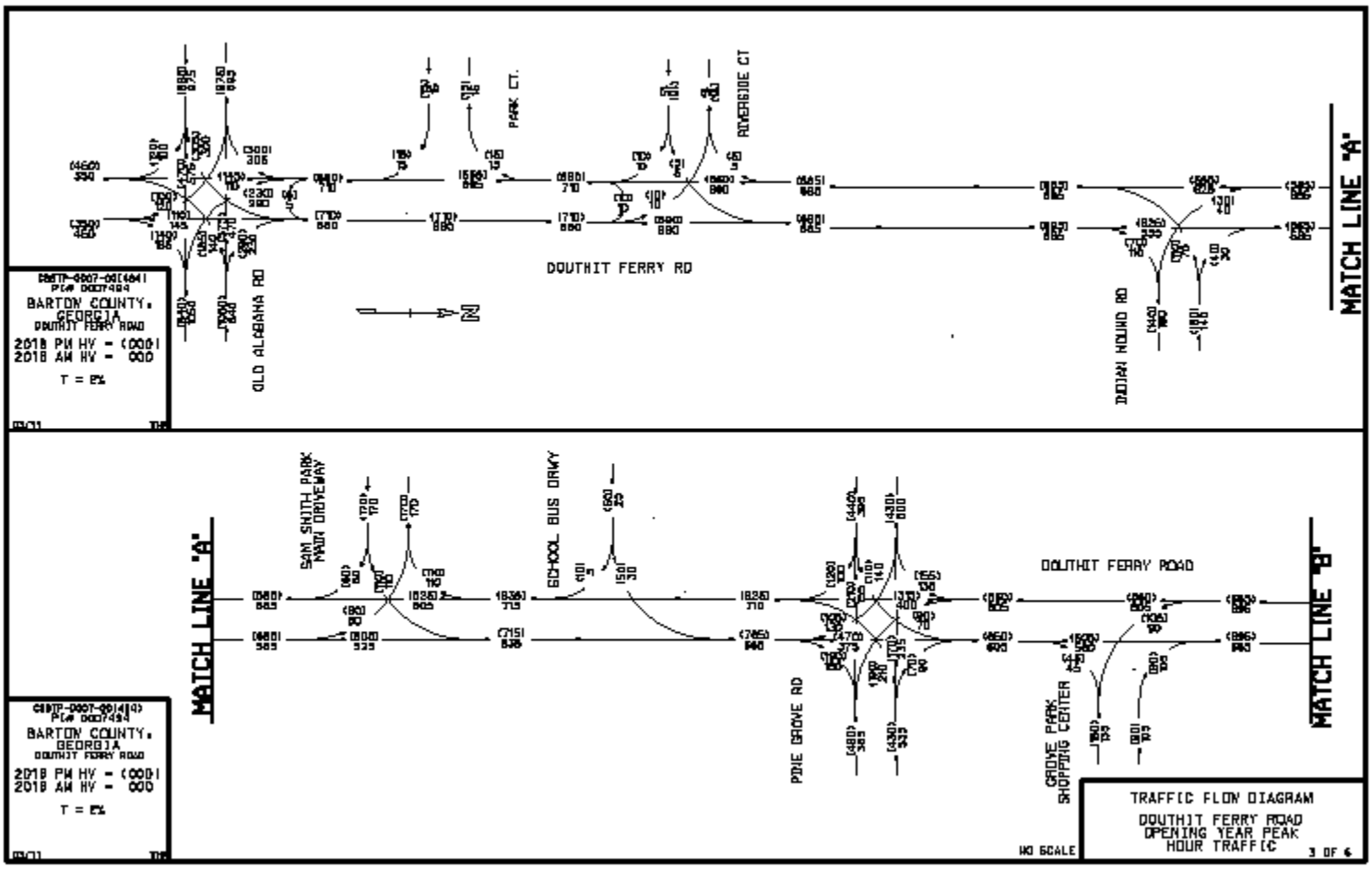
CARRINGTON DR.
GROVE PARK CIR.
OLD MILL ROAD
LOCAL TRAFFIC
SR 61 / SR 113
DOUTHIT FERRY RD
OLD MILL RD
BURNT HICKORY RD
SR 61 / SR 113
BARTON COUNTY,
GEORGIA
DOUTHIT FERRY ROAD
2011 PM HV = (000)
2011 AM HV = 000
T = 5%
NO SCALE
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
EXISTING PEAK
HOUR TRAFFIC
4 OF 4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OLD ALABAMA RD
PARK CT.
RIVERSIDE CT
INDIAN MOUND RD
MATCH LINE 'A'
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2018 PM HV = (000)
2018 AM HV = 000
T = 5%
SAM SMITH PARK MAIN DRIVEWAY
SCHOOL BUS DRWY
PINE GROVE RD
GROVE PARK SHOPPING CENTER
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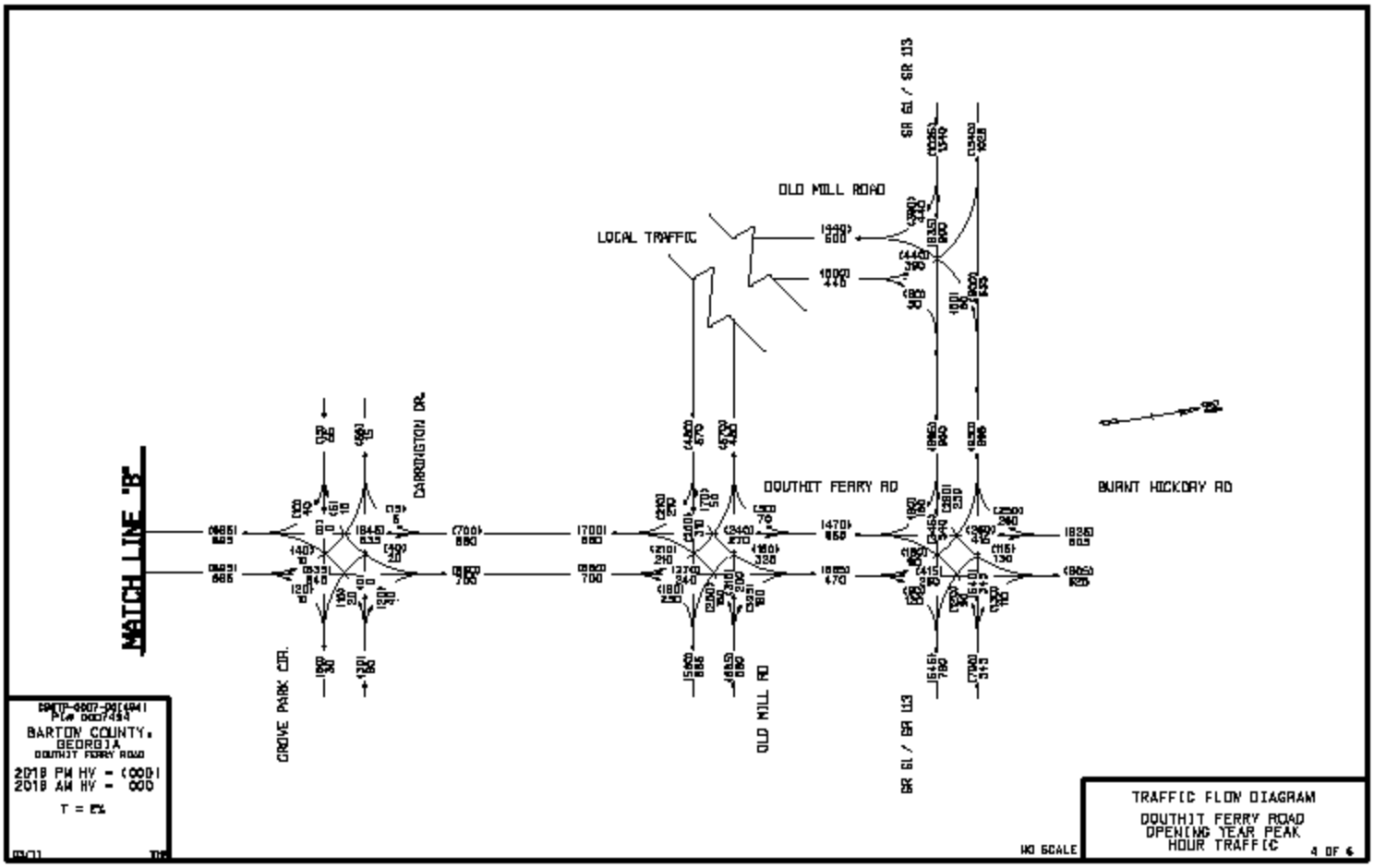
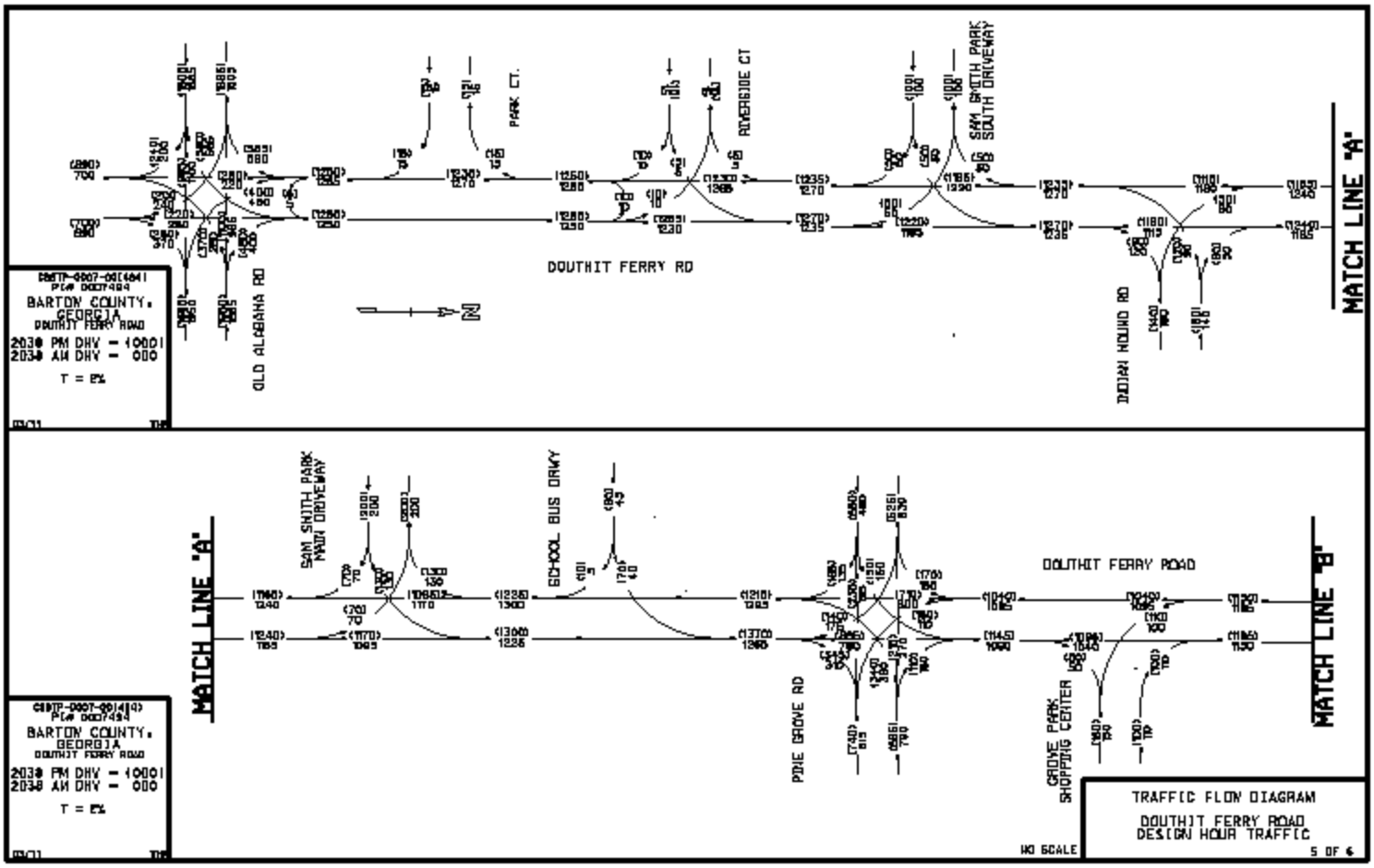
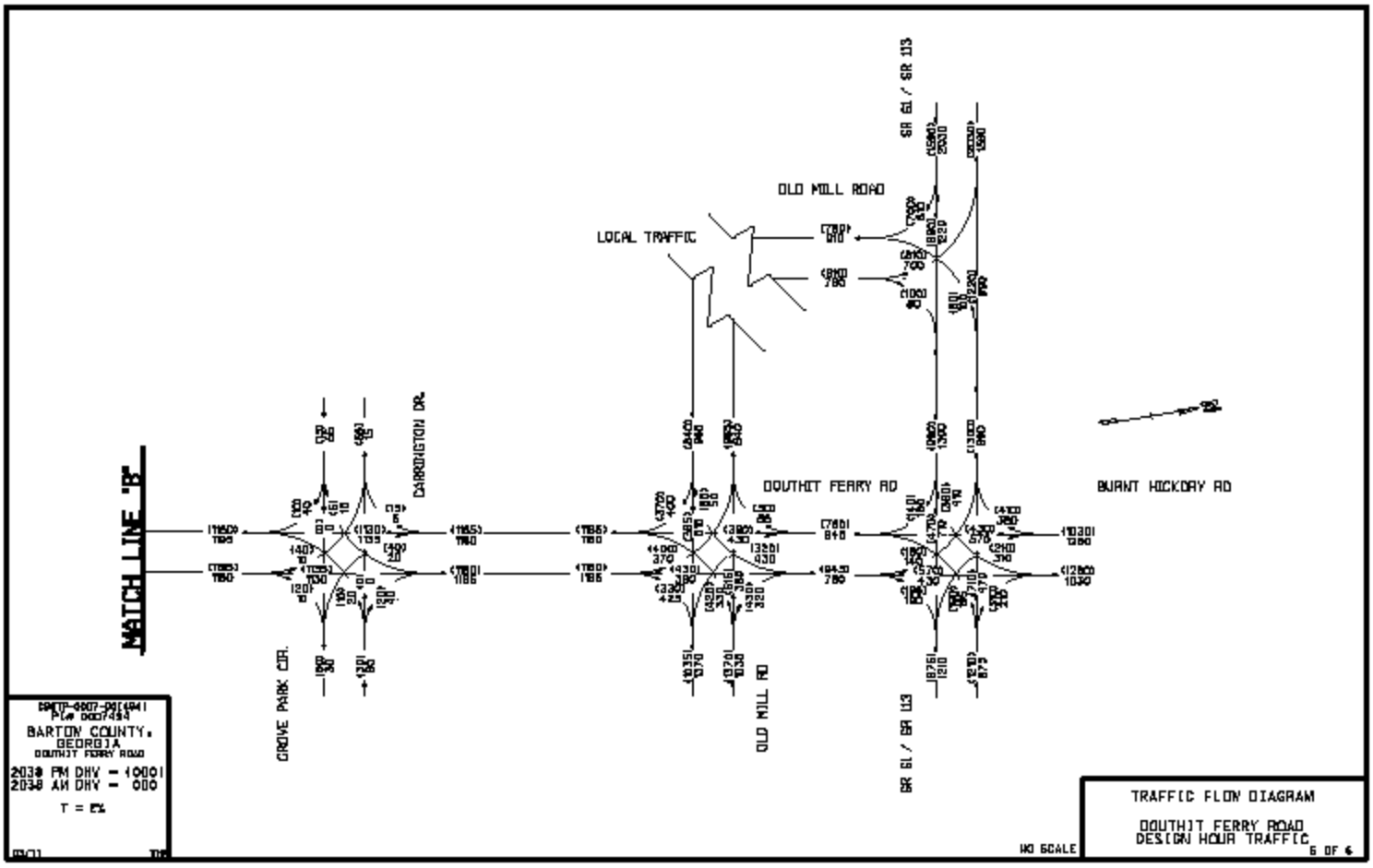
NO SCALE
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
OPENING YEAR PEAK HOUR TRAFFIC
3 OF 6


MATCH LINE "B"
CARRINGTON DR.
GROVE PARK CIR.
OLD MILL ROAD
LOCAL TRAFFIC
DOUTHIT FERRY RD
SR 61 / SR 113
BURNT HICKORY RD
SR 61 / SR 113
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2018 PM HV = (880)
2018 AM HV = 880
T = 8%
NO SCALE
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
OPENING YEAR PEAK HOUR TRAFFIC
4 OF 6


DOUTHIT FERRY RD
OLD ALABAMA RD
PARK CT.
RIVERSIDE CT
SAM SMITH PARK SOUTH DRIVEWAY
INDIAN MOUND RD
MATCH LINE "A"
SAM SMITH PARK MAIN DRIVEWAY
SCHOOL BUS DRWY
PINE GROVE RD
GROVE PARK SHOPPING CENTER
MATCH LINE "A"
DOUTHIT FERRY ROAD
MATCH LINE "B"
BARTON COUNTY, GEORGIA
DOUTHIT FERRY ROAD
2030 PM DHV = 10001
2030 AM DHV = 000
T = 5%
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
DESIGN HOUR TRAFFIC
NO SCALE
5 OF 6


MATCH LINE "B"
OLD MILL ROAD
LOCAL TRAFFIC
SR 61 / SR 113
DOUTHIT FERRY RD
BURNT HICKORY RD
CARRINGTON DR.
GROVE PARK CIR.
OLD MILL RD
SR 61 / SR 113
BARTON COUNTY,
GEORGIA
DOUTHIT FERRY ROAD
2038 PM DHV = 4000
2038 AM DHV = 000
T = 8%
TRAFFIC FLOW DIAGRAM
DOUTHIT FERRY ROAD
DESIGN HOUR TRAFFIC
NO SCALE
6 OF 6

Intersection Analysis

The existing conditions analysis was conducted for existing traffic, opening year traffic, and design year traffic. The analysis shows that there will be a need to improve Douthit Ferry Road as the traffic on the road increases from proposed development. To determine the improvements needed to efficiently move traffic along Douthit Ferry Road SYNCHRO was used to determine the needed intersection improvements to provide a LOS D or better at each potentially signalized intersection along the corridor. In addition, key unsignalized intersections were reviewed to help determine median opening locations and configurations. In addition, a roundabout analysis was conducted to determine if a roundabout maybe the best way to move traffic through the intersection of Pine Grove Road and Douthit Ferry Road.

The Synchro results are shown in Tables 8, 9 and 10. Table 8 shows the LOS of each signalized intersection and for each movement and the associated volume to capacity ratio is shown in Table 9. The intersection lanes were designed to insure a LOS D or better for the overall intersection with each movement through the intersection at a LOS E or better. Table 10 shows the 95th percentile queue length determined from SYNCHRO.

Old Alabama Road at Douthit Ferry Road is presently a signalized intersection and is primarily the southern terminus of Douthit Ferry Road as it continues southwards .into Carter Grove Plantation a planned subdivision. Old Alabama is presently being designed to be a four lane divided roadway and will provide direct access to I-75. At this intersection to achieve a LOS D dual left turn lanes and right turn lanes will be required on the eastbound, westbound and southbound approaches. The proposed design of Old Alabama Road will allow the dual left turn lanes to be constructed at the intersection with minimal problems since there is a proposed 44 foot median.

The recommended lanes for this intersection to provide a LOS D with the design traffic are:

Eastbound Old Alabama Road
- Dual left turn lanes
- Two through lanes
- Right turn lane

Westbound Old Alabama Road
- Dual left turn lanes
- Two through lanes
- Right turn lane

Northbound Douthit Ferry Road
- One left turn lane
- One through lane and
- One combined through and right turn lane

Southbound Douthit Ferry Road

Dual left turn lanes
Two through lanes and
Right turn lane

Douthit Ferry Road at Park Court and at Riverside Court: Both Park Court and Riverside Court are small subdivision streets. The main concern for both of these subdivisions is which should obtain a median opening. Park Court is located from centerline to centerline of the reconstructed Old Alabama Road is a little over 600 feet and a driveway to a pharmacy is being proposed to align with Park Court. It would be desirable to provide this intersection with a median opening, however, the present GDOT design standards state median openings should be at 1000 feet spacing. Park Court is also only 300 feet from Riverside Court. In addition the northbound left turn lane would have to be designed to keep from impacting the dual southbound left turn lanes on Douthit Ferry Road at Old Alabama Road.

Riverside Court is located about 185 feet south of the end of the Etowah River Bridge. The present requirements are that a median opening should have a left turn lane in each direction on the main road. The 185 feet is not sufficient length to develop a left turn lane in unless it is shorter than presently recommended by GDOT and AASHTO without impacting the existing bridge. The left turn lane should be eliminated or designed to a short left turn lane.

If the median opening is provided at Park Court and not at Riverside Court a driver wanting to turn left at Riverside Court would have to drive north of the Etowah River Bridge and make a U-turn 1000 feet north of Riverside Court. The design recommendations for these two streets are:

Douthit Ferry Road at Park Court:
Eastbound Park Court:
Right out only
Northbound Douthit Ferry Road
Two through lanes
Southbound Douthit Ferry Road
Two through lanes and
Right Turn Lane

Douthit Ferry Road at Riverside Court:
Eastbound Riverside Court:
Combined left and right turn lane
Northbound Douthit Ferry Road
Left turn lane
Two through lanes
Southbound Douthit Ferry Road
Two through lanes and
Right turn lane
No left turn lane

Douthit Ferry Road at South Sam Smith Park Entrance is the secondary park entrance to Sam Smith Park as it is being developed. It will be a limited use driveway and it is anticipated that only about 20% of the traffic entering and exiting the park will use this driveway at build out. It is recommended that a median opening be provided at this driveway and the design recommendations are:

Eastbound South Sam Smith Park Entrance:
Combined left and right turn lane
Northbound Douthit Ferry Road
Left turn lane
Two through lanes
Southbound Douthit Ferry Road
Two through lanes and
Right turn lane
No left turn lane

Douthit Ferry Road at Indian Mound Road is an unsignalized t-intersection. This intersection was compared to the Manual on Uniform Traffic Control Devices traffic signal warrants and the traffic signal warrants will not be satisfied with opening year traffic. The intersection traffic will satisfy the MUTCD signal warrants in the design year and a more thorough analysis should be made as delay and traffic increases at the intersection. A traffic signal should not be installed in the opening year. The base year traffic per NCHRP Report 457 will warrant a right turn lane opening year on both the Indian Trail Road and the driveway to Sam Smith Park. Based on this analysis the following lanes are needed at the intersection of Douthit Ferry Road and Indian Trail Road.

Westbound Indian Mound Road
left turn, and
right turn lane
Northbound Douthit Ferry Road
left turn lane and
Two through lanes
Southbound Douthit Ferry Road
Two through lanes and
right turn lane

Douthit Ferry Road at Sam Smith Park Main Entrance is the primary entrance to a city park that will be primarily for athletic events with six (6) soccer fields, twelve (12) baseball fields and three (3) football fields. In addition there is an indoor aquatic center and an amphitheater. The ITE Trip Generation Manual has a trip generation rate for a soccer complex based on the number of fields for both daily trips and peak hour trips. It was assumed that the baseball fields and football fields will generate about the same number of trips which is a projected total volume of 1500 vehicles per day plus the present trips being generated by the aquatic center. The daily traffic is not enough to meet

MUTCD Warrants 1 and 2. The projected opening year (2018) peak hour traffic was determined to be 110 vehicles turning left out of the park during the p.m. peak hour. The proposed left turn volume will not satisfy MUTCD Warrant 3 at 100% volumes, however, Warrant 3 at 70% volumes will be satisfied. Warrant 3 is applicable to unusual cases where large numbers of vehicles are generated over a short time span. A park dedicated to athletic events will tend to have this type of traffic behavior at the end of the events. Opposite of the park driveway is a proposed church driveway establishing the fourth leg of the intersection. The warrant analysis is included in the appendix.

This intersection indicates that the projected traffic does meet a traffic signal warrant and a traffic signal should be considered for installation with the widening of Douthit Ferry Road. The traffic signal will operate at LOS A with the following proposed improvements:

.

Eastbound Sam Smith Park Entrance
- Left turn lane
- Combined through and right turn lane

Northbound Douthit Ferry Road
- Left turn lane
- Two through lanes, and
- Right turn lane

Southbound Douthit Ferry Road
- Left turn lane
- Two through lanes and
- Right turn lane

A roundabout analysis was also conducted for this intersection. The daily traffic from the park entrance will be less than 10% of the traffic through the intersections in a day. This generally is undesirable for a roundabout

Douthit Ferry Road and the School Bus Driveway is the exit for the bus and visitors driveway for the Cartersville Middle School which comes in front of the school with its entrance on Pine Grove Road. The traffic on the driveway will not warrant signalization based on volume or the school crossing warrant. The school crossing warrant is not applicable because the pedestrians go to the intersection Douthit Ferry Road and Pine Grove Road to cross Douthit Ferry Road. The busses will have difficulty in finding adequate gaps in the traffic at the end of school so the use of a traffic control officer will be needed when the busses are leaving the school. The proposed intersection lanes are:

Eastbound School Bus Driveway
- Existing left and right turn lanes
- Median designed for left turn out only

Northbound Douthit Ferry Road
- Two through lanes

Southbound Douthit Ferry Road
- Two through lanes

Douthit Ferry Road and Pine Grove Road is presently a four-way stop controlled intersection. During the a.m. peak hour the intersection has long queues of traffic on both eastbound and westbound Pine Grove Road as students are taken and picked up at school. The intersection is also being impacted by a commercial and retail development n the northeast corner of the intersection and mixed-use DRI project in the south east corner. The existing traffic volumes are just below the thresholds for signal warrants 1, 2 and 3. The projected growth in the vicinity of the intersection will increase the traffic at the intersection to where warrants 2 and 3 100% volumes will be satisfied in the opening year. Warrant 1 will not meet at the 100% volumes, however the 70% volume for Warrant 1 will be satisfied in the opening year. This intersection will meet the MUTCD signal warrants with the projected opening year traffic.

The GDOT policy manual states that a roundabout should be considered before a traffic signal is installed. A roundabout analysis was conducted using the GDOT roundabout analysis tool. Initially a roundabout analysis was conducted for the intersection of Pine Grove Road and Douthit Ferry Road with opening year traffic. The roundabout configuration was two approach lanes northbound and southbound on Douthit Ferry Road and one lane approach eastbound and westbound Pine Grove Road. The results of this analysis, using the NCHRP method, were LOS C or better on all approaches during both a.m. and p.m. peak hours. This layout was then analyzed using the Design Year (2038) traffic, which resulted in a LOS F on three out four of the approaches during both the a.m. and p.m. peak hours.

The Roundabout analysis was conducted for 3 different configurations for a proposed roundabout. The alternatives are:

> **Alternative A:** Two approach lanes for northbound and southbound approaches and one lane for eastbound and westbound approaches.
>
> **Alternative B:** Two approach lanes on all four approaches
>
> **Alternative C:** Two approach lanes each approach and a slip lane on both northbound and southbound approaches.

The analysis of each of these alternatives are included in the appendix. The results of the analysis is shown in Table 6. Alternative A has LOS F for three out of the four approaches during both a.m. and p.m. and peak periods. With alternative B the southbound approach is LOS F in the a.m. peak and during the p.m. peak the northbound and westbound approaches are at LOS F. Alternative C with the northbound and southbound slip ramps will allow for a LOS D or better for all approaches.

.Table 7
Pine Grove Road at Douthit Ferry Road Roundabout Alternative LOS Analysis

Alternative	Northbound Approach	Southbound Approach	Eastbound Approach	Westbound Approach
A	D (F)	F (D)	F (F)	F (F)
B	D (F)	F (E)	C (D)	E (F)
C	B (C)	D (C)	C (D)	D (D)

AM (PM)

The intersection lane requirements were reviewed using Synchro to determine the recommended lanes to achieve a LOS D or better if the intersection is signalized. To keep efficient traffic flow on Douthit Ferry Road with a LOS C for the through traffic and a LOS C for a signalized intersection the following lanes will be needed

Eastbound Pine Grove Road
One left turn lanes
One through lanes
One right turn lane
Westbound Pine Grove Road
One left turn lanes
One through lanes
One right turn lane
Northbound Douthit Ferry Road
One left turn lane
Two through lanes and
One right turn lane
Southbound Douthit Ferry Road
One left turn lanes
Two through lanes and
One right turn lane

Douthit Ferry Road at Grove Park Shopping Center Driveway is the main entrance to a 40,000 square foot retail center which was about 50% occupied when traffic counts were being conducted. The intersection is located only 400 feet north of Pine Grove Road. The present standard for the spacing of full median opening is 1000 feet center to center. Based on the median opening standard a full median opening should not be allowed at this location. The southbound left turn volume is 110 vehicles during the p.m. peak. If the left turn lane is not allowed at a median opening at this location the left will have to be made at Pine Grove Road. With the median on Douthit Ferry Road the driveway to the retail portion of the mixed use development will be closed except for left turns into the retail center. If the opening for the left turn vehicles is not allowed the LOS for the northbound through will be reduced from LOS C to LOS D.

The recommend lanes at the intersection of Douthit Ferry Road and Grove Park Shopping Center Driveway are:

Westbound Shopping Center Driveway
Right Turn lane only
Northbound Douthit Ferry Road
Two through lanes
One right turn lane
Southbound Douthit Ferry Road
One left turn lane
(Median designed for left turn lane in only.)
Two through lanes

Douthit Ferry Road at Carrington Drive and Grove Park Circle this intersection is the entrance to two residential neighborhoods. The subdivision on Carrington Drive has about 45 residential units and Grove Park is to have 104 units. There are two entrances to Grove Park the other being on Pine Grove Road. The volume of traffic from these two subdivisions will not be great enough to warrant the intersection being signalized. The traffic light at Pine Grove Road should help provide gaps in the through traffic on Douthit Ferry Road for the left turn traffic exiting both neighborhoods.

The proposed lanes for this intersection and any other unsignalized intersection at a median opening are:

Eastbound Carrington Drive
One combined left, through and right turn lane
Westbound Grove Park Circle
One combined left, through and right turn lane
Northbound and Southbound Douthit Ferry Road
300 foot single left turn lane
Two through lanes and
300 foot right turn lane

Douthit Ferry Road at Old Mill Road is presently a signalized intersection. Old Mill Road is a primary route to a major industrial area and the City of Cartersville elementary schools. Over the past few years traffic has greatly increased on this road with both new residential developments and an increase in industry. A major movement at this intersection is an east-west movement between SR 113 / SR 61 / SR 113 and Old Mill Road which creates an existing heavy southbound left turn movement from Douthit Ferry Road to Old Mill Road. This is shown in the reduction in traffic between Douthit Ferry Road north of Old Mill Road of 8,000 vehicles per day and 5,250 vehicles per day south

of Old Mill Road. The section of Douthit Ferry Road between Old Mill Road and SR 61 / SR 113 is constrained by development on both sides of the road.

These improvements will help the operation of the intersection of Douthit Ferry Road and Old Mill Road however major improvements will be needed at the intersection. The following lanes that will provide a LOS D are recommended for the intersection.

Eastbound Old Mill Road
One left turn lane
One through lanes
One right turn lane
Westbound Old Mill Road
Two left turn lanes
One through lanes
One right turn lane
Northbound Douthit Ferry Road
One left turn lane
Two through lanes and
One right turn lane
Southbound Douthit Ferry Road
One left turn lane
Two through lanes and
One right turn lane

Douthit Ferry Road at SR 61/SR 113 is a major signalized intersection and is being reconstructed to provide for a four lane SR 61 / SR 113. The widening of Douthit Ferry Road is constrained at this location due to existing businesses on both east and west side of Douthit Ferry Road. To obtain a LOS D the following lanes need to be provided at the intersection.

Eastbound SR 61 / SR 113
One left turn lanes
Two through lanes
One right turn lane
Westbound SR 61 / SR 113
One left turn lanes
Two through lanes
One right turn lane
Northbound Douthit Ferry Road
One left turn lanes
One through lane
One right turn lane
Southbound Douthit Ferry Road
One left turn lanes
One through lanes and
One right turn lane

Table 8

Douthit Ferry Road Intersection Level of Service Analysis

Design Year Traffic and Recommended Geometrics

Cross Street	Intersection LOS	Northbound			Southbound			Eastbound			Westbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Old Alabama Road	D (D)	F (F)	F (E)	D (A)	E (E)	E (D)	D (C)	E (E)	D (D)	A (A)	E (E)	D (D)	A (B)
Indian Mound Road*	A (A)		A (B)	A (A)	A (A)	A (A)					C (C)		A (A)
Sam Smith Park*	A (A)	A (A)	A (A)		A (A)	A (A)		E (D)		B (B)			
Pine Grove Road (Signal) **	C (C)	C (B)	C (C)	C (A)	B (C)	C (C)	A (A)	C (C)	D (E)	B (A)	D(D)	D (D)	A (A)
Pine Grove Road (Roundabout) ***			B (C)			D (C)			C (D)			D (D)	
Old Mill Road	D (C)	D (D)	D (D)	D (A)	D (C)	D (D)		C (D)	E (E)	A (A)	E (E)	C (C)	A (A)
SR 61 /SR 113	D (D)	D (D)	E (E)	D (A)	E (E)	E (D)	A (A)	D(F)	C (D)	A (B)	D (C)	D (E)	A (B)

A.M. (P.M.)

*Indian Mound Road and Sam Smith Park signalization is not included in project

** Pine Grove Road is proposed as a roundabout.

*** Roundabout analysis based on NCHRP Procedures

Table 9

Douthit Ferry Road Intersection Volume / Capacity Ratio

Design Year Traffic and Recommended Geometrics

Cross Street	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Old Alabama Road	0.90 (0.92)	0.93 (0.75)	0.92 (0.58)	0.91 (0.90)	0.72 (0.91)	0.93 (0.92)	0.93 (0.95)	0.81 (0.77)	0.28 (0.33)	0.82 (0.74)	0.92 (0.94)	0.55 (0.66)
Indian Mound Road*		0.52 (0.60)	0.12 (0.10)	0.17 (0.16)	0.48 (0.53)					0.33 (0.42)		0.18 (0.20)
Sam Smith Park*	0.26 (0.24)	0.42 (0.46)			0.45 (0.43)	0.11 (0.11)	0.64 (0.60)		0.29 (0.28)			
Pine Grove Road (signal)**	0.62 (0.42)	0.66 (0.57)	0.59 (0.39)	0.43 (0.61)	0.75 (0.47)	0.31 (0.22)	0.43 (0.38)	0.68 (0.56)	0.38 (0.30)	0.81 (0.77)	0.61 (0.36)	0.32 (0.19)
Pine Grove Road (Roundabout)***		0.67 (0.77)			0.83 (0.74)			0.62 (0.70)			0.83 (0.82)	
Old Mill Road	0.89 (0.83)	0.68 (0.61)	0.88 (0.58)	0.91 (0.66)	0.78 (0.60)		0.18 (0.48)	0.95 (0.87)	0.54 (0.57)	0.81 (0.87)	0.47 (0.68)	0.37 (0.48)
SR 61 /SR 113	0.68 (0.63)	0.91 (0.97)	0.36 (0.32)	0.91 (0.95)	0.93 (0.73)	0.50 (0.54)	0.96 (0.99)	0.70 (0.45)	0.31 (0.25)	0.74 (0.54)	0.74 (0.97)	0.46 (0.60)

A.M. (P.M.)

*Indian Mound Road and Sam Smith Park signalization is not included in project

** Pine Grove Road is proposed as a roundabout

*** Roundabout analysis based on NCHRP Procedures

Table 10

Douthit Ferry Road Intersection Queue Length

Design Year Traffic and Recommended Geometrics

Cross Street	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Old Alabama Road	328 (318)	356 (285)	310 (80)	294 (268)	260 (394)	404 (653)	352 (272)	515 (390)	46 (56)	190 (234)	542 (522)	98 (195)
Indian Mound Road*		235 (270)	20 (19)	16 (16)	147 (171)					83 (111)		29 (32)
Sam Smith Park*	36 (33)	178 (185)			200 (167)	14 (14)	166 (140)		43 (39)			
Pine Grove Road (Signal)**	140 (99)	336 (400)	290 (60)	80 (146)	373 (308)	50 (46)	129 (129)	237 (278)	56 (55)	345 (357)	292 (227)	54 (45)
Pine Grove Road (Roundabout)***		134 (191)			223 (167)			104 (136)			209 (197)	
Old Mill Road	404 (334)	221 (230)	321 (82)	371 (302)	274 (247)		63 (115)	634 (461)	74 (79)	206 (264)	292 (448)	48 (57)
SR 61 /SR 113	160 (167)	594 (702)	186 (173)	361 (288)	687 (444)	66 (87)	463 (462)	345 (240)	78 (102)	176 (145)	262 (430)	68 (147)

A.M. (P.M.)

*Indian Mound Road and Sam Smith Park signalization is not included in project

** Pine Grove Road is proposed as a roundabout

*** Roundabout analysis based on NCHRP Procedures

Logical Termini

The present limits of the proposed project for the widening of Douthit Ferry Road are from Old Alabama Road to SR 61 / SR113. South of Old Alabama Road, Douthit Ferry Road becomes a residential collector and is presently four lanes wide entering mixed used development. The traffic on Douthit Ferry Road within the development will be 13,200 per day and will increase to 26,050 north of Old Alabama Road. The northern end of the project is at SR 61 / SR 113. At the intersection of Douthit Ferry Road and Old Mill Road the traffic on Douthit Ferry Road reduces by about 24% from 23,400 vehicles south of Old Mill Road to 17,900 north of Old Mill Road. SR 61 / SR 113 about 40% of the traffic from Douthit Ferry Road turns onto SR 61 / SR 113 only 60% of the traffic continues north to Burnt Hickory Road. Only 10, 400 vehicles continue between Douthit Ferry Road and Burnt Hickory per day. This volume will be able to be served with only one lane northbound and one lane southbound and maintain a LOS D at the intersection.

Conclusion

The study has shown that Douthit Ferry Road will warrant being widened as the road will be at LOS F with a daily volume of 12,900 vehicles in the opening year without improvements. The LOS F is primarily due to the four-way stop at Pine Grove Road. In the design year, most intersections will be at LOS F with a traffic volume of 26,050. With the improvements described in the study, Douthit Ferry Road will operate at LOS D in the design year.

The intersection layouts have been determined that will provide a LOS D or better for each intersection. The analysis also indicates that the intersection of Douthit Ferry Road and Old Alabama Road and the intersection of Douthit Ferry Road and SR 61 / SR 113 are logical termini for the Douthit Ferry Road widening.

Recommendations

The study has reviewed the need for improvements on Douthit ferry Road and has determined the desired intersection improvements. The recommendations from the study are:

- Douthit Ferry Road should be designed and constructed as a four lane divided roadway to maintain a LOS D or better for this major collector on the west side of the City of Cartersville.
- The improvements listed in the intersection design section should be constructed for each intersection.
- A roundabout or a traffic signal should be installed at the intersection of Douthit Ferry Road and Pine Grove Road. The roundabout will provide about the same overall operation at the intersection. Both alternatives will require improvements to the side street approaches.

- A traffic signal should be installed at the intersection of Douthit Ferry Road and the main driveway to Sam Smith Park during the reconstruction of Douthit Ferry Road. The intersection of Indian Mound Road should be monitored for signalization as traffic increase along Douthit Ferry Road.

- GDOT variance shall be required at several median opening along Douthit Ferry Road. The variances are related to the present GDOT standard of median spacing of 1000 feet.

    1. Park Court or Riverside Court are two intersections 300 feet apart and are within 1000 feet of Old Alabama Road. Therefore, only one median opening should be constructed preferably at Riverside Court. If the median opening is constructed at Riverside Court, a southbound left turn lane will not be able to be constructed. The variance will be for both the median opening and for not constructing the southbound left turn lane.

    2. The intersection of the School Bus Driveway and Douthit Ferry Road is located about 600 feet from Pine Grove Road. If this median opening is not provided the access into and out of the school for busses and visitors will need to be altered. Also if this median opening is not constructed the busses may also have to make u-turns at a median opening south of the school which is not safe for a school bus full of students.

    3. At the intersection of Douthit Ferry Road and Grove Park Shopping Center it is proposed that the median opening be designed for a left turn lane from Douthit Ferry Road into the shopping center. The variance is required due to the median opening being only 400 feet from Pine Grove road and 700 feet from Carrington Drive.

    4. The installation of a median will be required since the present requirement for installing a median is for the opening year traffic to be greater than 18,000 vehicles and the projected opening year 12,900 vehicles per day. The design year requirement is 24,000 vehicles a day the projected design year volume is 26,050 vehicles a day.

Appendix-A

Traffic Signal Warrant Study

A traffic signal warrant study was conducted for the intersections of Douthit Ferry Road at Pine Grove Road and Douthit Ferry Road at Sam Smith Park. The intersection of Douthit Ferry Road and Pine Grove Road is presently a heavily traveled intersection. During the hour before the middle school begins and the hour that it is ended there are large queues of traffic on all four approaches to the intersection. The intersection is presently a four-way stop controlled intersection.

Sam Smith Park is presently under design and will consist of 21 athletic fields when built out. The proposed main entrance to this development was analyzed to determine if a traffic signal would be warranted when it is completed.

Traffic Signal Warrant Analysis

To determine if a traffic signal should be installed a traffic warrant study per the FHWA Manual on Uniform Traffic Control Devices (MUTCD) should be conducted. The MUTCD provides 8 different signal warrants of which at least one of the warrants should be satisfied before a traffic signal is considered for installation.

The MUTCD traffic signal warrants are:

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume
- Warrant 3: Peak Hour
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network

The first 3 warrants based on traffic volumes are more applicable to the study intersections.

Warrants 1, 2 and 3 are based on hourly traffic volumes for each approach, the number of approach lanes, and the speed limit. Warrant 1 should be satisfied for any eight (8) hours of a day, while warrant 2 is to be satisfied for four hours of a day and warrant 3 is to be satisfied for one hour. The volume warrants are reduced to 70% of the volume if the 85^{th} percentile operating speed on the road is greater than or equal to 40 mph.

Traffic Signal Warrant Analysis Douthit Ferry Road and Pine Grove Road

Based on the initial traffic analysis and observation of long queues in both the a.m. and p.m. peaks it was determined that improvements will need to be made at the intersection of Douthit Ferry Road and Pine Grove Road. The intersection presently operates as a 4-way stop which will not be useable traffic control with the widening of Douthit Ferry Road. The intersection is adjacent to Cartersville Middle School and the traffic through the intersection is influenced by both the school traffic and the on-going development in the area. Due to the present traffic through the intersection a warrant study conducted for both existing traffic and opening year traffic.

Existing Conditions

Warrant 1: Eight-Hour Vehicular Volume is based on the highest eight hours of traffic volumes at an intersection. There three different conditions for this warrant and if one of the conditions is satisfied Warrant 1 is satisfied. Condition A - The Minimum Vehicular Volume is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Condition B - The Interruption of Continuous Traffic is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. In addition the traffic can satisfy Warrant 1 if 80% of the volumes during any 8 hours exceed the requirements of both Condition A and Condition B, the hours can be different.

The major street volume for Condition A that needs to be satisfied by the traffic on Douthit Ferry Road is 350 vehicles per hour since it is presently a two-lane roadway with a present operating speed greater than 40 mph away from the existing all-way stop control intersection. The Pine Grove Road approach traffic needs to equal or exceed 105 vehicles per hour. The existing traffic for the warrant analysis is shown in Table A-1. Based on the existing volumes and the criteria for Warrant 1 Condition A it is satisfied for 7 hours out of the required 8 hours of a day

Warrant 1 Condition B requirements for the intersection of Douthit Ferry Road and Pine Grove Road are a major street volume of 525 vehicles per hour with a minor street approach of 53 vehicles per hour. The major street volume is satisfied for during only 4 hours shown in Table A-2. The minor street approach volume is exceeded for 14 hours of the day. Warrant 1 Condition B is satisfied for 4 hours out of the required 8 hours.

The Combination of Condition A and B warrant requires that an alternative to enhance traffic flow is considered prior to warranting the signal. To satisfy this requirement 80% of the volume for both Conditions A and B need to be satisfied. The 80 % volume for the major street for Condition A is 280 vehicles and for Condition B is 420 vehicles. The 80 % volume for the minor street for Condition A is 84 vehicles and for Condition B is 42 vehicles. 80% volume for

Table A-2
Existing Approach Traffic

	Douthit Ferry Rd (Vehicles)		Pine Grove Rd. (Vehicles)	
Begin Time	NB	SB	EB	WB
6:00	44	136	39	24
7:00	199	229	292	289
8:00	172	172	43	77
9:00	85	113	24	60
10:00	74	96	12	41
11:00	111	101	20	48
12:00	88	108	22	63
1:00	99	100	41	57
2:00	122	111	42	126
3:00	233	248	169	223
4:00	300	173	90	145
5:00	310	209	94	151
6:00	246	164	69	84
7:00	115	68	28	61
8:00	72	54	12	48

Table A-3
MUTCD Warrant 1 Analysis with Existing Traffic

			Condition A		Condition B	
Begin Time	Major Street	Minor Street	Major Street (500 veh.)	Minor Street (150 veh.)	Major Street (750 veh.)	Minor Street (75 veh.)
6:00	180	39	NO	NO	NO	NO
7:00	428	292	NO	YES	NO	YES
8:00	348	77	NO	NO	NO	YES
9:00	198	60	NO	NO	NO	NO
10:00	170	41	NO	NO	NO	NO
11:00	212	48	NO	NO	NO	NO
12:00	196	63	NO	NO	NO	NO
1:00	199	57	NO	NO	NO	NO
2:00	233	126	NO	NO	NO	NO
3:00	481	223	NO	YES	N0	YES
4:00	473	145	NO	NO	NO	YES
5:00	519	151	YES	YES	NO	YES
6:00	410	84	NO	NO	NO	YES
7:00	183	61	NO	NO	NO	NO
8:00	126	48	NO	NO	NO	YES

	Number of Hours Satisfied		1 HOURS		0 HOURS

MUTCD Warrant 1 Analysis with Existing Traffic 70% Volumes

Begin Time	Major Street	Minor Street	Condition A		Condition B	
			Major Street (350 veh.)	Minor Street (105 veh.)	Major Street (525 veh.)	Minor Street (53 veh.)
6:00	180	39	NO	NO	NO	NO
7:00	428	292	YES	YES	NO	YES
8:00	348	77	YES	NO	NO	YES
9:00	198	60	NO	NO	NO	YES
10:00	170	41	NO	NO	NO	NO
11:00	212	48	NO	NO	NO	NO
12:00	196	63	NO	NO	NO	YES
1:00	199	57	NO	NO	NO	YES
2:00	233	126	NO	YES	NO	YES
3:00	481	223	YES	YES	NO	YES
4:00	473	145	YES	YES	NO	YES
5:00	519	151	YES	YES	NO	YES
6:00	410	84	YES	NO	NO	YES
7:00	183	61	NO	NO	NO	YES
8:00	126	48	NO	NO	NO	YES
	Number of Hours Satisfied			4 HOURS		0 HOURS

Condition A is satisfied for 4 hours and Condition B is satisfied for 0 hours of the day. The combined warrant is also not satisfied. Warrant 1 is not met with the existing traffic.

Warrant 2: Four-Hour Vehicular Volume is to be used similar to Warrant 1 because of the volume of traffic making a traffic signal desirable. This warrant is based on the chart shown in Figure A-1 from the MUTCD if the corresponding major street volume and minor street volume are over the corresponding line on the curve for the intersection geometry for any 4 hours of the day the signal is warranted. The existing traffic in Table A-1 reduced by the percentage of right turn vehicles exceed the minimum threshold curve for one lane on the major street and a one lane on the minor street for only 3 hours. Warrant 2 is not satisfied with the existing traffic.

