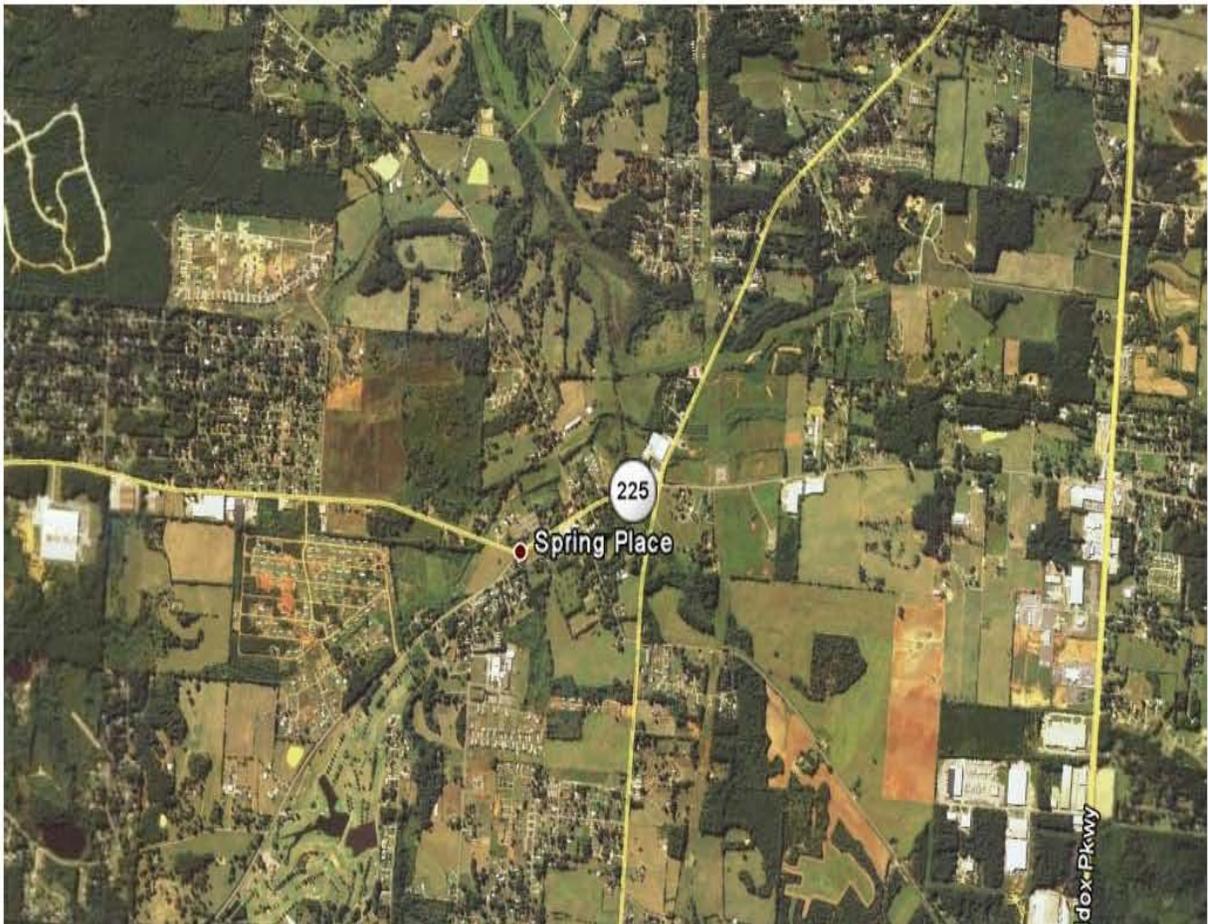


Value Engineering Study Report

Project No. STP00-0151-01(005)
Construction of SR 225/Spring Place Bypass
Murray County



Value Management Team



Design Team



December 18, 2008



December 18, 2008

Ms. Lisa Myers
Design Review Engineer Manager/VE Coordinator
Georgia Department of Transportation-Engineering Services
One Georgia Center
600 W. Peachtree Street NW
Atlanta, GA 30308

RE: Submittal of the final Value Engineering Report
Project No.: STP00-0151-01(005)
P.I. No.: 631550
Construction of SR 225/Spring Place Bypass
PBS&J Project Task Order No. 34

Dear Ms. Myers:

Please find enclosed two (2) hard copies and one (1) CD of our final Value Engineering Report for the Construction of SR 225/Spring Place Bypass.

This Value Engineering Study, which was performed during the period December 1 through December 4, 2008, identified **10 Alternative Ideas** which **are recommended for implementation**. We believe that the **Alternative Ideas** recommended may have a significant positive affect on the project.

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 design the disposition of the contents of this report.

On behalf of our VE Team, we thank you very much for this opportunity to work with you and the hard working staff of the Georgia Department of Transportation.

Yours truly,

PBS&J

A handwritten signature in black ink that reads "Les M. Thomas".

Les M. Thomas, P.E., CVS-Life
VE Team Leader

A handwritten signature in black ink that reads "Randy S. Thomas".

Randy S. Thomas, CVS
Assistant Team Leader

Value Engineering Study Report

Project No. STP00-0151-01(005))

P.I. No. 631550

***Construction of SR 225/Spring Place Bypass
Murray County***

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Executive Summary

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 December 1 – December 4, 2008 in Atlanta, at the office of the Georgia Department of Transportation. The subject of the Value Engineering study was Project STP00-0151–01(005) - P.I. No. 631550, the Construction of SR 225/Spring Place Bypass. The concept design for the project has been prepared by Moreland Altobelli Associates, Inc. (MA). At the time of the workshop the plans had advanced to the final design level.

PROJECT DESCRIPTION

This project consists of the reconstruction of a portion of SR 225 and the relocation of a second portion of SR 225 to create a bypass around the community of Spring Place. The project will begin at CR104/New Hope Road where SR 225 will be reconstructed from a two lane rural section to a five lane with curb and gutter urban section. The second portion will be a bypass of Spring Place constructed beginning at Imperial Blvd. on a new alignment to the west of Spring Place. The realignment will be constructed as a four lane rural section continuing to and connecting to US 76/SR 52

The estimated construction cost and right-of-way cost for this project are \$16,397,209, and \$14,382,000 respectively, for a total project cost of \$30,779,209.

This project is rather fully described in the documentation that is located in Tabbed section of this report, entitled ***Project Description***.

PROJECT CONCERNS AND OBJECTIVES

Some of the information from the concept report and the designer's presentation indicated the following important points about the project:

- The project has been through final design and is ready to let.
- Any change to the alignment would result in going back through environmental studies which could result in delaying this project for several years.
- The Chief Vann House is on the National Historical Register and must not be disturbed thus the reason for realignment of SR 225/Spring Place Bypass.
- Final plans for the bridge have been approved
- The intersection at SR 52A and SR 225 is the driving force for this project to eliminate traffic congestion.
- Alignment needs to avoid heavy power lines.
- Design needs to avoid environmental impacts to the existing streams.

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 morning 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 a “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 entitled *Study Results* for a review of the details of the developed alternatives. The tabbed section *Project Description* includes information about the project itself and the tabbed section *Value Engineering Process* presents the detail process of the Value Engineering Study.

CONCLUSIONS AND RECOMMENDATIONS

During the speculation phase the VE Team identified 19 *Alternative Ideas* that appeared to hold potential for reducing the construction cost, improving the end product, and/or reducing the difficulty and time of project construction.

After the evaluation phase was completed, 10 *Alternative Ideas* remained for further consideration. These Alternative Ideas may be found, in their documented form, in the section of this report entitled *Study Results*.

The following *Summary of Alternatives and Design Suggestions* coupled with the documentation of the developed alternatives should provide the reader with the information required to fully evaluate the merits of each of the alternatives.

Study Results

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, comments on the technical justifications, 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.

Also included here are photographs of the project site taken by the VE Team.

This introductory sheet is followed by a *Summary of Alternatives and Design Suggestions*. 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. The enclosed *Summary of Alternatives & Design Suggestions* may also be used as a “score sheet” within the bounds of an implementation meeting.

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*.

SR 225/Spring Place Bypass

Project: STP00-0151-01(005)

P.I. No. 631550

- Chief Vann House on the corner of SR 225 and SR 52A
– Historical site that must be preserved



- Intersection of SR 225 and SR 52A



SR 225/Spring Place Bypass

Project: STP00-0151-01(005)

P.I. No. 631550

- SR 225 and New Hope Road
– Beginning of the project



- SR 225 North



Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	BR-1
DESCRIPTION:	Reduce width of the bridges to match rural section	SHEET NO.:	1 of 4

Original Design:

The original design calls for the construction of identical twin five span bridges, 400' long, to carry the new SR 225 alignment over Town Branch Creek. The bridges are each 41'-3" out-to-out and accommodate an 8' outside shoulder, 2 – 12' travel lanes and a 6' inside shoulder. The intermediate span is 120' long and comprises of BT 63 Girders while all other spans are 70' long and are comprised of AASHTO Type III girders. The end bents are founded on Steel H Piles while the intermediate bents are founded on three concrete caissons each. The bridges are on a curve and super elevated.

Alternative:

The Alternative suggests the use of 6' outside shoulders in-lieu of the 10' outside shoulders and 2' buffers from the railing on the inside in-lieu of the 4' inside shoulders.

All other geometry remains the same as in the original design.

Opportunities:

- Potential savings in construction costs and construction time
- Additional construction staging area between the bridges will be available
- Reduced bent cap width and elimination of 1 caisson per bent
- Reduced wetlands mitigation

Risks:

- Minimal redesign effort
- Design exception may be required

Technical Discussion:

A 6' outside shoulder and 2' buffer on the inside between the inside travel lanes and the bridge rail will be adequate per AASHTO Geometric Design of Highways and Streets (pgs. 224, 315, 412, 455 & etc.). Additionally, the shoulder and buffer widths will closely match the typical roadway cross section.

The out-to-out bridge width in the Alternative will measure 35'-3".

The calculations of quantities and savings are provided in the following pages.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 282,481	\$ 0	\$ 282,481
ALTERNATIVE	\$ 0	\$ 0	\$ 0
SAVINGS	\$ 282,481	\$ 0	\$ 282,481

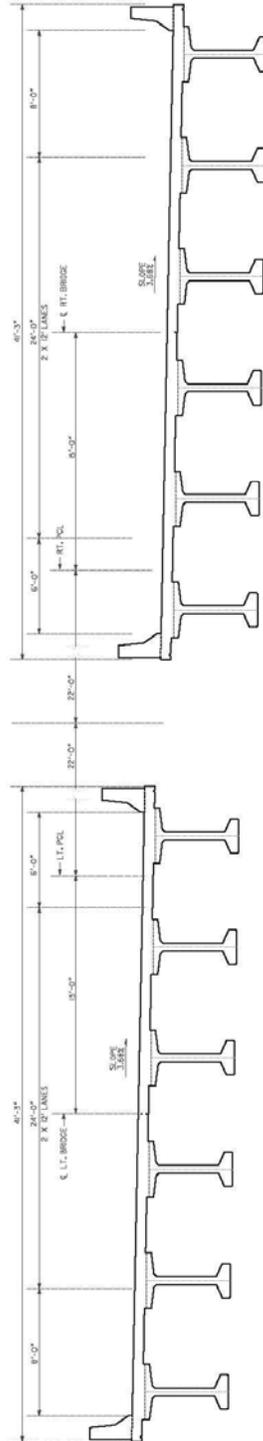
Illustration

PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

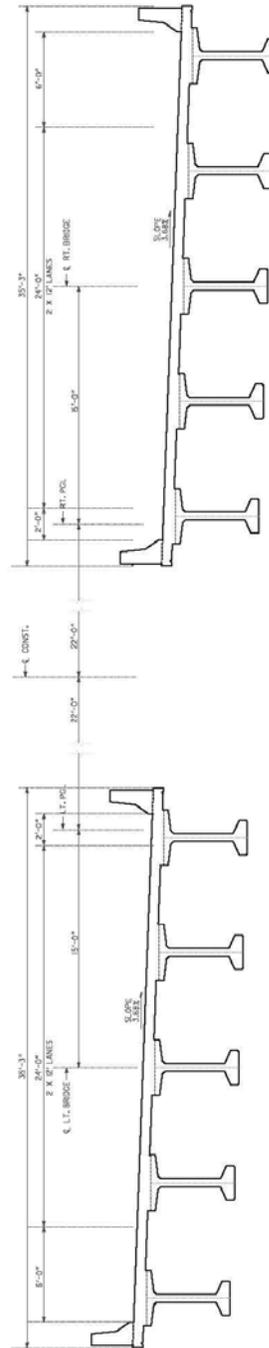
ALTERNATIVE NO.:
BR-1

DESCRIPTION: **Reduce width of the bridges to match rural section**

SHEET NO.: **2** of **4**



FULL SECTION - CURRENT DESIGN



FULL SECTION - ALTERNATIVE BR-1

Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
BR-1

DESCRIPTION: **Reduce the width of the bridges to match rural
section**

SHEET NO.: **3** of **4**

Note:

- 1) For simplicity of quantity calculations, straight bridges are assumed
- 2) Same number of Caissons as in current design are assumed for reduced bridge width
- 3) For a 6' reduction in bridge width, 5 girders are assumed to be sufficient
- 4) **Reduction from current design = savings for alternative**

Current Design (5 Span – 400' Long, 41'-3" Out-to-Out Twin Bridges on a curve)

Reductions:

Vol. of 7.5" thick (average) Class AA Superstructure Deck concrete = $2 * [6' * (7.5" / 12)] * 400' / 27 = 111.11$ CY

Area of Grooved concrete (approx.) = $2 * 6' * 400' / 9 = 533.33$ SY

Approximate length of Type III PPC Girders (1 Beam per span) = $2 * (70' * 4) = 560$ LF

Approximate length of 63" Bulb Tee PPC Girders (1 Beam per span) = $2 * (120' * 1) = 240$ LF

Approximate Class AA concrete cap (end and intermediate bents) = $2 * 6' * [(3 * 2 * 2) + (5 * 4 * 4)] / 27 = 40.88$ CY

Area of Rip-Rap and other components / treatments (assumed same for current design & alternative, therefore, not considered - conservative)

Alternative Design (5 Span – 400' Long, 35'-3" Out-to-Out Twin Bridges on a curve)

Reduction from current design = savings for alternative

NOTE:

A more detailed cost analysis may be performed on sufficiently developed alternative bridge plans to be able to itemize major components and realize greater cost savings than that shown in this study.

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005)) – P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	BR-1
DESCRIPTION:	Reduce width of the bridges to match rural section	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Class AA Concrete (Incl. Reinf.)	CY	155	\$ 848.10	\$ 131,439	0	\$ 848.10	\$ -
BT 63 Girder	LF	240	\$ 181.62	\$ 43,589	0	\$ 181.62	\$ -
Type III Girder	LF	560	\$ 142.17	\$ 79,615	0	\$ 142.17	\$ -
Deck Grooving	SY	533	\$ 4.05	\$ 2,159	0	\$ 4.05	\$ -
Note: Reduction from current design = savings for alternative							
Sub-total				\$ 256,801			\$ -
Mark-up at 10.00%				\$ 25,680			\$ -
TOTAL				\$ 282,481			\$ -
Estimated Savings:							\$282,481

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	BR-2
DESCRIPTION:	Reconfigure span arrangement to four equal spans	SHEET NO.:	1 of 5

Original Design:

The original design calls for the construction of identical twin five span bridges, 400' long, to carry the new SR 225 alignment over Town Branch Creek. The bridges are each 41'-3" out-to-out and accommodate an 8' outside shoulder, 2 – 12' travel lanes and a 6' inside shoulder. The intermediate span is 120' long and comprises of BT 63 Girders while all other spans are 70' long and are comprised of AASHTO Type III girders. The end bents are founded on Steel H Piles while the intermediate bents are founded on three concrete caissons each. The bridges are on a curve and superelevated.

Alternative:

The Alternative suggests the use of four equal spans of 133.33' each, thus eliminating two intermediate bents.

All other geometry remains the same as in the original design.

Opportunities:

- Potential savings in construction costs and construction time
- Elimination of 1 bent per bridge and 6 caissons in all
- Increased hydraulic opening
- Reduced wetlands mitigation

Risks:

- Some redesign effort

Technical Discussion:

The bridges may be reconfigured to four equal spans of 133.33'. All spans will be comprised of BT 63" girders. Should higher release strengths be required for girders of this length and depth, concrete strengths of 8000 psi or higher may be used.

