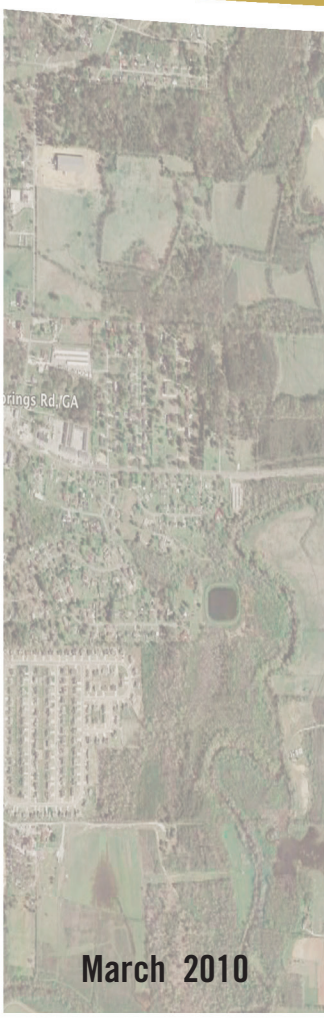
Value Engineering Study Report

Georgia Department of Transportation

STP00-1111-00(011) – P.I. No. 642220

SR 146/Cloud Springs Road from SR 1/US 27, East to CR 553/Lakeview Road

Catoosa County



March 2010

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Georgia Department of Transportation

Value Engineering Team

PBS&J®

Design Team

QK4

March 4, 2010

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
STP00-1111-00(011) – P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 east to CR 553/Lakeview Road
Catoosa County

Dear Ms. Myers:

Please find enclosed two (2) hard copies and one (1) CD of our final Value Engineering Report for SR 146/Cloud Springs Road from SR 1/US 27 east to CR 553/Lakeview Road.

Using the Value Engineering "Job Plan" – Investigation, Analysis (*Function)*, Speculation, Evaluation & Development, the VE Team identified and recommends for implementation:

- Nine (9) Alternatives which we believe will improve the project value.

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, Matt, and the hard working staff of the Georgia Department of Transportation.

Yours truly,
PBS&J

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

Randy S. Thomas, CVS
Assistant Team Leader

Value Engineering Study Report

Georgia Department of Transportation

STP00-1111-00(011) – P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27
East to CR 553/Lakeview Road

Catoosa County

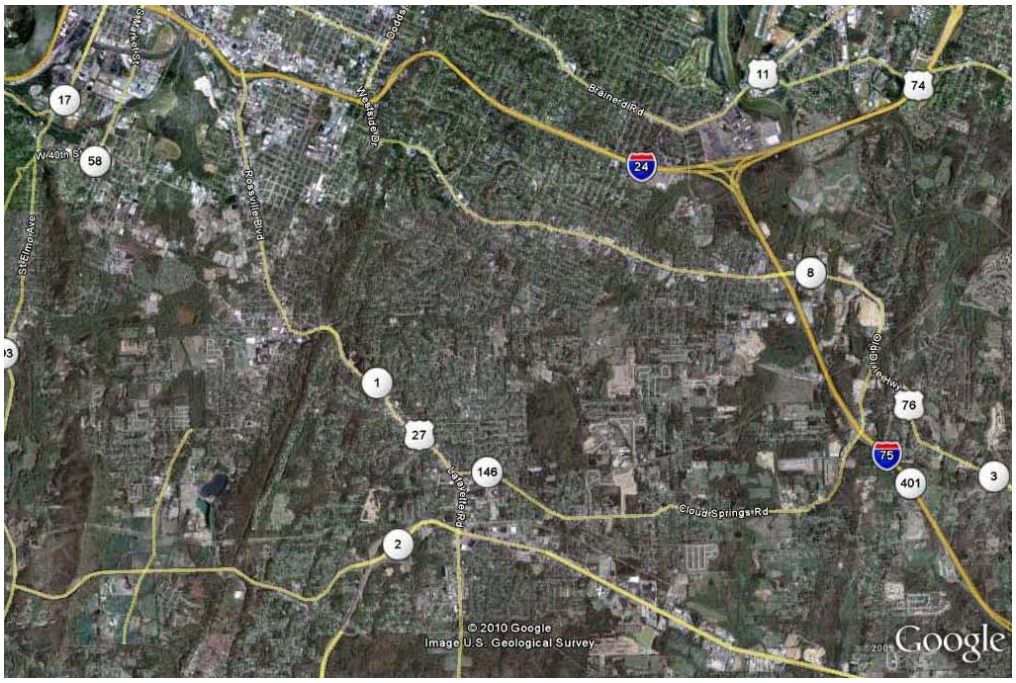
Table of Contents

EXECUTIVE SUMMARY

INTRODUCTION

The subject of this Value Engineering study is project STP00-1111-00(011) – P.I. No. 642220. This project is for the widening of SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road in Catoosa County, Georgia. The length of the project is 2.2 miles.

PROJECT LOCATION:



PROJECT DESCRIPTION

SR 146 is classified as an urban minor arterial roadway. The AADT for 2006 indicated 23,400 vehicles with an estimated 29,300 vehicles for the 2026 design year.

The current roadway consists of two lanes with substandard rural ditches. The right-of-way is very narrow. The proposed typical section will consist of four 12 ft. through lanes, curb and gutter, a 20' raised median, a 4' bike lane and a 5' sidewalk on both sides of the roadway. The proposed design speed will be posted at 45 mph.

The new alignment will not be symmetrical to avoid impacts to historical properties. Twenty-two residential properties and four commercial properties will be displaced.

Environmental concerns include impacts to Black Branch Creek. Box culverts will need to be modified and or replaced.

PROJECT CONCERNS AND OBJECTIVES

The key concern and objective of the project is to provide additional capacity for the anticipated future growth. The present horizontal alignment is bounded on both sides by numerous historic properties.

VALUE ENGINEERING PROCESS

The Value Engineering team followed the seven step Value Engineering Job Plan as promulgated by SAVE International.

Using the first two steps of the Value Engineering Job Plan - Investigation & Analysis (*Function Analysis)*; the VE Team identified the goal of this project to add capacity.

This led the team through the “Speculative” phase, wherein possible alternatives were identified. Following this, the VE Team moved to the Evaluation and Development Phases where the ideas were determined to either offer an improvement to the project value, or discarded.

OBSERVATIONS

1. Mulching quantities on the construction cost estimate appear to be high.
2. Review clearing and grubbing estimates as they appear to be high.
3. Review signal warrants for the opening year.
4. Consider using lighter GAB application
5. Eliminate existing C.M.P. from structure E-61 under proposed roadway
6. Outfall E-41 is at an angle toward Diychon Fernwood Drive and inside row.
7. Connect I-11 to I-10 to improve flow
8. Traffic diagram numbers (ADT) Sheet 10-2 don’t match at match line “A”

CONCLUSIONS AND RECOMMENDATIONS:

The VE Team concluded that the project generally meets the functional requirements of the project as proposed.

The VE Team identified, developed and ***recommends Nine (9) Design Alternatives*** for implementation to improve the value of the project – see the following "*Summary of Alternatives and Design Suggestions*".

Summary of Alternatives & Design Suggestions

PROJECT: **Georgia Department of Transportation**
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

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

ALTERNATIVE NUMBER	DESCRIPTION OF ALTERNATIVE	INITIAL COST SAVINGS
	ROADWAY (RD)	
RD-1	Eliminate bike lanes	$3,532,114
RD-3	Construct outside travel lanes at 12’ wide and inside lanes at 11’ wide	$953,294
RD-4	Construct one 10' multi-use trail in-lieu of one 5' sidewalk and two 4' bike lanes	$1,330,167
RD-8	Minimize improvements on Cross Street	$345,555
RD-12	Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane	$148,380
RD-14	Use a 4” concrete median instead of a 7 ½” concrete median	$163,080
RD-18	Eliminate sidewalks on side streets: Cross Street, Fant Drive and Cedar Lane.	$59,835
RD-19	Reduce ROW required for Pine Hill Drive to avoid the taking of the existing Conoco gas station	$550,000
RD-21	Modify the alignment for the reconstruction of Fant Drive	$316,888

STUDY RESULTS

INTRODUCTION

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

This introductory sheet is followed by a ***Summary of Alternatives***. 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*** 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.***

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-1**
DESCRIPTION:	**Eliminate bike lanes**	SHEET NO.: **1** of **4**

Original Design:

The original design calls for the construction of a 4' bike lane in each direction contiguous to the outside travel lanes.

Alternative Design:

The alternative design proposes deleting the bike lanes from the project.