Warrant 3: Peak Hour is intended for use at an intersection where there is excessive delay for the minor street traffic for one hour of the day. This warrant shall be applied only in unusual cases such a high employee centers where a large number of vehicles exit over a short period of time such as office complexes, manufacturing plants and industrial complexes.

The MUTCD states that if the criteria in one of two categories are satisfied then Warrant 3 is satisfied.

Category A. requires that all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

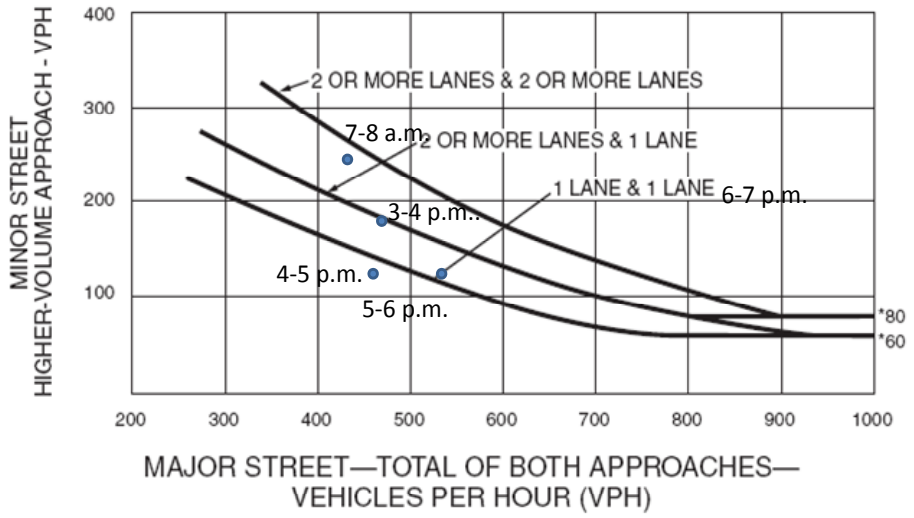
1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

The criteria for Category B is the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 of the MUTCD (shown in Figure A-1) for the existing combination of approach lanes.

The existing traffic at the intersection of Douthit Ferry Road and Pine Grove Road presently do not satisfy this warrant for two (1) hours out of the day using the minor street approach traffic reduced by not including the side street right turn traffic. The warrant based on Category B as shown in Figure A-1 is not satisfied.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

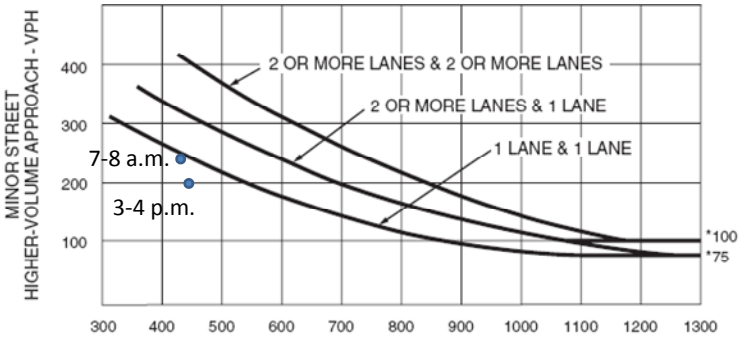
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

MUTCD Traffic Signal Warrants 2 and 3 Analysis
Douthit Ferry Road and Pine Grove Road Existing Traffic (2011)

Figure A-1

Future Traffic Signal Warrant Analysis

The previous analysis showed that a traffic signal is presently warranted at the intersection of Douthit Ferry Road and Pine Grove Road. With the widening of Douthit Ferry Road the traffic signal warrant does change slightly. The warrants require that higher traffic volumes be satisfied.

Warrant 1: Eight-Hour Vehicular Volume is based on the highest eight hours of traffic volumes at an intersection. The hourly traffic volumes for the intersection at the opening year of the design facility developed based on the projected daily traffic and the existing hourly distribution of traffic is provided in Table A-3. With the widening of the road right turn lanes will be developed on each approach therefore the right turn lane volume was reduced from the intersection approach volumes. The projected traffic over the busiest 14 hours of a 24-hour day approach counts, from 6:00 a.m. to 8:00 p.m., are shown in Table A-4. For the warrant analysis the side street volumes used in the warrant analysis do not include right turn traffic. As previously conducted these volumes were compared to the Warrant 1, Warrant 2, and Warrant 3 criteria. The comparison with Warrant 1 is shown in Table A-4. The results of this comparison indicate that the future traffic will not satisfy the 100% volumes of Warrant 1 Condition A or Condition B for 8 hours of a day. The volumes will meet the 70% volumes of Warrant 1 Condition A for 10 hours, however Condition B volumes for only 6 hours.

Warrant 1 will be satisfied with the opening year traffic since the operating speed along Douthit Ferry Road will be 40 mph or greater.

Warrant 2: Four-Hour Vehicular Volume is based on the chart in MUTCD Figure 4C-1 (shown in Figure A-2) for 100% volumes and only requires that it is satisfied for 4 hours of the day. The projected 2018 traffic volumes will meet the criteria for Warrant 2 at 100% volumes for four hours of a day; therefore, this warrant will be satisfied.

Warrant 3- Peak Hour is based on MUTCD Figure 4C-3 for 100% volumes and 4C-4 for 70% volumes and only requires that it is satisfied for one hour of the day. The projected a.m. and p.m. peak hour traffic for Douthit Ferry Road at Pine Grove Road was used to compare to this criteria. Both projected 2018 opening year a.m. and p.m. traffic satisfy this warrant at 100% volumes as shown in Figure A-2.

Table A-3
Douthit Ferry Road and Pine Grove Road 2018 Hourly Turning Movement Volumes

Begin Time	Northbound			Southbound			Eastbound			Westbound		
	NB LT	NB Thru	NB RT	SB LT	SB THRU	SB RT	EB LT	EB THRU	EB RT	WB LT	WB THRU	WB RT
12:00 AM	2	17	6	1	4	0	0	1	0	3	1	1
1:00 AM	1	8	3	0	2	0	0	0	0	1	1	0
2:00 AM	1	6	2	1	4	0	0	1	0	3	1	1
3:00 AM	0	2	1	1	5	1	0	1	0	0	0	0
4:00 AM	1	6	2	3	18	2	0	0	0	4	2	1
5:00 AM	1	13	5	19	109	11	2	4	2	14	6	5
6:00 AM	7	84	31	43	247	24	11	27	13	31	12	11
7:00 AM	34	381	142	72	416	41	86	201	100	372	149	130
8:00 AM	29	329	123	54	312	31	13	30	15	99	40	35
9:00 AM	4	163	61	35	205	20	7	16	8	77	31	27
10:00 AM	12	142	53	30	174	17	4	8	4	53	21	18
11:00 AM	19	113	79	32	183	18	6	14	7	62	25	22
12:00 PM	15	169	63	34	196	19	6	15	8	81	32	28
1:00 PM	17	190	71	31	182	18	12	28	14	73	29	26
2:00 PM	21	234	87	35	202	20	12	29	14	162	65	57
3:00 PM	39	446	167	78	450	44	50	116	58	287	115	100
4:00 PM	51	574	215	54	314	31	26	62	31	187	75	65
5:00 PM	52	594	22	66	380	37	28	65	32	194	78	68
6:00 PM	41	471	176	51	298	29	20	47	24	108	43	38
7:00 PM	19	220	82	21	123	12	8	19	10	79	31	27
8:00 PM	12	140	52	17	98	10	4	8	4	62	25	22

9:00 PM	7	84	31	13	74	7	2	4	2	18	7	6
10:00 PM	5	54	20	6	35	3	2	4	2	24	10	9
11:00 PM	1	11	4	3	18	2	0	1	0	6	3	2
Total	400	4550	1700	700	4050	400	300	700	350	2000	800	700

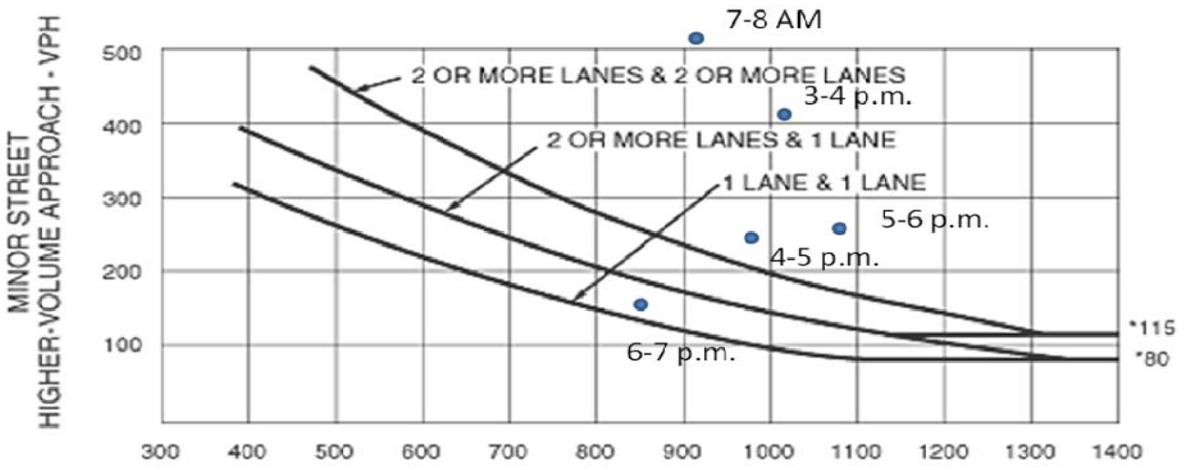
Table A-4
MUTCD Warrant 1 Analysis with 2018 Traffic
Douthit Ferry Road at Pine Grove Road

			Condition A		Condition B	
Begin Time	Major Street	Minor Street	Major Street (>600 veh.)	Minor Street (>150 veh.)	Major Street (>900 veh.)	Minor Street (>75 veh.)
6:00	437	43	NO	NO	NO	NO
7:00	1086	521	YES	YES	YES	YES
8:00	879	139	YES	NO	NO	YES
9:00	499	108	NO	NO	NO	YES
10:00	429	74	NO	NO	NO	NO
11:00	544	86	NO	NO	NO	YES
12:00	496	114	NO	NO	NO	YES
1:00	508	103	NO	NO	NO	YES
2:00	598	227	NO	YES	NO	YES
3:00	1225	402	YES	YES	YES	YES
4:00	1239	261	YES	YES	YES	YES
5:00	1350	272	YES	YES	YES	YES
6:00	1076	151	YES	YES	YES	YES
7:00	479	110	NO	NO	NO	YES
	Number of Hours Satisfied		5 HOURS			5 HOURS

Table A-4
MUTCD Warrant 1 Analysis (70% Volumes) with 2018 Traffic
Douthit Ferry Road at Pine Grove Road

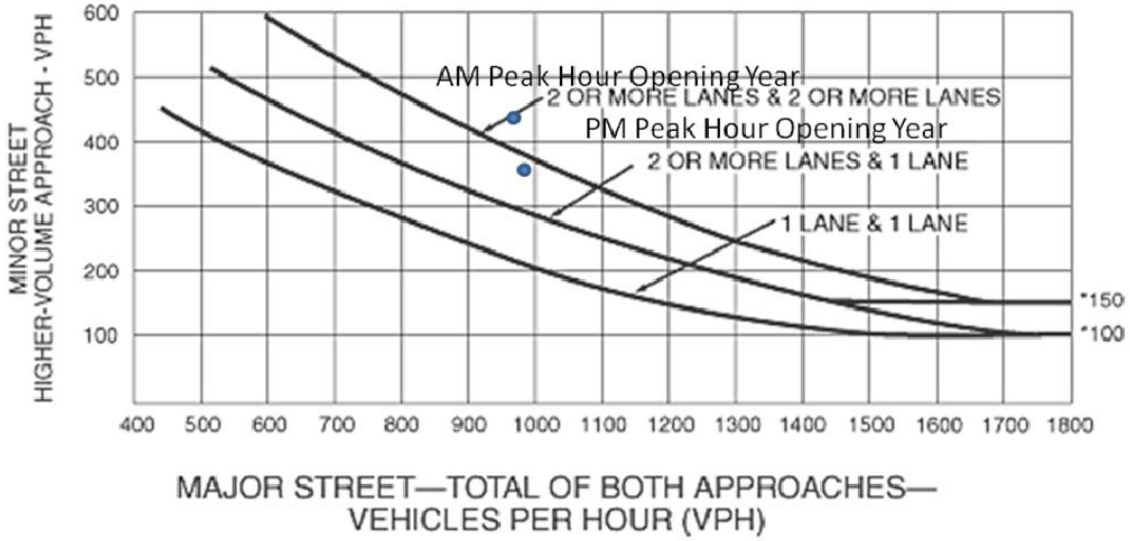
			Condition A		Condition B	
Begin Time	Major Street	Minor Street	Major Street (420 veh.)	Minor Street (105 veh.)	Major Street (630 veh.)	Minor Street (53 veh.)
6:00	437	43	YES	NO	NO	NO
7:00	1086	521	YES	YES	YES	YES
8:00	879	139	YES	YES	YES	YES
9:00	499	108	YES	YES	NO	YES
10:00	429	74	YES	NO	NO	YES
11:00	544	86	YES	NO	NO	YES
12:00	496	114	YES	YES	NO	YES
1:00	508	103	YES	NO	NO	YES
2:00	598	227	YES	YES	NO	YES
3:00	1225	402	YES	YES	YES	YES
4:00	1239	261	YES	YES	YES	YES
5:00	1350	272	YES	YES	YES	YES
6:00	1076	151	YES	YES	YES	YES
7:00	479	110	YES	YES	NO	YES
						6 HOURS
	Number of Hours Satisfied		10 HOURS			

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-3. Warrant 3, Peak Hour



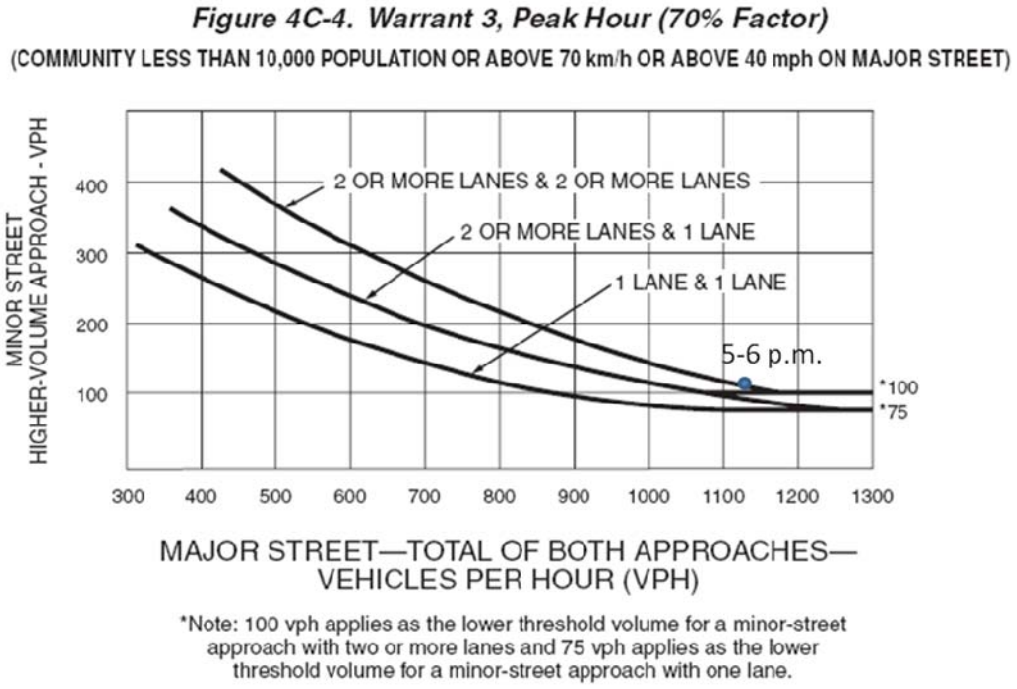
*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

MUTCD Traffic Signal Warrants 2 and 3 Analysis
Douthit Ferry Road and Pine Grove Road Opening Year (2018)

Figure A-2

Traffic Signal Warrant Analysis Douthit Ferry Road at Sam Smith Park Main Entrance

The intersection of Douthit Ferry Road at Sam Smith Park Main Entrance will be the primary entrance to a city park that will be primarily for athletic events with six (6) soccer fields, twelve (12) baseball fields and three (3) football fields. In addition there is an indoor aquatic center and an amphitheater. The ITE Trip Generation Manual has a trip generation rate for a soccer complex based on the number of fields for both daily trips and peak hour trips. It was assumed that the baseball fields and football fields will generate about the same number of trips. Based on this data the park will generate approximately 1500 vehicles per day with approximately 75% of the daily traffic exiting at this entrance to the park. The daily traffic is not enough to meet MUTCD Warrants 1 which requires 8 hours of traffic to exceed a minimum of 53 vehicles (using 70%) an hour turning left out of the park on this driveway. With a park majority of the traffic is entering and exiting during the p.m. peak. Warrant 3 Peak Hour Warrant is applicable to a park due to peaking of the traffic entering and exiting the facility. Based on this information the 2018 projected volumes for the entrance to the park was developed. The 2018 traffic projected 170 vehicles exiting the park during the p.m. peak with 110 of the vehicles turning left. Using the projected traffic volumes Warrant 3 will be satisfied as shown in Figure A-3. This entrance to the park will not satisfy any warrants at 100% volumes.



MUTCD Traffic Signal Warrant 3 Analysis
Douthit Ferry Road and Sam Smith Park Main Entrance

Figure A-3

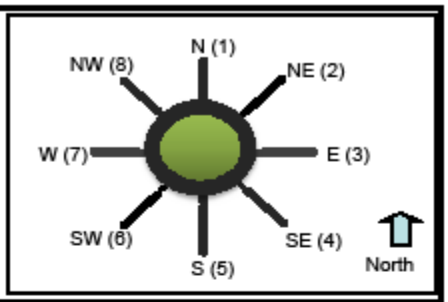
Appendix-B

Roundabout Analysis

Roundabout Analysis Tool
Multi-Lane

6/6/2011
Version 1.3

General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2018 A.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph					90			
Exit	NE (2), vph								
Legs	E (3), vph	70							
(TO)	SE (4), vph								
	S (5), vph	220	150			210			
	SW (6), vph								
	W (7), vph		135			235			
	NW (8), vph								
	Entry Volume, vph	290	285	0	0	535	0	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	200	175			140			
	NE (2), vph								
	E (3), vph		160			155			
	SE (4), vph								
	S (5), vph					100			
	SW (6), vph								
	W (7), vph	130							
	NW (8), vph								
	Entry Volume, vph	330	335	0	0	395	0	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	90	0	175	0	140	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	70	0	0	0	160	0	155	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	220	0	210	0	0	0	100	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	0	0	235	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	290	0	535	0	335	0	395	0
No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

Georgia Department of Transportation
Office of Traffic Operations

Roundabout Analysis Tool
Multi-Lane

6/6/2011
Version 1.3

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	100	0	416	0	155	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	78	0	0	0	177	0	172	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	410	0	233	0	0	0	111	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	150	0	261	0	144	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	638	0	715	0	405	0	721	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	723	NA	685	NA	851	NA	682	NA
Crit. Lane Entry Flow pcu/h	322	0	593	0	371	0	438	0
V/C ratio	**0.44**		**0.87**		**0.44**		**0.64**	
Control Delay, sec/pcu	**8.9**		**29.5**		**7.5**		**14.2**	
LOS	A		D		A		B	
95th % Queue (ft)	**59**		**261**		**57**		**119**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1968	NA	1912	NA	2134	NA	1908	NA
Entry Flow pcu/h	638	0	593	0	737	0	438	0
V/C ratio	**0.32**		**0.31**		**0.35**		**0.23**	
Control Delay, sec/pcu	**2.7**		**2.7**		**2.6**		**2.4**	
LOS	A		A		A		A	
95th % Queue (ft)	**36**		**34**		**40**		**23**	

Notes:

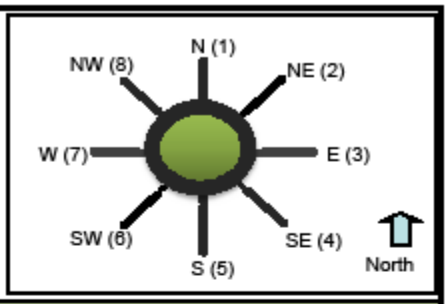
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Georgia Department of Transportation
Office of Traffic Operations

Roundabout Analysis Tool
Multi-Lane

6/6/2011
Version 1.3

General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	son Transportation Consultant
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2018 P.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph					90			
Exit	NE (2), vph								
Legs	E (3), vph		70						
(TO)	SE (4), vph								
	S (5), vph	200	200			190			
	SW (6), vph								
	W (7), vph	135				170			
	NW (8), vph								
	Entry Volume, vph	335	270	0	0	450	0	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	235	235			110			
	NE (2), vph								
	E (3), vph		190			210			
	SE (4), vph								
	S (5), vph					120			
	SW (6), vph								
	W (7), vph	105							
	NW (8), vph								
	Entry Volume, vph	340	425	0	0	440	0	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	90	0	235	0	110	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	0	0	0	0	190	0	210	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	200	0	190	0	0	0	120	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	135	0	170	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	335	0	450	0	425	0	440	0
No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	100	0	521	0	122	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	78	0	0	0	211	0	233	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	443	0	211	0	0	0	133	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	150	0	188	0	116	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	516	0	759	0	432	0	732	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	788	NA	664	NA	835	NA	677	NA
Crit. Lane Entry Flow pcu/h	371	0	499	0	471	0	488	0
V/C ratio	**0.47**		**0.75**		**0.56**		**0.72**	
Control Delay, sec/pcu	**8.6**		**19.9**		**9.7**		**17.8**	
LOS	A		C		A		C	
95th % Queue (ft)	**65**		**174**		**92**		**157**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	2055	NA	1880	NA	2114	NA	1900	NA
Entry Flow pcu/h	671	0	499	0	848	0	488	0
V/C ratio	**0.33**		**0.27**		**0.40**		**0.26**	
Control Delay, sec/pcu	**2.6**		**2.6**		**2.8**		**2.5**	
LOS	A		A		A		A	
95th % Queue (ft)	**37**		**27**		**51**		**26**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Critical Lane Flow (Default) in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Critical Lane Flow (Default) in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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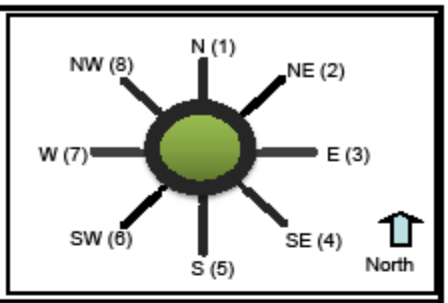
General & Site Information

Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 A.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt A



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph					160			
Exit	NE (2), vph								
Legs	E (3), vph	110							
(TO)	SE (4), vph								
	S (5), vph	435	365			360			
	SW (6), vph								
	W (7), vph		185			270			
	NW (8), vph								
	Entry Volume, vph	545	550	0	0	790	0	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	455	325			150			
	NE (2), vph								
	E (3), vph		310			195			
	SE (4), vph								
	S (5), vph					135			
	SW (6), vph								
	W (7), vph	175							
	NW (8), vph								
	Entry Volume, vph	630	635	0	0	480	0	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	160	0	325	0	150	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	0	0	0	0	310	0	195	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	365	0	360	0	0	0	135	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	185	0	270	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	550	0	790	0	635	0	480	0
No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	177	0	865	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	122	0	0	0	344	0	216	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	887	0	399	0	0	0	150	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	205	0	299	0	194	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	893	0	1225	0	504	0	1408	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	605	NA	479	NA	794	NA	422	NA
Crit. Lane Entry Flow pcu/h	610	0	876	0	704	0	532	0
V/C ratio	**1.01**		**1.83**		**0.89**		**1.26**	
Control Delay, sec/pcu	**59.7**		**395.7**		**28.7**		**158.7**	
LOS	F		F		D		F	
95th % Queue (ft)	**393**		**1415**		**295**		**577**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1785	NA	1547	NA	2063	NA	1416	NA
Entry Flow pcu/h	1214	0	876	0	1403	0	532	0
V/C ratio	**0.68**		**0.57**		**0.68**		**0.38**	
Control Delay, sec/pcu	**6.2**		**5.3**		**5.4**		**4.1**	
LOS	A		A		A		A	
95th % Queue (ft)	**150**		**96**		**152**		**45**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

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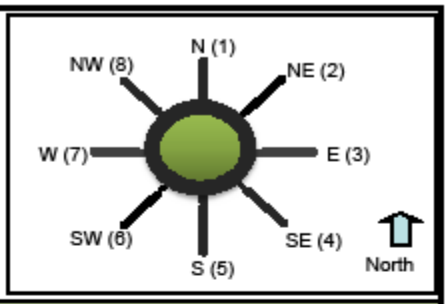
General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 P.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt A



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph					110			
Exit	NE (2), vph								
Legs	E (3), vph	160							
(TO)	SE (4), vph								
	S (5), vph	360	350			340			
	SW (6), vph								
	W (7), vph		170			215			
	NW (8), vph								
	Entry Volume, vph	520	520	0	0	665	0	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	525	360			150			
	NE (2), vph								
	E (3), vph		345			235			
	SE (4), vph								
	S (5), vph					165			
	SW (6), vph								
	W (7), vph	140							
	NW (8), vph								
	Entry Volume, vph	665	705	0	0	550	0	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	110	0	360	0	150	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	160	0	0	0	345	0	235	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	360	0	340	0	0	0	165	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	0	0	215	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	520	0	665	0	705	0	550	0

No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	122	0	981	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	177	0	0	0	383	0	261	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	787	0	377	0	0	0	183	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	188	0	238	0	155	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	771	0	1303	0	604	0	1342	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	659	NA	454	NA	740	NA	442	NA
Crit. Lane Entry Flow pcu/h	577	0	737	0	782	0	610	0
V/C ratio	**0.87**		**1.62**		**1.06**		**1.38**	
Control Delay, sec/pcu	**31.6**		**308.0**		**67.1**		**204.9**	
LOS	D		F		F		F	
95th % Queue (ft)	**266**		**1071**		**507**		**737**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1872	NA	1491	NA	1991	NA	1464	NA
Entry Flow pcu/h	1153	0	737	0	1519	0	610	0
V/C ratio	**0.62**		**0.49**		**0.76**		**0.42**	
Control Delay, sec/pcu	**5.0**		**4.7**		**7.3**		**4.2**	
LOS	A		A		A		A	
95th % Queue (ft)	**117**		**73**		**215**		**54**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	N (1)	S (5)	E (3)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	E (3)	N (1)	S (5)		
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	388	820	847	959		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Critical Flow	388	820	847	959		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	766	497	485	433		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	4.7	7.2	7.4	8.3		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	N (1)	S (5)	E (3)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	E (3)	N (1)	S (5)		
Volumes						
Entry Leg: Insert Right Turn Volume	185	250	185	135		
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	504	560	806	958		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.***						
Entry/Conflicting Flows						
Entry Flow	205	277	205	150		
Conflicting Critical Flow	504	560	806	958		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	682	646	505	434		
V/C ratio	0.30	0.43	0.41	0.35		
Control Delay, sec/pcu	7.5	9.7	11.9	12.6		
LOS	A	A	B	B		
95th % Queue (ft)	32	55	50	39		

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6/6/2011
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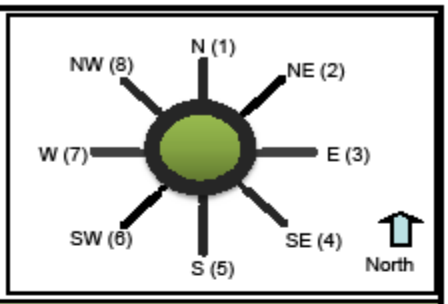
General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 P.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt A



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph					110			
Exit	NE (2), vph								
Legs	E (3), vph	160							
(TO)	SE (4), vph								
	S (5), vph	360	350			340			
	SW (6), vph								
	W (7), vph		170			215			
	NW (8), vph								
	Entry Volume, vph	520	520	0	0	665	0	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	525	360			150			
	NE (2), vph								
	E (3), vph		345			235			
	SE (4), vph								
	S (5), vph					165			
	SW (6), vph								
	W (7), vph	140							
	NW (8), vph								
	Entry Volume, vph	665	705	0	0	550	0	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	110	0	360	0	150	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	160	0	0	0	345	0	235	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	360	0	340	0	0	0	165	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	0	0	215	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	520	0	665	0	705	0	550	0

No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	122	0	981	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	177	0	0	0	383	0	261	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	787	0	377	0	0	0	183	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	188	0	238	0	155	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	771	0	1303	0	604	0	1342	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	659	NA	454	NA	740	NA	442	NA
Crit. Lane Entry Flow pcu/h	577	0	737	0	782	0	610	0
V/C ratio	**0.87**		**1.62**		**1.06**		**1.38**	
Control Delay, sec/pcu	**31.6**		**308.0**		**67.1**		**204.9**	
LOS	D		F		F		F	
95th % Queue (ft)	**266**		**1071**		**507**		**737**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1872	NA	1491	NA	1991	NA	1464	NA
Entry Flow pcu/h	1153	0	737	0	1519	0	610	0
V/C ratio	**0.62**		**0.49**		**0.76**		**0.42**	
Control Delay, sec/pcu	**5.0**		**4.7**		**7.3**		**4.2**	
LOS	A		A		A		A	
95th % Queue (ft)	**117**		**73**		**215**		**54**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

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Office of Traffic Operations

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	N (1)	S (5)	E (3)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	E (3)	N (1)	S (5)		
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	388	820	847	959		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Critical Flow	388	820	847	959		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	766	497	485	433		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	4.7	7.2	7.4	8.3		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

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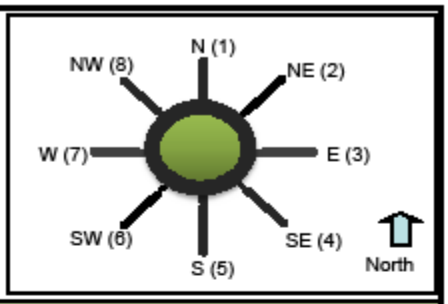
General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 A.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt B



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph						160		
Exit	NE (2), vph								
Legs	E (3), vph	110							
(TO)	SE (4), vph								
	S (5), vph	435	365			360			
	SW (6), vph								
	W (7), vph		185			35	235		
	NW (8), vph								
	Entry Volume, vph	545	550	0	0	395	395	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	425	345			150			
	NE (2), vph								
	E (3), vph		310			90	105		
	SE (4), vph								
	S (5), vph						135		
	SW (6), vph								
	W (7), vph	175							
	NW (8), vph								
	Entry Volume, vph	600	655	0	0	240	240	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	0	0	345	0	150	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	0	0	0	0	310	0	90	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	365	0	360	0	0	0	0	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	185	0	35	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	550	0	395	0	655	0	240	0
No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	177	0	854	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	122	0	0	0	344	0	216	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	887	0	399	0	0	0	150	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	205	0	299	0	194	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	893	0	1214	0	504	0	1408	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	605	NA	483	NA	794	NA	422	NA
Crit. Lane Entry Flow pcu/h	610	0	438	0	726	0	266	0
V/C ratio	**1.01**		**0.91**		**0.91**		**0.63**	
Control Delay, sec/pcu	**59.7**		**45.4**		**32.6**		**22.0**	
LOS	F		E		D		C	
95th % Queue (ft)	**393**		**263**		**327**		**107**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1785	NA	1555	NA	2063	NA	1416	NA
Entry Flow pcu/h	1214	0	876	0	1391	0	532	0
V/C ratio	**0.68**		**0.56**		**0.67**		**0.38**	
Control Delay, sec/pcu	**6.2**		**5.3**		**5.3**		**4.1**	
LOS	A		A		A		A	
95th % Queue (ft)	**150**		**95**		**148**		**45**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	N (1)	S (5)	E (3)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	E (3)	N (1)	S (5)		
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	466	455	799	958		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Critical Flow	466	455	799	958		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	709	717	508	434		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	5.1	5.0	7.1	8.3		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

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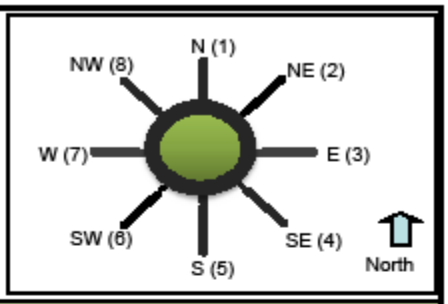
Version 1.3

General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 P.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt B



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph						110		
Exit	NE (2), vph								
Legs	E (3), vph	160							
(TO)	SE (4), vph								
	S (5), vph	360	350			340	20		
	SW (6), vph								
	W (7), vph		170			20	250		
	NW (8), vph								
	Entry Volume, vph	520	520	0	0	360	380	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	525	360			150			
	NE (2), vph								
	E (3), vph		340			115	120		
	SE (4), vph								
	S (5), vph						165		
	SW (6), vph								
	W (7), vph	140							
	NW (8), vph								
	Entry Volume, vph	665	700	0	0	265	285	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	110	0	360	0	0	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	160	0	0	0	340	0	120	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	360	0	20	0	0	0	165	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	0	0	250	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	520	0	380	0	700	0	285	0

No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	122	0	981	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	177	0	0	0	377	0	261	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	787	0	399	0	0	0	183	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	188	0	299	0	155	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	854	0	1303	0	604	0	1364	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	622	NA	454	NA	740	NA	435	NA
Crit. Lane Entry Flow pcu/h	577	0	421	0	776	0	316	0
V/C ratio	**0.93**		**0.93**		**1.05**		**0.73**	
Control Delay, sec/pcu	**41.3**		**51.5**		**64.9**		**27.3**	
LOS	E		F		F		D	
95th % Queue (ft)	**310**		**273**		**496**		**146**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1813	NA	1491	NA	1991	NA	1448	NA
Entry Flow pcu/h	1153	0	820	0	1513	0	610	0
V/C ratio	**0.64**		**0.55**		**0.76**		**0.42**	
Control Delay, sec/pcu	**5.4**		**5.3**		**7.3**		**4.3**	
LOS	A		A		A		A	
95th % Queue (ft)	**126**		**90**		**213**		**55**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	**N (1)**	**S (5)**	**E (3)**	**W (7)**		
Select Exit Leg for Bypass (TO)	**W (7)**	**E (3)**	**N (1)**	**S (5)**		
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	429	687	847	913		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.***						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Critical Flow	429	687	847	913		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	736	568	485	453		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	4.9	6.3	7.4	7.9		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

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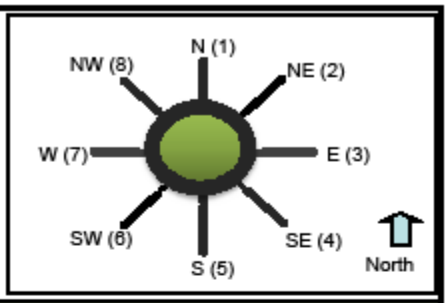
6/7/2011
Version 1.3

General & Site Information

Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 A.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt C



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph						110		
Exit	NE (2), vph								
Legs	E (3), vph	110							
(TO)	SE (4), vph								
	S (5), vph	340	460			340			
	SW (6), vph								
	W (7), vph					20	250		
	NW (8), vph								
	Entry Volume, vph	450	460	0	0	360	360	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	300	480			150			
	NE (2), vph								
	E (3), vph					90	105		
	SE (4), vph								
	S (5), vph						135		
	SW (6), vph								
	W (7), vph	175							
	NW (8), vph								
	Entry Volume, vph	475	480	0	0	240	240	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	0	0	480	0	150	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	0	0	0	0	0	0	90	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	460	0	340	0	0	0	0	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	0	0	20	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	460	0	360	0	480	0	240	0
No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	122	0	865	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	122	0	0	0	0	0	216	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	887	0	377	0	0	0	150	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	0	0	299	0	194	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	870	0	1225	0	504	0	1386	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	614	NA	479	NA	794	NA	428	NA
Crit. Lane Entry Flow pcu/h	510	0	399	0	532	0	266	0
V/C ratio	**0.83**		**0.83**		**0.67**		**0.62**	
Control Delay, sec/pcu	**28.0**		**34.9**		**13.2**		**21.2**	
LOS	D		D		B		C	
95th % Queue (ft)	**223**		**209**		**134**		**104**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1801	NA	1547	NA	2063	NA	1432	NA
Entry Flow pcu/h	1009	0	798	0	1059	0	532	0
V/C ratio	**0.56**		**0.52**		**0.51**		**0.37**	
Control Delay, sec/pcu	**4.5**		**4.8**		**3.6**		**4.0**	
LOS	A		A		A		A	
95th % Queue (ft)	**94**		**79**		**79**		**45**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Georgia Department of Transportation
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Multi-Lane

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	N (1)	S (5)	E (3)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	E (3)	N (1)	S (5)		
Volumes						
Entry Leg: Insert Right Turn Volume	185	310	160			
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	329	226	769	943		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*						
Entry/Conflicting Flows						
Entry Flow	205	344	177	0		
Conflicting Critical Flow	329	226	769	943		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	813	902	524	440		
V/C ratio	0.25	0.38	0.34	0.00		
Control Delay, sec/pcu	5.9	6.4	10.4	8.2		
LOS	A	A	B	A		
95th % Queue (ft)	25	46	38	0		

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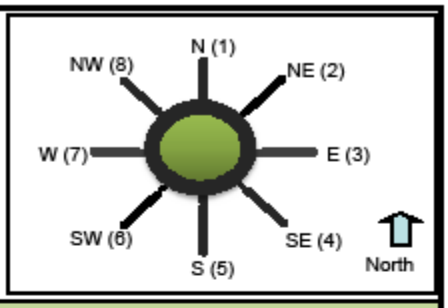
General & Site Information	
Analyst:	Harris Robinson
Agency/Company:	RTC
Date:	6/3/2011
Project Name or PI#:	Douthit Ferry Road
Year, Peak Hour:	2038 P.M. Peak
County/District:	Bartow/District
Intersection:	Douthit Ferry Road at Pine Grove Road Alt C



Volumes		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph						110		
Exit	NE (2), vph								
Legs	E (3), vph	160							
(TO)	SE (4), vph								
	S (5), vph	280	430			330	10		
	SW (6), vph								
	W (7), vph						215		
	NW (8), vph								
	Entry Volume, vph	440	430	0	0	330	335	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph	375	510			150			
	NE (2), vph								
	E (3), vph					120	115		
	SE (4), vph								
	S (5), vph						165		
	SW (6), vph								
	W (7), vph	140							
	NW (8), vph								
	Entry Volume, vph	515	510	0	0	270	280	0	0

Critical Lane Volumes	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	110	0	375	0	0	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	160	0	0	0	0	0	115	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	280	0	10	0	0	0	165	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	0	0	215	0	140	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	440	0	335	0	515	0	280	0
No. of Conflict Flow Lanes to	2	2	2	2	2	2	2	2

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Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	98%	98%	98%	98%	98%	98%	98%	98%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	2%	2%	2%	2%	2%	2%	2%	2%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	0.980	1.000	0.980	1.000	0.980	1.000	0.980	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to N (1), pcu/h	0	0	122	0	981	0	166	0
Leg # NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	177	0	0	0	0	0	261	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	787	0	377	0	0	0	183	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	0	0	238	0	155	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Conflicting flow, pcu/h	771	0	1303	0	604	0	1342	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	659	NA	454	NA	740	NA	442	NA
Crit. Lane Entry Flow pcu/h	488	0	371	0	571	0	310	0
V/C ratio	**0.74**		**0.82**		**0.77**		**0.70**	
Control Delay, sec/pcu	**19.4**		**34.8**		**19.3**		**25.2**	
LOS	C		D		C		D	
95th % Queue (ft)	**167**		**197**		**191**		**136**	

UK Model**	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1872	NA	1491	NA	1991	NA	1464	NA
Entry Flow pcu/h	965	0	737	0	1136	0	610	0
V/C ratio	**0.52**		**0.49**		**0.57**		**0.42**	
Control Delay, sec/pcu	**3.9**		**4.7**		**4.2**		**4.2**	
LOS	A		A		A		A	
95th % Queue (ft)	**79**		**73**		**98**		**54**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Georgia Department of Transportation
Office of Traffic Operations

Roundabout Analysis Tool
Multi-Lane

6/6/2011
Version 1.3

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	N (1)	S (5)	E (3)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	E (3)	N (1)	S (5)		
Volumes						
Entry Leg: Insert Right Turn Volume	170	345	0	0		
Exit Leg: ***(Select Input Method)***	Default	Default	Default	Default		
*Critical Lane Flow (Default) in Exit Leg****	394	305	847	898		
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	310	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92	0.92	0.92	0.92		
F_{HV} (Entry Leg)	0.98	0.98	0.98	0.98		
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.***						
Entry/Conflicting Flows						
Entry Flow	188	383	0	0		
Conflicting Critical Flow	394	305	847	898		
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	762	833	485	460		
V/C ratio	0.25	0.46	0.00	0.00		
Control Delay, sec/pcu	6.3	7.9	7.4	7.8		
LOS	A	A	A	A		
95th % Queue (ft)	25	62	0	0		

ATTACHMENT 6

ROUNDABOUT DATA

Roundabout Checklist

Lighting Agreement and Commitment Letter

Feasibility Study

GDOT Office of Design Policy Support

GDOT ROUNDABOUT DESIGN CHECKLIST

GDOT ROUNDABOUT DESIGN CHECKLIST - CONCEPT DEVELOPMENT

Notes:

1) This checklist is specifically written for a standalone intersection project. Some minor adjustments may be needed for a consultant designed roundabout with respect to roles. **For linear or interchange reconstruction projects much of the concept development effort can be accomplished during the preliminary design.** Additional items should be added as necessary to define/document the design. The preparation of a roundabout design may be terminated at any time during the process, if a decision is made to eliminate a roundabout from further consideration. In this case, documentation should be organized and retained to support this decision.

2) This checklist includes work items which are specific to the roundabout project and does not include many items which would be common to all conventional intersection projects. The level of detail and timing of some tasks will vary with the complexities of the roundabout and site constraints.

3) The checklist is meant to combine certain categories of information and is not meant to reflect a precise sequence of performance. Any items which do not apply to a specific project can be marked as "N/A" (i.e. not applicable).

PI Number:	0007494	County:	Bartow/City of Cartersville
Design Phase Leader:	Cartersville/Southland Engineering	Design Office:	Project Management
Description:	Douthit Ferry Road Fm Old Alabame Road to SR 61/ SR 113 Widening and reconstruction		

No.	Completed	Action By	Item	Commentary (Can modify text to replace with project specific info, will show in bold letters.)
1. Operations - Planning Level Assessment - *See DPM Section 8.2.1*				
1	Complete	SE	Vicinity Map	***Map prepared by Southland Engineering***
2	Complete	SE	Intersection Layout	***The existing survey info is used to display the existing intersection***
3	Complete	SE	Letter of support from local government	***Letter of support is attached - signed 1/20/2012***
4	Complete	HRT	Crash history	***Traffic Study prepared by Harris Robinson Transportation and approved by GDOT includes crash history.***
5	Complete	SE	Pedestrian and bike activity	***Designated Bike Trail 145 travels through the intersection where the Roundabout will be laocated.***
6	Complete	HRT	Estimate current traffic volumes	***Traffic Study prepared by Harris Robinson Transportation and approved by GDOT includes Traffic Volumes***
7	Complete	HRT	Estimate design year traffic volumes	***Traffic Study prepared by Harris Robinson Transportation and approved by GDOT includes Design Year Traffic Volumes***
8	Complete	SE	Percent traffic on major roads	***Percent Traffic on Douthit Ferry Road is 66.42%.***
9	Complete	HRT	Number of circulatory lanes	***The N/S legs will have two circulatory lanes. The West to East leg will have a left thru/Right turn only and the East to West leg will have a left turn only/ right thru***
10	Complete	SE	Favorable conditions	***Number of through lanes from 2 lanes to 4 lanes in an urban environment.***
11	Complete	SE	Unfavorable conditions	***There is a Designated Bike Path # 145 that will travel through the roundabout.***
12	Complete	SE	Purpose of roundabout	***The Roundabout is part of the overall project that needs to meet a minimum LOS of D. The roundabout meets a Minimum LOS of D***
13	Complete	SE	Roundabout sketch	***Sketch drawn with CADD is provided..***

GDOT Office of Design Policy Support

PI Number:	0007494	County:	Bartow/ City of Cartersville
Design Phase Leader:	Cartersville/Southland Engineering	Design Office:	Project Management
Description:	Douthit Ferry Road Fm Old Alabame Road to SR 61/ SR 113 Widening and reconstruction		

No.	Completed	Action By	Item	Commentary (Can modify text to replace with project specific info, will show in bold letters.)
2. Design - Gather information for concept - *for existing intersection and for base & design years*				
1	Completed	SE	Vicinity Map	***Map prepared by Southland Engineering***
2	Complete	SE	Approach speeds	***The Design Speed and Posted Speed is 35 MPH.***
3	Complete	SE	Grades	***Roundabout South leg is 0.500% - North Leg is 0.774%***
4	Complete	SE	Functional classification	***Contacted District 6 Road Inventory. Records show the Functional Class to be an Urban Collector.***
5	Complete	SE	Current year traffic volumes	***Traffic Study prepared by Harris Robinson Transportation and approved by GDOT.***
6	Complete	HRT	Base year traffic projections	***Traffic Study prepared bt Harris Robinson Transportation and approved by GDOT. This answers items 6 and 7.***
7	Complete	HRT	Design year traffic projections	
8	Complete	SE	Future projects	***The City of Catersville received a TEA project award that will prepare a multi use trail that will connect to Douthit Ferry Road. Also, STP00-2946-00(001) Bartow***
9	Complete	SE	Desirable LOS	***Table 6.5 in the DPM shows a LOS of C or D with heavy urban or suburban area. This is in a heavy urban or suburban area.***
3. Design - Roundabout Feasibility Study, Part 1 - *Alternate comparison and selection*				
1	Complete	SE	Intersection base map	***The existing survey info is used to display the existing intersection***
2	Complete	HRT	Signal Warrant Study	***Harris Robinson Transportation prepared a signal warrnt study as a part of the traffic study. It is attached***
3	Complete	SE	Identify/sketch alternative intersection forms	***Included in Feasibility Study***
4	Complete	SE	Safety assessment	***Included in Feasibility Study***
5	Complete	SE	Number of entry lanes for each approach leg	***2 entry lanes per N, S, E, W***
6	Completed	SE	Operational Analyses	***Included in Feasibility Study***
7	Completed	SE	Cost Comparison	***Included in Feasibility Study***
8	Completed	SE	Select most favorable alternate	***Included in Feasibility Study***

GDOT Office of Design Policy Support

PI Number:	0007494	County:	Bartow/ City of Cartersville
Design Phase Leader:	Cartersville/Southland Engineering	Design Office:	Project Management
Description:	Douthit Ferry Road Fm Old Alabama Road to SR 61/ SR 113 Widening and reconstruction		

No.	Completed	Action By	Item	Commentary (Can modify text to replace with project specific info, will show in bold letters.)
4. Design - Roundabout Feasibility Study, Part 2 - *Roundabout layout (as required to define the footprint)*				
1	Complete	SE	Design alternate roundabout layouts	***Southland in consultation with GDOT and PEER Review by Howard McCulloch determined the alternate used. Several designs were considered from single lane toDual lane with bypass lanes.***
2	Complete	SE	Identify likely impacts	***Since the Roundabout is on a section of relocated roadway due to a shift to avoid a lake, the utility conflics and environmental conflicts are minimized.***
3	Completed	SE	Fastest paths	***Included in Feasibility Study***
4	Completed	SE	Design vehicle	***Used WB 67 as this area is near an Industrial Park***
5	Completed	SE	Design vehicle swept path	***Icluded in Feasibility Study***
6	Completed	SE	Stopping sight distance	***Soutlnad determined that the design meets all minimum stopping site distances in all directions Bsed on the NCHRP 672 Section 6.7.3.***
7	Complete	SE	Staging improvements	***Basesd on the GDOT Roundabout tool a double lane is needed N/S/E and a single lane is used W with rt turn lane***
8	Completed	SE	Finalize concept layout	***Final Designn used is what the PEER Review and GDOT Traffic Operations agreed to use. Included in Feasibility Study***
5. Design - Other information - *required for concept report*				
1	Completed	SE	Typical section	***Typical section is in plans***
2	Completed	SE	Construction sequencing	***The new road is shifted left that will allow enough room to maintain traffic on existing roadway until enough of the Roundabout can be constructedtomplace traffic there.***
3	Completed	SE	Lighting	***Lighting will be required. Will be included in PFPR plans.***
4	Completed	SE	Landscaping requirements	***Landscaping will be required will be included in PFPR Plans.***
5	Completed	SE	Pavement Type	***Pavement section will match roadway paving. Will be 8" PCC with 12" GAB.***
6. Design - Implement program of local government coordination and public involvement				
1	Completed	SE	Presentation layouts	***Prepared for meeting with School Officials***
2	Complete	SE	Meeting with local officials	***Met with Local Officials: Cityofficials, School Board, Rep.Battles. GDOT Board Member Lewis, GDOT representaives on1/16/2012***
3	Completed	SE	Public outreach	***A public meeting was held at the request of the City of Cartersville school system. Future public meetings will be required. A PIOGH and a PHOH will be reauired as a part of the PDP.***

PI Number:	0007494	County:	Bartow/ City of Cartersville
Design Phase Leader:	Cartersville/Southland Engineering	Design Office:	Project Management
Description:	Douthit Ferry Road Fm Old Alabame Road to SR 61/ SR 113 Widening and reconstruction		

No.	Completed	Action By	Item	Commentary (Can modify text to replace with project specific info, will show in bold letters.)
7. Complete quality assurance reviews - *occurs at various points in the process*				
1	Completed	SE	QA review by design process	***Reviwed 3 times by Southland Engineering before submission***
2	Completed	GDOT	Informal review by GDOT roundabout SME	***Scott Zehngraff Assisted in early design amd review Also attended meeting with Local School Officails on 2 occasions as well as Paul Denard. Feasibility Study submitted to Daniel Pass for review.***
3	Completed	NE Rbouts	Peer Review by Consultant peer reviewer	***NE Roundabouts / Mr. Howard McCulloch prepared PEER Review***

Notes:

1) *Key objectives during concept development includes identifying the best solution that addresses the project need and defining a layout which best considers geometric, operational and other project-specific constraints. Defining an "accurate" footprint is particularly important for projects with significant site constraints and for roundabouts of greater complexity (complex roundabouts). Complex roundabouts include multilane roundabouts and single land roundabouts which addresses difficult conditions such as bad skews or significant geometric or operational constraints.*

2) *It should be recognized that unlike conventional intersection forms (e.g., signalization, stop control, etc.) the configuration and layout of a roundabout can be dramatically affected by the results of capacity, fastest path, and truck turning template studies and thus often requires higher level of engineering during the concept phase.*

3) *Include a completed checklist with the submittal package to the peer reviewer and with submission of the concept report for review and approval. Any peer review recommended changes not implemented must be coordinated with the peer reviewer and/or the Office of Design Policy and Support. The peer review report should also be included in the concept report if any recommended changes are to be made after concept development. At minimum, make all changes which affect impacts, cost, required R/W, basic operation of the roundabout leg, elimination of a bypass lane, etc. prior to submitting the concept report for review and approval.*

List of Acronyms:

SME - Subject Matter Expert
DPM - Design Policy Manual
ICD - Inscribed Diameter
TPAS - Traffic Polling and Analysis System

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INDICATION OF ROUNDABOUT SUPPORT

To the Georgia Department of Transportation:

Attn: State Traffic Engineer
935 E. Confederate Ave, Building 24
Atlanta, GA 30316

Location

The City of Cartersville in Bartow County supports the consideration of a roundabout at the location specified below.