The calculations of quantities and savings are provided in the following pages.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,235,062	\$ 0	\$ 1,235,062
ALTERNATIVE	\$ 958,954	\$ 0	\$ 958,954
SAVINGS	\$ 276,109	\$ 0	\$ 276,109

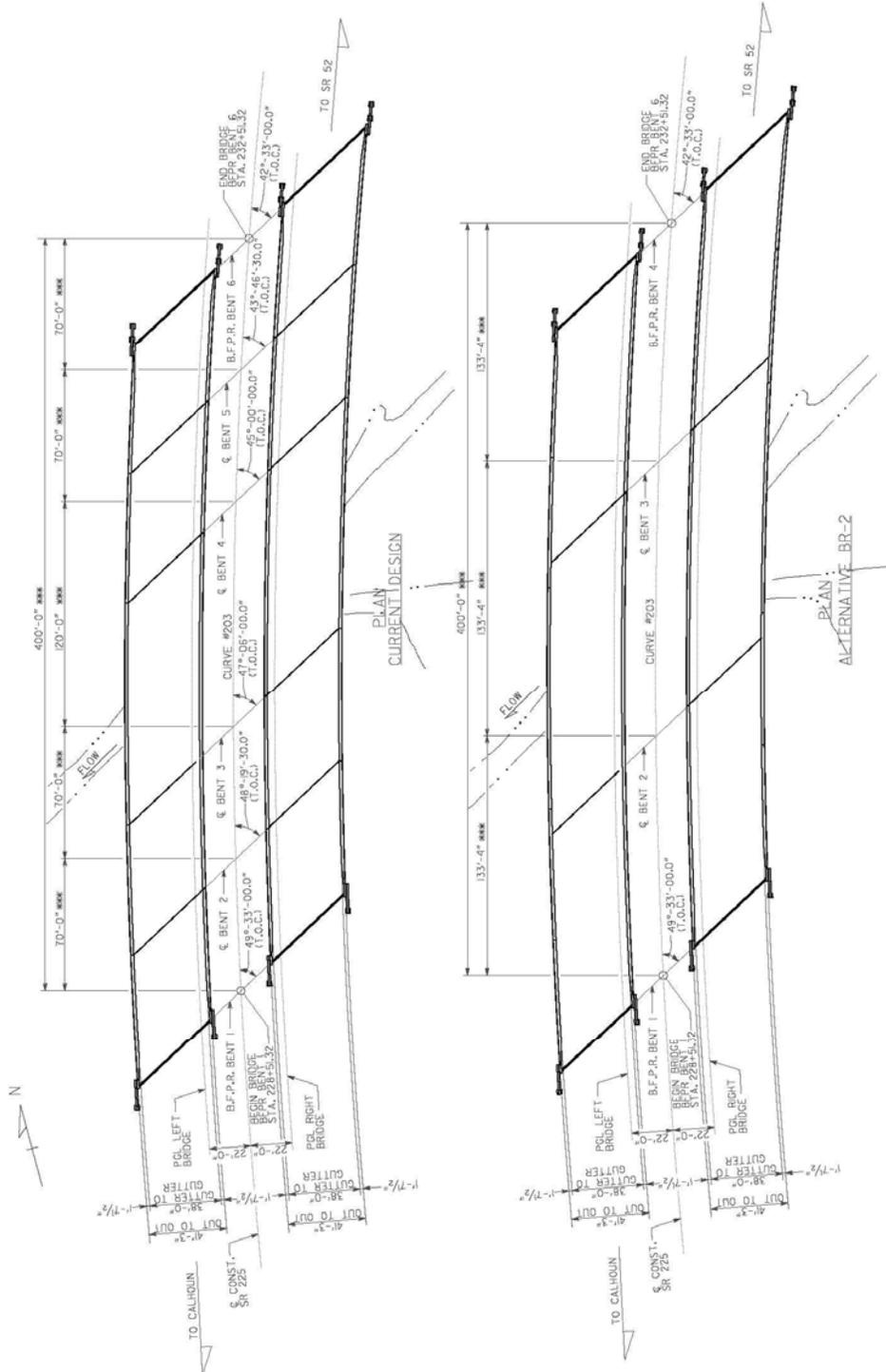
Illustration



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
BR-2

DESCRIPTION: **Reconfigure span arrangement to four equal spans** SHEET NO.: **2 of 5**



Illustration

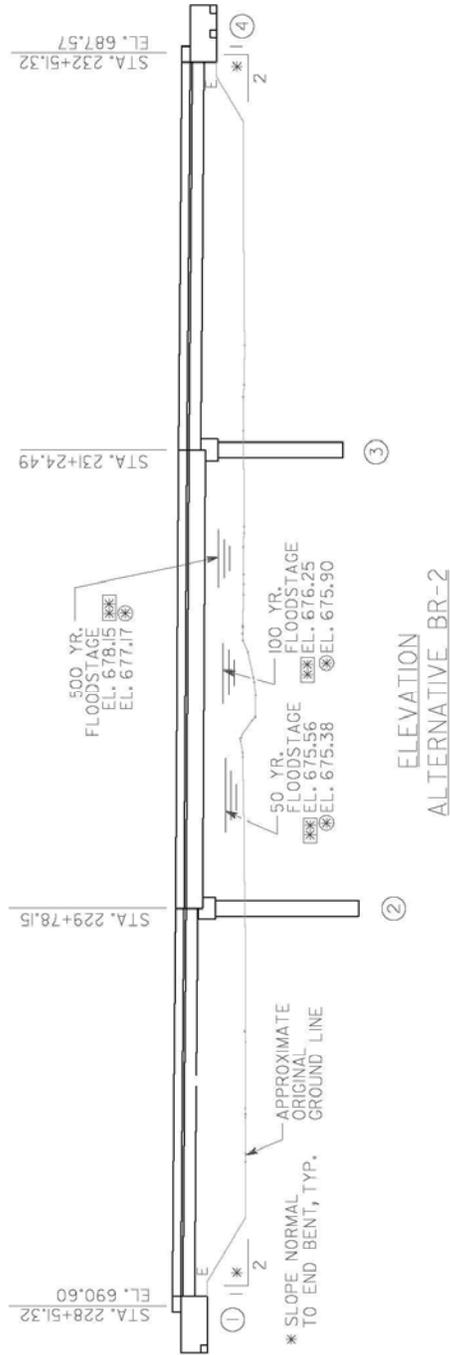
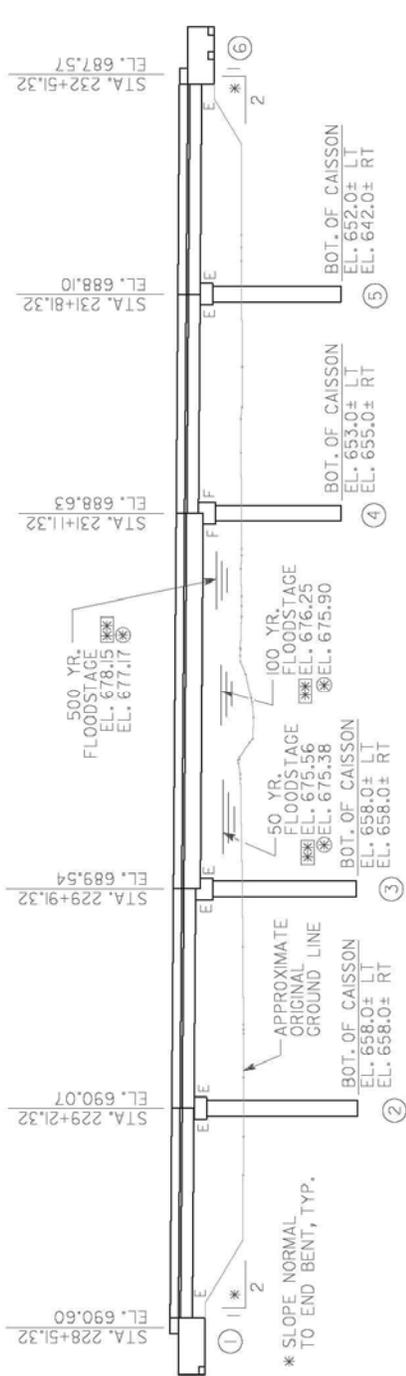


PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
BR-2

DESCRIPTION: **Reconfigure span arrangement to four equal spans**

SHEET NO.: **3** of **5**



Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
BR-2

DESCRIPTION: **Reconfigure span arrangement to four equal spans**

SHEET NO.: **4** of **5**

Note:

- 1) For simplicity of quantity calculations, straight bridges are assumed
- 2) Same number of Caissons as in current design are assumed for reconfigured bridge bents
- 3) BT 63" girders are assumed sufficient to span 133'-4". Higher strength concrete may be anticipated
- 4) **Reduction from current design = savings for alternative**

Current Design (5 Span – 400' Long, 41'-3" Out-to-Out Twin Bridges on a curve)

Girder Lengths in Current Design

Approximate length of Type III PPC Girders = $2*(70'*4*6) = 3360$ LF

Approximate length of 63" Bulb Tee PPC Girders (1 Beam per span) = $2*(120'*6) = 1440$ LF

Reductions from Current Design:

Assume average length of Caissons = $412'/24 = 17.17'$

Reduction in Caissons = $2*(17.17'*3*2) = 206.04$ LF

Approximate reduction in Class AA substructure concrete (intermediate bents, cap and column) = 66.7 CY

(Based on quantities shown on intermediate bent drawings of current bridge plans)

Area of Rip-Rap and other components / treatments (assumed same for current design & alternative, therefore, not considered - conservative)

Alternative Design (3 Span – 400' Long, 41'-3" Out-to-Out Twin Bridges on a curve)

Approximate length of 63" Bulb Tee PPC Girders = $2*(400'*6) = 4800$ LF

Reduction of other components from current design = savings for alternative

NOTE:

A more detailed cost analysis may be performed on sufficiently developed alternative bridge plans to be able to itemize major components and realize greater cost savings than that shown in this study.

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005)) – P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	BR-2
DESCRIPTION:	Reconfigure span arrangement to four equal spans	SHEET NO.:	5 of 5

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE			
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL	
Class AA Concrete (Incl. Reinf.)	CY	67	\$ 848.10	\$ 56,568	0	\$ 848.10	\$ -	
BT 63 Girder	LF	1,440	\$ 181.62	\$ 261,533	4800	\$ 181.62	\$ 871,776	
Type III Girder	LF	3,360	\$ 142.17	\$ 477,691	0	\$ 142.17	\$ -	
Caissons	LF	206	\$ 1,587.03	\$ 326,992	0	\$ 1,587.03	\$ -	
Note: Reduction from current design = savings for alternative								
Sub-total				\$ 1,122,784			\$ 871,776	
Mark-up at	10.00%				\$ 112,278			\$ 87,178
TOTAL				\$ 1,235,062			\$ 958,954	

Estimated Savings: \$276,109

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	BR-3
DESCRIPTION:	Combine two bridges to one bridge with positive separation	SHEET NO.:	1 of 4

Original Design:

The original design calls for the construction of identical twin five span bridges, 400' long, to carry the new SR 225 alignment over Town Branch Creek. The bridges are each 41'-3" out-to-out and accommodate an 8' outside shoulder, 2 – 12' travel lanes and a 6' inside shoulder. The intermediate span is 120' long and comprises of BT 63 Girders while all other spans are 70' long and are comprised of AASHTO Type III girders. The end bents are founded on Steel H Piles while the intermediate bents are founded on three concrete caissons each. The bridges are on a curve and super elevated.

Alternative:

The Alternative suggests combining the two bridges to a single structure with positive separation provided by a barrier in the median.

All other geometry remains the same as in the original design.

Opportunities:

- Potential savings in construction costs and construction time
- Elimination of caissons by combining substructure
- Less hydraulic interference
- Reduced wetlands mitigation

Risks:

- Redesign effort

Technical Discussion:

The bridges may be combined to one single structure. The cross section of the alternative will provide 6' outside shoulders, 4' inside shoulders and 2 – 4' travel lanes in each direction along with a Type I median barrier for positive traffic separation.

The calculations of quantities and savings are provided in the following pages.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 672,166	\$ 1,186,080	\$ 672,166
ALTERNATIVE	\$ 22,330	\$ 0	\$ 22,330
SAVINGS	\$ 649,836	\$ 1,186,080	\$ 649,836

Illustration

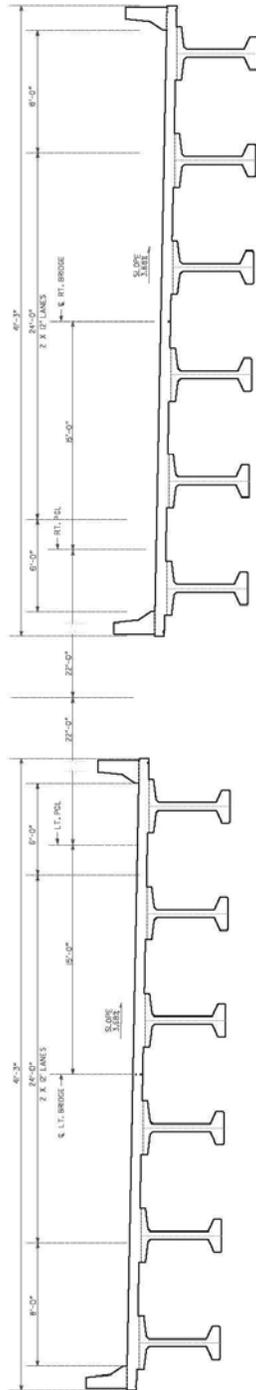


PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

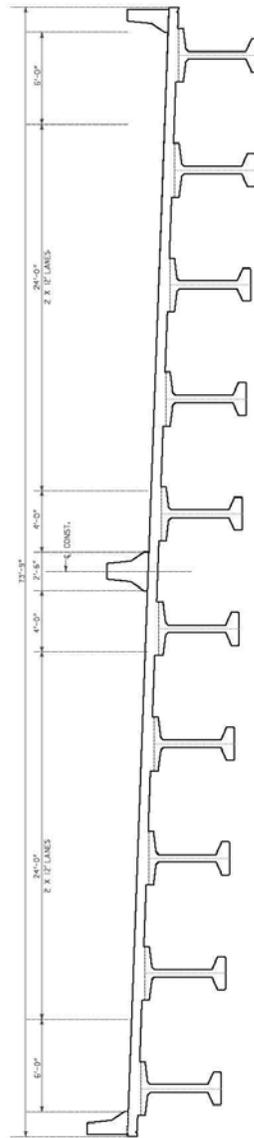
DESCRIPTION: **Combine two bridges to one bridge with positive
separation**

ALTERNATIVE NO.:
BR-3

SHEET NO.: **2** of **4**



FULL SECTION - CURRENT DESIGN



FULL SECTION - ALTERNATIVE BR-3

Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
BR-3

DESCRIPTION: **Combine two bridges to one bridge with positive
separation**

SHEET NO.: **3** of **4**

Note:

- 1) For simplicity of quantity calculations, straight bridges are assumed
- 2) Assume average length of Caissons = $412' / 24 = 17.17'$
- 3) Assume alternative will require 4 Caissons per intermediate bent
- 4) Assume Alternative design with 73'-9" out-to-out bridge will require 10 girders
- 5) Assume average length of Steel H-Piles = $700' / (8 * 4) = 22'$
- 6) **Reduction from current design = savings for alternative**

Current Design (5 Span – 400' Long, 41'-3" Out-to-Out Twin Bridges on a curve)

Reductions:

Volume of 7.5" thick (average) Class AA Superstructure Deck concrete =

$$[(2 * 41.25' - 73.75') * (7.5" / 12) * 400'] / 27 = 81.02 \text{ CY}$$

Area of Grooved concrete (approx.) = $(2 * 41.25' - 73.75') * 400' / 9 = 388.89 \text{ SY}$

Approximate length of Type III PPC Girders = $70' * 4 * (12 - 10) = 560 \text{ LF}$

Approximate length of 63" Bulb Tee PPC Girders = $120' * (12 - 10) = 240 \text{ LF}$

Reduction in Caissons = $4 * 2 * 17.17' = 137.36 \text{ LF}$

Reduction in Steel H-Piles = $4 * 22' = 88 \text{ LF}$

Approximate reduction in Class AA substructure concrete (intermediate and end bent cap) =

$$\{(2 * 56.5' - 75') * [(4 * 3 * 2) + (4 * 5 * 4)]\} / 27 = 146.37 \text{ CY}$$

Approximate reduction in Class AA substructure concrete (intermediate bent columns) =

$$\{(4 * 3 * 2) * (\text{PI} * 4^2) / 4\} / 27 = 44.70 \text{ CY}$$

Reduction in Bridge Railing = $2 * 400' = 800'$

Area of Rip-Rap, Wing walls and other components / treatments assumed same for current design & alternative, therefore, not considered. (Conservative)

Alternative Design (5 Span – 400' Long, 73'-9" Out-to-Out Single Bridge on a curve)

Addition of Type 20 Median Barrier = $1 * 400' = 400'$

NOTE: A more detailed cost analysis may be performed on sufficiently developed alternative bridge plans to be able to itemize major components and realize greater cost savings than that shown in this study.

