

# Value Engineering Study Report

## Federal Aid Projects: I-75/Union Grove Road Interchange

P.I. No. 610870 NH-75-3(203)

&

## South Calhoun Bypass

P.I. No. 662510 – STP-00MS(7)

Gordon County



Value Management Team



Design Team:



May 2007



May 14, 2007

**Lisa L. Myers**  
Design Review Engineer Manager  
**Georgia Department of Transportation**  
#2 Capitol Square, Room 266  
Atlanta, GA 30334

RE: Submittal of Value Engineering Study Report  
Project Task Order No. 10 – Contract TOOESV06796  
Project I-75/Union Grove Road Interchange  
**Project No.** NH-75-3(203) – P.I. Number: 610870  
Project South Calhoun Bypass  
**Project No.** STP-00MS(7) – P.I. Number 662510  
County Gordon

Dear Ms. Myers:

We are pleased to submit this one (1) CD-ROM copy of the PDF version of the report and four (4) hard copies of the final value engineering report for the above noted project. This Value Engineering workshop was performed during the week of May 1 – 4, 2007. The team fielded by PBS&J was able to identify thirty five creative ideas and, in the end produced twelve alternatives that have the potential for affecting the cost of constructing these new facilities. In addition, the team has provided ten design suggestions that could help create an even stronger end product as the design moves to construction.

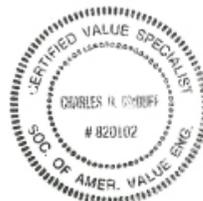
We trust that you will find this report to be in proper order. It should be noted that the results of this workshop are volatile in that they can be overcome by the events that accompany the expeditious continuance of the design process. Accordingly, we encourage an equally expeditious implementation meeting to determine the disposition of the contents of this report.

Thank you very much for this opportunity to work with you and the hard working staff of the Georgia Department of Transportation.

Yours truly,



**Charles R. McDuff, PE, CVS, CCE**  
Project Manager



**Certified Value Specialist - Life**  
Certification No. 820102

# ***Value Engineering Study Report***

## ***I-75/Union Grove Road Interchange and South Calhoun Bypass Gordon County, Georgia***

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## *Executive Summary*

## INTRODUCTION

This report summarizes the analysis and conclusions by the PBS&J Value Engineering workshop team as they performed a VE study during the period of May 1 – 4, 2007 in Atlanta, at the office of the Georgia Department of Transportation. The subjects of the Value Engineering study were the projects for the building a new interchange on I-75 at Union Grove Road NH-STP-75(203) – P.I. No. 610870 and to build the new South Calhoun Bypass STP-00MS(7) – P.I. No. 662510 in Gordon County, Georgia. The design for these two projects is being performed by Greenhorne & O’Mara, with offices in Marietta, Georgia.

## PROJECT DESCRIPTION

### *Union Grove Road Interchange*

The primary purpose of the proposed interchange addition is to provide direct access to Interstate 75 from the Tom B. David Field airport and the industrial park area. As proposed, the interchange, in conjunction with the proposed improvements to Union Grove Road and subsequent addition of the South Calhoun Bypass highway, would provide alternate routing for SR 53, acting as a bypass for through-vehicles traveling through the south Calhoun area.

The new interchange is to be a full diamond with supplemental work to address the required reconfiguration of the existing local road network. The current construction cost estimate for this interchange and the associated improvements is as follows:

Construction	\$18,748,108
Right of Way	\$ 7,570,000
Reimbursable Utilities	\$ 226,449

**Grand Total Project Cost = \$26,544,557**

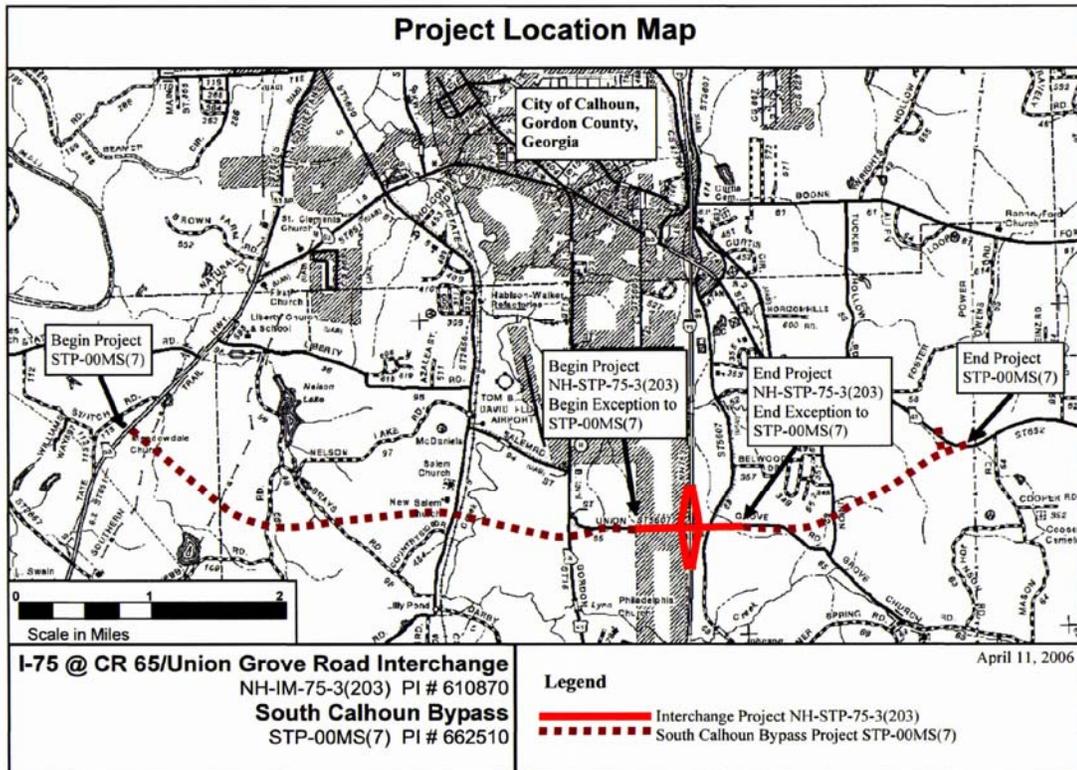
### *South Calhoun Bypass*

Known as the South Calhoun bypass, the project begins at SR 53 southwest of Calhoun near CR 113 in Gordon County. The proposed concept would travel east/southeastward to the Intersection of I-75, then veer northeastward and tie back into SR 53 on the east side of Calhoun (see the enclosed location map). The new bypass will have its beginning point at its intersection with SR 53 at mile post 4.5 and its ending at its intersection with SR 53 at approximate mile post 12.5. The total length of the project is 6.8 miles.

The current construction cost estimate for this interchange and the associated improvements is as follows:

Construction	\$44,491,562
Right of Way	\$ 6,550,960
Reimbursable Utilities	\$ 2,011,680

**Grand Total Project Cost = \$53,054,202**



This project is rather fully described in the documentation that is located in Tab 4 of this report, entitled *Project Description*

## VALUE ENGINEERING PROCESS

The Value Engineering team followed the seven step Value Engineering job plan as promulgated by the Georgia Department of Transportation. This seven step job plan includes the following:

- Investigative
- Analysis
- Speculation

- Evaluation
- Development
- Recommendation
- Presentation

This report is a component of the Presentation Phase. As part of the VE workshop in Atlanta, the team made an informal presentation of their results on the last afternoon of the workshop. This report is intended to formalize the workshop results and set the stage for a formal implementation meeting in which alternatives and design suggestions will typically be accepted, accepted with modifications, or rejected for cause. The worksheet that follows, along with the formally developed alternatives and design suggestions can be used as “score sheet” for the implementation meeting. It is also included in this report to identify, on a summary basis, the results of the workshop. The reader is encouraged to visit the third tabbed section of this report for a review of the details of the study results. Tabbed section number four includes information about the project itself and tabbed section number five goes into more detail about the process of Value Engineering, as used in this workshop.

Again, as mentioned earlier, the enclosed Summary of Alternatives and Design Suggestions, coupled with the documentation of the developed alternatives in the tabbed section of the report entitled *Study Results*, should provide the reader with the information required to fully evaluate the merits of the alternatives that the VE team documented during their work in the study.

## **CONCLUSIONS AND RECOMMENDATIONS**

The Value Engineering job plan worked well during this team effort. The information phase included an excellent presentation by the Project Delivery Team from Georgia DOT and by their consultant design team representatives from Greenhorne & O’Mara. What was highlighted in that presentation and in the analyses subsequently performed by the VE team was that the following items emerged as the high cost centers of interest for this Value Engineering workshop:

- Right-of-Way
- Asphalt Pavement
- Unclassified Excavation
- Bridge Construction

Weighing heavily on the final cost for the first four of the items listed above is the make-up of the typical section for the roadway. Most notably, most of the typical section application calls for the use of a 44’ wide depressed median, necessitating a 250’ wide final right-of-way width, hence, making the cost of the right-of-way a large part of the total construction cost. Some of the offerings by the VE team, to help address all of these key costs, are depicted in the third tabbed section of this report entitled *Study Results* and are summarized below:

**Asphalt Pavement** – the team noted in alternative AP-1 that there appeared to be an opportunity to make use of some of the transitional pavement near the beginning of the job – pavement slated for removal and replacement. It is pointed out that this pavement might be reused in place resulting in nearly \$500,000 in construction cost savings. Alternative AP-9 suggests the possibility of reducing the thickness of the pavement strata in the rural pavement typical section. This appeared to be normally acceptable practice, however, the pavement design emerged from the in-house process in a format more closely reflecting an urban or suburban design section. If this alternative is found to be acceptable, approximately \$300,000 in cost savings may be realized.

**Unclassified Excavation** – alternative UE-3 calls for the consideration of going from the current roadway typical section with a 44' depressed median to a 36' depressed median. This approach maintains some of the rural “feel” for the roadway’s appearance while not yielding the benefits of a wide median, but significantly reducing the earthwork and some of the right-of-way costs. The approximate cost savings associated with this alternative is \$1.5 million. There is also a Design Suggestion that encourages the fine tuning of the vertical alignment to help make sure that the unclassified excavation is minimized.

**Construction of Bridges** – there are four alternatives that relate to the bridges that are to be constructed. Alternative UE-1 and -3 could work together to create possible cost savings of approximately one million dollars. The key decision relates to whether or not the currently designed turning lane (on the Eastbound Bridge) is deemed to be necessary to handle the limited traffic turning onto Brickyard Road. The other two alternatives offer variations on this theme.

**Right-of-Way** – the largest potential cost savings is based on very significant reductions in the right-of-way taking width. This would be accomplished through the reduction of the depressed median width to 20 feet (from 44') and substitution of a 20' wide raised median for the entire length of the project. This is a rather radical departure from the current roadway typical section, however, the cost of this decision is close to four million dollars.

These and the other alternatives and design suggestions may be reviewed more thoroughly where they are documented in the third tab of this report entitled *Study Results*.

# SUMMARY OF ALTERNATIVES DESIGN SUGGESTIONS



PROJECT: <b>GEORGIA DEPARTMENT OF TRANSPORTATION                      I-75/Union Grove Road Interchange (P.I. Number 610870) and                      South Calhoun Bypass (P.I. Number 662510)</b>						
ALT. NO.	DESCRIPTION	INITIAL COST SAVINGS	RECURRING COST SAVINGS	TOTAL COST SAVINGS	COMMENTS	IMPLEMENTATION GUIDANCE
<b>(I) I-75/Union Grove Road Interchange (P.I. No. 610870)</b>						
I-1	Use AASHTO Type III Beams for bridge instead of 54" Bulb Tees	\$99,075.00		\$99,075.00		
I-2	Verify vertical clearance of 17' - 0" vs 17' - 6"	DESIGN	SUGGESTION			
I-3	Shift alignment at Bridge 30 ± to south to eliminate stage construction of bridge	\$273,788.00		\$273,788.00		
I-5	Shorten lengths of ramps C and D	\$336,573.00		\$336,573.00		
I-6	Clarify MSE wall locations	DESIGN	SUGGESTION			
I-7	Construct ramps of asphalt instead of PCC	\$1,041,161.00	<del>-\$3,718,419.00</del>	<del>-\$2,677,250.00</del>		From a Life Cycle Cost viewpoint, this alternative would be seen as not cost effective.
I-8	Construct Calhoun Bypass mainline (within the interchange project) of asphalt instead of PCC	\$584,491.00	<del>-\$5,431,760.00</del>	<del>-\$4,847,270.00</del>		From a Life Cycle Cost viewpoint, this alternative would be seen as not cost effective.
I-9	Use portions of Bypass project area as borrow source	DESIGN	SUGGESTION			
I-10	Shorten bridge, eliminate end spans, use MSE abutments	\$605,370.00		\$605,370.00		
I-11	Eliminate guardrail in locations of 4:1 slopes	\$34,100.00		\$34,100.00		
I-15	Shorten spans over interstate by using guardrail or concrete barrier along I-75	DESIGN	SUGGESTION			
I-16	Selectively reduce shoulder widths on ramps	\$573,924.00		\$573,924.00		
I-19	Widen bridge to increase left turn storage length	-\$1,953,221.00		-\$1,953,221.00		
I-20	Eliminate mast arm lighting standards in interchange	\$605,110.00		\$605,110.00		
<b>(C) South Calhoun Bypass (P.I. No. 662510)</b>						
C-1	Optimize right of way takings	DESIGN	SUGGESTION			
C-8	Reduce median width from 44' wide to 30' wide	\$1,063,454.00		\$1,063,454.00		
C-9	Construct eastbound roadway from SR 53 to US 41 for two way traffic	\$6,475,524.00		\$6,475,524.00		
C-10	Offset roadway east of Union Grove Road 34' from centerline	DESIGN	SUGGESTION			
C-11	Increase inside paved shoulder width from 2' to 4'	DESIGN	SUGGESTION			
C-13	Separate bridges at McDaniel Station Road/CSX & Oothkalooga Creek into four bridges instead of two bridges	DESIGN	SUGGESTION			
C-14	Provide disposition for abandoned roadways/tie-in locations	DESIGN	SUGGESTION			
C-16	Consider use of 3:1 fill slopes in areas where clear zone requirements can be met beyond toe of slope	DESIGN	SUGGESTION			

## *Study Results*

## INTRODUCTION

This section includes the study results presented in the form of fully developed value engineering alternatives that include descriptions of the original design, description of the alternative design configurations, opportunities and risks associated with the alternatives, sketches, calculations and technical justification for these alternatives. For the most part, these fully developed alternatives represent an array of choices that clearly could have an impact on the eventual cost and performance of the finished project.

The documented alternatives also include Design Suggestions. As their name implies, these are short write-ups making note of VE perspectives on technical issues and sharing some thoughts for consideration as the design moves forward.

This introductory sheet is followed by a *Summary of Alternatives & Design Suggestions* table which provides the reader with the listing of the developed alternatives and design suggestions and an indication of their potential cost impact on the project. This table may also be used as a “score sheet” during an implementation meeting if desired. It should be noted that the alternatives that are included, which have cost estimates attached are not necessarily representative of the final cost outcome for each alternative. Some of these alternatives have components that are mutually exclusive so they may not be added together.

The users of this report are asked to consider these alternatives and design suggestions as a smorgasbord of choices for selection and use as the project moves forward.

## COST CALCULATIONS

The cost calculations are intended only as a guide to the approximate results that might be expected from implementation of the alternatives. They should be helpful in making clear choices as to the pursuit of individual alternatives.

The composite mark-up of 10% for the construction cost comparisons was derived from the cost estimate for the project. This estimate can be found in the section of this report entitled *Project Description*.

# SUMMARY OF ALTERNATIVES DESIGN SUGGESTIONS



PROJECT: <b>GEORGIA DEPARTMENT OF TRANSPORTATION                      I-75/Union Grove Road Interchange (P.I. Number 610870) and                      South Calhoun Bypass (P.I. Number 662510)</b>						
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C-14	Provide disposition for abandoned roadways/tie-in locations	DESIGN	SUGGESTION			
C-16	Consider use of 3:1 fill slopes in areas where clear zone requirements can be met beyond toe of slope	DESIGN	SUGGESTION			

***Union Grove Road Interchange  
P.I. Number: 610870***

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-1**

DESCRIPTION: **USE AASHTO TYPE III BEAMS FOR BRIDGE INSTEAD OF 54"  
BULB TEES**

SHEET NO.: **1** of **3**

## Original Design:

The original design recommends 54" Bulb Tee prestressed concrete beams for spans 2 & 3 (85 FT long spans) with 54" Bulb Tee fascia beams for spans 1 & 4.

## Alternative:

The alternative design is to use AASHTO Type III prestressed concrete beams instead of 54" Bulb Tee beams for spans 2 & 3 and for the fascia beams on spans 1 & 4.

## Opportunities:

- Initial cost savings
- Less weight in Type III beams simplifies beam erection operation
- 17'-6" vertical clearance can be achieved

## Risks:

- AASHTO Type III beams require higher concrete strength

## Technical Discussion:

AASHTO Type III beams are viable alternatives for 90' to 95' spans. The concrete strength requirements for final and release are higher but are achievable.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 475,200	\$	\$ 475,200
ALTERNATIVE	\$ 376,125	\$	\$ 376,125
SAVINGS	\$ 99,075	\$	\$ 99,075

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
 UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870

ALTERNATIVE NO.: **I - 1**

DESCRIPTION: **USE AASHTO TYPE III BEAMS FOR BRIDGE INSTEAD OF**  
**54" BULB TEES**

SHEET NO.: **2 of 3**

FOR AN 88' SPAN, MAXIMUM BEAM SPACING IS 7.75'

MAINTAINING 3'-2 1/2" OH  $86.4167 - 3.2083(2) = 80'$

$$\frac{80}{7.75} = 10.32 \rightarrow 11 \text{ SPACES } 12 \text{ BEAMS}$$

$$\frac{80}{11} = 7.27 \rightarrow \text{use } 7.25' \quad 11 \times 7.25 = 79.75'$$

$$86.4167 - 79.75' = 6.6667'$$

$$\text{OH} = 3'-4"$$

<u>BEAMS</u>	TYPE III	SPANS 12.4	2(57.5)(2) *	230	* INCREASE END SPAN LENGTH FOR REDUCED STRUCTURE DEPTH
		SPANS 22.3	12(80)(2)	= 2112	
				<u>2342 LF</u>	
	54" BULB TEE	SPANS 12.4	2(56)(2)	= 224	
		SPANS 22.3	11(88)(2)	= 1936	
				<u>2160 LF</u>	

CONCRETE

PER GDOT SLAB DESIGN CHART

TYPE III BEAM SPACING 7.25', DESIGN SPAN = 5.9167'  
 $T = 7\frac{3}{4}"$

54" BULB TEE BEAM SPACING 8', DESIGN SPAN = 6.25'  
 $T = 7\frac{7}{8}"$

ORIGINAL DESIGN  $\frac{7.75(86.4167)(290)}{12} = 605 \text{ CY}$

ALTERNATIVE DESIGN  $\frac{7.25(86.4167)(291)}{12} = 602 \text{ CY}$

THE ALTERNATIVE DESIGN WILL HAVE LESS CONCRETE IN THE MISCELLANEOUS ITEMS (COPINGS, LTGE BEAM, ETC) BUT THE CONCRETE AND REBAR QUANTITIES WILL BE CLOSE.



# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-2**

DESCRIPTION: **VERIFY VERTICAL CLEARANCE OF 17' 0" VS 17'-6"**

SHEET NO.: **1 of 1**

## Original Design:

The original design indicates a vertical clearance of 17'-0" over I-75.

## Alternative:

Provide for a minimum vertical clearance of 17'-6" over I-75.

## Opportunities:

- Meet GDOT desirable vertical clearance

## Risks:

- May require raising profile of the bridge

## Technical Discussion:

Current GDOT bridge policy is to provide a minimum vertical clearance of 17'-6" over interstate routes. The additional 6" of vertical clearance could be achieved by using Type III beams. Another way to achieve the desired vertical clearance is by raising the profile of the bridge. The costs, impact to right-of-way, a sight distance on Calhoun Bypass would have to be evaluated.

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-3**

DESCRIPTION: **SHIFT ALIGNMENT AT BRIDGE 30' +/- TO SOUTH TO ELIMINATE  
STAGE CONSTRUCTION OF BRIDGE**

SHEET NO.: **1** of **3**

**Original Design:**

The original design requires stage construction of bridge at I-75 Interchange at Union Grove Road.

**Alternative:**

Shift the roadway alignment approximately 30 ft. south to allow the entire bridge to be constructed without staging.

**Opportunities:**

- Initial cost savings
- Reduce mobilization costs
- reduce traffic control costs

**Risks:**

- Shortens ramps on southside of interchange
- Introduces alignment on west side of interchange
- Increases roadway curvature on eastside of interchange

**Technical Discussion:**

Staging construction of bridges adds cost to a project due to mobilization and inflation of material and labor costs. Shifting the alignment to the south could also reduce right-of-way impacts on the northwest corner of the interchange. On the east side the ramp would be west of Johnson Lake Road. It appears the impact to Ramp "A" will be insignificant. The impact to Ramp "C" will be greater but this could be lessened by increasing bridge skew.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,737,680	\$	\$ 2,737,680
ALTERNATIVE	\$ 2,463,912	\$	\$ 2,463,912
SAVINGS	\$ 273,768	\$	\$ 273,768

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
 UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870 ALTERNATIVE NO.: **I-3**

DESCRIPTION: **SHIFT ALIGNMENT AT BRIDGE 30' +/- TO SOUTH TO ELIMINATE STAGE CONSTRUCTION OF BRIDGE** SHEET NO.: 2 of 3

INCREASED COST DUE TO STAGING - MOBILIZATION, TRAFFIC CONTROL  
 INFLATION

INCREASE IS APPROXIMATELY 10%

INCREASE BRIDGE SKEW TO AVOID SHIFTING ALIGNMENT ON  
 EAST SIDE OF INTERCHANGE

AMOUNT OF SHIFT = 30'  
 LENGTH OF BRIDGE = 288

$$\frac{30}{288} = .1042 \rightarrow 6^\circ \quad \begin{array}{r} 88.4517 \\ - 6 \\ \hline 82.4517^\circ \end{array}$$

INCREASED LENGTH DUE TO SKEW

$$\frac{5 \sin 88.4517^\circ}{5 \sin 82.4517^\circ} = 1.008 \quad .8\% \text{ increase}$$

EFFECT OF SHIFT ON RAMPS

RAMP 'A'	EL 689.99	STA 49+64.62
	- EL. 684.52	- STA 45+00.00
	<u>5.47'</u>	<u>464.62' - 30' = 434.62'</u>

$$\frac{5.47}{434.62} = .0126 \rightarrow 1.26\%$$

RAMP 'C'	EL 696.88	STA 49+65.98
	- EL. 694.68	- STA 48+65.98
	<u>2.20'</u>	<u>100' - 30' = 70'</u>

$$\frac{2.20}{70} = .0314 \rightarrow 3.14\%$$

ELIMINATE 100' VC	EL 696.88	STA 49+65.98
	- EL 683.87	- STA 40+63.71
	<u>13.01'</u>	<u>902.27'</u>

$$\frac{13.01}{(902.27-30)} = .0149 \rightarrow 1.49\%$$



# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-5**

DESCRIPTION: **SHORTEN LENGTHS OF RAMPS C AND D**

SHEET NO.: **1** of **5**

**Original Design:**

Ramp C (NB off Ramp) and Ramp D (NB On Ramp) are adequate designs that meet required design speed and criteria.

**Alternative:**

Shorten ramps that will still meet design speed and criteria.

**Opportunities:**

- Initial cost savings
- Decrease required right-of-way
- Decrease required amount of pavement

**Risks:**

- Less tangent distance between curves on ramps
- Greater superelevation requirement on entrance curve for Ramp D

**Technical Discussion:**

Move tie point of Ramp C approximately 300' while still holding taper rate at beginning of ramp and using same curve radii as original design. Change curve radii of entrance curve to 1200' and move tie point of ramp approximately 620' while using same curve radii of second curve nad taper rate as original design.