Local Street Names: Douthit Ferry Road at Pine Grove Road/Walnut Grove Road

County Route/City Street Numbers: CR 343 at CS 96103/CR 347

Associated Conditions

The undersigned agrees to participate in the following maintenance of the intersection in the event that the roundabout is selected as the preferred concept alternative:

- The full and entire cost of the electric energy used for any lighting installed and the maintenance thereof (if needed)
- Any maintenance costs associated with the landscaping as approved by the local government and the Georgia Department of Transportation (after construction is complete)

We agree to participate in a formal Local Government Lighting Project Agreement during the preliminary design phase. This indication of support is submitted and all of the conditions are hereby agreed to. The undersigned are duly authorized to execute this agreement.

This is the 20th day of January, 2012

Attest: _____
Clerk

By: _____

Title: Mayor

ROUNDABOUT FEASIBILITY REPORT

For

CR 343 Douthit Ferry Road Intersection
With
CS 96103 Pine Grove Road / CR 347 Walnut Grove Road

Project Number CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County, Georgia

Submitted for approval to

Georgia Department of Transportation
600 West Peachtree Street
Atlanta, GA 30308

Project Sponsor

Cartersville
Be Charmed • Be Prosperous • Belong
City of Cartersville
Public Works Department
330 South Erwin Street
Cartersville, GA 30120

Prepared By

SOUTHLAND ENGINEERING
CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS
925 North Tennessee Street
Cartersville, Georgia 30120

SECTION 1
Project Background and Existing Conditions

Southland Engineering is providing the design for the City of Cartersville through a Project Framework Agreement on the widening along CR 343 Douthit Ferry Road in Bartow County Georgia. As a part of the project the intersection of CR 343 Douthit Ferry Road with CS 96103 Pine Grove Road / CR 347 Walnut Grove Road is proposed to be upgraded. The intersection is currently a four leg intersection with an all way stop control. CR 343 Douthit Ferry Road is currently classified as an Urban Collector and has two lanes in each direction with a posted speed limit of 35 mph. CS 96103 Pine Grove Road is a two lane local road with a posted speed limit of 35 mph. CR 347 Walnut Grove Road is a two lane local road with a posed speed of 30 mph. Walnut Grove Road and Pine Grove Road have an East / West orientation. Douthit Ferry Road connects Old Alabama Road with SR 61 / SR 113 in a North / South direction. Old Alabama Road is currently under design as a divided four lane road and SR 61 / SR 113 is an existing four lane road.

As a part of the Douthit Ferry Road Widening project the existing unsignalized four leg intersection will be upgraded to improve capacity and safety at the intersection. The proposed speed design on Douthit Ferry Road is 35 mph.

SECTION 2
Safety Assessment

Historical crash data was obtained from the GDOT Office of Transportation Data for the most recent available data for the intersection of CR 343 Douthit Ferry Road at CS 96103 Pine Grove Road / CR 347 Walnut Grove Road.

Tables 1 and 2 provide crash data summary for the existing all way stops at the intersection of CR 343 Douthit Ferry Road at CS 96103 Pine Grove Road / CR 347 Walnut Grove Road. Douthit Ferry Road has angle crashes accounting for 50% of the total crashes. Also the one accident on Pine Grove Road / Walnut Grove Road is and Angle crash. The rear end and sideswipe crashes on Douthit Ferry Road account for 33.35% of the total crashes. The remaining crashes are an overturned vehicle and a vehicle crash with an object. No fatal crashes were noted at the intersection in the three years provided.

Table1 Crash History – CR 343 Douthit Ferry Road @ CS 96103 Pine Grove Road /CR 347 Walnut Grove Road

YEAR	Douthit Ferry Road	Injuries	Pine Grove Road / Walnut Grove Road
2008	6	1	0
2009	4	0	0
2010	Info Not Available	0	Info Not Available
2011	2	2	1
Total	**12**	3	**1**

Table 2 Crash Type History - CR 343 Douthit Ferry Road @ CS 96103 Pine Grove Road /CR 347 Walnut Grove Road

Crash Type	Douthit Ferry Road		Pine Grove Road/ Walnut Grove Road	
	Count	%	Count	%
Angle	6	50%	1	100%
Sideswipe-Opposite Direction	2	16.68%	0	0%
Rear End	2	16.67%	0	0%
Other	2	16.67%	0	0%
Total	**12**	**100%**	**1**	**100%**

SECTION 3
Alternate Sketches

The design alternates considered for the intersection of CR 343 Douthit Ferry Road and CS96103 Pine Grove Road / CR 347 Walnut Grove Road are presented in this section. The Alternates are as follows:

- Alternate 1 – Unsignalized four leg intersection
- Alternate 2 – Signalized four leg intersection
- Alternate 3 – Multi-Lane Roundabout

Sketches are shown in figures 1, 2, 2A, 3, and 3A below.

Figure 1 – Alternate 1 – Unsignalized Four – Way Intersection

Figure 2 – Alternate 2 – Signalized Four-Way Intersection

Roundabout Feasibility Report -Page 7
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

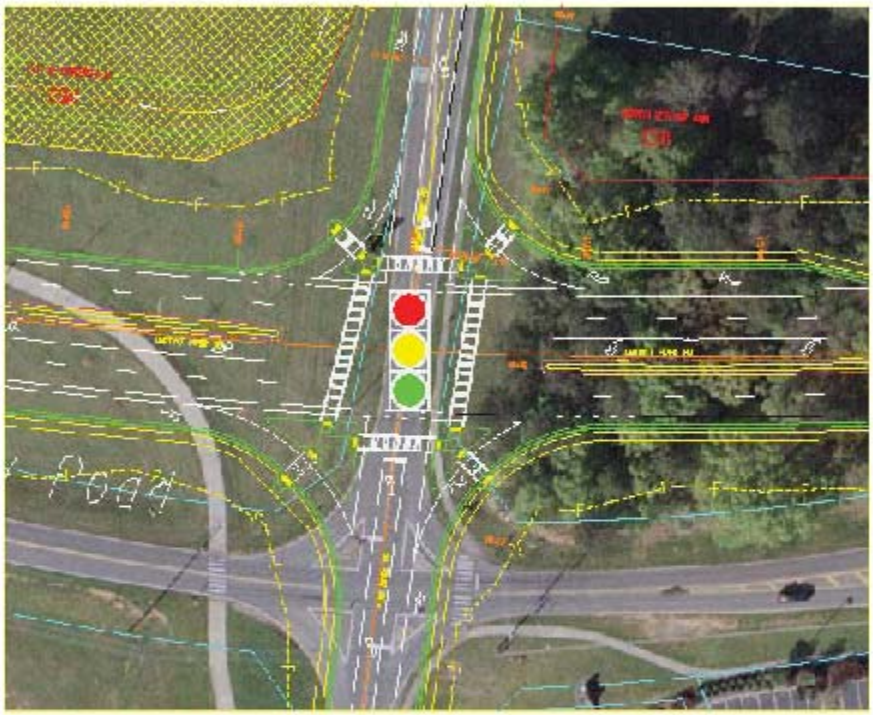

Figure 2A – Alternate 2 – Signalized Four-Way Intersection – Enlarged View

Roundabout Feasibility Report -Page 8
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

Figure 3 – Alternate 3 – Roundabout

Roundabout Feasibility Report -Page 9
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

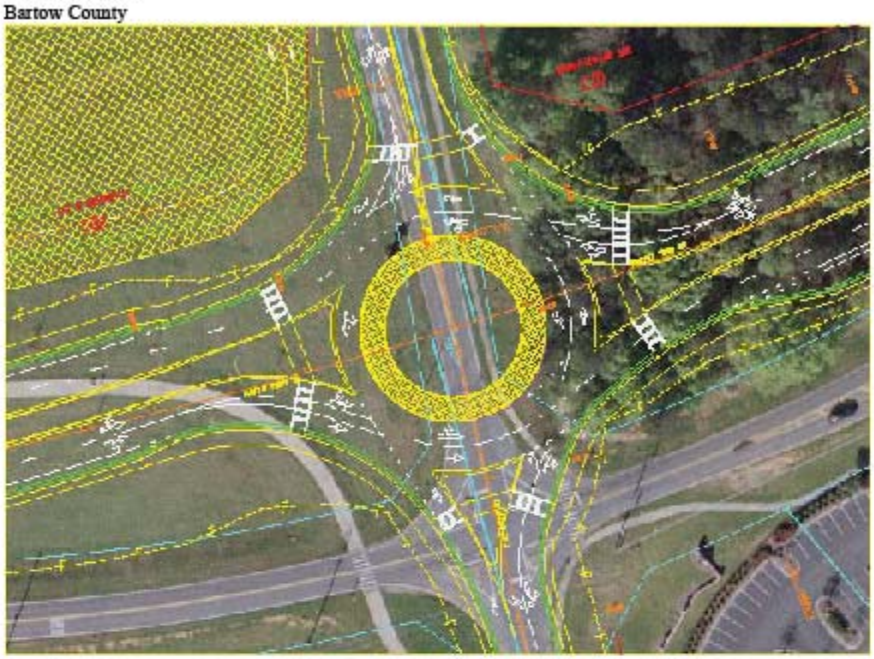

Figure 3A – Alternate 3 – Roundabout - Enlarged View

SECTION 4
Operational Analysis

Operational analysis was performed for two of the three alternates in the open to traffic year (2018) and the design year (2038). The analysis results for the intersection of Douthit Ferry Road and Pine Grove Road / Walnut Grove Road are summarized in Table 3.

The operational analysis was performed using SYNCRO software for the signal option and SIDRA and the GDOT Roundabout analysis tool were used to analyze the roundabout. The unsignalized option was considered but no analysis was performed.

Not performing the traffic analysis on the unsignalized option is a result of the character of the surrounding area and the type of pedestrians that will be utilizing the crosswalks. Cartersville Middle School is on the southwest corner of the intersection and has students from ages 9 to 12 years old utilizing the crosswalks every school day. In addition the City of Cartersville has a multi-use trail crossing the intersection which links Dellinger Park to Sam Smith Park, thus the area is highly active with recreational pedestrian uses as well as school children. An unsignalized intersection with stops on the side roads will cause the pedestrians to attempt to cross Douthit Ferry Road under traffic. This option would make the students and recreational pedestrians cross five lanes of traffic without a protected crossing or stop condition on Douthit Ferry Road.

The analysis results summarized on Table 3 indicate that the signalized intersection will operate in the 2018 open to traffic year at a LOS of C for the AM traffic and a LOS of B for the PM traffic. Also the 2038 design year will operate at a LOS of C for the AM and PM Traffic.

If a multi-lane roundabout is installed it will operate at a LOS of B in the 2018 open to traffic year in the AM and PM traffic. The SIDRA software results show the roundabout will operate at a LOS of C in the 2038 AM and PM traffic. The SIDRA software results were used for the design year (2038) LOS in lieu of the GDOT tool as the results are a better indication of the use of a roundabout and how the travelling public becomes familiar with the roundabout after it has been in place for many years.

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Table 3 Capacity Analysis Results - CR 343 Douthit Ferry Road @ CS 96103 Pine Grove Road /CR 347 Walnut Grove Road

Table 3 - Capicity Analysis Results

Analysis Tool	Approach/Movement		2019 Build AM Delay (sec/veh)	2019 Build AM LOS	2019 Build PM Delay (sec/veh)	2019 Build PM LOS	2039 Build AM Delay (sec/veh)	2039 Build AM LOS	2039 Build PM Delay (sec/veh)	2039 Build PM LOS
Alternate 1 - Unsignalized Intersection										
*N/A	Northbound		*	*	*	*	*	*	*	*
	Eastbound		*	-	*	-	*	-	*	*
	Southbound		*	*	*	*	*	*	*	*
	Westbound		*	-	*	-	*	-	*	*
Alternate 2 - Signalized Intersection										
SYNCRO	Northbound	Left Turn	19.10	B	14.10	B	25.10	C	19.50	B
		Thru	22.10	C	24.70	C	25.40	C	33.20	C
		Right Turn	24.50	C	6.00	A	35.90	C	4.50	A
	Eastbound	Left Turn	15.00	B	13.90	B	24.70	C	25.00	C
		Thru	28.00	C	30.70	C	52.90	D	59.60	E
		Right Turn	7.90	A	7.00	A	12.00	B	9.30	A
	Southbound	Left Turn	14.00	B	14.00	B	13.70	B	31.00	C
		Thru	27.10	C	23.50	C	34.70	C	29.50	C
		Right Turn	7.10	A	6.70	A	5.10	A	4.50	A
	Westbound	Left Turn	16.70	B	15.60	B	37.10	D	41.20	D
		Thru	31.60	C	24.50	C	35.70	D	36.10	D
		Right Turn	7.40	A	6.90	A	8.50	A	7.10	A
	Overall Intersection		20.50	C	16.40	B	29.90	C	28.20	C
Alternate 2 - Multilane Roundabout										
SYDRA	Northbound	Left-Thru	10.90	B	10.40	B	18.50	C	18.80	D
		Right-Thru	8.40	A	8.00	A	13.90	B	20.30	D
	Eastbound	Left-Thru	12.70	B	11.40	B	19.50	C	17.80	C
		Right-Only	11.60	B	11.00	B	16.70	C	16.40	C
	Southbound	Left-Thru	10.10	B	9.80	A	17.50	C	14.80	C
		Right-Thru	8.90	A	8.20	A	13.90	B	13.00	B
	Westbound	Left-Only	10.10	B	10.50	B	30.00	D	22.60	C
		Right-Thru	8.70	A	8.80	A	20.40	C	22.50	C
	Overall Intersection		10.70	B	10.30	B	19.60	C	21.60	C
GDOT Tool	Northbound	Left-Thru	10.90	B	10.20	B	31.60	D	50.80	D
		Right-Thru	10.60	B	10.50	B	44.50	E	71.40	G
	Eastbound	Left-Thru	13.40	B	13.60	B	52.20	F	52.60	E
		Right-Only	7.20	A	6.70	A	14.40	B	11.30	B
	Southbound	Left-Thru	12.10	B	8.60	A	58.60	E	33.10	D
		Right-Thru	12.60	B	9.00	A	75.10	F	47.50	G
	Westbound	Left-Only	10.50	B	10.20	B	42.60	D	45.80	E
		Right-Thru	14.10	B	11.20	B	67.50	E	49.30	D

* Analysis not performed on unsignalized option. See page 10 Section 4.

SECTION 5
Cost Comparison of Alternates

A cost comparison has been prepared for the three alternates and is summarized on Table 4.

TABLE 4 – COST COMPARISSON

ITEMS	Alternate 1 Unsignalized	Alternate 2 Signalized	Alternate 3 Roundabout
Roadway	$574,688	$574,688	$608,912
Drainage	$81,425	$81,425	$81,425
Erosion Control	$66,450	$66,450	$66,450
Grassing/Landscaping	$30,000	$30,000	$45,000
Lighting, Signing & Marking, Traffic Control	$76,350	$84,030	$100,000
Traffic Signal	$0	$110,000	$0
ROW Estimated Costs	$407,866	$407,866	$415,136
TOTAL	$1,236,779	$1,354,459	$1,316,923

SECTION 6
Alternate Selection

Location: This intersection will be on a slightly relocated Douthit Ferry Road and will be to the west of the current intersection approximately 140 ft. The current traffic control is an all way stop. The intersection is located 5700 ft south of SR 61 / SR113. There is a signal 5100 ft north at the intersection of Douthit Ferry Road and Old Mill Road. Old Alabama Road is located 7100 ft to the south of the intersection.

Operations: Alternate 1 (Unsignalized) was not studied for future operation due to pedestrian consideration mentioned in Section 4 of this report. Both Alternate 2 (signalized) and Alternate 3 (Roundabout) would accommodate the design year and operate at an acceptable level of service. Alternate 3 reduces the average delay for each movement in the open to traffic year (2018) when analyzed using SYDRA and the GDOT Tool software. In Addition delays are also less on each

movement for the design year (2038) using the SYDRA Software for Alternate 3. SYDRA Software results are employed for the design year because of preferred modeling. SYDRA incorporates public familiarity and driver expectations during the life of a roundabout and how the travelling public becomes familiar with the roundabout after it has been in place for many years.

Design and Right of Way: The Intersection is being raised 3 ft +/- to accommodate the drainage in the area. Alternate 1 and 2 will require 2.40 acres of Rights of Way. Alternate #3 will require 2.429 acres of Rights of Way.

Costs: Alternate 1 would have the lowest costs but will not fulfill the needs of the intersection. As mentioned traffic analysis was not conducted on an unsignalized intersection because of the pedestrian crossing an unprotected four lane roadway. Alternate 3 is less that alternate 2 by the amount of $46, 916. However long term benefits for Alternate 3 will be much more significant when the life cycle cost and maintenance of the signal is considered.

Summary: Alternate 1 is not feasible due to the unprotected pedestrian crossing of a multi-lane roadway. Alternate 2 would cost more than Alternate 3. Alternate 3 is recommended as the preferred alternate as it has a lower cost, has reduced approach speeds, provides greater safety, reduced delays, and is more efficient operationally. Roundabouts are proven to reduce injury crashes and pedestrian conflicts.

SECTION 7
Roundabout Design

The design of the multi-lane roundabout includes a 185 ft diameter inscribed island with and a central island diameter of 121 ft. The circulars roadway consists of 2 16 ft lanes with an exception on the south leg where only one 16 ft lane is required. There is a 15 ft wide truck apron to accommodate the WB-67 truck design that is used in the design. The turning paths for the WB-67 truck design are shown in figures 4A, 4B, 4C, and 4D. The fastest path vehicle speed was checked and is shown on table 5. Figures 5A and 5B is attached to present the fastest path graphically.

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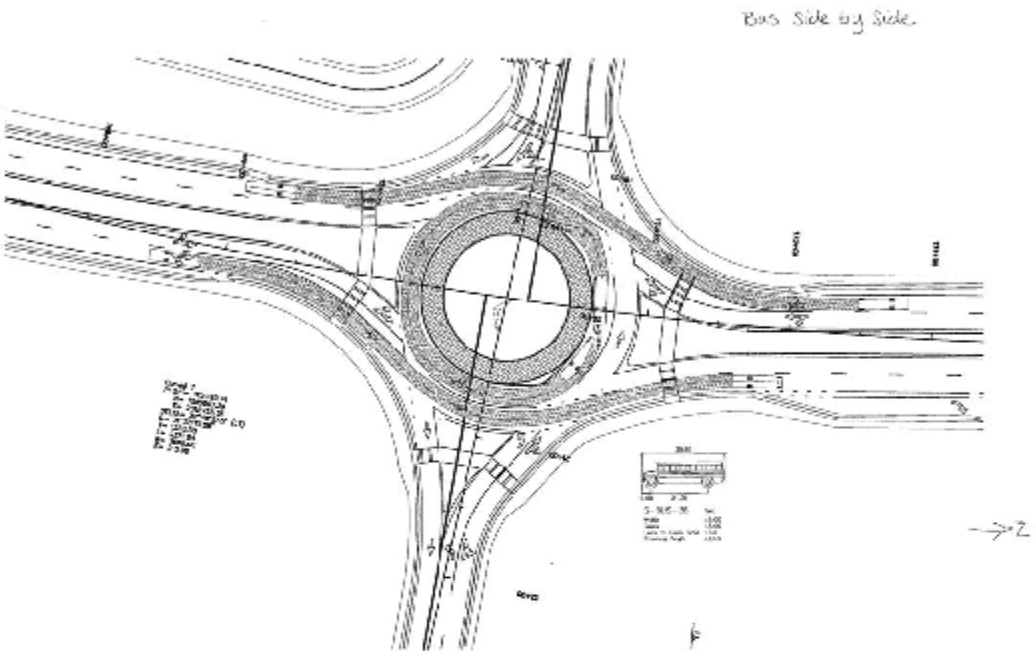

Figure 4A – Auto-Turn Bus Side By Side

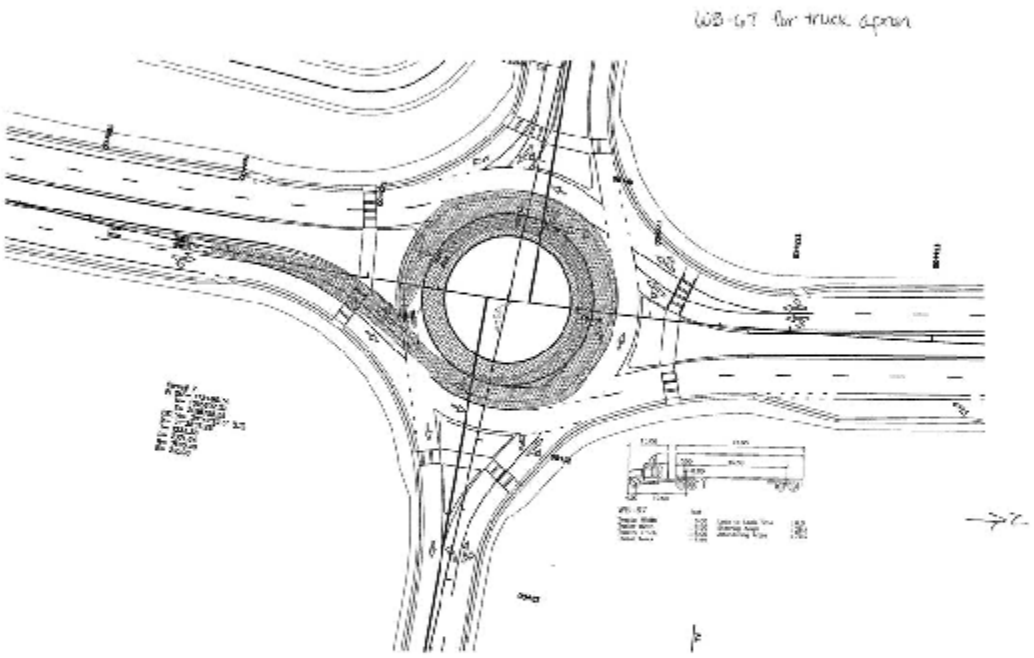

Figure 4B – Auto-Turn WB-67 for Truck Apron

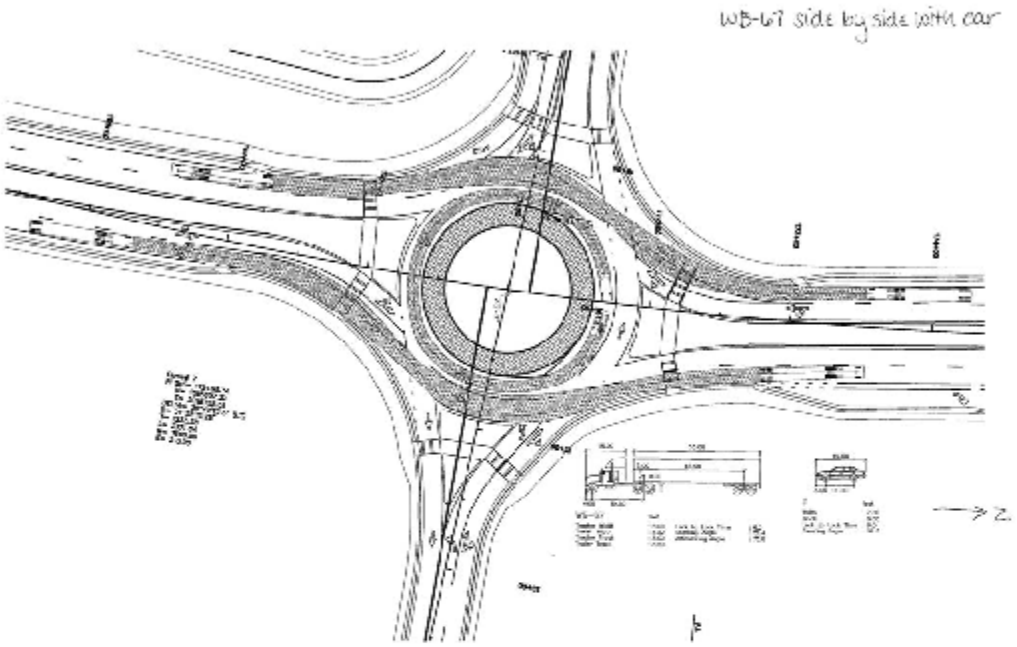

Figure 4C – Auto-Turn WB-67 Side By Side with Car

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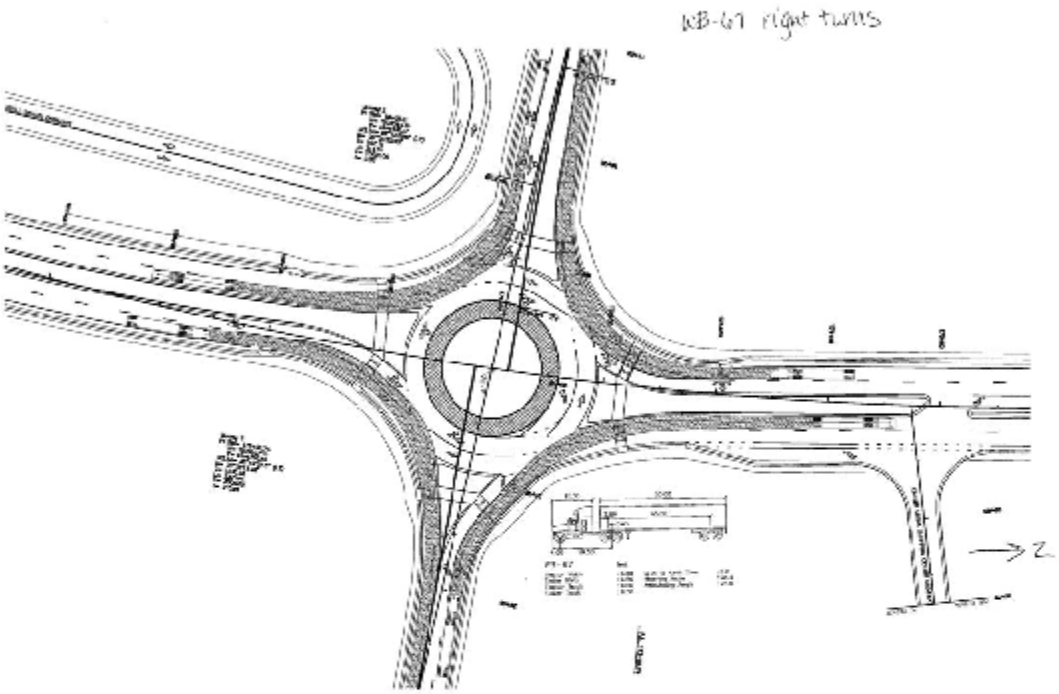

Figure 4D – Auto-Turn WB-67 Right Turns

Table 5 Fastest Path Vehicle Speed Results

Fastest Path Vehicle Speed			
	Curve	Radius (ft)	Speed (mph)
Northbound	R1	200	24
	R2	65.5	16
	R3	200	24
	R4	65.5	16
	R5	175	23
Westbound	R1	150	22
	R2	65.5	16
	R3	300	21
	R4	65.5	16
	R5	175	23
Southbound	R1	200	24
	R2	65.5	16
	R3	200	24
	R4	65.5	16
	R5	120	20
Eastbound	R1	150	22
	R2	65.5	16
	R3	175	23
	R4	65.5	16
	R5	130	21

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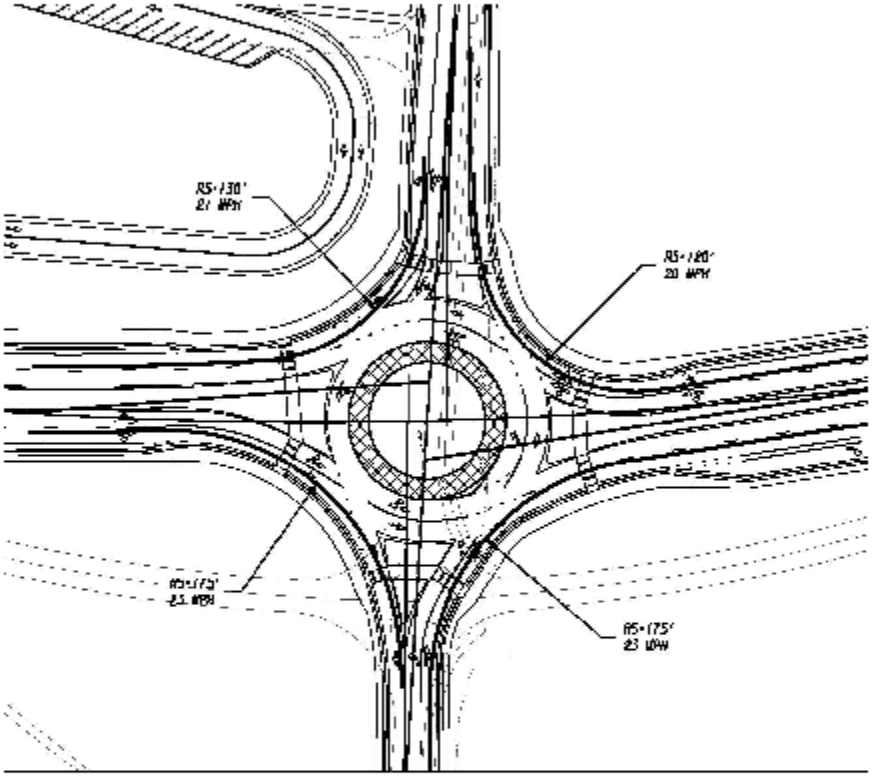

Figure 5A – Fastest Path Right Turns

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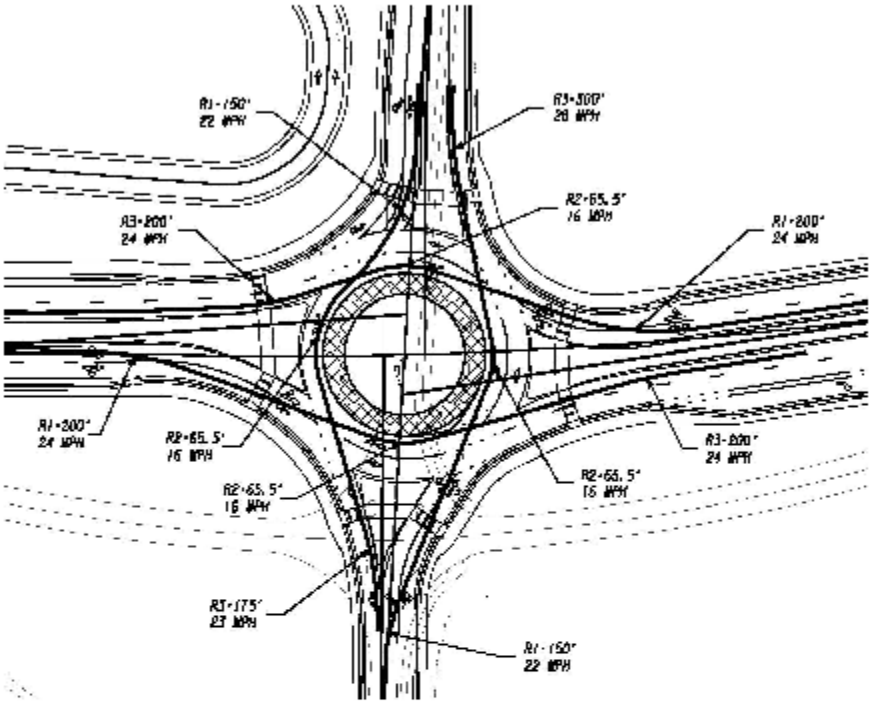

Figure 5B – Fastest Path – Thru Movements

SECTION 8
Recommendations

The redesign of the intersection of CR 343 Douthit Ferry Road with CS 96103 Pine Grove Road / CR 347 Walnut Grove Road in the City of Cartersville, Georgia in Bartow County is a part of the project under design to widen CR 343 Douthit Ferry Road from a two lane roadway to a divided 4-Lane roadway. Based on the preceding analysis the following recommendation is proposed.

The existing all way stop would be upgraded. Three alternates have been considered: The unsignalized intersection (Alternate 1), the signalized intersection (Alternate 2), and a multi-lane roundabout (Alternate 3). The unsignalized intersection would cause the students to cross 4 lanes of traffic unprotected. Also there is a multi-use trail that crosses at the intersection on the south leg. Therefore alternate 1 is not feasible. Alternate 2 and Alternate 3 would both provide an acceptable level of service in the design year (2038). Alternate 2 would cost significantly more and provide less safety benefits than Alternate 3. Alternate 3 is recommended as the preferred alternate as it has a lower cost, has reduced approach speeds, reduced conflict points for vehicles, and is more efficient operationally.

Alternate 3, the multi-lane roundabout is recommended as the preferred alternate because it has a lower cost, reduces approach speeds, is more efficient operationally, and statistically provides the greatest safety benefits for pedestrians and vehicles.

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Signal at Douthit Ferry Road at Pine Grove Road / Walnut Grove Road
SYNCRO

Douthit Ferry Road — with signal at Pine Grove
13: Pine Grove Rd & Douthit Ferry Rd — 2010 AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	180	160	210	350	90	130	370	160	70	100	130
Sat. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.450			0.599			0.511			0.512		
Sat. Flow (perm)	838	1863	1583	1004	1863	1583	979	3539	1583	954	3539	1583
Sat. Flow (RTOR)			169			98						141
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	196	189	228	380	98	141	402	174	76	109	141
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Total Split (s)	18.0	25.0	25.0	28.0	35.0	35.0	18.0	52.0	52.0	14.0	47.0	47.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	23.7	13.6	13.6	28.0	14.8	14.8	27.7	18.7	18.7	22.2	14.7	14.7
Actuated g/C Ratio	0.24	0.21	0.21	0.35	0.22	0.22	0.42	0.30	0.30	0.34	0.22	0.22
v/c Ratio	0.54	0.44	0.25	0.42	0.61	0.23	0.33	0.39	0.37	0.10	0.55	0.32
Control Delay	15.0	29.0	7.8	15.7	31.6	7.4	15.1	29.1	24.5	14.0	37.1	7.1
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	15.0	29.0	7.8	15.7	31.6	7.4	15.1	29.1	24.5	14.0	37.1	7.1
LOS	B	C	A	B	C	A	B	C	C	B	D	A
Approach Delay		18.6			21.3			24.3			31.1	
Approach LOS		B			C			C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 86.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 20.8 — Intersection LOS: C
Intersection Capacity Utilization 51.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: Pine Grove Rd & Douthit Ferry Rd

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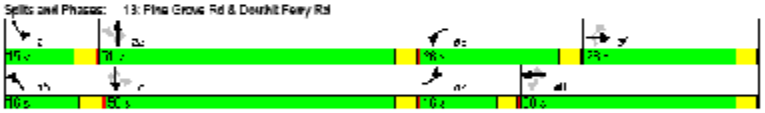
Douthit Ferry Road with signal at Pine Grove
13: Pine Grove Rd & Douthit Ferry Rd 2018 PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	210	120	150	110	70	100	470	150	90	370	100
Satd. Flow (prot)	1770	1863	1568	1770	1863	1568	1770	3539	1568	1770	3539	1583
Flt Permitted	0.611			0.259			0.730			0.384		
Satd. Flow (perm)	1191	1863	1568	482	1863	1568	891	3539	1568	666	3539	1583
Satd. Flow (RTOR)			150			76			207			198
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	228	150	207	180	76	114	511	207	98	402	198
Turn Type	pm+pt		Perm	pm+ov		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Total Split (s)	19.0	25.0	25.0	29.0	35.0	35.0	16.0	51.0	51.0	15.0	50.0	50.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	23.4	11.2	11.2	27.6	19.2	19.2	23.8	16.9	16.9	23.7	19.4	19.4
Actuated g/C Ratio	0.37	0.22	0.22	0.43	0.30	0.30	0.37	0.26	0.26	0.36	0.28	0.28
v/c Ratio	0.28	0.56	0.29	0.42	0.33	0.14	0.28	0.56	0.36	0.29	0.38	0.32
Control Delay	13.5	33.7	7.3	10.6	21.0	9.5	11.1	24.7	6.0	11.0	23.3	6.1
Queue Delay	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0
Total Delay	13.5	33.7	7.3	10.6	21.0	9.5	11.1	24.7	6.0	11.0	23.3	8.1
LOS	B	C	A	B	C	A	B	C	A	B	C	A
Approach Delay		23.1			17.7			18.8			17.2	
Approach LOS		C			B			B			B	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 64.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 18.4 Intersection LOS: B
Intersection Capacity Utilization 52.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: Pine Grove Rd & Douthit Ferry Rd



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2038 AM PEAK

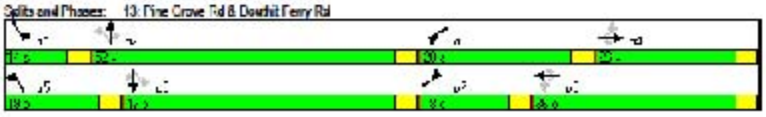
Lanes, Volumes, Timings
13: Pine Grove Rd & Douthit Ferry Rd 12/3/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	185	135	960	270	160	175	780	910	110	820	185
Ideal Flow (vphpl)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Fit Permitted	0.569			0.264			0.127			0.199		
Satd. Flow (perm)	1059	1863	1583	548	1863	1583	237	3539	1583	371	3539	1583
Satd. Flow (RTOR)			147			174						501
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	212	147	961	293	174	190	848	937	120	820	201
Turn Type	perm		Perm	perm		Perm	custom		Perm	perm		Perm
Protected Phases	7	4		5	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Total Split (s)	18.0	95.0	95.0	28.0	35.0	35.0	19.0	59.0	59.0	18.0	47.0	47.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	27.8	16.3	16.3	40.8	25.3	25.3	47.2	35.3	35.3	40.8	31.9	31.9
Actuated g/C Ratio	0.28	0.17	0.17	0.42	0.26	0.26	0.48	0.36	0.36	0.42	0.33	0.33
v/c Ratio	0.43	0.68	0.38	0.81	0.61	0.32	0.62	0.66	0.59	0.43	0.75	0.31
Control Delay	24.7	52.9	10.0	37.1	38.7	6.8	25.1	26.4	30.9	18.7	34.7	5.1
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	24.7	52.9	10.0	37.1	38.7	6.8	25.1	26.4	30.9	18.7	34.7	5.1
LOS	C	D	B	D	D	A	C	C	C	B	C	A
Approach Delay		32.0			31.9			26.3			28.2	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	85	131	0	180	163	0	68	241	176	41	283	0
Queue Length 95th (ft)	128	237	56	#345	292	54	140	335	290	80	373	50
Internal Link Dist (ft)		352			530			522			338	
Turn Bay Length (ft)	300		300	300		300	400		250	350		400
Base Capacity (vph)	437	440	486	545	640	658	364	1825	816	312	1635	839
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	0.37	0.48	0.30	0.72	0.46	0.26	0.52	0.46	0.41	0.38	0.53	0.24

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 97.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 29.9 Intersection LOS: C
Intersection Capacity Utilization: 75.4% ICU Level of Service D
Analysis Period (min): 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
13. Pine Grove Rd & Douthit Ferry Rd 12/3/2012

Splits and Phases: 13: Pine Grove Rd & Douthit Ferry Rd



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Douthit Ferry Road — with signal at Pine Grove
13: Pine Grove Rd & Douthit Ferry Rd — 2033 PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	235	135	240	215	110	140	385	245	150	710	170
Satd. Flow (prot)	1770	1863	1503	1770	1863	1503	1770	3539	1503	1770	3539	1503
Flt Permitted	0.513			0.241			0.214			0.127		
Satd. Flow (perm)	1142	1863	1503	449	1863	1503	399	3539	1503	237	3539	1503
Satd. Flow (RTOR)			147			120			275			185
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	255	147	370	234	120	152	962	375	174	772	185
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Total Split (s)	16.0	28.0	28.0	26.0	38.0	38.0	16.0	51.0	51.0	15.0	50.0	50.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	29.6	18.7	18.7	42.5	27.5	27.5	47.2	56.9	35.9	46.8	36.8	36.8
Actuated g/C Ratio	0.29	0.18	0.18	0.42	0.27	0.27	0.46	0.56	0.35	0.46	0.36	0.36
v/c Ratio	0.41	0.75	0.56	0.84	0.47	0.25	0.47	0.72	0.46	0.57	0.60	0.27
Control Delay	25.0	33.6	9.3	41.8	26.1	7.1	19.9	33.2	4.5	31.3	29.5	4.6
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	25.0	33.6	9.3	41.8	26.1	7.1	19.9	33.2	4.5	31.3	29.5	4.6
LOS	C	F	A	D	D	A	B	C	A	C	C	A
Approach Delay		24.7			24.2			24.6			25.7	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	71	170	0	184	135	0	56	304	0	63	236	0
Queue Length 95th (ft)	129	278	72	#357	227	45	99	400	60	#145	308	46
Internal Link Dist (ft)		1680			1833			329			359	
Turn Bay Length (ft)	300		300	500		300	400		400	300		300
Base Capacity (vph)	496	455	488	483	645	597	360	1594	953	594	1608	840
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	0.58	0.56	0.30	0.77	0.36	0.19	0.42	0.57	0.39	0.61	0.47	0.22

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 102
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 28.2 — Intersection LOS: C
Intersection Capacity Utilization 77.9% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Douthit Ferry Road — with signal at Pine Grove
13: Pine Grove Rd & Douthit Ferry Rd — 2033 PM Peak

Splits and Phases: 13: Pine Grove Rd & Douthit Ferry Rd

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Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

SYDRA runs for Roundabout at Douthit Ferry Road at Pine Grove Road / Walnut Grove Road

LANE SUMMARY

Site: 2018 Build AM EF 1.2 - 2 thru NB & SB as well as WB LTO & EB RTO - CAD

Cartersville
2018 AM Build 1.2 EF
2 lanes NB & SB as well as WB LTO & EB RTO - CAD
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Lane Length ft	Int. Type	Cap. Adj. %	Prob. Block. %
South: Douthit Ferry NB																
Lane 1	141	206	0	347	2.0	856	0.388	100	10.0	LOS B	2.6	66.6	1600		0.0	0.0
Lane 2	0	202	174	376	2.0	969	0.388	100	8.4	LOS A	2.7	68.2	1600		0.0	0.0
Approach	141	408	174	723	2.0		0.388		9.5	LOS A	2.7	68.2				
East: Pine Grove WB																
Lane 1	220	0	0	220	2.0	551	0.391	100	16.1	LOS C	1.7	43.7	230	Turn Bay	0.0	0.0
Lane 2	0	356	93	363	2.0	784	0.469	100	9.7	LOS A	2.8	71.1	1600		0.0	0.0
Approach	220	356	93	583	2.0		0.469		12.2	LOS B	2.8	71.1				
North: Douthit Ferry SB																
Lane 1	70	330	0	399	2.0	701	0.417	100	16.1	LOS C	2.3	57.3	1600	–	0.0	0.0
Lane 2	0	100	147	322	2.0	755	0.417	100	6.9	LOS A	2.3	57.4	1600	–	0.0	0.0
Approach	70	430	147	820	2.0		0.417		9.0	LOS A	2.3	57.4				
West: Walnut EB																
Lane 1	152	188	0	341	2.0	778	0.435	100	12.7	LOS B	2.5	63.7	1600	–	0.0	0.0
Lane 2	0	0	109	109	2.0	474	0.229	100	11.5	LOS B	1.0	24.8	100	Turn Bay	0.0	0.0
Approach	152	188	109	450	2.0		0.435		12.5	LOS B	2.5	63.7				
Intersection				2541	2.0		0.469		10.7	LOS B	2.8	71.1				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model: ON.