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005)) – P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	BR-3
DESCRIPTION:	Combine two bridges to one bridge with positive separation	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
Class AA Concrete (Incl. Reinf.)	CY	272	\$ 848.10	\$ 230,760	0	\$ 848.10	\$ -
BT 63 Girder	LF	240	\$ 181.62	\$ 43,589	0	\$ 181.62	\$ -
Type III Girder	LF	560	\$ 142.17	\$ 79,615	0	\$ 142.17	\$ -
Caissons	LF	137	\$ 1,587.03	\$ 217,994	0	\$ 1,587.03	\$ -
H-Piles	LF	88	\$ 53.81	\$ 4,735	0	\$ 53.81	\$ -
Bridge Railing	LF	800	\$ 40.99	\$ 32,792	0	\$ 40.99	\$ -
Type 20 Median Barrier	LF	0	\$ 50.75	\$ -	400	\$ 50.75	\$ 20,300
Deck Grooving	SY	389	\$ 4.05	\$ 1,575	0	\$ 4.05	\$ -
Note: Reduction from current design = savings for alternative							
Sub-total				\$ 611,060			\$ 20,300
Mark-up at 10.00%				\$ 61,106			\$ 2,030
TOTAL				\$ 672,166			\$ 22,330

Estimated Savings: \$649,836

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction of SR 225/Spring Place Bypass, Murray County	ALTERNATIVE NO.:	RD-2
DESCRIPTION:	Use two lanes on new alignment with a center two-way left turn lane	SHEET NO.:	1 of 4

Original Design:

The original design calls for a 4-lane divided roadway on the new alignment of SR 225 from Imperial Blvd to US 76 (SR 52).

Alternative:

The alternative is to build a 2-lane roadway with a center 2-way left turn lane on the new alignment.

Opportunities:

- Reduce construction costs
- Reduce right-of-way costs

Risks:

- Lower Level of Service

Technical Discussion:

A capacity analysis using the Highway Capacity Software (HCS) for a two-lane highway with 100% no-passing resulted in LOS D for the new alignment based on the 2029 Design Hour Volume (DHV) provided to the VE team. This indicates that the proposed 4-lane roadway would be an overdesign based on the traffic forecasts.

The proposed 44-ft median must be eliminated or replaced with a two-way left turn lane when a four-lane highway is reduced to a two-lane highway. Elimination of the median with addition of left turn bays at key intersections is selected to go along with this VE alternative.

The consultant (Moreland Altobelli Associates) stated that the traffic forecasts are based on Phase 1 of the SR 225 by-pass project (which is the current project). The consultant anticipated an increase of the traffic once Phase 2 kicks in. However, the consultant noted that Phase 2 is still on the long range plan and GDOT has no funding for the planning and design of Phase 2.

With the VE alternative, one lane in each direction could be added to the new alignment of SR 225 should it ever be needed.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$7,635,124	\$ 0	\$7,635,124
ALTERNATIVE	\$3,857,238	\$ 0	\$3,857,238
SAVINGS	\$3,777,886	\$ 0	\$3,777,886

Illustration

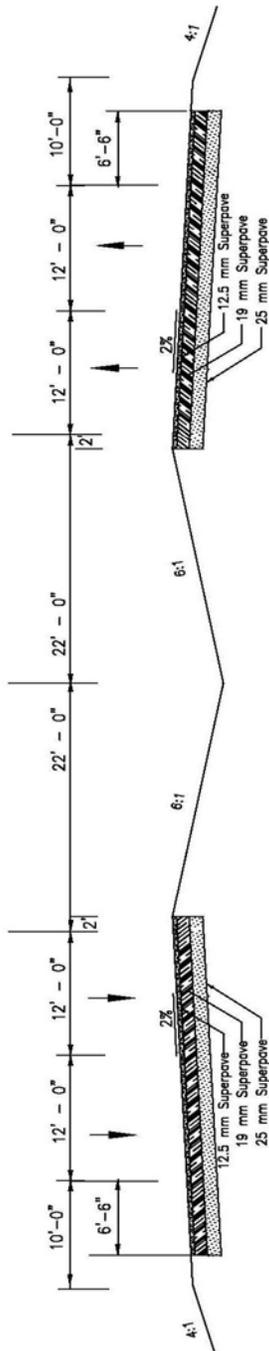


PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction of SR 225/Spring Place Bypass,
Murray County**

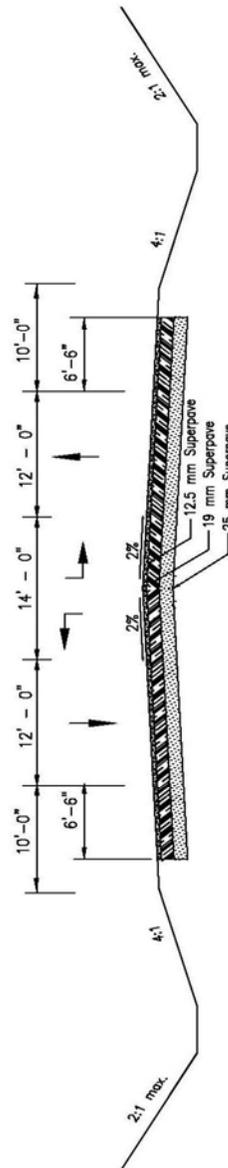
DESCRIPTION: **Use two lanes on new alignment with a center two-
way left turn lane**

ALTERNATIVE NO.:
RD-2

SHEET NO.: **2** of **4**



Original Design



VE Alternative Design

Calculations



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction of SR 225/Spring Place Bypass, Murray County	ALTERNATIVE NO.:	RD-2
DESCRIPTION:	Use two lanes on new alignment with a center two-way left turn lane	SHEET NO.:	3 of 4

Original Design:

Paved areas:

Travel lanes: 12-ft x 4-lane x 14,782-ft length (from Sta. 174+80 to Sta. 322+62) = 709,536 SF

Left turn bays: Sta. 178+81 to Sta. 183+91 – 4,260 SF

Sta. 185+28 to Sta. 191+50 – 4,932 SF

Sta. 207+22 to Sta. 213+48 – 4,956 SF

Sta. 214+38 to Sta. 220+20 – 5,892 SF

Sta. 252+10 to Sta. 258+32 – 4,932 SF

Sta. 260+00 to Sta. 266+20 – 4,920 SF

Sta. 266+70 to Sta. 272+90 – 4,920 SF

Sta. 274+30 to Sta. 280+90 – 5,160 SF

Sta. 315+70 to Sta. 320+80 – 4,260 SF Total left turn lane areas = 44,232 SF

Grass median areas: 44-ft x 14,782-ft length – 44,232 SF of left turn lane areas = 606,176 SF

Total paved areas = 709,536 SF + 44,232 SF = 753,768 SF

Total R/W areas = (12-ft x 4-lane + 44-ft) x 14,782-ft length = 1,359,944 SF

VE Alternative:

Paved areas:

Travel lanes: 12-ft x 2-lane x 14,782-ft length = 354,768 SF

Two-way left turn lane: 14-ft x 14,782-ft length = 206,948 SF

Total paved areas = 354,768 SF + 206,948 SF = 561,716 SF

Total R/W areas = (12-ft x 2-lane + 14-ft) x 14,782-ft length = 561,716 SF

R/W Acquisition Cost Calculations:

Prices and square footage data obtained from Preliminary ROW Cost Estimate dated June 9, 2008.

Total square footage of ROW required in fee simple and permanent easement = 4,567,127 SF.

Total R/W acquisition cost provided = \$9,569,000

Average burdened cost per SF = \$2.10

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005)) – P.I. 631550 Construction of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	RD-2
DESCRIPTION:	Use two lanes on new alignment with a center two-way left turn lane	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
GR AGGR Base	TN	50,251	\$ 21.59	\$ 1,084,919	37,448	\$ 21.59	\$ 808,502
12.5mm Superpave	TN	6,910	\$ 63.24	\$ 436,988	5,149	\$ 63.24	\$ 325,623
19.mm Superpave	TN	9,213	\$ 63.01	\$ 580,511	6,865	\$ 63.01	\$ 432,564
25.0mm Superpave	TN	18,425	\$ 63.18	\$ 1,164,092	13,731	\$ 63.18	\$ 867,525
Bridge Savings	LS	1	\$ 1,078,255.00	\$ 1,078,255	0		\$ -
Sub-total				\$ 4,344,765			\$ 2,434,213
Mark-up at 10%				\$ 434,477			\$ 243,421
TOTAL				\$ 4,779,242			\$ 2,677,635
ROW Costs	SF	1,359,944	\$ 2.10	\$ 2,855,882	561,716	\$ 2.10	\$ 1,179,604
Totals including ROW Costs:				\$ 7,635,124			\$ 3,857,238
Estimated Savings:							\$ 3,777,886

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	RD-4
DESCRIPTION:	Reduce median from 44' to 32'	SHEET NO.:	1 of 4

Original Design:

The original design calls for a 44' grassy depressed median on the rural section of the project from STA 175+00+/- to the northern terminus into US 76 at STA 322+61.95.

Alternative:

The alternative proposes using a 32' grassy depressed median as opposed to the designed 44' grassy depressed median.

Opportunities:

- Reduction in grading/earthwork
- Reduction in ROW required
- Reduces future maintenance area

Risks:

- Reduces buffer between travel ways
- Increases perceived loss of safety

Technical Discussion:

The alternative proposes narrowing the median in the rural section from 44' to 32'. A reduction of 12' in the median width will not reduce the functional requirements as a clear zone, and should not have an adverse impact on vehicular traffic.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 10,802,395	\$ 0	\$ 10,802,395
ALTERNATIVE	\$ 10,348,228	\$ 0	\$ 10,348,228
SAVINGS	\$ 454,167	\$ 0	\$ 454,167

Illustration

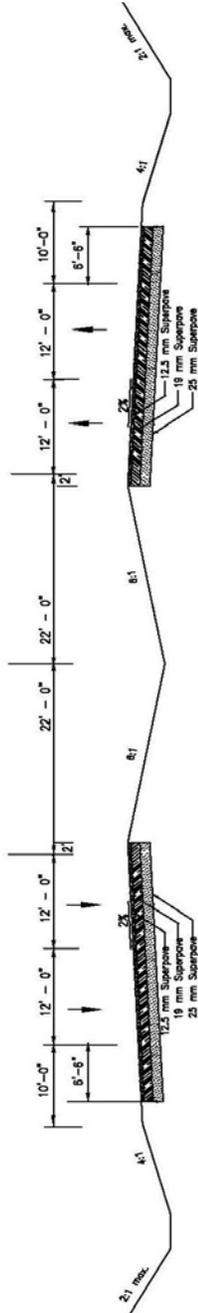


PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction of SR 225/Spring Place Bypass,
Murray County**

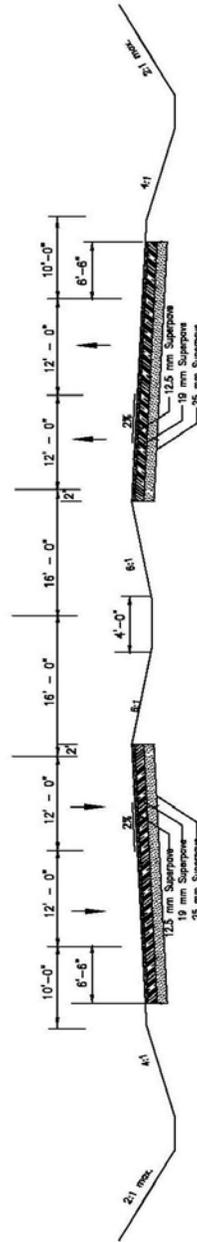
ALTERNATIVE NO.:
RD-4

DESCRIPTION: **Reduce 44' median to 32' median**

SHEET NO.: **2** of **4**



Original Design



Alternative Design

Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
RD-4

DESCRIPTION: **Reduce 44' median to 32' median**

SHEET NO.: **3 of 4**

Assumptions:

- Reduce median width from 44' to 32' from STA 175+00 to STA 322+62.
- STA 322+62-STA 175+00= 14,762LF
- 14,762LF x 12'w= 177,144SF/43,560=4.07AC
- Borrow excavation should be reduced by an estimated 25%.
- 38,850CY estimated x 0.25=9,713CY saved

ROW calculations:

- STA 175+00-STA 322+62=14,762LF x 12' reduction=177,144 SF reduction.
- Prices and ft2 data obtained from Preliminary ROW Cost Estimate dated June 9, 2008.
- Total ft2 of ROW required in fee simple and permanent easement= 4,567,127 SF.
- 4,567,127SF/43,560= 104.847AC
- Alternative total cost provided= \$9,569,000
- Average burdened cost per SF= \$2.10
- Average burdened cost per acre=\$91,266.32
- 177,144SF x \$2.10= \$372,002 total proportional ROW savings for this alternative.
- 177,144SF/43560= 4.07AC

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	RD-9
DESCRIPTION:	Delete sidewalks in urban section	SHEET NO.:	1 of 4

Original Design:

The original design calls for 5' concrete sidewalks to be constructed on each side of the proposed five lane urban section.

Alternative:

The alternative would delete the construction of the sidewalks on the urban sections throughout the project.

Opportunities:

- Elimination of sidewalk costs
- Reduction in construction time
- Reduction in ROW required by using narrower footprint

Risks:

- Minimal design impacts
- Deletes proposed pedestrian access from New Hope Church Road to Imperial Boulevard

Technical Discussion:

The alternative proposes removing the designed sidewalks from the urban section on the southern end of the project from approximate STA 106+43 to STA 174+80. There are no existing sidewalks in place, and no logical terminus at the project limits to the south or on the northern end where the design changes from an urban section to a rural section, which contains no sidewalk for the remainder of the project.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 10,803,676	\$ 0	\$ 10,803,676
ALTERNATIVE	\$ 10,368,585	\$ 0	\$ 10,368,585
SAVINGS	\$ 435,091	\$ 0	\$ 435,091

Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
RD-9

DESCRIPTION: **Delete sidewalks in urban section**

SHEET NO.: **3 of 4**

Assumptions:

-Plans appear to show 5' sidewalk from STA 106+43 to STA 174+80 in both directions of the proposed urban section.

-STA 174+80-STA 106+43= 6,837LF x 10'(5'ea. x 2)/9'=7,597 SY concrete sidewalk.

-Cost Estimate Report dated 5/30/2008 estimated 3373 SY, possibly calculating one side as opposed to both. Estimated savings are calculated using the calculated quantities according to the set of design plans provided by the designer.

-Lineal calculations for this alternative did not deduct driveways and side streets which would slightly reduce the quantity estimated.

ROW reduction

-STA 174+80-STA 106+43=6837LF x 10' reduction=68,370SF in urban section only.

-Prices and ft² data obtained from Preliminary ROW Cost Estimate dated June 9, 2008.

-Total ft² of ROW required in fee simple and permanent easement= 4,567,127 SF.

-4,567,127SF/43,560= 104.847AC

-Alternative total cost provided= \$9,569,000

-Average burdened cost per SF= \$2.10

-Average burdened cost per acre=\$91,266.32

-68370SF x \$2.10= \$143,577 total proportional ROW savings for this alternative.

-68370/43560=1.57AC

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) – P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	RD-9
DESCRIPTION:	Delete sidewalks in urban sections	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
441-0104 Concrete Sidewalk, 4"	SY	7,597	\$ 33	\$ 252,524	0	33	\$ -
ROW Acquisition required	AC	105	\$ 91,266	\$ 9,569,000	103	91,266	\$ 9,425,986
Sub-total				\$ 9,821,524			\$ 9,425,986
Mark-up at 10.00%				\$ 982,152			\$ 942,599
TOTAL				\$ 10,803,676			\$ 10,368,585
Estimated Savings:							\$ 435,091

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction of SR 225/Spring Place Bypass, Murray County	ALTERNATIVE NO.:	RD-12
DESCRIPTION:	Use two lanes on new alignment with left turn bays at key intersections	SHEET NO.:	1 of 4

Original Design:

The original design calls for a 4-lane divided roadway on the new alignment of SR 225 from Imperial Blvd to US 76 (SR 52).

Alternative:

The alternative is to build a 2-lane roadway with left turn bays at key intersections on the new alignment.

Opportunities:

- Reduce construction costs
- Reduce right-of-way costs

Risks:

- Lower Level of Service

Technical Discussion:

A capacity analysis using the Highway Capacity Software (HCS) for a two-lane highway with 100% no-passing resulted in LOS D for the new alignment based on the 2029 Design Hour Volume (DHV) provided to the VE team. This indicates that the proposed 4-lane roadway would be an overdesign based on the traffic forecasts.

The proposed 44-ft median must be eliminated or replaced with a two-way left turn lane when a four-lane highway is reduced to a two-lane highway. Elimination of the median with addition of left turn bays at key intersections is selected to go along with this VE alternative.