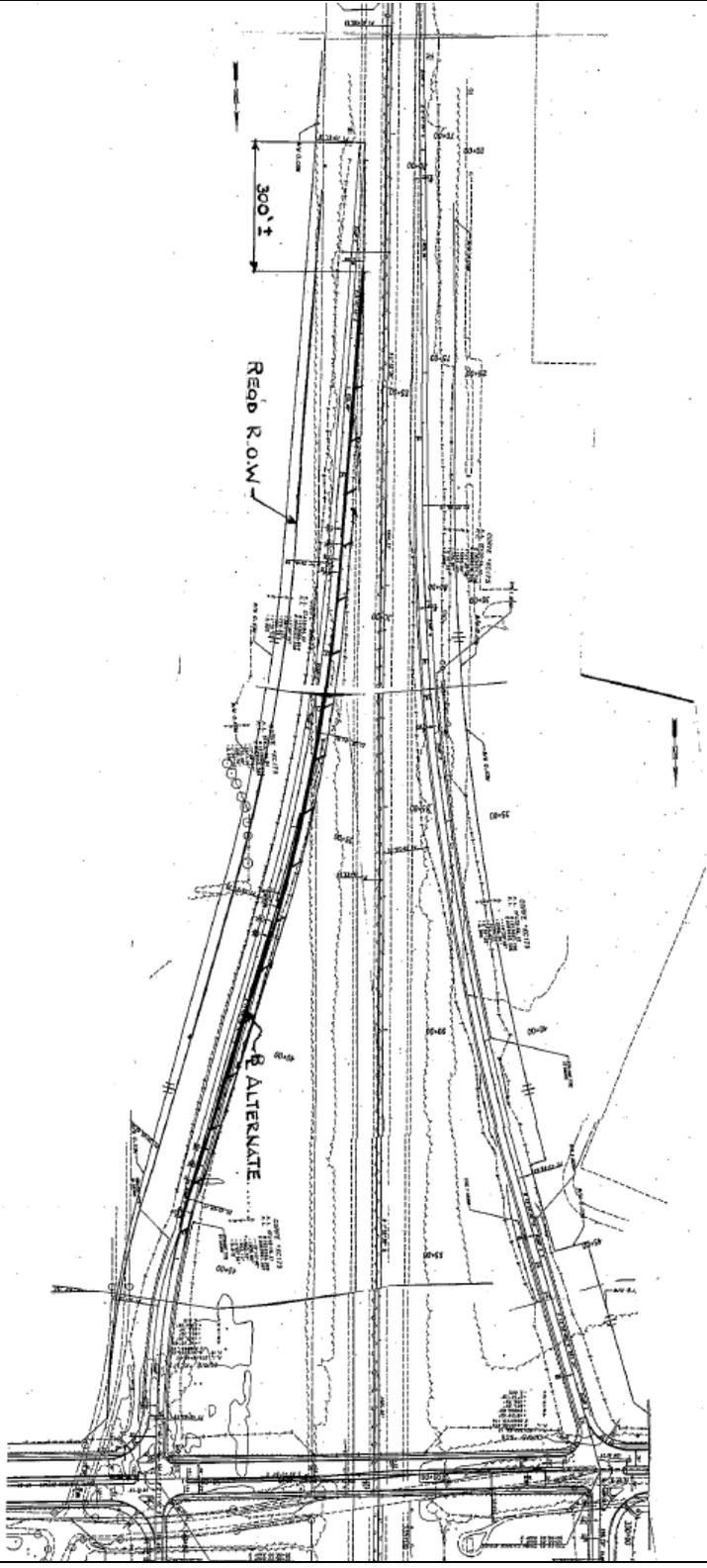
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 336,573	\$	\$ 336,573
ALTERNATIVE	\$	\$	\$
SAVINGS	\$ 336,573	\$	\$ 336,573

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-5**

DESCRIPTION: **SHORTEN LENGTHS FO RAMPS C AND D**

SHEET NO.: **2 of 5**



# Illustrations

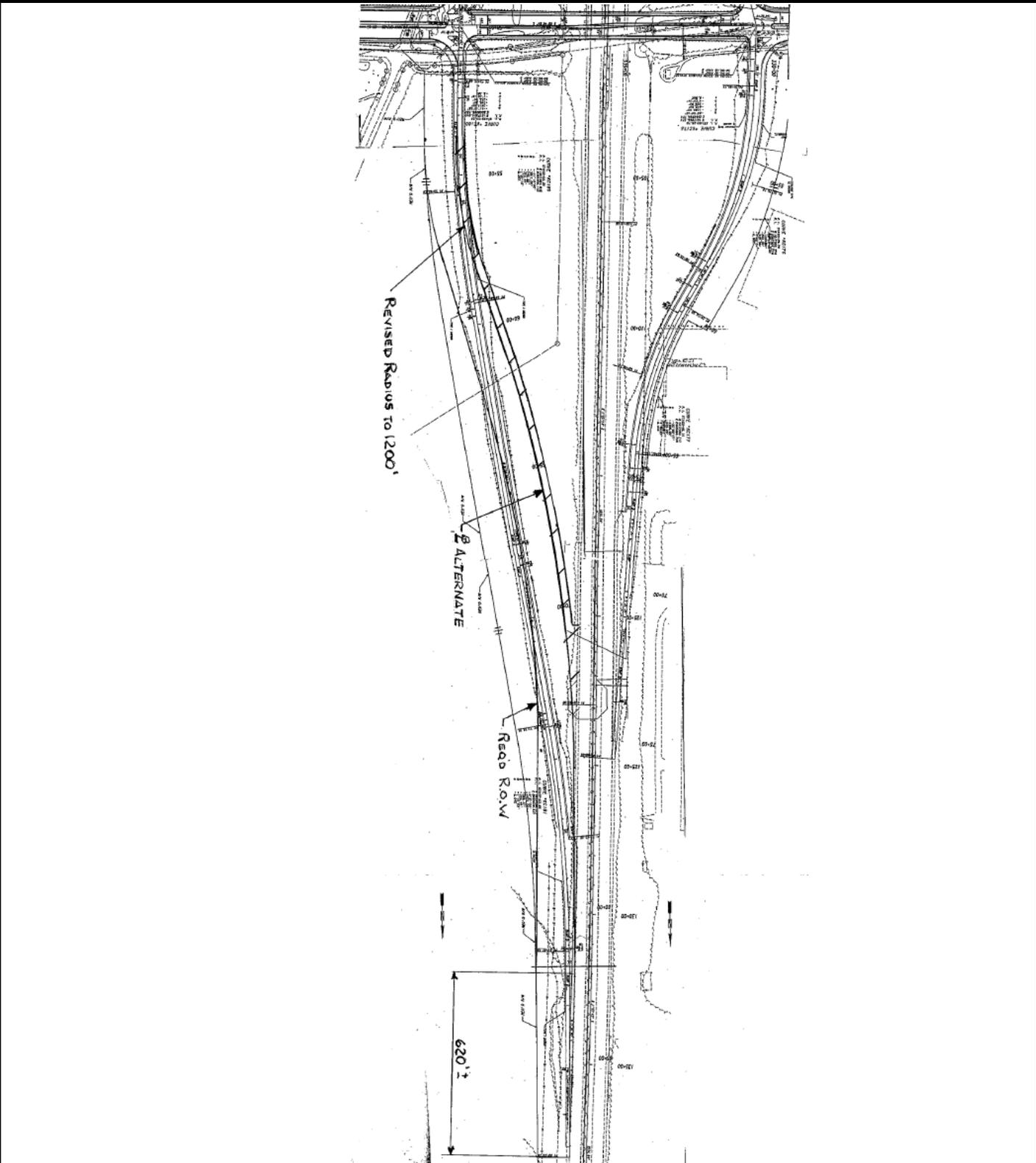


PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-5**

DESCRIPTION: **SHORTEN LENGTHS FO RAMPS C AND D**

SHEET NO.: **3 of 5**



# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-5**

DESCRIPTION: **SHORTEN LENGTHS FO RAMPS C AND D**

SHEET NO.: **4 of 5**

## REQUIRED R.O.W. SAVINGS

$$\text{RAMP C : } 2400' \times 25' \text{ AVG} = 60,000 / 43,560 = 1.38 \text{ ACRES}$$

$$\text{RAMP D : } 2685' \times 60' \text{ AVG} = 161,100 / 43,560 = 3.70 \text{ ACRES}$$

$$\text{TOTAL SAVED ACRES} = 5.08$$

---

$$5.08 \text{ ACRES} \times \$ 20,000 = \$ 101,600 \text{ TOTAL R.O.W. SAVINGS}$$

## REQUIRED PAVEMENT SAVINGS

$$\text{RAMP C : } 300' \times 16' = 4800 \text{ s.f.} / 9 = 533 \text{ s.y.}$$

$$\text{RAMP D : } 620' \times 16' = 9920 \text{ s.f.} / 9 = 1102 \text{ s.y.}$$

$$\text{TOTAL PAVEMENT SAVED} = 1635 \text{ s.y.}$$

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$$1635 \text{ s.y.} \times \$ 125.00 \text{ s.y.} = \$ 204,444 \text{ TOTAL PAVEMENT SAVINGS}$$



# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.:  
**I-6**

DESCRIPTION: **CLARIFY MSE WALL LOCATIONS**

SHEET NO.: **1** of **1**

## Original Design:

The concept cost estimate has costs for 3,000 SF of MSE walls (0-10 FT HT) and 7,500 SR of MSE Walls (10-20 FT HT).

## Alternative:

Clarify locations fo proposed MSE walls and reduce or eliminate if possible

## Opportunities:

- Reduce or eliminate MSE wall

## Risks:

- No apparent, must be balance with right-of-way impacts

## Technical Discussion:

The project concept report indicates the potential need for retaining walls in the northwest and southwest quadrants fo the interchange to reduce impacts to industrial structures. Based on plans and cross sections it appears tht retaining walls may not be required in these areas. It is unclear if MSE walls have been proposed or are needed at other locations.

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-7**

DESCRIPTION: **CONSTRUCT RAMPS OF ASPHALT INSTEAD OF PCC PAVEMENT**

SHEET NO.: **1 of 6**

**Original Design:**

The original design specifies all ramps be constructed of 12" PCC pavement. From the gore areas on I-75 to the radius returns on the Calhoun Bypass, SR 53.

**Alternative:**

The alternative design proposes to construct the ramps of an equal strength section of recycled asphalt concrete pavement.

**Opportunities:**

- Initial cost savings
- Simplify construction

**Risks:**

- Pavement deterioration

**Technical Discussion:**

The existing I-75 mainline is constructed of asphalt. The proposed tapers are to be built of asphalt and then changed to concrete pavement at the full width ramp pavement to the tie in at the bypass mainline. Potential problems would exist at the asphalt and concrete transition.

**From a life cycle cost viewpoint this alternative would be seen as not cost effective. From a first cost viewpoint, the initial cost is reduced by \$1,041,161.**

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 5,646,850	\$ 1,359,799	\$ 7,006,649
ALTERNATIVE	\$ 4,605,689	\$ 5,078,218	\$ 9,683,907
SAVINGS	\$ 1,041,161	\$ (3,718,419)	\$ (2,677,250)



# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870**

ALTERNATIVE NO.: **I-7**

DESCRIPTION: **CONSTRUCT RAMPS OF ASPHALT INSTEAD OF PCC**  
**PAVEMENT**

SHEET NO.: **3 of 6**

## RAMP A

$$\begin{aligned} & \text{STA } 31+15 - \text{STA } 49+64 \quad 32' \text{ WIDTH} \\ & 1849 \text{ FT} \times 32 \text{ FT} = \underline{59168 \text{ SF}} = \underline{6574 \text{ SY}} \end{aligned}$$

## RAMP B

$$\begin{aligned} & \text{STA } 58+45 - \text{STA } 67+03 \quad 32' \text{ WIDTH} \\ & \text{STA } 54+00 - \text{STA } 58+45 \quad 32' - 48' \text{ WIDTH} \\ & \text{STA } 50+36 - \text{STA } 54+00 \quad 48' \text{ WIDTH} \\ & 858 \text{ FT} \times 32 \text{ FT} = 27456 \text{ SF} = 3050 \text{ SY} \\ & 445 \text{ FT} \times \frac{32+48}{2} \text{ FT} = 17800 \text{ SF} = 1977 \text{ SY} \\ & 364 \text{ FT} \times 48 \text{ FT} = 17472 \text{ SF} = 1941 \text{ SY} \\ & \underline{62728 \text{ SF}} \quad \underline{6968 \text{ SY}} \end{aligned}$$

## RAMP C

$$\begin{aligned} & \text{STA } 24+39 - \text{STA } 44+50 \quad 32' \text{ WIDTH} \\ & \text{STA } 44+50 - \text{STA } 46+15 \quad 32' - 48' \text{ WIDTH} \\ & \text{STA } 46+15 - \text{STA } 49+64 \quad 48' \text{ WIDTH} \\ & 2011 \text{ FT} \times 32 \text{ FT} = 64352 \text{ SF} = 7150 \text{ SY} \\ & 165 \text{ FT} \times \frac{32+48}{2} = 6600 \text{ SF} = 733 \text{ SY} \\ & 349 \text{ FT} \times 48 \text{ FT} = 16752 \text{ SF} = 1861 \text{ SY} \\ & \underline{87704 \text{ SF}} \quad \underline{9744 \text{ SY}} \end{aligned}$$

## RAMP D

$$\begin{aligned} & \text{STA } 50+36 - \text{STA } 77+69 \quad 32' \text{ WIDTH} \\ & 2733 \text{ FT} \times 32 \text{ FT} \quad \underline{87456 \text{ SF}} \quad \underline{9717 \text{ SY}} \end{aligned}$$

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870** ALTERNATIVE NO.: **I-7**

DESCRIPTION: **CONSTRUCT RAMPS OF ASPHALT INSTEAD OF PCC**  
**PAVEMENT** SHEET NO.: **4 of 6**

TOTAL RAMP QUANTITIES 297056 SF 3270354

## EXISTING PAVEMENT SECTION

10" GAB

3" RECYCLED ASPH CONC 19 mm SUPERPAVE

12" PCC PAVEMENT

## PROPOSED PAVEMENT SECTION

10" GAB

10" RECYCLED ASPH CONC 25 mm SUPERPAVE

4" RECYCLED ASPH CONC 19 mm SUPERPAVE

1/2" RECYCLED ASPH CONC 12.5 mm SUPERPAVE

## QUANTITY CHANGES

GAB - 0

RECYCLED ASPH CONC 25 mm - INCREASE 10"

RECYCLED ASPH CONC 19 mm - INCREASE 1"

RECYCLED ASPH CONC 12.5 mm - INCREASE 1/2"

PLAIN PCC PAVEMENT - DECREASE 12"

RECYCLED 25 mm SUPERPAVE

$3270354 \times 1100 \# / 54 \div 2000 = 17986 T$

RECYCLED 19 mm SUPERPAVE

$3270354 \times 110 \# / 54 \div 2000 = 1798 T$

RECYCLED 12.5 mm SUPERPAVE

$3270354 \times 165 \# / 54 \div 2000 = 2697 T$

PLAIN PCC PAVEMENT

3270354



# LIFE CYCLE COST WORKSHEET

PROJECT:	<b>UNION GROVE ROAD -- GORDON COUNTY - P.I. No. 610870</b> <i>Georgia Department of Transportation</i>				SHEET NO.	<b>I-7</b> <b>6 of 6</b>	
<b>LIFE CYCLE PERIOD:</b>	25	years			<b>ORIGINAL</b>	<b>PROPOSED</b>	
<b>INTEREST RATE:</b>	4.20%	<b>ESCALATION RATE:</b>	0.00%				
<b>A. INITIAL COST</b>	(Note - escalation shown as 0.0% since using constant dollar LCC analysis)				5,646,850	4,605,689	
<b>Useful Life (Years)</b>							
<b>INITIAL COST SAVINGS</b>						1,041,161	
<b>B. RECURRENT COSTS (Annual Expenditures)</b>							
1. <b>Maintenance</b>	Based on first cost x 0.01 for PCC and x 0.05 for Asphalt				56,469	230,284	
2. <b>Operating</b>							
3. <b>Energy</b>							
4.							
5.							
6.							
<b>Total Annual Costs</b>					56,469	230,284	
<b>Present Worth Factor</b>					15.2970	15.2970	
<b>Present Worth of RECURRENT COSTS</b>					863,799	3,522,664	
<b>C. SINGLE EXPENDITURES</b>							
	Year	Amount	PW factor	Present Worth	Present Worth		
ORIG	PROP	< Put "x" in appropriate box (original design or proposed design)					
<b>X</b>		1. <b>Refurbishing of limited nature</b>	20	1,129,370	0.4392	496,000	-
	<b>X</b>	2. <b>Milling resurfacing</b>	10	1,411,713	0.6627	-	935,554
	<b>X</b>	3. <b>Milling resurfacing</b>	20	1,411,713	0.4392	-	620,000
		4.			1.0000	-	-
		5.			1.0000	-	-
		6.			1.0000	-	-
		7.			1.0000	-	-
		8.			1.0000	-	-
<b>D. SALVAGE VALUE</b>							
		Year	Amount	PW factor	Present Worth	Present Worth	
		1.		1.0000	-	-	
		2.		1.0000	-	-	
<b>Present Worth of SINGLE EXPENDITURES</b>					496,000	1,555,554	
<b>E. Total Recurrent Costs &amp; Single Expenditures (B + C + D)</b>					1,359,799	5,078,218	
<b>RECURRENT COSTS &amp; SINGLE EXPENDITURES SAVINGS</b>						(3,718,419)	
<b>TOTAL PRESENT WORTH COST (A + E)</b>					7,006,649	9,683,907	
<b>TOTAL LIFE CYCLE SAVINGS</b>						(2,677,258)	

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-8**

DESCRIPTION: **CONSTRUCT CALHOUN BYPASS MAINLINE WITHIN THE  
INTERCHANGE PROJECT OF ASPHALT INSTEAD OF PCC**

SHEET NO.: **1 of 6**

**Original Design:**

The original design specifies full depth concrete pavement between Sta.339+42 and Sta. 341+68. Dowelled median and curb would be used in this area.

**Alternative:**

The alternative design would utilize asphaltic concrete pavement for the travel lanes and TP 7 and TP 2 curbs for the medians and outside curb respectively.

**Opportunities:**

- Initial cost savings
- Simplify construction

**Risks:**

- Increased maintenance costs

**Technical Discussion:**

Construction of short sections of concrete pavement present problems with getting acceptable rideability. The required stage construction of the bridge and concrete approaches will require an additional mobilization for a small concrete quantity.

**From a life cycle cost viewpoint this alternative would be seen as not cost effective. From a first cost viewpoint, the initial cost is reduced by \$584,491.**

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 7,352,950	\$ 1,770,640	\$ 9,123,590
ALTERNATIVE	\$ 6,768,460	\$ 7,202,400	\$ 13,970,860
SAVINGS	\$ 584,491	\$ (5,431,760)	\$ (4,847,270)

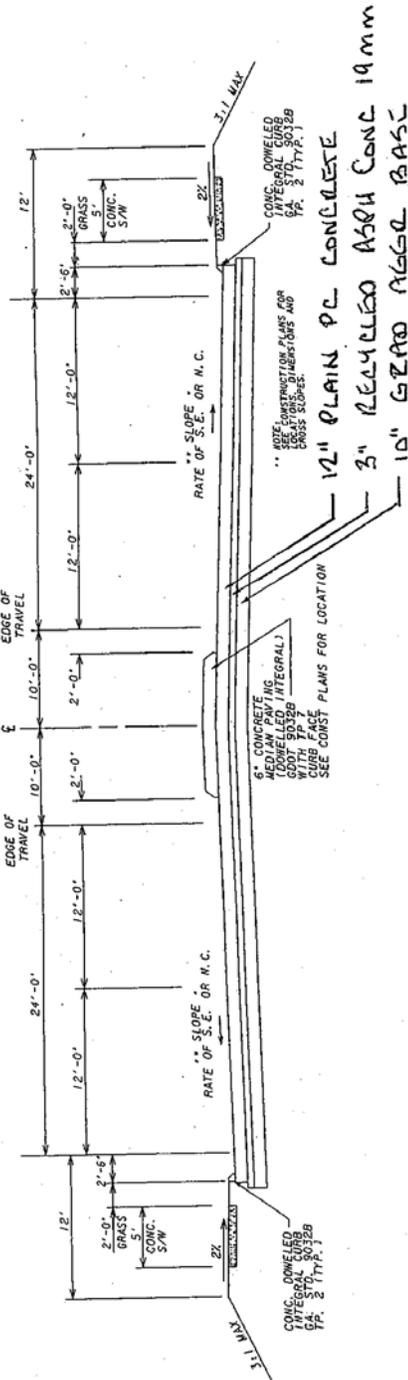
PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-8**

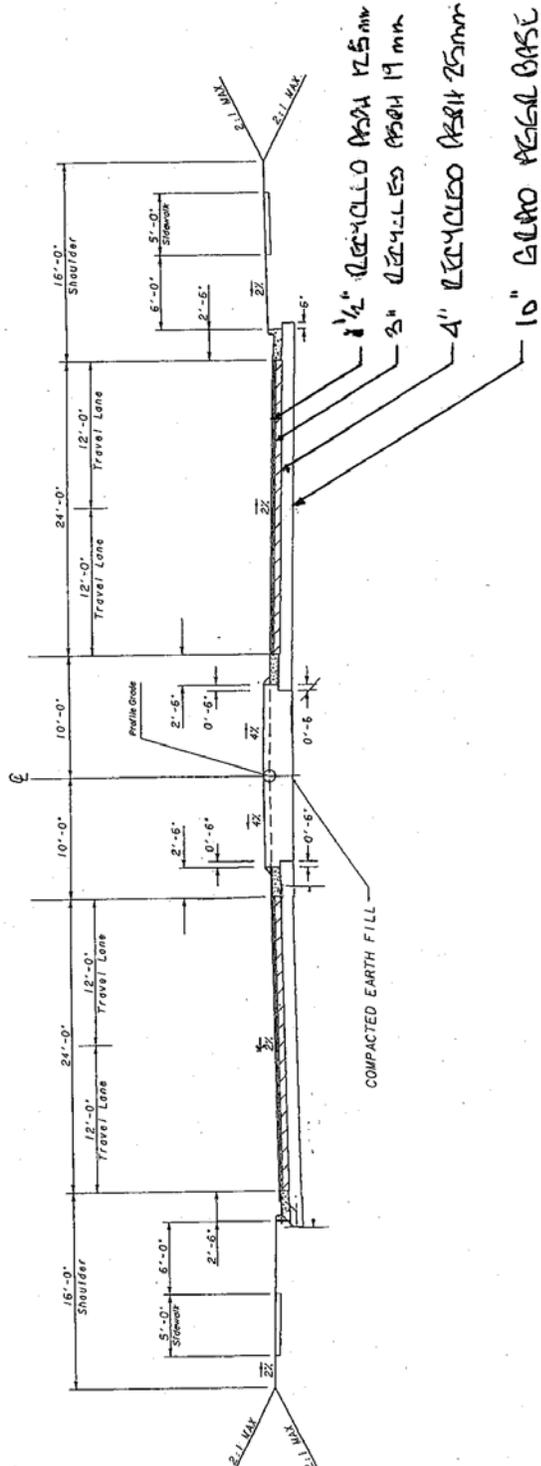
DESCRIPTION: **CONSTRUCT CALHOUN BYPASS MAINLINE WITHIN THE INTERCHANGE PROJECT OF ASPHALT INSTEAD OF PCC**

SHEET NO.: **2 of 6**

## ORIGINAL DESIGN



## ALTERNATE DESIGN



# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870 ALTERNATIVE NO.: **I-8**

DESCRIPTION: **CONSTRUCT CALHOUN BYPASS MAINLINE WITHIN THE INTERCHANGE PROJECT OF ASPHALT INSTEAD OF PCC** SHEET NO.: 3 of 6

## SOUTH CALHOUN BYPASS - PLAIN PCC PAVEMENT

STA 329+42 - STA 333+81 73' WIDTH

$$439 \text{ FT} \times 73 \text{ FT} = 32047 \text{ SF} = 3560 \text{ SY}$$

STA 337+29 - STA 341+68 73' WIDTH

$$439 \text{ FT} \times 73 \text{ FT} = 32047 \text{ SF} = 3560 \text{ SY}$$

## Doweled Median

7120 SY

STA 329+42 - STA 333+81 16' WIDTH

$$439 \text{ FT} \times 16 \text{ FT} = 7024 \text{ SF} = 780 \text{ SY}$$

STA 337+29 - STA 341+68

$$439 \text{ FT} \times 16 \text{ FT} = 7024 \text{ SF} = 780 \text{ SY}$$

1560 SY

## PROPOSED ASPHALT SECTION

GAPS - 10" DEPTH

RECYCLED ASPH CONC 12.5 mm - 1 1/2" = 165 #/SY

RECYCLED ASPH CONC 19 mm - 3" = 330 #/SY

RECYCLED ASPH CONC 25 mm - 4" = 440 #/SY

ASPHALT PAVEMENT WIDTH - 48' WIDTH

GAPS WIDTH - 60' WIDTH

ADDITIONAL TP 1 CURB AND GUTTER

$$(439 \text{ LF} + 439 \text{ LF}) \times 2 + 100 \text{ LF (RADIUS)} = 978 \text{ LF}$$

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870 ALTERNATIVE NO.: **I-8**

DESCRIPTION: **CONSTRUCT CALHOUN BYPASS MAINLINE WITHIN THE INTERCHANGE PROJECT OF ASPHALT INSTEAD OF PCC** SHEET NO.: 4 of 6

## REQUIRED ASPHALT QUANTITIES

STA 329+42 - STA 333+81

STA 337+29 - STA 341+68

LENGTH 878 LF

### 12.5 mm SUPERPAVE

$$878 \text{ FT} \times 48 \text{ FT} \div 9 \times 165 \# / \text{yd}^2 \div 2000 = \underline{386 \text{ TN}}$$

### 19 mm SUPERPAVE

$$878 \text{ FT} \times 48 \text{ FT} \div 9 \times 330 \# / \text{yd}^2 \div 2000 = \underline{712 \text{ TN}}$$

### 25 mm SUPERPAVE

$$878 \text{ FT} \times 48 \text{ FT} \div 9 \times 440 \# / \text{yd}^2 \div 2000 = \underline{1030 \text{ TN}}$$

### GAB

$$878 \text{ FT} \times 60 \text{ FT} \times 0.83 \text{ FT} \times 145 \# / \text{ft}^3 \div 2000 = \underline{3170 \text{ TN}}$$

## REQUIRED PCC PAVEMENT QUANTITIES

CONCRETE PAVEMENT 7720 SY

DOWELED MEDIAN 1560 SY

### GAB

$$878 \text{ LF} \times 74 \text{ F} \times 0.83 \text{ FT} \times 145 \# / \text{ft}^3 \div 2000 = \underline{3909 \text{ TN}}$$



# LIFE CYCLE COST WORKSHEET

<b>PROJECT:</b>	<b>UNION GROVE ROAD -- GORDON COUNTY - P.I. No. 610870</b> <i>Georgia Department of Transportation</i>				<b>I-8</b>			
					SHEET NO.	<b>6 of 6</b>		
<b>LIFE CYCLE PERIOD:</b>	25	years						
<b>INTEREST RATE:</b>	4.20%	<b>ESCALATION RATE:</b>	0.00%		<b>ORIGINAL</b>	<b>PROPOSED</b>		
<b>A. INITIAL COST</b>	(Note - escalation shown as 0.0% since using Useful Life (Years) constant dollar LCC analysis)				7,352,950	6,768,460		
<b>INITIAL COST SAVINGS</b>						584,490		
<b>B. RECURRENT COSTS (Annual Expenditures)</b>								
1.	Maintenance Based on first cost x 0.01 for PCC and x 0.05 for Asphalt				73,530	338,423		
2.	Operating							
3.	Energy							
4.								
5.								
6.								
<b>Total Annual Costs</b>					73,530	338,423		
<b>Present Worth Factor</b>					15.2970	15.2970		
<b>Present Worth of RECURRENT COSTS</b>					1,124,782	5,176,861		
<b>C. SINGLE EXPENDITURES</b>								
		Year	Amount	PW factor	Present Worth	Present Worth		
ORIG	PROP	< Put "x" in appropriate box (original design or proposed design)						
<b>X</b>		1.	Refurbishing of limited nature	20	1,470,590	0.4392	645,858	-
	<b>X</b>	2.	Milling resurfacing	10	1,838,238	0.6627	-	1,218,216
	<b>X</b>	3.	Milling resurfacing	20	1,838,238	0.4392	-	807,323
		4.				1.0000	-	-
		5.				1.0000	-	-
		6.				1.0000	-	-
		7.				1.0000	-	-
		8.				1.0000	-	-
<b>D. SALVAGE VALUE</b>								
				Year	Amount	PW factor	Present Worth	Present Worth
		1.				1.0000	-	-
		2.				1.0000	-	-
<b>Present Worth of SINGLE EXPENDITURES</b>					645,858	2,025,539		
<b>E. Total Recurrent Costs &amp; Single Expenditures (B + C + D)</b>					1,770,640	7,202,400		
<b>RECURRENT COSTS &amp; SINGLE EXPENDITURES SAVINGS</b>						(5,431,760)		
<b>TOTAL PRESENT WORTH COST (A + E)</b>					9,123,590	13,970,860		
<b>TOTAL LIFE CYCLE SAVINGS</b>						<b>(4,847,270)</b>		

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.:  
**I-9**

DESCRIPTION: **IF SOUTH CALHOUN BYPASS AND UNION GROVE INTERCHANGE  
ARE LET IN SEPARATE CONTRACT, SPECIFY A BORROW LOCATION FOR  
THE INTERCHANGE EMBANKMENT IN THE BYPASS PROJECT**

SHEET NO.: **1** of **1**

## Original Design:

The South Calhoun Bypass and the Union Grove Road Interchange are currently shown as two separate contracts.

## Alternative:

Specify a borrow location on the Bypass project where fill material can be obtained for the embankment required on the Interchange project.

## Opportunities:

- Delete borrow excavation from the Interchange project

## Risks:

- Borrow location will need to be near Interchange
- Right-of-Way will have to be acquired on Bypass project at borrow location and access to it when the Interchange project is let to contract
- Additional traffic control may be needed on Interchange project

## Technical Discussion:

The Calhoun South Bypass and the Union Grove Interchange are currently two stand alone projects. It appears that a borrow location could be provided on the Bypass project to fulfill the fill requirements on the interchange project, thus eliminating borrow excavation on that project. The borrow location would have to be near the Interchange to be feasible so that the cost of moving this material would not be greater than the cost of borrow excavation. Right-of-Way acquisition of the location and access to it will be needed when the Interchange project is let to contract.

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-10**

DESCRIPTION: **SHORTEN BRIDGE, ELIMINATE END SPANS, USE MSE  
ABUTMENTS**

SHEET NO.: **1 of 4**

## Original Design:

The original design is a 4-span bridge 280 ft long, including end spans of 56 ft. each, with end slopes.