Opportunities:

- Reduction in pavement costs
- Provides a uniform typical section with adjoining projects

Risks:

- None apparent

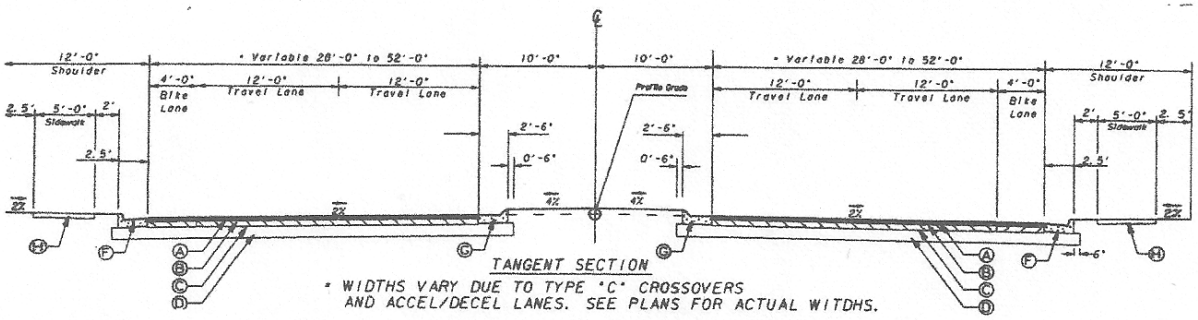
Technical Discussion:

The alternative proposes removing the bike lanes from the project entirely. There are no receiving bike lanes on either the eastern or western termini of the project. Also, the current adjacent construction project which is underway to the east does not provide bike lanes.

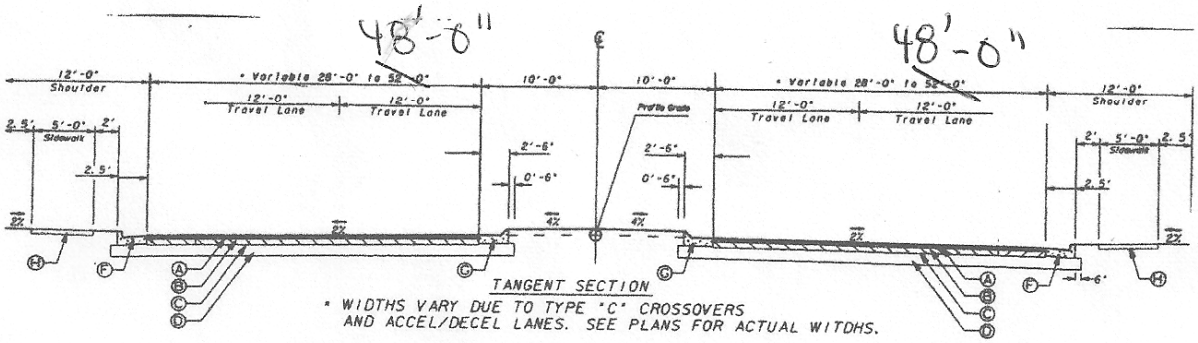
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 32,889,725	$ 0	$ 32,889,725
ALTERNATIVE	$ 29,357,611	$ 0	$ 29,357,611
SAVINGS	$ 3,532,114	$ 0	$ 3,532,114

Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-1**
DESCRIPTION:	**Eliminate bike lanes**	SHEET NO.: **2** of **4**



ORIGINAL DESIGN W/ 4' BIKE LANES



ALTERNATIVE DESIGN W/ BIKE LANES OMITTED

Calculations

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-1**
DESCRIPTION:	**Eliminate bike lanes**	SHEET NO.: **3** of **4**

ROW savings= 8’ less to be acquired by elimination of bike lanes. Average width acquired throughout the project= 70’ plus existing ROW.

Therefore: 8’/70’= 11% average ROW reduction.

Project length=2.36 miles x 5,280LF/Mile= 12,461 LF x 8’ width reduction=99,688 SF/9= 11,076 SY full depth pavement reduction.

GAB reduction=11,076 SY saved
25mm Superpave- 11,076 SY x 440lb/sy/2000lb/ton = 2,437 tons saved
19mm Superpave- 11,076 SY x 220lb/sy/2000lb/ton = 1,218 tons saved
12.5mm Superpave- 11,076 SY x 165lb/sy/2000 lb/ton= 914 tons saved

Cost Worksheet

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-1**

DESCRIPTION: **Eliminate bike lanes**

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
310-5120 GAB 12"	SY	81,000	$13.24	$ 1,072,440	69,924	$13.24	$ 925,794
402-3147 12.5mm Superpave	TN	12,000	$56.36	$ 676,320	11,086	$56.36	$ 624,807
402-3190 19mm Superpave	TN	16,000	$57.93	$ 926,880	14,782	$57.93	$ 856,321
402-3121 25mm Superpave	TN	31,000	$53.81	$ 1,668,110	28,563	$53.81	$ 1,536,975
ROW costs	LS	1	$25,556,000	$ 25,556,000	0.89	$25,556,000	$ 22,744,840
Sub-total				$ 29,899,750			$ 26,688,737
Mark-up at 10.00%				$ 2,989,975			$ 2,668,874
TOTAL				**$ 32,889,725**			**$ 29,357,611**
Estimated Savings:							$3,532,114

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-3**
DESCRIPTION:	**Construct outside travel lanes at 12' width and inside lanes at 11' width**	SHEET NO.: **1** of **4**

Original Design:

The original design proposes construction of two 12' travel lanes eastbound and westbound throughout the project.

Alternative Design:

The alternative proposes constructing a 12' outside travel lane, as well as an 11' inside travel lane throughout the project.

Opportunities:

- Reduction in pavement costs
- Reduced ROW footprint
- Reduction in construction time

Risks:

- Typical section will differ from adjoining project

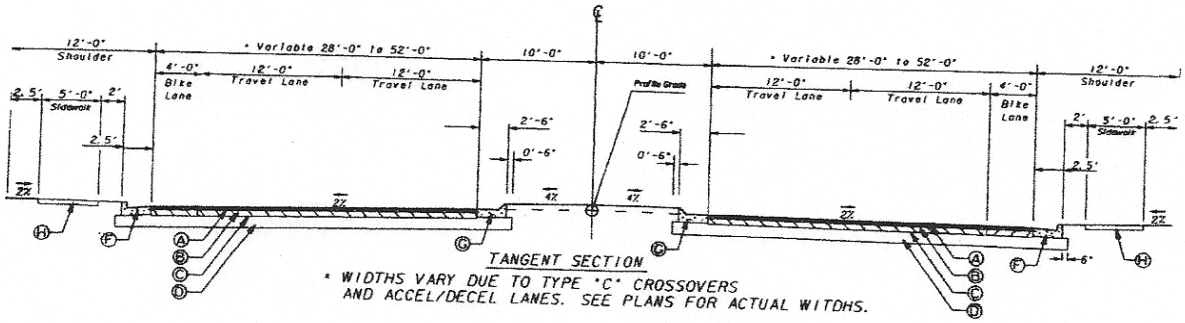
Technical Discussion:

Reduction of width of travel lanes throughout the project would result in 2' of full build-up widening that would not have to be constructed. AASHTO's "Policy on Geometric Design of Highways 2004" states that 11' lanes are permissible. It also states that under interrupted – flow operating conditions at low speeds (45 mph or less), narrower lanes are normally adequate and have some advantages. (See Pages 472-473). The combination would construct 12' outside lanes to accommodate the local truck traffic, as well as allowing a greater turn radius to right-turning vehicles.