The consultant (Moreland Altobelli Associates) stated that the traffic forecasts are based on Phase 1 of the SR 225 by-pass project (which is the current project). The consultant anticipated an increase of the traffic once Phase 2 kicks in. However, the consultant noted that Phase 2 is still on the long range plan and GDOT has no funding for the planning and design of Phase 2.

With the VE alternative, one lane in each direction could be added to the new alignment of SR 225 should it ever be needed.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$7,914,113	\$ 0	\$7,914,113
ALTERNATIVE	\$2,739,932	\$ 0	\$2,739,932
SAVINGS	\$5,174,180	\$ 0	\$5,174,180

Illustration

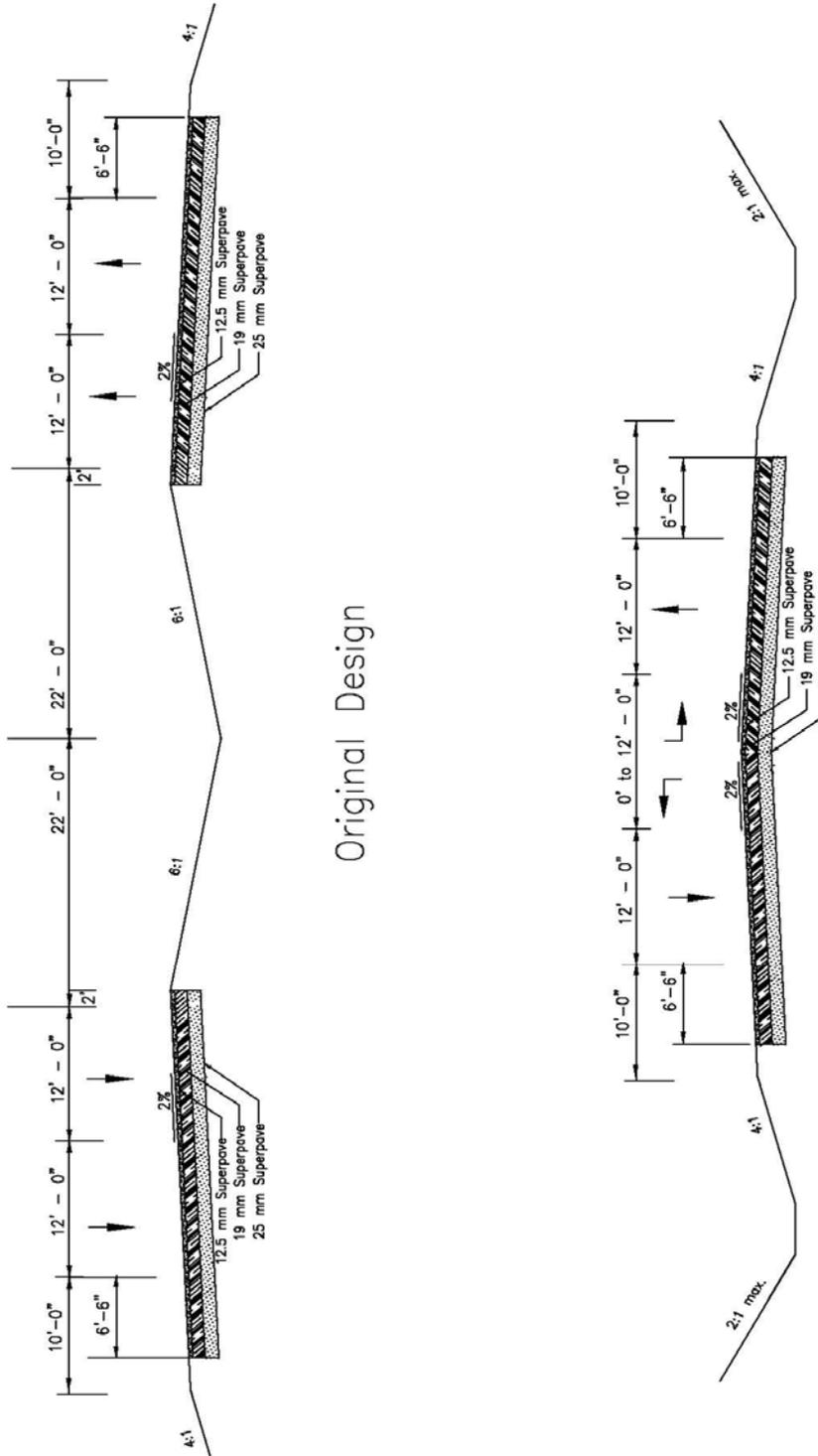


PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction of SR 225/Spring Place Bypass,
Murray County**

ALTERNATIVE NO.:
RD-12

DESCRIPTION: **Use two lanes on new alignment with left turn bays at key intersections**

SHEET NO.: **2 of 4**



Original Design

VE Alternative Design

NTS

Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction of SR 225/Spring Place Bypass,
Murray County**

ALTERNATIVE NO.:
RD-12

DESCRIPTION: **Use two lanes on new alignment with left turn bays
at key intersections**

SHEET NO.: **3** of **4**

Original Design:

Paved areas:

Travel lanes: 12-ft x 4-lane x 14,782-ft length (from Sta. 174+80 to Sta. 322+62) = 709,536 SF

Left turn bays: Sta. 178+81 to Sta. 183+91 – 4,260 SF

Sta. 185+28 to Sta. 191+50 – 4,932 SF

Sta. 207+22 to Sta. 213+48 – 4,956 SF

Sta. 214+38 to Sta. 220+20 – 5,892 SF

Sta. 252+10 to Sta. 258+32 – 4,932 SF

Sta. 260+00 to Sta. 266+20 – 4,920 SF

Sta. 266+70 to Sta. 272+90 – 4,920 SF

Sta. 274+30 to Sta. 280+90 – 5,160 SF

Sta. 315+70 to Sta. 320+80 – 4,260 SF Total left turn lane areas = 44,232 SF

Grass median areas: 44-ft x 14,782-ft length – 44,232 SF of left turn lane areas = 606,176 SF

Total paved areas = 709,536 SF + 44,232 SF = 753,768 SF

Total R/W areas = (12-ft x 4-lane + 44-ft) x 14,782-ft length = 1,359,944 SF

VE Alternative:

Paved areas:

Travel lanes: 12-ft x 2-lane x 14,782-ft length = 354,768 SF

Total left turn areas = 44,232 SF

Total paved areas = 354,768 SF + 44,232 SF = 399,000 SF

Total R/W areas = 399,000 SF

R/W Acquisition Cost Calculations:

Prices and square footage data obtained from Preliminary ROW Cost Estimate dated June 9, 2008.

Total square footage of ROW required in fee simple and permanent easement = 4,567,127 SF.

Total R/W acquisition cost provided = \$9,569,000

Average burdened cost per SF = \$2.10

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) – P.I. 631550 Construction of SR 225/Spring Place Bypass, Murray County	ALTERNATIVE NO.: RD-12
DESCRIPTION:	Use two lanes on new alignment with left turn bays at key intersections	SHEET NO.: 4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
GR AGGR Base	TN	50,251	\$ 21.59	\$ 1,084,919	26,600	\$ 21.59	\$ 574,294
12.5mm Superpave	TN	6,910	\$ 63.24	\$ 436,988	3,658	\$ 63.24	\$ 231,332
19.mm Superpave	TN	9,213	\$ 63.01	\$ 580,511	4,877	\$ 63.01	\$ 307,300
25.0mm Superpave	TN	18,425	\$ 63.18	\$ 1,164,092	9,753	\$ 63.18	\$ 616,195
Bridge Savings	LS	1	\$ 1,331,881	\$ 1,331,881	0		\$ -
Sub-total				\$ 4,598,391			\$ 1,729,120
Mark-up at 10%				\$ 459,839			\$ 172,912
TOTAL				\$ 5,058,230			\$ 1,902,032
ROW Costs	SF	1,359,944	\$ 2.10	\$ 2,855,882	399,000	\$ 2.10	\$ 837,900
Totals including ROW Costs:				\$ 7,914,113			\$ 2,739,932
Estimated Savings:							\$ 5,174,180

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction of SR 225/Spring Place Bypass, Murray County	ALTERNATIVE NO.:	RD-14
DESCRIPTION:	Signalize the intersection of SR 52 Alt and old SR 225	SHEET NO.:	1 of 2

Original Design:

The original design keeps the existing SR 225 and SR 52 Alt intersection untouched, leaving it as a four-way stop sign controlled intersection.

Alternative:

The alternative is to signalize this intersection.

Opportunities:

- Reduce delays and queue lengths
- Increase capacity

Risks:

- Increase construction costs

Technical Discussion:

The consultant stated that the existing SR 225 from Imperial Boulevard to SR 52 Alt is congested. A field observation indicates that the four-way stop sign control at the SR 225 and SR 52 Alt intersection is a major factor contributing to the congestion on SR 225, as four-way stop sign controls generally provide the least capacity to intersections.

Although a significant portion of the SR 225 traffic would change to use the new alignment of SR 225 after the new alignment opens, the traffic remaining on the existing SR 225, combined with the SR 52 Alt traffic, would still cause the SR 52 Alt and existing SR 225 intersection to be congested. One way to alleviate the congestion is to change its control from a four-way stop sign to signalization.

Georgia typically uses four mast arms or a box-span with four poles to signalize intersections. A diagonal span with two poles, one in the NW quadrant and one in the SE quadrant, could be used to signalize this intersection to avoid impact on the Chief's Vann House property in the NE quadrant.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 231,000	\$ 0	\$ 231,000
ALTERNATIVE	\$ 308,000	\$ 0	\$ 308,000
SAVINGS	\$ (77,000)	\$ 0	\$ (77,000)

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	RD-15
DESCRIPTION:	Use two-way stop sign at SR 52 Alt and Old SR 225	SHEET NO.:	1 of 1

Original Design:

The original design proposes no changes at the intersection of SR 52 Alt and existing SR 225.

Alternative:

The alternative proposes making the intersection a two-way stop as opposed to its current condition as a four-way stop. The alternative proposes removing the stop signs on SR 52 Alt, while maintaining the stop signs on NB and SB SR 225.

Opportunities:

- Reduce stack on SR 52 Alt
- Improve travel times
- Improve backstreet circulation

Risks:

- None identified

Technical Discussion:

The intent of the alternative is to promote a free flow condition on SR52 Alt to be utilized when the Spring Place bypass is built and put into service. The effect of removing the stop signs on SR 52 Alt and maintaining a two-way stop on SR 225 would be to “push” through traffic on the existing SR 225 alignment to the proposed bypass, and help to avoid unnecessary congestion on SR 52 Alt once the bypass is in service. This may improve travel times and provide a free flowing east-west corridor parallel to US 76.

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

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
RD-16

DESCRIPTION: **Use 11' travel lanes in urban section**

SHEET NO.: **1 of 4**

Original Design:

The original design has a typical section with 4-12' travel lanes and a 14' two-way left turn lane.

Alternative:

The alternative proposes using 4-11' travel lanes, maintaining the 14' two-way left turn lane.

Opportunities:

- Reduction in pavement costs in urban section
- Narrower footprint may reduce ROW required in the urban sections

Risks:

- Minimal design impact
- May require design exception to implement

Technical Discussion:

The alternative proposes reducing the travel lanes to 11' in the urban section. Although 11' lanes would require an exception to GDOT policy based on traffic counts, AASHTO's "Policy on Geometric Design of Highways, 2004 Edition" states that 11' lanes are permissible in low-speed(45mph) interrupted flow conditions. It goes on to state that 11' lanes are normally adequate under these conditions and offer some benefits. See Pages 472-473.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 6,505,992	\$ 0	\$ 6,505,992
ALTERNATIVE	\$ 6,375,593	\$ 0	\$ 6,375,593
SAVINGS	\$ 130,399	\$ 0	\$ 130,399

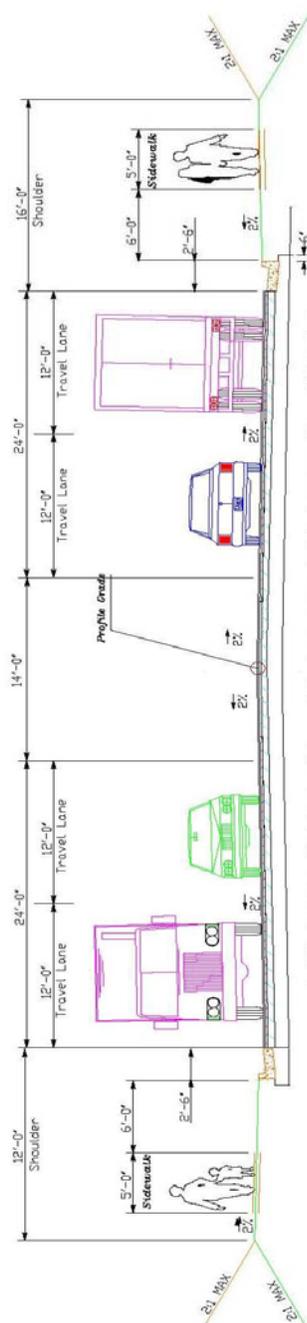
Illustration

PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
RD-16

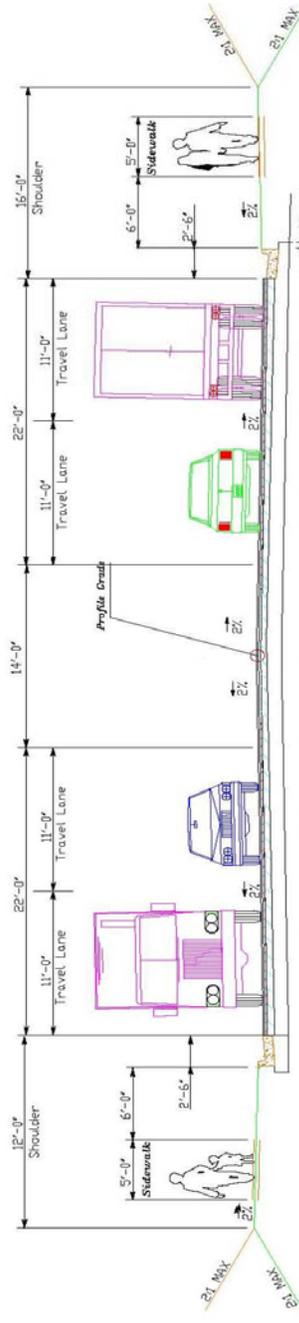
DESCRIPTION: **Use 11' travel lanes in urban section**

SHEET NO.: **2 of 4**



4-12' Lanes Divided with a 14' two way left turn with sidewalks

CURRENT DESIGN



4-11' Lanes Divided with a 14' two way left turn with sidewalks

ALTERNATE DESIGN

Calculations



PROJECT: **Georgia Department of Transportation
STP00-0151-01(005) - P.I. 631550
Construction Of SR 225/Spring Place Bypass
Murray County**

ALTERNATIVE NO.:
RD-16

DESCRIPTION: **Use 11' travel lanes in urban section**

SHEET NO.: **3** of **4**

Assumptions:

- Use 11' travel lanes in lieu of 12' travel lanes in urban section proposed from STA 106+43 to STA 174+80= 6837 LF.
- 4 travel lanes reduced by 1' each = 4'w x 6837L/9=3039SY reduction in full build-up pavement.
- GAB= 3039 SY @ 1200lb/sy/2000= **1823 tons saved.**
- 25mm Superpave= 3039SY x 440lb/sy/2000= **669 tons saved.**
- 19mm Superpave= 3039SY x 220lb/sy/2000=**334 tons saved.**
- 12.5mm Superpave=3039SY x 165/sy/2000=**251 tons saved.**

NOTE:

-The narrowing of the footprint through the urban section may have the effect of reducing the ROW required to construct the proposed widening in this area. ROW costs could be relieved substantially by reducing the amount of Heavy and Light Commercial ROW concentrated in this area that is much more expensive than the Large and Small residential ROW found concentrated primarily on the rural sections of the project to be constructed. Using this alternative in conjunction with RD-9 would reduce the footprint by 14' in total.

Cost Worksheet



PROJECT:	Georgia Department of Transportation STP00-0151-01(005)) – P.I. 631550 Construction Of SR 225/Spring Place Bypass Murray County	ALTERNATIVE NO.:	RD-16
DESCRIPTION:	Use 11' travel lanes in urban section	SHEET NO.:	4 of 4

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
310-1101- GAB, inc mat'l	TN	100,801	\$ 21.59	\$ 2,176,294	98,978	\$ 21.59	\$ 2,136,935
402-3121- 25mm Superpave	TN	31,475	\$ 63.18	\$ 1,988,591	30,806	\$ 63.18	\$ 1,946,323
402-3190- 19mm Superpave	TN	15,701	\$ 63.01	\$ 989,320	15,367	\$ 63.01	\$ 968,275
402-3130- 12.5mm Superpave	TN	12,023	\$ 63.24	\$ 760,335	11,772	\$ 63.24	\$ 744,461
Sub-total				\$ 5,914,539			\$ 5,795,994
Mark-up at 10.00%				\$ 591,454			\$ 579,599
TOTAL				\$ 6,505,992			\$ 6,375,593
Estimated Savings:							\$130,399

Project Description

PROJECT DESCRIPTION

PROJECT INTRODUCTION

This Project No. is STP00-0151-00(005). This project consists of the reconstruction of a portion of SR 225 and the relocation of a second portion of SR 225 to create a bypass around the community of Spring Place. The project begins at CR104/New Hope Road where SR 225 will be reconstructed from a two lane rural section to a four lane urban section. A second section will be constructed beginning at Imperial Blvd. on a new location to the west to bypass Spring Place. The bypass will be constructed as a four lane rural section continuing and connecting to US 76/SR 52.