## Alternative:

The alternative design shortens the bridge by eliminating the end spans through the use of MSE abutments; the alternative design bridge length is 184 ft.

## Opportunities:

- Initial cost savings

## Risks:

- Potential increase in temporary shoring

## Technical Discussion:

It is common practice to use MSE abutments to reduce bridge lengths. MSE walls can be stage constructed and are economical alternatives to end spans. The MSE wall foundations may not be appropriate if the soils are of very poor quality.

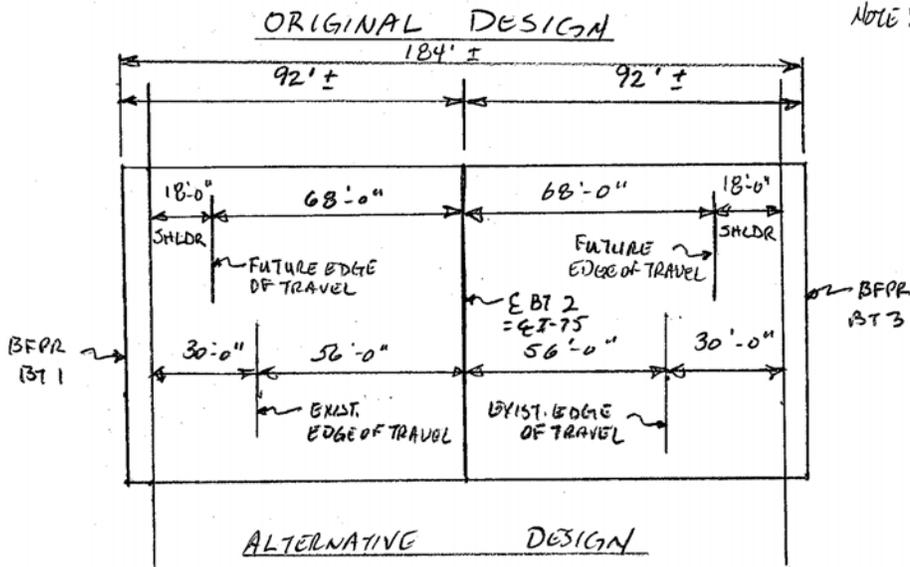
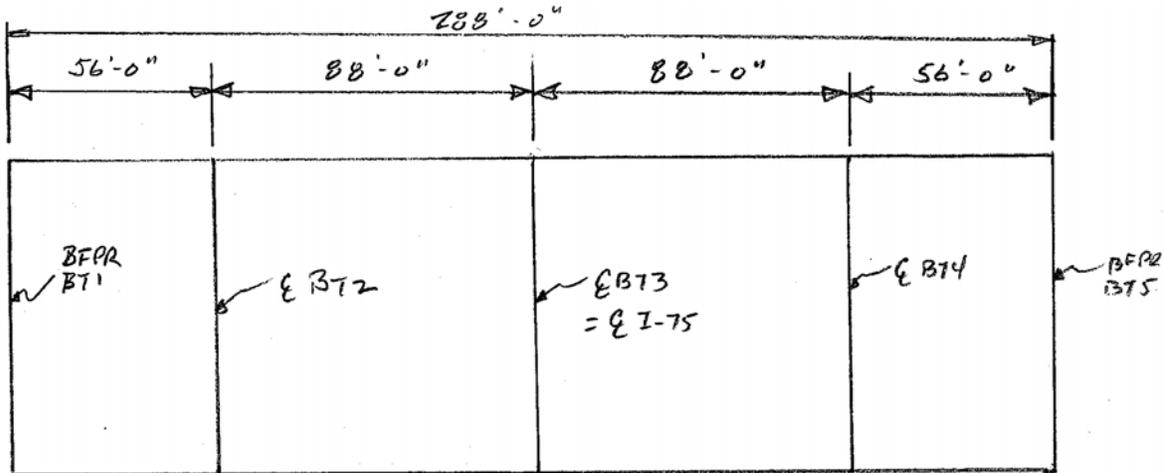
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,689,620	\$	\$ 3,689,620
ALTERNATIVE	\$ 3,084,250	\$	\$ 3,084,250
SAVINGS	\$ 605,370	\$	\$ 605,370

# Illustrations

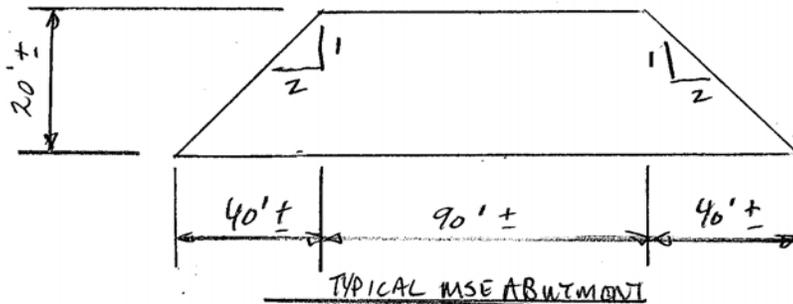


PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
 UNION GROVE ROAD – GORDON COUNTY – P.I. Number: **610870** ALTERNATIVE NO.: **I-10**

DESCRIPTION: **SHORTEN BRIDGE, ELIMINATE END SPANS, USE MSE**  
**ABUTMENTS** SHEET NO.: **2 of 4**



NOTE: BRIDGE SKEW =  $88^{\circ}27'06.1''$



# Calculations



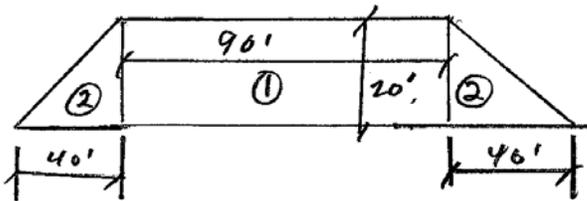
PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
 UNION GROVE ROAD – GORDON COUNTY – P.I. Number: **610870** ALTERNATIVE NO.: **I-10**

DESCRIPTION: **SHORTEN BRIDGE, ELIMINATE END SPANS, USE MSE** SHEET NO.: **3 of 4**  
**ABUTMENTS**

ORIGINAL DESIGN - BRIDGE AREA  $86.4167(288) = 24888 \text{ SF}$

ALTERNATIVE DESIGN - BRIDGE AREA  $86.4167(184) = 15900 \text{ SF}$

## WALL AREA



## Area

$$\begin{array}{r}
 1 \quad 90(20) = 1800 \\
 2 \quad 20(40)(.5)(2) = 800 \\
 \hline
 2600 \\
 \swarrow \text{2 WALLS} \\
 2600(2) = 5200 \text{ SF}
 \end{array}$$

## ADDITIONAL MSE BACKFILL

(USE SAME RATIO AS ESTIMATED FOR OTHER WALLS)

$$\frac{400 \text{ CY}}{(7500+3000) \text{ SF}} = .04 \text{ CY/SF} \quad 5200(.04) = 208 \text{ CY}$$

CODING 'A'  $90+40+40 = 170 \times 2 = 340 \text{ LF}$



# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-11**

DESCRIPTION: **ELIMINATE GUARDRAILS IN LOCATIONS OF 4:1 SLOPES**

SHEET NO.: **1 of 4**

## Original Design:

Various locations along the South Calhoun Bypass and ramps show guardrail required to protect 4:1 slopes.

## Alternative:

Remove guardrail in these areas since a 4:1 slope is a recoverable slope.

## Opportunities:

- Eliminate unnecessary hazard

## Risks:

- Review each location to insure clear zone requirements are met if guardrail is removed

## Technical Discussion:

4:1 slopes are shown as recoverable slopes in the AASHTO Roadside Design Guide. If the clear zone requirements are met by using these slopes, it appears that the required guardrail shown in these areas should be removed in order to eliminate an unnecessary hazard.

At the informal out-briefing on the last day of the study, the designer noted that the alternative will be accepted and implemented.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 34,100	\$	\$
ALTERNATIVE	\$ 0	\$	\$
SAVINGS	\$ 34,100	\$	\$

# Illustrations

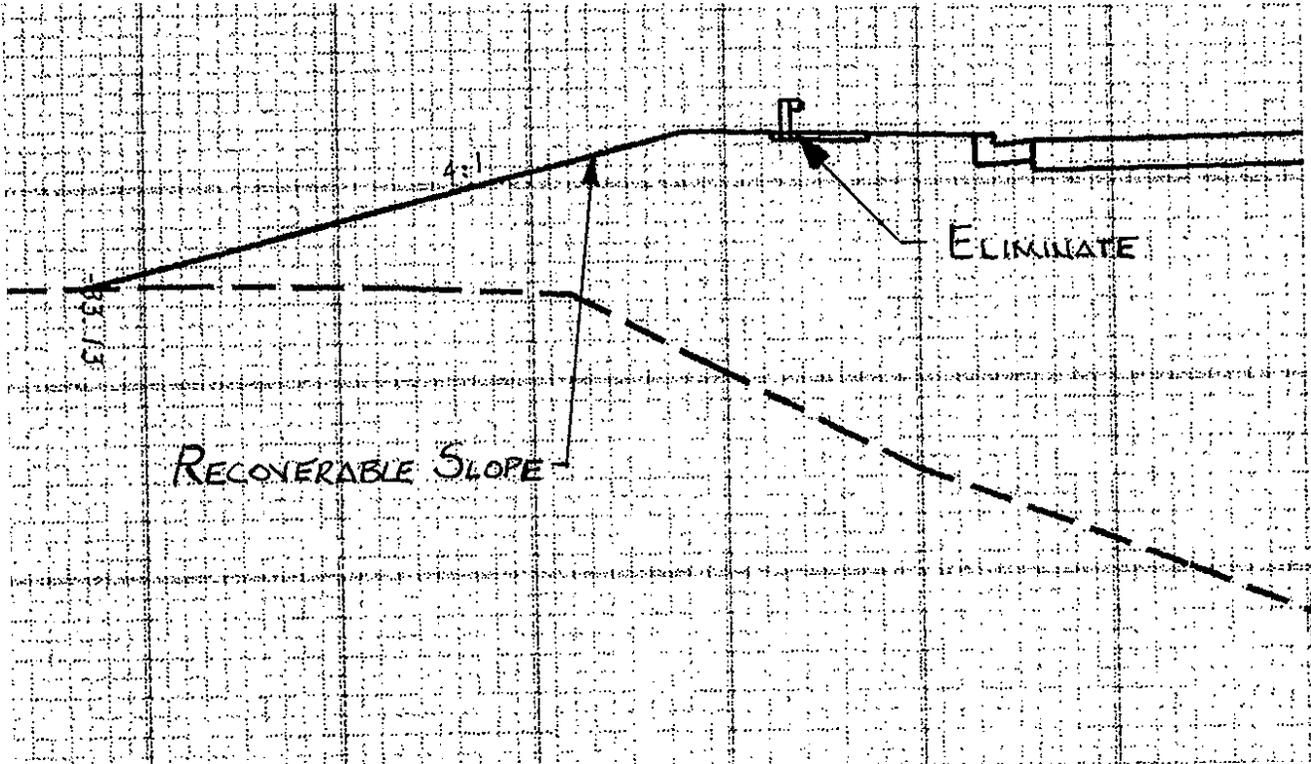


PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-11**

DESCRIPTION: **ELIMINATE GUARDRAIL IN LOCATIONS OF 4:1 SLOPES**

SHEET NO.: **2 of 4**



# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870** ALTERNATIVE NO.: **I-11**

DESCRIPTION: **ELIMINATE GUARDRAIL IN LOCATIONS OF 4:1 SLOPES** SHEET NO.: **3 of 4**

## ELIMINATE GUARDRAIL

### LOCATIONS

ROADWAY	STATION TO STATION	SIDE	LENGTH
SC BYPASS	327+00 - 328+00	L & R	200'
SC BYPASS	337+50 - 338+50	L	100'
SC BYPASS	344+00 - 345+50	L & R	300'
RAMP A	45+00 - 46+50	L	150'
RAMP A	46+00 - 46+50	R	50'
RAMP B	52+50 - 53+00	R	50'
RAMP C	44+50 - 47+00	L	250'
RAMP C	45+00 - 47+00	R	200'
RAMP D	79+50 - 82+00	R	250'

TOTAL LENGTH GUARDRAIL: 1550'

1550' GUARDRAIL x 20.00 PER FOOT = \$ 31,000 TOTAL SAVINGS



# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.:  
**I-15**

DESCRIPTION: **SHORTEN SPANS OVER INTERSTATE BY USING GUARDRAIL OR  
CONCRETE BARRIER ALONG I-75**

SHEET NO.: **1 of 1**

## Original Design:

The original design provides for a 30 ft clear zone at intermediate piers 2 and 4.

## Alternative:

The alternative design is to shorten the spans over I-75 by placing piers 2 & 4 as required for the future I-75 roadway section (less than 30' clear zone) and provide guardrail or concrete barrier protection at piers.

## Opportunities:

- More balanced span arrangement
- Initial cost savings

## Risks:

- Requires guardrail or side barrier
- Requires more construction on I-75

## Technical Discussion:

Shortening the spans over the interstate could be accomplished through the use of guardrail or concrete side barrier. With the guardrail option no paving on the interstate would be necessary. Concrete slope paving would be used to fill in the area behind the guardrail. The concrete side barrier option would require cross slope adjustment and paving on the interstate.

The primary benefit of shortening the spans over I-75 is that it provides a better balance on the bridge constructing less of the spans with deeper, more costly beams. Additionally, if Type III beams are used (suggested in a separate alternative design) shortening the intermediate spans by a few feet has potential to reduce the number of beams required in those spans.

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-16**

DESCRIPTION: **REDUCE SHOULDER WIDTHS ON RAMPS FROM GORE POINT TO  
RADIUS AT TOP FO RAMP**

SHEET NO.: **1 of 4**

**Original Design:**

The original design specifies the ramp construction to include a 12 FT paved shoulder on the right side. The pavement is to be constructed to a full depth section.

**Alternative:**

The alternative design proposed to reduce the paved shoulder width to 6 FT. the total shoulder width would remain at the original 14 FT width.

**Opportunities:**

- Initial cost savings

**Risks:**

- Possible increased maintenance costs

**Technical Discussion:**

The reduced paved shoulder does not meet the GDOT Design Policy Manual but by retaining the overall shoulder width, sufficient room for emergency parking will be retained. The reduced paved shoulder will apply only to the ramp sections constructed of concrete.

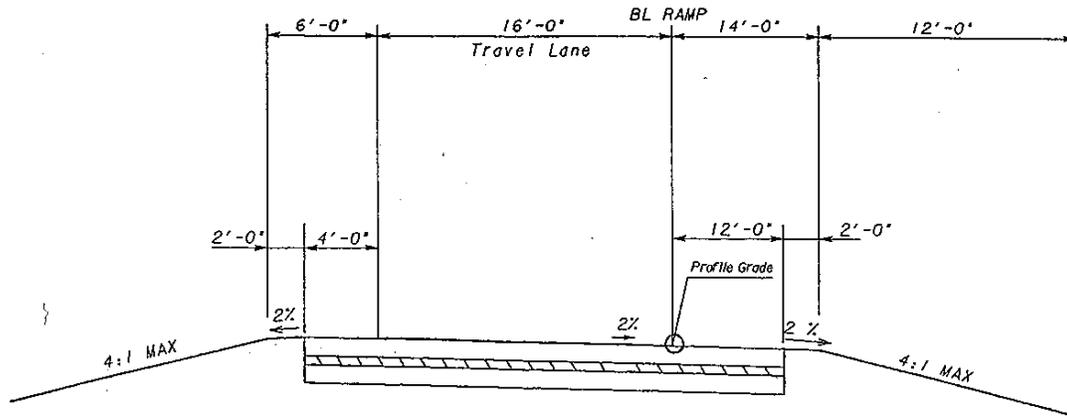
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 4,994,220	\$	\$ 4,994,220
ALTERNATIVE	\$ 4,420,296	\$	\$ 4,420,296
SAVINGS	\$ 573,924	\$	\$ 573,924

# Illustrations

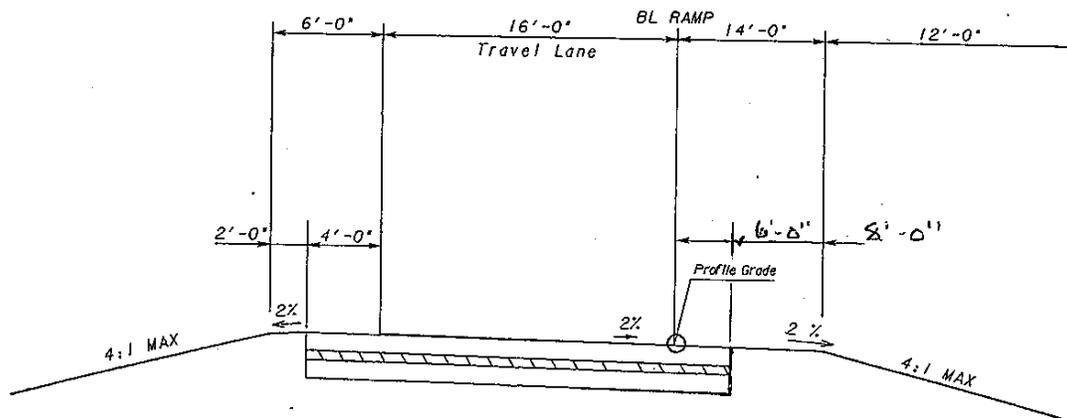


PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870** ALTERNATIVE NO.: **I-16**

DESCRIPTION: **REDUCE SHOULDER WIDTHS ON RAMPS FROM GORE POINT TO RADIUS AT TOP FO RAMP** SHEET NO.: **2 of 4**



ORIGINAL DESIGN



ALTERNATE DESIGN

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
 UNION GROVE ROAD – GORDON COUNTY – P.I. Number: **610870** ALTERNATIVE NO.: **I-16**

DESCRIPTION: **REDUCE SHOULDER WIDTHS ON RAMPS FROM GORE POINT TO**  
**RADIUS AT TOP FO RAMP** SHEET NO.: **3 of 4**

RAMP A		
STA 31+15 - STA 49+64		1849 LF
RAMP B		
STA 50+36 - STA 67+03		1667 LF
RAMP C		
STA 24+39 - STA 49+64		2525 LF
RAMP D		
STA 50+36 - STA 77+69		2733 LF
	TOTAL	<u>8774 LF</u>

## TYPICAL SECTION - SHOULDER

PLAIN PCC PAVT	12"
ASPH CONC 19 mm	3" = 330 #/yd <sup>2</sup>
GRAD AGGR BASE	10" = 145 #/ft <sup>3</sup> x 0.83 FT

## AREA

$$8774 \text{ FT} \times 6 \text{ FT} = 52644 \text{ SF} = 5849 \text{ SY}$$

## QUANTITIES - REDUCTION

PLAIN PCC PAVT	<u>5849 SY</u>
----------------	----------------

ASPH CONC 19 mm	
$5849 \text{ yd}^2 \times 330 \text{ #/yd}^2 \div 2000 =$	<u>965 TN</u>

GRAD AGGR BASE	
$52644 \text{ ft}^2 \times 0.83 \text{ FT} \times 145 \text{ #/ft}^3 \div 2000 =$	<u>3167 TN</u>



# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-19**

DESCRIPTION: **WIDEN BRIDGE TO INCREASE LEFT TURN STORAGE LENGTH**

SHEET NO.: **1 of 4**

**Original Design:**

The original design provides left turn storage length over approximately half the bridge length for both northbound and southbound turning movements.

**Alternative:**

An alternative design is to provide additional storage length of approximately half the bridge length (144 ft.).

**Opportunities:**

- Provide additional storage length

**Risks:**

- Increase bridge cost
- Increase roadway cost

**Technical Discussion:**

Due to the high volume of truck traffic at the interchange it may be desirable to provide left turn storage the full length of the bridge. So that the lanes and medians alignment is maintained, east and west of bridge a full width median is required.

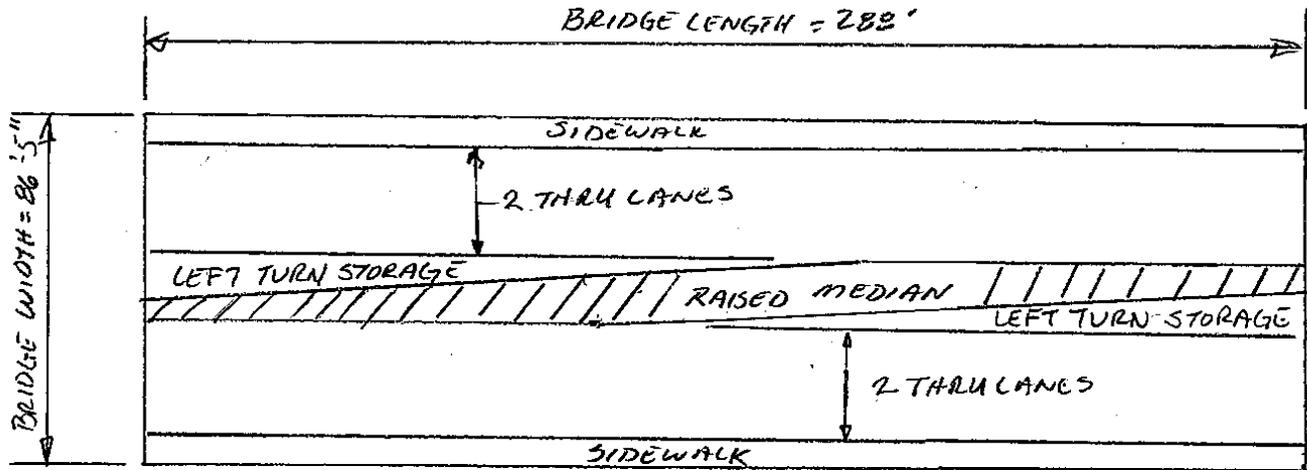
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 7,693,323	\$	\$ 7,693,323
ALTERNATIVE	\$ 9,646,544	\$	\$ 9,646,544
SAVINGS	\$ (1,953,221)	\$	\$ (1,953,221)

# Illustrations



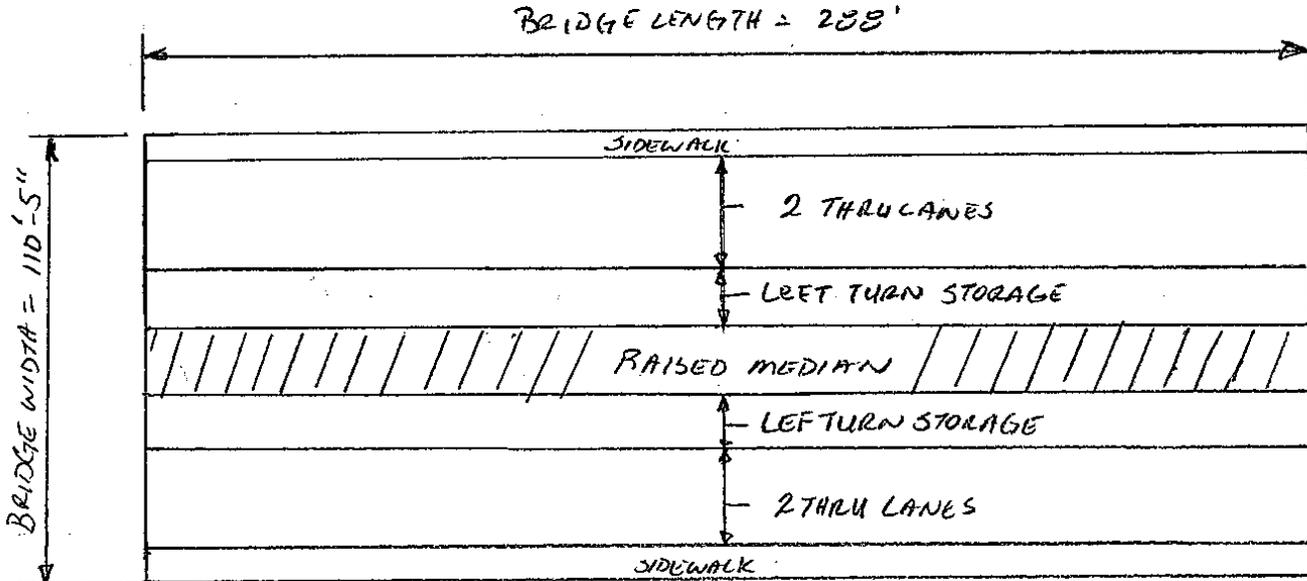
PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870** ALTERNATIVE NO.: **I-19**

DESCRIPTION: **WIDEN BRIDGE TO INCREASE LEFT TURN STORAGE** SHEET NO.: **2 of 4**  
**LENGTH**



ORIGINAL DESIGN

AREA = 24888 SF



ALTERNATIVE DESIGN

AREA = 31800 SF

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**UNION GROVE ROAD - GORDON COUNTY - P.I. Number: 610870**

ALTERNATIVE NO.: **I-19**

DESCRIPTION: **WIDEN BRIDGE TO INCREASE LEFT TURN STORAGE**  
**LENGTH**

SHEET NO.: **3 of 4**

DETERMINE AVERAGE ROADWAY COST

$$16974484 - 2617900 = 14356584$$

$$\text{PROJECT LENGTH} = 0.6 \text{ mile} = 3168 \text{ LF}$$

$$\text{TYPICAL SECTION WIDTH} = 100' (\text{AVG})$$

$$\frac{14356584}{100(3168)} = 45.3 \rightarrow \text{SAY } \$45/\text{SF}$$

ADDITIONAL WIDTH OF BRIDGE (2 ROADWAY BETWEEN RAMPS)  
(MAINTAIN ALIGNMENT OF LANES / MEDIUM FLOW WEST OF INTERCHANGE TO EAST OF INTERCHANGE)

$$\text{GUTTER TO GUTTER} : 2' + 14' + 12' + 20' + 12' + 24' + 2' = 96'$$

$$96' - 72' = 24' \text{ ADDITIONAL WIDTH}$$

ROADWAY LENGTH      STA 340+59.76 ← RAMP C / RAMP D  
                                 - STA 330+58.62 ← RAMP A / RAMP B

$$1001.14' \times 24' \times \$45 = \$1,081,231.2$$

BRIDGE : ALT DESIGN 31,800 SF  
                                 ORIG DESIGN 24,900 SF

$$\underline{69,120 \text{ SF}}$$

$$6,912 (\$100) = \$691,200$$



# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
UNION GROVE ROAD – GORDON COUNTY – P.I. Number: 610870**

ALTERNATIVE NO.: **I-20**

DESCRIPTION: **ELIMINATE MAST ARM LIGHTING STANDARDS IN INTERCHANGE** SHEET NO.: **1 of 2**

**Original Design:**

The original design contains pay items for both mast arm lighting standards and high mast lighting towers in the interchange.

**Alternative:**

The alternate design would eliminate all mast arm lighting, luminaries, and associated wiring. High mast lighting towers would provide all required lighting.

**Opportunities:**

- Initial cost savings
- Eliminate roadside obstructions
- Minimize light mainenance

**Risks:**

- “Dark” spots could occur due to insufficient lighting

**Technical Discussion:**

The high mast towers provide sufficient lighting for the interchange layout. Typically both high tower mast lighting and mast arm lights are not utilized for roadway lighting. The high mast lights are standard installations for rural interchanges.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 750,860	\$	\$
ALTERNATIVE	\$ 145,750	\$	\$
SAVINGS	\$ 605,110	\$	\$



***South Calhoun Bypass***  
***P.I. Number: 662510***

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-1**

DESCRIPTION: **OPTIMIZE RIGHT-OF-WAY TAKINGS**

SHEET NO.: **1 of 1**

## Original Design:

At some locations, the preliminary plans appear to show right-of-way takings greater than necessary.