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SIDRA INTERSECTION

Roundabout Feasibility Report -Page 27
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

LANE SUMMARY

Site: 2018 Build PM EF 1.2 - 2 thru NB & SB as well as WB LTO & EB RTO - CAD

Cartersville
2018 PM Build 1.2 EF
2 lanes NB & SB as well as WB LTO & EB RTO - CAD
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Lane Length ft	Int. Type	Cap. Adj. %	Prob. Block. %
South: Doubtil Ferry NB																
Lane 1	114	283	0	398	2.0	864	0.466	100	10.8	LOS B	3.4	86.0	1600		0.0	0.0
Lane 2	0	227	207	434	2.0	932	0.466	100	5.0	LOS A	3.4	86.7	1600		0.0	0.0
Approach	114	511	207	832	2.0		0.466		8.0	LOS A	3.4	86.7				
East: Pine Grove WB																
Lane 1	297	0	0	297	2.0	662	0.312	100	10.0	LOS C	1.9	30.4	230	Turn Bay	0.0	0.0
Lane 2	0	186	75	261	2.0	722	0.361	100	8.0	LOS A	1.9	47.6	1600		0.0	0.0
Approach	297	186	75	467	2.0		0.361		11.9	LOS D	1.9	47.6				
North: Doubtil Ferry SB																
Lane 1	90	200	0	304	2.0	656	0.355	100	9.0	LOS A	1.0	45.0	1600	–	0.0	0.0
Lane 2	0	130	160	304	2.0	607	0.355	100	6.2	LOS A	1.0	45.0	1600	–	0.0	0.0
Approach	90	342	160	609	2.0		0.355		8.0	LOS A	1.0	45.0				
West: Walnut EB																
Lane 1	120	220	0	340	2.0	768	0.442	100	11.6	LOS B	2.6	65.1	1600	–	0.0	0.0
Lane 2	0	0	130	130	2.0	548	0.241	100	11.0	LOS B	1.0	25.6	100	Turn Bay	0.0	0.0
Approach	120	220	130	470	2.0		0.442		11.5	LOS B	2.6	65.1				
Intersection				2586	2.0		0.466		10.3	LOS B	3.4	86.7				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model: ON.

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SIDRA INTERSECTION 5.1.8.2035
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SIDRA INTERSECTION

Roundabout Feasibility Report -Page 28
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

LANE SUMMARY

Site: 2036 Build AM EF 1.1 2 thru NB & SB as well as WB LTO & EB RTO CAD

Cartersville
2030 AM Build 1.1 DT
2 lanes NB & SB as well as WB LTO & EB RTO CAD
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% back of Queue vehicles veh	Distance ft	Lane Length ft	Inv. Type	Cap. Adj. %	Prob. Block. %
South: Double Ferry NB																
Lane 1	190	654	0	844	2.0	1107	0.762	100	16.4	LOS C	13.8	260.4	1600	–	0.0	0.0
Lane 2	0	824	337	1161	2.0	1524	0.762	100	13.4	LOS B	13.8	275.3	1600	–	0.0	0.0
Approach	190	978	337	1505	2.0		0.762		15.3	LOS C	13.8	275.3				
East: Pine Grove WE																
Lane 1	391	0	0	391	2.0	463	0.846	100	30.0	LOS D	9.1	284.9	250	Turn Bay	0.0	0.0
Lane 2	0	265	174	439	2.0	568	0.774	100	20.1	LOS C	8.6	217.2	1600	–	0.0	0.0
Approach	391	265	174	830	2.0		0.846		24.9	LOS C	9.6	217.2				
North: Double Ferry SE																
Lane 1	120	436	0	564	2.0	636	0.872	100	21.3	LOS C	13.3	261.2	1600		0.0	0.0
Lane 2	0	436	201	636	2.0	729	0.872	100	16.5	LOS C	13.9	278.0	1600		0.0	0.0
Approach	120	870	201	1190	2.0		0.872		18.9	LOS C	13.9	278.0				
West: Walnut CD																
Lane 1	163	212	0	375	2.0	498	0.753	100	20.0	LOS C	9.0	173.6	1600	–	0.0	0.0
Lane 2	0	0	147	147	2.0	344	0.427	100	16.7	LOS C	2.3	59.7	100	Turn Bay	0.0	0.0
Approach	163	212	147	522	2.0		0.753		21.0	LOS C	9.0	173.6				
Intersection				3846	2.0		0.872		18.5	LOS C	13.9	278.0				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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5000551, NE ROUNDABOUT6, SINGLE

SIDRA INTERSECTION

Roundabout Feasibility Report -Page 29
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

LANE SUMMARY

Site: 2038 Build PM EF 1.1 2 thru NB & SB as well as WB LTO & EB RTO CAD

Cartersville
2038 PM Build 1.1 EF
2 lanes NB & SB as well as WB LTO & EB RTO CAD
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Lane Length ft	Shared Type	Cap. Adj. %	Prob. Block. %
South: Double Ferry NB																
Lane 1	152	525	0	677	2.0	778	0.870	100	26.9	LOS D	15.4	404.6	1600	–	0.0	0.0
Lane 2	0	837	375	1212	2.0	1388	0.870	100	26.2	LOS D	23.2	613.9	1600	–	0.0	0.0
Approach	152	1362	375	1889	2.0		0.870		26.4	LOS D	23.2	613.9				
East: Pine Grove WB																
Lane 1	370	0	0	370	2.0	521	0.710	100	22.0	LOS C	5.8	146.9	250	Turn Bay	0.0	0.0
Lane 2	0	234	120	353	2.0	434	0.814	100	22.5	LOS C	7.1	181.5	1600	–	0.0	0.0
Approach	370	234	120	723	2.0		0.814		22.7	LOS C	7.1	181.5				
North: Double Ferry SB																
Lane 1	174	368	0	532	2.0	706	0.766	100	16.0	LOS C	7.1	180.0	1600		0.0	0.0
Lane 2	0	418	186	606	2.0	792	0.766	100	13.0	LOS B	7.4	188.1	1600		0.0	0.0
Approach	174	786	186	1138	2.0		0.766		14.4	LOS B	7.4	188.1				
West: Walnut CD																
Lane 1	163	250	0	413	2.0	541	0.774	100	22.9	LOS C	7.4	187.0	1600	–	0.0	0.0
Lane 2	0	0	179	179	2.0	393	0.460	100	16.4	LOS C	2.7	67.0	100	Turn Bay	0.0	0.0
Approach	163	250	179	592	2.0		0.774		20.9	LOS C	7.4	187.0				
Intersection				3849	2.0		0.870		21.5	LOS C	23.2	613.9				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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5000551, NE ROUNDABOUT6, SINGLE

SIDRA INTERSECTION

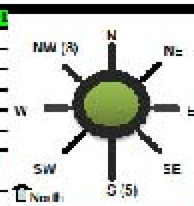
Roundabout Feasibility Report -Page 30
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

GDOT Roundabout Analysis Tool runs for Roundabout at Douthit Ferry Road at Pine Grove Road / Walnut Grove Road

Roundabout Analysis Tool
Multi-Lane

10/16/2012
Version 2.1

General & Site Information	v2.1
Analyst:	David Moore
Agency/Co:	Southland Engineering
Date:	2/5/2012
Project or PI#:	0007494 Bartow Douthit Ferry Road Widening
Year, Peak Hour	2018 AM w/ RLT to W to S & LT T Only RT Thru East Leg
County/District	Bartow District 6
Intersection:	Douthit Ferry Road at Pine Grove Road / Walnut Grove Road



Volumes		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation		Left-Thru	Right-Thru	SELECT	SELECT	Left Only	Right-Thru	SELECT	SELECT
Exit Legs (TO)	N (1), vph						90		
	NE (2), vph								
	E (3), vph	70							
	SE (4), vph								
	S (5), vph	214	186			210			
	SW (6), vph								
	W (7), vph		135				235		
	NW (8), vph								
	Entry Volume, vph	284	321	0	0	210	325	0	0

Entry Legs (FROM)

		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation		Left Thru	Right Thru	SELECT	SELECT	Left Thru	Right only	SELECT	SELECT
	N (1), vph	185	192			140			
	NE (2), vph								
	E (3), vph		160			155			
	SE (4), vph								
	S (5), vph						100		
	SW (6), vph								
	W (7), vph	170							
	NW (8), vph								
	Entry Volume, vph	355	352	0	0	295	100	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	2	0
# of Conflict Flow Lanes	2	2	2	2	2	2	2	2

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	99%	100%	97%	100%	99%	100%
% Heavy Vehicles	2%	0%	0%	0%	2%	0%	0%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)	10	0	40	0	43	0	10	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F_{HV}	0.985	1.000	1.005	1.000	0.985	1.000	1.005	1.000
F_{ped}	0.996	1.000	0.980	1.000	0.960	1.000	0.997	1.000

Entry/Conflicting Flows		N	NE	E	SE	S	SW	W	NW
Flow to	N (1), pcu/h	0	0	67	0	434	0	151	0

Georgia Department of Transportation
Office of Traffic Operations

Roundabout Feasibility Report -Page 31
Project Number: CSSTP-0007-00 (494)
P.I. No. 0007494
Bartow County

Roundabout Analysis Tool
Multi-Lane

10/16/2012
Version 2.1

Leg #									
	NE (R), pcu/h	0	0	0	0	0	0	0	0
	> (L), pcu/h	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SE (L), pcu/h	0	0	0	0	0	0	0	0
	S (T), pcu/h	441	0	327	0	0	0	108	0
	SW (R), pcu/h	0	0	0	0	0	0	0	0
	W (T), pcu/h	549	0	254	0	108	0	0	0
	NW (R), pcu/h	0	0	0	0	0	0	0	0
	Entry flow, pcu/h	987	0	373	0	778	0	427	0
	Entry flow Lane 1, pcu/h	313	0	227	0	389	0	313	0
	Entry flow Lane 2, pcu/h	674	0	477	0	389	0	108	0
	Circulating flow, pcu/h	669	0	733	0	336	0	748	0

Results: Approach Measures of Effectiveness

HCM 2010 Model (build yr)	N		E		S		W	
Lane Designation	Left-Thru	Right-Thru	Left Only	Right-Thru	Left-Thru	Right-Thru	Left-Thru	Right only
Entry Capacity, veh/h	671	694	633	663	801	817	647	672
Entry Flow Rates, veh/h	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
v/C ratio	0.46	0.50	0.36	0.53	0.48	0.47	0.50	0.16
Control Delay, s/veh	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LOS	B	B	B	B	B	B	B	A
95th % Queue (ft)	62	72	40	79	67	64	69	14
Approach Delay, LOS	[illegible]		[illegible]		[illegible]		[illegible]	

	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/C ratio			[illegible]	[illegible]			[illegible]	[illegible]
Control Delay, sec/pcu			[illegible]	[illegible]			[illegible]	[illegible]
LOS			[illegible]	[illegible]			[illegible]	[illegible]
95th % Queue (ft)			[illegible]	[illegible]			[illegible]	[illegible]
Approach Delay, LOS			[illegible]				[illegible]	

Calibrated Model (future yr)	N		E		S		W	
Lane Designations	Left Thru	Right Thru	Left Only	Right Thru	Left Thru	Right Thru	Left Thru	Right only
Entry Capacity, veh/h	824	881	760	828	1003	1056	780	840
Entry Flow Rates, veh/h	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
v/C ratio	0.37	0.40	0.30	0.43	0.36	0.35	0.41	0.13
Control Delay, s/veh	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LOS	A	A	A	A	A	A	A	A
95th % Queue (ft)	[illegible]	[illegible]	33	39	43	40	50	13
Approach Delay, LOS	8.8 sec, LOS A		9.1 sec, LOS A		7 sec, LOS A		8.8 sec, LOS A	

	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/C ratio			[illegible]	[illegible]			[illegible]	[illegible]
Control Delay, sec/pcu			[illegible]	[illegible]			[illegible]	[illegible]
LOS			[illegible]	[illegible]			[illegible]	[illegible]
95th % Queue (ft)			[illegible]	[illegible]			[illegible]	[illegible]
Approach Delay, LOS			[illegible]				[illegible]	

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	2	2	2	2	2	2
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: *(Select Input Method)*						
*Lane Flow in exit Leg****						
Sum of inner circulatory Flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
P_{HV} (Entry Leg)						
f_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
f_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Failing Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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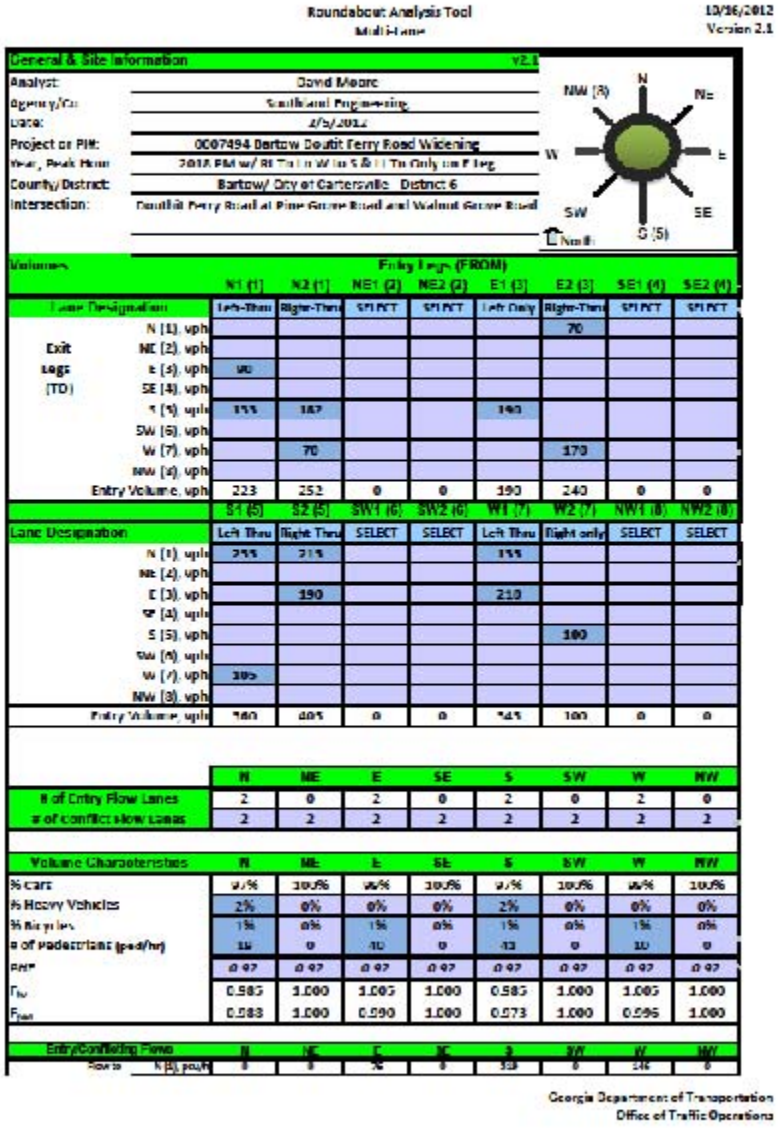

Roundabout Analysis Tool
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General & Site Information — v2.1

Analyst:	David Moore
Agency/Co:	Southern Engineering
Date:	2/5/2012
Project or PI#:	0007494 Bartow Doutit Ferry Road Widening
Year, Peak Hour:	2035 PM w/ RT Thru in W to S & T to Only on E leg
County/District:	Bartow/ City of Cartersville District 6
Intersection:	Doutit Ferry Road at Pine Grove Road and Walnut Grove Road

Volumes — Entry Legs (FROM)

Lane Designation		N1 (1) Left-Thru	N2 (1) Right-Thru	NE1 (2) SELECT	NE2 (2) SELECT	E1 (3) Left Only	E2 (3) Right-Thru	SE1 (4) SELECT	SE2 (4) SELECT
	N (1), vph						70		
Exit	NE (2), vph								
Legs	E (3), vph	40							
(TO)	SE (4), vph								
	S (5), vph	155	187			140			
	SW (6), vph								
	W (7), vph		70				170		
	NW (8), vph								
Entry Volume, vph		223	252	0	0	190	240	0	0

Lane Designation		S1 (5) Left Thru	S2 (5) Right Thru	SW1 (6) SELECT	SW2 (6) SELECT	W1 (7) Left Thru	W2 (7) Right only	NW1 (8) SELECT	NW2 (8) SELECT
	N (1), vph	155	215			155			
	NE (2), vph								
	E (3), vph		190			210			
	SE (4), vph								
	S (5), vph						100		
	SW (6), vph								
	W (7), vph	395							
	NW (8), vph								
Entry Volume, vph		760	405	0	0	565	100	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	2	0
# of conflict flow Lanes	2	2	2	2	2	2	2	2

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% cars	97%	100%	95%	100%	97%	100%	95%	100%
% Heavy Vehicles	2%	0%	0%	0%	2%	0%	0%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of pedestrians (ped/hr)	10	0	10	0	10	0	10	0
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
f_{hv}	0.985	1.000	1.005	1.000	0.985	1.000	1.005	1.000
f_{bp}	0.983	1.000	0.990	1.000	0.973	1.000	0.995	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to	N (1), pc/h	0	0	52	0	559	0	146	0

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Leg #									
	NE (R), pcu/h	0	0	0	0	0	0	0	0
	E (L), pcu/h	44	0	0	0	218	0	227	0
	SE (U), pcu/h	0	0	0	0	0	0	0	0
	S (R), pcu/h	348	0	385	0	0	0	108	0
	SW (U), pcu/h	0	0	0	0	0	0	0	0
	W (T), pcu/h	77	0	184	0	116	0	0	0
	NW (L), pcu/h	0	0	0	0	0	0	0	0
	Entry flow, pcu/h	324	0	460	0	344	0	481	0
	Entry flow Lane 1, pcu/h	246	0	285	0	207	0	373	0
	Entry flow Lane 2, pcu/h	178	0	760	0	447	0	108	0
	Circulating flow, pcu/h	383	0	788	0	472	0	632	0

Results: Approach Measures of Effectiveness

HCM 2010 Model (build yr)	N		E		S		W	
Lane Designation	Left-Thru	Right-Turn	Left Only	Right-Turn	Left-Thru	Right-Turn	Left-Thru	Right only
Entry Capacity, veh/h	753	772	626	651	760	778	693	716
Entry Flow Rates, veh/h	247	274	207	241	491	440	375	189
V/C ratio	0.32	0.35	0.33	0.40	0.52	0.57	0.54	0.15
Control Delay, s/veh	8.6	9.0	10.2	11.2	12.3	13.5	13.8	8.7
LOS	A	A	B	B	B	B	B	A
95th % Queue (ft)	35	41	36	48	76	93	81	13
Approach Delay, LOS	8.8 sec, LOS A		10.7 sec, LOS B		12.8 sec, LOS B		12.2 sec, LOS B	
	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

Calibrated Model (future yr)	N		E		S		W	
Lane Designations	Left Thru	Right Turn	Left Only	Right Turn	Left Thru	Right Turn	Left Thru	Right only
Entry Capacity, veh/h	963	1013	743	809	980	1027	855	912
Entry Flow Rates, veh/h	247	274	207	241	491	440	375	189
V/C ratio	0.25	0.27	0.28	0.32	0.50	0.43	0.44	0.12
Control Delay, s/veh	8.2	8.2	8.9	9.2	9.1	8.5	9.7	9.1
LOS	A	A	A	A	A	A	A	A
95th % Queue (ft)	25	28	23	35	48	36	36	10
Approach Delay, LOS	8.2 sec, LOS A		8.1 sec, LOS A		8.2 sec, LOS A		8.6 sec, LOS A	
	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
V/C ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	2	2	2	2	2	2
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: *(Select Input Method)*						
*Lane Flow in exit Leg****						
Sum of inner circulatory Flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
P_{HV} (Entry Leg)						
f_{pd}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
f_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Failing Traffic, veh/h						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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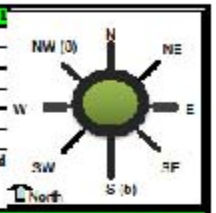
10/26/2012
Version 2.1

General & Site Information v2.1

Analyst:	David Moore
Agency/Co:	South and Engineering
Date:	4/9/2013
Project or Pilt:	0007494 Bartow Deutit Ferry Road Widening
Year, Peak Hour:	2028 AM w Rt Tn Ln W to S & Lt Tn Only Ft Thr on E Leg
County/district:	Bartow/ City of Cameryille
Intersection:	Deuthit Ferry Road at Pine Grove Road and Walnut Grove Road



Volumes — Entry Legs (FROM)

Lane Designation	N1 (1) Left-Thru	N2 (1) Right-Thru	NE1 (2) SELECT	NE2 (2) SELECT	E1 (3) Left Only	E2 (3) Right-Thru	SE1 (4) SELECT	SE2 (4) SELECT
N (1), vph						325		
NE (2), vph								
E (3), vph	90							
SE (4), vph								
S (5), vph	310	290			285			
SW (6), vph								
W (7), vph		160				253		
NW (8), vph								
Entry Volume, vph	400	450	0	0	285	578	0	0

Lane Designation	S1 (5) Left-Thru	S2 (5) Right-Thru	SW1 (6) SELECT	SW2 (6) SELECT	W1 (7) Left-Thru	W2 (7) Right only	NW1 (8) SELECT	NW2 (8) SELECT
N (1), vph	300	278			145			
NE (2), vph								
E (3), vph		235			175			
SE (4), vph								
S (5), vph						318		
SW (6), vph								
W (7), vph	155							
NW (8), vph								
Entry Volume, vph	455	513	0	0	320	318	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	2	0
# of Conflt Flow Lanes	?	?	?	?	?	?	?	?

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	99%	100%	97%	100%	99%	100%
% Heavy vehicles	2%	0%	0%	0%	2%	0%	0%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)	10	0	10	0	11	0	10	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F_{hv}	0.985	1.000	1.005	1.000	0.985	1.000	1.005	1.000
f_{ped}	0.997	1.000	1.000	1.000	0.971	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow N (1), pcph	0	0	143	0	648	0	137	0

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Input									
NB (A), pcu/h	0	0	0	0	0	0	0	0	
EB (B), pcu/h	99	0	0	0	239	0	189	0	
SB (C), pcu/h	0	0	0	0	0	0	0	0	
WB (D), pcu/h	447	0	666	0	0	0	178	0	
SW (E), pcu/h	0	0	0	0	0	0	0	0	
NW (F), pcu/h	177	0	174	0	171	0	0	0	
NE (G), pcu/h	0	0	0	0	0	0	0	0	
Entry flow, pcu/h	538	0	727	0	1000	0	474	0	
Entry flow Lane 1, pcu/h	441	0	388	0	592	0	346	0	
Entry flow Lane 2, pcu/h	494	0	489	0	398	0	128	0	
Conflicting flow, pcu/h	753	0	966	0	445	0	1000	0	

Results: Approach Measure of Effectiveness

HCM 2010 Model (build yr)	N		E		S		W	
Lane Designation	Left-Thru	Right-Thru	Left Only	Right-Thru	Left-Thru	Right-Thru	Left-Thru	Right only
Entry Capacity, veh/h	651	655	551	578	771	782	569	557
Entry Flow Rates, veh/h	405	489	310	411	495	558	348	128
v/c ratio	0.66	0.75	0.56	0.71	0.64	0.71	0.61	0.23
Control Delay, s/veh	20.8	23.6	17.4	23.7	15.7	18.1	24.4	10.0
LOS	C	C	C	C	C	C	C	A
95th % Queue (ft)	138	169	86	144	119	151	128	23
Approach Delay, LOS	22.3 sec, LOS C		21 sec, LOS C		17 sec, LOS C		20.5 sec, LOS C	
	NE		SE		SW		NW	
Lane Designation	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

Calibrated Model (future yr)	N		E		S		W	
Lane Designation	Left-Thru	Right-Thru	Left Only	Right-Thru	Left-Thru	Right-Thru	Left-Thru	Right only
Entry Capacity, veh/h	759	813	623	691	1005	1051	566	630
Entry Flow Rates, veh/h	405	489	310	411	495	558	348	128
v/c ratio	0.57	0.60	0.48	0.58	0.49	0.53	0.61	0.20
Control Delay, s/veh	13.8	13.7	13.7	13.9	9.5	9.9	19.1	8.7
LOS	B	B	B	C	A	A	C	A
95th % Queue (ft)	94	105	68	98	71	92	105	19
Approach Delay, LOS	13.7 sec, LOS B		14.1 sec, LOS B		9.7 sec, LOS A		16.1 sec, LOS C	
	NE		SE		SW		NW	
Lane Designation	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

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Version 2.1

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	2	2	2	2	2	2
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: *(Select Input Method)*						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (lag bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (lag bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) at Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
f_{HV} (Entry Leg)						
f_{p}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
f_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
v/c ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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Roundabout Analysis Tool
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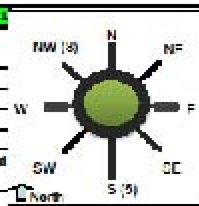
[illegible]
Version 2.1

General & Site Information	V2.1
Analyst:	David Moore
Agency/Co:	Southland Engineering
Date:	4/5/2012
Project or PI#:	0007494 Bartow Douthit Ferry Road Widening
Year, Peak Hour:	2028 PM w Rt Th Ln W to S and Lt Th Only Rt Th on E Leg
County/District	Bartow/ City of Cartersville
Intersection:	Douthit Ferry Road at Pine Grove Road and Walnut Grove Road



Volumes	Entry Legs (FROM)							
	N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
Lane Designation	Left Thru	Right Thru	SELECT	SELECT	Left Only	Right Thru	SELECT	SELECT
Exit Legs (TO) N (1), vph						90		
NE (2), vph								
E (3), vph	125							
SE (4), vph								
S (5), vph	231	282			265			
SW (6), vph								
W (7), vph		120				193		
NW (8), vph								
Entry Volume, vph	356	402	0	0	265	283	0	0
	S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
Lane Designation	Left-Thru	Right-Thru	SELECT	SELECT	Left-Thru	Right only	SELECT	SELECT
N (1), vph	379	299			135			
NE (2), vph								
E (3), vph		268			223			
SE (4), vph								
S (5), vph						158		
SW (6), vph								
W (7), vph	125							
NW (8), vph								
Entry Volume, vph	502	567	0	0	358	158	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	2	0
# of Conflict Flow Lanes	?	?	?	?	?	?	?	?

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	99%	100%	97%	100%	99%	100%
% Heavy vehicles	2%	0%	0%	0%	2%	0%	0%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)	10	0	40	0	41	0	10	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F_{hv}	0.985	1.000	1.005	1.000	0.985	1.000	1.005	1.000
F_{ped}	0.995	1.000	1.000	1.000	0.975	1.000	1.000	1.000

Entry/Conflicting Flows		N	NE	E	SE	S	SW	W	NW
From	S (5), pcph	0	0	[illegible]	0	[illegible]	0	[illegible]	0

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Input									
	NB (A), pcu/h	0	0	0	0	0	0	0	0
	EB (B), pcu/h	158	0	0	0	236	0	241	0
	SB (C), pcu/h	0	0	0	0	0	0	0	0
	WB (D), pcu/h	166	0	251	0	0	0	149	0
	RT (E), pcu/h	0	0	0	0	0	0	0	0
	LT (F), pcu/h	122	0	189	0	126	0	0	0
	RT (G), pcu/h	0	0	0	0	0	0	0	0
	Entry flow, pcu/h	606	0	933	0	1170	0	536	0
	Entry flow Lane 1, pcu/h	292	0	387	0	534	0	387	0
	Entry flow Lane 2, pcu/h	444	0	306	0	628	0	149	0
	Conflicting flow, pcu/h	631	0	1030	0	525	0	598	0

Results: Approach Measures of Effectiveness

HCM 2010 Model (build yr)	N		E		S		W	
Lane Designations	Left-Thru	Right-Thru	Left Only	Right-Thru	Left-Thru	Right-Thru	Left-Thru	Right only
Entry Capacity, veh/h	690	712	525	554	752	752	540	566
Entry Flow Rates, veh/h	387	437	283	303	540	630	389	150
v/c ratio	0.56	0.61	0.55	0.55	0.72	0.84	0.72	0.26
Control Delay, s/veh	14.5	15.8	17.6	17.2	23.6	26.7	25.6	9.9
LOS	B	C	C	C	C	D	D	A
95th % Queue (ft)	80	108	82	84	172	227	146	26
Approach Delay, LOS	15.2 sec, LOS C		17.4 sec, LOS C		24.3 sec, LOS C		21.2 sec, LOS C	
	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

Calibrated Model (future yr)	N		E		S		W	
Lane Designations	Left-Thru	Right-Thru	Left Only	Right-Thru	Left-Thru	Right-Thru	Left-Thru	Right only
Entry Capacity, veh/h	656	611	580	652	632	682	612	675
Entry Flow Rates, veh/h	387	437	283	303	540	630	389	150
v/c ratio	0.45	0.48	0.48	0.47	0.56	0.63	0.64	0.22
Control Delay, s/veh	9.9	9.9	10.4	10.3	12.1	12.8	18.7	7.9
LOS	A	A	B	B	B	B	C	A
95th % Queue (ft)	60	67	49	49	98	117	117	21
Approach Delay, LOS	9.9 sec, LOS A		10.3 sec, LOS B		12.4 sec, LOS B		15.7 sec, LOS C	
	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of conflicting exit slow lanes	1	1	1	1	1	1
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: *(Select Input Method)*						
*Inner Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						
F_{ped}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
v/c ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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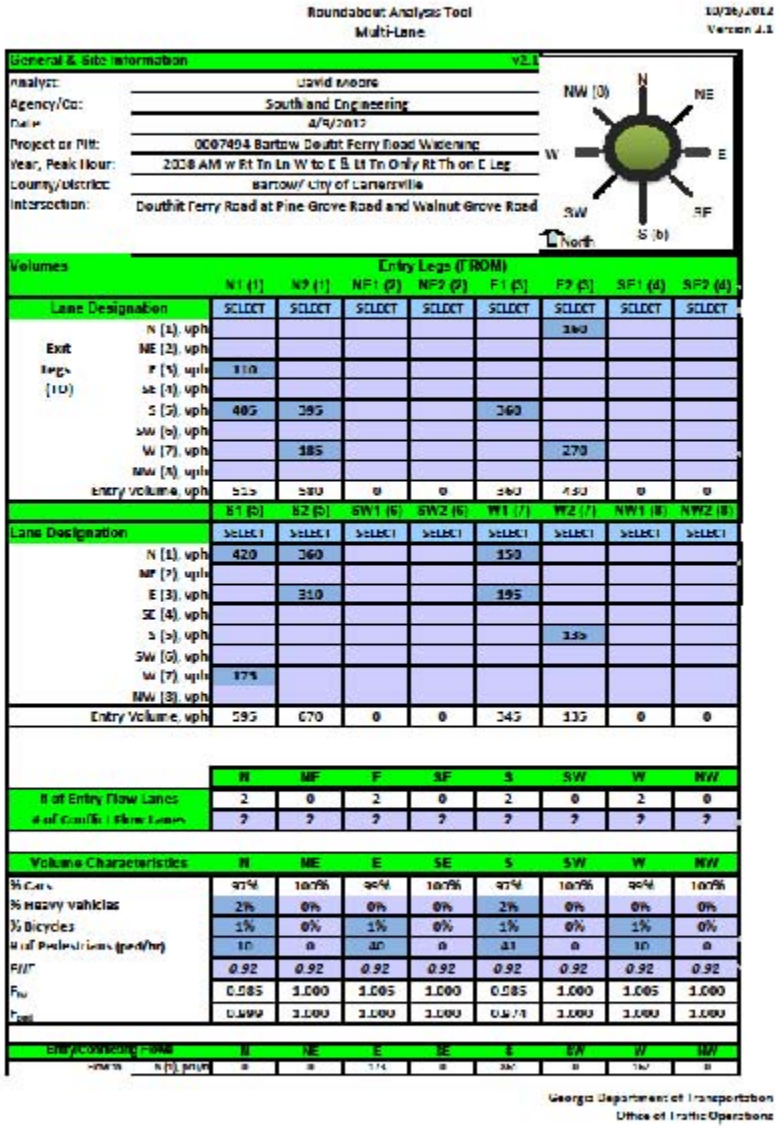

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General & Site Information — v2.1

Analyst:	David Moore
Agency/Co:	South and Engineering
Date:	8/9/2012
Project or Pilt:	0007494 Bartow Deutit Ferry Road Widening
Year, Peak Hour:	2038 AM w Rt Tn Ln W to E & Lt Tn Only Rt Th on E Leg
County/District:	Bartow/ City of Lanersville
Intersection:	Deutit Ferry Road at Pine Grove Road and Walnut Grove Road

Volumes — Entry Legs (FROM)

Lane Designation	N1 (1) SELECT	N2 (1) SELECT	NE1 (2) SELECT	NE2 (2) SELECT	E1 (3) SELECT	E2 (3) SELECT	SE1 (4) SELECT	SE2 (4) SELECT
N (1), vph						360		
NE (2), vph								
E (3), vph	110							
SE (4), vph								
S (5), vph	405	295			360			
SW (6), vph								
W (7), vph		185				270		
NW (8), vph								
Entry Volume, vph	515	480	0	0	360	630	0	0

Lane Designation	S1 (5) SELECT	S2 (5) SELECT	SW1 (6) SELECT	SW2 (6) SELECT	W1 (7) SELECT	W2 (7) SELECT	NW1 (8) SELECT	NW2 (8) SELECT
N (1), vph	420	360			150			
NE (2), vph								
E (3), vph		310			195			
SE (4), vph								
S (5), vph						335		
SW (6), vph								
W (7), vph	175							
NW (8), vph								
Entry Volume, vph	595	670	0	0	345	335	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	2	0
# of Conflic. Flow Lanes	?	?	?	?	?	?	?	?

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	99%	100%	97%	100%	99%	100%
% Heavy Vehicles	2%	0%	0%	0%	2%	0%	0%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)	10	0	10	0	11	0	10	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F_{hv}	0.985	1.000	1.005	1.000	0.985	1.000	1.005	1.000
f_{ped}	0.999	1.000	1.000	1.000	0.971	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow N (1), pcph	0	0	174	0	367	0	167	0

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Inputs								
NB (A), pcu/h	0	0	0	0	0	0	0	0
EB (B), pcu/h	121	0	0	0	342	0	211	0
SB (C), pcu/h	0	0	0	0	0	0	0	0
WB (D), pcu/h	324	0	389	0	0	0	146	0
NB (E), pcu/h	0	0	0	0	0	0	0	0
EB (F), pcu/h	394	0	392	0	182	0	0	0
WB (G), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	1000	0	854	0	1000	0	569	0
Entry flow Lane 1, pcu/h	568	0	389	0	636	0	372	0
Entry flow Lane 2, pcu/h	640	0	465	0	739	0	198	0
Conflicting flow, pcu/h	874	0	1210	0	494	0	1000	0

Results: Approach Measure of Effectiveness

HCM 2010 Model (build yr)	N		E		S		W	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	577	605	456	486	748	767	599	416
Entry Flow Rates, veh/h	560	630	391	467	647	728	375	147
v/c ratio	0.97	1.05	0.86	0.96	0.86	0.95	0.64	0.35
Control Delay, s/veh	36.8	75.3	40.8	68.5	30.6	54.3	20.2	14.4
LOS	F	F	E	F	D	E	F	B
95th % Queue (ft)	341	436	217	303	266	363	250	37
Approach Delay, LOS	66.5 sec, LOS F		53.5 sec, LOS F		38.3 sec, LOS E		49.5 sec, LOS E	
	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								
Calibrated Model (future yr)	N		E		S		W	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	673	735	480	552	550	1008	469	470
Entry Flow Rates, veh/h	560	630	391	467	647	728	375	147
v/c ratio	0.83	0.86	0.80	0.85	0.67	0.72	0.80	0.31
Control Delay, s/veh	30.3	31.3	34.8	36.8	18.9	15.9	37.7	17.8
LOS	D	D	D	E	B	C	F	B
95th % Queue (ft)	279	295	184	223	154	187	247	55
Approach Delay, LOS	30.7 sec, LOS D		36 sec, LOS E		15.7 sec, LOS C		45 sec, LOS E	
	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	2	2	2	2	2	2
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: *(Select Input Method)*						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (lag bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (lag bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
f_{HV} (Entry Leg)						
$f_{p,ex}$						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
f_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
v/c ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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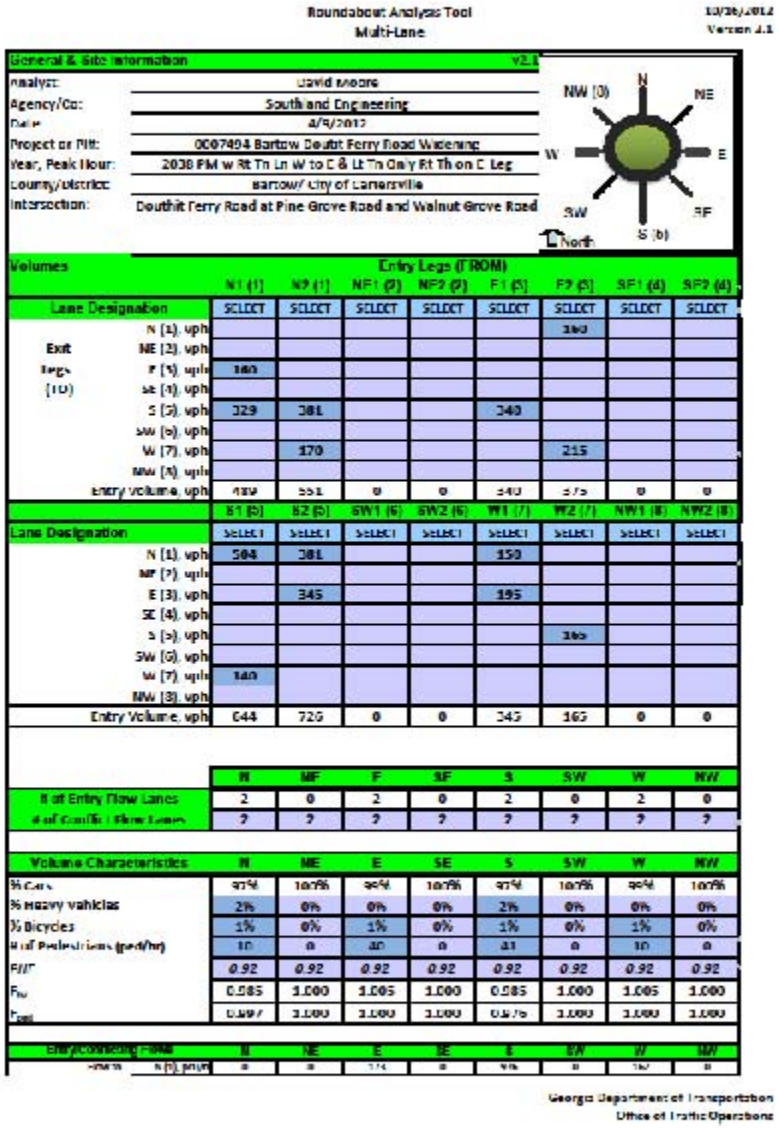

Roundabout Analysis Tool
Multi-Lane

10/26/2012
Version 2.1

General & Site Information — v2.1

Analyst:	David Moore
Agency/Co:	South and Engineering
Date:	8/9/2012
Project or Pilt:	0007494 Bartow Deutit Ferry Road Widening
Year, Peak Hour:	2030 PM w Rt Tn Ln W to C & Lt Tn Only Rt Th on C Leg
County/District:	Bartow/ City of Lamersville
Intersection:	Deutit Ferry Road at Pine Grove Road and Walnut Grove Road

Volumes — Entry Legs (FROM)

Lane Designation	N1 (1) SELECT	N2 (1) SELECT	NE1 (2) SELECT	NE2 (2) SELECT	E1 (3) SELECT	E2 (3) SELECT	SE1 (4) SELECT	SE2 (4) SELECT
N (1), vph						160		
NE (2), vph								
E (3), vph	160							
SE (4), vph								
S (5), vph	329	381			340			
SW (6), vph								
W (7), vph		170				215		
NW (8), vph								
Entry Volume, vph	489	551	0	0	340	375	0	0

Lane Designation	S1 (5) SELECT	S2 (5) SELECT	SW1 (6) SELECT	SW2 (6) SELECT	W1 (7) SELECT	W2 (7) SELECT	NW1 (8) SELECT	NW2 (8) SELECT
N (1), vph	504	381			150			
NE (2), vph								
E (3), vph		345			195			
SE (4), vph								
S (5), vph						365		
SW (6), vph								
W (7), vph	140							
NW (8), vph								
Entry Volume, vph	644	726	0	0	345	365	0	0

	N	NE	E	SE	S	SW	W	NW
# of Entry Flow Lanes	2	0	2	0	2	0	2	0
# of Conflic. Flow Lanes	?	?	?	?	?	?	?	?

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	99%	100%	97%	100%	99%	100%
% Heavy Vehicles	2%	0%	0%	0%	2%	0%	0%	0%
% Bicycles	1%	0%	1%	0%	1%	0%	1%	0%
# of Pedestrians (ped/hr)	10	0	10	0	11	0	10	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F_{hv}	0.985	1.000	1.005	1.000	0.985	1.000	1.005	1.000
f_{ped}	0.997	1.000	1.000	1.000	0.996	1.000	1.000	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flows: N (1), pcph	0	0	174	0	976	0	167	0

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Input									
	NB (A), pcu/h	0	0	0	0	0	0	0	0
	EB (B), pcu/h	277	0	0	0	382	0	211	0
	SB (C), pcu/h	0	0	0	0	0	0	0	0
	WB (D), pcu/h	154	0	0	0	0	0	0	0
	SW (E), pcu/h	0	0	0	0	0	0	0	0
	NW (F), pcu/h	122	0	122	0	154	0	0	0
	NE (G), pcu/h	0	0	0	0	0	0	0	0
	Entry flow, pcu/h	1147	0	772	0	1536	0	332	0
	Entry flow Lane 1, pcu/h	529	0	368	0	736	0	372	0
	Entry flow Lane 2, pcu/h	618	0	404	0	800	0	178	0
	Conflicting flow, pcu/h	755	0	1220	0	330	0	1220	0

Results: Approach Measures of Effectiveness

HCM 2010 Model (build yr)	N		E		S		W	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	650	655	451	459	720	740	420	446
Entry Flow Rates, veh/h	532	599	370	403	780	789	375	379
v/c ratio	0.81	0.91	0.82	0.88	0.97	1.07	0.89	0.85
Control Delay, s/veh	30.3	42.2	45.8	48.3	38.9	75.4	32.6	25.3
LOS	D	E	E	E	F	F	F	C
95th % Queue (ft)	234	382	213	237	381	522	234	47
Approach Delay, LOS	37.9 sec, LOS E		47.2 sec, LOS E		63.9 sec, LOS F		40.5 sec, LOS E	

	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

Calibrated Model (future yr)	N		E		S		W	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	757	817	452	515	911	962	437	490
Entry Flow Rates, veh/h	532	599	370	403	780	789	375	379
v/c ratio	0.70	0.73	0.82	0.78	0.77	0.82	0.86	0.86
Control Delay, s/veh	18.8	19.2	38.8	32.8	19.8	22.5	35.4	19.0
LOS	C	C	E	D	C	C	E	B
95th % Queue (ft)	165	185	191	185	195	241	218	80
Approach Delay, LOS	18.9 sec, LOS C		35.8 sec, LOS E		21 sec, LOS C		34.9 sec, LOS D	

	NE		SE		SW		NW	
Lane Designations	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
Entry Capacity, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
Entry Flow Rates, veh/h	NA	NA	NA	NA	NA	NA	NA	NA
v/c ratio								
Control Delay, sec/pcu								
LOS								
95th % Queue (ft)								
Approach Delay, LOS								

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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)						
Select exit Leg for bypass (TO)						
Does the bypass have a dedicated receiving lane?						
# of Conflicting Exit Flow Lanes	2	2	2	2	2	2
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: *(Select Input Method)*						
*Lane Flow in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) at Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
f_{HV} (Entry Leg)						
f_{p}						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
f_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results						
Entry Capacity of Bypass, veh/h						
Flow Rates of Exiting Traffic, veh/h						
v/c ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

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ATTACHMENT 7

BRIDGE INVENTORY

P.I. Number: 0007494

Project Concept Report –
County: Bartow

Processed Date:6/21/2011

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:015-5061-0 **Bartow** **SUFF. RATING:** 76.29

Location & Geography

Structure ID:	015-5061-0
200 Bridge Information:	03
'6A Feature Int:	ETOWAH RIVER
'6B Critical Bridge:	0
'7A Route No Carried:	CR00343
'7B Facility Carried:	DOUTHIT BRIDGE RD.
9 Location:	3.6 MI W OF EMERSON
2 Dot District:	6
207 Year Photo:	2010
'91 Inspection Frequency:	24 Date: 09/21/2010
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	1 Date: 03/20/2007
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
'4 Place Code:	00000
'5 Inventory Route(O/U):	1
Type:	4
Designation:	1
Number:	00343
Direction:	0
'16 Latitude:	34 07.2298 HMMS Prefix: -
'17 Longitude:	84 -49.2348 HMMS Suffix: MP:0.00
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
'100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	152034300
13B Sub Inventory Route:	0
101 parallel Structure:	N
'102 Direction of Traffic:	2
'264 Road Inventory Mile Post:	001.12
'208 Inspection Area:	6 Initials: EFP
Engineer's Initials:	kww
Location ID No:	015-00343X-002.198

'104 Highway System:	0
'26 Functional Classification:	17
'204 Federal Route Type:	0 No: 00000
105 Federal Lands Highway:	0
'110 Truck Route:	0
2006 School Bus Route:	0
217 Benchmark Elevation:	0000.00
218 Datum:	0
'19 Bypass Length:	06
'20 Toll:	3
'21 Maintenance:	02
'22 Owner:	02
'31 Design Load:	6
37 Historical Significance:	5
208 Congressional District:	11
27 Year Constructed:	1985
106 Year Reconstructed:	0000
33 Bridge Medium:	0
34 Skew:	00
35 Structure Flared:	0
38 Navigation Control:	0
213 Special Steel Design:	0
267 Type of Paint:	0
'42 Type of Service On:	1
Type of Service Under:	5
214 Movable Bridge:	0
203 Type Bridge:	A
259 Pile Encasement	3
'43 Structure Type Main:	5 02
45 No.Spans Main:	004
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horiz	0 Vert: 0
111 pier Protection	0
107 Deck Structure Type:	1
108 Wearing Structure Type:	1
Membrane Type:	0
Deck Protection:	8

Signs & Attachments

225 Expansion Joint Type:	02
242 Deck Drains:	1
243 Parapet Location:	0
Height:	0
Width:	0
238 Curb Height:	0
Curb Material:	0
239 Handrail	9 9
'240 Medium Barrier Rail:	0
241 Bridge Median Height:	0
Bridge Median Width:	0
230 Guardrail Loc. Dir. Rear:	6
Fwd:	6
Oppo. Dir. Rear:	0
Oppo. Fwd:	0
244 Aproach Slab	3
224 Retaining Wall:	0
233Posted Speed Limit:	35
236 Warning Sign:	0.00
234 Delineator:	0.00
235 Hazzard Boards:	0
237 Utilities Gas:	22
Water:	31
Electric	00
Telephone:	00
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
'248 County Continuity No.:	00

P.I. Number: 0007494

Project Concept Report –
County: Bartow

Processed Date:6/21/2011

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:015-5061-0

Programming Data

201 Project No:	BR2LB-015 (2)
202 Place Available:	4
249 Prop Proj No:	000000000000000000000000
250 Approval Status:	0000
251 PI Number:	0000000
252 Contract Date:	02/01/1901
260 Seismic No:	00004
75 Type Work:	00 0
94 Bridge Imp. Cost:	$0
95 Roadway Imp. Cost:	0
96 Total Imp Cost:	0
76 Imp Length:	000000
97 Imp Year:	0000
114 Future ADT:	009180 Year:2027

Hydraulic Data

215 Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	01270
Area of Opening:	003781
113 Scour Critical	U
216 Water Depth:	5.3 Br.Height:24.7
222 Slope Protection:	1
221 Slope Protection	0 Fwd:0
219 Fender System	0
220 Dolphin:	0
223 Current Cover:	000
Type:	0
No. Barrels:	0
' Width:	0.00 Height:0.00
' Length:	0 Apron:0
265 U/W Insp. Area	1 Diver:RMO
Location ID No:	015-00343X-002.198

Measurements:

'29 ADT	006120 Year:2007
109 %Trucks:	0
' 28 Lanes On:	02 Under:00
210 No. Tracks On:	00 Under:00
' 48 Max. Span Length	0070
' 49 Structure Length:	280
51 Br. Rwdy. Width	28.00
52 Deck Width:	31.20
' 47 Tot. Horiz. Cl:	28
50 Curb / Sidewalk Width	0.00 / 0.00
32 Approach Rdwy. Width	020
'229 Shoulder Width:	
Rear Lt:	3.00 Type:4 Rt:6.00
Fwd. Lt:	6.00 Type:8 Rt:6.00
Permanent Width:	
Rear:	20.00 Type:4
	20.00 Type:2
Intersection Rear:	0 Fwd: 0
36 Safety Features Br. Rail:	1
Transition:	2
App. G. Rail:	1
App. Rail End:	1
53 Minimum Cl. Over:	99' 99 "
Under:	
'228 Minimum Vertical Cl	
Act. Odm Dir::	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	N 0 0
56 Lateral Undercl. Lt:	0.00
'10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main Deck Thick Approach:	7.80 0.00
246 Overlay Thickness	0.00
212 Year Last Painted:	Sup:0000 Sub:0000

65 Inventory Rating Method:	1
63 Operating Rating Method:	1
66 Inventory Type:	2 Rating: 31
64 Operating Type:	2 Rating: 31
231 Calculated Loads:	
H-Modified:	21 0
HS-Modified:	30 0
Type 3:	29 0
Type 3s2:	40 0
Timber:	36 0
Piggyback:	00 0
261 H Inventory Rating:	24
262 H Operating Rating	52
67 Structural Evaluation:	6
58 Deck Condition:	8
59 Superstructure Condition:	8
' 227 Collision Damage:	0
60A Substructure Condition:	6
60B Scour Condition:	6
60C Underwater Condition	6
71 Waterway Adequacy:	8
61 Channel Protection Cond.:	7
68 Deck Geometry:	4
69 UnderCir. Horz/Vert:	N
72 Appr. Alignment:	8
62 Culvert:	N

Posting Data

70 Bridge Posting Required	5
41 Struct Open, Posted, CL:	A
' 103 Temporary Structure:	0
232 Posted Loads	
H-Modified:	00
HS-Modified:	00
Type 3:	00
Type 3s2:	00
Timber:	00
Piggyback	00
253 Notification Date:	02/01/1901
258 Fed Notify Date:	2/1/1901 12:00:00AM

ATTACHMENT 8

PAVEMENT STUDIES

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE CSSTP-0007-00 (494) Bartow
PI No. 0007494

OFFICE Materials
Forest Park, GA.