It is recommended that the intersections along SR 225 at Spring Place Road Connector and SR 52A be signalized to provide a higher level of service. SR 225 serves as a north-south connector for traffic from Murray and Gordon counties traveling to I-75. This project should provide additional capacity. Because of its location west of the existing SR 225, it is expected to relieve traffic traveling SR 52A by providing better movement of traffic traveling to US 76 and Dalton.

The purpose of moving the alignment is to avoid conflicts with the Chief Vann Historic site which is listed on the National Register.

The estimated construction cost for this project is \$16,397,209 and a Right-of-Way cost of \$14,382,000 for a total project cost projected at \$30,779,209.

REPRESENTATIVE DOCUMENTS

- Georgia Department of Transportation
- Moreland Altobelli Associates, Inc. Engineering Documents
 - Half size plan set (2 volumes)
 - Construction Cost Estimates
 - Preliminary Right-of-Way Cost Estimate
 - Concept Report/Revised Concept Report

The VE Team utilized the supplied project materials noted above and the current standard drawings, details and specifications provided by Moreland Altobelli Associates, Inc..

Preliminary Right of Way Cost Estimate

Date: June 9, 2008
Project: STP00-0151-01 (005); Murray County **P.I. Number** 631550
Existing/Required R/W: Varies/Varies **No. Parcels** 118
Project Termini: Highway 225 from S of New Hope Road to US 76
Project Description: Widening and Reconstructon of State Route 225

Fee Simple:

Small Residential						
	1,280,541	sf	@ \$	0.57 /sf = \$	729,908	
Large Residential						
	2,919,209	sf	@ \$	0.17 /sf = \$	496,266	
Light Comm/Industrial						
	154,346	sf	@ \$	2.30 /sf = \$	354,996	
Heavy Comm						
	80,311	sf	@ \$	3.44 /sf = \$	276,270	
						\$ 1,857,440

Permanent Easement:

Small Residential						
	38,195	sf	@ \$	0.29 /sf = \$	11,077	
Large Residential						
	94,525	sf	@ \$	0.09 /sf = \$	8,507	
Light Comm/Industrial						
	0	sf	@ \$	1.15 /sf = \$	0	
Heavy Comm						
	0	sf	@ \$	1.72 /sf = \$	0	
						\$ 19,584

Improvements:

34 Residential, Site Improvements					\$ 2,072,000	
2 Commercial, Site Improvements					\$ 180,000	
						\$ 2,252,000

Relocation:

0 Commercial	@ \$50,000 /parcel	=	\$	0	
38 Residential	@ \$20,000 /parcel	=	\$	760,000	
					\$ 760,000

Damages:

Proximity - 33 Parcels	\$	780,000	
Consequential - 4 Parcels	\$	130,000	
Cost To Cure - 0 Parcels	\$	0	
			<u>\$ 910,000</u>

Net Cost		\$	5,799,024
Scheduling Contingency	55%	\$	3,189,463
Adm/Court Cost	60%	\$	5,393,092
			<u>\$ 14,381,579</u>

Total Cost

\$ 14,382,000

*** NOTES:**

1) For budgetting purposes, Moreland Altobelli recommends escalating the net right-of-way estimate by 65% to cover all contingencies and extra costs in-lieu of the standard 115% outlined above. This estimate assumes the ROW acquisition will be completed in the next two years (2008-2009). The alternative total right-of way cost would be as follows:

Net Cost of Right of Way		\$	5,799,024
Scheduling Contingency, Adm/Court Costs, Inflation	65%	\$	<u>3,769,366</u>
			9,568,390

* Alternative Total Cost

\$ 9,569,000

Prepared By :


Embury Dixon
Moreland Altobelli Associates, Inc.

Approved :

GDOT R/W

Estimate Report for file "97527_2008-05-30"

Section MAJOR STRUCTURES					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
500-0100	3200	SY	3.95	GROOVED CONCRETE	12640.00
500-1006	1079	LS	862.75	SUPERSTR CONCRETE, CL AA, BR NO -	930907.25
500-2100	1569	LF	42.28	CONCRETE BARRIER	66337.32
500-3002	604	CY	551.41	CLASS AA CONCRETE	333051.64
507-9003	3230	LF	143.91	PSC BEAMS, AASHTO TYPE III, BR NO -	464829.30
507-9031	1411	LF	173.66	PSC BEAMS, AASHTO, BULB TEE, 63 IN, BR NO -	245034.26
511-1000	95856	LB	0.89	BAR REINF STEEL	85311.84
511-3000	253907	LS	0.90	SUPERSTR REINF STEEL, BR NO -	228516.30
520-1125	700	LF	54.25	PILING IN PLACE, STEEL H, HP 12 X 53	37975.00
520-4125	2	EA	0.86	LOAD TEST, STEEL H, HP 12 X 53	1.72
520-4147	2	EA	0.94	LOAD TEST, STEEL H, HP 14 X 73	1.88
524-0010	412	LF	1541.89	DRILLED CAISSON -	635258.68
603-2024	3028	SY	54.72	STN DUMPED RIP RAP, TP 1, 24 IN	165692.16
603-7000	3028	SY	5.23	PLASTIC FILTER FABRIC	15836.44
Section Sub Total:					\$3,221,393.79

Section GRADING AND EARTHWORK					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
201-1500	120	LS	8000.00	CLEARING & GRUBBING -	960000.00
206-0002	38850	CY	6.47	BORROW EXCAV, INCL MATL	251359.50
Section Sub Total:					\$1,211,359.50

Section DRAINAGE					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
550-1180	8307	LF	40.19	STORM DRAIN PIPE, 18 IN, H 1-10	333858.33
550-1240	1277	LF	46.13	STORM DRAIN PIPE, 24 IN, H 1-10	58908.01
550-1300	272	LF	64.57	STORM DRAIN PIPE, 30 IN, H 1-10	17563.04
550-1360	891	LF	80.97	STORM DRAIN PIPE, 36 IN, H 1-10	72144.27
550-1420	624	LF	102.43	STORM DRAIN PIPE, 42 IN, H 1-10	63916.32
550-1480	3473	LF	115.44	STORM DRAIN PIPE, 48 IN, H 1-10	400923.12
550-1600	200	LF	281.06	STORM DRAIN PIPE, 60 IN, H 1-10	56212.00
550-1664	130	LF	0.00	STORM DRAIN PIPE, 66 IN, H 25-30	0.00
550-3618	42	EA	623.61	SAFETY END SECTION 18 IN, SIDE DRAIN, 6:1 SLOPE	26191.62
550-3624	12	EA	975.07	SAFETY END SECTION 24 IN, SIDE DRAIN, 6:1 SLOPE	11700.84
550-3630	6	EA	1286.54	SAFETY END SECTION 30 IN, SIDE DRAIN, 6:1 SLOPE	7719.24
550-3636	2	EA	2802.89	SAFETY END SECTION 36 IN, SIDE DRAIN, 6:1 SLOPE	5605.78
550-4218	28	EA	653.91	FLARED END SECTION 18 IN, STORM DRAIN	18309.48
550-4224	13	EA	777.77	FLARED END SECTION 24 IN, STORM DRAIN	10111.01
550-4230	4	EA	955.24	FLARED END SECTION 30 IN, STORM DRAIN	3820.96
550-4236	5	EA	1236.02	FLARED END SECTION 36 IN, STORM DRAIN	6180.10
550-4242	6	EA	1668.53	FLARED END SECTION 42 IN, STORM DRAIN	10011.18
668-1100	63	EA	2552.53	CATCH BASIN, GP 1	160809.39
XXX-XXXX	1	Lump Sum	20000.00	MISC DRAINAGE	20000.00
Section Sub Total:					\$1,283,984.69

Section BASE AND PAVING					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
310-1101	100801	TN	21.59	GR AGGR BASE CRS, INCL MATL	2176293.59
402-3121	31475	TN	63.18	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	1988590.50
402-3130	12023	TN	63.24	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	760334.52
402-3190	15701	TN	63.01	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	989320.01

413-1000	9800	GL	1.90	BITUM TACK COAT	18620.00
432-5010	2500	SY	1.63	MILL ASPH CONC PVMT, VARIABLE DEPTH	4075.00
Section Sub Total:					\$5,937,233.62

Section CONCRETE WORK					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
441-0016	289	SY	39.75	DRIVEWAY CONCRETE, 6 IN TK	11487.75
441-0104	3373	SY	33.24	CONC SIDEWALK, 4 IN	112118.52
441-4020	1157	SY	41.43	CONC VALLEY GUTTER, 6 IN	47934.51
441-6222	7056	LF	16.96	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	119669.76
Section Sub Total:					\$291,210.54

Section SIGNING, STRIPING AND SIGNALS					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
647-1000	3	LS	70000.00	TRAFFIC SIGNAL INSTALLATION NO -	210000.00
652-5451	70200	LF	0.18	SOLID TRAFFIC STRIPE, 5 IN, WHITE	12636.00
652-5452	63200	LF	0.18	SOLID TRAFFIC STRIPE, 5 IN, YELLOW	11376.00
652-5701	650	LF	2.19	SOLID TRAF STRIPE, 24 IN, WHITE	1423.50
652-5801	7400	LF	1.63	SOLID TRAF STRIPE, 8 IN, WHITE	12062.00
652-6501	48500	GLF	0.15	SKIP TRAFFIC STRIPE, 5 IN, WHITE	7275.00
652-6502	11300	GLF	0.11	SKIP TRAFFIC STRIPE, 5 IN, YELLOW	1243.00
653-0120	126	EA	74.16	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	9344.16
653-0170	5	EA	90.22	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	451.10
653-0210	5	EA	113.12	THERMOPLASTIC PVMT MARKING, WORD, TP 1	565.60
653-6004	7500	SY	3.05	THERMOPLASTIC TRAF STRIPING, WHITE	22875.00
653-6006	570	SY	2.92	THERMOPLASTIC TRAF STRIPING, YELLOW	1664.40
654-1001	560	EA	3.08	RAISED PVMT MARKERS TP 1	1724.80
654-1003	1160	EA	3.76	RAISED PVMT MARKERS TP 3	4361.60
Section Sub Total:					\$297,002.16

Section GUARDRAIL					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
641-1100	160	LF	42.44	GUARDRAIL, TP T	6790.40
641-1200	6386	LF	15.44	GUARDRAIL, TP W	98599.84
641-5001	8	EA	619.00	GUARDRAIL ANCHORAGE, TP 1	4952.00
641-5012	20	EA	1838.99	GUARDRAIL ANCHORAGE, TP 12	36779.80
Section Sub Total:					\$147,122.04

Section TRAFFIC CONTROL					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	191419.44	TRAFFIC CONTROL -	191419.44
Section Sub Total:					\$191,419.44

Section LANDSCAPING AND EROSION CONTROL					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0300	6	EA	1807.17	CONSTRUCTION EXIT	10843.02
163-0530	18957	LF	4.07	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	77154.99
163-0531	3	EA	8336.05	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO -	25008.15
165-0010	3092	LF	0.74	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	2288.08
165-0020	940	LF	7.07	MAINTENANCE OF TEMPORARY SILT FENCE, TP B	6645.80
165-0030	1922	LF	1.32	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	2537.04
165-0060	3	EA	1400.14	MAINTENANCE OF TEMPORARY SEDIMENT BASIN, STA NO -	4200.42
165-0070	9479	LF	1.72	MAINTENANCE OF BALED STRAW EROSION CHECK	16303.88

171-0010	6183	LF	1.59	TEMPORARY SILT FENCE, TYPE A	9830.97
171-0020	1879	LF	2.77	TEMPORARY SILT FENCE, TYPE B	5204.83
171-0030	3844	LF	3.73	TEMPORARY SILT FENCE, TYPE C	14338.12
700-6910	51	AC	1022.21	PERMANENT GRASSING	52132.71
Section Sub Total:					\$226,488.01

Section MISCELLANEOUS ITEMS					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
153-1300	1	EA	69627.91	FIELD ENGINEERS OFFICE TP 3	69627.91
Section Sub Total:					\$69,627.91

Total Estimated Cost: \$12,876,841.70

Subtotal Construction Cost	\$12,876,841.70
E&C Rate 10.0 %	\$1,287,684.17
Inflation Rate 5.0 % @ 3 Years	\$2,232,683.39
<hr/>	
Total Construction Cost	\$16,397,209.26
Right Of Way	\$5,895,666.00
ReImb. Utilities	\$398,400.00
<hr/>	
Grand Total Project Cost	\$22,691,275.26

97527
FILE

ORIGINAL TO GENERAL FILES

D.O.T. 66

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE STP-151-1(5)/STP-0003-00(061) Murray County **OFFICE** Preconstruction
P. I. Nos. 631550/0003061

DATE September 6, 2002

FROM *John Kunkle*
Margaret B. Pirkle, P.E., Assistant Director of Preconstruction

TO ~~SEE DISTRIBUTION~~

SUBJECT **REVISED PROJECT CONCEPT REPORT APPROVAL**

Attached for your files is the approval for subject project.

MBP/cj

Attachment

DISTRIBUTION:

- David Mulling
- Harvey Keepler
- Jerry Hobbs
- Herman Griffin
- Michael Henry
- Phillip Allen
- Marta Rosen
- Ben Buchan
- ~~██████████~~
- Kent Sager
- BOARD MEMBER
- Jerry Brooks, MAAZ

REVISED PROJECT CONCEPT REPORT

Need and Purpose: As described in the project concept report.

Project Location: As described in the project concept report.

Description of approved concept: The approved project concept for STP-151-1(5) in Murray County consists of the reconstruction of a portion of SR 225 and the relocation of a second portion of SR 225 to create a bypass around the community of Spring Place. The improvements would begin at CR 104/New Hope Road where SR 225 would be reconstructed from a two-lane rural section to a four-lane urban section to north of CR 105. The project would then continue on new location to the west to bypass Spring Place and would be constructed as a four-lane divided rural section, rejoining existing SR 225 just south of the Conasauga Mill Creek bridge. As part of the project, a crossover section of road would be constructed on new location from CR 40/Spring Place-Smryna Road to the beginning of the new location portion of the bypass.

PDP Classification:

Full Oversight (), Exempt (x), SF (), Other ()

Functional Classification:

SR 225..... Rural Minor Arterial

Traffic (AADT) – Existing 1998:

SR 225.....11,700 vpd

Traffic (AADT) – Design Year 2018:

SR 225.....19,700 vpd

Proposed features to be revised: Due to funding allocation procedures, it is recommended that the approved project concept be revised such that the original project be split into two independent projects to be constructed in two phases. A Project Identification number would be assigned to each project. Phase I would construct STP-151-1(5) – SR 225/Spring Place Bypass from New Hope Road to SR 52/US 76. Phase II would construct STP-0003-00(061) – SR 225/Spring Place Bypass from SR 52/US 76 to SR 225 south of Mill Creek.

June 25, 2002

Project Number: STP-151-1(5) Phase I
STP-0003-00(061) Phase II
P.I. Number: 631550/0003061, Murray County

State of Georgia
Department of Transportation

Recommendation: It is recommended that the proposed revision to the concept be approved for implementation.

Concur: Thomas L. Johnson
Director of Preconstruction

Approve: L. W. [Signature]
Chief Engineer

Attachments:

1. Project Location Sketch
2. Cost Estimates, Phase I & II
3. Revised Traffic Analysis & Traffic Flow Diagrams

SUMMARY OF PROJECT COST

SR225 / SPRING PLACE BY-PASS PHASE 1
NEW HOPE ROAD TO SR52 / US76
STP- 151-1(5) MURRAY COUNTY
P.I. NO. 631550

Non-Construction Costs

A.	Right of Way	\$2,225,000
B.	Reimbursable Utilities	LGPA

Construction Costs

C.	Major Structures	\$2,500,000
D.	Grading and Earthwork	\$800,000
E.	Drainage	\$316,000
F.	Base and Paving	\$2,700,000
G.	Concrete Work	\$240,000
H.	Sign, Stripe and Signals	\$225,000
I.	Traffic Control	\$150,000
J.	Erosion Control	\$80,000
K.	Misc.	<u>\$200,000</u>

Sub-Total	\$7,211,000
Three years inflation at 5%	\$1,081,650
E & C at 10%	<u>\$721,100</u>

Total Construction Cost \$9,013,750

Total Project Cost \$11,238,750

June 24, 2002

Project Number: STP-151-1(5) Phase I
 STP-0003-00(061) Phase II

P.I. Number: 631550/0003061, Murray County

State of Georgia
 Department of Transportation

REVISED TRAFFIC ANALYSIS & TRAFFIC FLOW DIAGRAMS

Future 2025 design year peak hour traffic conditions for SR 225 were analyzed using the Highway Capacity Software (HCS), version 4.1. The software analysis results in an intersection delay (sec/veh), which translates into a Level of Service (LOS) denoted by a letter designation for a given range of delay, as defined in the Highway Capacity Manual. The results of the analysis are provided below in Table 1 for the future 2025 design hour volumes.