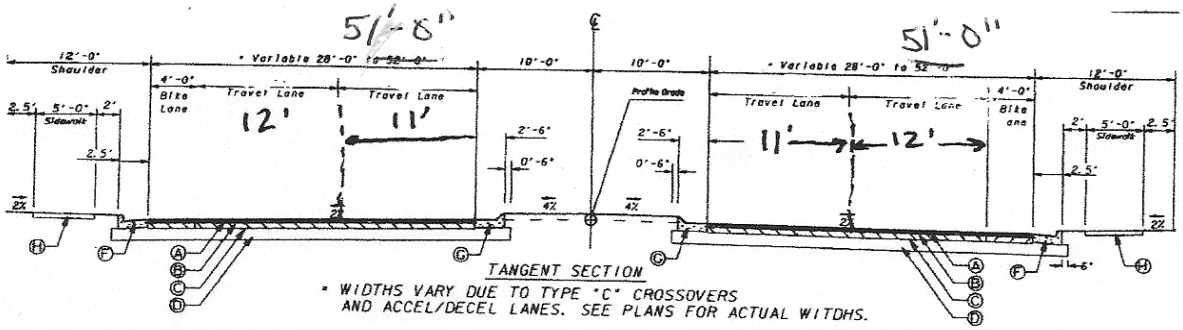
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 32,889,725	$ 0	$ 32,889,725
ALTERNATIVE	$ 31,936,431	$ 0	$ 31,936,431
SAVINGS	$ 953,294	$ 0	$ 953,294

Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-3**
DESCRIPTION:	**Construct outside travel lanes at 12' width and inside lanes at 11' width.**	SHEET NO.: **2** of **4**



ORIGINAL DESIGN W/ 12' INSIDE TRAVEL LANES



ALTERNATIVE DESIGN W/ 11' INSIDE TRAVEL LANES

Calculations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-3**
DESCRIPTION:	**Construct outside travel lanes at 12' width and inside lanes at 11' width.**	SHEET NO.: **3** of **4**

Project length=2.36 miles x 5,280LF/Mile= 12461 LF x 2' width reduction=24,922 SF/9SF/SY=2,769 SY full depth pavement reduction.

GAB reduction=2,769 SY saved
25mm Superpave- 2,769 SY x 440lb/sy/2000lbs/ton=609 tons saved
19mm Superpave- 2,769 SY x 220lb/sy/2000lbs/ton=305 tons saved
12.5mm Superpave- 2,769 SY x 165lb/sy/2000lbs/ton=228 tons saved

ROW savings= 2'
Average width acquired throughout the project= 70' plus existing ROW.
Therefore: 2'/70'= 3% average ROW reduction.

Cost Worksheet

PBS&J

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-3**

DESCRIPTION: **Construct outside lanes at 12' width and inside lanes at 11' width**

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
310-5120 GAB 12"	SY	81,000	$ 13.24	$ 1,072,440	78,231	$ 13.24	$ 1,035,778
402-3147 12.5mm Superpave	TN	12,000	$ 56.36	$ 676,320	11,772	$ 56.36	$ 663,470
402-3190 19mm Superpave	TN	16,000	$ 57.93	$ 926,880	15,695	$ 57.93	$ 909,211
402-3121 25mm Superpave	TN	31,000	$ 53.81	$ 1,668,110	30,391	$ 53.81	$ 1,635,340
ROW	LS	1	$ 25,556,000	$ 25,556,000	97.00%	$ 25,556,000	$ 24,789,320
Sub-total				$ 29,899,750			$ 29,033,119
Mark-up at 10.0%				$ 2,989,975			$ 2,903,312
TOTAL				**$ 32,889,725**			**$ 31,936,431**
Estimated Savings:							$953,294

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-4**
DESCRIPTION:	**Construct one 10' multi-use trail in-lieu of one 5' sidewalk and two 4' bike lanes**	SHEET NO.: **1** of **4**

Original Design:

The original design calls for the construction of 2-4’ bike lanes adjacent to the eastbound and westbound roadway. The original design also calls for the construction of a 5’ sidewalk in each direction.

Alternative Design:

The alternative design proposes removing the bike lanes from the roadway section, constructing a 5’ sidewalk in one direction and a 10’ multi-use trail in the other direction.

Opportunities:

- Reduction in pavement costs
- Reduction in ROW costs

Risks:

- None apparent

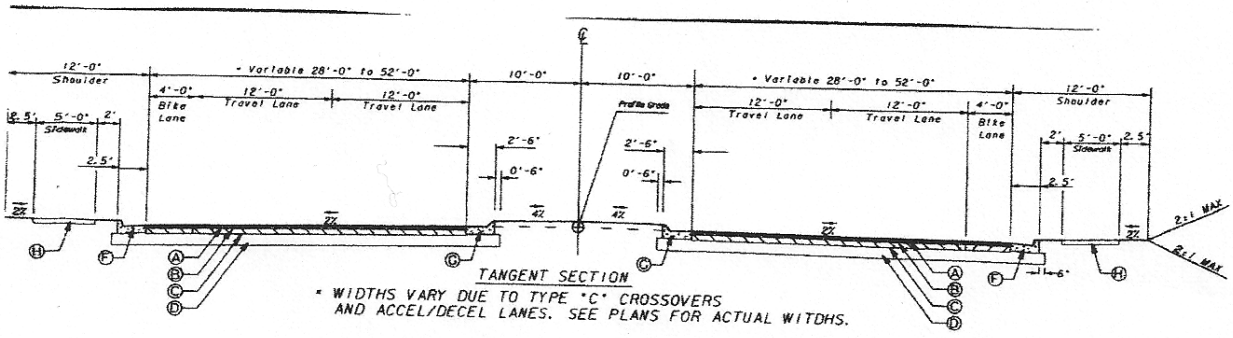
Technical Discussion:

Using a 10' multi-use trail in-lieu of bike lanes in the roadway should provide approximately equal functional capability. Bike lanes are not provided on this roadway

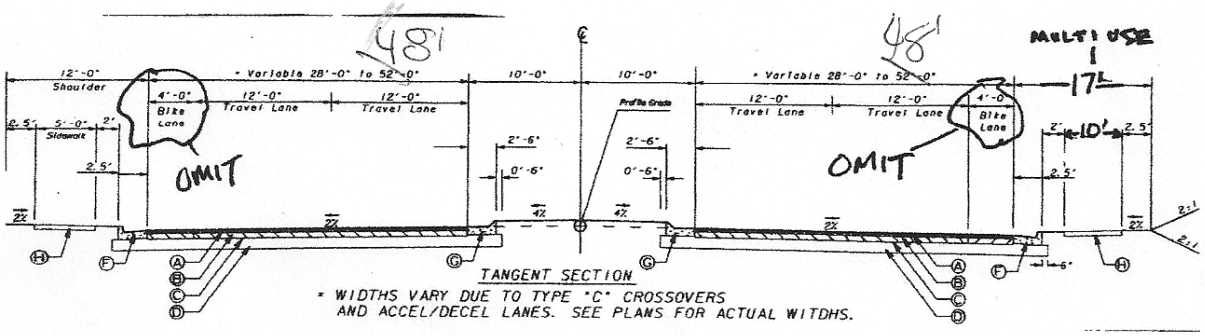
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 33,357,995	$ 0	$ 33,357,995
ALTERNATIVE	$ 32,027,828	$ 0	$ 32,027,828
SAVINGS	$ 1,330,167	$ 0	$ 1,330,167

Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-4**
DESCRIPTION:	**Construct one 10' multi-use trail in-lieu of one 5' sidewalk and two 4' bike lanes**	SHEET NO.: **2** of **4**



ORIGINAL DESIGN



ALTERNATIVE- OMIT BIKE LANES; CONSTRUCT MULTI-USE TRAIL ON SINGLE SIDE W/ 17' URBAN SHOULDER. UTILIZE 5' SIDEWALK ON OPPOSITE SIDE.

ROW savings= Removing bike lanes=8’ width savings
Additional width required for multi-use trail= 5’
=3’ net ROW width savings

Average width acquired throughout the project= 70’ plus existing ROW.

3’/70’=4% average ROW reduction.

Full Depth pavement reduction:
Project length=2.36 miles x 5,280LF/Mile= 12,461 LF x 8’ width reduction=99,688 SF/9= 11,076 SY full depth pavement reduction.

GAB reduction=11,076 SY saved
25mm Superpave- 11,076 SY x 440lb/sy/2000lbs/ton = 2437 tons saved
19mm Superpave- 11,076 SY x 220lb/sy/2000 lbs/ton = 1,218 tons saved
12.5mm Superpave- 11,076 SY x 165lb/sy/2000 lbs/ton = 914 tons saved

Additional sidewalk quantities:
Each sidewalk requires approximately 9,000 sy
Therefore, an additional 9,000 sy is required to widen one of the walks to be a 10' multi-purpose trail.