DATE August 16, 2013

FROM Charles A. Hasty, P. E., State Materials Engineer

TO Genetha Rice-Singleton, State Program Delivery Engineer
Attn: Lenora Leigh, Project Manager

SUBJECT Review of Life Cycle Cost Analysis (LCCA) / Pavement Type Selection (PTS)
CR 343/Douthit Ferry Road From Old Alabama Road To SR 61/SR 113

As requested, we have reviewed the Life Cycle Cost Analysis (LCCA) / Pavement Type Selection (PTS) Report Summary submitted on July 25, 2013 by Southland Engineering, Inc. of Cartersville, Georgia. This submitted report is acceptable.

If additional information is needed, please contact James Turner of the Geotechnical Environmental Pavement Bureau at 404-608-4776.

CAH: JHT

Copy: Southland Engineering, Inc.
Cartersville, Georgia

Life Cycle Costs Analysis (LCCA) / Pavement Type Selection (PTS) Report Summary

PI No. 0007494
CSSTP-0007-00 (494)
Bartow County

1. *LOCATION / DESCRIPTION*

Project 0007494 is for the proposed Widening of CR 343 Douthit Ferry Road in Bartow County. The project is located within the following station limits:

Station / Mileposts	Location
Sta 99+00 to Sta 229+00 M.P. 0.00 to M.P. 2.46	CR 343 – 2.46 miles Project begins at the intersection of DFR with Old Alabama Road and ends at the intersection of DFR and SR 61/SR 113 in the City of Cartersville

Note: There is no Milepost located along CR 343 Douthit Ferry Road. M.P. is shown for information only.

2. *PAVEMENT DESIGNS CONSIDERED*

The LCCA analyzed the costs of the project by comparing two alternative pavement types. Alternative A uses HMA Full Depth. Alternative B uses PCC Full Depth.

3. *PAVEMENT TYPE RECOMMENDATION*

The PTS concludes that HMA Full Depth, considering the economics of construction costs, maintenance costs, pavement performance and other factors over the analysis period.

4. *TABLE 1 : PAVEMENT DESIGN ALTERNATIVES*

Design Alternates	Profile	Surface	Intermediate (Binder)	Base	Subbase
Alternate A, HMA	Mainline	12.5 mm Superpave (1.50")	19 mm Superpave (2.00")	25 mm Superpave (4.00")	Graded Aggregate Base (12.00")
Alternate B, PCC	Mainline	PCC (8.00")	---	---	Graded Aggregate Base (10.00")

Life Cycle Costs Analysis (LCCA) / Pavement Type Selection (PTS) Report Summary

5. *TABLE 2 : AGENCY COSTS*

Design Alternates	Agency Costs		Total Costs
	Initial Agency Costs (A)	Future Maintenance Costs (B)	(A)+ (B)
Alternative A, HMA	$3,603,325	$1,197,612	$4,800,936
Alternative B, PCC	$4,550,269	$966,849	$5,517,118

6. *TABLE 3 : USER COSTS*

Design Alternates	User Costs		Total Costs
	Initial User * Costs (A)	Future User Costs (B)	(A) + (B)
Alternate A, HMA	0.00	$38,244	$38,244
Alternate B, PCC	0.00	$19,102	$19,102

Life Cycle Costs Analysis (LCCA) / Pavement Type Selection (PTS) Report Summary

7. *TABLE 4 : RANKING AND SCORING – DECISION MATRIX*

Table 4 summarizes the Total Scores and Ranking from the Decision Matrix. The scores were determined from the LCCA using a 40-year Analysis Period.

Design Alternates	Rank	Total Score
Alternate A, HMA	1	88.2
Alternate B, PCC	2	86.0

8. *LCCA CRITERIA*

The LCCA is based on the following:

- Staging costs and durations for staging were not considered.
- Discount Rate of 3 %.
- The analysis periods were 40 years and 50 years. Recommendations were based on the 40-year analysis.
- The service life prior to first major maintenance activities were as follows:
- 10 years for Asphaltic Concrete Pavements (AC)
- 20 years for Portland Cement Concrete Pavements (PCC)
- Deterministic approach to LCCA is based on the guidelines in the following document:
- Federal Highway Administration Publication No. FHWA-SA-98-079, "Life-Cycle Cost Analysis in Pavement Design."
- Average Plant Production rates were determined from historical project information within the Georgia Department of Transportation. They are:
    - Asphalt Concrete plant production rate of 200 tons per hour.
    - Ready Mix Concrete plant production rate of 6000 square yards per day in addition to the following:
        - A 4000 linear feet of paving for a 12-foot wide lane
        - A 2500 linear feet of paving for a 24-foot wide lane

DECISION MATRIX

	DECISION FACTOR										Total Score	Rank
	Initial Construction Agency Costs	**Maintenance Costs** (nominal / discounted)	**Annualized Agency Costs** (LCC)	**Annualized User Costs** (LCC)	**Salvage Value**	**Expected Life** (Rehabilitation Frequency)	**Construction** (production rate - initial days)	**Ease of Repairing / Maintaining** (production rate - rehab days)	**Constructibilit y / Traffic Control** (Lifts)	**Proven Design in Agency**		
Relative Importance	50%	25%	5%	5%	2%	2%	2%	2%	2%	5%		
ALTERNATIVE A-HMA Full Depth Mainline	1.00 50.0	0.81 20.2	1.00 5.0	0.50 2.5	0.00 0.0	0.50 1.0	1.00 2.0	0.50 1.0	0.75 1.5	1.00 5.0	88.2	1
ALTERNATIVE B-PCC Full Depth Mainline	0.79 39.6	1.00 25.0	0.87 4.4	1.00 5.0	0.00 0.0	1.00 2.0	0.52 1.0	1.00 2.0	1.00 2.0	1.00 5.0	86.0	2

DECISION MATRIX

	Initial Construction	Maintenance Costs (nominal / discounted)	Annualized Agency Costs (Life Cycle Costs)	Annualized User Costs (Life Cycle Costs)	Salvage Value	Expected Life (Rehabilitation Frequency)	Construction (production rate - initial days)	Ease of Repairing / Maintaining (production rate - rehab days)	Construction / Traffic Control (Lifts)	Proven Design in Agency
ALTERNATIVE A Asphalt Full Depth	$1,452,953	$482,908	$83,750	$667	$0	10	11	6	8.0	1.0
ALTERNATIVE B Concrete Full Depth	$1,834,786	$389,858	$96,243	$333	$0	20	21	3	6.0	1.0
										1.0
										1.0
										1.0
										1.0
										1.0
										1.0
										1.0
										1.0
Minimum	$1,452,953.49	$389,858.41	$83,749.97	$333.23	$0.00	10.00	11.00	3.00	6.00	1.00
Maximum	$1,834,785.95	$482,907.91	$96,243.41	$667.14	$0.00	20.00	21.00	6.00	8.00	1.00

FLEXIBLE PAVEMENT DESIGN ANALYSIS

Project: CSSTP-0007-00(494) **County:** Bartow
P.I. no.: 0007494
Description: CR 343/Douthit Ferry Road fm Old Alabama Road to SR 61/ SR 113

Traffic Data (NOTE: AADTs are one-way)
24-hour Truck Percentage: 4.00%
AADT initial year of design period: 6,325 vpd (2018)
AADT final year of design period: 13,025 vpd (2038)
Mean AADT (one-way): 9,675 vpd

Design Loading

Mean AADT		LDF		Trucks		18-K ESAL		Total Daily Loads
9,675	*	0.82	*	0.040	*	0.73	=	233

Total predicted design period loading = 233 * 20 * 365 = 1,700,900

Design Data
Terminal Serviceability Index: 2.50
Soil Support: 2.50
Regional Factor: 2.00

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
12.5 mm Superpave	1.50	(38)	0.44	0.66
19 mm Superpave	2.00	(51)	0.44	0.88
25 mm Superpave	1.00	(25)	0.44	0.44
	3.00	(76)	0.30	0.90
Graded Aggregate Base	12.00	(305)	0.16	1.92

Required SN = 5.05 Proposed SN = 4.80

>>> Proposed pavement is 5.0% Underdesign <<<

Remarks:

Prepared by David Moore, Southland Engineers December 20, 2011
Date

Recommended _____
State Consultant Design Engineer Date

Approved _____
State Pavement Engineer Date

Rigid Pavement Design Analysis
Based on AASHO Interim Guide for Design of Pavement Structures

P.I. No.	0007494	Project No.	CSSTP-0007-00(494)	County	Bartow
Description	Douthit Ferry Road from Old Alabama to SR 61/SR 113	Location	Douthit Ferry Road	Type Section	JPCP
Begin Project	0	End Project	0	Project Length	2.4± miles

Traffic Data

Begin Design Year	2018	Begin one way AADT, VPD	6325
End Design Year	2038	Ending one way AADT, VPD	13025
Total Truck %	4	Mean one way AADT, VPD	9675

Design Loading

Mean one way AADT		LDF		Volume, %			ESAL Factor	
9675	*	90	*	96	Vehicles	*	0.004	34
9675	*	90	*	3	SU	*	0.500	131
9675	*	90	*	1	MU	*	2.680	234
				Total Daily ESAL's				399
Total Design Period ESALs			=	2,912,700				

Design Data

Terminal Serviceability, (Pt)	2.5	Working Stress	450 psi	Soil Support Value	2.5
Subgrade Modulus, k	130	Subbase Modulus, k_1	195	Subbase Modulus, k_2	195
Trial Depth of PCC Pavement, inches	8.00	Calculated Stress from Equation, psi			473.3
% Overstressed	5.2	% Underdesigned	4.9	Balanced Thickness	8.3

Recommended Rigid Pavement Structure

8 inches Plain Portland Cement with 1.25 inch diameter dowel bars
0 inches of 19 mm Superpave Asphaltic Concrete Interlayer
10 inches Graded Aggregate Base

Prepared By Eugene Utsalo Date 12/20/2011

Recommended By _____ Date _____
Office Head / District Engineer

Approved By _____ Date _____
State Pavement Engineer

ATTACHMENT 9

UTILITY RISK MANAGEMENT PLAN

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

DATE 12-19-11

FROM District Utilities Engineer

TO State Utilities Engineer

SUBJECT Utility Risk Management Plan

Project Number CSSTP-0007-00 (494) PI Number 0007494

County BARTOW

☒ Recommendation from Concept Team Meeting

☐ Recommendation from Preliminary Field Plan Review Team Meeting

☐ Recommendation from the Final Field Plan Review Meeting
(Check the Recommendation that Applies)

From the above noted Team Meeting, the Subject Matter Experts have utilized the Public Interest Determination Policy on the referenced project and recommend the following Utility Risk Management Plan:
(Check the Recommendation that Applies)

☐ Through risk identification, analysis, and assessment, the Team has established that there is a high risk assessment associated with the project and 3rd Party involvement and recommends that, in the best interest of the public and in order to expedite the staging of the project, the Department participate in the costs associated with the relocation, removal, and adjustment of the utility facilities and to include the work in the construction project. The Team's recommended Utility Risk Management Plan is Risk Avoidance. **Therefore, please review and forward this request as a Public Interest Determination Recommendation to the Office of the Chief Engineer for its review and action.**

☐ Through risk identification, analysis, and assessment, the Team has established that there is a moderate risk assessment associated with the project and 3rd Party involvement and recommends that, in the best interest of the public and in order to expedite the staging of the project, the Department consider participating in the costs associated with the relocation, removal, and adjustment of the utility facilities and to consider including the work in the construction project. This recommendation may also include considerations for addressing certain utility facilities on the project that may present higher risks than other utility facilities. The Teams recommended Utility Risk Management Plan is Risk Avoidance. **Therefore, please review and forward this request as a Public Interest Determination Recommendation to the Office of the Chief Engineer for its review and action.**

☐ Through risk identification, analysis, and assessment, the Team has established that there is a moderate risk assessment associated with the project and 3rd Party involvement, and recommends that the Department accept the identified risks and not participate in the costs associated with the relocation, removal, and adjustment of the utility facilities and not include the work in the construction project. The Teams recommended Utility Risk Management Plan is Risk Acceptance.

☒ Through risk identification, analysis, and assessment, the Team has established that there is a low risk assessment associated with the project and 3rd Party involvement, and recommends that the Department accept the identified risks and not participate in the cost associated with the relocation, removal, and adjustment of the utility facilities and not to include the work in the construction project. The Team's recommended Utility Risk Management Plan is Risk Acceptance.

Attachment - Utility Risk Management Plan

SOUTHLAND ENGINEERING
CIVIL ENGINEERS - LAND SURVEYORS - LAND PLANNERS

Public Interest Determination Meeting

December 15, 2011

Project Number
CSSTP-0007-00 (494) Bartow County
GDOT P.I. No. 0007494

Douthit Ferry Road Widening from Old Alabama Road to SR 61/SR 113

Prepared for the City of Cartersville

Project Team Subject Matter Experts

Name/Title	Office/Company	E-Mail Address
MIKE GARRETT	AT&T	mike.garrett2@att.com
LEONORA LEIGH	GDOT - Program Delivery	lleigh@dot.ga.gov
[illegible]	Cartersville Gas	gthacker@[illegible]

Project Team Subject Matter Experts

Name/Title	Office/Company	E-Mail Address
David Moore	South Land Engineers	Dmoore@southlandengineers.com
James Steinbrenner	Southland Engineering	jsteinbrenner@southlandengineers.com
Karl Lutjens	Southland Engineering	Karl@southlandengineers.com
Tommy Sanders	City of Cartersville	TSANDERS@CITYOFCARTERSVILLE.ORG
[illegible]	[illegible]	[illegible]
Roger O. Ellis	Bartow County Water	ellisr@bartowga.org
Derek Hampton	Cartersville Electric	dhampton@cityofcartersville.org
Rick Ross	"	rross@cityofcartersville.org
Jerry Towe	City of Cartersville Water Dept	JTOWE@CITYOFCARTERSVILLE.ORG
Jon Jeffries	Georgia Power Co.	JDJeffri@southernco.com
Steve Gafford	GDOT Utilities	sgafford@dot.ga.gov
Kerry Bonner	Dist Utilities	kbonner@dot.ga.gov
Stanley McCarley	Dist. Utilities	smccarley@dot.ga.gov
Brian Friery	Cartersville Gas	BFRIERY@CITYOFCARTERSVILLE.ORG

631260DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: CSSTP-0007-00(494); Bartow County
Douthit Ferry Rd. from Old Alabama to SR 61/113
P.I. No. 0007494

OFFICE: Cartersville

FROM: Kerry D. Bonner, District Utilities Engineer

DATE: September 28, 2011

TO: Bobby Hilliard, P.E., Office of Program Delivery
ATTN: Leonora Leigh

SUBJECT: PRELIMINARY UTILITY COST ESTIMATE

We are furnishing you with a Preliminary Utility Cost estimate for each utility with facilities potentially located within the project limits.

FACILITY OWNER	NON REIMBURSABLE	REIMBURSABLE*
AT&T – Georgia	$ 150,000.00	
City of Cartersville – Gas	$ 670,000.00	
City of Cartersville – Water	$ 630,000.00	
City of Cartersville – Electric	$ 99,556.00	
Georgia Power Co. – Dist		$ 781,000.00
Comcast	$ 30,000.00	
Bartow County Water & Sewer	$ 100,000.00	
Totals	$1,679,556.00	$ 781,000.00

Total cost for the above project is $ 2,460,556.00.

*The reimbursable cost for this project will be the responsibility of the City of Cartersville.

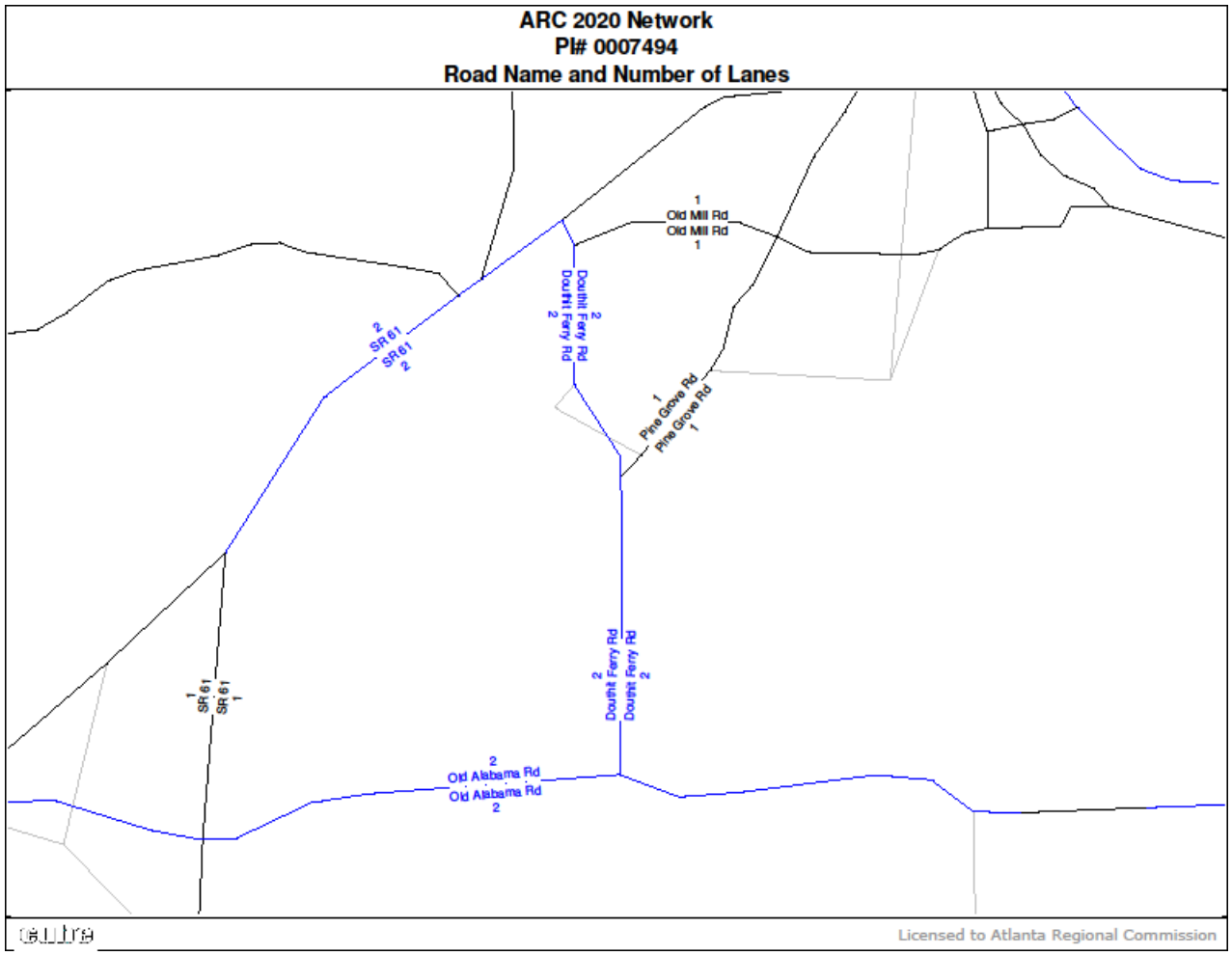
If you have any questions, please contact Jennifer Deems at 770-387-3616.

KDB/jd

C: Jeff Baker, P. E., State Utilities Engineer;
File/Estimating Book

ATTACHMENT 10

CONFORMING PLANS NETWORK SCHEMATICS SHOWN THROUGH LANES



ATTACHMENT 11

MINUTES OF CONCEPT MEETINGS

pharrengineering

INITIAL CONCEPT TEAM MEETING MINUTES
Project No. STP-0007-00(494), Bartow County, P.I. 0007494
Douthit Ferry Road from S.R. 113 (Old Alabama Road) to S.R. 61 (West Avenue)

Date: October 22, 2008
Time: 10:00 AM
Location: GDOT District 6 Conference Room

ATTENDEES:

Name	Office	E-MAIL
David Moore	GDOT District 6	dmoore@dot.ga.gov
Cherie Marsh	GDOT District 6	cmarsh@dot.ga.gov
Lisa Wesley	GDOT District 6 Area Construction	lwesley@dot.ga.gov
Galen Barrow	GDOT District 6 Environment/Location	gbarrow@dot.ga.gov
Andrew Heath	GDOT Office of Planning	aheath@dot.ga.gov
Nabil Raad	GDOT Traffic Operations	nraad@dot.ga.gov
Stanley McCarley	GDOT Traffic Operations	smccarley@dot.ga.gov
Jennifer Deems	GDOT Utilities	jdeems@dot.ga.gov
Katy Allen	FHWA	katy.allen@fhwa.dot.gov
Jerry Milam	City of Cartersville	jmilam@cityofcartersville.org
Bobby Elliott	City of Cartersville Public Works	belliott@cityofcartersville.org
Thomas W. Sanders Jr.	City of Cartersville Public Works	tsanders@cityofcartersville.org
David Myers	City of Cartersville Electric	dmyers@cityofcartersville.org
Brian Friery	City of Cartersville Gas System	bfriery@cityofcartersville.org
Greg Anderson	City of Cartersville Parks & Recreation	ganderson@cityofcartersville.org
Ed Mullinax	City of Cartersville Water Department	emullinax@cityofcartersville.org
Louis Tonsmeire	City Council Cartersville	letons@comcast.net
David Bacon	Pharr Engineering	dbacon@pharrengineering.com
Michael F. Williamson	Pharr Engineering	mwilliamson@pharrengineering.com
Jacqueline Phang	Pharr Engineering	jphang@pharrengineering.com
Kian Kuet Chai	Pharr Engineering	kchai@pharrengineering.com
Susan Thomas	Edwards-Pitman Environmental	sthomas@edwards-pitman.com
Harris Robinson	Robinson Transportation Consultants	robinsontransportation@comcast.net
Jimmy Amos	AT&T	james.amos@att.com
Jon Jeffries	Georgia Power Company	jdjeffri@southernco.com

A meeting was held in the GDOT District 6 Conference Room at 10:00 AM. Its purpose was to review and discuss the concept development of the referenced project.

Mr. David Moore of GDOT District 6 opened this meeting. Two sign-in sheets were passed out, and everyone present was asked to introduce themselves. He then introduced Mr. David Bacon, the Design Project Manager of this project.

Initial Concept Meeting Minutes
Project No. STP-0007-00(494), Bartow County, P.I. 0007494
Douthit Ferry Road from S.R. 113 (Old Alabama Road) to S.R. 61 (West Avenue)
October 22, 2008
Page 2

Mr. Bacon began by distributing the meeting agenda and the draft concept report. He explained that this project is a Project Frame Agreement (PFA) between GDOT and the City of Cartersville. He also said that the city is responsible for the engineering, right-of-way, and utilities relocations. He further reviewed the items from the GDOT Plan Presentation Process (PDP) manual that were to be discussed on this meeting.

Mr. Moore asked whether the Need and Purpose had been submitted to Mr. Andrew Heath of the GDOT Office of Planning for review and approval. Mr. Bacon said that it will be submitted.

Mr. Robinson of Robinson Transportation Consultants presented an overview of the traffic study. He indicated that with the "No Build Alternative," the existing two-lane Douthit Ferry Road will operate at Level of Service (LOS) F.

Ms. Allen of the FHWA asked about the logical termini for this project. She commented that the logical termini cannot impact another roadway corridor. She requested that the determination of logical termini be included in the report. Mr. Bacon said that the county has a plan to widen Burnt Hickory Road to four lanes in the near future.

Mr. Moore stated that a design exception is required if the proposed design speed of 35 mph does not meet the 85th percentile. Mr. Bacon said that it was necessary to utilize a design speed of 35 mph at the beginning and end of the project due to horizontal and vertical restrictions. The remaining portion of the road is designed to meet 45 mph; however, it was felt that the conditions at both ends controlled. This issue will be reviewed in more detail.

Mr. Bacon asked whether there is any district information on public contacts and concerns to date. Ms. Marsh of GDOT District 6 said that there is none.

Ms. Thomas of Edwards-Pitman Environmental indicated that there will be one or possibly two Public Information meetings and one Public Hearing.

Mr. Myers of the City of Cartersville Electric indicated that the majority of the existing electric lines are not in conflict. He said that the lines were located on the southwestern and northeastern corridors of Douthit Ferry Road and Indian Mound Road.

Mr. Amos of AT&T said that their lines are attached to Cartersville Electric poles.

Mr. Friery of the City of Cartersville Gas System indicated that there are existing high pressure gas lines along Douthit Ferry Road from Old Mill Road to Old Alabama Road. He also said that there are gas lines attached to the existing bridge which currently serves Carter Grove development. Mr. Bacon said that the concept report proposes keeping the existing bridge with the addition of a new bridge parallel to the existing one.

Mr. Moore stated that the existing bridge will need to be upgraded to current standards or else a design exception must be requested. Mr. Bacon said he will coordinate with the bridge engineer to determine whether to make improvements or to ask for an exception.

Mr. Mullinax of the City of Cartersville Water Department mentioned that there is a force main within the limits of this project. It is owned by the Bartow County Water Department. Mr. Milam of the City of Cartersville stated that Carter Grove development is aware of this project and that the force main will be relocated.

Mr. Moore noted that providing adequate room for utilities is sometimes an issue when there is a retaining wall. He commented that the cost of the retaining wall needs to be weighed against the cost of acquiring a residence. He also stated that the city must have all the utilities estimates submitted with the concept report.

Mr. Bacon mentioned that there is a CSX railroad track north of this project. Mr. Moore stated that railroad coordination with the downtown DOT is required to make sure there are no conflicts.

Mr. Moore questioned the estimated construction let date and the right-of-way acquisition time frame. Ms. Phang of Pharr Engineering said that the let date is set for January 2013 and that the right-of-way acquisition is going to take nine months. Mr. Moore stated that a minimum of 18 months may be needed for right-of-way acquisitions.

Mr. Moore stated that sidewalks are required on both sides of the shoulder with proposed curb and gutter along this project.

Ms. Thomas indicated that the truss bridge may be historic and that a Section 106 process may be required. A Section 404 permit may also be required. Coordination with the US Fish and Wildlife Service, the EPD, and a Native American tribe will be part of this process. She estimated that it could take up to 24 months or longer if a Section 4(f) is necessary.

Mr. Moore stated that the maximum superelevation on a four-lane divided roadway is 4%. He further stated that a VE study is required for projects with costs of over $10,000,000 and that it has to be done before concept approval. He estimated that the city will have to pay $35,000 to $40,000 for the study.

Mr. Sanders of the City of Cartersville Public Works Department mentioned the city ordinance requiring 5' sidewalks and bike lane requirements. He is concerned that the 35 mph speed limit is too low and that the road may be viewed as a speed trap. He also asked about the warrants for the traffic signals and whether there is an alternate plan if the signal is not approved at the intersection of Walnut Grove Road and Pine Grove Road. Mr. Bacon said that lanes can be striped out to a single lane stop condition if the signal is not warranted.

Mr. Moore reminded everyone present to sign-in and then adjourned the meeting.

Initial Concept Meeting Minutes
Project No. STP-0007-00(494), Bartow County, P.I. 0007494
Douthit Ferry Road from S.R. 113 (Old Alabama Road) to S.R. 61 (West Avenue)
October 22, 2008
Page 4

The above is taken from the notes and memory of the writer. Any discrepancies or additions should be brought to the writer attention as soon as possible.

Submitted,

Jacqueline Phang, P.E.

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MEETING MINUTES

Date:	Friday, June 8, 2012
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Date:	Wednesday, June 6, 2012 – 10 am
Meeting Location:	GDOT District Six Large Conference Room
RE:	Concept Team Meeting
Copy to:	Attendees, File
Attendees:	David Moore – Southland Engineering Karl Lutjens – Southland Engineering Janis Steinbrenner – Southland Engineering Larry Bowman – GDOT/OES Nathan Soldat – ARC Scott Naugher – Georgia Power Tom Lewis – Edwards Pitman Environmental Drew Pitman – Edwards Pitman Environmental Stanley McCarley – GDOT District 6 Utilities Jennifer Deems – GDOT District 6 Utilities Pam Digsby – GDOT – R/W Danny Roberson – GDOT – District 6 Design Derek W. Lindsay – GDOT – Engineering Services Brian Friery – Cartersville Gas Dan Porta – City of Cartersville Tommy Sanders – City of Cartersville Lisa Wesley – GDOT Sheila Martin – GDOT R/W Michael Long – GDOT Traf/Ops Derek Hampton – Cartersville Electric System Mike Garrett – AT&T Edmund Mullinax – Cartersville Water Department Kyle Mote – GDOT Planning Katrina Lawrence – GDOT Planning Harris Robinson – Robinson Transportation Consultants, LLC Leonora Leigh – GDOT Project Manager

Welcome and Introductions

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MEETING MINUTES

Concept Team Meeting follows the order of the Concept Report

- The project is widening Douthit Ferry Road from a 2-lane to a 4-lane road with a 20' raised, grassed median and a 14' flush median between Old Mill Road and SR 61/SR 113.
- Project Location Map shows the begin and end of the project
- The Project Justification Statement can be found in Attachment 4. Kyle Mote has reviewed this and approved it to date.
- The project limits are from Old Alabama Road to SR 61/SR113. AADT for the 2038 Build Condition was used to determine the project limits and logical termini.
    - 80% of the southbound traffic on Douthit Ferry Road turns eastbound or westbound onto Old Alabama Road. South of Old Alabama Road, Douthit Ferry Road becomes a residential collector for a mixed-use development.
    - At the north end, the northbound traffic reduces by 24% north of Old Mill Road. 60% of the remaining northbound traffic continues north across SR 61/SR 113 to Burnt Hickory Road.
- Federal Oversight – selected Other because the project is required to have the ARC Conformity Model completed.
- The project is located in Georgia Congressional District 11
- There are 2 bike routes on the project, Trails 125 and 145. On-street bike lanes run the full length of the project.
- Context Sensitive Solutions
    - Coordination with the Eastern Band American Indian Tribe near the Etowah River Bridge
        - Minimize impacts to the bridge
        - Fill over the archeological site
        - City of Cartersville will purchase R/W to include entire site to control access and any future development
        - No clearing and grubbing at the site
    - Recreation Facility at Sam Smith Park
        - Design has coordinated with the City to place driveways and access breaks as needed.
    - Roundabout will be designed for the intersection of Douthit Ferry Road and Pine Grove Road/Walnut Grove Road.
        - Roundabout design has been shown to the City
        - Roundabout presented to the school system
        - Cartersville Middle School driveway for buses was redesigned to reduce impacts to the roundabout
        - Public Meeting was held for parents at the middle school to show the plan for the roundabout and the simulation video.
- Review the Concept Display – Janis Steinbrenner reviewed the logical termini, typical sections, intersection improvements, concrete paving and asphalt overlay sections
- Medians – determined it was cheaper to build a 20' raised, grassed median than a 14' flush median with R/W for a future 20' median
- Shoulders – 12' shoulders in the raised median section, 10' shoulders in the 5 lane section.

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MEETING MINUTES

- Access control is by permit per the Design Manual
- R/W – using 7-10' behind limits for Cut and 10-15' behind limits for Fill. Southland will smooth out the R/W to keep it more consistent throughout the project.
- WB-67 is the design vehicle for the project.
- No changes will be made to Old Alabama Road
- SR 113 is new construction so the project will tie into the existing road.
- Southbound right turn lane at Old Mill Road is omitted. The turn lane would require purchasing a building. No design exception or variance is necessary.
- Park Court/Riverside Court
  - Existing Park Court intersection is too close to the Old Alabama Road intersection
  - Tie Park Court into Riverside Court and create one access point on Douthit Ferry Road.
- Basic side road information – 12' lanes with curb and gutter. Turn lanes as needed.
- One bridge on the project over the Etowah River. Bridge Condition Survey stated that the existing bridge could be widened.
- Utilities
  - Plan for the bridge – What side will be widened? There is a high pressure gas line on the existing bridge that must remain open. The bridge will be widened on both sides.
  - Will there need to be a separate Utility Phase? The utility estimate has already been approved.
  - A utility phase needs to be added to the project to get it included in the STIP.
- Public Interest Determination (PID)
  - Required for this project
  - Held a separate meeting in December 2011
  - The District will provide Southland the completed form to add to the Concept Report
  - The project will follow RISK ACCEPTANCE
- There is a railroad line north of SR 113. If anything is changed to the SR 113 signal, Southland will coordinate with the railroad
- Virginia Leming did the R/W estimate. There are 54 parcels with 8 residential displacements. The estimate is in the report and will be updated. L&D will be required.
- Do not anticipate off-site detours. We will not delay traffic more than 30 minutes, no traffic management plan needed. Traffic will remain open at all times.
- Design variance will be needed for a one-way median break north of the Pine Grove Road/Walnut Grove Road intersection. If any more design variances are needed, Southland will submit them.
- Environmental
  - The environmental document will be an EA/FONSI.
  - Will need to have both a PIOH and PHOH
  - Letter of Determination and CO model for Old Alabama Road intersection
  - Anticipate 404 Permit, Buffer Variance for Open Water 3, and potential USFWS coordination for informal Section 7
  - No PAR is required
  - Section 4(f) resource – Sam Smith Park

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MEETING MINUTES

  - Ecology assessment underway now – possible Etowah and Cherokee Darters. Survey has been submitted to DOT
  - Historic truss bridge east of existing Douthit Ferry Road bridge
  - Existing noise model has been done. Mitigation may be required but the build year has not been done.
  - AOE will be driven by archeology
  - Archeology
    - Phase 1 survey is completed
    - 2 sites – north bank of the Etowah River, Indian Mound and associated sites
    - Prepared testing plan and submitted to tribes March 2012
    - Recommend that site is preserved in place
  - No widening to the west to avoid Sam Smith Park (4(f) resource)
- Planning Level Assessment – Roundabout checklist is not needed until PFPR. Peer review is 90% complete by Howard McCulloch. He has approved the design
- Construction
  - Get roundabout constructed when school is not in session with 108 and Special Provision
  - Recommend restrictive hours of 7-8:30am and 3-5pm Mon-Fri for the school. School begins at 7:55am and ends at 3:15pm
  - Prohibit clearing and grubbing at the archeological site
  - No early completion incentive
  - City of Cartersville is providing all funding except for construction. Construction will use State and Federal funds.
  - This project is included in the T-SPLOST if it passes.
- Other projects in the area
  - Old Alabama Road, Phase 3. Project number STP00-2946-00(001), P.I. 621410. The project is currently in the R/W phase
  - The City has been awarded a TE Grant that will be near the end of the project on Douthit Ferry Road.
- Held several meetings regarding the roundabout – city officials, school officials and parents. At the meeting for the parents, we had the VISIM simulation and displays. There was not a large turnout.
- R/W and Utility cost estimates have been approved. The construction cost estimate has not yet been approved. Once approved and all cost estimates have been updated, submit to Planning so the STIP can be updated.
- Project Alternatives
  - 20' raised, grass median
  - No build
  - 20' raised concrete median
  - 14' flush median with R/W for future 20' median
- BC is 12.77
- The Traffic Study was completed by Harris Robinson. The traffic numbers have been approved.
- First page of the LCCA shows that using PCC paving will be cheaper for this project.
- All meeting minutes have been included in the report.
- The Project Framework Agreement is included in the report

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MEETING MINUTES

- We have been given permission by the Office of Design Policy and Support to hold the Concept Team Meeting. The project needs to be modeled as part of ARC's Conformity Model. That will be completed at the end of 2012. The Concept Report will not be submitted until the conformity model is done. We will proceed from this meeting to the VE Study.
- Project Schedule
  - PFPR – Dec. 2013
  - R/W – May 2014
  - Let – Aug 2016
- SUE is not required per GDOT
- Airport Impacts – the project is 1.6 miles from the airport. Douthit Ferry Road runs parallel to the runway. No issues as of now.
- City Electric asked what will happen to the houses at Old Alabama Road. Will the properties be landscaped and interfere with the power lines? The City will buy the parcels and coordinate with utilities.
- What will be in the middle of the roundabout? Landscaping but nothing too high to obstruct sight distance. Nothing will be on the splitter islands
- Construction – will be DOT letting and contractor. Everything up to that point will be handled by the City.
- Utilities were surveyed.
- Cartersville Gas asked if there will be a separate inclusion of gas and water in the contract. With Risk Acceptance, they will not be specified in the contract.
- There is a 4" HP gas main north of Pine Grove/Walnut Grove that will need to be relocated. There is an 8" HP gas main south of Pine Grove/Walnut Grove. That line will need to remain open at all times. Gas will need to coordinate the relocations. DOT will look into adding gas and water into the contract since the project is City owned and these are City utilities.
- No utilities in the archeological site.
- Bartow County has a sewer main on the east side of the road and a pump station. Will they need to be relocated? The main can be moved under the shoulder.
- Through Risk Acceptance, GDOT Utilities will make sure that coordination is done during construction. It is accounted for in UAS.
- It is suggested that the City utilities meet internally and discuss options for construction.

Adjourn

ATTACHMENT 12

MINUTES OF METINGS IN SUPPORT OR OBJECTION TO THE CONCEPT

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MEETING MINUTES

Date:	Wednesday, November 10, 2010
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Number:	1
Meeting Date:	Tuesday, November 9, 2010
Meeting Location:	GDOT District 6 Office, Cartersville
RE:	Current Project Status
Copy to:	File
Attendees:	Karl Lutjens – Southland Engineering Janis Steinbrenner – Southland Engineering David Moore – Southland Engineering (Retired GDOT) David Ray - GDOT

- Project oversight will be required by the City of Cartersville. Project is Long Range.
- City need to get certified as Project Manager.
- CES Access needs to be set up by GDOT. Janis Steinbrenner will be main point of access for Southland Engineering. GDOT will begin process of getting CES Access.
- Updates needed to budget and traffic. Traffic needs to use Build Year and at least 20 years after build year.
- New version of LAP Manual requires oversight money be provided to GDOT by the City of Cartersville.
- Need to update the project schedule. Requires a Project Change Request Form (PCRF)
- David Ray stated than another Initial Concept Team Meeting will not be necessary.
    - David Ray will email copies of the Benefit/Cost (B/C) Forms to Janis Steinbrenner.
- Order to proceed with project
    - City needs certification
    - Update project schedule
    - Prepare updated cost estimate

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MEETING MINUTES

Date:	Monday, December 6, 2010
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Number:	1
Meeting Date:	Friday, December 3, 2010, 2 pm
Meeting Location:	Edwards-Pitman Office, Smyrna
RE:	Current Project Status – Environmental
Copy to:	File
Attendees:	Karl Lutjens – Southland Engineering Janis Steinbrenner – Southland Engineering David Moore – Southland Engineering (Retired GDOT) Susan Thomas – Edwards-Pitman Garrett Silliman – Edwards-Pitman

- Project will follow new LAP Manual – new section 2.6 deals with funding.
- Old Alabama Road – R/W is funded, has set construction year. Logical Termini is good on this end of the project
- Walls – Pharr concept reports walls are needed at the intersection of Old Alabama on both the east & west sides.
- Three sites have been identified on the east side, north of the Etowah River to Indian Mounds Road. Two sites were identified south the River but Edwards-Pitman did not find them in their survey.
- Etowah River – is an ESA, construct northbound lanes on new bridge with no impact to the River (clear span)
- Logical Termini on north end – Old Mill now terminates @ SR 61. LT is based 100% on traffic. The project can't force a worse situation to the north. Will need to look at LOS outside of termini. Douthit Ferry will operate as a city bypass. If this project is not constructed, city traffic will get worse requiring the improvement.
- Discussed adverse impacts – these may be any construction activities.
- Edwards-Pitman will transition to Phase 2 of their investigation to study the west side of the project.
- Nothing physical (arch.) is on the surface
- Can reduce impacts by reducing the median, even making it flush with the travel lanes instead of raised, reduce sidewalk width
- Will try to use existing trail on west side of Douthit Ferry Road instead of adding sidewalks through that section. Park is a 4(f) and may require additional oversight. Using this trail would require a ped. Bridge to get pedestrians over the river.
- Keeping the existing road for the northbound lanes and shifting the southbound lanes to the west would displace homes between the River and Old Alabama Road but may avoid the ESA's on the east side of Douthit Ferry Road.
- Need to check with Andy Pitman to see if contract has been signed.
- David Ray is the Project Manager out of GDOT District 6 and the project is in Long Range.

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MEETING MINUTES

- FHWA will not sign documents not in the current TIP/STIP
- David Moore thinks the project status will change to "prepare for shelf"
- Construction funds are State/Federal and all other funding is from the City of Cartersville
- There will be coordination with GDOT and Office of Engineering Services (OES)
- FHWA reviewer may change from Katy Allen
- Bring project to FHWA monthly meeting in February (they meet on the 1st Thursday of the month) to make them aware of the project and that it is ESA in a Historic District. FHWA will want to see the layout, traffic, logical termini, environmental survey to date, and how we are avoiding or minimizing impacts. They will be most concerned with environmental issues.
- Garrett Silliman will send PDF of Geophysical Reports – or due to file size just sheets with color photos
- Southland needs an updated schedule from Edwards-Pitman
- Terri Malone will be the new NEPA Specialist on this project.
- FAA Coordination will be needed due to the project being located within 2 miles of the Cartersville Airport. There should be no conflict and only required to fill out a 7464 form for offsite construction. Karl Lutjens can help with the FAA.
- FHWA will require updated traffic numbers
- Janis Steinbrenner will email the updated design schedule to Susan Thomas.
- Terri Malone will contact Janis Steinbrenner to touch base on the project.
- Edwards-Pitman will request a meeting with OES, get a NEPA Planner, get on the FHWA schedule.

Meeting Minutes

Phase II Archaeological Testing, Douthit Ferry Road Improvements, Bartow County, Georgia (P.I. No. 0007494)

Date: December 13, 2010

Location: Georgia Department of Transportation, Office of Environmental Services (OES)

Attendees: James Pomfret, OES; Garrett Silliman, Edwards-Pitman Environmental, Inc. (EPEI)

Representatives from OES and EPEI met to discuss the scoping and direction for the investigation of two sites located within the proposed area of potential effect (APE) of the currently designed Douthit Ferry road improvements/bridge replacement. Phase I survey of the area indicated that two sites warranted additional testing to help clarify their eligibility for inclusion to the National Register of Historic Places (NRHP). During the Phase I investigations, geophysical survey identified subsurface anomalies that are potentially associated with the prehistoric occupation of the area as identified by previous work conducted by Robert Wauchope and Chad Braley. Specifically, GPR images comparing favorably to the prehistoric mound investigated by both Wauchope and Braley at 9BR7 as well as gradiometer images of what may be prehistoric structures located at 9BR821 were identified.

It was suggested during the meeting that the focus of testing should be on determining the origins of these anomalies as well as one angular anomaly identified during the GPR investigations of 9BR821. It was agreed that this would be the most effective use of investigations at this stage as no particularly distinct artifact concentrations were noted during the survey. This would also potentially help understand site chronology as well as integrity.

In general, the level of field effort described in the testing proposal submitted by EPEI to Pharr Engineering should be adequate to test the two sites; however, additional considerations were raised by OES. One consideration is that the plan only accounts for one deep testing trench to be investigated by the geomorphologist; OES would like to account for up to three to be investigated in the project area. Additionally, based on previous deep testing at Hardin Bridge Road, unidentified material may be encountered, which would require investigation. If encountered during deep testing, these are not materials that would have been detectable during the phase I survey. OES suggested that an additional test unit be accounted for to accommodate potential discoveries.

EPEI indicated that rates of personnel and services have/may have changed since the submittal of the June 2009 testing plan. Also, EPEI has recently revamped its QA/QC review process (in consultation with OES) to ensure more effective report completion and review. This redesigned process was not accounted for in the original testing plan.

OES raised the question whether any additional ROW or easement may be necessary at this stage of the project. EPEI stated that a recent meeting with Southland indicated that no changes were anticipated. OES would like to have what is considered to be the worst case scenario (greatest amount of footprint) prior to continuing with Native American consultation. It was agreed that as specific information as possible should be provided to the tribal parties concerning where test units and other investigations will be conducted. These locations are contingent on the final project footprint. At present two units will investigate anomalies identified in the 9BR821 site area and two in the 9BR7 site area. This presumes that no construction (including easements, etc) would be needed on the west side of Douthit Ferry Road in the 9BR636 site area, which needs to be confirmed.