Table 1 - HCS Analysis Results					
Intersection	Type	AM		PM	
		Delay	LOS	Delay	LOS
SR 225 at New Hope Road	Unsignalized	17.7	C	19.1	C
SR 225 at Spring Place Road Connector	Unsignalized	19.6	C	N/A	F
	Signalized	13.1	B	13.4	B
Spring Place Rd Conn. at Old SR 225	Unsignalized	11.8	B	13.5	B
Spring Place Rd Conn. at Spring Place Smyrna Rd	Unsignalized	14.1	B	25.2	D
SR 225 at Tibbs Bridge Road	Unsignalized	21.0	C	27.8	D
SR 225 at SR 52 Alternate	Unsignalized	23.4	F	N/A	F
	Signalized	17.9	B	18.8	B
SR 225 at Beddie Jones Road	Unsignalized	15.0	B	17.8	C
SR 225 at SR 52	Signalized	18.0	B	21.6	C

The results of the HCS analysis indicate that each intersection would independently operate at an acceptable level of service for both morning and evening peak time periods. Based on the HCS analysis results, it is recommended that the intersections along SR 225 at Spring Place Road Connector and SR 52 Alt. be signalized in order to provide a higher level of service to both the main roadway and the cross street.

Darwin

ORIGINAL TO GENERAL FILES

D.O.T. 66

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP-151-1(5) Murray County OFFICE Preconstruction
P. I. No. 631550 DATE January 23, 1998

FROM *CWH* C. Wayne Hutto, Assistant Director of Preconstruction

TO SEE DISTRIBUTION

SUBJECT PROJECT CONCEPT REPORT APPROVAL

Attached for your files is the approval for subject project.

CWH/cj

Attachment

DISTRIBUTION:

- Walker Scott
- Bobby Mustin
- David Studstill (ATTN: Harvey Keeper)
- Jerry Hobbs
- Herman Griffin
- Marta Rosen (ATTN: Michael Henry)
- Marion Waters
- Toni Dunagan
- Paul Liles
- Jim Hitt (Traffic Ops)
- Don Mills
- Charles Law
- Jim Kennerly

SP 225

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP-151-1(5) Murray County OFFICE Preconstruction
P.I. No. 631550

DATE January 5, 1998

FROM Walker W. Scott, Jr., P.E., Director of Preconstruction

TO Wayne Shackelford, Commissioner

SUBJECT PROJECT CONCEPT REPORT

SR 225
97527

This project is the Spring Place Bypass from SR 225 at New Hope Road south of Spring Place to SR 225 just south of Mill Creek for a total of 9.07km. 5 1/2 miles

State Route 225 in Murray County is a north-south access roadway facility that serves regional traffic from Murray and Gordon Counties to I-75. This project, as proposed, provides additional capacity for north-south traffic traveling around and through the community of Spring Place. The project begins at the intersection of SR 225 and New Hope Road with a five lane section with a flush median and extends along existing SR 225 to CR 105 where new alignment for a four lane divided roadway with a 13.4m depressed grassed median will bypass Spring Place on the west. The alignment will continue north to cross SR 52 Alt and US 76 at-grade and will tie back into SR 225 with a two lane typical section just south of Mill Creek. A short connector will be constructed from New Smyrna Road to the proposed Spring Place Bypass. The connector will extend from New Smyrna Road just south of Leonard Bridge Road west on new location with a three lane typical section to the proposed bypass just north of CR 105. Twin 36.58m x 11.58m bridges will be constructed over Town Branch and a box culvert will be constructed at Mill Creek Tributary. Base year traffic (1998) varies from 3,900 VPD to 11,700 VPD and the design year traffic (2018) varies from 6,450 VPD to 19,700 VPD. Access along the route will be partial limited with a speed design of 90km/h.

Three alternatives were considered for the SR 225 reconstruction in Spring Place. Alternative #1 is a short loop around Spring Place city limits; alternative #2 is widening existing SR 225 through Spring Place; alternative #3 is a longer loop around Spring Place. Alternative #3 is the preferred alternative. This alternative avoids conflicts with historic properties on the National Register or potentially eligible for nomination to the National Register. It also avoids the need to displace residences and businesses. (See attachment for Alternatives Analysis.)

Environmental concerns include requiring a COE 404 permit; an Environmental Assessment will be prepared; T & E survey will be required for Town Branch; two (2) archaeological sites found, however, not eligible for National Register; a public hearing is required; time saving procedures are not appropriate.

STP-151-1(5) Murray
January 5, 1998

The estimated costs for this project are:

	<u>PROPOSED</u>	<u>APPROVED</u>	<u>PROG DATE</u>	<u>LET DATE</u>
Construction (includes E&C and inflation)	\$9,721,000	\$8,678,000	LR	LR
Right-of-Way	\$2,856,000	\$1,276,000		
Utilities*	LGPA	LGPA		

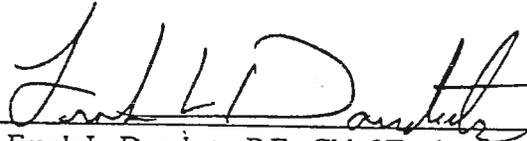
*Murray County signed contract on 7-5-95 to be responsible for preliminary engineering and required utility relocations.

I recommend this project concept be approved and Alternative #3 be implemented.

WWS:JDQ/cj

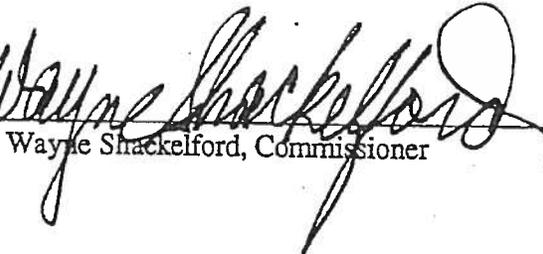
Attachment

CONCUR



Frank L. Danchetz, P.E., Chief Engineer

APPROVE



Wayne Shackelford, Commissioner

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

RECEIVED
NOV 19 1996
PRECONSTRUCTION

INTERDEPARTMENT CORRESPONDENCE

FILE STP-151-1(5) MURRAY OFFICE Atlanta, Georgia
P.I. NO. 631550 DATE NOVEMBER 18, 1996

FROM Bob Mustin, Project Review Engineer *JTM*

TO C. Wayne Hutto, Assistant Director of Preconstruction

SUBJECT PROJECT CONCEPT REPORT

The concept report submitted November 7, 1996 by the letter from James Kennerly dated November 7, 1996 has been reviewed and is considered satisfactory.

The estimated costs for the project are as follows:

Construction	\$ 8,034,000
Inflation	\$ 803,000
E & C	\$ 884,000
Right of Way	\$ 2,856,000
Reimbursable Utilities	\$? (LGPA)

DTM

c: Jim Kennerly

ALTERNATIVES INCLUDING THE PROPOSED ACTION

Three alternatives were considered for determining the best alignment for improvements to SR 225 (see Figure 3, *Alternative Alignments*). Alternative #1 would be a short loop around the Spring Place community. Alternative #2 would widen existing SR 225 through Spring Place. Alternative #3 would be a longer bypass around Spring Place. Each of the alternative alignments considered would begin at the intersection of New Hope Road and SR 225 south of Spring Place and end just south of the Mill Creek bridge on existing SR 225. Each of the three alternative alignments is discussed in the following sections.

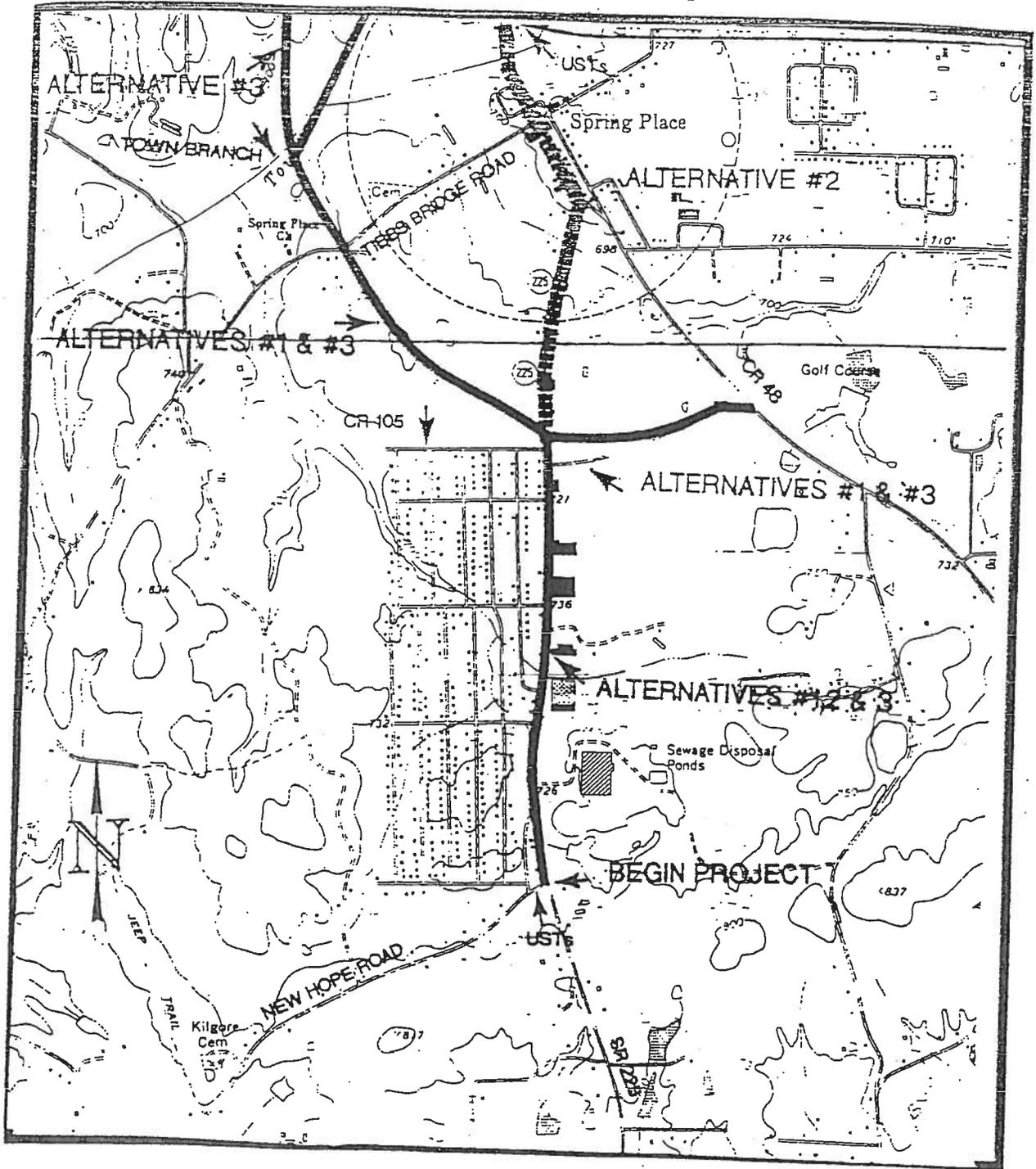
A. The Preferred Alternative

The preferred alternative, Alternative #3, would begin at New Hope Road where improvements from a two-lane to a four-lane rural section would be made following the existing alignment of SR 225 for approximately 1.77 kilometers (1.10 miles) to just north of the intersection of CR 105 with SR 225. The new location portion of this alternative would then leave the existing alignment and turn to the northwest towards Tibbs Bridge Road. The proposed SR 225 Bypass would maintain the same orientation through the intersections with SR 52A and US 76. North of US 76, the proposed bypass would taper to a two-lane rural section and turn northeast to rejoin the existing alignment of SR 225 south of the Mill Creek bridge, approximately 4.11 kilometers (2.56 miles) north of Spring Place. The total length of Alternative #3, including the new location crossover connecting SR 225 and Spring Place-Smyrna Road, would be approximately 10.09 kilometers (6.27 miles).

An inventory of the resources along the preferred alternative indicates that this alternative would have fewer impacts on the physical, social, and economic resources of the community than the other alternatives considered. The preferred alternative avoids conflicts with historic properties listed on the National Register of Historic Places (National Register) or potentially eligible for nomination to the National Register. It also avoids the need to displace residences and businesses. This alternative would encounter two sites at the beginning of the proposed project with potential underground storage tanks (USTs). These sites are located at the intersection of New Hope Road and SR 225.

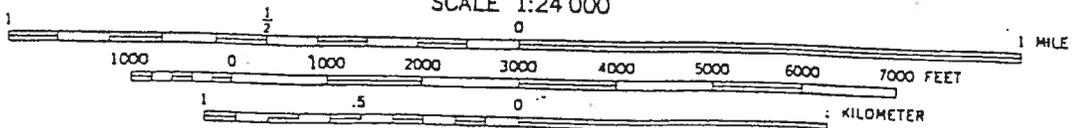
The preferred alternative would relocate traffic presently using SR 225 to a bypass on new location to the west of SR 225. Additionally, this proposed new location bypass would provide the needed additional capacity which would allow through traffic to bypass the community of Spring Place and access US 76 directly without using existing SR 225 or SR 52A. This would provide four-lane capacity for the entire length of area with congested flow.

Figure 3a
Alternative Alignment Map



Source: USGS Chatsworth, GA. and Calhoun, N.E., GA. 7.5 Minute Quadrangles
Project STP 151-1(5) Murray County
P.L NUMBER 631550

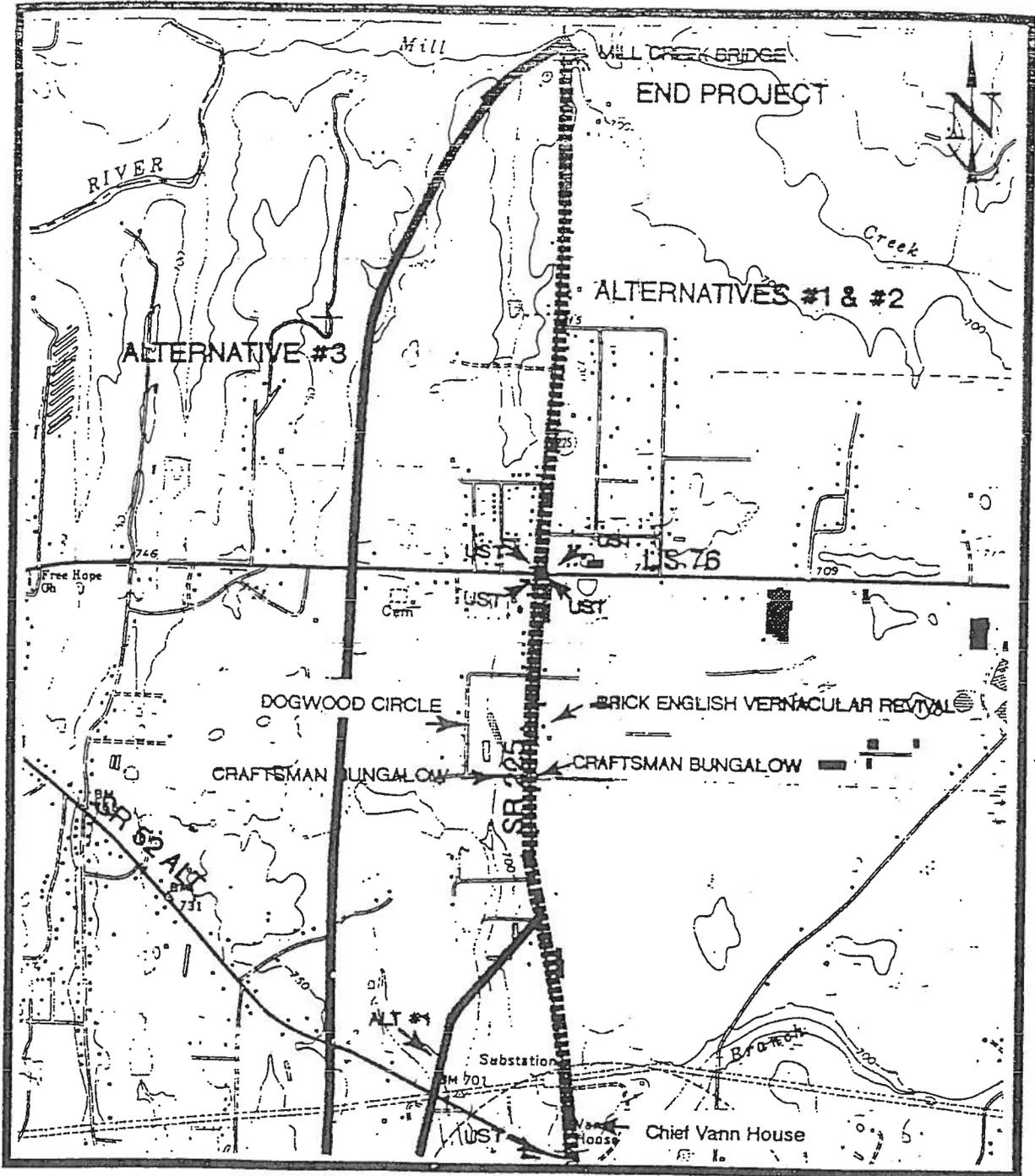
SCALE 1:24 000



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

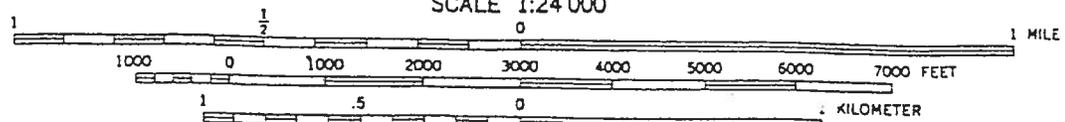
2A

Figure 3b
Alternative Alignment Map



Source: USGS Chatsworth, GA. 7.5 Minute Quadrangle
Project STP 151-1(5) Murray County
P.L NUMBER 631550

SCALE 1:24 000



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

B. Other Alternatives Under Consideration

The No-Build Alternative. This alternative would result in no action by the Georgia Department of Transportation to construct any project which would alleviate the traffic congestion in and around the Spring Place community. The No-Build alternative would result in a continuation of the two-lane traffic through the Spring Place community, and would provide no relief from the existing traffic problems in the proposed project area. Murray County is growing rapidly with an expanding manufacturing and residential base. With the No-Build Alternative, the existing traffic flow problems would be expected to increase in the future which would not be beneficial for future growth in the area.