Cost Worksheet

PROJECT: **Georgia Department of Transportation**
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Catoosa County

ALTERNATIVE NO.: **RD-4**

DESCRIPTION: **Construct one 10' multi-use trail in-lieu of one 5' sidewalk and two 4' bike lanes**

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
Bike Lanes:							
310-5120 GAB 12"	SY	81,000	$13.24	$ 1,072,440	69,924	$13.24	$ 925,794
402-3147 12.5mm Superpave	TN	12,000	$56.36	$ 676,320	11,086	$56.36	$ 624,807
402-3190 19mm Superpave	TN	16,000	$57.93	$ 926,880	14,782	$57.93	$ 856,321
402-3121 25mm Superpave	TN	31,000	$53.81	$ 1,668,110	28,563	$53.81	$ 1,536,975
Multi-Use Trail additional costs							
Concrete Sidewalk- 4"	SY	18,000	$ 23.65	$ 425,700	27,000	$ 23.65	$ 638,550
ROW savings 4% (net)	LS	1	$25,556,000	$ 25,556,000	0.96	$25,556,000	$ 24,533,760
Sub-total				$ 30,325,450			$ 29,116,207
Mark-up at 10.00%				$ 3,032,545			$ 2,911,621
TOTAL				**$ 33,357,995**			**$ 32,027,828**
Estimated Savings:							$1,330,167

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-8**
DESCRIPTION:	**Minimize improvements on Cross Street**	SHEET NO.: **1** of **5**

Original Design:

The original design proposes constructing approximately 500' of storage and taper for the northbound traffic on Cross Street entering SR-146.

Alternative Design:

The alternative design proposes reducing the proposed storage and taper for the northbound left-turn on Cross Street entering SR-146, to approximately 260'.

Opportunities:

- Reduced construction costs
- Reduced ROW costs

Risks:

- None apparent

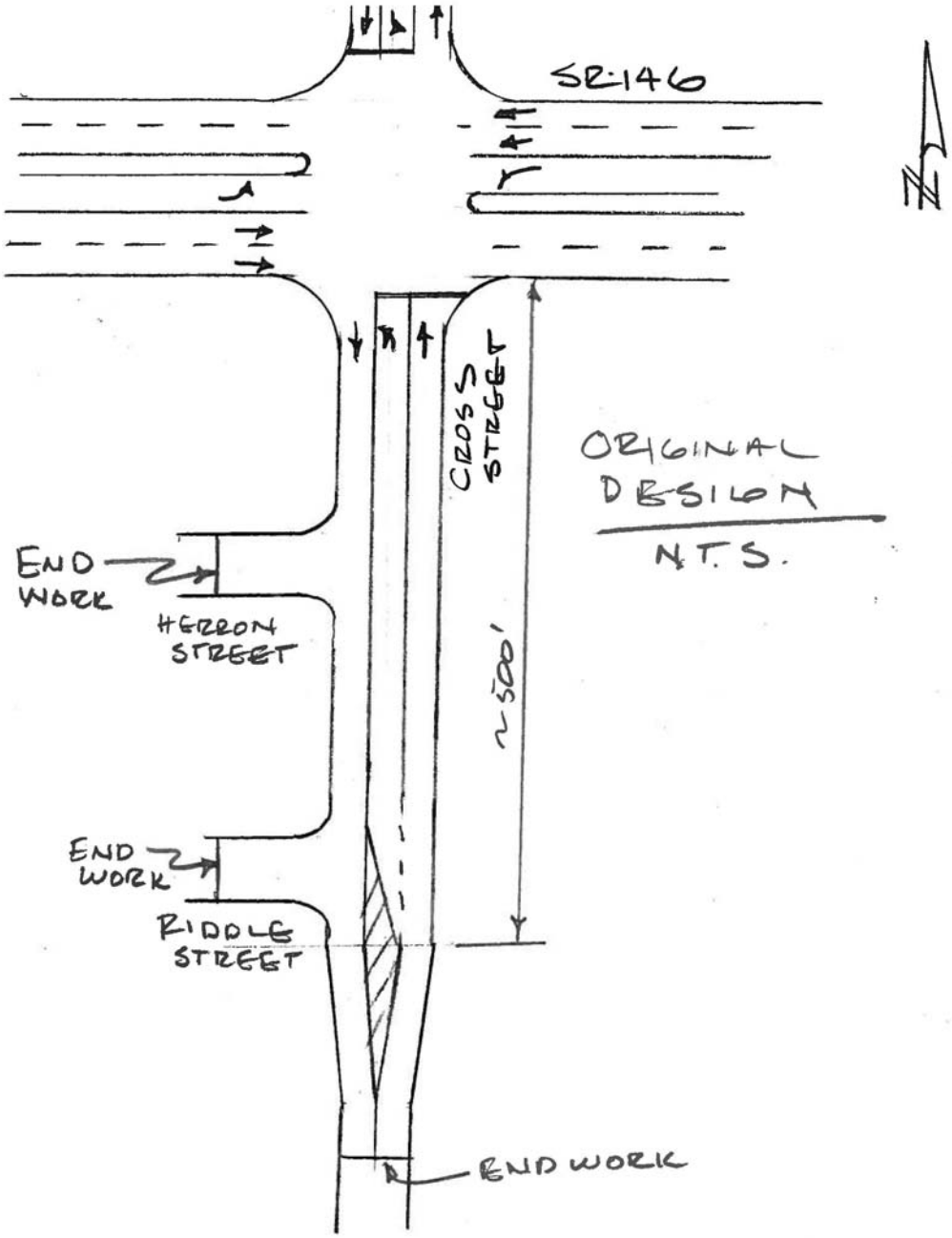
Technical Discussion:

It appears that the design may be to provide additional storage bay of sufficient length to allow left turning vehicles to "jump the queue" of the vehicles proceeding northbound on Cross Street. For higher volumes this would be desirable to avoid blocking this thru movement. However, the left-turn movement from Cross Street northbound onto SR-146 has a Design Year (2032) DHV of 25 VPH. This level of usage typically does not require extended storage and that for this projected movement, one would anticipate that a minimum design would be adequate.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 345,555	$ 0	$ 345,555
ALTERNATIVE	$ 0	$ 0	$ 0
SAVINGS	$ 345,555	$ 0	$ 345,555

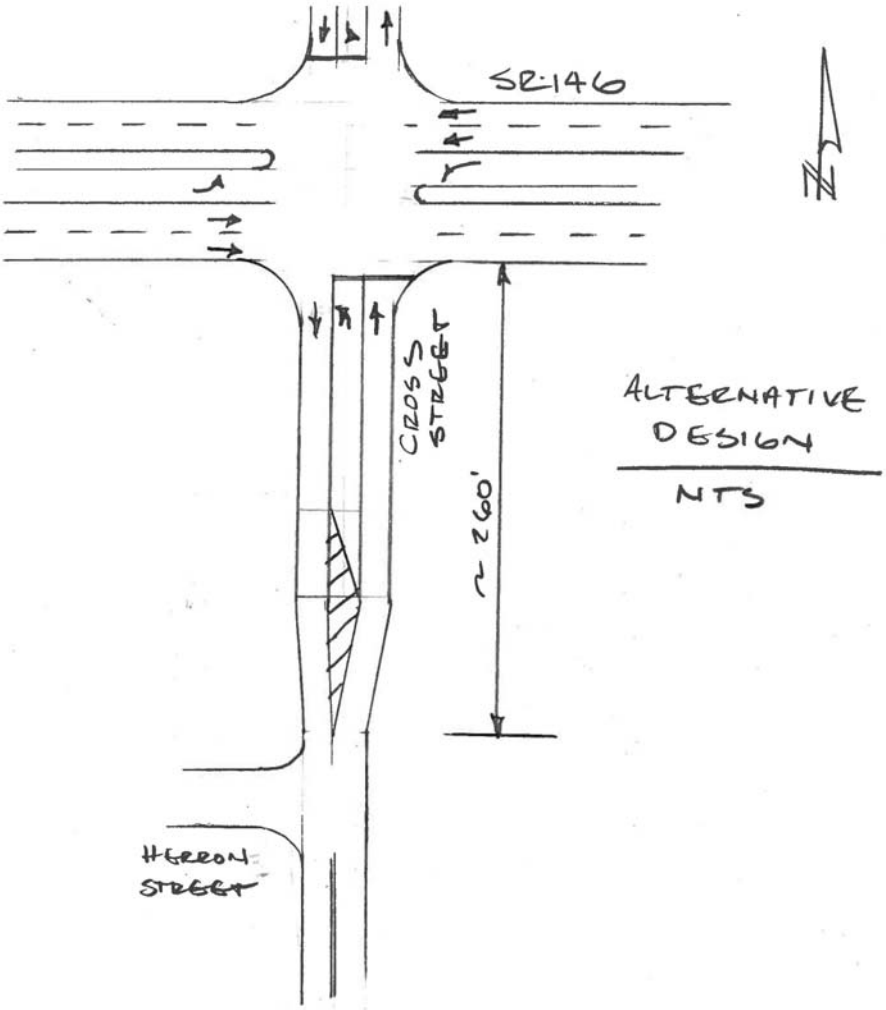
Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-8**
DESCRIPTION:	**Minimize improvements on Cross Street**	SHEET NO.: **2** of **5**



Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-8**
DESCRIPTION:	**Minimize improvements on Cross Street**	SHEET NO.: **3** of **5**



Calculations

PBS&J

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-8**
DESCRIPTION:	**Minimize improvements on Cross Street**	SHEET NO.: **4** of **5**

Reduced paving width:

Riddle Street- 20' x 130' = 2,600 SF
Herron Street- 30 x 100' = 3,000 SF
Cross Street- 36' x 370' =13,320 SF
Total 18,920 SF / (9SF / SY) => 2,105 SY

Reduced base width:

Riddle Street- 27' x 130' = 3,510 SF
Herron Street- 37 x 100' = 3,700 SF
Cross Street- 43' x 370' =15,910 SF
Total 23,120 SF / (9SF / SY) => 2,570 SY

Right of Way-
Assume 15,000 SF / 43,560 SF/AC => 0.35 Acres
0.35 AC x $250,000=> $87,500

Right of way:	Net cost	= $87,500
	Scheduling @ 55%	= $48,125
		= $135,625
	Court cost @ 60%	= $81,375
	Total	= $217,000

Paving-

Superpave	12.5mm	= [(2,105 SY) x 165#/SY-IN / (2000#/Ton)] => 174 TN
Superpave	19.0mm	= [(2,105 SY) x 220#/SY-IN / (2000#/Ton)] => 232 TN
Superpave	25.0mm	= [(2,105 SY) x 440#/SY-IN / (2000#/Ton)] => 463 TN
12" GAB		=> 2,570 SY

Curb & Gutter:

600 LF x 2 sides => 1200 LF

Sidewalk:

(500 LF x 5 FT) / (9SF / SY) => 30 SY

Cost Worksheet

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa
Catoosa County

ALTERNATIVE NO.: **RD-8**

DESCRIPTION: **Minimize improvements on Cross Street**

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
				$ -			$ -
12.5 mm Superpave	TN	174	$ 56.36	$ 9,807	0	$ 56.36	$ -
19.0 mm Superpave	TN	232	$ 57.93	$ 13,440	0	$ 57.93	$ -
25.0 mm Superpave	TN	463	$ 53.81	$ 24,914	0	$ 53.81	$ -
GAB	SY	2,570	$ 13.24	$ 34,027	0	$ 13.24	$ -
Curb & Gutter Type-2	LF	1,200	$ 11.87	$ 14,244	0	$ 11.87	$ -
Sidewalk	SY	30	$ 23.65	$ 710	0	$ 23.65	$ -
Right of Way	LS	1	$ 217,000.00	$ 217,000	0		$ -
Sub-total				$ 314,141			$ -
Mark-up at 10.00%				$ 31,414			$ -
TOTAL				**$ 345,555**			**$ -**
Estimated Savings:							$345,555

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-12**
DESCRIPTION:	**Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane**	SHEET NO.: **1** of **6**

Original Design:

The original design proposes full median openings at all the major cross-streets and several minor cross-streets.

Alternative Design:

The alternative design proposes eliminating the median openings and turn lanes at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane.

Opportunities:

- Improved traffic operations
- Reduced paving costs
- Improved access control

Risks:

- Objections by local citizens

Technical Discussion:

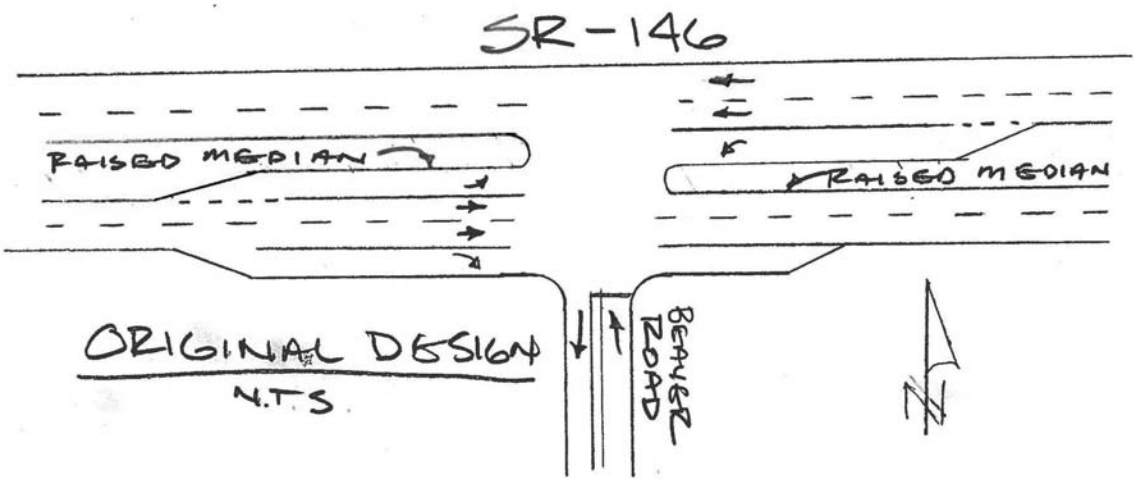
CR-57/Beaver Road has a Design Hour Volume of 100 vehicles in the design year (2032); Park Lane apartments and Linda Lane traffic projections were not provided. The traffic volumes on SR-146 in the vicinity of these three roadways range from ~33,000 VPD to ~38,500 VPD in the design year (2032).

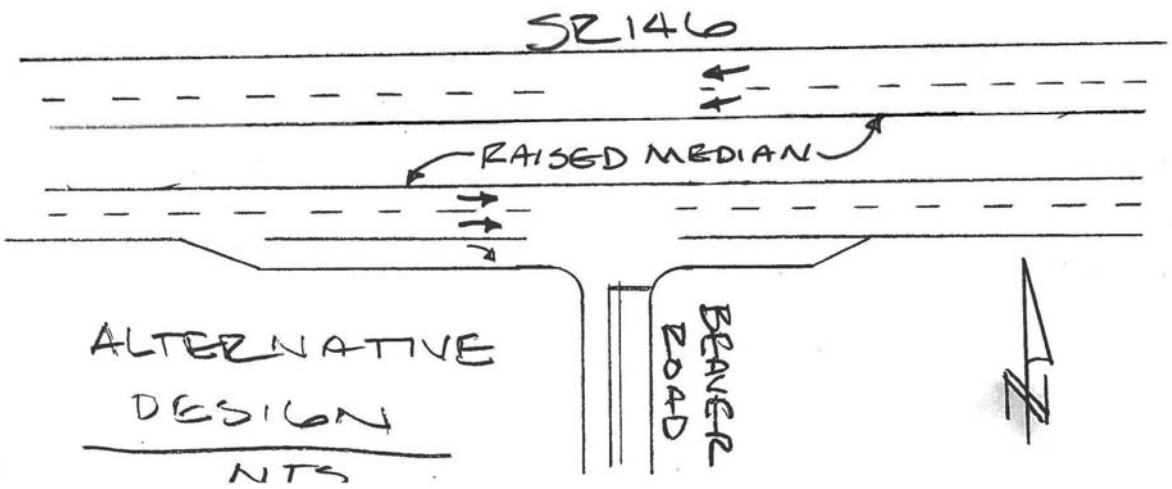
The introduction of full median openings at low volume (100) side streets which are unsignalized may adversely affect the operational efficiency of the main roadway.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 158,005	$ 0	$ 158,005
ALTERNATIVE	$ 9,625	$ 0	$ 9,625
SAVINGS	$ 148,380	$ 0	$ 148,380

Illustrations

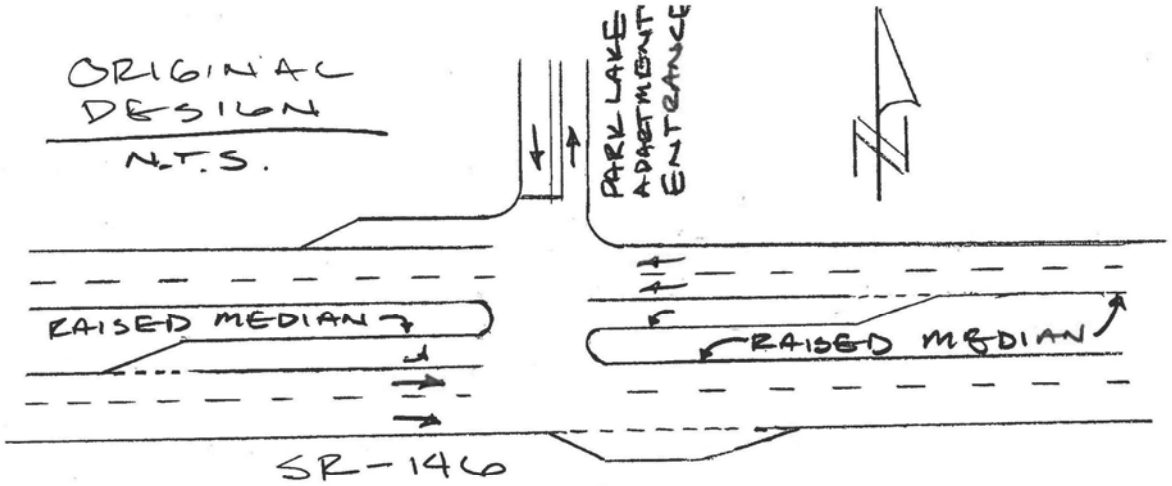
PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-12**
DESCRIPTION:	**Reduce median openings**	SHEET NO.: **2** of **6**