A right-of-entry letter will also need to be drafted for the landowner(s) that outlines the testing plan and that all materials recovered from investigations associated with the project become the property of GDOT. Further, due to the nature of 9BR7, OES mentioned that additional time may be needed for EPEI to conduct/be available for tribal consultation.

Action items:

1. Determine “worst case” footprint that would be needed to construct the project (Southland to complete by January 14, 2011?)
2. Reconfigure plan and budget to accommodate changes in project or assumptions since the June 2009 plan (EPEI)

3. Draft right-of-entry agreement for landowner (OES)
4. Initiate next phase of tribal consultation based on items 1 and 2 (OES)

Garrett W. Silliman, Principal Investigator/Archaeologist, EPEI

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MEETING MINUTES

Date:	Thursday, April 14, 2011
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Number:	1
Meeting Date:	Tuesday, April 12, 2011, 11am
Meeting Location:	Southland Engineering Office
RE:	Updated Traffic Study
Copy to:	File
Attendees:	Karl Lutjens – Southland Engineering Janis Steinbrenner – Southland Engineering David Moore – Southland Engineering Harris Robinson – Robinson Transportation Consultants

- Preference for this project is a 20' raised median. Current traffic counts call for a 14' flush median
- 2010 US Census showed approximately 3.2% annual growth in Bartow Co. over the last 10 years. Used a 4% growth rate to determine future traffic: 2.5% background growth rate then added Carter Grove and Park Village to get to 4% growth, assuming 50% build-out.
- Discussed the possibility of getting a Design Exception for the 20' raised median. Putting any more traffic on Douthit Ferry Road between Old Mill Road and SR 61/SR 113 would create a LOS E for the intersection of Douthit Ferry and SR 61/SR 113. Possible change of logical termini to Mission Road. Accident rates are higher than state average.
- The City owns a lot of the R/W along the project and Carter Grove donated enough R/W to construct the road with a 20' raised median.
- Will likely get a Design Exception for not having a median on Douthit Ferry Road between Old Mill Road and SR 61/SR 113 due to location of commercial properties in that segment and the cost associated with them.
- The City is looking to do an intersection study at SR 61 and Burnt Hickory Road to go over the RR tracks. They eventually would like to widen Burnt Hickory Road to 4 lanes.
- If logical termini is moved north, we can break up the project into separate phases of construction however the environmental document would need to cover all phases together.
- 2018 numbers include 50% build-out. When will the Dellinger property on Old Alabama be developed? May be able to add that to the traffic.
    - Add development of Dellinger property
    - Add airport expansion which includes addition of runway/taxiway
- Buses are included with the truck numbers
- Need to talk to the City of Cartersville
    - Bump numbers up to higher growth rate for developments
    - Just below 20' raised median with traffic
    - Will make LOS E at SR 61 and possibly at Old Mill which would have FHWA not approve the logical termini there and move it north.
- Traffic will increase with the completion of SR 61 and SR 113 intersection

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MEETING MINUTES

- Harris can see an increase of about 1000 trips from the Dellinger development (across from the airport
- Lake Point development – Streetsmarts is doing a traffic study. Show traffic on Old Alabama. We can use a % of that traffic for Douthit Ferry
- Southland will discuss with Tommy first then go over the decision with Harris.
- Lengths of turn lanes in the traffic study only account for stacking.

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MEETING MINUTES

Date:	Wednesday, July 20, 2011
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Number:	2
Meeting Date:	Wednesday, July 20, 2011
Meeting Location:	Southland Engineering
RE:	Current Project Status
Copy to:	File
Attendees:	Karl Lutjens – Southland Engineering Janis Steinbrenner – Southland Engineering David Moore – Southland Engineering (Retired GDOT) Karyn Matthews - GDOT

- Need letter that says PE and R/W is in the STIP. There will be $56,000 in oversight funds and will need money for the VE Study
- Karyn needs the contact information for Tommy Sanders (City of Cartersville)
- City of Cartersville needs to be LAP certified before R/W is authorized. Karyn will double check that since R/W is 100% city funds.
- Bike trail – check if it was moved to the trail. Then it won't need to be on the road.
- Send the R/W estimate to Karyn. Will also need to do the construction cost estimate.
- Karyn will send Southland the memo regarding using a 17' raised median.

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MEETING MINUTES

Date:	Friday, December 16, 2011
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Number:	1
Meeting Date:	Thursday, December 15, 2011, 9am
Meeting Location:	GDOT District Six Conference Room
RE:	Public Interest Determination
Copy to:	Attendees, File
Attendees:	David Moore – Southland Engineering Janis Steinbrenner – Southland Engineering Karl Lutjens – Southland Engineering Tommy Sanders – City of Cartersville Edmund L. Mullinax – City of Cartersville Roger O. Ellis – Bartow County Water Derek Hampton – Cartersville Electric Rick Ross – Cartersville Electric Jeramy Towe – City of Cartersville Water Dept. Jon Jeffries – Georgia Power Co. Steve Gafford – GDOT Utilities Kerry Bonner – District Utilities Stanley McCarley – District Utilities Brian Friery – Cartersville Gas Mike Garrett – AT&T Leonora Leigh – GDOT Program Delivery Greg Thacker – Cartersville Gas

1. Welcome
   - Reviewed the funding of the Douthit Ferry Road project – Right-of-Way and Utilities will be funded by the City of Cartersville and construction will be paid for with State and Federal funds.
   - This meeting was arranged as part of a new process for determining risk in utility relocation. Douthit Ferry Road is the first project in District Six to go through the new process.
   - Southland Engineering provided a layout of the concept design of the project. Alignment and R/W are fairly set unless the environmental process requires a change.

2. Introductions

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MEETING MINUTES

3. Purpose of Meeting
- Public Interest Determination (PID) Meeting is held to decide if it is in the best interest of the public to have risk acceptance or risk avoidance when relocating utilities on a project.
- Policy 6863-12 is to be followed on all major projects. Douthit Ferry Road is considered a major project.
- Utilities are considered a 3rd Party. If relocations are not included in the Contract, the utility owner is responsible for moving utilities.
- Risk Acceptance – Accepting the risks associated with allowing the 3rd Party to perform the required utility relocation, removal, and adjustment work.
- Risk Avoidance – Avoiding the risks associated with the 3rd Party performing the required utility relocation by placing the utility work in the Contract to be done by the Contractor.
- Determining Risk Avoidance does not relieve the City of financial responsibility but the Contractor is responsible for moving utilities to avoid delays.
- Will decide today if the project will be Risk Acceptance or Risk Avoidance. The risk matrix determines the level of risk.
- High Risk – risk avoidance, utilities placed in the Contract
- Moderate Risk – can go either way
- Low Risk - risk acceptance, 3rd Party moves utilities.
- If Risk Avoidance is determined, the Contract will include specifications from the 3rd Party on procedures to maintain and transfer service.
- Risk is all or nothing – if one utility requires avoidance, the project will be deemed risk avoidance.
- If High Risk is determined, District Six will contact the utility companies through a Memo of Understanding (MOU). The companies can still decide not to let the Contractor do the work and do the work themselves.
- The meeting is simply determining the risk.
- According to SB19, DOT can pay for relocation work as long as it expedites the staging of the project.
- According to the District, water and sewer has already been included in contracts. They're recently added gas to the contracts. They've been successful with Georgia Power (not incl. Georgia Transmission) and they are looking for test projects for EMC's, Cable, and Phone.
- David Moore will fill out the required form after this meeting and provide to Kerry Bonner.

4. Explanation of Project
- Given by Janis Steinbrenner
- The alignment of Douthit Ferry Road follows the existing road, keeping existing travel lanes to either the east or west side of the alignment. The major deviation from this occurs at the intersection with Walnut Grove Rd./Pine Grove Rd to provide the necessary space for a roundabout.
- The typical section from Old Alabama Rd to just south of Old Mill Rd is 4-12' travel lanes with a 20' raised, grassed median and urban shoulders with curb & gutter and 5' sidewalks.

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MEETING MINUTES

- The typical section from just south of Old Mill Rd to SR 113, due to limited space for widening, is 4-12' travel lanes with a 14' flush median and urban shoulders with curb & gutter and 5' sidewalks.

5. Risk Management Plan
   - Reviewed the risk matrix. Weights given to scope (10%), schedule (20%), budget (20%), and staging (50%).
   - This determination will be for Concept
   - Prior to the Concept Meeting the Area Office and Utilities Office will look at the concept plan and facilitate discussion at the Concept Meeting
   - Bridge construction and bridge widening may need to be considered in staging for risk. Gas and sewer main are attached to the existing bridge.
   - Gas concerns – switching sides of the road, high pressure line is the only feed to the south and needs to remain open at all times. Traveling south the line is on the east side to Indian Mounds Rd and crosses to the west side.
   - Water concerns – how much construction will be done before relocations
   - Tommy Sanders (City of Cartersville) feels the City will want Risk Acceptance in order to retain control over the relocations. Project should be low risk.
   - GDOT accepts utility owner specs. Utility owners provide pay items. GDOT will use any matching GDOT pay items otherwise they will modify pay items to match what is provided by the utility owners.
   - Memo of Agreement between GDOT and City of Cartersville will include all directives before construction.
   - Georgia Power was concerned that there may be transmission lines on the project but it was determined that the lines are located just off the project and will not be in conflict.
   - The construction schedule will include timing for relocations. The schedule will get worked out before construction begins.
   - Bridge widening – utilities only need to be removed with widening if they are attached to the overhang. Look into widening entirely to the east side.
   - Risk Severity is determined to be a "B" which is low risk

6. Risk Summary Sheet for each Utility Owner
   - Filled out the summary sheet with verbal responses from the utility owners
   - Project will be Risk Acceptance
   - Will discuss this issue at the Concept Meeting and again at PFPR

7. Other Comments
   - None

8. Adjourn

SOUTHLAND ENGINEERING
CIVIL ENGINEERS · LAND SURVEYORS · LAND PLANNERS

MEETING MINUTES

Date:	Friday, May 11, 2012
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Number:	1
Meeting Date:	Tuesday, January 17, 2012
Meeting Location:	Cartersville Chamber of Commerce
RE:	Roundabout Informational Meeting
Copy to:	Attendees, File
Attendees:	David Moore – Southland Engineering Janis Steinbrenner – Southland Engineering Karl Lutjens – Southland Engineering Jayce Stepp – The Benefit Planning Group Howard Hinesley – Cartersville City Schools Louis Tonsmeire – Cartersville City Board Dee Corson - GDOT Paul Denard - GDOT Scott Zehngraff – GDOT – Traffic Ops Paul Battles – Georgia House of Representatives Matt Santini – City of Cartersville Tommy Sanders – City of Cartersville Sam Grove – City of Cartersville

- Construction on the Roundabout will begin in 2016. It will be open to traffic in 2018.
- Southland Engineers are open to discussion on any part of the project but the purpose of this meeting is primarily to discuss the roundabout and the intersection of Douthit Ferry Road at Pine Grove Rd/Walnut Grove Rd.
- Southland is required to analyze every intersection to see if it is suitable for a roundabout vs. a traffic signal.
- Southland has worked with GDOT on the roundabout design and we believe we have the best location
- The City needs to enter into an agreement of support. The agreement states that the City approves of the roundabout and will provide and maintain lighting and landscaping.
- The school (Cartersville Middle School) is concerned with students walking, cars in the parking lot across the street and at the park. They want to know the safety for pedestrians and kids driving through the roundabout.
- Currently 76 roundabouts are under construction in GA on state highways and local roads.
    - 35% decrease in crashes
    - 70% decrease in injury crashes

SOUTHLAND ENGINEERING

MEETING MINUTES

  - 85% decrease in fatal crashes
  - Severity of crashes is less than at other intersections
- Schools are a good location for a roundabout because
  - they slow traffic
  - pedestrians have right-of-way at the approaches
  - there are many roundabouts at high schools and in university settings (concern about kids navigating a roundabout)
  - 5-6 colleges in GA have roundabouts
- There are 123 intersections identified as roundabouts in the state.
- Major difference now in intersection design than a few years ago.
- Roundabouts reduce severe crashes i.e. teens turning left in front of oncoming cars.
- FHWA is pushing for roundabout design so GDOT is looking at them more as an option for intersections.
- Lighting is very important at the intersection. Beacons can be used that flash when pedestrians are crossing.
- With a traffic signal, pedestrians will be crossing 6 lanes, 4 thru lanes, one left turn lane, and one right turn lane, with no refuge.
- The City counted the pedestrians. There is a large group of students when school lets out and all (or 2 different groups) cross the intersection at the same time.
- Signal would be pedestrian-controlled and have a set time to cross. At the roundabout, cars have to yield to all pedestrians.
- The City prefers the roundabout to a signal
- The school would like to know if there will be backup from cars if more parents decide to pick up their kids.
- LOS gets better as people get used to the roundabout.
- If queuing at the school becomes an issue, there will be problems at either a signal or a roundabout.
- Safer travel through a roundabout.
- The school asked about a pedestrian bridge. Southland has not looked at a pedestrian bridge. They can look into it in the Value Engineering Phase but there would have to be a need for it.
- As for cost, a traditional intersection needs 90-degree angles at the intersection but with a roundabout you can have roads come in at any angle.
- There is a question about the required right-of-way at parcel 14 and cost to acquire it. The lake at Carter Grove is the limiting factor to placement of the roundabout.
- The roundabout can save money. It may cost more initially but save more long term in right-of-way cost and safety.
- The Letter of Support will be on the next Council agenda. What happens if the City doesn't sign it?
  - Landscaping helps with safety. Vertical elements help as well. GDOT has zero maintenance landscape designs if the City does not want to maintain
  - The roundabout can be used as a gateway with certain landscaping.
  - Lighting – more where the pedestrian crossings are.
  - The Letter of Support does not say that the roundabout is the only option but that the City does support this option if it goes forward.
- One Council Member says he is not comfortable voting on this issue at the next meeting on Jan. 19, 2012.

SOUTHLAND ENGINEERING

MEETING MINUTES

- The school would like some information on safety to provide to parents to support the roundabout.
- There are 7000 cars on Douthit Ferry now. There are expected to be 24,000 cars in 20 years. For comparison – 18,000 cars on Tenn. St. at the movie theater, 17,000 cars on Main St., and 35,000 cars on US 41
- There will be a Peer Review on the roundabout. A 3rd Party will review the design and Southland will update the design as recommended. The peer reviewer can provide animation that shows how the roundabout is used including pedestrians and can be shown at public meetings.
- Design speed for Douthit Ferry Road is 35 mph. The fastest path through the roundabout is 25mph.
- Landscaping does not impede the view of oncoming traffic or pedestrians.
- Are there any repercussions if the roundabout is not approved or the City does not sign the Letter of Support?
    - There is some time to put together a presentation for the City, the schools, etc.
    - A month (4-6 weeks) would be okay to look into this.
- GDOT recommends a PIOH when there is a roundabout to explain safety and operational benefits. Can have demos and strategies to show support.
- Scott Zehngraff permits traffic signals for GA. People don't realize the safety benefits of roundabouts.
    - Fatalities in roundabouts are rare.
    - There have been 7 fatalities in 20 years for 3000 roundabouts (U.S.)
- Scott Zehngraff is asked to attend the PIOH to help answer questions
- Polls taken before a roundabout is built, typically about 80% against but after it is built only 20% are against
- Roundabouts are designed for future traffic.
- Would there be an issue with the roundabout if the school wasn't there? Most concerns are coming from the school.
- This meeting today is required by GDOT roundabout checklist.
- Want to have answers to public's questions before the PIOH is held. The PIOH can be done any time but the earlier the better.
- Letter of Support states that if the roundabout Is built, the City will provided landscaping and lighting but does not say the roundabout is going there. So if the decision is made to not go with a roundabout, the City isn't tied to its design.
- The roundabout can be removed from the design at any time. The intersection did meet signal warrants for design.
- Southland would like to go through the Peer Review process before any public meetings are scheduled.
- It would be at least 6 weeks before a public meeting could be held. Will need to have all materials to provide for a positive outcome.

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MEETING MINUTES

Date:	Friday, March 2, 2012
Prepared by:	Janis Steinbrenner
Project Name:	Douthit Ferry Road Improvement
Project Number:	CSSTP-0007-00(494)
Meeting Date:	Thursday, March 1, 2012, 11am
Meeting Location:	GDOT District Six Small Conference Room
RE:	Status Update
Copy to:	Attendees, File
Attendees:	David Moore – Southland Engineering Janis Steinbrenner – Southland Engineering Karl Lutjens – Southland Engineering Tommy Sanders – City of Cartersville Leonora Leigh – GDOT Program Delivery

Schedule – Discuss Alternatives – ARC Modeling Issue

- Concept was not held in February
  - Held up by issues regarding the bidding process of the project that have since been resolved
  - LCCA – Southland is the first company that has had to complete this (GDOT has done this in the past) and it has taken longer than expected
- ARC modeling will be completed at the end of 2012 (calendar year)
  - Kyle Mote received the modeling letter request, accepted it, and said model will run in November 2012
  - Results should be available in December 2012. Cartersville is not part of ARC but Bartow County is non-attainment and therefore requires the ARC model to be run for Douthit Ferry Road.
- Southland would like to hold the Concept Team Meeting without the ARC Modeling Letter
  - Hold the Concept Team Meeting at the end of April 2012
  - Request a courtesy review of the concept by ODPS, proceed with the VE Study, and then Concept is approved when the ARC Modeling Letter is received. Request also that Southland can proceed with preliminary plans while waiting on the ARC
  - Can get back on the project schedule for PFPR and future dates
- Leonora (Leo) Leigh has a meeting at ODPS this afternoon and will discuss this option with them. David Moore has a copy of the letter from ARC regarding the 2012 model and will send a copy to Leo.
- Question from Tommy – Do we need an approved concept to proceed with the VE Study. Does not want Southland to get too far ahead with preliminary plans if the VE study has to wait. May have to slow schedule. **(David and Janis checked the PDP after this meeting and the VE Study is performed after the Concept Team Meeting and before Concept Approval)**

SOUTHLAND ENGINEERING

MEETING MINUTES

CES – Janis needs access to do the cost estimate

- Need the 3 passwords to access the CES program
- Leo will need to request these as the PM

Pavement Evaluation and LCCA is underway

Roundabout

- Currently going through the Peer Review with Howard McCulloch of NE Roundabouts
- Southland has redesigned the bus entrance to the school due to the proximity of the current bus entrance to the proposed roundabout and it not meeting standards for left turn lanes
- School officials have not seen the redesign yet. Southland is trying to set up a meeting within the next 2 weeks with the City, the School Board, and the School Principal.
- The new driveway entrance is located 660' from the roundabout and will not require a design variance or exception.
- The Peer Review has suggested one change to the SW quadrant of the roundabout (Walnut Grove Road to SB Douthit Ferry Road)
- Southland will inform Leo of any decisions made on the proposed bus entrance.

Archeology Sites near Bridge

- Aerials with both alternates were placed on GDOT's ftp site this morning for Sara Gale.
- Edwards-Pitman thinks that the tribes will approve the option that allows the City to purchase ROW that includes the sites so it will not be disturbed in the future.
- The East Alternate that fills over the sites without disturbing them looks to be the best option but waiting on tribe approval.
- If the tribe negotiations have not been completed by the Concept Team Meeting, Southland will show both the East and West Alternates.

Signals on Project

- The section of Old Alabama Road that is being designed by Jacobs is not scheduled for letting in the next 2 years. Southland will work on coordination at this intersection with Douthit Ferry Road
- Is there any work on the signal plans that needs to be done for the Concept Team Meeting?
    - GDOT has the permit for SR 113
    - Old Mill Road and Old Alabama Road signals are City-owned
    - Apply for permit at Old Alabama Road, don't rely on having a permit from the Old Alabama Road project.
    - Old Alabama Road will be permitted when it goes to construction.
    - Southland will look into the 3 signals and permits

ATTACHMENT 13

PROJECT FRAMEWORK AGREEMENT

HAROLD E. LINNENKOHL
COMMISSIONER
(404) 656-5206

GERALD M. ROSS, P.E.
CHIEF ENGINEER
(404) 656-5277

Department of Transportation
State of Georgia
#2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

BUDDY GRATTON, P.E.
DEPUTY COMMISSIONER
(404) 656-5212

EARL L. MAHFUZ
TREASURER
(404) 656-5224

October 29, 2007

The Honorable Mike Fields, Mayor
City of Cartersville
P. O. Box 1390
Cartersville, Georgia 30120

Dear Mayor Fields:

I am returning for your files an executed agreement between the Georgia Department of Transportation and the City of Cartersville for the following project:

PROJECT#: CSSTP-0107-00(494) Bartow County, P.I. #0007494

We look forward to working with you on the successful completion of the joint project. Should you have any questions, please contact the Project Manager Dewayne Comer at (770)387-3619.

Sincerely,

James T. Simpson
Financial Management Administrator

JTS:mn
Enclosure
c: Bob Rogers
Kent Sager - District 6
Jeff Baker – Utilities

Project# County

AGREEMENT

BETWEEN

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

AND

THE CITY OF CARTERSVILLE

FOR

TRANSPORTATION FACILITY IMPROVEMENTS

This Framework Agreement is made and entered into this 1 day of October, 2007, by and between the DEPARTMENT OF TRANSPORTATION, an agency of the State of Georgia, hereinafter called the "DEPARTMENT", and the City of Cartersville, acting by and through its Mayor and City Council or Board of Commissioners, hereinafter called the "LOCAL GOVERNMENT".

WHEREAS, the LOCAL GOVERNMENT has represented to the DEPARTMENT a desire to improve the transportation facility described in Attachment A, attached and incorporated herein by reference and hereinafter referred to as the "PROJECT"; and

WHEREAS, the LOCAL GOVERNMENT has represented to the DEPARTMENT a desire to participate in certain activities including the funding of

certain portions of the PROJECT and the DEPARTMENT has relied upon such representations; and

WHEREAS, the DEPARTMENT has expressed a willingness to participate in certain activities of the PROJECT as set forth in this Agreement; and

WHEREAS, the Constitution authorizes intergovernmental agreements whereby state and local entities may contract with one another "for joint services, for the provision of services, or for the joint or separate use of facilities or equipment, but such contracts must deal with activities, services or facilities which the parties are authorized by law to undertake or provide." Ga. Constitution Article IX, §III, ¶II(a).

NOW THEREFORE, in consideration of the mutual promises made and of the benefits to flow from one to the other, the DEPARTMENT and the LOCAL GOVERNMENT hereby agree each with the other as follows:

1. The LOCAL GOVERNMENT shall contribute to the PROJECT by funding all or certain portions of the PROJECT costs for the preconstruction engineering (design), all reimburseable utility relocation costs, right of way acquisitions and construction, as specified in Attachment A, attached hereto and incorporated herein by reference. Expenditures incurred by the LOCAL GOVERNMENT and eligible for reimbursment by the DEPARTMENT shall not be considered reimbursible to the

LOCAL GOVERNMENT until the LOCAL GOVERNMENT receives a written notice to proceed for each phase of the PROJECT.

2. The DEPARTMENT shall contribute to the PROJECT by funding all or certain portions of the PROJECT costs for the preconstruction engineering (design) activities, right of way acquisitions or construction as specified in Attachment A.

3. It is understood and agreed by the DEPARTMENT and the LOCAL GOVERNMENT that the funding portion as identified in Attachment "A" of this Agreement only applies to the Preconstruction Engineering Activities.

4. The LOCAL GOVERNMENT shall be responsible for all costs for the continual maintenance and the continual operations of any and all sidewalks and the grass strip between the curb and gutter and the sidewalk within the PROJECT limits.

5. Both the LOCAL GOVERNMENT and the DEPARTMENT hereby acknowledge that Time is of the Essence. It is agreed that both parties shall adhere to the schedule of activities currently established in the approved Transportation Improvement Program/State Transportation Improvement Program (TIP/STIP). Furthermore, all parties shall adhere to the detailed project schedule as approved by the DEPARTMENT, attached as Attachment B and incorporated herein by reference. In the completion of respective commitments contained herein, if a change in the schedule is needed, the LOCAL GOVERNMENT shall notify the DEPARTMENT in writing of the proposed schedule change and the DEPARTMENT

shall acknowledge the change through written response letter; provided that the DEPARTMENT shall have final authority for approving any change.

If, for any reason, the LOCAL GOVERNMENT does not produce acceptable deliverables in accordance with the approved schedule, the DEPARTMENT reserves the right to delay the project's implementation until funds can be re-identified for construction or right of way, as applicable.

6. The LOCAL GOVERNMENT shall certify that they have read and understands the regulations for "CERTIFICATION OF COMPLIANCES WITH FEDERAL PROCUREMENT REQUIREMENTS, STATE AUDIT REQUIREMENTS, AND FEDERAL AUDIT REQUIREMENTS" and will comply in full with said provisions.

7. The LOCAL GOVERNMENT shall accomplish all of the design activities for the PROJECT. The design activities shall be accomplished in accordance with the DEPARTMENT's Plan Development Process, the applicable guidelines of the American Association of State Highway and Transportation Officials, hereinafter referred to as "AASHTO", the DEPARTMENT's Standard Specifications Construction of Transportation Systems, the DEPARTMENT's Plan Presentation Guide, PROJECT schedules, and applicable guidelines of the DEPARTMENT. The LOCAL GOVERNMENT responsibility for design shall include, but is not limited to the following items:

a. Prepare the PROJECT concept report in accordance with the format used by the DEPARTMENT. The concept for the PROJECT shall be

developed to accommodate the future traffic volumes as generated by the LOCAL GOVERNMENT as provided for in paragraph 7b and approved by the DEPARTMENT. The concept report shall be approved by the DEPARTMENT prior to the LOCAL GOVERNMENT beginning further development of the PROJECT plans. It is recognized by the parties that the approved concept may be modified by the LOCAL GOVERNMENT as required by the DEPARTMENT and re-approved by the DEPARTMENT during the course of design due to public input, environmental requirements, or right of way considerations.

b. Develop the PROJECT base year (year facility is expected to be open to traffic) and design year (base year plus 20 years) traffic volumes. This shall include average daily traffic (ADT) and morning (am) and evening (pm) peak hour volumes. The traffic shall show all through and turning movement volumes at intersections for the ADT and peak hour volumes and shall indicate the percentage of trucks expected on the facility.

c. Validate (check and update) the approved PROJECT concept and prepare a PROJECT Design Book for approval by the DEPARTMENT prior to the beginning of preliminary plans.

d. Prepare environmental studies, documentation, and reports for the PROJECT that show the PROJECT is in compliance with the provisions of the National Environmental Protection Act and Georgia Environmental Protection Act, as appropriate to the PROJECT funding. This shall include any and all archaeological, historical, ecological, air, noise, underground storage tanks (UST), and hazardous waste site studies required as well as

any environmental reevaluations required. The LOCAL GOVERNMENT shall submit to the DEPARTMENT all environmental documents and reports for review and approval by the DEPARTMENT and the FHWA.

e. Prepare all public hearing and public information displays and conduct all required public hearings and public information meetings in accordance with DEPARTMENT practice.

f. Perform all surveys, mapping, soil investigation studies and pavement evaluations needed for design of the PROJECT.

g. Perform all work required to obtain project permits, including, but not limited to, US Army Corps of Engineers 404 and Federal Emergency Management Agency (FEMA) approvals. These efforts shall be coordinated with the DEPARTMENT.

h. Prepare the PROJECT drainage design including erosion control plans and the development of the hydraulic studies for the Federal Emergency Management Agency Floodways and acquisition of all necessary permits associated with the drainage design.

i. Prepare traffic studies, preliminary construction plans including a cost estimate for the Preliminary Field Plan Review, preliminary and final utility plans, preliminary and final right of way plans, staking of the required right of way, and final construction plans including a cost estimate for the Final Field Plan Review, erosion control plans, lighting plans, traffic handling plans, and construction sequence plans and specifications including special provisions for the PROJECT.

j. Provide certification, by a Georgia Registered Professional Engineer, that the construction plans have been prepared under the guidance of the professional engineer and are in accordance with AASHTO and DEPARTMENT guidelines.

k. Failure of the LOCAL GOVERNMENT to follow the DEPARTMENT's Plan Development Process will jeopardize the use of Federal funds in some or all of the categories outlined in this Agreement, and it shall be the responsibility of the LOCAL GOVERNMENT to make up the loss of that funding.

8. A. Primary Consultant Firms hired by the LOCAL GOVERNMENT to provide services on the PROJECT shall be prequalified with the DEPARTMENT in the appropriate area-classes. The DEPARTMENT shall, on request, furnish the LOCAL GOVERNMENT with a list of prequalified consultant firms in the appropriate area-classes.

B. The PROJECT construction and right of way plans shall be prepared in English units.

C. All drafting and design work performed on the project shall be done utilizing Microstation and CAICE software respectively, and shall be organized as per the Department's guidelines on electronic file management.

11. The DEPARTMENT shall review and has approval authority for all aspects of the PROJECT provided however this review and approval does not relieve the LOCAL GOVERNMENT of its responsibilities under the terms of this agreement. The DEPARTMENT will work with the FHWA to obtain all needed approvals as deemed necessary with information furnished by the LOCAL GOVERNMENT.

12. The LOCAL GOVERNMENT shall be responsible for the design of all bridge(s) and preparation of any required hydraulic and hydrological studies within the limits of this PROJECT in accordance with the DEPARTMENT's policies and guidelines. The LOCAL GOVERNMENT shall perform all necessary survey efforts in order to complete the design of the bridge(s) and prepare any required hydraulic and hydrological studies. The final bridge plans shall be incorporated into this PROJECT as a part of this Agreement.

13. The LOCAL GOVERNMENT shall follow the DEPARTMENT's procedures for identification of existing and proposed utility facilities on the PROJECT. These procedures, in part, require all requests for existing, proposed, or relocated facilities to flow through the DEPARTMENT's Project Liaison and the District Utilities Engineer.

14. The LOCAL GOVERNMENT shall address all railroad concerns, comments, and requirements to the satisfaction of the DEPARTMENT.

15. If the right of way phase is 100% local funding with no Federal or State reimbursement, upon the DEPARTMENT's approval of the project right of way plans, verification that the approved environmental document is current, which shall mean that the approval of the environmental document occurred within six (6) months of the approval notice by the DEPARTMENT's for project right of way plans, and delivery of a written notice to proceed, the LOCAL GOVERNMENT may proceed with the acquisition of the necessary right of way for the PROJECT. If the right of way phase involves federal and/or state funding reimbursement, upon the Department's approval of the project right of way plans, the Local Government may proceed with all pre-acquisition right of way activities, however, property negotiation and acquisition cannot commence until right of way funding authorization is approved. Right of way acquisition shall be in accordance with the law and the rules and regulations of the FHWA including, but not limited to, Title 23, United States Code; 23 CFR 710, et. Seq., and 49 CFR Part 24 and the rules and regulations of the DEPARTMENT and in accordance with the "Contract for the Acquisition of Right of Way" to be prepared by the Office of Right of Way and executed between the LOCAL GOVERNMENT and the DEPARTMENT prior to the commencement of any right of way activities. Failure of the LOCAL GOVERNMENT to adhere to the provisions and requirements specified in the acquisition contract may result in the loss of Federal funding for the PROJECT and it will be the responsibility of the LOCAL GOVERNMENT to make up the loss of that funding. In the event the LOCAL GOVERNMENT is to receive reimbursement of all or part of the acquisition funding, reimbursable right of way costs are to include land and improvement costs, property damage values, relocation assistance expenses and contracted property

management costs. Non reimbursable costs include administrative expenses such as appraisal, consultant, attorney fees and any in-house property management or staff expenses. All required right of way shall be obtained and cleared of obstructions, including underground storage tanks, prior to advertising the PROJECT for bids. The LOCAL GOVERNMENT shall further be responsible for making all revisions to the approved right of way plans, as deemed necessary by the DEPARTMENT, for whatever reason, as needed to purchase the required right of way.

16. Upon completion and approval of the PROJECT plans, certification that all needed rights of way have been obtained and cleared of obstructions, and certification that all needed permits for the PROJECT have been obtained by the LOCAL GOVERNMENT the PROJECT shall be let for construction. The DEPARTMENT, unless shown otherwise on Attachment A, shall be solely responsible for securing and awarding the construction contract for the PROJECT.

17. The LOCAL GOVERNMENT shall review and make recommendations concerning all shop drawings prior to submission to the DEPARTMENT. The DEPARTMENT shall have final authority concerning all shop drawings.

18. The LOCAL GOVERNMENT agrees that all reports, plans, drawings, studies, specifications, estimates, maps, computations, computer diskettes and printouts, and any other data prepared under the terms of this Agreement shall become the property of the DEPARTMENT if required. This data shall be

organized, indexed, bound, and delivered to the DEPARTMENT no later than the advertisement of the PROJECT for letting. The DEPARTMENT shall have the right to use this material without restriction or limitation and without compensation to the LOCAL GOVERNMENT.

19. The LOCAL GOVERNMENT shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other services furnished by or on behalf of the LOCAL GOVERNMENT pursuant to this Agreement. The LOCAL GOVERNMENT shall correct or revise, or cause to be corrected or revised, any errors or deficiencies in the designs, drawings, specifications, and other services furnished for this PROJECT. Failure by the LOCAL GOVERNMENT to address the errors or deficiencies within 30 days shall cause the LOCAL GOVERNMENT to assume all responsibility for construction delays caused by the errors and deficiencies. All revisions shall be coordinated with the DEPARTMENT prior to issuance. The LOCAL GOVERNMENT shall also be responsible for any claim, damage, loss or expense, to the extent allowed by law that is attributable to errors, omissions, or negligent acts related to the designs, drawings, specifications, and other services furnished by or on behalf of the LOCAL GOVERNMENT pursuant to this Agreement.

This Agreement is made and entered into in FULTON COUNTY, GEORGIA, and shall be governed and construed under the laws of the State of Georgia.

The covenants herein contained shall, except as otherwise provided, accrue to the benefit of and be binding upon the successors and assigns of the parties hereto.

Project County

IN WITNESS WHEREOF, the DEPARTMENT and the LOCAL GOVERNMENT have caused these presents to be executed under seal by their duly authorized representatives.

RECOMMENDED:

District Engineer

Director of Preconstruction

Chief Engineer

DEPARTMENT OF TRANSPORTATION

BY: Commissioner

ATTEST:

Treasurer

REVIEWED AS TO LEGAL FORM:

Office of Legal Services 10-18-07

LOCAL GOVERNMENT NAME

BY:
Mike Fields
Mayor – City of Cartersville

Signed, sealed and delivered this ____ day of _____, 200_, in the presence of:

Witness

Notary Public

Notary Public, Bartow [illegible]
My Commission Expires June [illegible]

This Agreement approved on the 4 day of October, 2007

City Clerk

FEIN: 58-6000534

ATTACHMENT "A"

Project Number: CSSTP-0007-00(494) - Bartow County

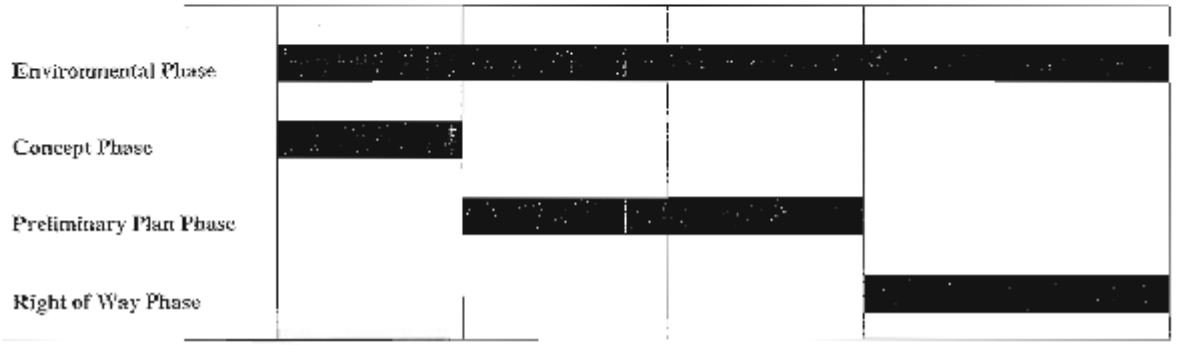
Project	Work	Preliminary Engineering		Right of Way		Construction		Utilities
(PI#, Project #Description)	Type	Funding	Design	Funding of Real Property	Acquisition & Administrative Cost by	Funding	Letting by	Relocation Costs by
PI# 0007494 CSSTP-0007-00(494) CR 343 DOUTHIT FERRY ROAD FROM OLD ALABAMA ROAD TO SR 61/SR 113	Roadway Project	100% City	City	100% City	City	80% Federal $9,357,600 20% State $2,339,400	GDOT	100% City

Note: 1. Maximum allowable GDOT reimbursible amount may be shown above in lieu of percentages when applicable. Local Government will only be reimbursed the percentage of the accured invoiced amounts up to but not to exceed the maximum amount indicated.

2. Cash participation limits may be shown above in lieu of percentages when applicable.

ATTACHMENT "B"
0007494 – Bartow County

Proposed Project Schedule



Deadlines for Responsible Parties	Execute Agreement	June/2008 (Approve Concept)	Feb/2010 (Approve Env. Document)	Sept/2010 (Authorize Right of Way funds)	July/2011 (Authorize Const. funds)

Annual Reporting Requirements

The Local Government shall provide a written status report to the Department's Project Manager with the actual phase completion date(s) and the percent complete/proposed completion date of incomplete phases. The written status report shall be received by the Department no later than the first day of February of every calendar year until all phases have been completed.

Training Certification Requirement

The Local Government shall provide a written certification that all appropriate staff (employees and consultants) involved in the Project have attended or are scheduled to attend the Department's Plan Development Process Training Course. The written certification shall be received by the Department no later than the first day of February of every calendar year until all phases have been completed.

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: Project Number: CSSTP-0007-00(494)
PI No.: 0007494
County: Bartow

OFFICE: Cartersville
DATE: 02/19/07

FROM: Kent L. Sager, District Engineer

TO: Brian Summers, Project Review Engineer

SUBJECT: REVISION TO PROGRAMMED COSTS

NO REVISION REQUIRED

PROGRAMMED COSTS

- Construction Cost $7,653,000
- Right-of-Way Cost LOCL
- Reimbursable Utility Cost $0.00

NEW COST ESTIMATES:

- Construction Cost $11,696,544
- Right-of-Way Cost LOCL
- Reimbursable Utility Cost $0.00

Reasons why costs changed: Programmed Construction Cost is from the PNRC. Consultant for project provided better estimate of actual work needed for project.

KLS:CDC:DPM:dwr

Attachments: Attach cost estimates

CC: Jamie Simpson, Office of Financial Management

Detail Estimate: Cost Estimate Report

Estimate Report for file "0007494"

Section ROADWAY

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	336000.00	TRAFFIC CONTROL - STP-0007-00(494)	336000.00
153-1300	1	EA	72192.84	FIELD ENGINEERS OFFICE TP 3	72192.84
159-1000	3500	HR	0.80	TRAINING HOURS	2800.00
201-1500	1	LS	1250000.00	CLEARING & GRUBBING - STP-0007-00(494)	1250000.00
205-0001	197205	CY	5.59	UNCLASS EXCAV	1102349.00
310-1101	27500	TN	17.32	GP AGGR BASE CRS, INCL MATL	476300.00
310-3000	1200	TN	17.45	AGGR SURF CRS	20940.00
402-1812	5450	TN	60.91	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	331959.50
402-3113	6250	TN	77.34	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	483375.00
402-3121	11200	TN	64.00	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	717472.00
402-3190	8560	TN	65.12	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	557476.20
413-1000	9500	GL	1.86	BITUM TACK COAT	17955.00
433-1000	230	SY	133.22	REINF CONC APPROACH SLAB	30640.60
441-0010	630	SY	42.26	DRIVEWAY CONCRETE, 8 IN TK	26626.40
441-0106	6000	SY	37.41	CONC SIDEWALK, 6 IN	224460.00
441-0302	2	EA	1986.00	CONC SPILLWAY, TP 2	3972.00
441-0600	47	CY	900.00	CONC HEADWALL 5	42300.00
441-0740	17470	SY	39.22	CONCRETE MEDIAN, 6 IN	685073.40
441-6022	90330	LF	19.52	CONC CURB & GUTTER, 6 IN X 30 IN, TP 2	926555.60
620-0100	1000	LF	37.34	TEMPORARY BARRIER, METHOD NO. 1	37340.00
634-1200	51	EA	109.55	RIGHT-OF-WAY MARKERS	5587.05
641-1100	59	LF	53.60	GUARDRAIL, TP T	3162.40
641-1200	650	LF	16.32	GUARDRAIL, TP W	11308.00
641-5001	1	EA	634.07	GUARDRAIL ANCHORAGE, TP 1	634.07
641-5012	9	EA	1005.67	GUARDRAIL ANCHORAGE, TP 12	9426.03
643-0010	2260	LF	4.93	FIELD FENCE WOVEN WIRE	11141.80
643-4000	2165	LF	6.00	WOVEN WIRE FENCE	12990.00
643-6030	3	EA	462.71	GATE, FIELD FENCE -	1388.13
643-6040	1	EA	676.67	GATE, WOVEN WIRE -	676.67
643-6200	5000	LF	3.14	BARRIER FENCE (ORANGE), 4 FT	15700.00
				Section Sub Total:	**$7,440,450.07**

Section DRAINAGE

Item Number	Quantity	Units	Unit Price	Item Description	Cost
500-3200	120	CY	436.85	CLASS B CONCRETE	52362.00
511-1000	100	LB	0.97	BAR REINF STEEL	174.60
550-1180	1720	LF	40.83	STORM DRAIN PIPE, 18 IN, H 1-10	70227.60
550-1240	4680	LF	52.54	STORM DRAIN PIPE, 24 IN, H 1-10	245882.20
550-1300	1150	LF	69.41	STORM DRAIN PIPE, 30 IN, H 1-10	79821.50
550-1360	800	LF	81.00	STORM DRAIN PIPE, 36 IN, H 1-10	64800.00
550-2180	320	LF	35.80	SIDE DRAIN PIPE, 18 IN, H 1-10	11456.00
550-3618	13	EA	829.95	SAFETY END SECTION 18 IN, SIDE DRAIN, 4:1 SLOPE	10789.35
573-2000	450	LF	18.39	UNDER PIPE INCL DRAINAGE AGGR, 6 IN	8275.50
668-1100	60	EA	2317.62	CATCH BASIN, GP 1	139057.20
668-1110	150	LF	235.23	CATCH BASIN, GP 1, ADDL DEPTH	35284.50
668-2100	9	EA	4405.96	DROP INLET, GP 1	39653.64
668-5000	3	EA	1049.47	JUNCTION BOX	3548.41
				Section Sub Total:	**$763,273.00**

Section PERMANENT EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
603-2024	1000	SY	54.35	STN DUMPED RIP RAP, TP 1, 24 IN	54350.00
603-2180	300	SY	41.67	STN DUMPED RIP RAP, TP 3, 12 IN	12501.00
603-6000	12	SY	66.28	SAND-CEMENT BAG RIP RAP, 6 IN	795.36
603-7000	1300	SY	4.95	PLASTIC FILTER FABRIC	6435.00
700-6910	20	AC	909.95	PERMANENT GRASSING	18199.00
700-7000	40	TN	59.12	AGRICULTURAL LIME	2364.80
700-7010	80	GL	19.30	LIQUID LIME	1544.00
700-8000	12	TN	349.60	FERTILIZER MIXED GRADE	4195.20
700-8100	1000	LB	2.10	FERTILIZER NITROGEN CONTENT	2100.00
710-0000	3450	SY	3.72	PERMANENT SOIL REINFORCING MAT	12834.00
716-2000	6500	SY	1.33	EROSION CONTROL MATS, SLOPES	8645.00

Detail Estimate Cost Estimate Report

Section TEMPORARY EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	40	AC	562.04	TEMPORARY GRASSING	22481.60
163-0240	400	TN	172.31	MULCH	68924.00
163-0300	7	EA	2821.82	CONSTRUCTION EXIT	19752.74
163-0503	23	EA	572.24	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP B	13161.52
163-0520	70	LF	16.83	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	1178.10
163-0521	50	EA	226.90	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS	11345.00
163-0531	3	EA	8307.42	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO -	24922.26
163-0550	144	EA	301.53	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	43420.32
165-0030	28350	LF	1.84	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	52237.60
165-0040	50	EA	67.11	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	4355.50
165-0060	12	EA	1323.01	MAINTENANCE OF TEMPORARY SEDIMENT BASIN, STA NO -	15876.12
165-0087	23	EA	198.74	MAINTENANCE OF SILT CONTROL GATE, TP 3	4571.02
165-0101	7	EA	666.44	MAINTENANCE OF CONSTRUCTION EXIT	4665.08
165-0105	72	EA	112.96	MAINTENANCE OF INLET SEDIMENT TRAP	8133.12
167-1000	3	EA	1291.40	WATER QUALITY MONITORING AND SAMPLING	3874.20
167-1500	30	MO	1069.02	WATER QUALITY INSPECTIONS	32070.60
171-0030	56790	LF	3.96	TEMPORARY SILT FENCE, TYPE C	224840.80
				Section Sub Total:	**$555,817.58**

Section SIGNING & MARKING

Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1020	380	SF	14.80	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	5624.00
636-2070	200	LF	8.40	GALV STEEL POSTS, TP 7	7560.00
647-1000	1	LS	55000.00	TRAFFIC SIGNAL INSTALLATION NO - 1	55000.00
647-1000	1	LS	80000.00	TRAFFIC SIGNAL INSTALLATION NO - 2	80000.00
647-1000	1	LS	80000.00	TRAFFIC SIGNAL INSTALLATION NO - 3	80000.00
647-1000	1	LS	80000.00	TRAFFIC SIGNAL INSTALLATION NO - 4	80000.00
647-1000	1	LS	55000.00	TRAFFIC SIGNAL INSTALLATION NO - 5	55000.00
653-0110	31	EA	69.33	THERMOPLASTIC PVMT MARKING, ARROW, TP 1	2149.23
653-0120	40	EA	71.39	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	2855.60
653-1704	100	LF	5.32	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	953.80
653-1804	3510	LF	1.87	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	6563.70
653-2501	6	LM	1389.19	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	8335.14
653-2502	6	LM	1398.89	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	8393.34
653-4501	5	GLM	837.84	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	4186.20
653-6004	230	SY	2.72	THERMOPLASTIC TRAF STRIPING, WHITE	788.80
653-6005	350	SY	3.29	THERMOPLASTIC TRAF STRIPING, YELLOW	1184.40
654-1003	450	EA	3.77	RAISED PVMT MARKERS TP 3	1696.50
657-9110	550	LF	3.00	WET REFLECTIVE PREFORMED SOLID PAVEMENT MARKINGS, 5 INCH	1650.00
657-9410	1	GL	9500.00	WET REFLECTIVE PREFORMED SKIP PAVEMENT MARKINGS, 5 INCH	9500.00
				Section Sub Total:	**$411,473.71**

Section BRIDGE

Item Number	Quantity	Units	Unit Price	Item Description	Cost
500-0100	1306	SY	4.24	GROOVED CONCRETE	5537.44
500-1006	510	LS	1122.40	SUPERSTR CONCRETE, CL AA, BR NO - 1	572424.00
500-2100	650	LF	55.14	CONCRETE BARRIER	35841.00
500-3101	160	CY	594.72	CLASS A CONCRETE	95208.00
507-9003	1680	LF	145.81	PSC BEAMS, AASHTO TYPE III, BR NO - 1	244960.80
511-1000	46460	LB	0.97	BAR REINF STEEL	47006.20
511-3000	88244	LS	0.95	SUPERSTR REINF STEEL, BR NO - 1	93031.30
520-1125	2320	LF	49.64	PILING IN PLACE, STEEL H, HP 12 X 53	115164.80
525-1000	6	EA	18503.59	COFFERDAM	111021.54
602-2024	920	SY	54.35	STN DUMPED RIP RAP, TP 1, 24 IN	32610.00
				Section Sub Total:	**$1,338,255.58**