Alternative #1/Short Bypass. Alternative #1 is the shorter of two bypass alternatives that would avoid the Spring Place community (*see Figure 3, Alternative Alignments*). This alternative would begin at the intersection of New Hope Road and SR 225. The proposed improvements would follow the existing alignment of SR 225 from New Hope Road north to Murray CR 105, a distance of approximately 1.77 kilometers (1.10 miles). North of SR 105, Alternative #1 would go on new location in a northwesterly direction and bypass the community of Spring Place on a western alignment. The new location portion of this alternative would be approximately 3.20 kilometers (1.99 miles) in length. This proposed bypass would turn back to the east and rejoin the existing alignment north of the Spring Place community. Alternative #1 would continue north on the existing alignment of SR 225 to the termination of the project south of the Mill Creek bridge, a distance of approximately 3.66 kilometers (2.27 miles). This alternative also includes a connector of approximately 0.85 kilometer (0.53 mile) from Spring Place-Smyrna Road to SR 225. The total length of Alternative #1, including the connector, would be approximately 9.48 kilometers (5.89 miles).

An inventory of the resources along Alternative #1 indicate that this alternative would have substantial impacts on the physical, social, and economic resources of the community. The Chief Vann House would not be impacted by this alternative because the new location bypass would rejoin the existing alignment of SR 225 north of this historic resource. Several residential and commercial displacements would be required with the implementation of this alternative.

Approximately 0.76 kilometer (0.47 mile) south of the SR 225/US 76 intersection there are three historic resources that would be affected by the implementation of Alternative #1. On the west side of SR 225 just north of its southern intersection with Dogwood Circle, there is a Craftsman Bungalow that faces SR 225. On the east side of SR 225, there is a second Craftsman Bungalow which also faces SR 225. A short distance to the north, there is a third historic structure located on the east side of the road facing SR 225. This is a brick English Vernacular Revival house.

These three structures appear to be eligible for nomination to the National Register. Selecting Alternative #1 as the preferred alternative for improvements to SR 225 would require a Determination of Eligibility (DOE) for the three historic structures. Assuming they are eligible for nomination to the National Register, an Assessment of Effect (AOE) would be required to determine if there would be an adverse effect to these properties. In the event the improvements proposed by Alternative #1 would require the use of land from any of the three historic properties, the regulations of the Federal Highway Administration (FHWA) would require a Section 4(f) Evaluation. Since the two Craftsman Bungalow houses are directly across the road from one another, it is unlikely that SR 225 could be widened without the acquisition of land from one or both of these properties. It is possible that the process involved in compliance with Section 106 of the National Historic Preservation Act and compliance with regulations of the FHWA would add as much as 24 months to the planning phase of the project before project construction could begin.

On the bypass portion of Alternative #1, this alignment would cross wetlands associated with Town Branch and several of its tributaries. The Federal Emergency Management Agency (FEMA) has identified a floodplain area associated with Town Branch that would be crossed with this alternative.

Another constraint related to the implementation of the proposed project using Alternative #1 is the possible location of two USTs at the intersection of New Hope Road and SR 225 and at all four corners of the intersection of SR 225 with US 76. The testing and possible removal of six USTs would add to the cost of the project.

Alternative #2/Existing SR 225 Alignment. Alternative #2 would begin at the same starting point as Alternatives #1 and #3, the intersection of New Hope Road and SR 225 south of Spring Place (see Figure 3, *Alternative Alignments*). This alternative would involve the improvement of SR 225 on essentially the same alignment as the existing SR 225. It would pass through the center of the Spring Place community and terminate just south of the Mill Creek bridge. The total length of Alternative #2 would be approximately 7.92 kilometers (4.92 miles).

This alternative would affect an historic store in the community of Spring Place that may be eligible for nomination to the National Register. The taking of land from the Chief Vann House, a Georgia Historic Site that is listed on the National Register, would appear to be unavoidable. The use of the existing alignment would also affect the two historic Craftsman Bungalows and the historic brick English Vernacular Revival house located across from the southern end of Dogwood Circle. It is possible that the process involved in compliance with Section 106 of the National Historic Preservation Act and compliance with regulations of the FHWA would add as much as 24 months to the planning phase of the project before construction could begin. It is also possible that the impact

of the implementation of this alternative on historic properties would be deemed unacceptable because other alternatives would be available.

Widening SR 225 on the existing alignment would result in the displacement of several residences and businesses that are located in close proximity to the existing right-of-way. In addition to the two USTs encountered at the intersection of New Hope Road and SR 225, common to all three alternatives, and the four USTs that may be encountered at the intersection of SR 225 and US 76, two additional USTs would be encountered at the intersection of SR 225 and SR 52A.

C. Alternatives Analysis

The alternatives discussed above were analyzed using four-lane divided roadway typical sections. Characteristics included in this analysis were alternative alignment length, right-of-way costs, construction costs, wetland impacts, archaeological resources, historic resources, and traffic. An alternatives analysis matrix showing the results of this study are shown in Table 1. A discussion of each parameter used in this matrix is found in the following sections.

TABLE 1. ALTERNATIVES MATRIX

	Length	Right-of-way	Construction Cost	Wetlands Impacts	Historic Impacts	Archaeological Impacts	Traffic Effects	Total
Alternative 1	2	2	2	3	2	N/A	2	13
Alternative 2	1	3	1	1	3	N/A	3	12
Alternative 3	3	1	3	2	1	N/A	1	11

Rating: 1 = Least Impact or lowest rating
 2 = Moderate Impact or moderate rating
 3 = Greatest Impact, or highest rating

Alignment Length. The longer the alignment length, the higher the impact rating would be based on increased costs for construction and potential impacts to the natural and manmade environment. Alternative #2, which is a widening of existing SR 225, would be considerably shorter in length than the other two alternatives which represent bypasses around Spring Place. Alternative #3 is rated with a 3 because it has the longest length. Alternative #2 is rated as a 2 because of its intermediate length.

Right-of-way Costs. The more expensive the right-of-way costs, the higher the impact rating would be. Purchasing right-of-way along existing roadways fronted

6A

by businesses and residential buildings is typically more expensive than purchasing right-of-way on new location with less intensive land uses. Therefore, Alternative #3, located mostly on new location, was given the lowest impact rating of 1. Alternative #1 was given an intermediate rating of 2 based on sizable distances along existing alignments. Finally, Alternative #2, which essentially follows the existing alignment of SR 225 for the entire distance, would be expected to have the highest right-of-way costs.

Construction Costs. The ratings for this parameter are based largely on the length of the proposed alternative alignment. Based on this criteria, Alternative #2, the shortest alternative, would be expected to cost the least compared to Alternatives #1 and #3.

A secondary consideration for this category would be the costs involved in remediation of potential contaminants such as USTs along each alignment. Alternative #2 has eight potential UST sites. Alternative #1 has six potential UST sites. Alternative #3 has two potential UST sites. Although Alternative #3 was given the highest construction cost based on length, this difference in cost would be reduced based on the added cost requirements for UST work associated with the other alternatives.

Wetland Impacts. The greater the potential wetland impacts anticipated along an alternative, the higher the wetland impact rating would be. Potential wetland impacts for each alternative were estimated from National Wetland Inventory Maps. The lowest amount of wetland impacts would occur with Alternative #2, which essentially follows the existing SR 225 for the entire distance. Therefore, this alternative was given a rating of 1. Alternative #2 and #3 would cross Town Branch, which has a sizable associated floodplain/wetland. Alternative #2 crosses two additional sizable wetlands associated with unnamed tributaries of Town Branch. Therefore, Alternative #3 was given an intermediate rating of 2, and Alternative #1 was given the highest wetland impact rating of 3.

Historic Impacts. The greater the potential impacts to historic resources along an alternative, the higher the impact rating would be. Alternative #2, a widening of existing SR 225, was given a rating of 3 based on potential impacts to several historic resources including the Chief Vann House which is on the National Register. Alternative #1 was given a rating of 2 based on potential impacts to some historic resources. Finally, Alternative #3 which bypasses the historic resources of the Spring Place community and would not impact any historic resources, was given the rating of 1.

Archaeological Impacts. The only alternative for which an archaeology survey was performed was Alternative #3. Therefore, no ratings could be given to the other alternatives in this category.

Traffic. The alignment which would result in the most traffic improvement was given the rating of 1. A traffic study conducted for the project indicated that Alternative #3 would operate at a higher level of service (LOS) than Alternatives #1 or #2 in traffic projections for the design year of 2018. Alternative #1 was given a rating of 2 based on a better LOS than Alternative #2. Therefore, Alternative #2 was given the rating of 3 for this category.

D. Alternatives Analysis Conclusions

Results from the alternatives analysis matrix study indicated that Alternative #3 would have the lowest overall environmental, cultural, and economic impacts, and would operate at a higher LOS than Alternatives #1 and #2.

Alternative #1 would reduce traffic movement in the center of the Spring Place community and bypass the historic resources in Spring Place including the Chief Vann House State Historic Site. Because of the backtracking effect at SR 52A to existing SR 225, Alternative #1 would not carry a heavy volume north of SR 52A. This alternative would continue to overload the rural two-lane SR 52A because of the heavy traffic movement to the west. The improvement of SR 225 north of the proposed bypass would also impact the two historic Craftsman Bungalows and the historic English Vernacular Revival house.

Alternative #2 would continue to carry the existing and projected volume of traffic through the Spring Place community and would not reduce the heavy westbound traffic movement onto SR 52A. Improving SR 225 would potentially have an adverse affect on the historic store in the community of Spring Place and would require the taking of land from the Chief Vann State Historic Site. This alternative would also affect the two historic Craftsman Bungalows and the English Vernacular Revival house.

Alternative #3 would remove the heavy volume of traffic from the portion of existing SR 225 that passes through the Spring Place community. Because of its location west of existing SR 225, it would relieve traffic traveling SR 52A by providing better movements of traffic to US 76 and west to Dalton. Although it is longer than Alternatives #1 and #2, Alternative #3 avoids conflicts with historic properties listed on the National Register, or potentially eligible for nomination to the National Register. It also avoids the need to displace residences and businesses located along existing SR 225.

As with Alternative #1, the preferred alternative (Alternative 3) would cross the floodplain and the wetlands associated with Town Branch. The impacts to wetlands and floodplains would be minimized by bridging them. This route was surveyed for protected plant and animal species, and no individuals were detected. The alignment has also been surveyed for archaeological sites that may be eligible for nomination to the National Register. Two archaeological sites were found, but were determined to be not eligible for nomination to the National Register.

Therefore, this alignment is considered to be the preferred alternative and is the alternative discussed throughout the remainder of this document.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP-151-1(5), Murray County
P.I. No. 631550

OFFICE Environment/Location

DATE December 6, 1996

FROM David E. Studstill, P.E., State Environmental/Location Engineer

TO Wayne Hutto, P.E., Assistant Director of Preconstruction

SUBJECT CONCEPT REPORT

DES

RECEIVED
DEC 13 1996
PRECONSTRUCTION

The concept report for the above listed project has been reviewed. Moreland Altobelli states a Individual Permit will be required; however, it does not state why. Also, they state that there are wetlands along Town Branch. T&E survey will be required for Town Branch.

If you have any questions, please let me know.

DES/JSS/bh

cc: Bobby Mustin
Jim Kennerly

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ROAD AND AIRPORT DESIGN
STP 151-1(5) MURRAY COUNTY

PROJECT CONCEPT REPORT
SR 225 ROADWAY IMPROVEMENTS

Project No. STP 151-1 (5) Murray County

GA DOT P.I. No. 631550

FEDERAL ROUTE NO: F-151-1
STATE ROUTE NO: 225
GA DOT P.I. NO: 631550

Date of Report: August 30, 1996

RECOMMENDATION FOR APPROVAL	
DATE _____	State Road & Airport Design Engineer _____
DATE _____	State Environmental Engineer _____
DATE _____	State Traffic & Safety Engineer _____
DATE _____	District Engineer _____
DATE <u>12/4/96</u>	<u>Paul V. Hills Jr.</u> State Bridge Engineer _____
DATE _____	FHWA _____

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ROAD AND AIRPORT DESIGN
STP 151-1(5) MURRAY COUNTY

PROJECT CONCEPT REPORT
SR 225 ROADWAY IMPROVEMENTS

Project No. STP 151-1 (5) Murray County

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FEDERAL ROUTE NO: F-151-1
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Date of Report: August 30, 1996

RECOMMENDATION FOR APPROVAL	
_____ DATE	_____ State Road & Airport Design Engineer
_____ DATE	_____ State Environmental Engineer
<u>11-18-96</u> DATE	<u><i>M. Waters III PMA</i></u> State Traffic & Safety Engineer <i>Operations</i>
_____ DATE	_____ District Engineer
_____ DATE	_____ State Bridge Engineer
_____ DATE	_____ FHWA

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ROAD AND AIRPORT DESIGN
STP 151-1(5) MURRAY COUNTY

PROJECT CONCEPT REPORT
SR 225 ROADWAY IMPROVEMENTS

Project No. STP 151-1 (5) Murray County

GA DOT P.I. No. 631550

FEDERAL ROUTE NO: F-151-1
STATE ROUTE NO: 225
GA DOT P.I. NO: 631550

Date of Report: August 30, 1996

RECOMMENDATION FOR APPROVAL	
DATE _____	State Road & Airport Design Engineer _____
DATE <u>12/5/96</u>	<u>[Signature]</u> State Environmental Engineer
DATE _____	State Traffic & Safety Engineer _____
DATE _____	District Engineer _____
DATE _____	State Bridge Engineer _____
DATE _____	FHWA _____

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ROAD AND AIRPORT DESIGN
STP 151-1(5) MURRAY COUNTY

PROJECT CONCEPT REPORT
SR 225 ROADWAY IMPROVEMENTS

Project No. STP 151-1 (5) Murray County

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Date of Report: August 30, 1996

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_____ DATE	_____ State Road & Airport Design Engineer
_____ DATE	_____ State Environmental Engineer
_____ DATE	_____ State Traffic & Safety Engineer
_____ DATE	_____ District Engineer
<u>12/4/96</u> DATE	<u>Paul V. Tiller Jr.</u> State Bridge Engineer
_____ DATE	_____ FHWA

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ROAD AND AIRPORT DESIGN
STP 151-1(5) MURRAY COUNTY

PROJECT CONCEPT REPORT
SR 225 ROADWAY IMPROVEMENTS

Project No. STP 151-1 (5) Murray County

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Date of Report: August 30, 1996

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DATE	State Road & Airport Design Engineer
DATE	State Environmental Engineer
11-18-96	<i>M. Waters III pma</i>
DATE	State Traffic & Safety Engineer <i>Operations</i>
DATE	District Engineer
DATE	State Bridge Engineer
DATE	FHWA

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

RECEIVED
NOV 27 1996
PRECONSTRUCTION

INTERDEPARTMENT CORRESPONDENCE

FILE STP-151- (5) Murray Co.
P.I. No. 621550

OFFICE Traffic Operations
Atlanta, Georgia
DATE November 22, 1996

MGW PTMA

FROM Marion G. Waters, III, P.E., State Traffic Operations Engineer

TO Wayne Hutto, Assistant Director of Preconstruction

SUBJECT Project Concept Report Review

We have reviewed the concept report on the above project for the proposed widening and reconstruction of SR 225 from New Hope Rd. to the Conasauga Mill Creek bridge. The existing two lane roadway will be widened to a five lane section from New Hope Rd. to a point just south of Spring Place. At this point SR 225 will turn to the west on new location and widen to a four lane roadway with a 44 ft. median. The new section of SR 225 will intersect SR 52 Alt. and SR 52 before tapering to a two lane roadway and tying to the existing alignment at the Mill Creek bridge. We believe this concept will improve safety and operational capacity along this section of roadway. We therefore find this report satisfactory for approval.