## Alternative:

Optimize right-of-way takings.

## Opportunities:

- Reduce right-of-way costs

## Risks:

- Reduced right-of-way limits may not coincide with property limits

## Technical Discussion:

Closely coordinate right-of-way limits with construction limits. Adjustments to right-of-way due to property limits and easement considerations may be necessary.

# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-8**

DESCRIPTION: **REDUCE MEDIAN WIDTH**

SHEET NO.: **1 of 4**

## Original Design:

The plan set does not include a depressed, grassed median as part of the typical sections. However, it was the impression of the VE team members that there is such a median that, according to the Concept Validation Report, runs from the western terminus of the project (Station 100+00) to 0.2 mile west of US 41 (Station 272+00 ±). This grassed median is depicted in the report and is shown as 44' feet in width.

## Alternative:

The depressed median would be decreased to 30' in width.

## Opportunities:

- Initial cost savings
- The reduction in width would potentially reduce the number of truck movements over local roads during construction
- May help expedite the project delivery date
- May help to reduce the width of right of way to be taken – reducing cost and effort

## Risks:

- Moderate redesign required
- Will need to have supplemental bulbs/eyebrows where truck movements are anticipated.

## Technical Discussion:

The area to which this alternative would be applicable is characterized by excellent vertical and horizontal sight distances and horizontal curves that are spacious in radius. This should be supportive of the decision to use a lesser median width.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,063,454	\$	\$ 1,063,454
ALTERNATIVE	\$ 0	\$	\$ 0
SAVINGS	\$ 1,063,454	\$	\$ 1,063,454

# Illustrations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:

**C-8**

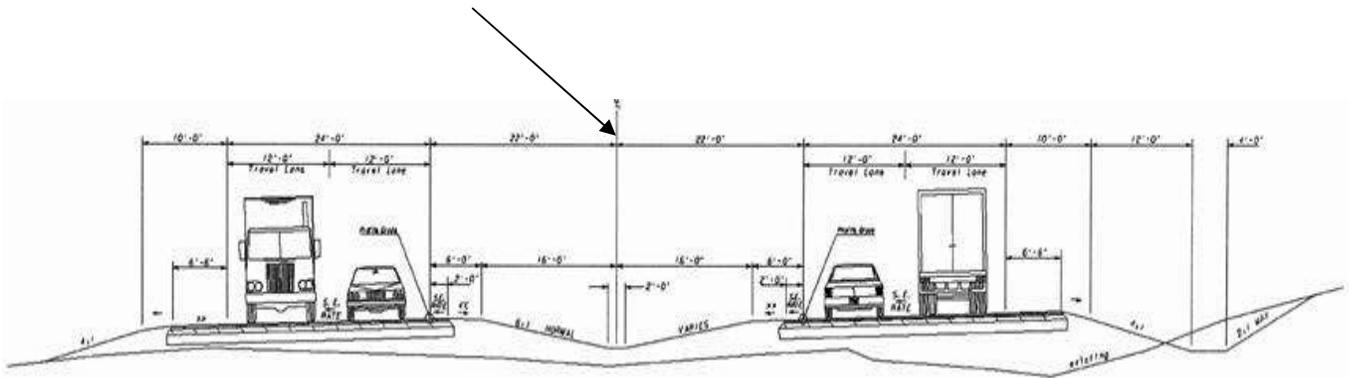
DESCRIPTION: **REDUCE MEDIAN WIDTH**

SHEET NO.:

**2 of 4**

Typical Section as Illustrated in the Concept Validation Report.

Reduce median From 44' to 30'



New Location  
 4 Lanes With a 44' Median  
 (D.S. 55mph)  
 SUPERELEVATED

\* SHOULDER TO SLOPE AT NORMAL RATE, HOWEVER, THE ALGEBRAIC DIFFERENCE IN PAVING SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 8%. MINIMUM SHOULDER SLOPE TO BE 2%.

\*\* SHOULDER TO SLOPE AT NORMAL RATE OR SUPERELEVATION RATE, WHICHEVER IS GREATER.

BEGINNING FROM WEST TERMINUS TO 0.2 MILES WEST OF US 41/SR5

N. T. S.

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:

**C-8**

DESCRIPTION: **REDUCE MEDIAN WIDTH**

SHEET NO.:

**3 of 4**

The current median width is 44'.

The median will be reduced to 30' in width.

Resulting, potential right of way area savings is about  $14' \times 17,200' = 240,800$  s.f. = 5.53 Acres

It is very difficult to approximate the depth of average fill in this area. On a conservative basis, will assume that it is about 8' in depth. This means that the embankment reduction would be  $240,800 \times 8' = 1,926,400$  c.f.

This would equate to 71,348 c.y. of embankment reduction.



# Value Analysis Design Alternative



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.: **C-9**

DESCRIPTION: **CONSTRUCT EB ROADWAY FROM SR 53 TO US 41 FOR TWO-  
WAY TRAFFIC**

SHEET NO.: **1 of 6**

## Original Design:

The original design specifies construction of two 12ft lanes in the eastbound and westbound directions separated by a 44 ft wide median. This typical sections starts on the west end at existing SR 53 and extends easterly to US 41. The limits go from Sta. 100+00 to Sta. 280+00.

## Alternative:

The alternative design would require purchase of right-of-way and grading for the original design section but would only base and pave the eastbound lanes and eastbound bridges. The resulting 24 ft wide roadway would carry both eastbound and westbound traffic.

## Opportunities:

- Initial cost savings
- Shorter construction time

## Risks:

- Traffic volume estimates incorrect – two-lane section under capacity
- Two separate contracts if project delayed

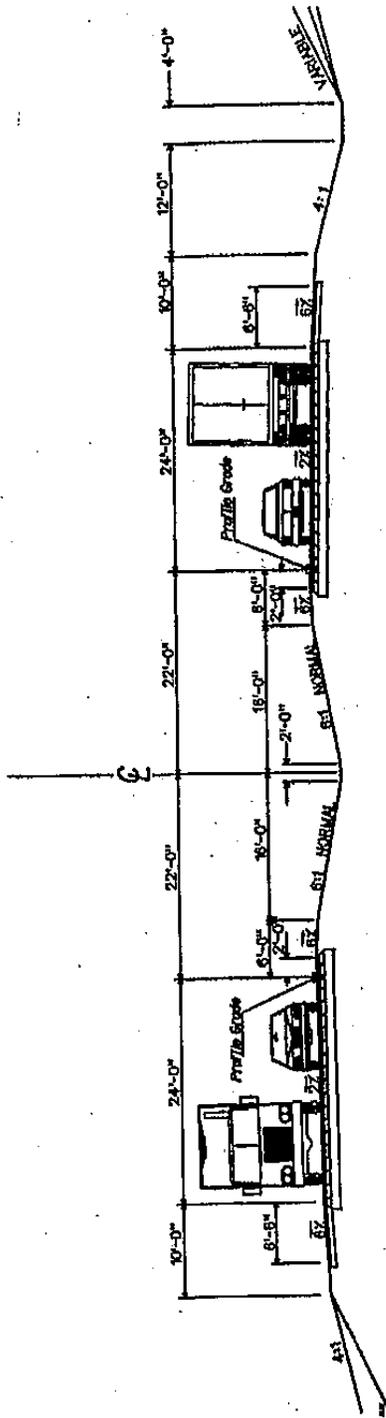
## Technical Discussion:

The revised concept report shows traffic volumes between 4,750 VPD. Traffic diagrams indicate highest volumes are in the industrial area which will be accessed by US41 and the new interchange on I-75. A two-lane section between SR 53 and US 41 would be adequate.

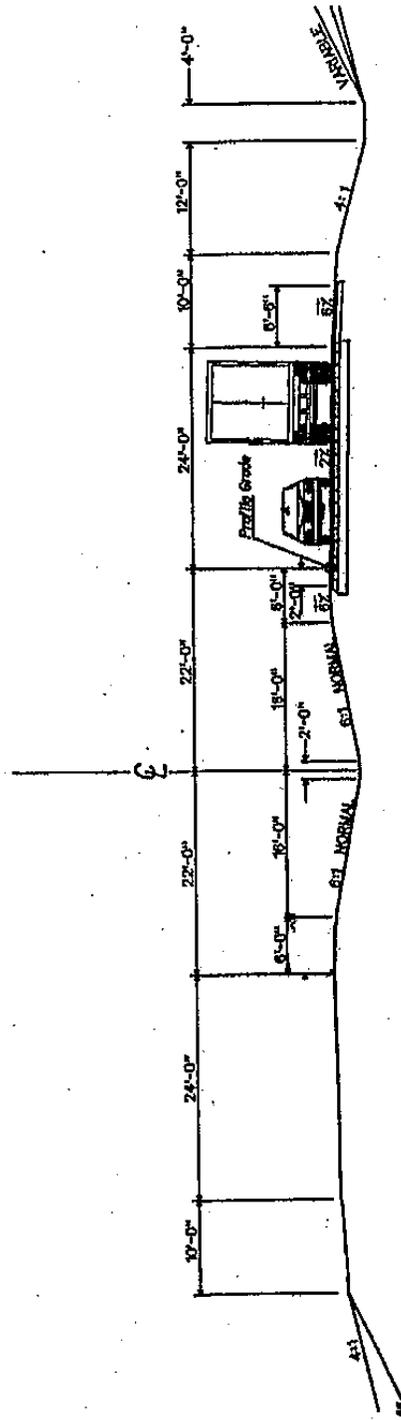
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 16,559,950	\$	\$
ALTERNATIVE	\$ 10,084,426	\$	\$
SAVINGS	\$ 6,475,524	\$	\$

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510** ALTERNATIVE NO.: **C-9**

DESCRIPTION: **CONSTRUCT EB ROADWAY FROM SR 53 TO US 41 FOR** SHEET NO.: **2 of 6**  
**TWO-WAY TRAFFIC**



ORIGINAL DESIGN

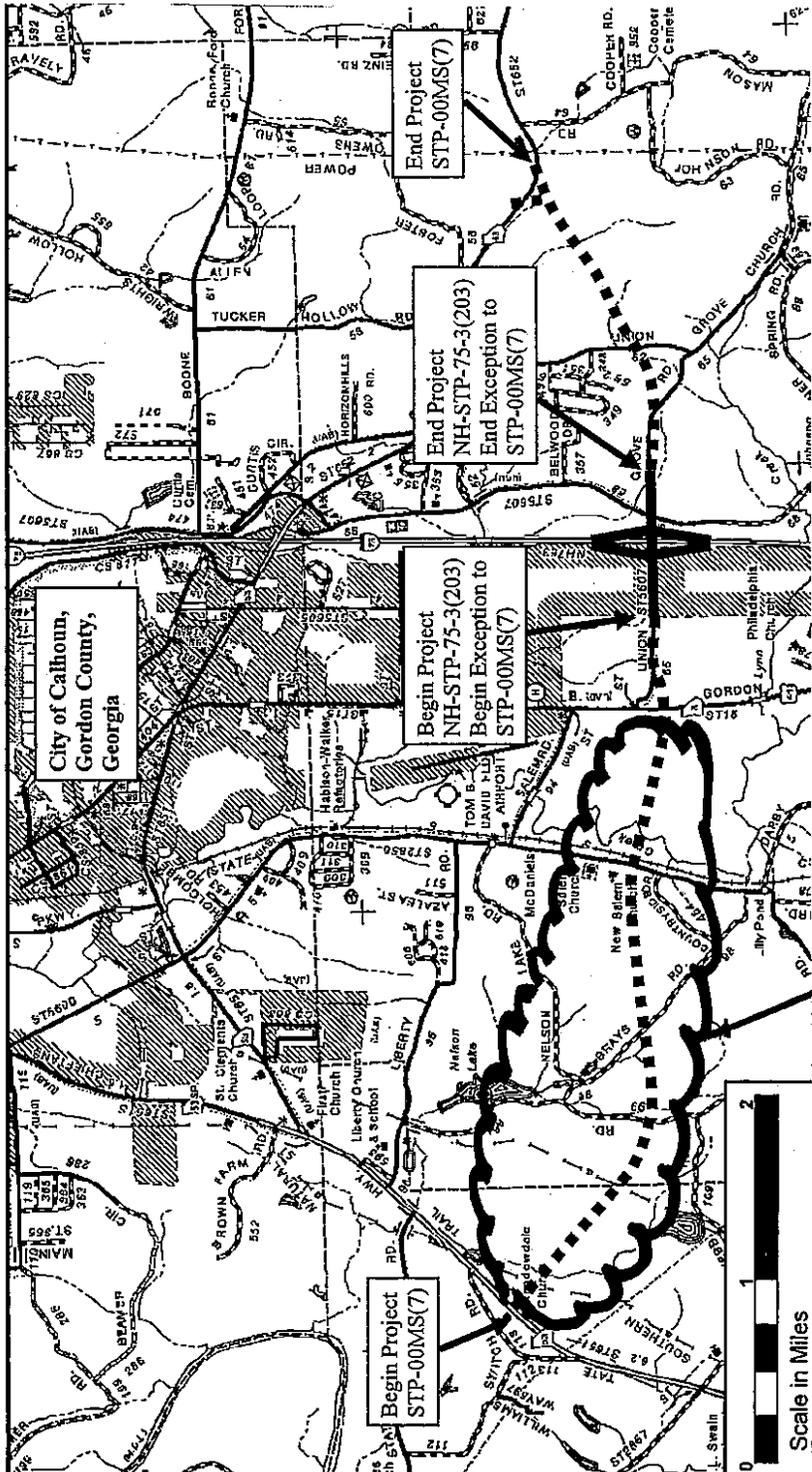


ALTERNATE DESIGN

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510** ALTERNATIVE NO.: **C-9**

DESCRIPTION: **CONSTRUCT EB ROADWAY FROM SR 53 TO US 41 FOR** SHEET NO.: **3 of 6**  
**TWO-WAY TRAFFIC**

Project Location Map



AREA OF ALTERNATE DESIGN

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS - GORDON COUNTY - P.I. Number: 662510** ALTERNATIVE NO.: **C-9**  
 DESCRIPTION: **CONSTRUCT EB ROADWAY FROM SR 53 TO US 41 FOR** SHEET NO.: **4 of 6**  
**TWO-WAY TRAFFIC**

LENGTH OF ROADWAY BETWEEN EXISTING SR 53  
 AND US 41, STA 160+70 - STA 280+00  
 LENGTH 17,930 LF

TURN LANES ELIMINATED AT THE FOLLOWING  
 LOCATIONS, STA 130+00, STA 166+32 (ONE DIRECTION ONLY)  
 STA 183+00, STA 211+00, STA 229+00, STA 261+50,

TURN LANE DIMENSIONS

TAPER 0'-28' WIDTH 420' LENGTH  
 TURN LANE 28' WIDTH 357' LENGTH

AREA OF TRAVEL LANES

$$17,930 \text{ FT} \times 24 \text{ FT} = 430,320 \text{ SF} = 478,135 \text{ YD}$$

AREA OF TURN LANES

$$420 \text{ FT} \times \frac{0+28}{2} \times 11 \text{ LOCATIONS} = 64,680 \text{ SF} = 7,186 \text{ YD}$$

$$357 \text{ FT} \times 28' \times 11 \text{ LOCATIONS} = 109,956 \text{ SF} = 12,217 \text{ YD}$$

TOTALS 604,956 SF 672,165 YD

TYPICAL SECTION

ASPH CONC	12.5 mm	SUPERPAVE - 1 1/2"	= 165 #/yd <sup>2</sup>
ASPH CONC	19 mm	SUPERPAVE - 3"	= 330 #/yd <sup>2</sup>
ASPH CONC	25 mm	SUPERPAVE - 4"	= 440 #/yd <sup>2</sup>
GRAVEL BASE		- 10"	= 145 #/ft <sup>3</sup> x 0.83

# Calculations



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS - GORDON COUNTY - P.I. Number: 662510**

ALTERNATIVE NO.: **C-9**

DESCRIPTION: **CONSTRUCT EB ROADWAY FROM SR 53 TO US 41 FOR**  
**TWO-WAY TRAFFIC**

SHEET NO.: **5 of 6**

## QUANTITY CALCULATIONS

ASPH CONC 12.5 mm SUPERPAVE

$$67216 \text{ SY} \times 165 \text{ \#/SY} \div 2000 = 5545 \text{ TN}$$

ASPH CONC 19 mm SUPERPAVE

$$67216 \text{ SY} \times 330 \text{ \#/SY} \div 2000 = 11090 \text{ TN}$$

ASPH CONC 25 mm SUPERPAVE

$$67216 \text{ SY} \times 440 \text{ \#/SY} \div 2000 = 14787 \text{ TN}$$

GRAV AGGR BASE

$$604956 \text{ SF} \times 0.83 \text{ FT} \times 145 \text{ \#/FT}^3 \div 2000 = 36403 \text{ TN}$$

CONSTRUCT ONE HALF OF ESTIMATED BRIDGES  
AT THE FOLLOWING LOCATIONS

- 1) SOUTH CALHOUN BYPASS OVER BRAM'S ROAD
- 2) SOUTH CALHOUN BYPASS OVER CR 5 & CSX RR
- 3) SOUTH CALHOUN BYPASS OVER SOUTH KALOOGA CREEK

# COST WORKSHEET



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION** ALTERNATIVE NO.: **C-9**

**SOUTH CALHOUN BYPASS - GORDON COUNTY - P.I. No. 662510**

DESCRIPTION: *Construct EB Roadway from SR 53 to US 41 for Two-Way Traffic* SHEET NO.: **6 of 6**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
<b>BRIDGES:</b>							
South Calhoun Bypass over Brays Road	LS	1	\$ 1,600,000.00	\$1,600,000.00	1	\$ 800,000.00	\$800,000.00
South Calhoun Bypass over CR 5 and CSX Railroad	LS	1	\$ 1,700,000.00	\$1,700,000.00	1	\$ 850,000.00	\$850,000.00
South Calhoun Bypass over Oothkalooga Creek	LS	1	\$ 2,600,000.00	\$2,600,000.00	1	\$ 1,300,000.00	\$1,300,000.00
<b>ROADWAY:</b>							
310-1101 Gr Agg Base Crs	TN	104,300	\$ 20.00	\$2,086,000.00	67,897	\$ 20.00	\$1,357,940.00
402-3112 Recycled Asphalt Concrete, 12.5 mm	TN	16,300	\$ 75.00	\$1,222,500.00	10,755	\$ 75.00	\$806,625.00
402-3112 Recycled Asphalt Concrete, 19 mm	TN	21,700	\$ 75.00	\$1,627,500.00	10,610	\$ 75.00	\$795,750.00
402-3121 Recycled Asphalt Concrete, 25 mm	TN	64,900	\$ 65.00	\$4,218,500.00	50,113	\$ 65.00	\$3,257,345.00
<b>Sub-total</b>				<b>\$15,054,500</b>			<b>\$9,167,660</b>
<b>Mark-up at 10.00%</b>				<b>\$1,505,450</b>			<b>\$916,766</b>
<b>TOTAL</b>				<b>\$16,559,950</b>			<b>\$10,084,426</b>

\$6,475,524

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-10**

DESCRIPTION: **OFFSET ROADWAY EAST OF UNION GROVE CHURCH ROAD 34'  
FROM CENTERLINE.**

SHEET NO.: **1 of 1**

## Original Design:

The two-lane roadway currently shown from station 0.1 miles east of CR 62 to end of project shows the centerline of the roadway 12' from each required edge of pavement.

## Alternative:

Offset the centerline of the roadway 34' from the centerline of project.

## Opportunities:

- Avoid possible additional right-of-way requirements when additional roadway is constructed

## Risks:

- Longer transition will be required at beginning of two-lane section
- Additional right-of-way may be required on current project

## Technical Discussion:

It appears that the two-lane section should be offset 34' from centerline of project. The future roadway should be constructed 34' from centerline as well, thus providing a 44' grassed median between roadways. Right-of-way purchased for the current bypass project should be provided for the ultimate four-lane divided roadway.

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-11**

DESCRIPTION: **INCREASE INSIDE PAVED SHOULDER WIDTH FROM 2' TO 4'**

SHEET NO.: **1 of 1**

## Original Design:

The current typical section for the Calhoun South Bypass shown required from beginning of project to approximately 0.2 miles west of US 41 shows a required 6' shoulder with 2' of which is paved.

## Alternative:

Increase the 2' width of paved shoulder to 4'.

## Opportunities:

- Safety

## Risks:

- Increased cost

## Technical Discussion:

Although the current 2' paved shoulder eliminates rutting and pavement drop-off at the inside edge of travelway. It appears that a 4' paved shoulder would be a safer provision of refuge for vehicles during emergency situations.

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-13**

DESCRIPTION: **SEPARATE BRIDGES AT MCDANIEL STATION ROAD/CSX AND  
OOTHKALOOGA CREEK INTO 4 BRIDGES INSTEAD OF 2 BRIDGES**

SHEET NO.: **1 of 1**

## Original Design:

The preliminary plans appear to show two long, parallel bridges over McDaniel Station Road/CSX, Oothkalooga Creek and the area between as well.

## Alternative:

The alternative design would separate the bridges into four bridges, two at each crossing, with roadway embankment between the crossings.

## Opportunities:

- Reduce initial cost
- Reduce construction time

## Risks:

- Area between crossings requires high roadway fill

## Technical Discussion:

The preliminary plans indicate parallel bridges from approximately Sta. 240+00 to Sta. 251+50, 1,150 feet. The bridges at these locations will likely be in the 350 ft range, leaving 450 ft between bridges. Based on the concept cost estimate 450 ft of roadway would cost less than \$750,000 but 450 ft of parallel bridges would cost around \$3,000,000.

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-14**

DESCRIPTION: **PROVIDE DISPOSITION FOR ABANDONED ROADWAYS/TIE-IN  
LOCATIONS**

SHEET NO.: **1 of 1**

## Original Design:

The original design provides realignment of various roads (Oak Grove Road, Union Grove Road, Johnson Lake Road, Bellwood Road and SR 53) and other unnamed roads but provides no direction as to possible removal or tie-ins to the new alignment.

## Alternative:

The plans need to specify cul-de-sac locations, tie-in alignment and locations, obliteration of unnecessary pavement and new access drives to residences and businesses located on the old alignments.

## Opportunities:

- Provide proper access points
- Possibly utilize existing pavements for access
- Remove unnecessary pavement

## Risks:

- Additional costs
- Minimal design costs

## Technical Discussion:

Numerous residences and businesses are located on roadways which will not be part of the Calhoun Bypass. To properly control traffic and provide appropriate access, the location of road terminations, tie-ins, and driveways need to be designed.

# Value Analysis Design Suggestion



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION  
SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510**

ALTERNATIVE NO.:  
**C-16**

DESCRIPTION: **CONSIDER USE OF 3:1 FILL SLOPES IN AREAS WHERE CLEAR  
ZONE REQUIREMENTS CAN BE MET BEYOND TOE OF SLOPE**

SHEET NO.: **1 of 2**

## Original Design:

All fill slopes currently shown required for the project are either 4:1 or 2:1.

## Alternative:

Consider the use of 3:1 fill slopes in areas where the clear zone width can be provided between the toe of the slope and right-of-way line.

## Opportunities:

- Elimination of guardrail
- Reduce fill requirements

## Risks:

- Greater frequency of mowing of clear zone area/or more general maintenance of this area

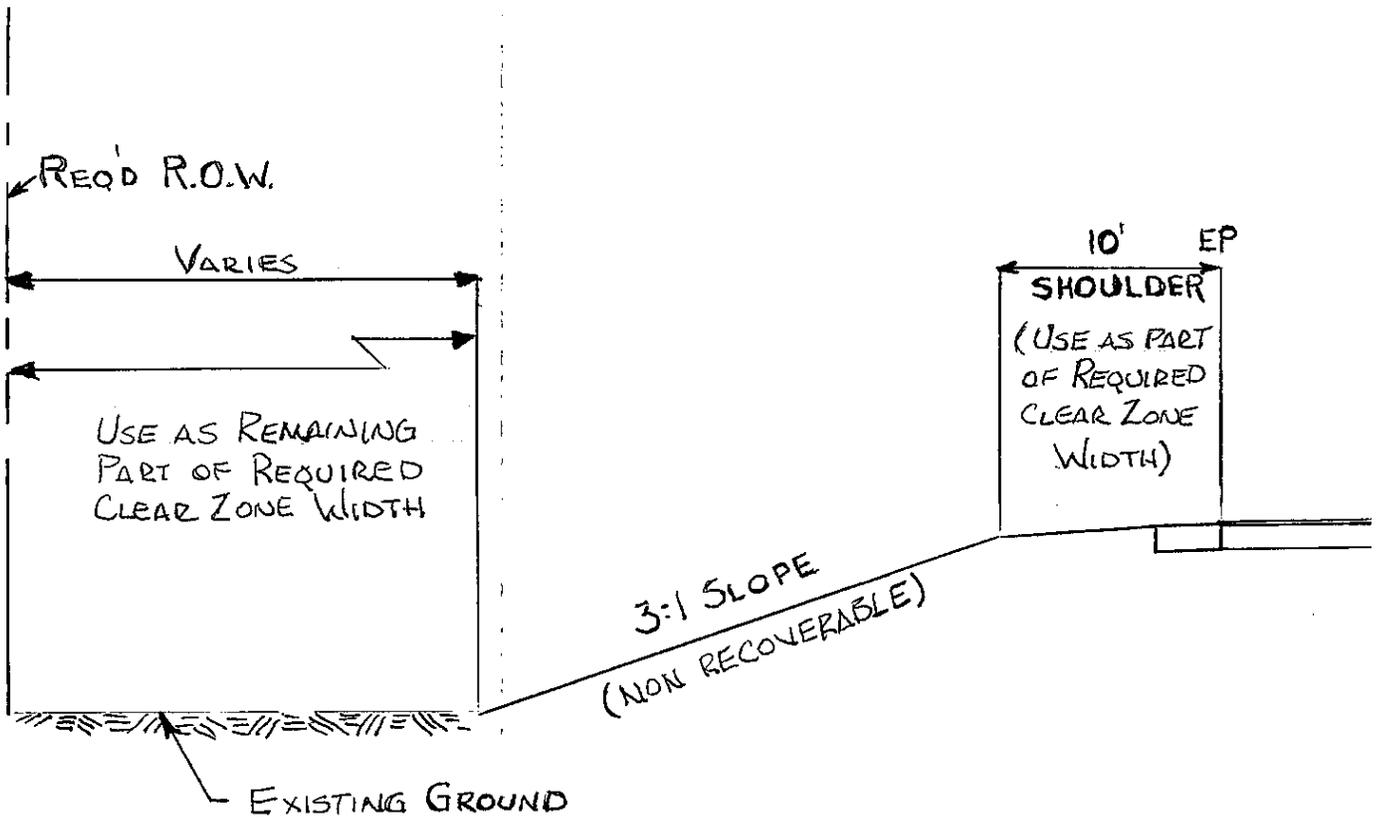
## Technical Discussion:

3:1 fill slopes are non-recoverable slopes as defined in the AASHTO Roadside Design Guide. However, it appears there are locations on the project where there are flat or near flat areas between the toe of fill slope and required right-of-way. This area can be used as a clear zone as long as it is properly maintained and no large vegetation is allowed to grow. This should reduce the amount of required 2:1 fill slopes, thus reducing the amount of required guardrail and fill.