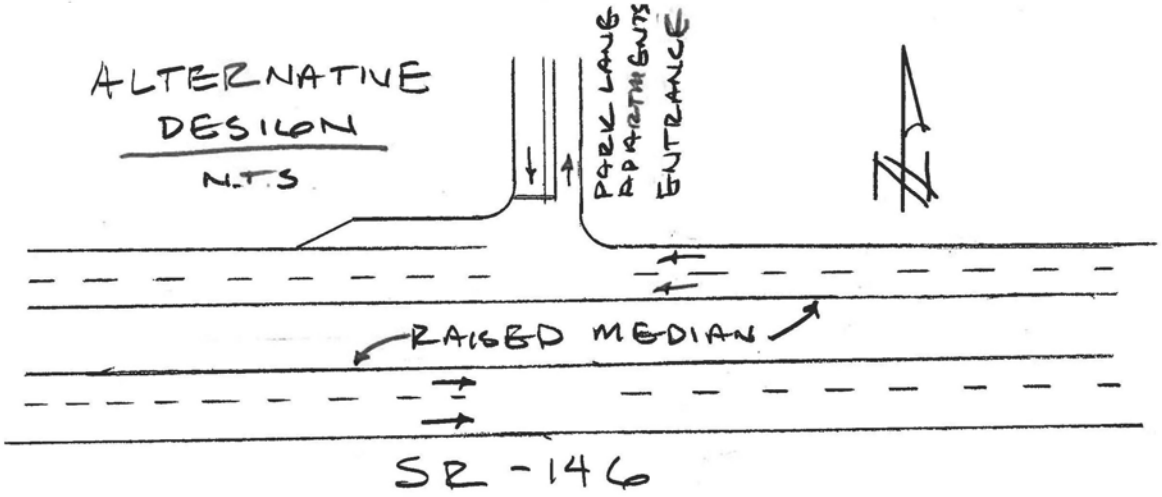




Illustrations

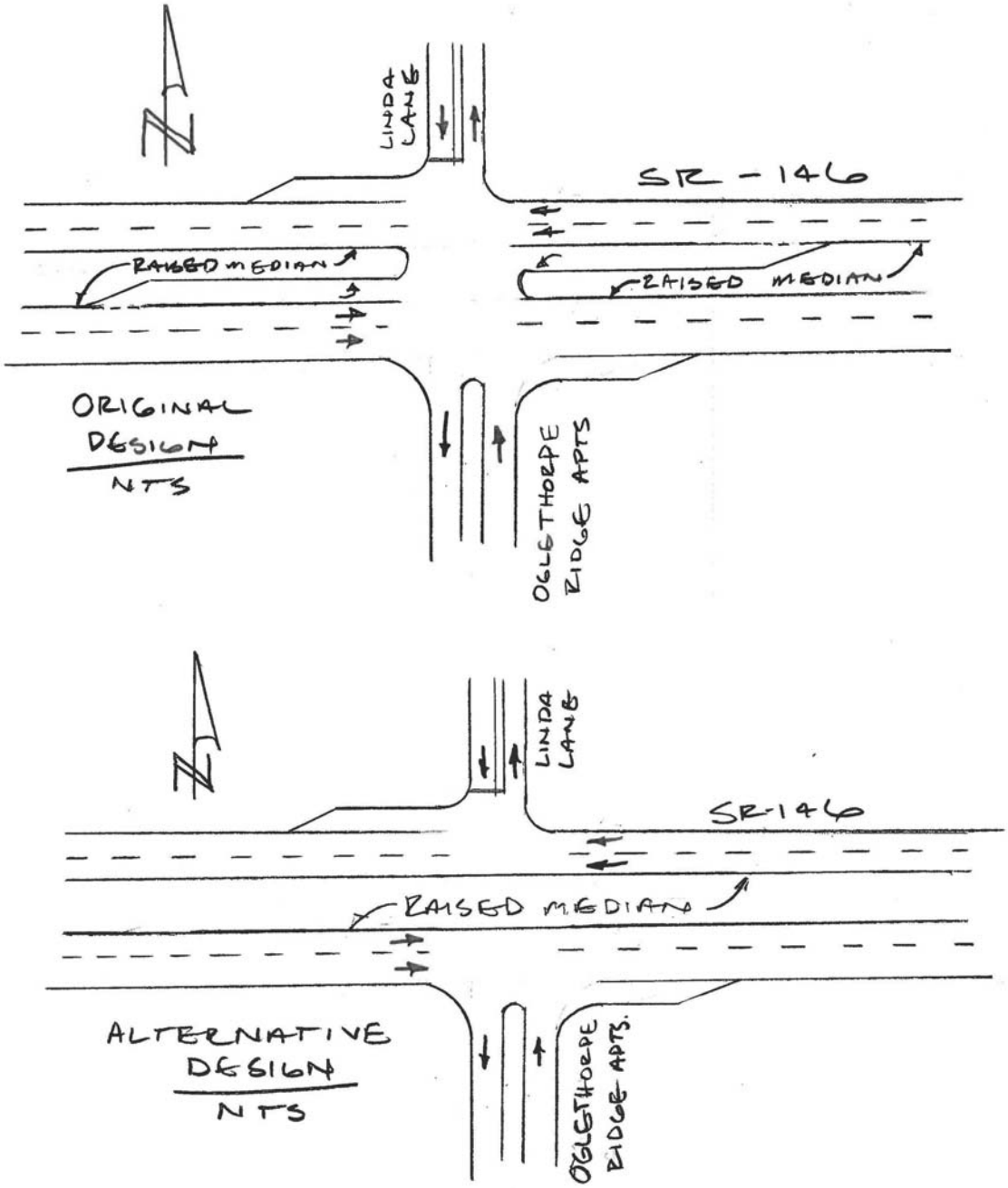
PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-12**
DESCRIPTION:	**Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane**	SHEET NO.: **3** of **6**





Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-12**
DESCRIPTION:	**Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane**	SHEET NO.: **4** of **6**



Calculations

PBS&J

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-12**
DESCRIPTION:	**Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane**	SHEET NO.: **5** of **6**

Paving Area:

Linda Lane –	Tapers	(50+50)x((12+0)/2)	= 600 SF
	Storage	(150+240)x12	= 4,680 SF
	Median	(100 x 20)	= 2,000 SF
Park Lake Drive –	Tapers	(100+100)x((12+0)/2)	= 1,200 SF
	Storage	(260+360)x12	= 7,440 SF
	Median	(100 x 20)	= 2,000 SF
Beaver Road –	Tapers	(100+100)x((12+0)/2)	= 1,200 SF
	Storage	(310+260)x12	= 6,840 SF
	Median	(100 x 20)	= 2,000 SF

Total- 27,960 SF / (9SF / SY) => 3,110 SY

Reduced Paving-

Superpave 12.5mm = [(3,110 SY) x 165#/SY-IN / (2000#/Ton)] => 257 TN
Superpave 19.0mm = [(3,110 SY) x 220#/SY-IN / (2000#/Ton)] => 342 TN
Superpave 25.0mm = [(3,110 SY) x 440#/SY-IN / (2000#/Ton)] => 684 TN
12" GAB = >3,110 SY

Curb & Gutter:

3 Locations x 2 sides x 100 LF => 600 LF

Concrete Median:

Linda Lane – (200 LF + 290 LF) x (3 FT wide) = 1,470 SF
Park Lake Drive – (360 LF + 460 LF) x (3 FT wide) = 2,460 SF
Beaver Road– (410 LF + 360 LF) x (3 FT wide) = 2,310 SF
Total- 6,240 SF / (9SF / SY) => 694 SY