Total Estimated Cost: $10,633,221.30

Subtotal Construction Cost $10,633,221.30

Detail Estimate; Cost Estimate Report

E&C Rate 10.0 %	$1,063,322.13
Inflation Rate 0.0 % @ 0.0 Years	$0.00
Total Construction Cost	**$11,696,543.43**
Right Of Way	$0.00
ReImb. Utilities	$0.00
Grand Total Project Cost	**$11,696,543.43**

Bartow County & City of Cartersville SPLOST Projects
GDOT State-Aid Participation
September 10, 2007

Priority	Project Name	City or County	GDOT Project Number	State Funding Fiscal Year	Approx. State Funding	F
1	SR 113/West Ave. @ Etowah Drive Intersection Improvements	City	[illegible]	2008	$ 190,000	
2	U.S. 41/S.R. 61 @ Tellus Drive Intersection Improvements - Friendly Museum Drive	City	FRC10-S009-00(063)	2007	$ [illegible]	
3	Cass White Road and Zion Road Alignment and Intersection Improvements	City - County	FR0000 S009 00(862)	2007	$ [illegible]	
4	Mission Road from West of Mission Hill Drive to Carter Road	County	FR000 S009 00(020)	2007	$ 455,074	
5	Mission Road from Carter Road to West of Burnt Hickory	City	FR010 S008-00(272)	2009	$ [illegible]	
6	Pine Street @ SR 293/ Cassville Road Intersection Improvement	City	TEAPC S008 00(209)	2008	$ 350,000	
7	SR 113/Main St. Gateway from I-75 to Cartersville Place	City	TEAPC S008 00(271)	2008	$ 600,000	
8	Five Forks Road from Cass-White Road to 2500' north of Cass-White	County	FR000-S008-00(361)	2010* Est.	$ 325,000	
9	Five Forks Road from 2500' north of Cass-White to Spring Place	County	FR000-S008-00(360)	2010* Est.	$ 100,000	
10	Shinall-Gaines Road from Ivy Chase Way to Willow Bend Drive	County	n/a	2011* Est.	$ 375,000	
11	Sugar Valley Road from Woodland Road to Martin Road	County	n/a			
12						
13						

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Bartow County & City of Cartersville SPLOST Projects
GDOT State-Aid Participation
September 10, 2007

Pri-ority	Project Name	City or County	GDOT Project Number	State Funding Fiscal Year	Approx. State Funding	County/City Ready for Letting	Status	Construction	Right of Way	Utilities	Total

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ATTACHMENT 14

20 FT RAISED MEDIAN COST COMPARISON TO 14 FT FLUSH MEDIAN

0007494 Bartow - Douthit Ferry Road Cost Comparisons - 20 ft Raised Concrete Median - 20 ft Raised Grass Median - 14 ft Flush Medan

14 Ft Flush Median - purchasing ROW for 20 ft Raised Median.

Item	Description	Quantity	Unit	Unit Cost	Total
402-3131	Recycled Asph Conc 9.5 mm Superpave , Gp 2 Only, Incl Bitum matl and H- Lime	1199	Tons	53.84	$64,554.16
402-3190	Recycled Asph Conc 19 mm Superpave, Gp 1 or 2, Incl Bitum Matl and H-Lime	2866	Tons	67.05	$192,165.30
402-3121	Recycled Asph Conc 25 mm Superpave, Gp 1 or 2, Incl Bitum Matl and H-Lime	3822	Tons	62.26	$237,957.72
310-1101	Gr Aggr Base Crs, Incl Matl	8598	Tons	19.88	$170,928.24
413-1000	Bitun Tack Coat	1824	Gal	2.24	4,085.76
	TOTAL				$669,691.18

20 ft Raised Concrete Median

441-0754	Concrete Median 7 1/2 In	10483	SY	38.86	$407,369.38
441-6740	Conc Curb & Gutter, 8 in X 30 In, TP 7	20825	Lin Ft	10.79	$224,701.75
668-1100	Catch Basin GP 1	35	Ea	2032.11	$71,123.85
550-1180	Storm Drain Pipe, 18 in, H 1 - 10	2780	Lin Ft	28.22	$78,451.60
550-4218	Flared End Section 18 In, Storm Drain	35	Ea	443.31	$15,515.85
	TOTAL				$797,162.43

20 ft Raise Grass Median

441-0754	Concrete Median 7 1/2 In	3049	SY	38.86	$118,484.14
441-6740	Conc Curb & Gutter, 8 in X 30 In, TP 7	20825	Lin Ft	14.58	$224,791.75
668-1100	Catch Basin GP 1	35	Ea	2032.11	$71,123.85
550-1180	Storm Drain Pipe, 18 in, H 1 - 10	2780	Lin Ft	28.22	$78,451.60
550-4218	Flared End Section 18 In, Storm Drain	35	Ea	443.31	$15,515.85
206-0002	Borrow Matl, Incl Matl	1549	Cu Yd	3.85	$5,963.65
700-6910	Permanent Grassing	1.536	AC	614.21	$943.43
700-7000	Agricultural Lime	4.61	Tons	48.18	$222,11
700-8000	Fertilizer Mixed Grade	1.076	Tons	360.57	$387.97
700-8100	Fertilizer Nitrogen Content	77	LB	2.30	$177.10
163-0232	Temporary Grassing	0.768	AC	165.37	$127.00
163-0240	Mulch	6.912	Tons	165.06	$1,140.90
	TOTAL				$517,329.35

ATTACHMENT 15

HYDROLOGY STUDY FOR MS-4 AREAS

BASIN A:
TOTAL DA = 2.6 AC
ONSITE DA = 2.3 AC
OFFSITE DA = 0.3 AC
IMPERVIOUS AREA = 0.6 AC (CN=98)
PERVIOUS AREA, WOODS = 1.8 AC (CN=55)
PERVIOUS AREA, PASTURE = 0.2 AC (CN=61)
FLOW PATH = 1074 FT
FLOW PATH AVG SLOPE = 5.4%
AVG CN = 65
OUTFALL = DITCH TO ETOWAH RIVER
STORMWATER MANAGEMENT – ENHANCED SWALES, SILT FENCE, CHECK DAMS

BASIN B:
TOTAL DA = 3.5 AC
ONSITE DA = 2.5 AC
OFFSITE DA = 1.0 AC
IMPERVIOUS AREA = 0.9 AC (CN=98)
PERVIOUS AREA, WOODS = 0.5 AC (CN=55)
PERVIOUS AREA, PASTURE = 2.1 AC (CN=61)
FLOW PATH = 1084 FT
FLOW PATH AVG SLOPE = 5.2%
AVG CN = 70
OUTFALL = DITCH TO ETOWAH RIVER
STORMWATER MANAGEMENT – ENHANCED SWALES, SILT FENCE, CHECK DAMS

BASIN C:
TOTAL DA = 12.0 AC
ONSITE DA = 0.7 AC
OFFSITE DA = 11.3 AC
IMPERVIOUS AREA = 0.1 AC (CN=98)
PERVIOUS AREA, PASTURE = 11.9 AC (CN=61)
FLOW PATH = 1655 FT
FLOW PATH AVG SLOPE = 0.4%
AVG CN = 61
OUTFALL = 18” PIPE TO BASIN E

BASIN D:
TOTAL DA = 51.5 AC
ONSITE DA = 4.3 AC
OFFSITE DA = 47.2 AC
IMPERVIOUS AREA = 1.6 AC (CN=98)
PERVIOUS AREA, PASTURE = 49.9 AC (CN=61)
FLOW PATH = 2633 FT
FLOW PATH AVG SLOPE = 1.4%
AVG CN = 62
OUTFALL = 24” PIPE TO BASIN E

BASIN E:
TOTAL DA = 4.8 AC
ONSITE DA = 4.0 AC
OFFSITE DA = 0.8 AC
IMPERVIOUS AREA = 0.9 AC (CN=98)
PERVIOUS AREA, PASTURE = 3.9 AC (CN=61)
FLOW PATH = 2433 FT
FLOW PATH AVG SLOPE = 1.8%
AVG CN = 68
OUTFALL = DITCH TO ETOWAH RIVER
STORMWATER MANAGEMENT – ENHANCED SWALES, SILT FENCE, CHECK DAMS

BASIN F:
TOTAL DA = 132.8 AC
ONSITE DA = 2.1 AC
OFFSITE DA = 130.7 AC
IMPERVIOUS AREA = 8.0 AC (CN=98)
PERVIOUS AREA, WOODS = 9.7 AC (CN=55)
PERVIOUS AREA, PASTURE = 115.1 AC (CN=61)
FLOW PATH = 4497 FT
FLOW PATH AVG SLOPE = 0.8%
AVG CN = 63
OUTFALL = 18” PIPE TO BASIN H

BASIN G:
TOTAL DA = 50.8 AC
ONSITE DA = 16.1 AC
OFFSITE DA = 34.7 AC
IMPERVIOUS AREA = 5.0 AC (CN=98)
PERVIOUS AREA, RES. 1/3 AC LOTS = 19.8 AC (CN=72)
PERVIOUS AREA, WOODS = 3.3 AC (CN=55)
PERVIOUS AREA, PASTURE = 22.7 AC (CN=61)
FLOW PATH = 2981 FT
FLOW PATH AVG SLOPE = 3.7%
AVG CN = 69
OUTFALL = 24" PIPE TO EXISTING SYSTEM
STORMWATER MANAGEMENT AREA

BASIN H:
TOTAL DA = 40.4 AC
ONSITE DA = 3.4 AC
OFFSITE DA = 37.0 AC
IMPERVIOUS AREA = 7.7 AC (CN=98)
IMPERVIOUS AREA, LAKES = 8.1 AC (CN=98)
PERVIOUS AREA, RES. 1/4 AC LOTS = 24.5 AC (CN=75)
PERVIOUS AREA, PASTURE = 0.1 AC (CN=61)
FLOW PATH = 1649 FT
FLOW PATH AVG SLOPE = 0.3%
AVG CN = 84
OUTFALL = 2-30" PIPES TO BASIN G

BASIN J:
TOTAL DA = 2.2 AC
ONSITE DA = 0.1 AC
OFFSITE DA = 2.1 AC
PERVIOUS AREA, WOODS = 0.4 AC (CN=55)
PERVIOUS AREA, PASTURE = 1.8 AC (CN=61)
FLOW PATH = 551 FT
FLOW PATH AVG SLOPE = 5.8%
AVG CN = 60
OUTFALL = 30" PIPE TO BASIN H

BASIN K:
TOTAL DA = 4.4 AC
ONSITE DA = 0.1 AC
OFFSITE DA = 4.3 AC
PERVIOUS AREA, WOODS = 3.1 AC (CN=55)
PERVIOUS AREA, PASTURE = 1.3 AC (CN=61)
FLOW PATH = 903 FT
FLOW PATH AVG SLOPE = 6.2%
AVG CN = 57
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT – CREATE CLOSED SYSTEM THAT OUTFALLS IN BASIN N

BASIN L:
TOTAL DA = 5.3 AC
ONSITE DA = 0.2 AC
OFFSITE DA = 5.1 AC
PERVIOUS AREA, WOODS = 4.1 AC (CN=55)
PERVIOUS AREA, PASTURE = 1.2 AC (CN=61)
FLOW PATH = 796 FT
FLOW PATH AVG SLOPE = 8.7%
AVG CN = 56
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT – CREATE CLOSED SYSTEM THAT OUTFALLS IN BASIN N

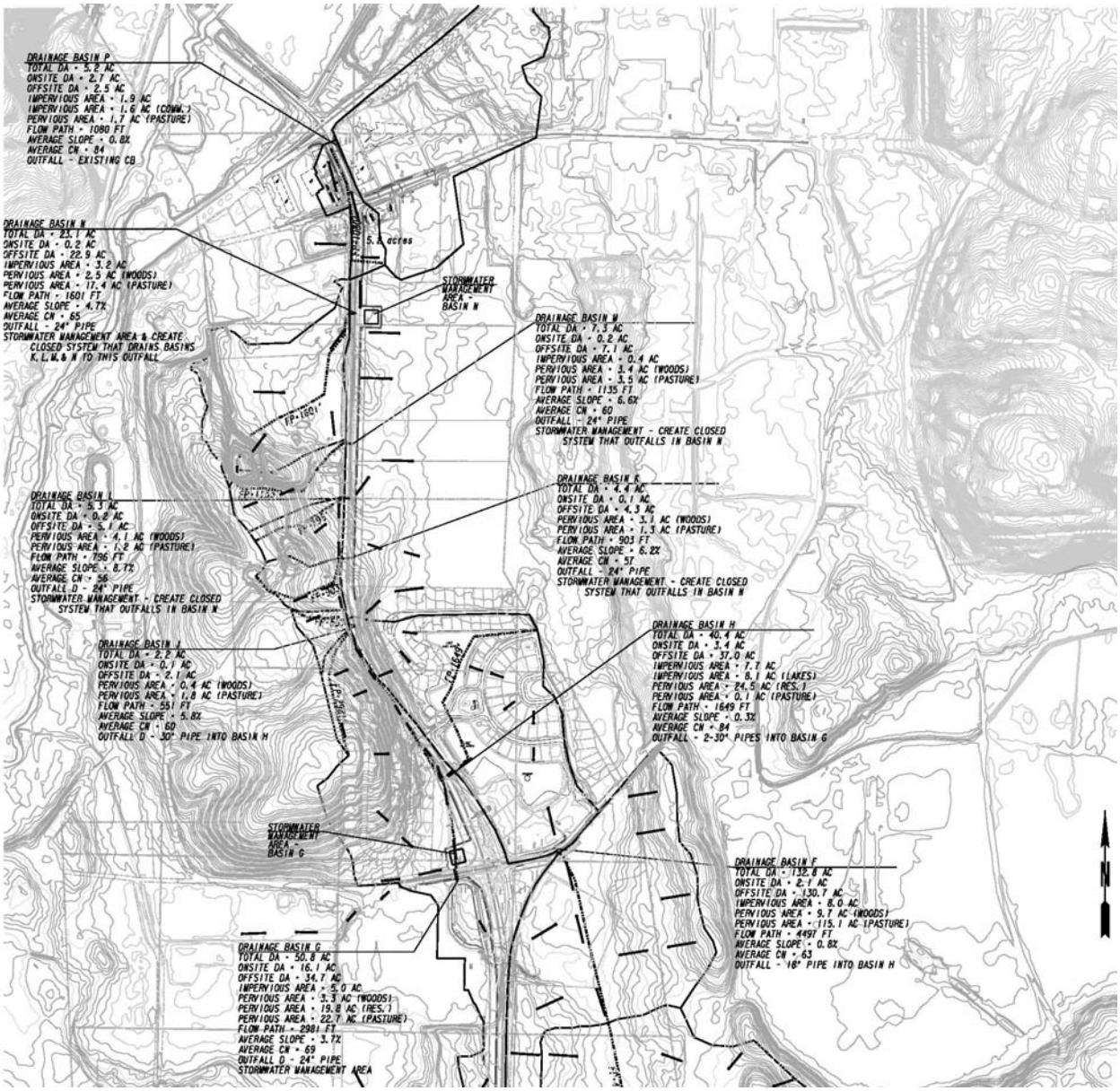
BASIN M:
TOTAL DA = 7.3 AC
ONSITE DA = 0.2 AC
OFFSITE DA = 7.1 AC
IMPERVIOUS AREA = 0.4 AC (CN=98)
PERVIOUS AREA, WOODS = 3.4 AC (CN=55)
PERVIOUS AREA, PASTURE = 3.5 AC (CN=61)
FLOW PATH = 1135 FT
FLOW PATH AVG SLOPE = 6.6%
AVG CN = 60
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT – CREATE CLOSED SYSTEM THAT OUTFALLS IN BASIN N

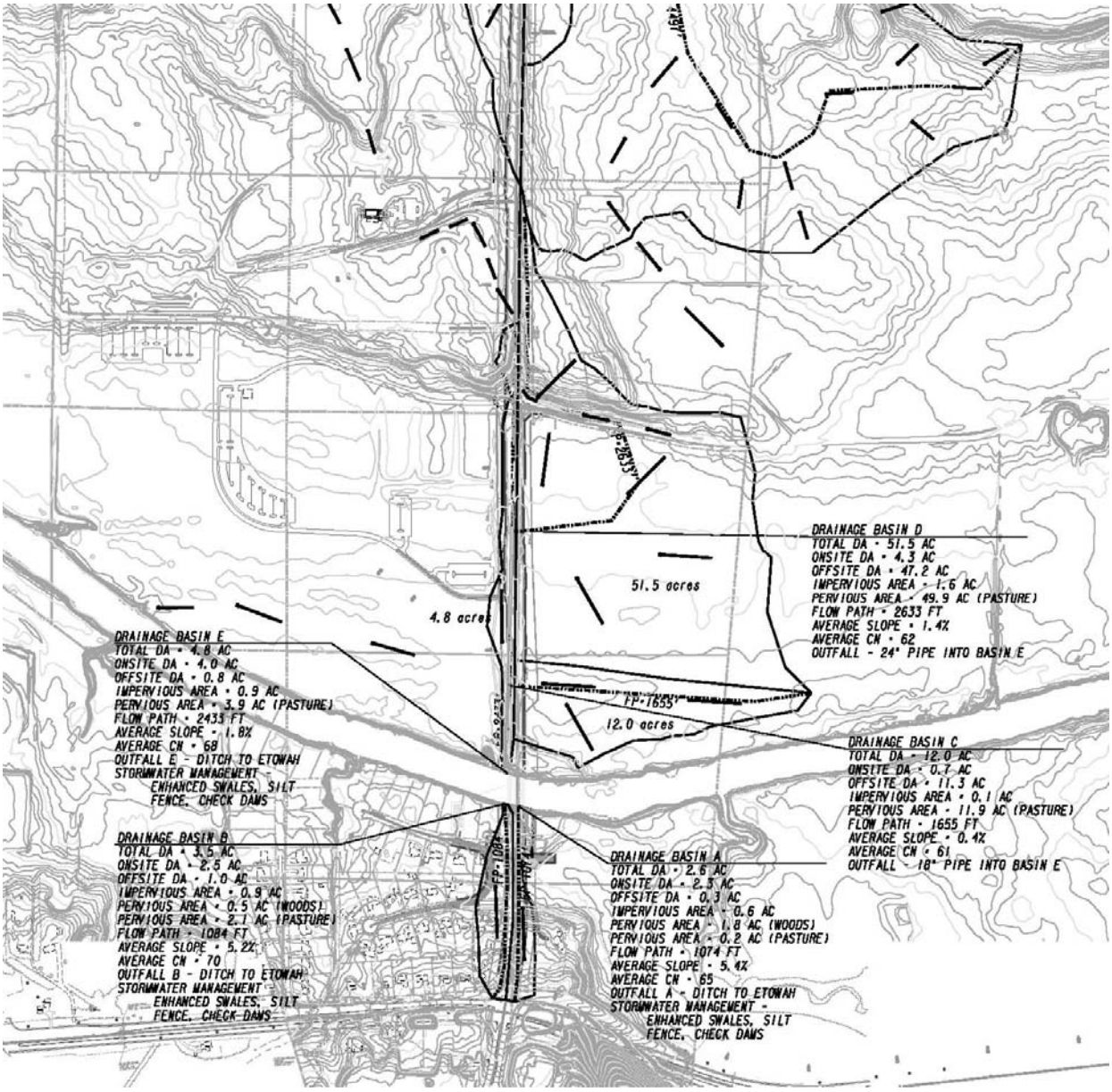
BASIN N:

TOTAL DA = 23.1 AC
ONSITE DA = 0.2 AC
OFFSITE DA = 22.9 AC
IMPERVIOUS AREA = 3.2 AC (CN=98)
PERVIOUS AREA, WOODS = 2.5 AC (CN=55)
PERVIOUS AREA, PASTURE = 17.4 AC (CN=61)
FLOW PATH = 1601 FT
FLOW PATH AVG SLOPE = 4.7%
AVG CN = 65
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT AREA AND CREATE CLOSED SYSTEM THAT DRAINS BASINS K,L,M & N TO THIS OUTFALL

BASIN P:

TOTAL DA = 5.2 AC
ONSITE DA = 2.7 AC
OFFSITE DA = 2.5 AC
IMPERVIOUS AREA = 1.9 AC (CN=98)
IMPERVIOUS AREA, COMM. = 1.6 AC (CN=92)
PERVIOUS AREA, PASTURE = 1.7 AC (CN=61)
FLOW PATH = 1067 FT
FLOW PATH AVG SLOPE = 0.8%
AVG CN = 84
OUTFALL = EXISTING CATCH BASIN


DRAINAGE BASIN P
TOTAL DA = 5.2 AC
ONSITE DA = 2.7 AC
OFFSITE DA = 2.5 AC
IMPERVIOUS AREA = 1.9 AC
IMPERVIOUS AREA = 1.6 AC (COMM.)
PERVIOUS AREA = 1.7 AC (PASTURE)
FLOW PATH = 1080 FT
AVERAGE SLOPE = 0.8%
AVERAGE CN = 84
OUTFALL = EXISTING CB
DRAINAGE BASIN N
TOTAL DA = 25.1 AC
ONSITE DA = 0.2 AC
OFFSITE DA = 22.9 AC
IMPERVIOUS AREA = 3.2 AC
PERVIOUS AREA = 2.5 AC (WOODS)
PERVIOUS AREA = 17.4 AC (PASTURE)
FLOW PATH = 1601 FT
AVERAGE SLOPE = 4.7%
AVERAGE CN = 65
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT AREA & CREATE CLOSED SYSTEM THAT DRAINS BASINS K, L, M, & N TO THIS OUTFALL
5.5 acres
STORMWATER MANAGEMENT AREA - BASIN N
DRAINAGE BASIN M
TOTAL DA = 7.3 AC
ONSITE DA = 0.2 AC
OFFSITE DA = 7.1 AC
IMPERVIOUS AREA = 0.4 AC
PERVIOUS AREA = 3.4 AC (WOODS)
PERVIOUS AREA = 3.5 AC (PASTURE)
FLOW PATH = 1135 FT
AVERAGE SLOPE = 6.6%
AVERAGE CN = 60
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT - CREATE CLOSED SYSTEM THAT OUTFALLS IN BASIN N
DRAINAGE BASIN K
TOTAL DA = 4.4 AC
ONSITE DA = 0.1 AC
OFFSITE DA = 4.3 AC
PERVIOUS AREA = 3.1 AC (WOODS)
PERVIOUS AREA = 1.3 AC (PASTURE)
FLOW PATH = 903 FT
AVERAGE SLOPE = 6.2%
AVERAGE CN = 57
OUTFALL = 24" PIPE
STORMWATER MANAGEMENT - CREATE CLOSED SYSTEM THAT OUTFALLS IN BASIN N
DRAINAGE BASIN L
TOTAL DA = 5.3 AC
ONSITE DA = 0.2 AC
OFFSITE DA = 5.1 AC
PERVIOUS AREA = 4.1 AC (WOODS)
PERVIOUS AREA = 1.2 AC (PASTURE)
FLOW PATH = 796 FT
AVERAGE SLOPE = 8.7%
AVERAGE CN = 56
OUTFALL D = 24" PIPE
STORMWATER MANAGEMENT - CREATE CLOSED SYSTEM THAT OUTFALLS IN BASIN N
DRAINAGE BASIN J
TOTAL DA = 2.2 AC
ONSITE DA = 0.1 AC
OFFSITE DA = 2.1 AC
PERVIOUS AREA = 0.4 AC (WOODS)
PERVIOUS AREA = 1.8 AC (PASTURE)
FLOW PATH = 551 FT
AVERAGE SLOPE = 5.8%
AVERAGE CN = 60
OUTFALL D = 30" PIPE INTO BASIN H
DRAINAGE BASIN H
TOTAL DA = 40.4 AC
ONSITE DA = 3.4 AC
OFFSITE DA = 37.0 AC
IMPERVIOUS AREA = 7.7 AC
IMPERVIOUS AREA = 8.1 AC (LAKES)
PERVIOUS AREA = 24.5 AC (RES.)
PERVIOUS AREA = 0.1 AC (PASTURE)
FLOW PATH = 1649 FT
AVERAGE SLOPE = 0.3%
AVERAGE CN = 84
OUTFALL = 2-30" PIPES INTO BASIN G
STORMWATER MANAGEMENT AREA - BASIN G
DRAINAGE BASIN F
TOTAL DA = 132.8 AC
ONSITE DA = 2.1 AC
OFFSITE DA = 130.7 AC
IMPERVIOUS AREA = 8.0 AC
PERVIOUS AREA = 9.7 AC (WOODS)
PERVIOUS AREA = 115.1 AC (PASTURE)
FLOW PATH = 4497 FT
AVERAGE SLOPE = 0.8%
AVERAGE CN = 63
OUTFALL = 18" PIPE INTO BASIN H
DRAINAGE BASIN G
TOTAL DA = 50.8 AC
ONSITE DA = 16.1 AC
OFFSITE DA = 34.7 AC
IMPERVIOUS AREA = 5.0 AC
PERVIOUS AREA = 3.3 AC (WOODS)
PERVIOUS AREA = 19.8 AC (RES.)
PERVIOUS AREA = 22.7 AC (PASTURE)
FLOW PATH = 2981 FT
AVERAGE SLOPE = 3.7%
AVERAGE CN = 69
OUTFALL D = 24" PIPE
STORMWATER MANAGEMENT AREA
FP=1601'
FP=1595'
FP=1595'
N


DRAINAGE BASIN D
TOTAL DA = 51.5 AC
ONSITE DA = 4.3 AC
OFFSITE DA = 47.2 AC
IMPERVIOUS AREA = 1.6 AC
PERVIOUS AREA = 49.9 AC (PASTURE)
FLOW PATH = 2633 FT
AVERAGE SLOPE = 1.4%
AVERAGE CN = 62
OUTFALL = 24" PIPE INTO BASIN E
51.5 acres
4.8 acres
DRAINAGE BASIN E
TOTAL DA = 4.8 AC
ONSITE DA = 4.0 AC
OFFSITE DA = 0.8 AC
IMPERVIOUS AREA = 0.9 AC
PERVIOUS AREA = 3.9 AC (PASTURE)
FLOW PATH = 2433 FT
AVERAGE SLOPE = 1.8%
AVERAGE CN = 68
OUTFALL E - DITCH TO ETOWAH
STORMWATER MANAGEMENT -
ENHANCED SWALES, SILT
FENCE, CHECK DAMS
FP-1655'
12.0 acres
DRAINAGE BASIN C
TOTAL DA = 12.0 AC
ONSITE DA = 0.7 AC
OFFSITE DA = 11.3 AC
IMPERVIOUS AREA = 0.1 AC
PERVIOUS AREA = 11.9 AC (PASTURE)
FLOW PATH = 1655 FT
AVERAGE SLOPE = 0.4%
AVERAGE CN = 61
OUTFALL = 18" PIPE INTO BASIN E
DRAINAGE BASIN B
TOTAL DA = 3.5 AC
ONSITE DA = 2.5 AC
OFFSITE DA = 1.0 AC
IMPERVIOUS AREA = 0.9 AC
PERVIOUS AREA = 0.5 AC (WOODS)
PERVIOUS AREA = 2.1 AC (PASTURE)
FLOW PATH = 1084 FT
AVERAGE SLOPE = 5.2%
AVERAGE CN = 70
OUTFALL B - DITCH TO ETOWAH
STORMWATER MANAGEMENT -
ENHANCED SWALES, SILT
FENCE, CHECK DAMS
FP-1074'
DRAINAGE BASIN A
TOTAL DA = 2.6 AC
ONSITE DA = 2.3 AC
OFFSITE DA = 0.3 AC
IMPERVIOUS AREA = 0.6 AC
PERVIOUS AREA = 1.8 AC (WOODS)
PERVIOUS AREA = 0.2 AC (PASTURE)
FLOW PATH = 1074 FT
AVERAGE SLOPE = 5.4%
AVERAGE CN = 65
OUTFALL A - DITCH TO ETOWAH
STORMWATER MANAGEMENT -
ENHANCED SWALES, SILT
FENCE, CHECK DAMS

ATTACHMENT 16

VE IMPLEMENTATION LETTER

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: CSSTP-0007-00(494)
P.I. No.: 0007494
Douthit Ferry Road Widening

OFFICE: Engineering Services

DATE: February 1, 2013

FROM: Lisa L. Myers, State Project Review Engineer

TO: Genetha Rice-Singleton, State Program Delivery Engineer
Attn.: Leonora Leigh

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

The VE Study for the above project was held October 29 - November 1, 2012. The revised responses were received on February 1, 2013. Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. The Project Manager shall incorporate the VE alternatives recommended for implementation to the extent reasonable in the design of the project. Please note, if the implementation of a VE recommendation requires a Design Exception and/or Design Variance, the DE or DV must be requested separately.

ALT #	Description	Potential Savings/ LCC	Implement	Comments
P-1	Reduce interior lane width from 12 feet to 11 feet.	$145,000	Yes	This will be done.
P-2	Reduce median width from 20 feet to 16 feet.	Proposed = $325,000 Actual = $75,000	No	The City of Cartersville is in a permitted area for MS-4 and a 20' wide median can accommodate the features to control the runoff of Total Suspended Solids (TSS) without purchasing additional required Right of Way for the construction of those features. This project qualifies as a 5-lane section but the 20' median provides better visibility with the larger offset for left turn lanes. See attached calculations for the actual cost savings for this alternative.
P-4	Reduce the median width from 20 feet to 8 feet from Carrington Drive/Carter Grove Circle to the First Baptist Church of Cartersville Driveway.	$195,000	No	As stated in P-2, a 20' median can accommodate MS-4 requirements on the project by controlling the runoff of TSS with enhanced swales and other features. An 8' median would not be able to accommodate those features. The City of Cartersville also plans to make this an aesthetic corridor by landscaping the median.

P-5	Use multi-use path and remove on-road bike lanes from the bridge to the roundabout.	$139,000	No	The Complete Streets Design Policy Ch. 9.5.2 states that "shared use paths are intended to supplement a network of on road facilities, not replace them." There are two designated bike trails located on this project (Route 123 & Route 140) which are included in the Bartow County and City of Cartersville Transportation Plan as well as other projects in the area. Attachments (2) have been included to illustrate the other Transporation Enhancement Project Locations.
P-7	Use rural shoulders on west side of Douthit Ferry Road from Sta.116+18 to 167+00 and move bike lane to the paved shoulder.	$206,600	No	This segment of Douthit Ferry Road is traveled by pedestrians from the residential areas to access the two churches, middle school, and park. It also meets the criteria in the Complete Streets Design Policy, Chapter 9.4.1 Pedestrian Warrants. Plans for future development already include a third church, elementary school, and more residential and commercial units.
P-7.1	Use rural shoulders on east side of Douthit Ferry Road from Sta.115+00 to 169+00 and move bike lane to the paved shoulder and remove the sidewalk	$367,000	No	This segment of Douthit Ferry Road is traveled by pedestrians from the residential areas to access the two churches, middle school, and park. It also meets the criteria in the Complete Streets Design Policy, Chapter 9.4.1 Pedestrian Warrants. Plans for future development already include a third church, elementary school, and more residential and commercial units.
P-9	Use a 5-lane section in lieu of the 4-lane with a 20' raised median.	$124,000	No	The need for a separated divided roadway is to connect two major roadways (SR 61 and the future SR 113). The 5-lane section alternative will not be able to accommodate MS-4 requirements without requiring additional Right of Way.
P-13	Shift Roundabout south to allow for constructability and reduced Right of Way impacts.	$321,000	No	Shifting the roundabout south will negatively impact the new bus driveway for the middle school which has curves already designed near the minimum based on Auto Turn. This shift would also affect the faculty parking lot which would have to be replaced. See those costs included in the attachments for P-13.

CSSTP-0007-00(494)
Implementation of Value Engineering Study Alternatives

P.I. No. 0007494
Page 3

E-1	Lower the profile grade at the proposed roundabout.	Proposed = $321,000 Actual = $446,720	Yes, with modifications	The vertical profile will be lowered 5 feet instead of the recommended 8.5 feet to maintain positive drainage at the intersection. However, see the attached calculations for additional savings along Pine Grove Road.
E-3	Remove redundant ditches along both sides of Douhit Ferry Road.	$2,480,000	Yes	This will be done.
RW-3	Narrow the Right of Way and use easements instead.	$338,000	Yes	This will be done.
RW-4	Re-align connection of Park Court to Riverside Court.	Proposed = $125,000 Actual = $62,500	No	The alternative alignment will not avoid all damages to the adjacent parcels: 5, 6, 46, & 47. See the attached sketch for RW-4 which was re-drawn during the consideration of this design alternative.
B-2	Review bridge design and proposed layout.	$0	No	The alignment previously shown at the VE Study no longer applies to the current design. With guidance from the GDOT Bridge Office the design team will maintain the location of the current proposed centerline which requires widening of the existing bridge on both the east and west sides.
P-10	Use a realistic unit cost for the proposed 8 inch concrete pavement.	$0	Yes	There is no cost savings associated with this suggestion, but the Office of Materials recommends the design team to use a unit price of $43/SY in future cost estimates.

The Office of Engineering Services concurs with the Project Manager's responses.

Approved: _____ **Date:** 2/5/13
Russell McMurry, P.E., Chief Engineer

LLM/MJS
Attachments

c: Russell McMurry
Genetha Rice-Singleton/Albert Shelby/Leonora Leigh
Mark Mastronardi/Melissa Harper

Ben Raburn/Bill Duvall
Carla Benton-Hooks/Pam Baughman
Patrick Bowers
Ken Werho
Matt Sanders

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: CSSTP-0007-00(494), Bartow County
P.I. No.: 0007494
CR343/Douthit Ferry Road from
Old Alabama Rd to SR61/SR113

OFFICE: Program Delivery

DATE: December 19, 2012

Albert Shelby for

FROM: Genetha Rice-Singleton, State Program Delivery Engineer

TO: Lisa Myers, State Project Review Engineer
Attn: Matt Sanders, Value Engineering Specialist

SUBJECT: RESPONSE TO VALUE ENGINEERING STUDY ALTERNATIVES

Attached are the responses for the Value Engineering Study. This office concurs with the responses.

If you have any questions, please contact Leonora Leigh, Project Manager at 678-580-8798

GRS:AVS:LEL
c: Russell McMurry

RESPONSE TO VALUE ENGINEERING REPORT DATED NOVEMBER 19, 1012

Douthit Ferry Road Widening
City of Cartersville
Bartow County
CSSTP-0007-00 (494) – PI No. 0007494

For Submission and Approval By:

Georgia Department of Transportation
600 West Peachtree Street
Atlanta, GA 30308

On Behalf of

Cartersville
Be Charmed • Be Prosperous • Belong

City of Cartersville
Public Works Department
330 South Erwin Street
Cartersville, GA 30120

Prepared By

SOUTHLAND ENGINEERING
CIVIL ENGINEERS - LAND SURVEYORS - LAND PLANNERS
925 North Tennessee Street Cartersville, Georgia 30120
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VE Team Recommended Savings: $4,823,000
VE Team Revised Savings: $4,386,800
Southland Engineering / City of Cartersville Proposed Savings: $3,409,500

Implementation of Value Engineering Study Alternatives
Douthe Ferry Rd Widening – P.I. 0007494

ALT #	Description	Southland Potential Savings/ LCC	Implement	Comments
P-1	Reduce interior lane width from 12 ft to 11 ft	$145,000	Yes	This will be done.
P-2	Reduce median width from 20 ft to 18 ft	(Revised Savings) $75,000	No	The City of Cartersvile will be in a Permitted Area for MS 4 beginning December 2012. A 20' median can accommodate the contro features to control the runoff of TSS. This project also qualifies as a 5-lane section purchasing R/W for a desirable 24' median or a minimum 20' median. The 20' median reduces the R/W and allows for construction of MS-4 requirements without purchasing additional R/W for their construction. The 20' median provides better site visibility with a larger offset of left turn lanes
P-4	Reduce the median width from 20 ft to 8 ft from Carrington Dr/Carter Grove Cir to First Baptist Church of Cartersville Driveway	$195,000	No	As stated in P-2, a 20' median can accommodate MS-4 requirements on the project by controlling the runoff of TSS with enhanced swales and other control features. An 8' median would not accommodate the MS-4 features. This project also qualifies as a 5-lane section purchasing R/W for a desirable 24' median or a minimum 20' median. The 20' median reduces the R/W and allows for construction of MS-4 requirements without purchasing additional R/W for their construction. The 20' median provides better site visibility with a larger offset of turn lanes. The City of Cartersville also has plans to make this an aesthetic corridor by landscaping the median. The 8' median will not accommodate this.

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P-5	Use multi-use path and remove on-road bike lane from the bridge to the roundabout.	$0	No	We are following the guidelines set forth in the Complete Streets Design Policy. Chapter 9.5.2 Item 3 - Shared Use Paths. Shared Use Paths are intended to supplement a network of on-road facilities, not replace them. There are two designated bike trails on this project - Route 125 and Route 145. The Bartow/Cartersville Long Range Transportation Plan includes Bicycle and Pedestrian Action Items with recommended goals. Projects have been identified in this area as part of the Bartow/Cartersville Short Term Transportation Study. AASHTO Guidance on "Side Paths" states that on paths adjacent to roadways, motorists often do not notice bicyclists approaching from their right.
P-7 and P-7.1	Use rural shoulders with paved bike lanes on both sides of Douthit Ferry Rd from the bridge to the roundabout. Remove sidewalk from the east side.	$208,600 and $367,700	No	This segment of Douthit Ferry Rd is traveled by pedestrians with anticipated future growth. Currently there are residential areas, 2 churches, a middle school and a park. Future plans for a mixed-use development include a 3rd church, residential units and commercial development. A property adjacent to the middle school is zoned for a future elementary school. Rural shoulders on both sides of Douthit Ferry Rd will not accommodate safe passage of the anticipated pedestrian traffic along this corridor. This segment of Douthit Ferry Rd. meets the criteria in the Complete Streets Design Policy, Chapter 9.4.1 Pedestrian Warrants.
P-9	Use a 5-lane section	$0	No	The City's need for a separated divided roadway is to connect two major roadways - Old Alabama Road (future SR 113) and SR 61/SR 113. This project is also part of a future City Plan of a western bypass that will connect Old Alabama Rd with US 411. A 5-lane section will increase the conflict points by 60% over a raised median section. MS-4 requirements for this project would need to be constructed on additional R/W. As the corridor develops a raised median section will be needed, requiring bridge widening, additional roadway widening and drainage structures, removing all curb and gutter and sidewalks and extending drainage structures and more R/W acquisition.

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P-13	Shift roundabout south to allow for constructibility and reduced R/W impacts	(Revised Savings) $265,810	No	Shifting the roundabout south will negatively impact the middle schools new bus driveway that has been approved by local school officials. Moving the roundabout south will impact the drive as the curves are already near the minimum design requirements based on Auto Turn. Shifting the roundabout south will also negatively impact the faculty parking lot requiring redesign and reconstruction to replace the displaced spaces.
E-1	Lower the grade at the proposed roundabout	(Revised Savings) $446,720	Yes	We will lower the roundabout by 5' instead of the recommended 8.5' to maintain positive drainage at the intersection. Lowering the grade will also reduce R/W providing additional savings.
E-3	Remove redundant ditches along both sides of the Douthit Ferry Rd	$2,480,000	Yes	This will be done.
RW-3	Narrow the Right of Way and use easements	$338,000	Yes	This will be done.
RW-4	Realign the connection of Park Ct to Riverside Ct	(Cost Increase) $62,500	No	The realignment will not avoid damages to Parcels 5 & 6 and will add additional relocations of Parcels 46 & 47.
B-2	Review bridge design and layout	$0	No	VE Team recommended shifting the road in order to match the centerline of the existing bridge. The design has changed since the VE Study to widen the road and bridge to the east side. We will maintain the road alignment across the bridge, widening the bridge to both the west and east sides. We will use one bridge by widening the existing bridge and carry the 0 ft raised median across it.
P-10	Use a realistic unit cost for 8 inch concrete pavement	$0	Yes	The Office of Materials recommends using a unit price of $43

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Recommendation P-1: Reduce interior lane width from 12 ft to 11 ft
VE Team Savings: $145,000

Yes will implement

Recommendation P-2: Reduce median width from 20 ft to 16 ft
VE Team Savings: $325,000

No, will not implement. The City of Cartersville will be in a Permitted Area for MS-4s in December 2012. A 20' median can accommocate MS-4 requirements on the project. The plan to meet the MS-4 along the corridor is to use the 20 ft grass median to control the runoff of total suspended solids (TSS) with enhanced swales and other types of control features. By putting the controls in the median this would save additional rights of way along the corridor to provide these TSS controls at the toe of the slopes. The Additional ROW cost is $250,000 as shown on the attachment for P-2. This project qualifies in the Design Project Manual on page 6-14, Table 6.3 as a 5-lane section purchasing right of way for a desirable 24 ft raised median or a minimum 20 ft raised median. The 20 ft minimum median was chosen to reduce rights of way and still provide room for the TSS features to be constructed. Also the 20 ft median wil provide better site visibility as there s more room to offset the turn lanes.

Proposed Revised Savings: $75,000. See attached calculations.

Recommendation P-4: Reduce the median width from 20 ft to 8 ft from Carrington Drive/Carter Grove Circle to First Baptist Church Cartersville Driveway
VE Team Savings: $195,000

No, will not implement. As stated in P-2, a 20' median can accommodate MS-4 requirements on the project. The plan to meet the MS-4 along the corridor is to use the 20 ft grass median to control the runoff of tota suspended solids (TSS) with enhanced swales and other types of control features. The recommended 8 ft median would not accommodate the MS-4 features. This project qualifies in the Design Project Manual on page 6-14, Table 6.3 as a 5-lane section purchasing right of way for a desirable 24 ft raised median or a minimum 20 ft raisec median. The 20 ft minimum median was chosen to reduce rights of way and still provide room for the TSS features to be constructed. Also the 20 ft median will provide better site visibility as there is more room to offset the turn lanes. Also the City of Cartersville has plans to landscape the grass mecian to make Douthit Ferry Road an aesthetic corridor entering the city from Old Alabama Road on the south side of Cartersville.

Recommendation P-5: Use multi-use path and remove on-road bike lane from the bridge to the roundabout
VE Team Savings: $139,000

No, will not implement. We are following the guidelines set forth in the Complete Streets Design Policy on page 9-16, Chapter 9.4.1, Pedestrian Warrants and page 9-25, Chapter 9.5.2 Bicycle Accommodat on Design, Item 3, Shared-Use Paths. The Design Policy Manual states on page 9-25 under Section 3, Shared Use Paths that shared-use paths are intended to supplement a network of on-road facilites and should not be used as an alternate for an on-road bikeway. Page 9-16 and 9-17 have standards and guidelines that this corridor meets. 1. There are pecestrian and bike traffic generators in the area as there are churches schools, residential neighborhoods, and a park. 2. There is evidence of pedestrian traffic along the corridor. 3. The City of Cartersville indicates there is a need for the bike and pedestrian facilities 4. There are two designated bike routes, Route 125 and Route 145, along the corridor. 5. There are two projects under design in the area now through the Transportation Enhancement Funding Program. P.I. No. 0010700 Bartow is the Petit Creek Trail Phase III. The project begins across SR 61/113 from this project with a sidewalk then a shared-use path and runs north to connect to an existing shared-use path. There is also under design P.I. No. 0008057 which begins at SR 61 / SR 113 approximately 2100 ft west of the Douthit Ferry Road/ SR 61/ SR 113 ntersection and runs south until it connects to an existing multi-use trail. This existing multi-use trail connects to Douthit Ferry Road. The location maps are attached. 6. There is Bicycle and Pedestrian Action Items induced in Table 6.1 of Bartow/Cartersville Long Range Transportation Plan, there are also

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maps and recommended pedestrian goals and projects identified in the Bartow/Cartersville Short Term Transportation Study. Information on item six was obtained from the City of Cartersville. 7. The City of Cartersville and Bartow County have a large community of avid bike riders. Previous training on the subject of parallel multi-use paths has indicated the following: AASHTO Guidance on "Side Paths" - some problems with paths located immediately adjacent to roadways - 3. At intersections, motorists entering or crossing the roadway often do not notice bicyclists approaching from their right, they are not expecting contra-flow vehicles. A motorist turning to exit the roadway may likewise fail to notice the bicyclist coming from the left, especially when site distances are limited.

Recommendation P-7: Use rural shoulders on west side of Douthit Ferry Road from station 116+18 to station 157+00. Move bike lane to paved shoulder.
VE Team Savings: $206,600

Recommendation P-7.1: Use rural shoulders on east side of Douthit Ferry Road from station 115+00 to station 169+00. Move bike lane to paved shoulder. Remove sidewalk.
VE Team Savings: $367,700

Response to items P-7 and P-7.1 - No, will not implement. This segment of Douthit Ferry Road is traveled by pedestrians with anticipated growth in the future. Currently, there are residential neighborhoods, 2 churches, a middle school, and a park. Future plans for a mixed-use development that include a 3rd church, residential units and commercial development are under way. There is also a property adjacent to the middle school that is zoned for a future elementary school. Rural shoulders on either side of Douthit Ferry Road will not accommodate safe passage of the anticipated pedestrian traffic along this corridor. The GDOT Pecestrian and Streetscape Guide states in Toolkit 5 page 92, that the desirable separation between the edge of the street and the walkway is 5 ft with a minimum of 2 ft. It also states on the same page that Sidewalks are typically raised and located adjacent to curbs. Since the curb and gutter section provides a separation of 4.5ft (2.5 ft curb and gutter – 2 ft grass strip) the rural shoulder would need to be 12.5 ft (5 ft separation 5 ft sidewalk 2.5 ft to shoulder point) to provide the necessary separation from the edge of pavement. This also does not allow for a bicycle lane on the shoulder unless bikers ride on the sidewalk. This segment meets the criteria stated in the Georgia Design Policy Manual, Chapter 9.4.1. Pedestrian Warrants page 9-16 and explained above under item P-5. There is Bicycle and Pedestrian Action Items included in Table 6.1 of Bartow/Cartersville Long Range Transportation Plan there are also maps and recommended pedestrian goals and projects identified in the Bartow/Cartersville Short Term Transportation Study. Information on the Long Range Transportation Plan was obtained from the City of Cartersville.