# Illustrations

PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION**  
**SOUTH CALHOUN BYPASS – GORDON COUNTY – P.I. Number: 662510** ALTERNATIVE NO.: **C-16**

DESCRIPTION: **CONSIDER USE OF 3:1 FILL SLOPES IN AREAS WHERE** SHEET NO.: **2 of 2**  
**CLEAR ZONE REQUIREMENTS CAN BE MET BEYOND TOE OF SLOPE**



## *Project Description*

## INTRODUCTION

### *Union Grove Road Interchange*

The primary purpose of the proposed interchange addition is to provide direct access to Interstate 75 from the Tom B. David Field airport and the industrial park area. As proposed, the interchange, in conjunction with the proposed improvements to Union Grove Road and subsequent addition of the South Calhoun Bypass highway, would provide an alternate routing for SR 53, acting as a bypass for through-vehicles traveling through the south Calhoun area.

The new interchange is to be a full diamond with supplemental work to address the required reconfiguration of the existing local road network. The current construction cost estimate for this interchange and the associated improvements is as follows:

Construction	\$18,748,108
Right of Way	\$ 7,570,000
Reimbursable Utilities	\$ 226,449

**Grand Total Project Cost = \$26,544,557**

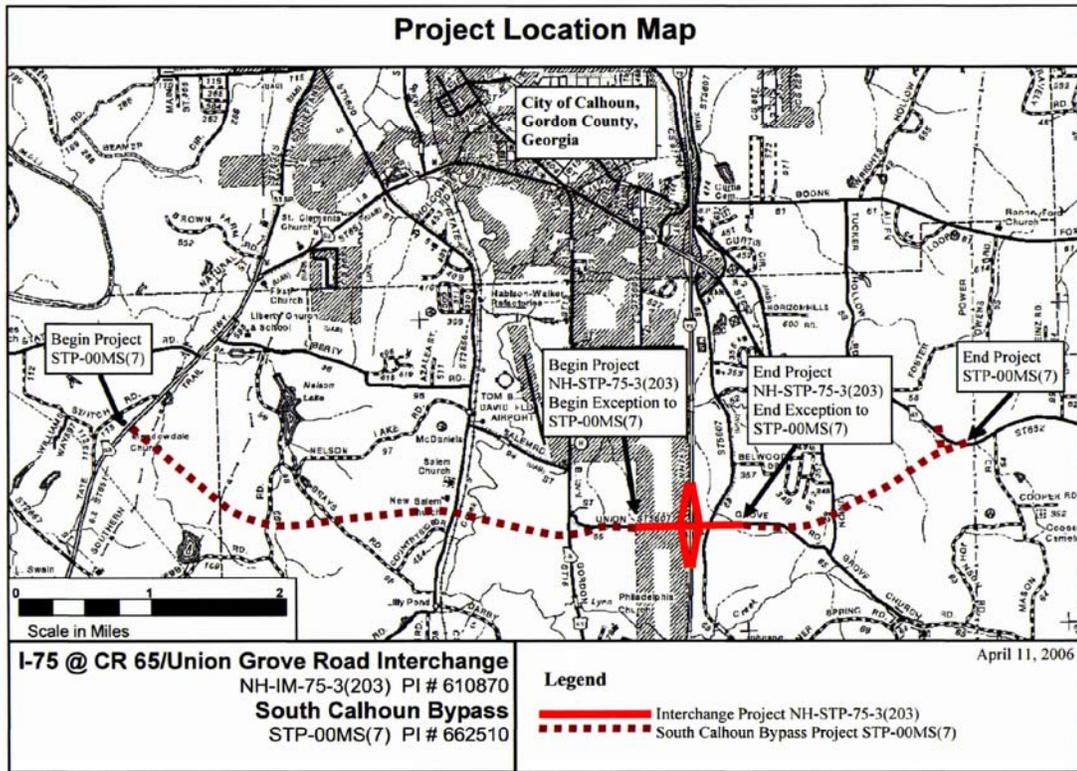
### *South Calhoun Bypass*

Known as the South Calhoun bypass, the project begins at SR 53 southwest of Calhoun near CR 113 in Gordon County. The proposed concept would travel east/southeastward to the Intersection of I-75, then veer northeastward and tie back into SR 53 on the east side of Calhoun (see the enclosed location map). The new bypass will have its beginning point at its intersection with SR 53 at mile post 4.5 and its ending at its intersection with SR 53 at approximate mile post 12.5. The total length of the project is 6.8 miles.

The current construction cost estimate for this interchange and the associated improvements is as follows:

Construction	\$44,491,562
Right of Way	\$ 6,550,960
Reimbursable Utilities	\$ 2,011,680

**Grand Total Project Cost = \$53,054,202**



Please see the following enclosed documents

- Concept Validation Report (Pages Extracted from Reports for the two projects)  
Prepared by Greenhorne & O'Mara for the Georgia Department of Transportation

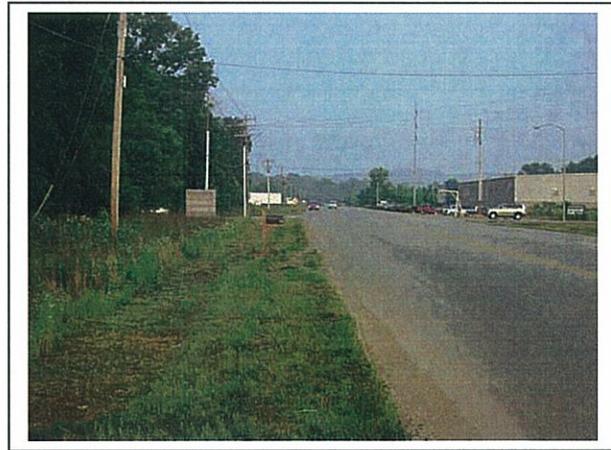
The VE team utilized the supplied project materials noted above, along with the design products from **G&O**, and the current standard drawings, details and specifications during the conduct of their work in the VE Study effort.

# Concept Validation Report

## Union Grove Road Interchange

NH-STP-75-3(203) Gordon County  
PI# 610870  
G&O Project #0730

July 06, 2006



Prepared For  
**Georgia Department of Transportation**

Prepared By:  
**Greenhorne & O'Mara, Inc.**  
2211 Newmarket Parkway  
Suite 104  
Marietta, GA 30067  
(770) 988-9555  
[www.G-and-O.com](http://www.G-and-O.com)



**GREENHORNE & O'MARA**  
CONSULTING ENGINEERS

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## Concept Validation Summary

Greenhorne & O'Mara concurs with the revised project concept report for project NH-STP-75-3(203) dated March 21, 2005, with an approval date of July 13, 2005. A summary of our findings follows on this.

**Project Constructability:** No exceptions or additions. The Concept complies with all relevant criteria

**Construction Staging & Maintenance of Traffic:** No exceptions or additions. The Concept complies with all relevant criteria

**Potential Traffic Signal Locations:** Two (2) traffic signals are recommended, one each at the interchange ramp termini.

**Construction and Right of Way Cost Estimates:** Escalating prices of steel, cement, and asphalt are reflected in the revised cost estimates.

**Impacts to Properties:** According the current proposed alignment on non-rectified aerial photos, three (3) properties are likely to be relocated on this project.

**Utility Conflicts:** There are no known utility conflicts that would affect staging or construction of this project

**Steps to Minimize Environmental Impacts:** Several differing alternatives were considered during concept. See the page 11 for details.

**Steps to Minimize Unexpected Design and Right of Way Problems:** The concept alignments have been set to limit impacts to existing properties. The first step in Preliminary Design will be verifying all boundaries using rectified photogrammetry.

## Project Constructability

This project consists of the construction of the Union Grove Road interchange in Gordon County, Georgia.

The revised concept for project NH-STP-75-3(203), PI # 610870, dated March 21, 2005, was reviewed to determine compliance with design criteria. The results of that analysis are discussed herein.

### *Horizontal Alignment*

The proposed horizontal alignment was reviewed with respect to the requirements and recommendations as defined by the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets* (2004), otherwise known as the Green Book.

All horizontal curves exceed minimum curve radii. See Table 1 for the relevant excerpt from the Green Book.

**Table 1: Minimum Curve Radius by Superelevation Percentage**

Superelevation	35 MPH Speed Design	45 MPH Speed Design	60 MPH Speed Design
4%	1,370'	711'	3,890'
6%	713'	643'	2,320'
8%	314'	587'	1,200'

Source: AASHTO Green Book

There are few horizontal curves on this project. The sharpest are on CR 68 (Bellwood Road) with a speed design of 35 MPH. The radius of 636' falls within design criteria for this roadway.

The interchange ramps have a design consistent with 45 MPH for an entrance ramp and 60 MPH for an exit ramp. Of particular note is the southbound exit ramp, which in order to meet the AASHTO minimum curve radius, will require an 8% superelevation.

### *Vertical Alignment*

It is difficult to determine whether or not the concept adheres to Green Book requirements for profile grades prior to Preliminary Design. Many elements of vertical design will not be set until after cross-sections are developed. However, we may state that all grades will meet the requirements as listed in Table 2. The terrain throughout the interchange project is close to Level and it is unlikely that profile grades will exceed two percent (2%) except on the ramps.

**Table 2: Profile Grade Maximums**

Speed Design	Level Terrain Maximum Grade
35 MPH	5%
45 MPH	5%
60 mph	3%

Source: AASHTO Green Book

---

## **Construction Staging & Maintenance of Traffic**

This project is 0.6 miles in length. Concept Right of Way widths appear to be adequate for construction and maintenance of traffic.

Traffic will be maintained during construction, providing access across the interstate alternately on the existing Union Grove Road crossover bridge and then on the newly constructed southern span of the interchange bridge. CR 68 (Bellwood Road/ Johnson Lake Road) will be relocated prior to construction of the interchange ramps to maintain existing traffic flow.

The southern span of the interchange bridge will be constructed then traffic will be shifted onto that span while the northern span is built. The interchange ramps will not be opened to traffic until bridge construction is complete.

Traffic will be maintained on I-75 at all times during construction of large guidesigns and the interchange bridge. This will include work on the shoulders for butterfly-type (Type III) overhead guidesigns. Two bridge-type (Type I) overhead guidesign structures will require work in the median of I-75 which can be accomplished at the same time as the bridge pier construction.

## Potential Traffic Signal Locations

There are two (2) potential locations for new signals on the Union Grove Road Interchange project: One at the east ramp terminus and one at the west ramp terminus. Both are recommended for signalization as a part of this project.

Each signal location was evaluated with respect to proposed roadway geometry and design traffic projections.

Capacity analysis was conducted at both ramps, and it was found that in 2031, AM and PM levels of service would be F at both termini in an unsignalized condition. Ninety-fifth percentile (95%) queue lengths at these intersections would range from 16.5 to 22.9 vehicles in the left turn lanes. If signalized, the 2031 levels of service would be B at both termini in both the AM and PM peak hours. Table 3 lists the levels of service for both the Build and No-Build conditions.

Signal permits will be required at all locations where traffic signals are recommended. Permits will be acquired during preliminary design through the normal process of Traffic Engineering Studies submitted through the district traffic operations office.

**Table 3: Design Year Levels of Service**

	Build (signalized)		No Build (unsignalized)	
	2031 AM	2031 PM	2031 AM	2031 PM
Northbound Ramp	B	B	F	F
Southbound Ramp	B	B	F	F

Source: *Highway Capacity Manual, Greenhorne & O'Mara*

## Construction and Right of Way Cost Estimates

Included in the revised cost estimate is the GDOT recommended practice of utilizing concrete pavement on interchange ramps and the attendant ramp intersections. All prices reflect updated unit prices.

Standard asphalt and concrete paving sections are used for cost estimation purposes.

**Table 4: Cost Estimate**

<b>ESTIMATED COST - UNION GROVE INTERCHANGE</b>			
CONSTRUCTION:	\$14,723,019	RIGHT-OF-WAY:	\$7,570,000
INFLATION :	\$2,320,716	ACQUIRED BY :	GDOT
E & C (10%) :	\$1,704,373	UTILITIES :	\$226,449
		ADJUSTED BY :	GDOT
<b>TOTAL PROJECT COST:</b>			<b>\$26,544,557</b>

See Attachment 2 for full breakdown of cost estimate.

## Impacts to Properties

We concur that rights to Partial Control of Access will be acquired throughout the project. All department policies with respect to access control will be adhered to. No driveways or median breaks will be within 300' of the ramp radius-return (per conversations with FHWA) as a minimum requirement with 1,000' being the desirable distance.

It is likely that a driveway will be required approximately 450' west of the southbound ramp radius return for access to a commercial drive on the north side of Union Grove Road.

The preferred access control distance of 1,000' will be maintained east of the northbound ramps, that length being the approximate distance to relocated CR 68 (Bellwood Road/Johnson Lake Road).

There appear to be three (3) relocations of existing properties on this project. Further refinement and confirmation will not be possible until the project database is complete in Preliminary Design.

---

## Utility Conflicts

All utility adjustments and relocations will proceed in a manner that minimizes disruption and maximizes safety. There are no known utility conflicts that would affect staging or construction of this project.

July 06, 2006

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## **Steps to Minimize Environmental Impacts**

This interchange project is part of a two-project process to provide relief to SR 53, access to numerous commercial properties, and access to the Tom B. David Field Airport. The other project involved is STP-00MS(7) (PI #662510) which will add 4 lanes on new location extending from SR 53 southwest of Calhoun to SR 53 southeast of Calhoun.

The environmental document examined these two projects and their alternatives as one whole project. Herein are summarized the alternatives that affected the Union Grove Road Interchange project.

### ***Alternative 1: The No-Build Alternative Alignment***

Under the No-Build Alternative Alignment, the Department would take no action to construct the proposed projects. While this alternative alignment would avoid right-of-way impacts, it is not prudent because it does not meet the proposed project's Need and Purpose. The No-Build Alternative Alignment would not address the following deficiencies: needed safety improvements by providing traffic relief to SR 53; direct access to the Tom B. David Airport and the Industrial Park area from I-75; and future traffic congestion relief along the existing SR 53 in the vicinity of I-75

### ***Alternative 2: CR 68 Realigned to Curve Into Existing CR 68 1,000 Feet South of Bypass***

This alternative alignment would follow the proposed alignment with an adjustment on CR 68/Johnson Lake Road. The proposed alignment creates a T-intersection of the realigned portion of CR 68/Johnson Lake Road to the existing CR 68/Johnson Lake Road at approximately 1,000 feet south of the proposed bypass alignment. This alternative would curve into CR 68/Johnson Lake Road at approximately 1,000 feet south of the proposed bypass alignment. This alternative was eliminated because of the proximity of the right-of-way to Shaw Industries, which would decrease sight distance on CR 68/Johnson Lake Road and increase right-of-way impacts to the Shaw Industries property.

### ***Alternative 3: CR 68 Realigned to Curve Into Existing CR 68 4,000 Feet South of Bypass***

This alternative alignment would follow the proposed bypass alignment with an adjustment on CR 68/Johnson Lake Road. The preferred alignment creates a T-intersection of the realigned portion of CR 68/Johnson Lake Road to the existing CR 68/Johnson Lake Road at approximately 1,000 feet south of the bypass alignment. This alternative would curve into CR 68/Johnson Lake Road at approximately 4,000 feet south of the bypass alignment. This alternative was eliminated due to wetland, open water and stream impacts. In addition, this alternative may have adversely affected protected aquatic species in Lynn Creek.

---

## **Steps to Minimize Unexpected Design and Right of Way Problems**

The proposed alignments for the Union Grove Road Interchange and relocated sidestreets within the limits of this project have been set to match existing conditions and limit property impacts. This current layout is based on non rectified aerial photography and preliminary properties. One of our first tasks during Preliminary Design, once the existing property database and topography is complete, will be to check the alignments more closely. We will place emphasis on avoiding impacts to the commercial properties that this project borders.

## **Attachments**

1. Sketch Map
2. Cost Estimate
3. Typical Sections
4. Concept & Revised Concept Reports

July 06, 2006

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**Attachment 1 - Sketch Map**



## **Attachment 2 - Cost Estimate**



# CONCEPT COST ESTIMATE

NH-STP-75-3(203), PI 610870

318-3000	100	TN	\$25	AGGR SURF CRS	\$2,500
402-1812	600	TN	\$90	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	\$54,000
402-3110	3100	TN	\$75	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	\$232,500
402-3121	12400	TN	\$75	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	\$930,000
402-3112	9400	TN	\$75	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	\$705,000
413-1000	13200	GL	\$2	BITUM TACK COAT	\$26,400
441-0004	2000	SY	\$40	CONC SLOPE PAV, 4 IN	\$80,000
610-4170	440	CY	\$105	REM ASPH PVTM INCL BASE	\$46,200
				<b>Section SubTotal</b>	<b>\$3,231,600</b>
<b>6. CONCRETE</b>					
422-2030	160	SY	\$175	REINF CONC APPROACH SLAB, INCL SLOPED EDGE	\$28,000
436-1000	6000	LF	\$12	ASPHALTIC CONCRETE CURB	\$72,000
439-0026	45200	SY	\$75	PLAIN PC CONC PVTM, CL 3 CONC, 12 INCH THK	\$3,390,000
441-0754	2050	SY	\$80	CONCRETE MEDIAN, 7 1/2 IN	\$164,000
441-0301	15	EA	\$2,300	CONC SPILLWAY, TP 1	\$34,500
441-0302	2	EA	\$2,300	CONC SPILLWAY, TP 2	\$4,600
441-0303	2	EA	\$2,450	CONC SPILLWAY, TP 3	\$4,900
441-6222	11600	LF	\$20	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	\$232,000
				<b>Section SubTotal</b>	<b>\$3,930,000</b>
<b>7. TRAFFIC CONTROL</b>					
150-1000	1	LS	\$150,000	TRAFFIC CONTROL - NH-STP-3-75-3(203)	\$150,000
				<b>Section SubTotal</b>	<b>\$150,000</b>
<b>8. CLEARING AND GRUBBING</b>					
201-1500	1	LS	\$750,000	CLEARING & GRUBBING - NH-STP-75-3(203)	\$750,000
				<b>Section SubTotal</b>	<b>\$750,000</b>
<b>9a. EROSION CONTROL (TEMPORARY)</b>					
163-0232	5	AC	\$500	TEMPORARY GRASSING	\$2,500
163-0240	50	TN	\$220	MULCH	\$11,000
163-0300	2	EA	\$1,800	CONSTRUCTION EXIT	\$3,600
163-0501	2	EA	\$850	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 1	\$1,700
163-0520	290	LF	\$14	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	\$4,060
163-0521	60	EA	\$180	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS	\$10,800
163-0530	2000	LF	\$3.50	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	\$7,000
163-0531	0	EA	\$8,000	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1	\$0
163-0550	8	EA	\$300	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	\$2,400
165-0010	450	LF	\$2	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	\$900
165-0030	1600	LF	\$2	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	\$3,200
165-0040	120	EA	\$120	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	\$14,400
165-0060	0	EA	\$1,100	MAINTENANCE OF TEMPORARY SEDIMENT BASIN	\$0
165-0070	2000	LF	\$2.00	MAINTENANCE OF BALED STRAW EROSION CHECK	\$4,000
165-0085	2	EA	\$375	MAINTENANCE OF SILT CONTROL GATE, TP 1	\$750
165-0105	8	EA	\$125	MAINTENANCE OF INLET SEDIMENT TRAP	\$1,000
171-0010	900	LF	\$4.00	TEMPORARY SILT FENCE, TYPE A	\$3,600
171-0030	3300	LF	\$5.00	TEMPORARY SILT FENCE, TYPE C	\$16,500
700-7000	12	TN	\$70	AGRICULTURAL LIME	\$840
700-7010	10	GL	\$20	LIQUID LIME	\$200

# CONCEPT COST ESTIMATE

NH-STP-75-3(203), PI 610870

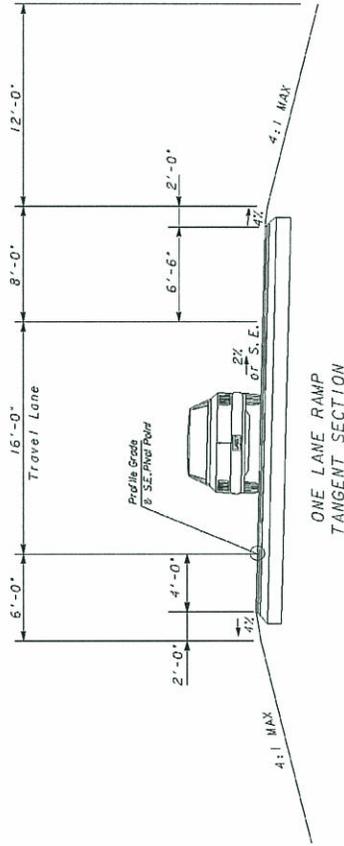
700-8000	8	TN	\$285	FERTILIZER MIXED GRADE	\$2,280
700-8100	260	LB	\$2.50	FERTILIZER NITROGEN CONTENT	\$650
716-2000	780	SY	\$2	EROSION CONTROL MATS, SLOPES	\$1,560
<b>9b. EROSION CONTROL (PERMANENT)</b>					
163-0240	80	TN	\$500	MULCH	\$40,000
167-1000	1	EA	\$1,800	WATER QUALITY MONITORING AND SAMPLING	\$1,800
167-1500	36	MO	\$900	WATER QUALITY INSPECTION	\$32,400
441-0204	470	SY	\$35	PLAIN CONC DITCH PAVING, 4 IN	\$16,450
700-6910	10	AC	\$825	PERMANENT GRASSING	\$8,250
700-7000	20	TN	\$70	AGRICULTURAL LIME	\$1,400
700-7010	30	GL	\$20	LIQUID LIME	\$600
700-8000	15	TN	\$285	FERTILIZER MIXED GRADE	\$4,275
700-8100	4	LB	\$2.50	FERTILIZER NITROGEN CONTENT	\$10
710-9000	360	SY	\$5.00	PERMANENT SOIL REINFORCING MAT	\$1,800
715-2200	600	SY	\$2.50	BITUMINOUS TREATED ROVING, WATERWAYS	\$1,500
<b>Section SubTotal</b>					<b>\$201,425</b>
<b>10. SIGNING AND STRIPING</b>					
636-1020	40	SF	\$16	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	\$640
636-1033	70	SF	\$25	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	\$1,750
636-2070	400	LF	\$8	GALV STEEL POST, TP 7	\$3,200
636-2080	60	LF	\$11	GALV STEEL POST, TP 8	\$660
636-2090	60	LF	\$8	GALV STEEL POST, TP 9	\$480
636-3010	8	EA	\$380	GROUND MOUNTED BREAKAWAY SIGN SUPPORT	\$3,040
639-2002	76	LF	\$4	STEEL WIRE STRAND CABLE, 3/8 IN	\$266
639-4002	2	EA	\$6,000	STRAIN POLE, TP II	\$12,000
647-1000	2	LS	\$85,000	TRAFFIC SIGNAL INSTALLATION	\$170,000
653-0120	16	EA	\$70	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	\$1,120
653-0170	4	EA	\$80	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	\$320
653-1501	6000	LF	\$1	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	\$6,000
653-1502	5800	LF	\$1	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	\$5,800
653-3501	5500	GLF	\$1	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	\$5,500
653-1804	216	LF	\$2	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	\$324
653-6004	1,500	SY	\$3	THERMOPLASTIC TRAF STRIPING, WHITE	\$4,500
653-6006	200	SY	\$3	THERMOPLASTIC TRAF STRIPING, YELLOW	\$600
<b>Section SubTotal</b>					<b>\$216,200</b>
<b>11. GUARDRAIL</b>					
641-1100	500	LF	\$60	GUARDRAIL, TP T	\$30,000
641-1200	5500	LF	\$20	GUARDRAIL, TP W	\$110,000
641-5001	12	EA	\$600	GUARDRAIL ANCHORAGE, TP 1	\$7,200
641-5012	4	EA	\$2,000	GUARDRAIL ANCHORAGE, TP 12	\$8,000
<b>Section SubTotal</b>					<b>\$155,200</b>
<b>12. CONCRETE BARRIER</b>					
621-4086	500	LF	\$75	CONCRETE SIDE BARRIER, TYPE 7WS	\$37,500
621-6013	60	LF	\$250	CONCRETE SIDE BARRIER, TYPE 7-TS	\$15,000
<b>Section SubTotal</b>					<b>\$52,500</b>
<b>13. LIGHTING</b>					



## **Attachment 3 - Typical Sections**



1-LANE RAMP



RAMPS A, B, C, D

N. T. S.

GREENHORNE & O' MARA  
 2211 NEWMARKET PARKWAY  
 SUITE 104 30067  
 MARIETTA, GA 988-9555  
 PHONE: (770)

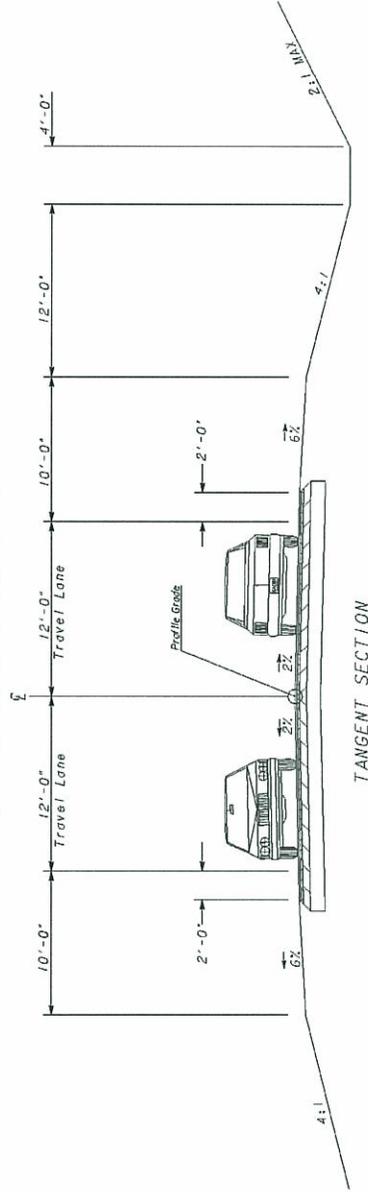


TYPICAL SECTIONS FOR  
 UNION GROVE INTERCHANGE

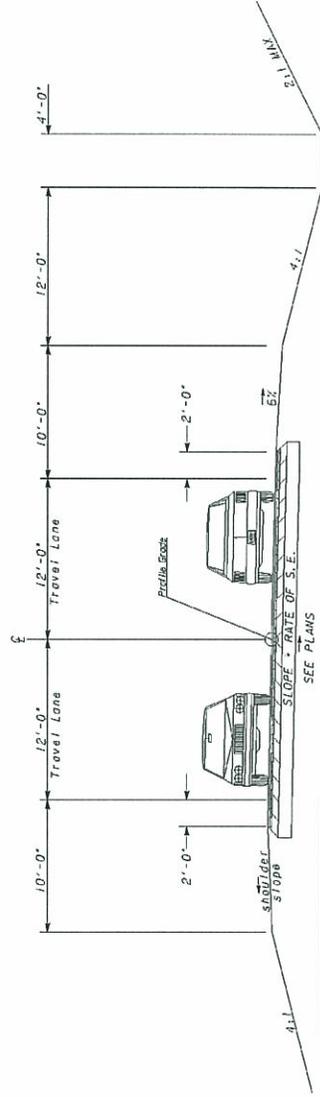
GEORGIA  
 DEPARTMENT OF TRANSPORTATION  
 TYPICAL SECTIONS  
 PROJECT: STP-00MS(7)  
 COUNTY: GORDON  
 DATE:

DRAWING

2-LANE RURAL SECTION  
45 MPH SPEED DESIGN



TANGENT SECTION



SUPER ELEVATED SECTION

S. E. RATE	Shoulder Slope
2.0% OR 3.0%	4.0%
4.0% OR 5.0%	2.0%
6.0% OR 7.0%	1.0%
8.0% +	0.0%

BELLWOOD ROAD/JOHNSON LAKE ROAD RELOCATION

N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104  
MARIETTA, GA 30067  
PHONE: (770) 988-9555



TYPICAL SECTIONS FOR  
UNION GROVE INTERSECTION

GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-000MS(7)  
COUNTY: GORDON  
DATE:

DRAWING

# Concept Validation Report

## South Calhoun Bypass

STP-00MS(7) Gordon County  
PI# 662510  
G&O Project #0730

July 06, 2006



Prepared For  
**Georgia Department of Transportation**

Prepared By:  
**Greenhorne & O'Mara, Inc.**  
2211 Newmarket Parkway  
Suite 104  
Marietta, GA 30067  
(770) 988-9555  
[www.G-and-O.com](http://www.G-and-O.com)



**GREENHORNE & O'MARA**  
CONSULTING ENGINEERS

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## Concept Validation Summary

Greenhorne & O'Mara concurs with the revised project concept report for project STP-00MS(7) dated March 21, 2005, with an approval date of April 19, 2005. A summary of our findings follows on this page.