Cost Worksheet

PBS&J

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-12**

DESCRIPTION: **Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane**

SHEET NO.: **6** of **6**

CONSTRUCTION ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL
				$ -			
12.5 mm Superpave	TN	257	$ 56.36	$ 14,485	0	$ 56.36	$ -
19.0 mm Superpave	TN	342	$ 57.93	$ 19,812	0	$ 57.93	$ -
25.0 mm Superpave	TN	684	$ 53.81	$ 36,806	0	$ 53.81	$ -
GAB	SY	3,110	$ 13.24	$ 41,176	0	$ 13.24	$ -
Curb & Gutter Type-7	LF	0	$ 11.87	$ -	600	$ 11.87	$ 7,122
Concrete Median 7.5"	SY	694	$ 45.19	$ 31,362	0	$ 45.19	$ -
Permenant Grassing	AC	0	$ 699.78	$ -	1	$ 699.78	$ 700
Fertilizer	TN	0	$ 400.19	$ -	1.5	$ 400.19	$ 600
Agricultural Lime	TN	0	$ 52.05	$ -	2	$ 52.05	$ 104
Nitrogen	LB	0	$ 2.24	$ -	100	$ 2.24	$ 224
Sub-total				$ 143,641			$ 8,750
Mark-up at 10.00%				$ 14,364			$ 875
TOTAL				**$ 158,005**			**$ 9,625**
Estimated Savings:							$148,380

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-14**
DESCRIPTION:	**Use 4” concrete median instead of 7.5” concrete median**	SHEET NO.: **1** of **4**

Original Design:

The original design calls for a 7.5” thick concrete median to be constructed throughout the project.

Alternative Design:

The alternative proposes using a 4” thick concrete median in lieu of the 7.5” concrete median thickness utilizing borrow material to make up the vertical differential.

Opportunities:

- Reduction in unit item costs
- Reduction in construction time

Risks:

- None apparent

Technical Discussion:

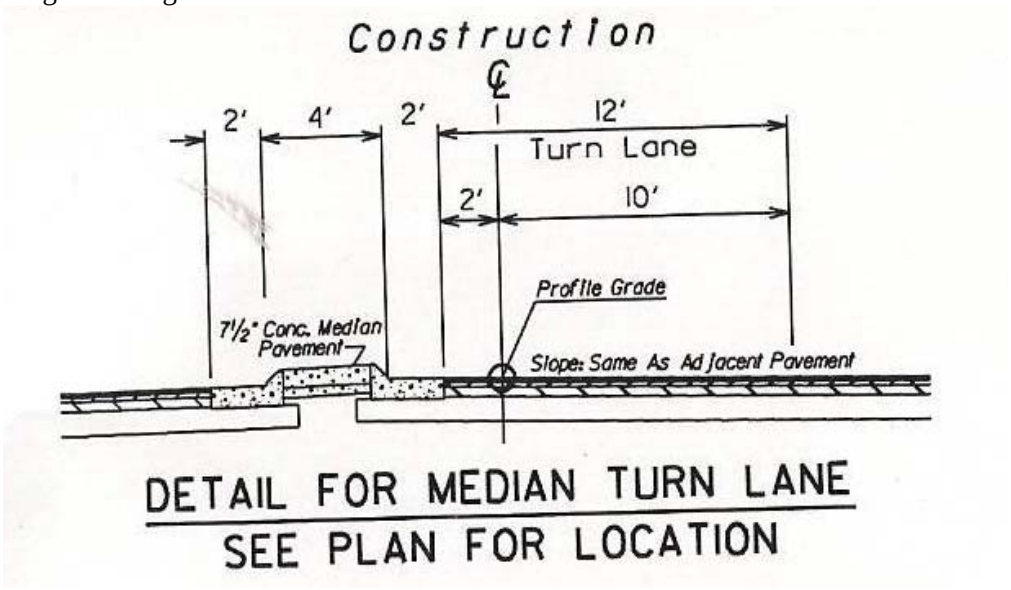
The VE Team is proposing using 4" concrete median in lieu of 7.5" median because the low volume of truck traffic (4%) makes damage to the median less likely in the event of trucks "hopping the curb" onto the median. The reason that the 7.5" concrete median is set up is to match the height of the curb and gutter. The alternative proposes using borrow to fill in the vertical differential from the bottom of the 4" median to the bottom of the adjoining curb. The 4" median should perform the intended function of the 7.5" median at a reduced cost to the project, without compromising the operation or function for which it is intended.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 342,992	$ 0	$ 342,992
ALTERNATIVE	$ 179,912	$ 0	$ 179,912
SAVINGS	$ 163,080	$ 0	$ 163,080

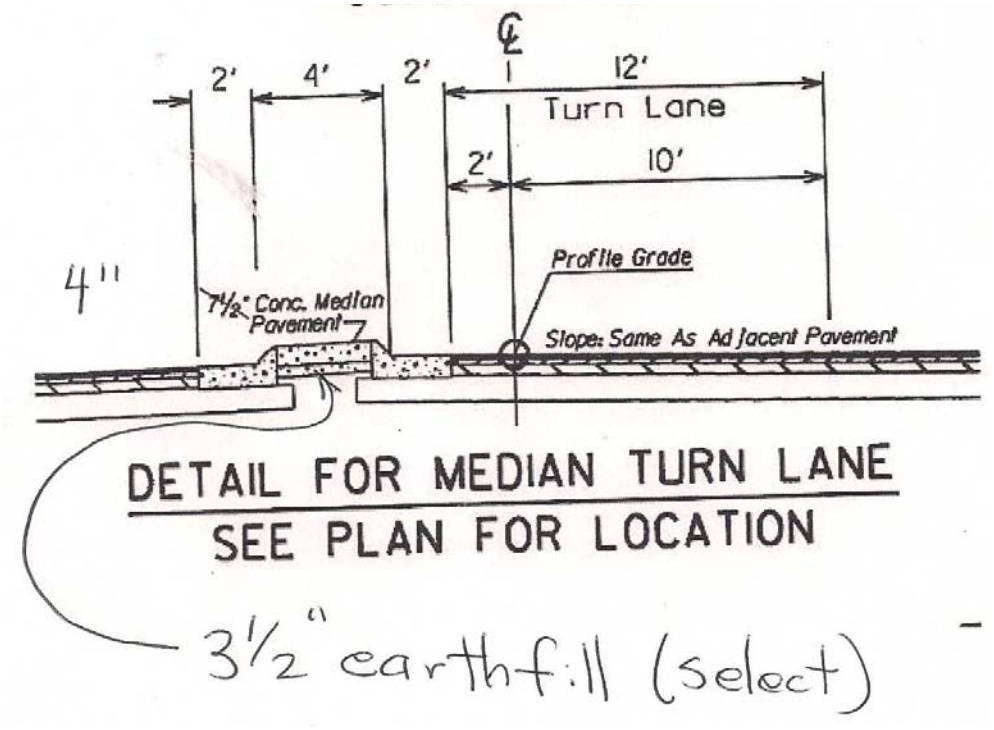
Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-14**
DESCRIPTION:	**Use 4" concrete median instead of 7.5" concrete median**	SHEET NO.: **2** of **4**

Original Design:



Alternative Design:



Calculations

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-14**
DESCRIPTION:	**Use 4” concrete median instead of 7.5” concrete median**	SHEET NO.: **3** of **4**

Price per SY of 4” Concrete Median= $22.60
Price per SY of 7.5” Concrete Median=$45.19
Prices derived from GDOT Item Mean Summary dated January 10, 2010

Concrete median area=6,900 SY per design. Using 4” concrete median in lieu of 7.5” concrete median leaves a 3.5” void to be filled. The alternative proposes using borrow excavation to fill this void.

6,900SY x 0.292FT= 2,015 CY Borrow required to fill void.

The vertical differential created by using the 4” concrete median is filled by using borrow excavation in this alternative. Cost savings are generated by unit price differentials and are offset by borrow costs.

Cost Worksheet

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27
East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-14**

DESCRIPTION: **Use 4" concrete median instead of 7.5" concrete**

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
441-0754 Concrete Median 7.5"	SY	6,900	$ 45.19	$ 311,811	0	$ 45.19	$ -
441-0740- Concrete Median 4"	SY	0	$ 22.60	$ -	6900	$ 22.60	$ 155,940
206-0002- Borrow Excavation	CY	0	$ 3.78	$ -	2015	$ 3.78	$ 7,617
Sub-total				$ 311,811			$ 163,557
Mark-up at 10.00%				$ 31,181			$ 16,356
TOTAL				**$ 342,992**			**$ 179,912**
Estimated Savings:							$163,080

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-18**
DESCRIPTION:	**Eliminate sidewalks on side streets: Cross Street, Fant Drive and Cedar Lane.**	SHEET NO.: **1** of **4**

Original Design:

The original design proposes constructing sidewalks along Cross Street, Fant Drive and Cedar Lane.