MGW:CKE:ke

Attachment (signature page)

- cc: David Studstill
- James Kennerly
- Bob Mustin, w/attachment
- General Files

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
OFFICE OF ROAD AND AIRPORT DESIGN
STP 151-1(5) MURRAY COUNTY

PROJECT CONCEPT REPORT
SR 225 ROADWAY IMPROVEMENTS

Project No. STP 151-1 (5) Murray County

GA DOT P.I. No. 631550

FEDERAL ROUTE NO: F-151-1
STATE ROUTE NO: 225
GA DOT P.I. NO: 631550

Date of Report: August 30, 1996

RECOMMENDATION FOR APPROVAL	
DATE	State Road & Airport Design Engineer
<u>12/5/96</u>	<u><i>[Signature]</i></u> State Environmental Engineer
DATE	State Traffic & Safety Engineer
DATE	District Engineer
DATE	State Bridge Engineer
DATE	FHWA

Value Engineering Process

VALUE ENGINEERING PROCESS

This report summarizes the analysis and conclusions by the PBS&J Value Engineering team as they performed a VE Study during the period of December 1 through December 4, 2008 in Atlanta, Georgia, for the Georgia Department of Transportation.

INTRODUCTION

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

Les M. Thomas, P.E., CVS-Life	Certified Value Specialist
John Luh, Ph.D., P.E., PTOE, AICP, AVS	Highway and Transportation PE
Kevin Martin, Esq. AVS	Highway Construction Specialist
Ramesh Kalvakaalva, PE, CVS	Senior Bridge Structural Engineer
Randy S. Thomas, CVS	Assistant Team Leader

A Site Visit was performed on December 1, 2008 (see pictures included).

The Value Engineering Team followed the Seven Step Value Engineering job plan as promulgated by SAVE International. This Seven Step job plan includes the following:

- **Investigation/Information Phase** – during this phase of the VE Team’s work, the team received a briefing from the MACTEC design team and the Georgia Department of Transportation (GDOT) staff. This briefing included discussions of the design intent behind the project, the cost concerns, and the physical project limitations. 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 (concept report, cost estimate, and special provisions) 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 Phase** – during this phase the VE Team determined the “**Functions**” of the project. This was accomplished by reviewing 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 project were identified as follows:
 - **Project Objective/Goals**
 - **Reduce Congestion**
 - **Increase Capacity**
 - **Improve Safety**
 - **Reduce Delays**
 - **Retain Historic sites**
 - **Maintain Schedule**
 - **Project Basic Functions**
 - **Construct new Bridges**
 - **Construct Additional Traffic Lanes**
 - **Construction Additional Turn Lanes**
 - **Create Separation of Traffic**
 - **Improve Traffic Controls**
- **Speculation Phase** - The VE team performed a brainstorming session to identify ideas that might help meet the project objectives:
 - Improve Safety
 - Increase Capacity
 - Reduce construction and life cycle costs
 - Reduce the time of construction

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

- **Evaluation Phase** – Once the VE Team identified the creative ideas, it was necessary to decide which alternatives should be carried forward. This is the work of the Evaluation or Judgment Phase. The VE 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 selected ideas that they believed would improve the project by a vote process.

- Following that selection process, the VE Team used 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
 - Scheduling Delays

Based on these criteria, 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 Phase** – During this phase, the VE Team developed each of the selected design alternatives whose rating was “4” or “5” because of time constraints. If time permitted, the team will develop additional recommendations. This effort included a detailed explanation of the idea with sketches as appropriate to clarify the idea from the original concept, advantages and disadvantages, a technical explanation and an estimation of the cost and resultant savings if implemented. (see the tabbed section – Study Results)
- **Recommendation Phase** – During this phase the VE Team reviews the alternative ideas to confirm which ones are appropriate for the project, have an opportunity for success and which will improve the value of the project if implemented.
- **Presentation Phase** – As noted earlier, the team made an informal “out-briefing” on the last day of the workshop, designed to inform the Owners and the Designers of the initial findings of the VE Study. This written report is intended to formalize those findings.

The following **Function – Worth - Cost** Analysis, was utilized to focus the team and stimulate brainstorming; a copy of the **Attendance Sheets** is also attached so that the reader can be informed about who participated in the Study proceedings.

VALUE ENGINEERING STUDY AGENDA

for
Georgia Department of Transportation

Project No. STP00-0151-01(005)
P.I. No. 631550
Construction of SR 225/Spring Place Bypass
Murray County

December 1-4, 2008

Pre-Workshop Activities

VE Team Leader organizes study, coordinates with the Owner and Designer the project objectives and materials necessary. The VE Team receives and reviews all project documents. The team develops a Pareto Chart and/or Cost Model for the project. A member of the VE Team visits the project site.

Day One

9:00-10:30 Design Team Presentation (Information Phase)

- Introduction of participants, owner, designer, and VE team members
- Presentation of the project by the design engineer including:
 - History and background
 - Design Criteria and Constraints
 - Special “U” turn requirements
 - Special needs (schools, businesses, etc.)
 - Sidewalks, bicycle lanes, and or multi-use trails
 - Historical Property protection
 - Current Construction Completion Schedule
 - Project Cost Estimate and Budget Constraints
- Owner Presentation – special requirements, definition of life cycle period and interest rate for life cycle costs
- Review VE Pareto Chart/Cost Model
- Discussion, questions and answers
- Overview of the VE Process and Agenda – Workshop goals & project goals

10:30-12:00 VE Team reviews project (Information Phase)

- Review design team’s presentation
- Review agenda and goals of the study
- VE Team Site Visit if time allows

1:00-2:30 Function Analysis Phase

- Analyze Cost Model – Pareto
- Identify basic and secondary functions
- Complete Function Matrix/FAST Diagram

2:30-5:00 Creative Phase

- Brainstorming of alternative ideas

Day Two

8:00-10:00 Evaluation Phase

- Establish criteria for evaluation
- Rank ideas
- Identify “best” ideas for development
- Identify those ideas that will become Design Suggestions
- Develop a cost/worth analysis
- Identify a “champion” for each idea to be developed

10:00-5:00 Development Phase

- Develop alternative ideas design suggestions with assessment of original design and write up new alternatives including:
 - Opportunities & risks
 - Illustrations
 - Calculations
 - Cost worksheets
 - Life cycle cost analysis

Day Three

8:00-5:00 Development Phase

- Continue developing Alternative Ideas
- Continue developing Design Suggestions
- Prepare for presentation to Owners and Designers

Day Four

8:00-9:00 Prepare Presentation

9:00-10:00 VE Team Presentation

FUNCTION ANALYSIS AND COST-WORTH



Georgia Department of Transportation
STP000-0151-01(005) – P.I. 631550
Construction of SR 225/Spring Place Bypass-Murray County

SHEET NO.: 1 of 2

NO.	ELEMENT	FUNCTION			COST (000)	WORTH (000)	COMMENTS
		VERB	NOUN	KIND			
1	OVERALL PROJECT	Increase	Traffic Capacity	B	32,616	24,000	C/W = 1.36
		Reduce	Congestion	B			
		Enhance	Safety	S			
2	RIGHT-OF-WAY	Accommodate	Widening	B	14,382	10,050	C/W= 1.43
		Facilitate	Utilities	RS			
3	BASE AND PAVING	Create	Lanes	B	5,937	4,750	C/W = 1.25
		Increase	Capacity	B			
		Enhance	Safety	RS			
4	BRIDGE	Cross	Creek	B	3,221	2,900	CW=1.1
		Separate	Traffic	B			
5	DRAINAGE (DR)	Convey	Storm Water	B	1,284	1,284	C/W = 1.0
		Facilitate	Utilities	S			
6	CLEARING & GRUBBING	Remove	Vegetation	S	960	800	CW=1.2
7	SIGNING, STRIPING & SIGNALS	Enhance	Safety	S	297	297	C/W=1.0

Function defined as: Action Verb
 Measurable Noun

Kind: B = Basic HO = Higher Order
 S = Secondary LO = Lower Order
 RS = Required Secondary

Cost/Worth Ratio =
 (Total Cost ÷ Basic Worth)

FUNCTION ANALYSIS AND COST-WORTH



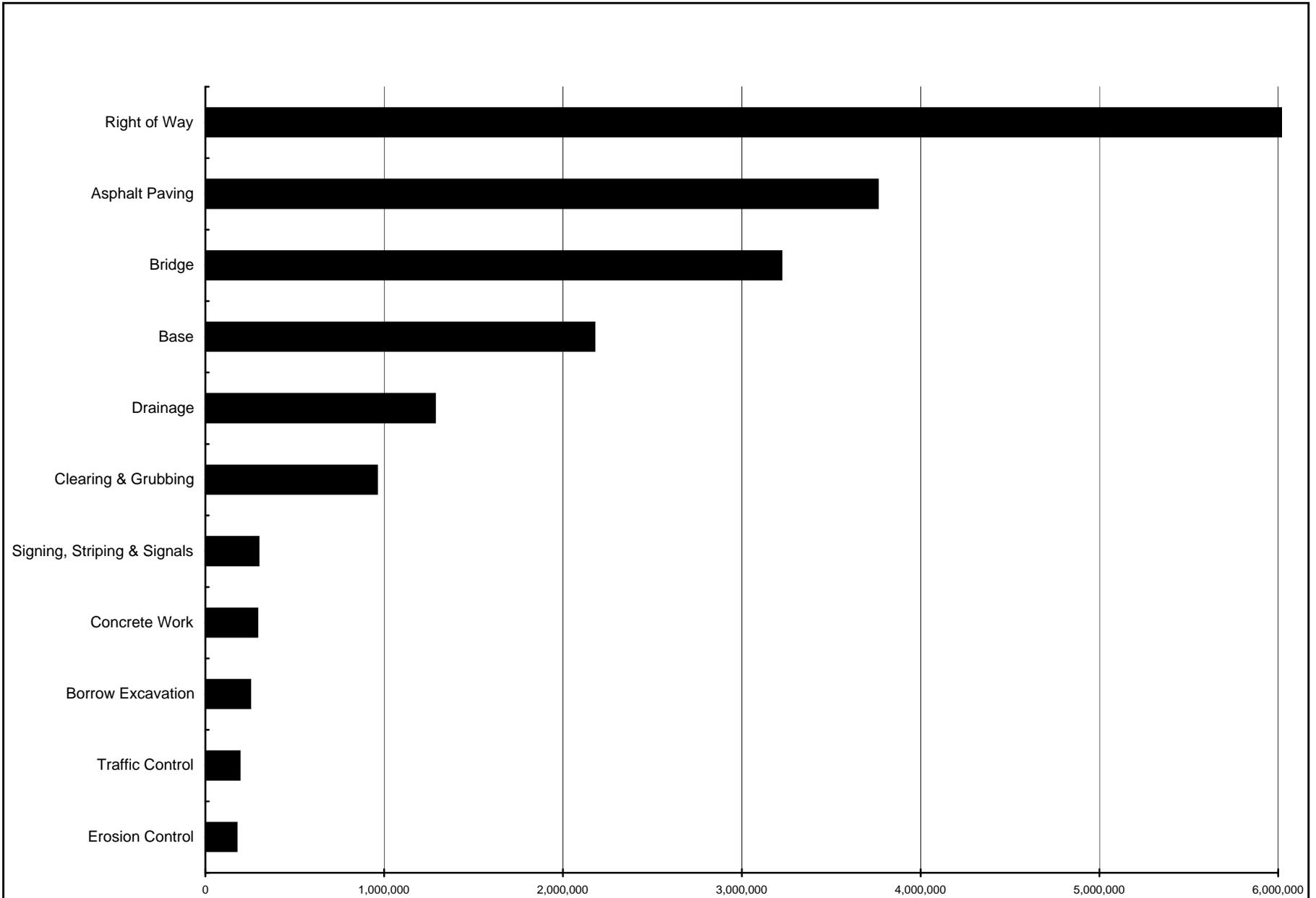
Georgia Department of Transportation
STP000-0151-01(005) – P.I. 631550
Construction of SR 225/Spring Place Bypass-Murray County

SHEET NO.: 2 of 2

NO.	ELEMENT	FUNCTION			COST (000)	WORTH (000)	COMMENTS
		VERB	NOUN	KIND			
8	CONCRETE WORK	Separate	Traffic	S	291	291	CW=1.0
9	EARTHWORK (EW)	Support	Alignment	B	251	251	CW=1.0
10	TRAFFIC CONTROL (TC)	Facilitate	Safe Construction	S	191	191	C/W = 1.0
11	EROSION CONTROL	Stabilize	Earthwork	S	174	174	CW=1.0
12	GUARDRAIL	Enhance	Safety	B	147	147	CW=1.0
13	FIELD ENGINEERS OFFICE	Enhance	Communication	S	70	70	CW=1.0
14	GRASSING	Stabilize	Earthwork	S	52	52	C/W=1.0

Function defined as: Action Verb Kind: B = Basic HO = Higher Order Cost/Worth Ratio =
 Measurable Noun S = Secondary LO = Lower Order (Total Cost ÷ Basic Worth)
 RS = Required Secondary

Project: STP00-0151-01(005)
P.I. No.:631550
Murray County



DESIGNER PRESENTATION



MEETING PARTICIPANTS

Georgia Department of Transportation		December 1, 2008		
STP00-0151-01(005) - P.I. No. 631550 - Murray County				
NAME		ORGANIZATION & TITLE	E-MAIL	PHONE
Lisa Myers		GDOT - Engineering Services	lmyers@dot.ga.gov	404-631-1770
Ken Werho		GDOT-TO Design Review	kwerho@dot.ga.gov	404-635-8144
Ron Wishon		GDOT-Engineering Services	rwishon@dot.ga.gov	404-631-1753
James Magnus		GDOT--Construction	jmagnus@dot.ga.gov	
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VE TEAM PRESENTATION

December 4, 2008

Geogia Department of Transportation		December 4, 2008		
STP00-0151-01(005) - P.I. No. 631550 - Murray County				
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CREATIVE IDEA LISTING



PROJECT: Georgia Department of Transportation STP00-0151-01(005) - P.I. 631550 Construction of SR 225/Spring Place Bypass Murray County	SHEET NO.:	1 of 1
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NO.	IDEA DESCRIPTION	RATING
ROADWAY (RD)		
RD-1	Instead of four lanes build two lanes on new alignment with grade separation at SR 52A; at SR 52A and Old SR 225 put a two way stop for SR 225	2
RD-2	Use two lands on new alignment with a center two-way left turn lane	5
RD-3	Use a raised earth median	2
RD-4	Reduce 44' median to 32'	5
RD-5	Reduce Spring Place connector work	1
RD-6	Improve SR 52A and make it the by-pass	2
RD-7	Take SR 225 over SR52 and use a three lane facility	2
RD-8	Eliminate two way turn lane in urban section	1
RD-9	Delete sidewalks in urban section	5
RD-10	Eliminate urban section and make a four lane rural section	2
RD-11	Reduce side slopes where appropriate	2
RD-12	Use two lanes on new alignment with left turn bays at key intersections	5
RD-13	Remove turn lanes at SR 52A intersection	2
RD-14	Signalize intersection at SR 52A and old SR 225	4
RD-15	Use two way stop sign at SR 52A and Old SR 225	5
RD-16	Use 11' travel lanes in urban section	4
BRIDGE (BR)		
BR-1	Reduce width of the bridge to match rural section	5
BR-2	Reconfigure span arrangement to four equal spans	4
BR-3	Combine two bridges to one bridge with positive separation	5

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