**Project Constructability:** No exceptions or additions. The Concept complies with all relevant criteria

**Construction Staging & Maintenance of Traffic:** No exceptions or additions. The Concept complies with all relevant criteria

**Potential Traffic Signal Locations:** Three (3) locations are recommended for signalization by 2031. The intersection of SR 53 (west terminus) and the South Calhoun Bypass, the intersection of SR 3 (US 41) and the South Calhoun Bypass and the intersection of SR53 (east terminus) and the South Calhoun Bypass.

**Construction and Right of Way Cost Estimates:** Escalating prices of steel, cement, and asphalt are reflected in the revised cost estimates.

**Impacts to Properties:** According the current proposed alignment on non-rectified aerial photos, eight (8) properties are likely to be relocated under this project.

**Utility Conflicts:** There are no known utility conflicts that would affect staging or construction of this project

**Steps to Minimize Environmental Impacts:** Several differing alternatives were considered during concept. See page 13 for details.

**Steps to Minimize Unexpected Design and Right of Way Problems:** The concept alignments have been set to limit impacts to existing properties. The first step in Preliminary Design will be verifying all boundaries using rectified photogrammetry.

## Project Constructability

This project consists of the construction of the South Calhoun Bypass in Gordon County, Georgia.

The revised concept for project STP-00MS(7), PI # 662510, dated March 21, 2005, was reviewed to determine compliance with design criteria. The results of that analysis are discussed herein.

### *Horizontal Alignment*

The proposed horizontal alignment was reviewed with respect to the requirements and recommendations as defined by the America Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets* (2004), otherwise known as the Green Book.

All horizontal curves exceed minimum curve radii. The smallest-radius curve on the proposed alignment is 2,550 feet. This is more than twice as large as the required minimum radius of 1,190 feet with a 4% superelevation. See Table 1 for the relevant excerpt from the Green Book.

**Table 1: Minimum Curve Radius by Superelevation Percentage**

Superelevation	45 MPH Speed Design	55 MPH Speed Design
4%	711'	1,190'
6%	643'	1,060'
8%	587'	960'

Source: AASHTO Green Book

Examination of the table shows that it is unlikely a superelevation of greater than four percent (4%) will be required on this project.

The crossroads on the South Calhoun Bypass project that require realignment or construction are CR 99 (Oak Grove Road) and Union Grove Spur<sup>1</sup>. Speed design for these crossroads is 35 MPH and all elements in the concept currently meet AASHTO Green Book requirements.

<sup>1</sup> Union Grove Spur is an as yet un-numbered county road which will link the South Calhoun Bypass to Union Grove Church Road. Prior to construction, Union Grove Road and Union Grove Church Road will have been linked by an at-grade intersection. This intersection will be removed and a the South Calhoun Bypass will bridge Union Grove Church Road without any intersection elements.

### Vertical Alignment

It is difficult to determine whether or not the concept adheres to Green Book requirements for profile grades prior to Preliminary Design. Many elements of vertical design will not be set until after cross-sections are developed. However, we may state that all grades will meet the requirements as listed in Table 2. The terrain in the 45 MPH section (4-lane rural divided and 4-lane urban divided typicals) of the South Calhoun Bypass is close to Level and it is unlikely that profile grades will exceed two percent (2%).

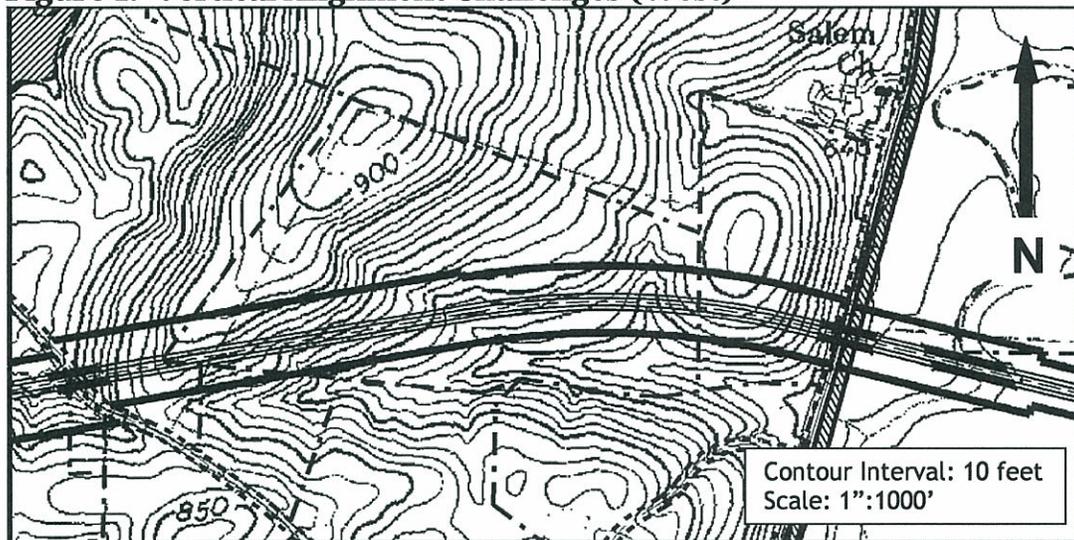
**Table 2: Profile Grade Maximums**

Speed Design	Rolling Terrain Maximum Grade
45 MPH	6%
55 MPH	5%

Source: AASHTO Green Book

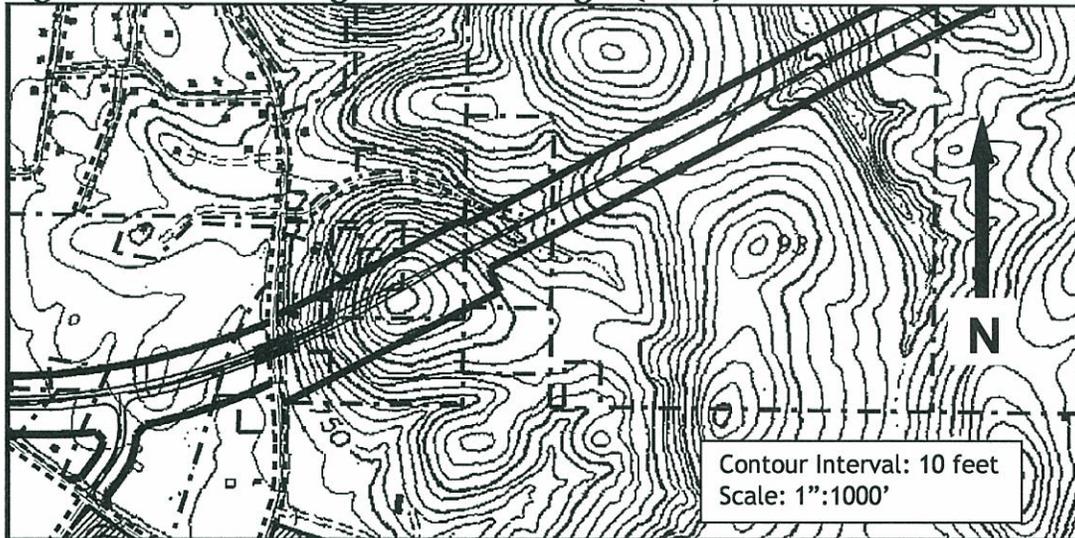
Two project segments will require significant grading to meet the requirements. Figure 1 and Figure 2 show these two segments, one on the west end of the project, between the Brays Road (CR 98) bridge and McDaniels Station Road (CR 5) bridge, and one on the east end between Union Grove Church Road (CR 65) and the end of project at SR 53

**Figure 1: Vertical Alignment Challenges (West)**



Source: Georgia Data Clearinghouse  
“<https://gis1.state.ga.us/index.asp?body=preview&dataId=6390>”

**Figure 2: Vertical Alignment Challenges (East)**



Source: Georgia Data Clearinghouse  
“<https://gis1.state.ga.us/index.asp?body=preview&dataId=6390>”

### **Bridges**

All bridges will meet minimum vertical clearance requirements. These bridges are:

- South Calhoun Bypass over CR 98 (Brays Road): twin span bridge
- South Calhoun Bypass over CR 5 (McDaniel Station Road)/CSX Rail line: twin span bridge
- South Calhoun Bypass over Oothkalooga Creek: twin span bridge
- South Calhoun Bypass over CR 62 (Union Grove Church Road): twin span bridge

## **Construction Staging & Maintenance of Traffic**

This project is 6.2 miles in length with a 0.6 mile exception for Project NH-STP-75-3(203), PI #610870. Concept Right of Way widths appear to be adequate for construction and maintenance of traffic.

Approximately 5.8 miles will be on new alignment. Accordingly, construction staging and maintenance of traffic will not be a significant obstacle for the majority of this project. From west to east, the areas that need staging treatment are as follows:

### ***From SR 53 (West Terminus) to CS 825 (Marine Road)***

Traffic will be maintained on SR 53 on the west project terminus throughout construction. Improvements to the intersection will be staged to maintain traffic continuously. Standard work-zone practices will be followed during construction of the new median opening, turn lanes, and any signal.

Traffic will be maintained at all crossings—both at-grade and grade-separated—including the McDaniels Station Road (CR 5)/CSX Railroad crossing and the new Union Grove Church Road (CR 62) bridge. All construction will take place in a manner which minimizes adverse impacts to existing traffic.

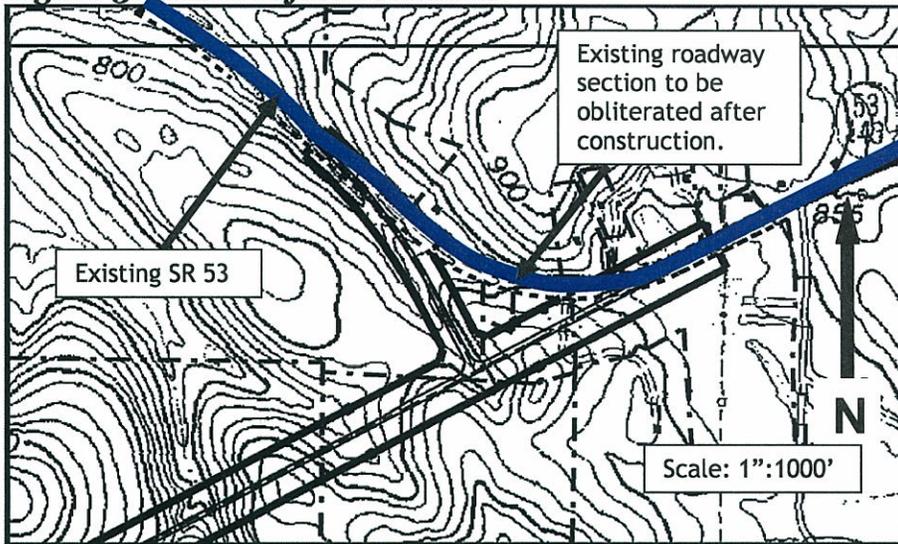
Union Grove Road will first be widened with new lanes to the south of existing lanes and then the existing lanes will be removed and replaced. There will be appropriate coordination with the Union Grove Road interchange construction project NH-STP-75-3(203) to minimize traffic conflicts.

### ***From CR 62 (Bellwood Road) to SR 53 (East Terminus)***

Coordination with the Union Grove Road interchange construction project NH-STP-75-3(203) will be maintained at the project boundary of Bellwood Road. Bellwood Road and Johnson Lake Road will be constructed in a fashion that will not require traffic to be detoured.

Traffic will be maintained at the east project terminus at SR 53. As shown in Figure 3, SR 53 will remain in its existing condition while the new “T” intersection with the South Calhoun Bypass is being constructed. Construction will be staged in a fashion that maintains traffic on SR 53 throughout the project lifetime.

**Figure 3: East Project Terminus**



Sources: Georgia Data Clearinghouse  
"<https://gis1.state.ga.us/index.asp?body=preview&dataId=6390>"  
Georgia Department of Transportation

July 06, 2006

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## Potential Traffic Signal Locations

There are three (3) potential locations for new signals on the South Calhoun Bypass: the western terminus with SR 53, the intersection with SR 3 (US 41), and the eastern terminus with SR 53.

Each signal location was evaluated with respect to proposed roadway geometry and design traffic projections. Capacity analysis was conducted at SR 53, both termini, and it was found the in 2031, AM and PM levels of service would be F at both intersections in an unsignalized condition.

### *South Calhoun Bypass and SR 53 (Western Terminus)*

This intersection is recommended for signalization due to the heavy left turn volume from the South Calhoun Bypass onto westbound SR 53 which conflicts with the through movements on SR 53. Heavy truck traffic is expected to traverse this intersection and adequate gaps may not be available for large vehicles without signalization. Signalization will result in a design year level of service of A in the AM peak hour and B in the PM peak hour.

### *South Calhoun Bypass and SR 3 (US 41)*

This intersection is recommended for signalization due to the large number of approach lanes that are proposed for each direction. An intersection with two (2) approach lanes and a left-turn bay on each approach is not likely to operate safely without signalized control.

### *South Calhoun Bypass and SR 53 (Eastern Terminus)*

This intersection is recommended for signalization due to the large turning movement and related control delay. Build-year volumes of traffic are not likely to require a traffic signal in order to make any of the designed movements safely. Design year traffic volumes, however, will probably require signalization at this location. Signalization will result in a design year level of service of A in the AM peak hour and B in the PM peak hour. Table 3 lists the levels of service for both the Build and No-Build conditions.

Signal permits will be required at all locations where traffic signals are recommended. Permits will be acquired during preliminary design through the normal process of Traffic Engineering Studies submitted through the district traffic operations office.

**Table 3: Design Year Levels of Service**

Intersecting Street	Build (signalized)		No Build (unsignalized)	
	2031 AM	2031 PM	2031 AM	2031 PM
SR 53 (West)	A	B	F	F
US 41	C	C	n/a <sup>1</sup>	n/a <sup>1</sup>
SR 53 (East)	A	B	F	F

<sup>1</sup> *The Highway Capacity Manual does not provide for analysis of an unsignalized intersection with greater than two approach lanes*  
Source: *Highway Capacity Manual, Greenhorne & O'Mara*

## Construction and Right of Way Cost Estimates

Included in the revised cost estimate are updated unit prices.

Standard asphalt and concrete paving sections are used for cost estimation purposes.

**Table 4: Cost Estimate**

<b>ESTIMATED COST - SOUTH CALHOUN BYPASS</b>			
CONSTRUCTION:	\$34,939,531	RIGHT-OF-WAY:	\$6,550,960
INFLATION :	\$5,507,344	ACQUIRED BY :	GDOT
E & C (10%) :	\$4,044,687	UTILITIES :	\$2,011,680
		ADJUSTED BY :	GDOT

**TOTAL PROJECT COST:**

**\$53,054,202**

See Attachment 2 for full breakdown of cost estimate

## **Impacts to Properties**

We concur with the revised concept report that rights to Limited Access will be acquired throughout the project, in accordance with department policies. There are several locations where the proposed alignment is bisecting existing parcels or depriving owners of existing access. Our evaluation of the alignment indicates that there are no insurmountable problems with providing alternate access to these parcels either through re-routing to side roads, or if necessary, providing access breaks along the alignment.

There appear to be eight (8) relocations of existing properties on this project. Further refinement and confirmation will not be possible until the project database is complete in Preliminary Design.

---

## Utility Conflicts

All utility adjustments and relocations will proceed in a manner that minimizes disruption and maximizes safety. There are no known utility conflicts that would affect staging or construction of this project.

## **Steps to Minimize Environmental Impacts**

This bypass project is part of a two-project process to provide relief to SR 53, access to numerous commercial properties, and access to the Tom B. David Field Airport. The other project involved is NH-STP-75-3(203) (PI #610870) which will add a new interstate interchange at the intersection of Union Grove Road and I-75.

The environmental document examined these two projects and their alternatives as one whole project. Herein are summarized the alternatives that affected the Union Grove Road Interchange project.

### ***The No-Build Alternative Alignment***

Under the No-Build Alternative Alignment, the Department would take no action to construct the proposed projects. While this alternative alignment would avoid right-of-way impacts, it is not prudent because it does not meet the proposed project's Need and Purpose. The No-Build Alternative Alignment would not address the following deficiencies: needed safety improvements by providing traffic relief to SR 53; direct access to the Tom B. David Airport and the Industrial Park area from I-75; and future traffic congestion relief along the existing SR 53 in the vicinity of I-75.

### ***Western Terminus at US 41/SR 3***

The Western Terminus at US 41/SR 3 Alternative Alignment would provide a western terminus at US 41/SR 3. While this alternative would avoid farmland, wetland, and stream impacts to the west of US 41/SR 3, the traffic analysis indicated that US 41/SR 3 was not a logical terminus. Further, this alternative would not meet the Need and Purpose of the proposed project, as it would not provide the safety benefits and traffic relief along SR 53 by allowing truck traffic to bypass Calhoun.

### ***Alignment Through the Moore Property Alternative***

The Alignment Through the Moore Property Alternative would begin on SR 53 southwest of Calhoun, and would be the same as the proposed alternative until crossing I-75. After crossing I-75, this alternative would cross over CR 65/Union Grove Road where the current proposed alternative ties in with this facility on the eastern side of I-75. This alternative would then travel to the northeast on new location until bridging CR 62/Union Grove Church Road. During the historic resources survey, it was discovered that this alternative would pass through a NRHP eligible property (the Moore Property). This alternative was dismissed from consideration due to the potentially adverse Section 4(f) impacts.

### ***Western Terminus Aligned with CR 113***

The Western Terminus Aligned with CR 113 alternative would begin on SR 53 southwest of Calhoun at its southern intersection with CR 113. The alignment would connect to the proposed alignment approximately 1.2 miles east of the proposed western terminus. This alternative was dismissed from consideration

due to the presence of potential large flowered skullcap habitat in a wooded area approximately 0.6 mile east of the CR 113 intersection with SR 53.

***Western Terminus Approximately 600 Feet South of Preferred Alignment***

This alternative would begin on SR 53 southwest of Calhoun at approximately 600 feet south of the proposed alternative alignment's western terminus. The alignment connected to the proposed alternative approximately 0.7 mile east of the current western terminus. This alternative was dismissed from consideration due to an additional residential displacement that could be avoided by shifting the alignment to the north without adverse impacts to other residences or businesses in the area.

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## **Steps to Minimize Unexpected Design and Right of Way Problems**

The proposed alignments for the South Calhoun Bypass and crossroads within the limits of this project have been set to match existing conditions and limit property impacts. This current layout is based on non rectified aerial photography and preliminary properties. One of our first tasks during Preliminary Design, once the existing property database and topography is complete, will be to check the alignments more closely. We will pay close attention to the historical Moore property.

## **Attachments**

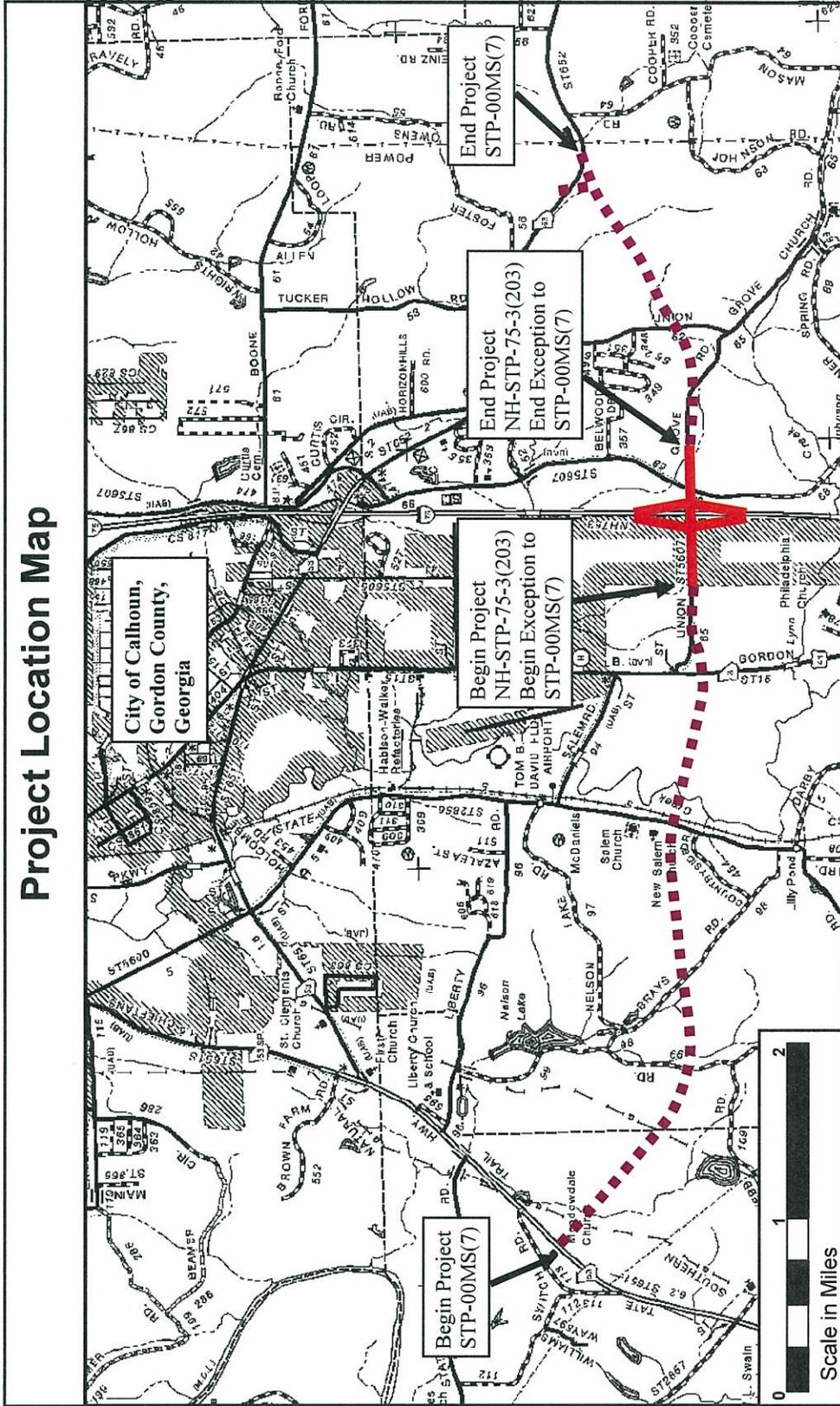
1. Sketch Map
2. Cost Estimate
3. Typical Sections
4. Concept & Revised Concept Reports

July 06, 2006

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**Attachment 1 - Sketch Map**

# Project Location Map



April 11, 2006

## Legend

- Interchange Project NH-STP-75-3(203)
- - - - - South Calhoun Bypass Project STP-00MS(7)

**I-75 @ CR 65/Union Grove Road Interchange**  
 NH-IM-75-3(203) PI # 610870  
**South Calhoun Bypass**  
 STP-00MS(7) PI # 662510

## **Attachment 2 - Cost Estimate**

## CONCEPT COST ESTIMATE

STP-00MS(7) PI# 662510

A. RIGHT OF WAY		QUANTITY	UNITS	UNIT COST	ITEM DESCRIPTION	COST
ITEM NUMBER		1	LS	\$6,550,960		\$6,550,960
					<b>Section SubTotal</b>	\$6,550,960
B. REIMBURSABLE UTILITIES		QUANTITY	UNITS	UNIT COST	ITEM DESCRIPTION	COST
ITEM NUMBER						
GEORGIA NATURAL GAS						
GEORGIA POWER						
CITY OF CALHOUN						
BELLSOUTH						
COMCAST						
GEORGIA PUBLIC WEB						
CALINET						
		1	LS	\$2,011,680		\$2,011,680
					<b>Section SubTotal</b>	\$2,011,680
C. CONSTRUCTION		QUANTITY	UNITS	UNIT COST	ITEM DESCRIPTION	COST
ITEM NUMBER						
1. BRIDGES						
		1	LS	\$1,600,000	SOUTH CALHOUN BYPASS OVER BRAYS ROAD - CR 98	\$1,600,000
		1	LS	\$1,700,000	SOUTH CALHOUN BYPASS OVER CR 5 & CSX RAILROAD	\$1,700,000
		1	LS	\$2,600,000	SOUTH CALHOUN BYPASS OVER OOTHKALOOGA CREEK	\$2,600,000
		1	LS	\$1,540,000	SOUTH CALHOUN BYPASS OVER UNION GROVE CHURCH ROAD	\$1,540,000
					<b>Section SubTotal</b>	\$7,440,000
2. MISCELLANEOUS						
		1	EA	\$65,000	FIELD ENGINEERS OFFICE, TP 3	\$65,000
		150	EA	\$100	RIGHT OF WAY MARKERS	\$15,000
		35000	LF	\$25	FIELD FENCE WOVEN WIRE	\$875,000
					<b>Section SubTotal</b>	\$955,000
3. EARTH WORK						
		2100000	CY	\$4	UNCLASSIFIED EXCAVATION	\$8,400,000
					<b>Section SubTotal</b>	\$8,400,000
4. DRAINAGE						
		1150	CY	\$50	FOUND BK FILL MATL, TP II	\$57,500
		900	CY	\$500	CLASS A CONCRETE	\$450,000
		125000	LB	\$5	BAR REINF STEEL	\$187,500
		4800	LF	\$22	STORM DRAIN PIPE, 18 IN, H 1-10	\$264,000
		1300	LF	\$65	STORM DRAIN PIPE, 24 IN, H 1-10	\$84,500
		270	LF	\$80	STORM DRAIN PIPE, 30 IN, H 1-10	\$21,600
		160	LF	\$95	STORM DRAIN PIPE, 36 IN, H 1-10	\$15,200
		150	LF	\$100	STORM DRAIN PIPE, 42 IN, H 1-10	\$15,000
		215	LF	\$35	SIDE DRAIN PIPE, 18 IN, H 1-10	\$7,525
		45	EA	\$935	FLARED END SECTION 18 IN, STORM DRAIN	\$42,075
		10	EA	\$900	FLARED END SECTION 24 IN, STORM DRAIN	\$9,000
		4	EA	\$1,000	FLARED END SECTION 30 IN, STORM DRAIN	\$4,000