Recommendation P-9: Use a 5-lane section
VE Team Savings: $124,000

No, will not implement. The purpose of a separated divided roadway is control of access and ease of operation. The City's need for this type of facility is to connect two major roadways. SR 61 /SR 113 a divided roadway on the north and Old Alabama Road which is under design by GDOT as a depressed median on the south. Old Alabama Road wil become SR 113 when completed. This project is also a part of a future City plan of a western bypass that will connect Old Alabama Road with US 411 approximately 0.75 miles west of SR 3/US 41 north of Cartersville. A project is on a SPLOST list that will connect Bunt Hickory Road to US 411 at 0.75 miles west of SR3 / US 41 at a new access break that has already been approved by GDOT. The Douthit Ferry Road corridor is developing. The north end of the project is commercial/incustrial. The rest of the project has residentia neighborhoods, 2 churches, a middle school, and a park. Future plans for a mixed-use development that include a 3rd church, residential units, a retirement community, and commercial developments are under way. There is also a property adjacent to the middle school that is zoned for a future elementary school. There are 60% more conflict points (131 with the raised median – 209 with flush median) along the flush median proposed by P-9 than a raised median. These conflict points do not include pedestrian conflicts which would also increase. These conflict points are the result of driveways along the corridor for residential and commercial connections. P-9 states that "most of this corridor is residential and park land and will be controlled". The VE team does not indicate how the corridor will be controlled. Whatever way the access controls are accomplished there will be additional access points required to accommodate the developments along the corridor. This project qualifies in the Design Project Manual on page 6-14, Table 6.3 as a 5-

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lane section purchasing right of way for a desirable 24 ft raised median or a minimum 20 ft raised median. The draft concept report provided to the VE Team indicates that a 20 ft raised median will cost $152,361 less to construct than a flush median section with the purchase of rights of way for a 20 ft future raised median. Also, if the project is constructed as a 5-lane flush median section, when the corridor grows as expected and a raised median is needed, the sidewalks, curb and gutter, drainage, utilities, and rights of way required would be relocated on one side of the entire corridor to accommodate the raised median. Also the bridge constructed on this project would require widening to accommodate the raised median. The bridge and roadway items would be an additional cost of approximately $2,132,000.This does not include the additional rights of way that would be necessary. The plan to meet the MS-4 along the corridor is to use the 20 ft grass median to control the runoff of total suspended solids (TSS) with enhanced swales and other types of control features. By putting the controls in the median this would save additional rights of way to provide these TSS controls at the toe of the slopes. Therefore, since a 5-lane facility with a flush median does not meet the needs of the corridor and the City of Cartersville and Bartow County SPLOST list for a western bypass, the increase of conflict points, the use of the median to control total suspended solids, and ongoing and expected development along the corridor it is not recommended to implement this item.

Recommendation P-13: Shift roundabout south to allow for constructability and reduced RW impacts.
VE Team Savings: $321,000

No, will not implement - Shifting the roundabout south will negatively impact the middle school by interfering with the design of the new middle school bus drive which has been shown to the local school officials. They were very pleased and in favor of the design and this is one of the factors in the local government's decision in approving the roundabout and signing the Letter of Support. The bus drive design separates the school bus traffic from the car traffic including teachers and parents. Moving the roundabout south will impact the drive as the curves are already close to minimum design based on auto turn. This item will cause the relocation of 20 parking spaces in the Cartersville Middle School teacher parking lot at a cost of $55,190. The sketch and calculations are attached. Some of the ROW savings mentioned in P-13 will be realized in E-1 as lowering the grade reduces the ROW along Pine Grove Road. Please see E-1 for details.

Proposed Revised Savings: $265,810. See attached calculations.

Recommendation E-1: Lower the grade at the proposed roundabout
VE Team Savings: $321,000

Yes, Partial Implementation: The grade will be lowered 5 ft instead of 8.5 ft to allow for positive drainage at the intersection. The revised cost savings are $254,500. See Attachment for E-1 for calculations. By lowering the grade on Item E-1, the design can be improved on Pine Grove Road. We can improve constructability and reduce the rights of way with a savings of $170,000. Also Permanent Easement will be used to construct the slopes. This is a savings of $22,220.00. This is a total savings of $192,220.00.

Proposed Revised Savings: $446,720. See attached calculations.

Recommendation E-3: Remove redundant ditches along both sides of Douthit Ferry Road
VE Team Savings: $2,480,000

Yes, will implement.

Recommendation RW-3: Narrow the Right of Way and use easements
VE Team Savings: $338,000

Yes, will implement.

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Recommendation RW-4: Realign connection of Park Court to Riverside Court.
VE Team Savings: $126,000

No, will not implement; the realignment will not avoid damages on Parcels 5 & 6 and will relocate parcels 46 and 47 as it appears on the sketch shown by the VE Study. The VE Study sketch does not consider the construction of the 12 ft urban shoulders construction limits, and rights of way necessary to construct the realigned roadway. A new sketch is provided that has the 12 ft urban shoulder, construction limits and approximate rights of way shown. The reduction or avoidance of the administrative fees associated with commendation filings will not be realized as two condemnations will still be required in parcels 46 and 47 and parcel 6 would still be a condemnation. Also parcel 5 would have damages as the driveway to the house would need to be relocated. So an additional cost of a third condemnation would be necessary. The VE Study estimated $62,500 per parcel for administrative cost which is based on the ROW estimate in the draft concept report. This amount of $62,500 would be an additional cost to the project. Therefore since the realignment will not produce the savings as thought by the VE Study and the alignment as designed only produces two condemnations instead of three, it is not recommended to implement item RW-4.

Cost Increase: $62,500. See attached calculations.

Design Consideration B-2: Review bridge design and layout.
VE Team Savings: $0

No, will not implement as suggested in the VE Study to shift the road in order to match the centerline of the existing bridge. The alignment that is shown on Design Recommendation B-2 no longer applies to the current design. The proposed plans used at the VE Study included an alignment that shifted the bridge widening/parallel bridge to the west side of the existing bridge using a 20 ft raised median. This was the alignment suggested by the Eastern band of tribes at that time. While the VE Study was ongoing, a webinar was held on October 31, 2012 with the Eastern band of tribes. OES facilitated this meeting with the necessary attendees. The tribes, after further discussion, agreed and decided to use an alignment that widens to the east side of the existing bridge using an 8 ft median. We will now design the bridge using an 8 ft median and carry that median across the bridge. This is being constructed this way to avoid the mound site just north of the bridge on the right side. The 8 ft median across the bridge will consist of 4 ft raised median with 2 ft of gutter line on each side which matches the roadway section. Initially, the updated design included maintaining the existing bridge with all widening to the east side. However, this creates a shift in the roadway that the Bridge Office deems undesirable (as stated in an email from Bill Duvall, Assistant State Bridge Engineer, on Monday, January 28, 2013). With guidance from the Bridge Office, we will maintain the location of the current proposed centerline and road across the bridge which will require widening of the existing bridge on both the east and west sides while still continuing the 8 ft raised median across the bridge.

Design Consideration P-10: Use a realistic unit cost for 8 inch concrete pavement.
VE Team Savings: $0

Yes, will implement. We have consulted with the Office of Materials on the unit cost for 8" concrete pavement. AJ Jubran, the State Pavement Engineer, recommends using a unit price of $43 for this project as stated in an email received on Thursday, January 17, 2013.

Attachments:
Total Proposed Cost Savings in response, P-2 ROW Cost, P-5 Transportation Enhancement Location Maps, P-9 Cost Estimate, P-13 Cost and Sketch, Calculations and Sketches for E-1, RW-4 Calculations and Sketch, and B-2 Sketch

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Total Proposed Cost Savings in Response to VE Study

PROPOSED COST SAVINGS						
Item	Implement			Savings – VE Study*	Savings VE Study Revised**	VE Savings Proposed***
	Yes	No	Partial			
P-1	Y			$145,000	$145,000	$145,000
P-2		N		$325,000	$75,000	$0
P-4		N		$195,000	$195,000	$0
P-5		N		$0	$0	$0
P-7		N		$206,600	$206,600	$0
P7.'		N		$367,700	$367,700	$0
P-9		N		$0	$0	$0
P-13		N		$321,000	$265,810	$0
E-1			Y	$321,000	$321,000	$446,720
E-3	Y			$2,480,000	$2,480,000	$2,480,000
RW-3	Y			$338,000	$338,000	$338,000
RW-4		N		$125,000	(-$62,500)	$0
B-2		N		$0	$0	$0
P-10	Y			$0	$0	$0
TOTALS				$4,823,000	$4,386,800	$3,409,500

* Savings – VE Study: These numbers represent the cost savings calculated by the VE Study Team.
** Savings – VE Study, Revised: These numbers represent the revised cost savings calculated by Southland Engineering.
*** VE Savings, Proposed: These numbers are the proposed savings that will be implemented.

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Attachment for P-2 – Additional Right of Way Cost to place Swales and TSS Features at toe of Slope

Station	Side	Average width of Add'l ROW - FT	Type of land	Calculation	SQ FT
101+00 – 110+00	LT	15	R	900 X 15	13,500
101+00 – 110+00	RT	15	R	900 X 15	13,500
112+50 – 120+00	RT	8	R	800 X8	6,400
112+50 – 120+00	LT	15	CI	NA	NA
126+50 – 135+50	LT	8	CI	NA	NA
126+50 – 135+50	RT	8	R	1000 X 8	8,000
147+50 – 155+00	RT	15	C	750 X 15	11,250
147+50 – 155+00	LT	8	CI	NA	NA
180+00 – 181+00	RT	8	C CI	700 X 8 1400 X 8	5,600 NA
180+00 – 181+00	LT	15	R CI	900 X 15 1200 X 15	13,500 NA
182+00 – 205+00	RT	15	R C	1300 X 15 1000 X 15	19,500 15,000
215+00 – 220+00	LT	8	C	500 X 8	4,000
Totals			Commercial		35 850
			Residential		74 400

R = Residential Property = $25,000 per acre – Per ROW Estimate
C = Commercial Property = $250,000 per Acre – Per ROW estimate
CI = City of Cartersville Land – As per ROW Cost Estimate will be a donation with no cost.

TOTALS – Residential Property = 74,400 SF / 43560 = 1.708 Acres
1.708 X $25,000 per acre = $42,700

Commercial Property – 35,850 SF / 43560 = 0.823 Acres
0.823 X $250 000 per acre = $205,750

Total Cost to provide Swales and TSS Features at toe of slope = $248,450
Rounded to $250,000

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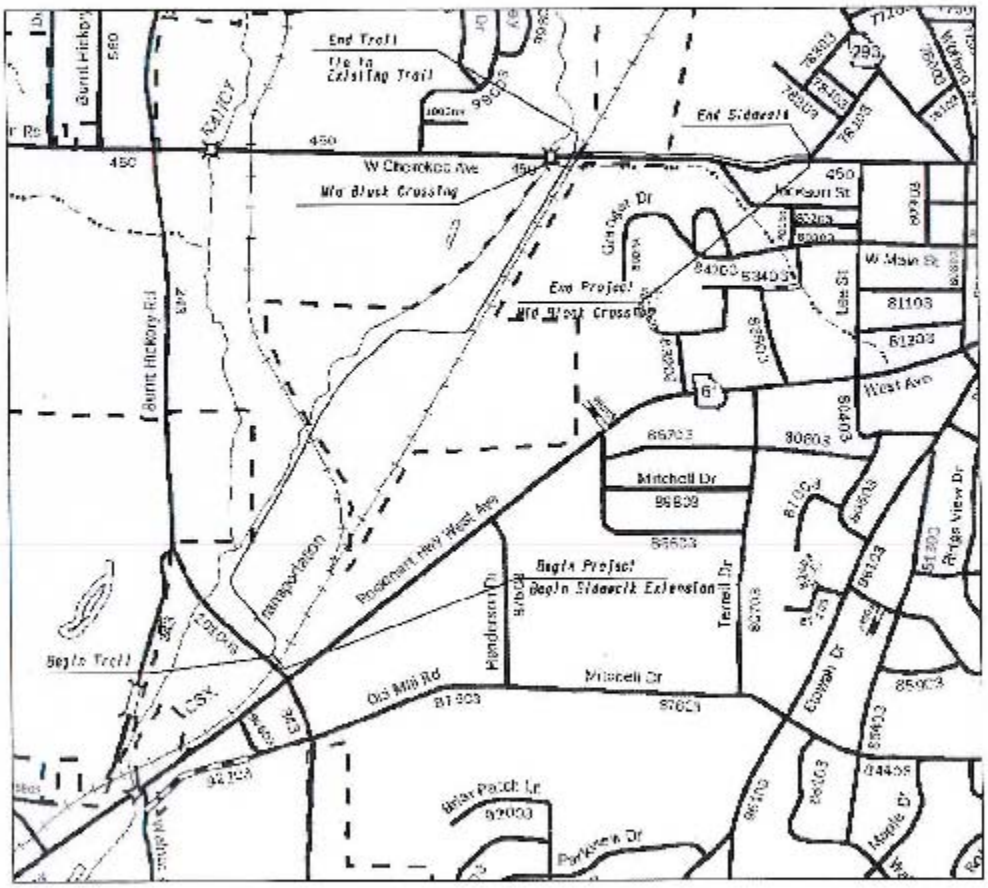
Attachment for P-5 – Transportation Enhancement Project Locations

001700 Bartow Pettit Creek Trail – Phase III



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Attachment for P-5 – Transportation Enhancement Project Locations (Cont.)

001700 Bartow Pettit Creek Trail – Phase III

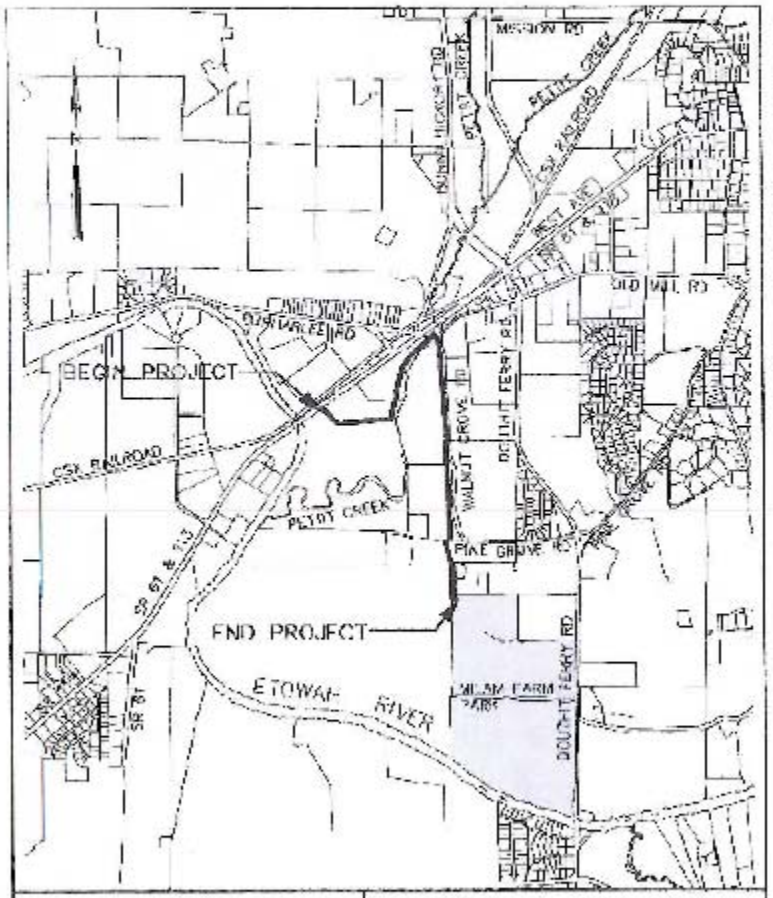

EXHIBIT A-1
PROJECT AREA MAP

Pharr Engineering

LEAKE MOUNDS - ETOWAH RIVERWALK LINK
CARTERSVILLE, GEORGIA

City of Cartersville

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Cost Estimate for P-9 to add Raised Median

DETAILED ESTIMATE

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
	ROADWAY ITEMS				
150-1000	TRAFFIC CONTROL -	LS	1	$ 30,000.00	$ 30,000.00
201-1500	CLEARING & GRUBBING -	LS	1	$ 8,000.00	$ 8,000.00
205-0001	UNCLASS EXCAV	CY	16360	$ 2.30	$ 37,674.00
207-0200	FOUND BKFILL MATL, TP II	CY	2030	$ 46.87	$ 93,116.10
310-1101	GR AGGR BASE CRS, INCL MATL	TN	9256.00	$ 14.77	$ 136,711.12
318-3000	AGGR SURF CRS	TN	675	$ 17.71	$ 11,954.25
402-1812	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	TN	91.00	$ 69.18	$ 6,295.38
402-3130	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	TN	1245	$ 65.96	$ 82,211.08
402-3121	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	TN	1246	$ 58.49	$ 72,873.54
402-3190	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	TN	1402.00	$ 63.68	$ 89,251.32
413-1000	BITUM TACK COAT	GL	1530.00	$ 2.47	$ 4,025.10
430-0180	PLN PC CONC PVMT(CLT/CB) 7" TK	SY	9542.00	$ 25.35	$ 241,883.70
					$ -
433-1000	REINF CONC APPROACH SLAB	SY	54.00	$ 175.54	$ 9,479.16
441-6222	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	LF	13820.30	$ 12.30	$ 166,986.00
441-6746	CONC CURB & GUTTER, 8 IN X 30 IN, TP 7	LF	15043.30	$ 11.86	$ 154,059.50
441-0104	CONC SIDEWALK, 4 IN	SY	7377	$ 23.88	$ 161,637.62
441-0756	CONCRETE MEDIAN, 8 IN	SY	1393	$ 46.81	$ 64,691.42
441-4030	CONC VALLEY GUTTER, 8 IN	SY	147	$ 41.04	$ 6,032.88
550-1180	STORM DRAIN PIPE, 18 IN, H 1-10	LF	5393	$ 33.00	$ 161,790.00
550-1240	STORM DRAIN PIPE, 24 IN, H 1-10	LF	2468	$ 39.85	$ 98,355.84
550-1300	STORM DRAIN PIPE, 30 IN, H 1-10	LF	962	$ 49.03	$ 47,166.85
550-1360	STORM DRAIN PIPE, 36 IN, H 1-10	LF	280	$ 57.52	$ 16,105.60
550-1480	STORM DRAIN PIPE, 48 IN, H 1-10	LF	67	$ 92.41	$ 6,191.47
550-2180	SIDE DRAIN PIPE, 18 IN, H 1-10	LF	466	$ 24.88	$ 11,594.09
550-3618	SAFETY END SECTION 18 IN, SIDE DRAIN, 6:1 SLOPE	EA	13	$ 412.41	$ 5,361.33
573-2005	UNDDR PIPE INCL DRAINAGE AGGR, 6 IN	LF	250	$ 10.13	$ 2,532.50
550-1842	STORM DRAIN PIPE, 84 IN, H 1-10	LF		$ 208.86	$ -
668-1100	CATCH BASIN, GP 1	EA	66	$ 2,166.62	$ 143,196.15
					$ -
					$ -
	PERMANENT EROSION CONTROL ITEMS				$ -
603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	SY	250	$ 36.50	$ 9,660.00
603-2181	STN DUMPED RIP RAP, TP 3, 18 IN	SY	100	$ 30.10	$ 3,010.00
603-7000	PLASTIC FILTER FABRIC	SY	350	$ 3.08	$ 1,078.00
700-6910	PERMANENT GRASSING	AC	18	$ 680.51	$ 10,868.16
700-7000	AGRICULTURAL LIME	TN	24	$ 64.14	$ 1,539.36
700-8000	FERTILIZER MIXED GRADE	TN	22	$ 456.95	$ 10,053.12
700-8100	FERTILIZER NITROGEN CONTENT	LB	300	$ 1.90	$ 1,520.00

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710-9000	PERMANENT SOIL REINFORCING MAT	SY	1500	$	3.95	$	5,940.00
716-2000	EROSION CONTROL MATS, SLOPES	SY	33750	$	0.90	$	30,375.00
						$	-
	TEMPORARY EROSION CONTROL ITEMS					$	-
163-0232	TEMPORARY GRASSING	AC	8	$	306.47	$	2,451.76
163-0240	MULCH	TN	342	$	126.89	$	43,396.38
163-0300	CONSTRUCTION EXIT	EA	2	$	1,129.78	$	2,259.56
163-0520	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	LF		$	11.58	$	-
163-0527	CONSTRUCT AND REMOVE RIP RAP CHECK DAMS, STONE PLAIN RIP RAP/SAND BAGS	EA	5	$	208.43	$	1,042.15
163-0528	CONSTRUCT AND REMOVE FABRIC CHECK DAM - TYPE C SILT FENCE	LF	2775	$	3.20	$	8,880.00
163-0529	CONSTRUCT AND REMOVE TEMPORARY SEDIMENT BARRIER OR BALED STRAW CHECK DAM	LF	720	$	3.55	$	2,555.00
163-0531	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO -	EA	1	$	8,220.20	$	8,220.20
163-0531	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO	EA	1	$	8,220.20	$	8,220.20
163-0542	CONSTRUCT AND REMOVE STONE FILTER RING	EA		$	420.17	$	-
163-0550	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	EA	89	$	156.91	$	10,816.89
165-0010	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	LF	1375	$	0.62	$	852.50
165-0030	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	LF	1750	$	0.60	$	1,050.00
165-0041	MAINTENANCE OF CHECK DAMS - ALL TYPES	LF	1420	$	1.47	$	2,087.40
165-0080	MAINTENANCE OF TEMPORARY SEDIMENT BASIN, STA NO -	EA	1	$	1,228.23	$	1,228.23
165-0080	MAINTENANCE OF TEMPORARY SEDIMENT BASIN, STA NO -	EA	1	$	1,228.23	$	1,228.23
165-0091	MAINTENANCE OF SEDIMENT BARRIER - BALED STRAW	LF	360	$	1.13	$	403.80
165-0101	MAINTENANCE OF CONSTRUCTION EXIT	EA	2	$	518.12	$	1,036.24
165-0105	MAINTENANCE OF INLET SEDIMENT TRAP	EA	68	$	48.80	$	3,367.20
165-0111	MAINTENANCE OF STONE FILTER RING	EA		$	148.55	$	-
167-1000	WATER QUALITY MONITORING AND SAMPLING	EA	2	$	303.72	$	607.44
167-1500	WATER QUALITY INSPECTIONS	MO	12	$	1,500.00	$	18,000.00
171-0030	TEMPORARY SILT FENCE, TYPE C	LF	2760	$	1.74	$	4,795.00
171-0030	TEMPORARY SILT FENCE, TYPE C	LF	3700	$	2.44	$	9,028.00
						$	-
	SIGNING & MARKING ITEMS					$	-
636-1023	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	SF		$	12.15	$	-
636-1033	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	SF	75	$	17.11	$	1,283.25
636-1041	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 9	SF		$	33.94	$	-
636-2070	GALV STEEL POSTS, TP 7	LF	750	$	6.61	$	4,957.50
636-2090	GALV STEEL POSTS, TP 9	LF	135	$	6.75	$	911.25
647-1000	TRAFFIC SIGNAL INSTALLATION NO 1	LS	1	$	75,000.00	$	75,000.00
647-1000	TRAFFIC SIGNAL INSTALLATION NO 2	LS	1	$	75,000.00	$	75,000.00
						$	-
653-0110	THERMOPLASTIC PVMT MARKING, ARROW, TP 1	EA	22	$	64.33	$	1,415.26
653-0120	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	EA	43	$	67.97	$	2,922.71
653-0130	THERMOPLASTIC PVMT MARKING, ARROW, TP 3	EA	5	$	67.97	$	339.85
653-1501	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	LF	5834	$	0.46	$	2,683.64
653-1502	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	LF	15669	$	0.62	$	9,714.78
653-1704	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	LF	500	$	4.82	$	2,410.00
653-1804	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	LF	3385	$	1.87	$	6,328.21
653-3501	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	GLF	12861	$	0.36	$	4,673.16
653-1704	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	LF		$	4.82	$	-
653-6004	THERMOPLASTIC TRAF STRIPING, WHITE	SY	166	$	2.86	$	474.80

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653-6306	THERMOPLASTIC TRAF STRIPING, YELLOW	SY	47	$	3.42	$	160.74
654-1301	RAISED PVMT MARKERS TP 1	EA	4	$	2.80	$	11.20
654-1302	RAISED PVMT MARKERS TP 2	EA	30	$	2.86	$	85.80
654-1303	RAISED PVMT MARKERS TP 3	EA	300	$	3.48	$	1,044.00
	Additional Bridge Widening 8 ft X 280 = 2240 SF X $95/SF =					$	212,800.00
					Grand Total	$	2,262,750.55

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P-13 Cost to Cure of 20 Parking Spaces in Teachers Parking lot of Cartersville Middle School

Loss of 20 parking spaces along Walnut Grove Road to shift Roundabout South

Area to Cure north of existing parking lot = 12,250 SF

12,250 / 9 = 1361 SY

Paving Section = 1.5" 12.5 mm GP 1 or 2 – 402-3113 – $65.98 ton
2" 19 mm GP 1 or 2 – 402-3191 - $63.66 ton
6" Graded Aggregate Base Crs – 310-1101 - $14.77 ton
Bitum Tack Coat – 413-1000 - $2.47 gal

1 ½ "12.5 mm - 1361 X 165 lbs/sy / 2000 = 112 tons X 65.98 = $7390
19 mm – 1361 X 220 lbs/sy / 2000 = 150 tons X $63.66 = $9549
6" GAB – 1361 X 660 lbs/sy / 2000 = 449 tons X $14.77 = $6632
Tack Coat – 1361 X 0.035 gal/sy / 2000 = 48 gal X $2.47 = $119
Clearing and Grading = $15,000
Striping = $1,500
Erosion Control = $5,000
Engineering – 100 man-hours ay $100 per hour = $10,000

TOTAL COST TO RELOCATE PARKING SPACES = $55,190

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Sketch for P-13 Cost to Cure of 20 Parking Spaces

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Attachment for E-1 – Partial Implementation of E-1 Calculations

Earthwork – Main Line: A reduction of the profile by 5 ft is 60% of the 8.5 ft reduction that was recommended by the VE Study Team. therefore, we will reduce the appropriate VE Study Team values to use 60% where appropriate. (Refer to p.46 of the VE Study Report)

Area between the original profile and the VE Team proposed profile: 6,647 SQ FT
Area between the original profile and proposed profile: (6,647 sq. ft) x 0.6 = 3,988 SQ. FT.

Average cross section length as per the provided cross section in range of station 162+57.63 to station 179+46.54: 160'
This will remain the same.

The earthwork reduction is estimated at 3,988 x 160/27 = 23,633 CY

The unit cost for earthwork is $4.22 per CY.
This will remain the same.

The total earthwork saving is 23,633 x $4.22 = $99,731

Right-of-Way – Main Line: This will remain the same as what the VE Study Team calculated for a total savings of $154, 500.

Total Savings with Partial Implementation:

Earthwork: **$99,731**
R/W: **$154, 500**

Total: **$254,231, rounded to $254,500**

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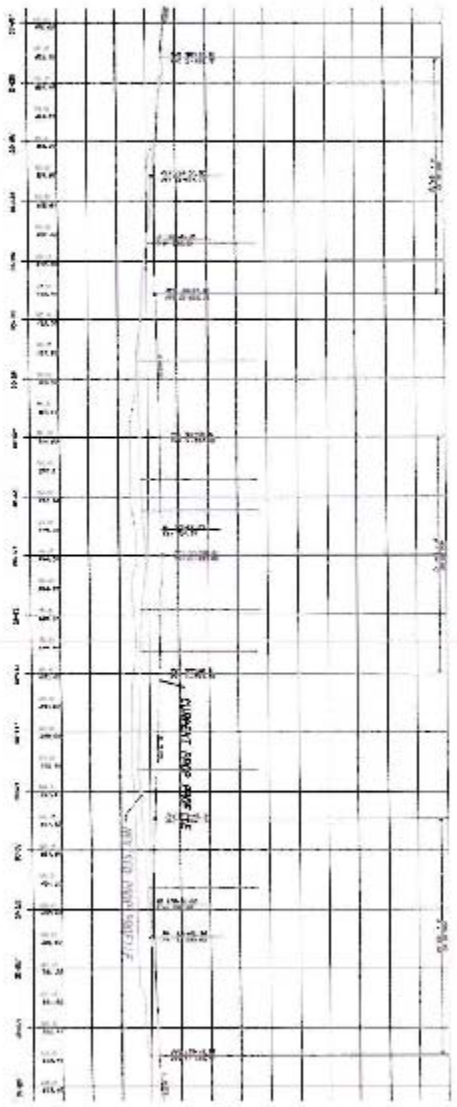
Attachment for E-1 – Partial Implementation of E-1 - Sketch



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E-1 Additional Savings – PINE GROVE ROAD

Calculations

Reduction of ROW from plans = 7835 SF

7835 / 43560 = 0.170 Acres

0.170 X $1,000,000 per acre = $170,000

Use Permanent Easement to construct shoulders

Area from plans = 1936 SF

1936 / 43560 = 0.044 Acres

Permanent Easement = 50% of ROW

0.044 X $500,000 per Acre = $22,220

$170,000 + $22,220 = $192,220

Total revised cost Savings = $192,220.00

TOTAL SAVINGS FOR E-1 = $254,500
+ $192,220
$446,720

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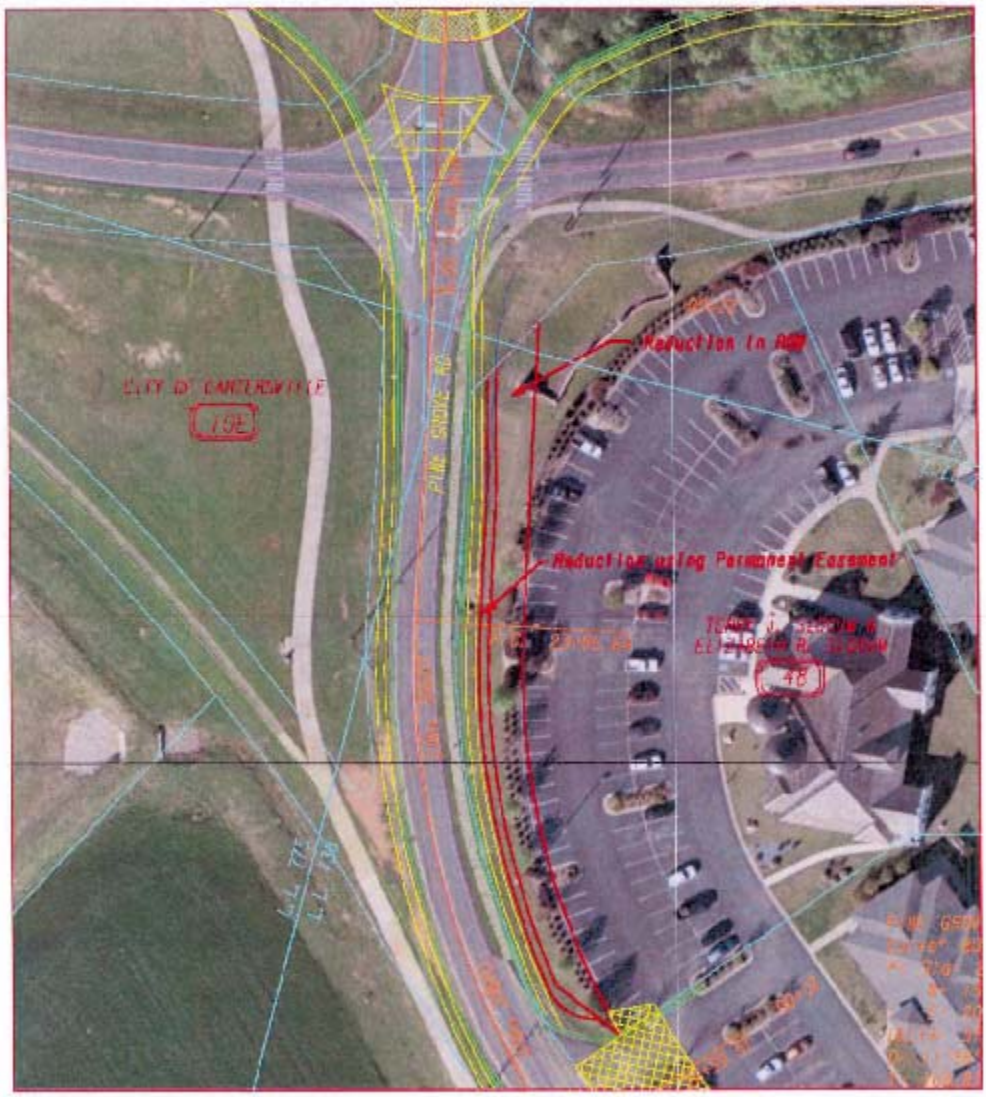
E-1 ADDITIONAL SAVINGS
Plan View Sketch



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Attachment for RW-4 Calculations

Information from page 56 in the VE Study

Administrative cost

Condemnation filing -	$5,000 Each
Displacements -	$40,000 Each
Demolition -	$15,000 Each
Relocation Administrative Service -	$2,500 Each
Total per Parcel -	$62,500

Parcels to relocate = 3 (6, 46 & 47) – See Sketch on Following Page

3 X 62,500 = $187,500

$187,500 - $125,000 expected savings for VE Study = $62,500

RW-4 will cost an additional $62,500 to implement

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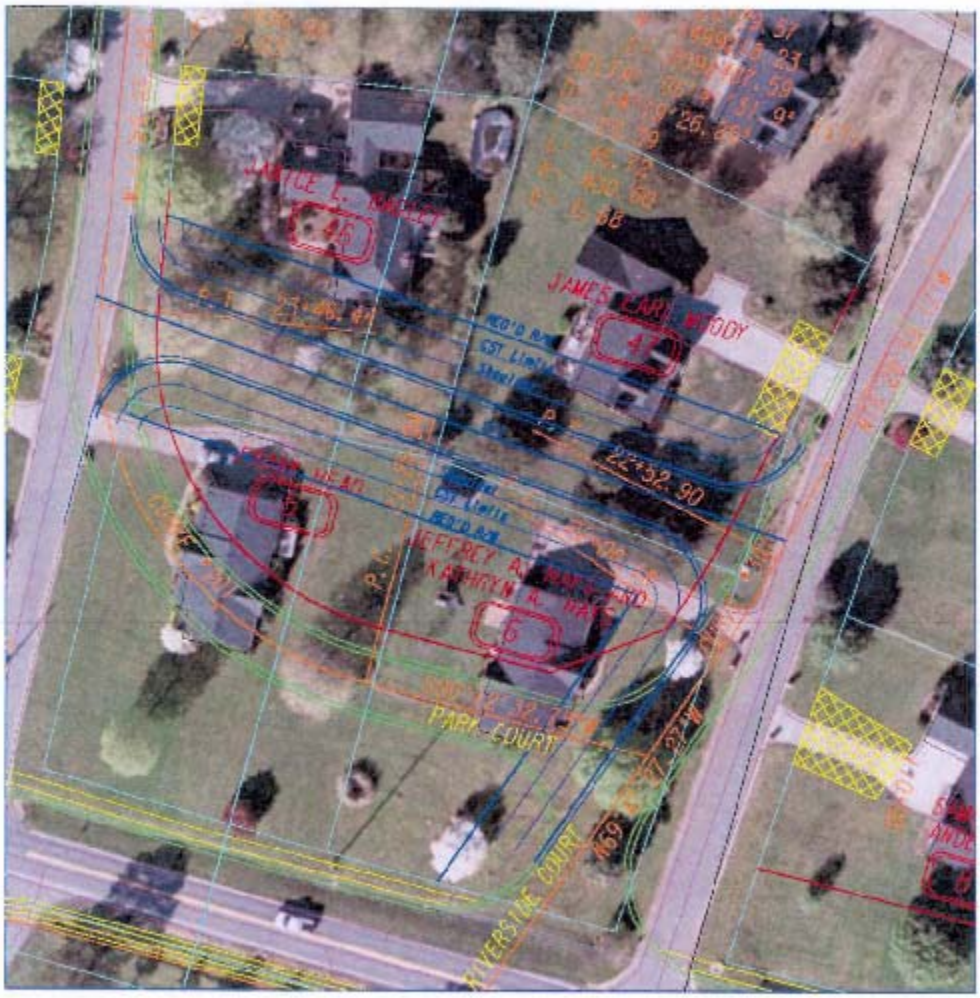
Attachment for New RW-4 Sketch



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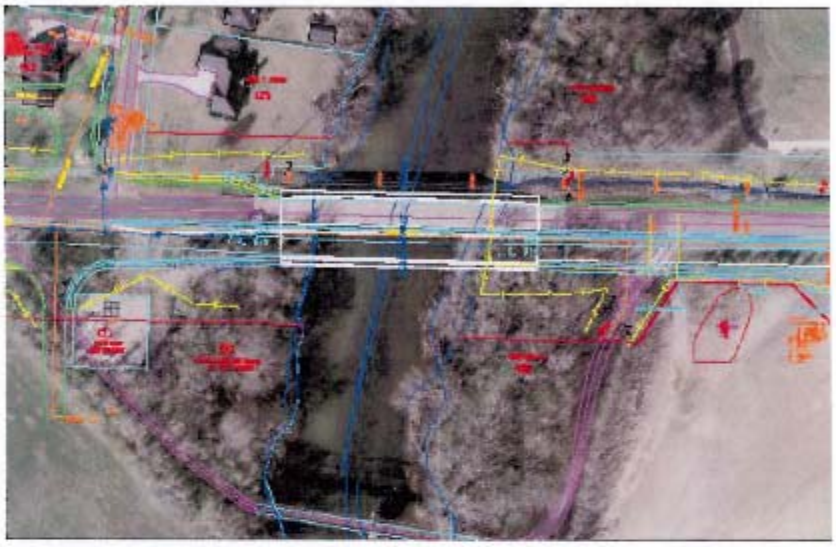
Attachment for B-2 - Sketch



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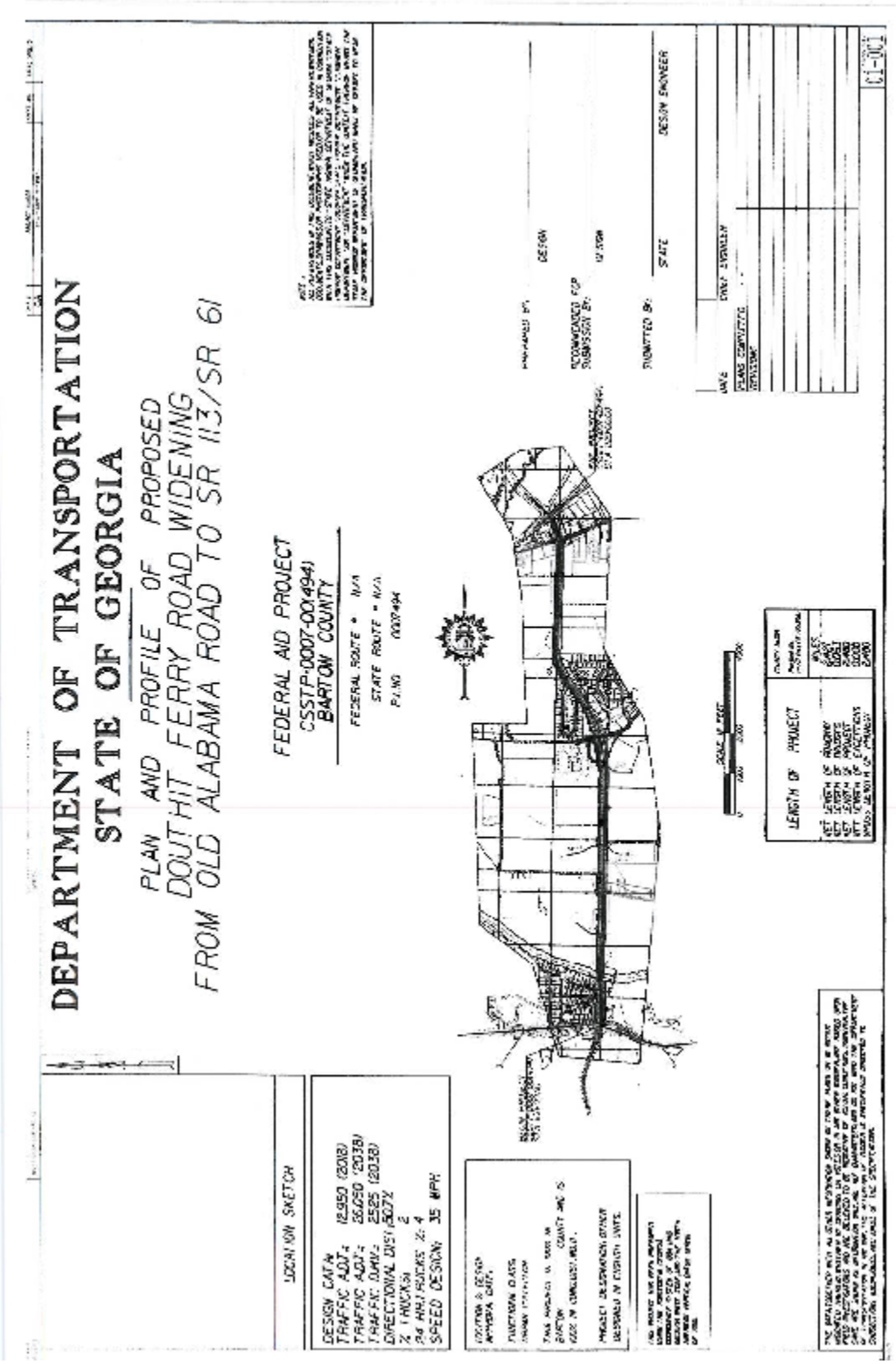
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
PLAN AND PROFILE OF PROPOSED
DOUTHIT FERRY ROAD WIDENING
FROM OLD ALABAMA ROAD TO SR 113/SR 61
FEDERAL AID PROJECT
CSSTP-0007-00(494)
BARTOW COUNTY
FEDERAL ROUTE = N/A
STATE ROUTE = N/A
P.I.NO. 0007494
LOCATION SKETCH
DESIGN DATA
TRAFFIC ADT: 12,950 (2008)
TRAFFIC ADT: 26,050 (2038)
TRAFFIC DHV: 2585 (2038)
DIRECTIONAL DIST: 50/50
% TRUCKS: 2
# OF LANES: 2 & 4
SPEED DESIGN: 35 MPH
LENGTH OF PROJECT
DESIGN ENGINEER
STATE
SCALE IN FEET

PRECONSTRUCTION STATUS REPORT FOR PI:0007494

CR 343/DOUTHIT FERRY RD FM OLD ALABAMA RD TO SR 61/SR 113

PROJ ID:	0007494	MPO:	Non-Urban	PRIORITY CODE:		MGMT LET DATE:	08/15/2016
COUNTY:	Bartow	TIP #:		DOT DIST:	6	MGMT ROW DATE:	07/15/2014
LENGTH (MI):	2.43	MODEL YR:		CONG. DIST:	11	BASELINE LET DATE:	08/08/2016
PROJ NO.:	CSSTP-0007-00(494)	TYPE WORK:	Widening	BIKE:	Y	SCHED LET DATE:	7/29/2016
PROJ MGR:	Leigh, Leonard	CONCEPT:	ADD 1 U(MCD 2?)	MEASURE:	E	WHO LETS?:	GDOT Let
AOHD Initials:	AVS	PROG TYPE:	Reconstruction/Rehabilitation	NEEDS SCORE:		LET WITH:	
OFFICE:	Program Delivery	Prov. for ITS:	N	BRIDGE SUFF:			
CONSULTANT:	Local Design, Local PE funds	BOND PROJ:					
SPONSOR:	Cartersville						
DESIGN FIRM:	Southland Engineering Inc						

BASE START	BASE FINISH	LATE START	LATE FINISH	TASKS	ACTUAL START	ACTUAL FINISH	%
	1/12/2012		4/16/2013	Concept Development	3/3/2008		50
11/16/2011	11/16/2011			Concept Meeting	6/6/2012	6/6/2012	100
11/30/2011	11/30/2011	3/5/2013	3/5/2013	PM Submit Concept Report			0
12/1/2011	1/11/2012	3/6/2013	4/16/2013	Receive Concept Review and Comments			0
1/11/2012	1/11/2012	4/16/2013	4/16/2013	Management Concept Approval Complete			0
11/10/2011	3/11/2012			Value Engineering Study	3/6/2012	2/5/2013	100
7/28/2012	7/23/2012	5/09/2013	5/09/2013	Public Information Open House Held			0
1/12/2012	11/27/2013		4/16/2013	Environmental Approval	10/01/2010		25
7/25/2012	9/18/2013		4/16/2013	Pub Hear Held/Comm Resp (EA/FONSI, GEPA)	2/3/2012		25
3/1/2012	3/21/2012		4/16/2013	Mapping	10/01/2010		100
3/23/2012	4/26/2012		6/5/2013	Field Survey/SDE	10/01/2010		50
5/3/2012	12/9/2013		11/29/2013	Preliminary Plans	10/01/2010		27
8/5/2012	1/28/2015	6/10/2013	11/29/2013	Preliminary Bridge Design			0
1/12/2012	5/25/2012	4/12/2013	8/25/2013	Underground Storage Tanks			0
7/28/2015	1/11/2016	7/30/2015	1/1/2016	404 Permit Obtainment			0
1/3/2014	3/7/2014	12/10/2013	12/20/2013	PFPR Inspection			0
1/8/2014	4/1/2014	12/11/2013	3/24/2014	R/W Plans Preparation			0
4/2/2014	4/2/2014	3/25/2014	3/24/2014	ROW Plans Final Approval			0
2/13/2014	2/17/2014	5/2/2014	5/2/2014	L & D Approval			0
7/1/2014	7/29/2014	6/23/2014	7/15/2014	R/W Authorization			0
11/1/2014	11/17/2014	10/7/2014	11/5/2014	Stake ROW			0
8/7/2012	9/13/2012	6/10/2013	4/15/2014	Soil Survey			0
1/29/2015	12/5/2011	1/7/2013	10/8/2014	Bridge Foundation Investigation			0
2/18/2014	11/23/2015	3/10/2014	11/13/2015	Final Design			0
4/11/2014	7/15/2015	10/9/2014	7/15/2015	Final Bridge Plans Preparation			0
12/22/2015	12/22/2015	12/14/2015	12/14/2015	FFPR Inspection			0
12/30/2015	1/12/2016	12/23/2015	1/4/2016	Submit FFPR Responses (OES)			0

PROGRAMMED FUNDS

Activity	Approved	Proposed	Cost	Fund	Status	Date Auth
PE	2012	2012	1,126,162.42	LOC	AUTHORIZED	11/4/2011
PE	2012	2012	56,308.12	L200	AUTHORIZED	11/4/2011
ROW	2015	2015	8,971,369.20	LOC	PRECST	
UTL	2018	2018	802,297.11	LOC	PRECST	
CST	2018	2018	10,925,875.84	M231	PRECST	

Cost Estimate Amount

Activity	Amount	Date
PE	$1,000,000.00	7/1/2005
PE	$56,308.12	7/1/2005
ROW	$8,623,100.00	8/21/2012
UTL	$781,000.00	8/21/2012
CST	$9,895,302.27	8/21/2012

STIP AMOUNTS

Activity	Cost	Fund
PE	1,126,162.42	LOC
PE	56,308.00	L200
ROW	1,000,000.00	LOC
UTL	0.00	LOC
CST	0.00	M231

Bridge:	BRIDGE REQUIRED
Design:	City of Cartersville/Southland Engineering
FIS:	EA/NotAppd/NotOnSchedule-Baseline 11.29.13/Pattern-Books01.23.13
LGPA:	REV PFA SGN CA UTERS VILLE DO PFR ... TO FUND CST 10-4-07.
Planning:	Non-attainment area
Prog. Develop:	PFIS FOR REVIEW ONLY
Programming:	ADDED BY PSRC 9-9 ... EXEMPT PER FHWA 9-7-2012
Utility:	Need plans 10-20-09
FMC:	RFPS/REHAB; PETTY LOCAL
Eng Services:	VE Implementation Approved 2/2013

District Comments

Concept Team Meeting held on 06/06/12. Concept Report will be submitted after ARC modeling. VE Study completed and designer is working on VE responses. LLL 2/2AN13

Prel. Parcel CT:	40	Total Parcel in ROW System:		Cond. Filed:		Acquired by:	LOC
Under Review:		Options - Pending:		Relocations:		Acquisition MGR:	
Released:		Condemnations Pend:		Acquired:		R/W Cert Date:	

DEEDS CT:

02/06/2013