# CONCEPT COST ESTIMATE

STP-00MS(7) PI# 662510

550-4236	4	EA	\$1,460	FLARED END SECTION 36 IN. STORM DRAIN	\$5,840
550-4242	2	EA	\$1,750	FLARED END SECTION 42 IN. STORM DRAIN	\$3,500
603-2018	300	SY	\$45	STN DUMPED RIP RAP, TP1, 18 IN	\$13,500
668-1100	26	EA	\$1,900	CATCH BASIN, GP 1	\$49,400
668-1110	20	LF	\$200	CATCH BASIN, GP 1, ADDL DEPTH	\$4,000
668-1200	6	EA	\$2,500	CATCH BASIN, GP 2,	\$15,000
668-2100	35	EA	\$2,900	DROP INLET, GP 1	\$101,500
				<b>Section SubTotal</b>	<b>\$1,350,640</b>

<b>5. BASE AND PAVING</b>					
310-1101	104300	TN	\$25	GR AGGR BASE CRS, INCL MATL	\$2,607,500
318-3000	600	TN	\$25	AGGR SURF CRS	\$15,000
402-1812	2000	TN	\$90	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	\$180,000
402-3110	16300	TN	\$75	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	\$1,222,500
402-3112	21700	TN	\$75	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	\$1,627,500
402-3121	64800	TN	\$75	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	\$4,867,500
413-1000	68800	GL	\$2	BITUM TACK COAT	\$137,600
610-4170	674	CY	\$105	REM ASPH PVMT INCL BASE	\$70,770
				<b>Section SubTotal</b>	<b>\$10,728,370</b>

<b>6. CONCRETE</b>					
436-1000	1200	LF	\$12	ASPHALTIC CONCRETE CURB	\$14,400
441-0754	1860	SY	\$80	CONCRETE MEDIAN, 7 1/2 IN	\$148,800
441-0301	35	EA	\$2,300	CONC SPILLWAY, TP 1	\$80,500
441-0302	10	EA	\$2,300	CONC SPILLWAY, TP 2	\$23,000
441-0303	10	EA	\$2,450	CONC SPILLWAY, TP 3	\$24,500
441-6222	3500	LF	\$20	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	\$70,000
441-6740	5800	LF	\$19	CONC CURB & GUTTER, 8 IN X 30 IN, TP 7	\$110,200
				<b>Section SubTotal</b>	<b>\$477,400</b>

<b>7. TRAFFIC CONTROL</b>					
150-1000	1	LS	\$250,000	TRAFFIC CONTROL - STP-00MS(7)	\$250,000
				<b>Section SubTotal</b>	<b>\$250,000</b>

<b>8. CLEARING AND GRUBBING</b>					
201-1500	1	LS	\$2,750,000	CLEARING & GRUBBING - STP-00MS(7)	\$2,750,000
				<b>Section SubTotal</b>	<b>\$2,750,000</b>

<b>9a. EROSION CONTROL (TEMPORARY)</b>					
163-0232	50	AC	\$500	TEMPORARY GRASSING	\$25,000
163-0240	800	TN	\$220	MULCH	\$176,000
163-0300	10	EA	\$1,800	CONSTRUCTION EXIT	\$18,000
163-0501	22	EA	\$850	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 1	\$18,700
163-0520	3000	LF	\$14	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	\$42,000
163-0521	370	EA	\$180	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS	\$66,600
163-0530	20000	LF	\$3.50	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	\$70,000
163-0531	4	EA	\$8,000	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1,	\$32,000
163-0550	82	EA	\$300	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	\$24,600
165-0010	4700	LF	\$2	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	\$9,400

# CONCEPT COST ESTIMATE

STP-00MS(7) PI# 662510

165-0030	17000	LF	\$2	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	\$34,000	
165-0040	370	EA	\$120	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	\$44,400	
165-0060	4	EA	\$1,100	MAINTENANCE OF TEMPORARY SEDIMENT BASIN	\$4,400	
165-0070	20000	LF	\$2.00	MAINTENANCE OF BALED STRAW EROSION CHECK	\$40,000	
165-0085	22	EA	\$375	MAINTENANCE OF SILT CONTROL GATE, TP 1	\$8,250	
165-0105	82	EA	\$125	MAINTENANCE OF INLET SEDIMENT TRAP	\$10,250	
171-0010	9400	LF	\$4.00	TEMPORARY SILT FENCE, TYPE A	\$37,600	
171-0030	3400	LF	\$5.00	TEMPORARY SILT FENCE, TYPE C	\$17,000	
700-7000	113	TN	\$70	AGRICULTURAL LIME	\$7,910	
700-7010	100	GL	\$20	LIQUID LIME	\$2,000	
700-8000	90	TN	\$285	FERTILIZER MIXED GRADE	\$25,650	
700-8100	2650	LB	\$2.50	FERTILIZER NITROGEN CONTENT	\$6,625	
716-2000	8100	SY	\$2	EROSION CONTROL MATS, SLOPES	\$16,200	
<b>9b. EROSION CONTROL (PERMANENT)</b>						
163-0240	800	TN	\$500	MULCH	\$400,000	
167-1000	3	EA	\$1,800	WATER QUALITY MONITORING AND SAMPLING	\$5,400	
167-1500	36	MO	\$900	WATER QUALITY INSPECTION	\$32,400	
441-0204	4850	SY	\$35	PLAIN CONC DITCH PAVING, 4 IN	\$169,750	
700-6910	100	AC	\$825	PERMANENT GRASSING	\$82,500	
700-7000	200	TN	\$70	AGRICULTURAL LIME	\$14,000	
700-7010	300	GL	\$20	LIQUID LIME	\$6,000	
700-8000	200	TN	\$285	FERTILIZER MIXED GRADE	\$57,000	
700-8100	20	LB	\$2.50	FERTILIZER NITROGEN CONTENT	\$50	
710-9000	3800	SY	\$5.00	PERMANENT SOIL REINFORCING MAT	\$19,000	
715-2200	8000	SY	\$2.50	BITUMINOUS TREATED ROVING, WATERWAYS	\$20,000	
					<b>Section SubTotal</b>	<b>\$1,542,685</b>
<b>10. SIGNING AND STRIPING</b>						
636-1020	355	SF	\$16	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	\$5,680	
636-1033	700	SF	\$25	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	\$17,500	
636-2070	2020	LF	\$8	GALV STEEL POST, TP 7	\$16,160	
636-2080	290	LF	\$11	GALV STEEL POST, TP 8	\$3,190	
636-2090	130	LF	\$8	GALV STEEL POST, TP 9	\$1,040	
636-3010	30	EA	\$380	GROUND MOUNTED BREAKAWAY SIGN SUPPORT	\$11,400	
639-2002	1540	LF	\$4	STEEL WIRE STRAND CABLE, 3/8 IN	\$5,390	
639-4002	14	EA	\$6,000	TRAFFIC SIGNAL INSTALLATION	\$84,000	
647-1000	3	LS	\$85,000	TRAFFIC SIGNAL INSTALLATION	\$255,000	
653-0120	50	EA	\$70	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	\$3,500	
653-0170	50	EA	\$80	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	\$4,000	
653-1501	64,000	LF	\$1	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	\$64,000	
653-1502	61,000	LF	\$1	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	\$61,000	
653-3501	57,000	GLF	\$1	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	\$57,000	
653-1804	384	LF	\$2	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	\$768	
653-6004	15,000	SY	\$3	THERMOPLASTIC TRAF STRIPING, WHITE	\$45,000	
653-6006	3,000	SY	\$3	THERMOPLASTIC TRAF STRIPING, YELLOW	\$9,000	
					<b>Section SubTotal</b>	<b>\$643,436</b>
<b>11. GUARDRAIL</b>						
641-1100	1000	LF	\$60	GUARDRAIL, TP T	\$60,000	

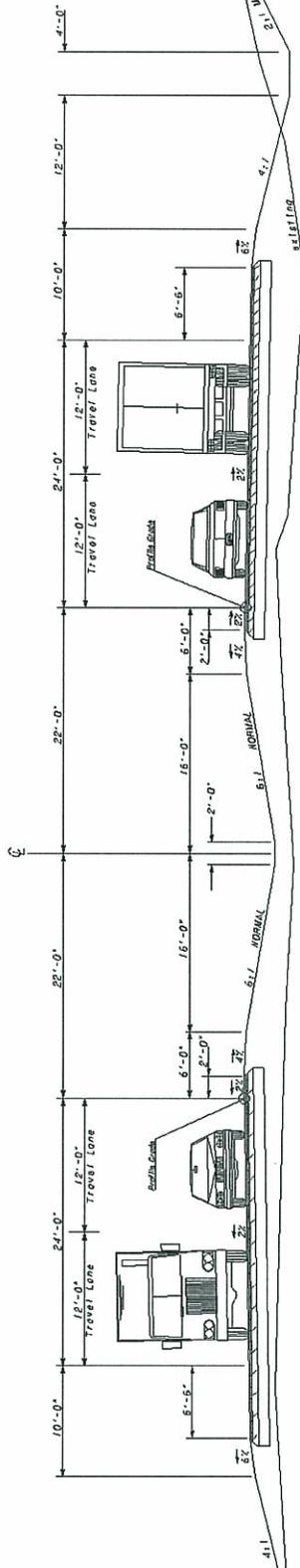
# CONCEPT COST ESTIMATE

STP-00MS(7) PI# 662510

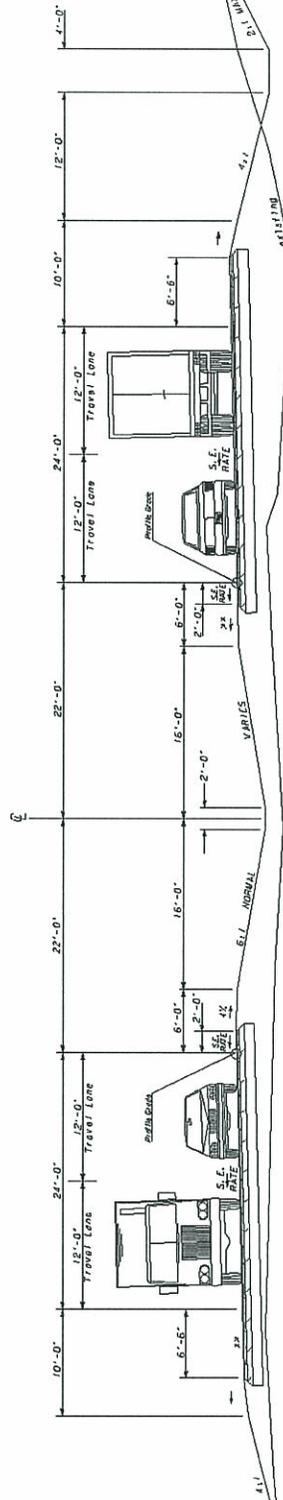
Item Code	Quantity	Unit	Rate	Description	Amount
641-1200	14000	LF	\$20	GUARDRAIL, TP W	\$280,000
641-5001	20	EA	\$600	GUARDRAIL ANCHORAGE, TP 1	\$12,000
641-5012	28	EA	\$2,000	GUARDRAIL ANCHORAGE, TP 12	\$56,000
<b>Section SubTotal</b>					<b>\$408,000</b>
<b>CONCEPT COST ESTIMATE SUMMARY</b>					
<b>A. RIGHT OF WAY</b>					
					<b>\$6,550,960</b>
<b>B. REIMBURSABLE UTILITIES</b>					
					<b>\$2,011,680</b>
<b>C. CONSTRUCTION</b>					
1. BRIDGE & WALLS					\$7,440,000
2. MISCELLANEOUS					\$955,000
3. EARTHWORK					\$8,400,000
4. DRAINAGE					\$1,350,640
5. BASE & PAVING					\$10,728,370
6. CONCRETE					\$471,400
7. TRAFFIC CONTROL					\$250,000
8. CLEARING & GRUBBING					\$2,750,000
9. EROSION CONTROL					\$1,542,685
10. SIGNING & STRIPING					\$643,436
11. GUARDRAIL					\$408,000
<b>SUBTOTAL CONSTRUCTION COST</b>					<b>\$34,939,531</b>
INFLATION RATE 5.0% @ 3 YEARS					\$5,507,344
E&C RATE 10%					\$4,044,687
<b>TOTAL CONSTRUCTION ESTIMATE</b>					<b>\$44,491,562</b>
<b>GRAND TOTAL PROJECT COST</b>					<b>\$53,054,202</b>

## **Attachment 3 - Typical Sections**

44-FOOT DEPRESSED GRASS MEDIAN RURAL SECTION  
55 MPH DESIGN SPEED



New Location  
4 Lanes With a 44' Median  
(D.S. 55mph)  
NORMAL CROWN



New Location  
4 Lanes With a 44' Median  
(D.S. 55mph)  
SUPERELEVATED

\* SHOULDER TO SLOPE AT NORMAL RATE, HOWEVER, THE ALGEBRAIC DIFFERENCE IN PAVING SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 8%. MINIMUM SHOULDER SLOPE TO BE 2%.

\*\* SHOULDER TO SLOPE AT NORMAL RATE OR SUPERELEVATION RATE, WHICHEVER IS GREATER.

BEGINNING FROM WEST TERMINUS TO 0.2 MILES WEST OF US 41/SR5

N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104  
MARLETTE, GA 30067  
PHONE: (770) 988-9555

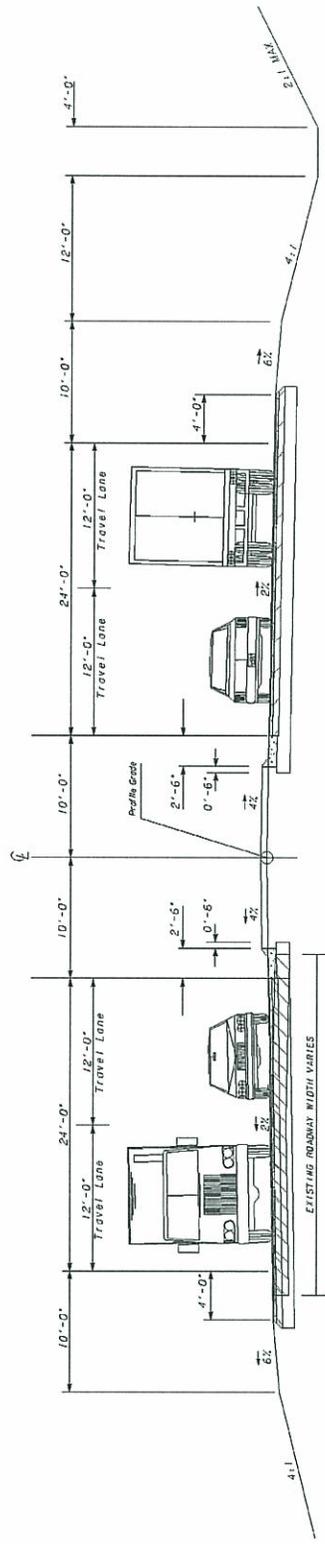


TYPICAL SECTIONS FOR  
SOUTH CALHOUN BYPASS

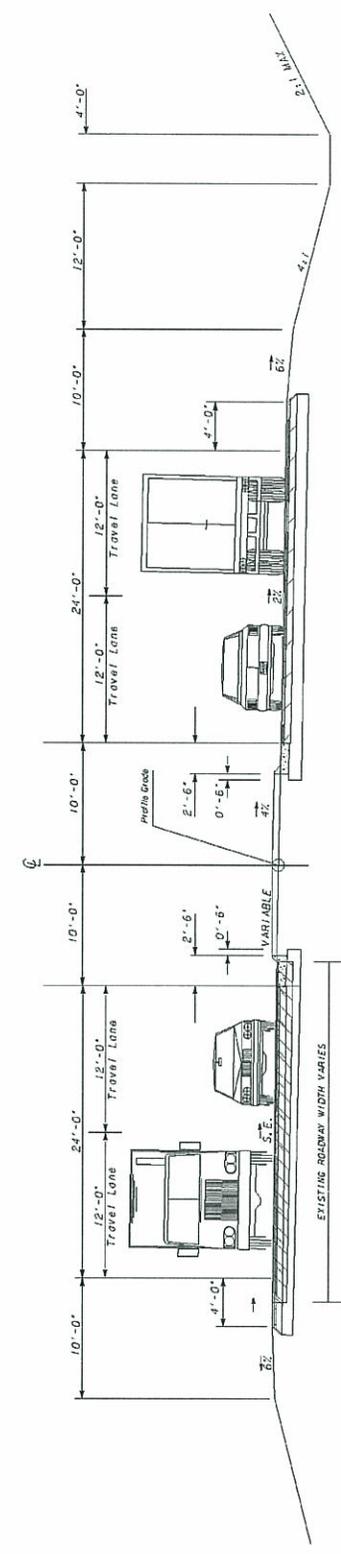
GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-00MS(7)  
COUNTY: GORDON  
DATE:

DRAWING

20-FOOT RAISED MEDIAN RURAL SECTION  
45 MPH DESIGN SPEED



TANGENT SECTION



SUPER ELEVATED SECTION

BEGINNING 0.2 MILES WEST OF US 41/SR 3 AND ENDING 0.1 MILES WEST OF C.S. 825 (MARINE ROAD)

N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104  
MARLETTE, GA 30067  
PHONE: (770) 988-9555

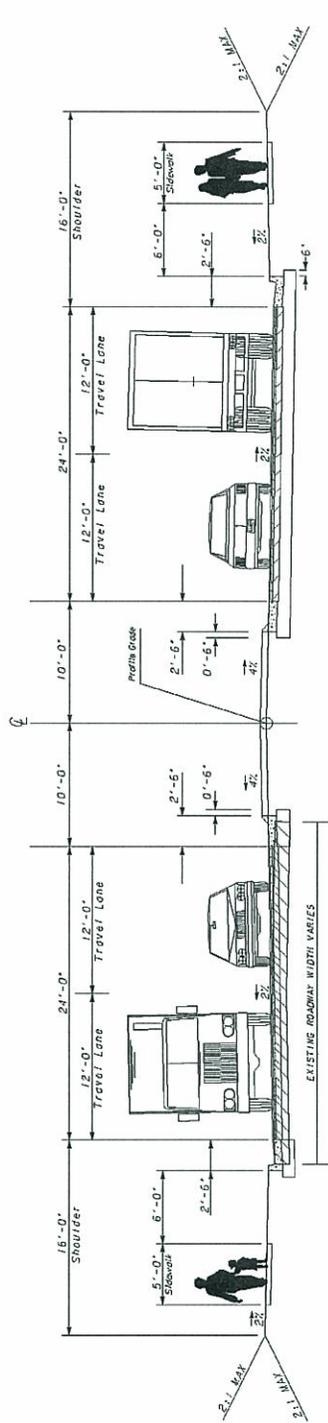


TYPICAL SECTIONS FOR  
SOUTH CALHOUN BYPASS

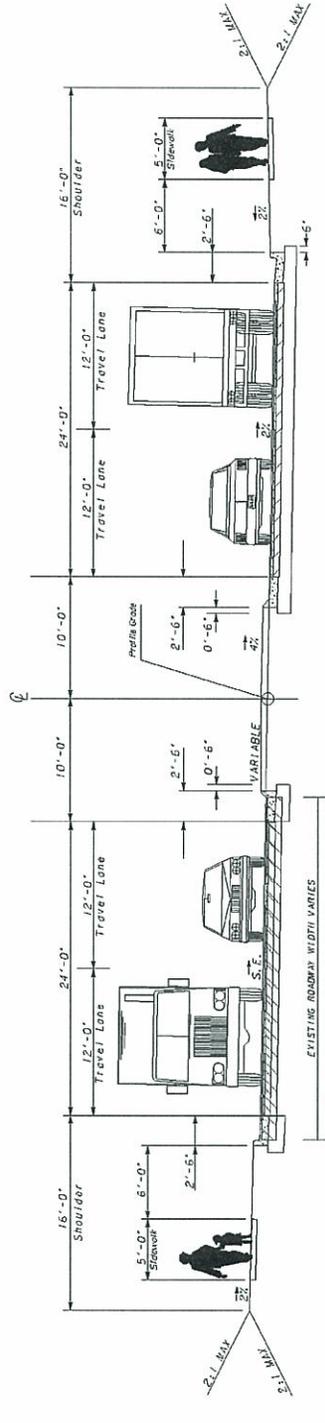
GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-00MS(7)  
COUNTY: GORDON  
DATE:

DRAWING

20-FOOT RAISED MEDIAN URBAN SECTION  
45 MPH SPEED DESIGN



TANGENT SECTION



SUPER ELEVATED SECTION

BEGINNING 0.1 MILES WEST OF CS 825 (MARINE ROAD) AND CONTINUING TO CS 825 (MARINE ROAD)  
EXCEPTION AT NH-STP-75-3(203) (0.6 MILES)  
CONTINUING AT RELOCATED CR 68 (BELLWOOD ROAD) AND ENDING 0.1 MILES EAST OF CR 62  
(UNION GROVE ROAD)  
N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104 30067  
MARIETTA, GA  
PHONE: (770) 988-9555

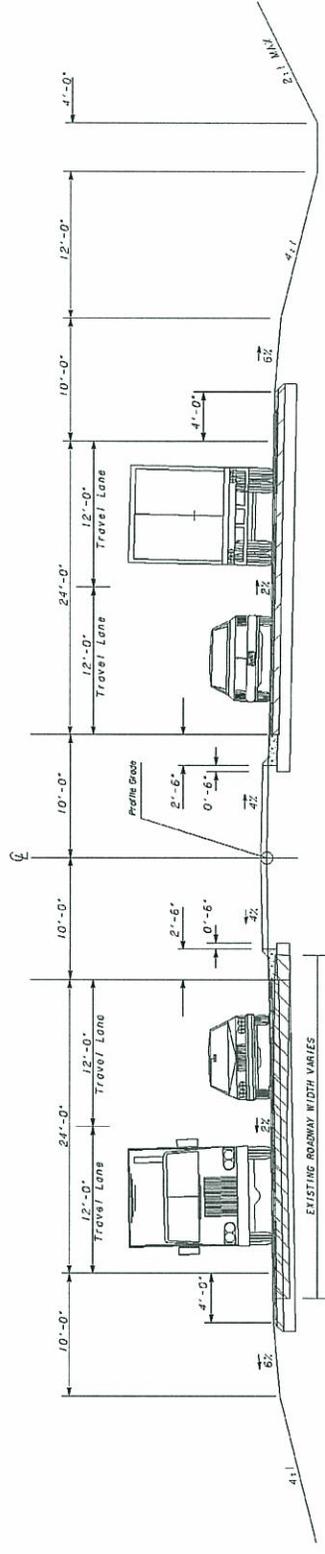


TYPICAL SECTIONS FOR  
SOUTH CALHOUN BYPASS

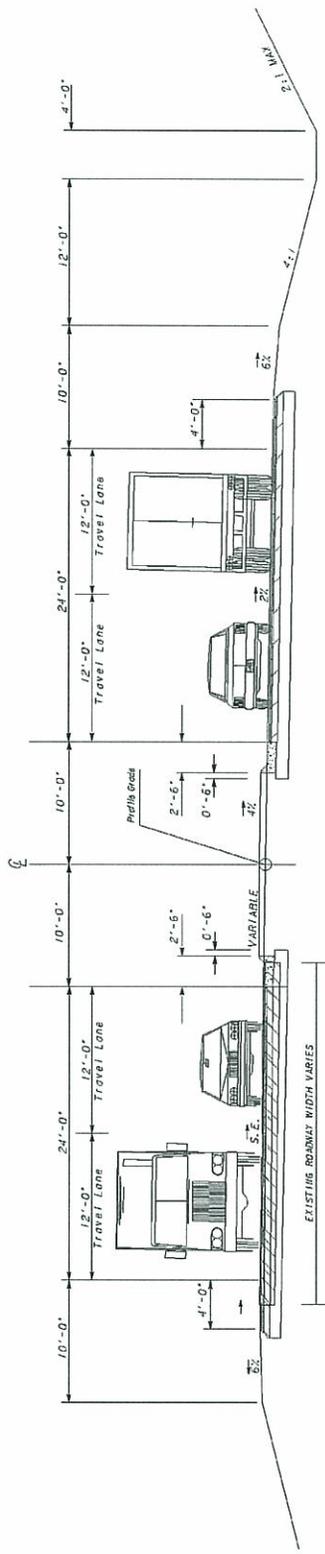
GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-00MS(7)  
COUNTY: GORDON  
DATE:

DRAWING

20-FOOT RAISED MEDIAN RURAL SECTION  
45 MPH DESIGN SPEED



TANGENT SECTION



SUPER ELEVATED SECTION

BEGINNING AT PROPOSED NEW LOCATION OF 68 (BELWOOD ROAD) AND ENDING  
0.1 MILES EAST OF CR 62 (UNION GROVE CHURCH ROAD)

N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104 30067  
MARIETTA, GA  
PHONE: (770) 988-9555

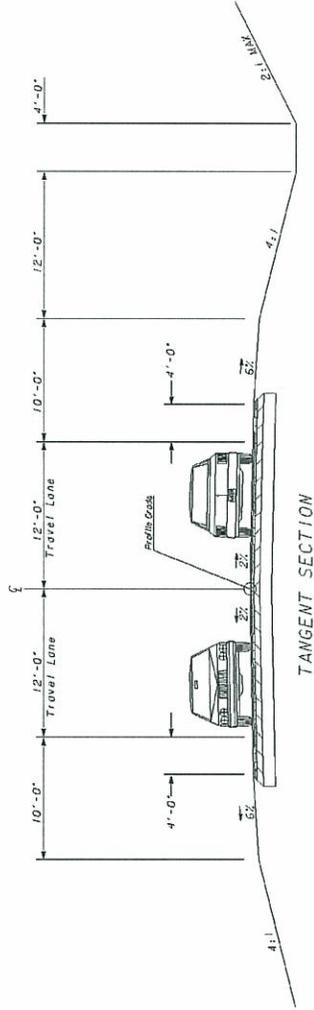


TYPICAL SECTIONS FOR  
SOUTH CALHOUN BYPASS

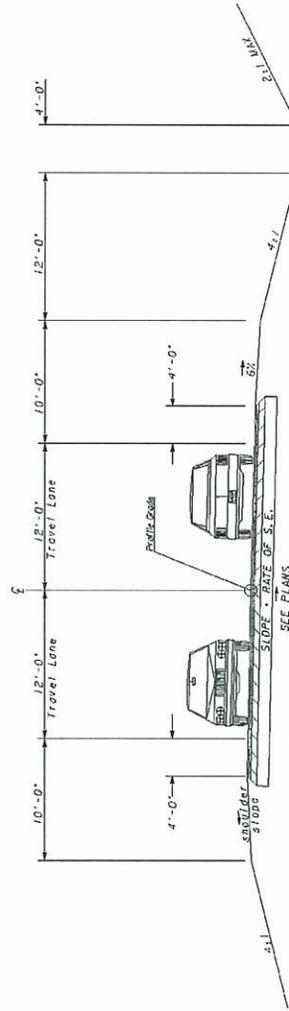
GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-00MS(7)  
COUNTY: GORDON  
DATE:

DRAWING

2-LANE RURAL SECTION  
55 MPH SPEED DESIGN



TANGENT SECTION



S.L. RATE	SHOULDER SLOPE
2.0% OR 3.0%	4.0%
4.0% OR 5.0%	2.0%
6.0% OR 7.0%	1.0%
8.0% +	0.0%

SUPER ELEVATED SECTION

BEGINNING 0.1 MILES EAST OF CR 62 (UNION GROVE CHURCH ROAD) AND ENDING AT SR 53

N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104 30067  
MARIETTA, GA  
PHONE: (770) 988-9555

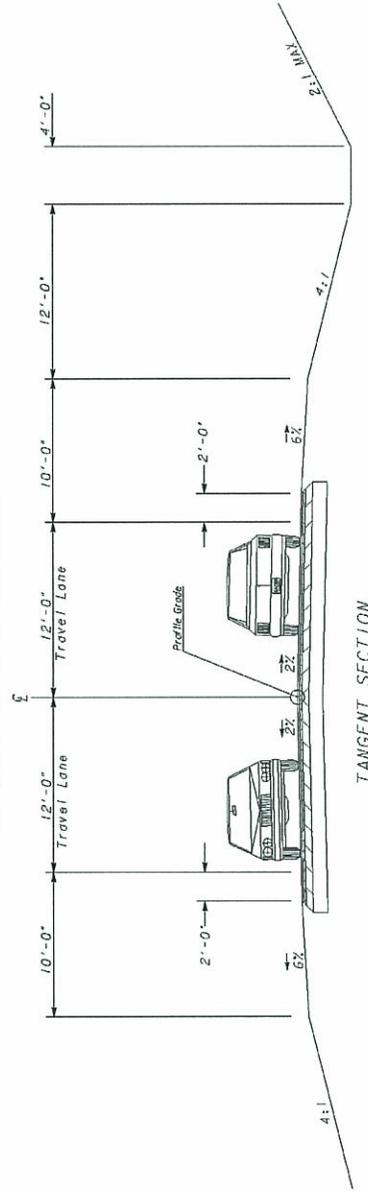


TYPICAL SECTIONS FOR  
SOUTH CALHOUN BYPASS

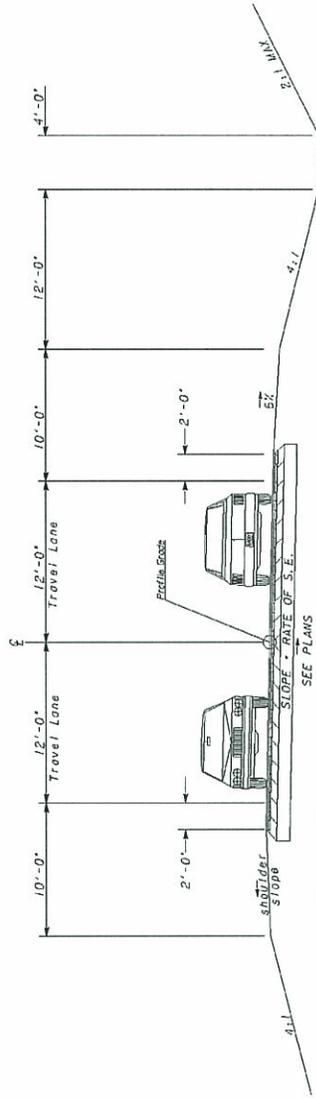
GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-00MS(7)  
COUNTY: GORDON  
DATE:

DRAWING

2-LANE RURAL SECTION  
45 MPH SPEED DESIGN



TANGENT SECTION



S. E. RATE	Shoulder Slope
2.0% OR 3.0%	4.0%
4.0% OR 5.0%	2.0%
6.0% OR 7.0%	1.0%
8.0% ±	0.0%

OAK GROVE ROAD RELOCATION  
UNION GROVE ROAD SPUR

N. T. S.

GREENHORNE & O' MARA  
2211 NEWMARKET PARKWAY  
SUITE 104  
MARJETTA, GA 30067  
PHONE: (770) 988-9555



TYPICAL SECTIONS FOR  
SOUTH CALHOUN BYPASS

GEORGIA  
DEPARTMENT OF TRANSPORTATION  
TYPICAL SECTIONS  
PROJECT: STP-00MS(17)  
COUNTY: GORDON  
DATE:

DRAWING

# *Value Engineering Process*

## INTRODUCTION

This report summarizes the analysis and conclusions by the PBS&J Value Engineering workshop team as they performed a VE study during the period of May 1 – 4, 2007 in Atlanta, at the office of the Georgia Department of Transportation. The subjects of the Value Engineering study were the projects for the building a new interchange on I-75 at Union Grove Road NH-STP-75(203) – P.I. No. 610870 and to build the new South Calhoun Bypass STP-00MS(7) – P.I. No. 662510 in Gordon County, Georgia. The design for these two projects is being performed by Greenhorne & O’Mara, with offices in Marietta, Georgia.

The Value Engineering workshop team and its leadership were provided by PBS&J. This team consisted of the following:

Charles McDuff	PBS&J	CVS/Civil Engineer/VE Team Leader
Andrew McCullough	PBS&J	Highway Design Engineer
Barry Brown	PBS&J	Structures Engineer
Gary King	PBS&J	Highway Construction Specialist

The Value Engineering team followed the seven step Value Engineering job plan as promulgated by the Georgia Department of Transportation. This seven step job plan includes the following:

- **Investigative** – during this phase of the team’s work, the team received a briefing from the project delivery team representatives of the Georgia Department of Transportation (GDOT). This briefing included discussions of the design intent behind the project, the cost concerns, design constraints and right-of-way issues. In the working session that followed, the VE team developed cost models from the cost data provided by the designers and familiarized themselves with the construction drawings and other data that was available to the team. Some of the representative project information may be found in the tabbed section of this report entitled *Project Description*. Following this current narrative the reader will also find a cost model done in the Pareto fashion, i.e., identifying the highest costs down to the lowest costs for the larger construction cost elements. This cost model, developed by the VE team, was used by the VE team to help focus their week of work. The headings on the Pareto Chart also were used as headings for creative phase activities.
- **Analysis** – during this phase the team reviewed the project from the simplest format in asking the questions of “What is the project supposed to do?”, and “How is it supposed to accomplish this purpose?” In the Value Engineering vernacular, the answers to these questions are cast in the form of active verbs and measurable nouns. These verb/noun pairs form the basis of the function analysis which distinguishes a Value Engineering effort from a potentially damaging cost cutting exercise. The important functions of the new project were identified as follows:

- **Project Objective/Goals (Higher Order Goals)**
    - **Relieve Congestion and Improve Safety**
    - **Enhance Access**
    - **Reduce Required Maintenance**
    - **Expedite Commerce**
    - **Improve Connectivity**
  - **Project Basic Functions**
    - **Connect Alignments (Use Bridge and Roadways)**
    - **Separate Traffic (Use bridge over I-75 and divided roadway)**
    - **Distribute Traffic Loads (Wheel Loads)**
    - **Support Alignment (Earthwork and Bridge Work)**
    - **Clear Construction Obstacle (Remove Bridge)**
    - **Comply With Regulations**
    - **Increase Load Capacity**
  - **Other Key Functions**
    - **Build Bridge**
    - **Protect Environment**
    - **Improve Operations**
    - **Control Access**
    - **Handle Storm Drainage**
- **Speculation** – The VE team performed a brainstorming session to identify ideas that might offer opportunities to help meet the VE team objectives for this workshop:
    - Reduce construction and life cycle costs
    - Improve roadway operations
    - Reduce the time of construction
    - Clarify risks and opportunities associated with the project and acts to mitigate risks and to act on opportunities.

This brainstorming session initially identified numerous ideas that were then evaluated in the next phase. The reader will find the creative worksheets enclosed. These same work sheets were also used to record the results of the Evaluation of these creative ideas.

- **Evaluation** – Once the team identified the creative ideas, it was necessary to decide which alternatives should be carried forward. This is the work of the Judgment or Evaluation Phase. The team reflected back on the project constraints and objectives shared with the team by the owner’s representatives, in the kick-off meeting on the first day of the workshop. From that guidance, the team settled on the following values as measures of whether or not an alternative had enough merit to be carried forward in the VE process:
  - Construction Cost Savings
  - Maintainability

- Ability to Implement the Idea
- General Acceptability of the Alternatives
- Constructability

Based on these measurement sticks, the VE team evaluated the alternatives and graded them from 5 (Excellent) down to 1 (Poor). Other notes about the alternatives are annotated at the bottom of the enclosed creative and evaluation sheets.

- **Development** – This is the section of the report (see tabbed section number three – Study Results) in which the alternatives are explained, sketched, documented and put to cost and technical tests to determine their suitability for implementation and for their impact on the project.
- **Recommendation** – As noted earlier, the team made a final, informal out-briefing on the last day of the workshop, designed to inform the stakeholders of the initial findings of the VE workshop. The purpose of that recommendation section of the workshop is to make sure that the stakeholders have a clear understanding of the work products of the VE team and to make sure that each of the alternatives brought forward have been developed in good context with the project facts.
- **Presentation** – This final report of the findings of the workshop represents the primary presentation to the client of the expected results from the workshop.

The VE team is enclosing a copy of the attendance sheets so that the reader can be informed about who participated in the workshop proceedings. The cost model developed in the information phase is also enclosed. These cost models are done in Pareto Fashion. This means that they are intended to highlight the high cost items in the current working estimate for the construction of the project. The high cost items were then evaluated by the VE team as to whether the team might be able to have an effect on these line items. Where it was felt that the team might affect the line items, they were typically used as the topics for the creative phase.

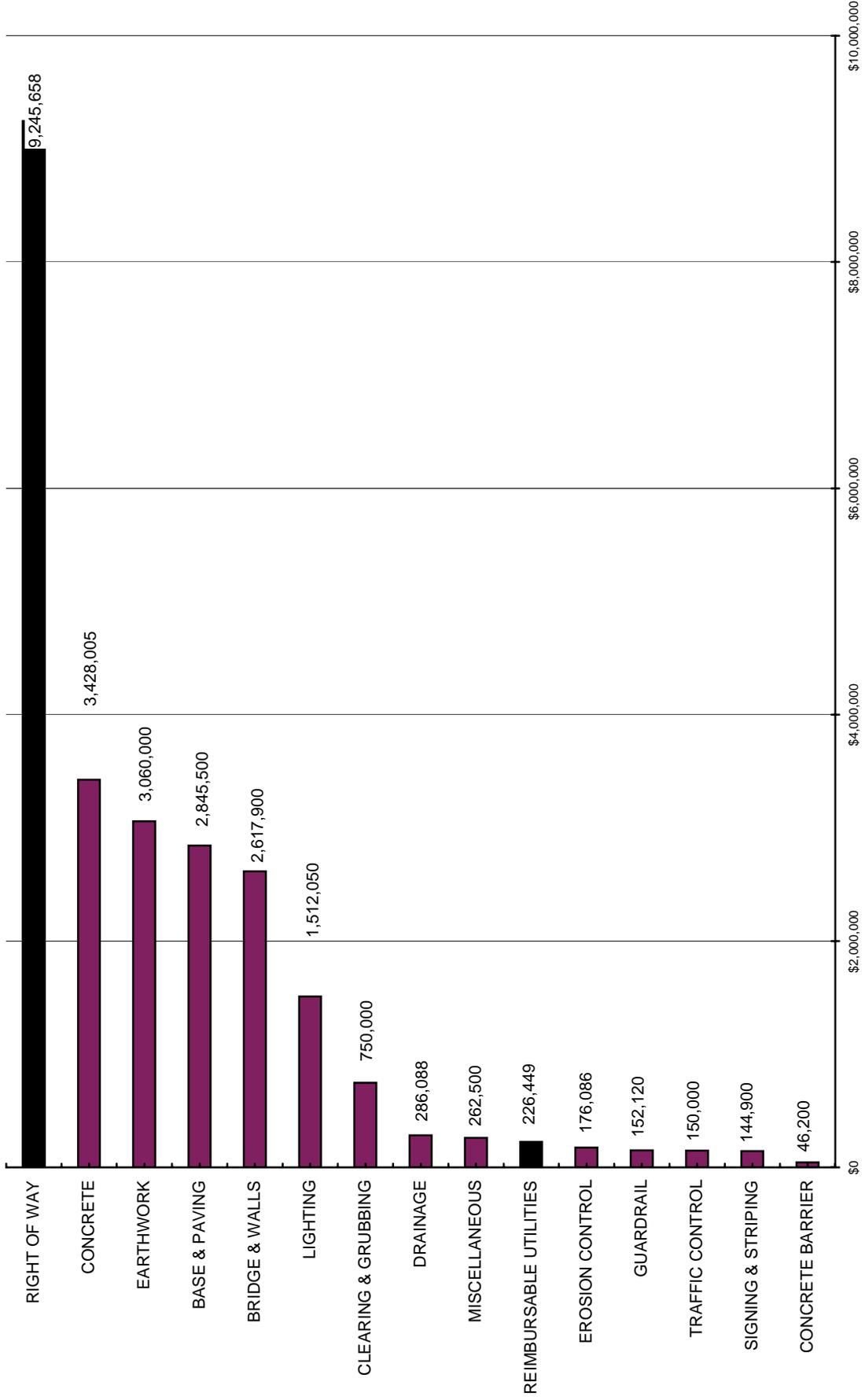
# PARETO CHART - COST HISTOGRAM

I-75 4/27/07

PROJECT: I-75 INTERCHANGE AT CR 65/UNION GROVE ROAD, GORDON COUNTY				
CONCEPT COST ESTIMATE NH-STP-75-3(203), PI 610870				
PROJECT ELEMENT	COST	COST	PERCENT	CUM. PERCENT
RIGHT OF WAY	9,245,658			
CONCRETE		3,428,005	22.21%	22.21%
EARTHWORK		3,060,000	19.83%	42.04%
BASE & PAVING		2,845,500	18.44%	60.48%
BRIDGE & WALLS		2,617,900	16.96%	77.45%
LIGHTING		1,512,050	9.80%	87.25%
CLEARING & GRUBBING		750,000	4.86%	92.11%
DRAINAGE		286,088	1.85%	93.96%
MISCELLANEOUS		262,500	1.70%	95.66%
REIMBURSABLE UTILITIES	226,449			
EROSION CONTROL		176,086	1.14%	96.80%
GUARDRAIL		152,120	0.99%	97.79%
TRAFFIC CONTROL		150,000	0.97%	98.76%
SIGNING & STRIPING		144,900	0.94%	99.70%
CONCRETE BARRIER		46,200	0.30%	100.00%
<b>Subtotal</b>	<b>9,472,107</b>	<b>\$ 15,431,349</b>	<b>100.00%</b>	
<b>E &amp; C Rate @ 10% INCL</b>		<b>\$ 1,543,135</b>		
<b>TOTAL CONSTRUCTION ESTIMATE</b>	<b>9,472,107</b>	<b>\$ 16,974,484</b>		
<b>GRAND TOTAL PROJECT COST</b>		<b>\$ 26,446,591</b>	<b>Comp Mark-up:</b>	<b>10%</b>

Chart I-75 CR65

I-75 INTERCHANGE AT CR 65/UNION GROVE ROAD, GORDON COUNTY



# PARETO CHART - COST HISTOGRAM

BYP 4/27/07

PROJECT: SOUTH CALHOUN BYPASS, GORDON COUNTY

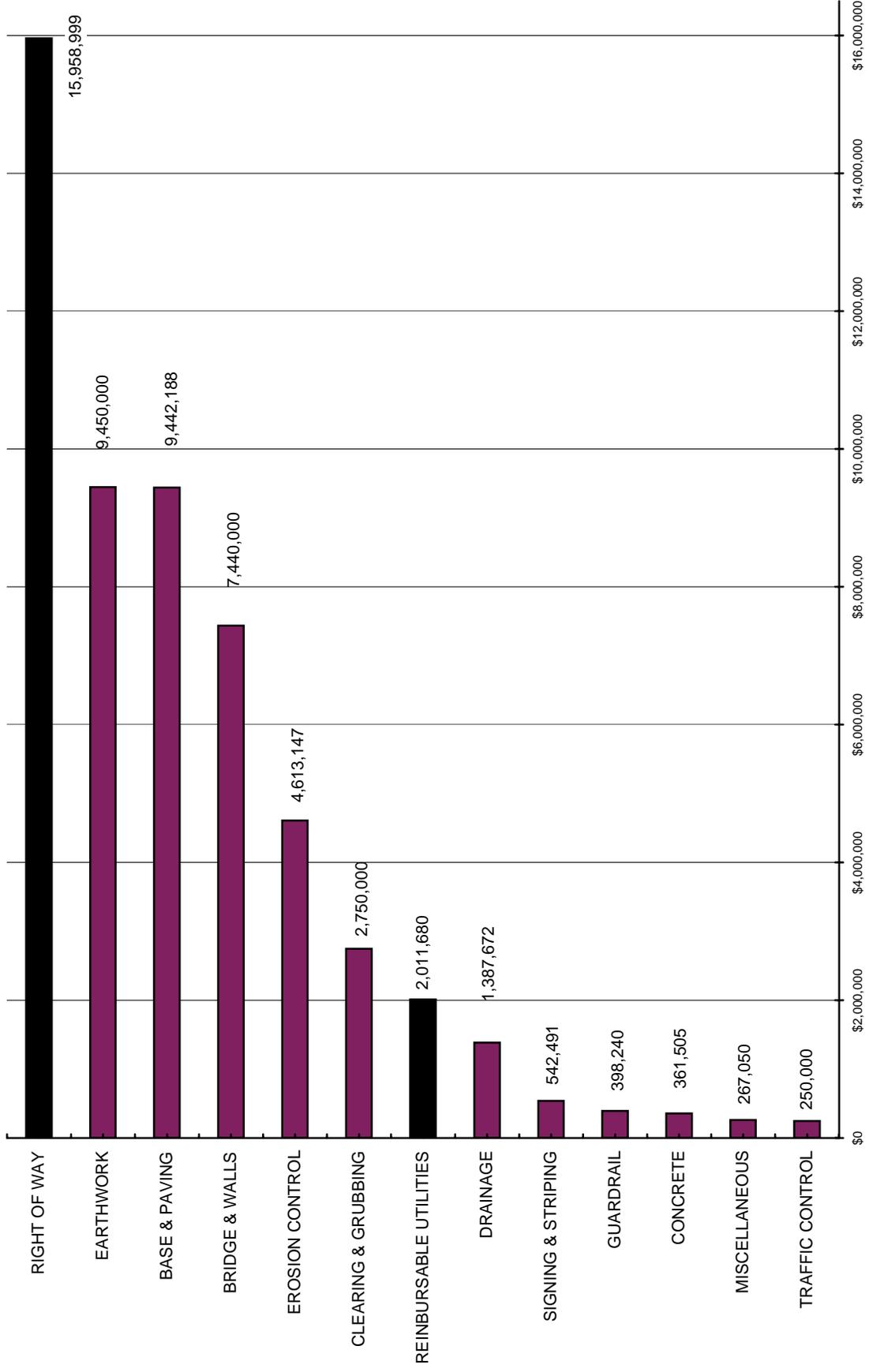
CONCEPT COST ESTIMATE

STP-00MS(7) PI# 662510

PROJECT ELEMENT	COST	COST	PERCENT	CUM. PERCENT
RIGHT OF WAY	15,958,999			
EARTHWORK		9,450,000	25.61%	25.61%
BASE & PAVING		9,442,188	25.59%	51.20%
BRIDGE & WALLS		7,440,000	20.16%	71.36%
EROSION CONTROL		4,613,147	12.50%	83.86%
CLEARING & GRUBBING		2,750,000	7.45%	91.31%
REINBURSABLE UTILITIES	2,011,680			
DRAINAGE		1,387,672	3.76%	95.07%
SIGNING & STRIPING		542,491	1.47%	96.54%
GUARDRAIL		398,240	1.08%	97.62%
CONCRETE		361,505	0.98%	98.60%
MISCELLANEOUS		267,050	0.72%	99.32%
TRAFFIC CONTROL		250,000	0.68%	100.00%
<b>Subtotal</b>	<b>17,970,679</b>	<b>\$ 36,902,293</b>	<b>100.00%</b>	
<b>E &amp; C RATE @ 10% INCL</b>		<b>\$ 3,690,229</b>		
<b>TOTAL CONSTRUCTION ESTIMATE</b>	<b>17,970,679</b>	<b>\$ 40,592,522</b>		
<b>GRAND TOTAL PROJECT COST</b>		<b>\$ 58,563,201</b>	<b>Comp Mark-up:</b>	<b>10%</b>

Chart S. CALHOUN BYP.

**SOUTH CALHOUN BYPASS, GORDON COUNTY**



# DESIGNER'S PRESENTATION

## MEETING PARTICIPANTS



Date: 1 May 2007

Project: I-75/Union Grove Road Interchange (P.I. No. 610870) and South Calhoun Bypass (P.I. No. 662510) - GORDON COUNTY

### GEORGIA DEPARTMENT OF TRANSPORTATION

NAME	ORGANIZATION & TITLE	E-MAIL	PHONE
Ron Wishon	Engineering Services	<a href="mailto:ron.wishon@dot.state.ga.us">ron.wishon@dot.state.ga.us</a>	404-651-7470
Lisa Myers	Engineering Services	<a href="mailto:lisa.myers@dot.state.ga.us">lisa.myers@dot.state.ga.us</a>	404-651-7468
Brian Summers	Engineering Services	<a href="mailto:brian.summers@dot.state.ga.us">brian.summers@dot.state.ga.us</a>	
Christy-Poon Atkins	FHWA	<a href="mailto:christy.poon-atkins@fhwa.dot.gov">christy.poon-atkins@fhwa.dot.gov</a>	404-562-3638
Jerry Milligan	GDOT- Right-of-Way		
Melanie Nable	GDOT -- OEL	<a href="mailto:melanie.nable@dot.state.ga.us">melanie.nable@dot.state.ga.us</a>	404-699-4432
Nabil Raad	GDOT	<a href="mailto:m.nabil.raad@dot.state.ga.us">m.nabil.raad@dot.state.ga.us</a>	404-635-8126
Lowell James	GDOT - OCD	<a href="mailto:lowell.james@dot.state.ga.us">lowell.james@dot.state.ga.us</a>	404-656-6109
Stanley Hill	GDOT - OCD	<a href="mailto:stanley.hill@dot.state.ga.us">stanley.hill@dot.state.ga.us</a>	404-656-6109
Brian Waters	Greenhorne & O'Mara	<a href="mailto:bwaters@g-and-o.com">bwaters@g-and-o.com</a>	678-987-3901
Chris Rideout	Greenhorne & O'Mara	<a href="mailto:crideout@g-and-o.com">crideout@g-and-o.com</a>	678-987-3916
Bill Ruhsam	Greenhorne & O'Mara	<a href="mailto:wruhsam@g-and-o.com">wruhsam@g-and-o.com</a>	678-987-3917
Charles McDuff	PBS&J	<a href="mailto:crmcduff@pbsi.com">crmcduff@pbsi.com</a>	919-538-6820
Gary King	PBS&J	<a href="mailto:gking@pbsi.com">gking@pbsi.com</a>	770-933-0280
Andrew McCullough	PBS&J	<a href="mailto:amccullough@pbsi.com">amccullough@pbsi.com</a>	205-969-3776
Barry Brown	PBS&J	<a href="mailto:bbrown@pbsi.com">bbrown@pbsi.com</a>	678-247-2487

# VE TEAM PRESENTATION

## MEETING PARTICIPANTS



Date: 4 May 2007

Project: I-75/Union Grove Road Interchange (P.I. No. 610870) and South Calhoun Bypass (P.I. No. 662510) - GORDON COUNTY

### GEORGIA DEPARTMENT OF TRANSPORTATION

NAME	ORGANIZATION & TITLE	E-MAIL	PHONE
Ron Wishon	Engineering Services	<a href="mailto:ron.wishon@dot.state.ga.us">ron.wishon@dot.state.ga.us</a>	404-651-7470
Lisa Myers	Engineering Services	<a href="mailto:lisa.myers@dot.state.ga.us">lisa.myers@dot.state.ga.us</a>	404-651-7468
Brian Summers	Engineering Services	<a href="mailto:brian.summers@dot.state.ga.us">brian.summers@dot.state.ga.us</a>	
Lowell James	GDOT - OCD	<a href="mailto:lowell.james@dot.state.ga.us">lowell.james@dot.state.ga.us</a>	404-656-6109
Brian Waters	Greenhorne & O'Mara	<a href="mailto:bwaters@g-and-o.com">bwaters@g-and-o.com</a>	678-987-3901
Stanley Hill	GDOT - OCD	<a href="mailto:stanley.hill@dot.state.ga.us">stanley.hill@dot.state.ga.us</a>	404-656-6109
Chris Rideout	Greenhorne & O'Mara	<a href="mailto:crideout@g-and-o.com">crideout@g-and-o.com</a>	678-987-3916
Bill Ruhsam	Greenhorne & O'Mara	<a href="mailto:wruhsam@g-and-o.com">wruhsam@g-and-o.com</a>	678-987-3917
Gary King	PBS&J	<a href="mailto:gking@pbsj.com">gking@pbsj.com</a>	770-933-0280
Andrew McCullough	PBS&J	<a href="mailto:amccullough@pbsj.com">amccullough@pbsj.com</a>	205-969-3776
Barry Brown	PBS&J	<a href="mailto:bbrown@pbsj.com">bbrown@pbsj.com</a>	678-247-2487
Charles McDuff	PBS&J	<a href="mailto:crmcduff@pbsj.com">crmcduff@pbsj.com</a>	919-538-6820

# CREATIVE IDEA LISTING



PROJECT: **GEORGIA DEPARTMENT OF TRANSPORTATION – GORDON COUNTY**

SHEET NO.:

UNION GROVE ROAD INTERCHANGE - P.I. NO. 610870/PROJ. NO. NH-STP-75-3(203)  
AND SOUTH CALHOUN BYPASS - P.I. NO. 662510/PROJ. NO. STP-00MS(7)

**1 of 2**

NO.	IDEA DESCRIPTION	RATING
<b><i>UNION GROVE ROAD INTERCHANGE - P.I. NO. 610870 (I)</i></b>		
I-1	Use AASHTO Type 3 Beam in lieu of 54" Bulb Tee	4
I-2	Verify vertical clearance fo 17' – 0" vs. 17' – 6"	DS
I-3	Shift alignment 30' to south to eliminate staged construction	4
I-4	Re-use existing bridge <span style="color: red;">Not cost effective</span>	1
I-5	Shift ramps toward I-75 (tighten ramps/interchange)	5
I-6	Clarify MSE wall locations	DS
I-7	Construct ramps of asphalt instead of PCC, except at breaking point at top of ramp	5
I-8	Construct Calhoun Bypass pavement with asphalt in lieu of PCC	5
I-9	If two separate construction contracts used, specify borrow location on bypass for alignment	DS
I-10	Shorten bridge, eliminate end spans, use abutment walls	4
I-11	Eliminate guardrail in locations of 4:1 slopes	4
I-12	Steepen side slopes, use guardrail	4
I-13	Increase left turn length for additional storage	DS
I-14	Shorten Belwood Road (new location) – adjust tie-in point <span style="color: red;">Not an improvement on current design</span>	3
I-15	Shorten bridge spans over interstate	5
I-16	Selectively reduce shoulder widths on ramps	4
I-17	Eliminate sidewalks	3
I-18	Selectively eliminate curb and gutter	2
I-19	Widen bridge to increase left turn storage length	4
I-20	Eliminate mast arm lighting standards in Interchange. High mast lighting is provided.	4

Rating: 1→2 = Not to be Developed; 3 = Varying Degrees of Development Potential;  
4→5 = Most likely to be Developed; DS = Design Suggestion; ABD = Already Being Done