Alternative Design:

The alternative design proposes eliminating the sidewalks along Cross Street, Fant Drive and Cedar Lane.

Opportunities:

- Reduce construction costs
- Reduce right of way construction

Risks:

- None apparent

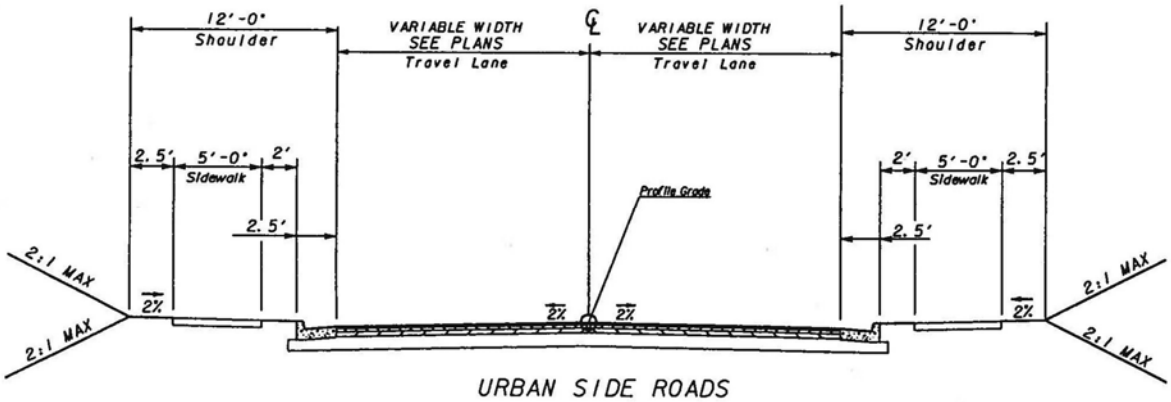
Technical Discussion:

Typically, when constructing new sidewalks in an existing area the limit of construction ends at the point of tangency or curvature with the existing side road. These existing side roads do not have sidewalks.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 59,835	$ 0	$ 59,835
ALTERNATIVE	$ 0	$ 0	$ 0
SAVINGS	$ 59,835	$ 0	$ 59,835

Illustrations

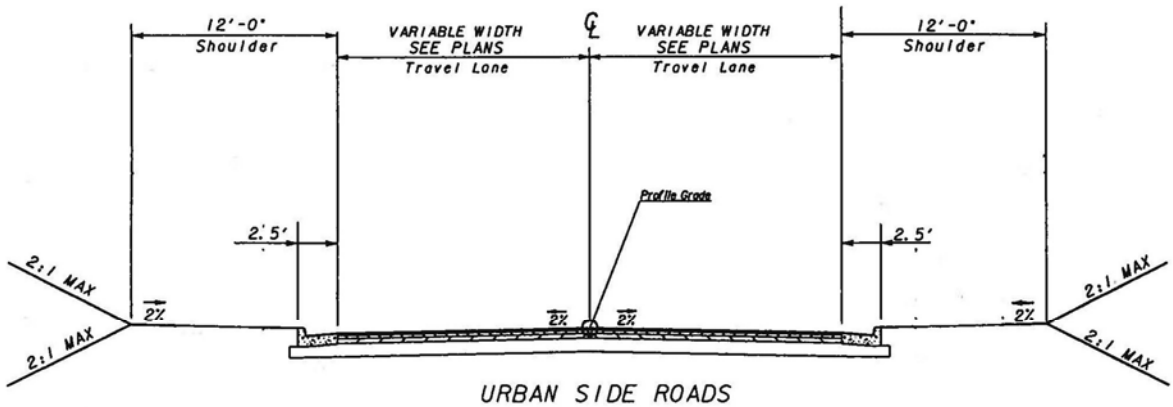
PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-18**
DESCRIPTION:	**Eliminate sidewalks on side streets: Cross Street, Fant Drive and Cedar Lane.**	SHEET NO.: **2** of **4**



URBAN SIDE ROADS

ORIGINAL DESIGN

N.T.S.



URBAN SIDE ROADS

ALTERNATING DESIGN

N.T.S.

Calculations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-18**
DESCRIPTION:	**Eliminate sidewalks on side streets: Cross Street, Fant Drive and Cedar Lane.**	SHEET NO.: **3** of **4**

Sidewalks:

Cross Street - 2,100 LF
Fant Drive- 1,200 LF
Cedar Lane- 800 LF
Total- 4,100 LF

(4,100 LF x 5 FT) / (9SF / SY) => 2,300SY

Cost Worksheet

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-18**

DESCRIPTION: **Eliminate sidewalks on side streets: Cross Street, Fant Drive and Cedar 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
				$ -			$ -
Concrete Sidewalk 4"	SY	2,300	$ 23.65	$ 54,395	0	$ 23.65	$ -
Sub-total				$ 54,395			$ -
Mark-up at 10.00%				$ 5,440			$ -
TOTAL				**$ 59,835**			**$ -**
Estimated Savings:							$59,835

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-19**
DESCRIPTION:	**Reduce ROW required for Pine Hill Drive to avoid the taking of the existing Conoco gas station**	SHEET NO.: **1** of **4**

Original Design:

The original design proposes adding a sidewalk with handi-cap ramps, curb and gutter and additional ROW on the north-east corner of Pine Hill Drive and US-27/SR-1 thereby taking the Conoco gas station.

Alternative Design:

The alternative design proposes to not extend the sidewalk at this location, and perform all new work within the current ROW thereby saving the taking of the Conoco Station.

Opportunities:

- Reduced ROW costs
- Reduce impact to local business

Risks:

- None apparent

Technical Discussion:

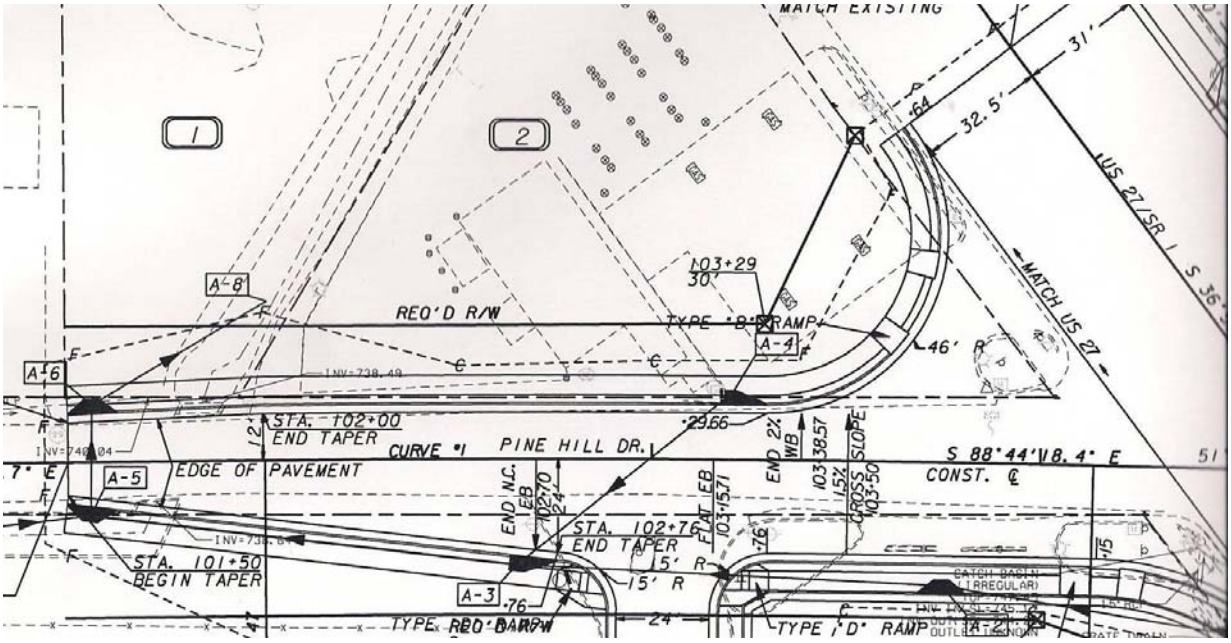
The current design does propose to keep the new pavement in line with the existing pavement, however, by increasing the radius of the curve and the addition of a new sidewalk with handi-cap ramps results in the taking of an existing business. The existing intersection is at 51 degrees with US 27 and the current design maintains this angle so as to minimize the adverse affects of the project. This minor change would significantly reduce the impact and save a business and about $550,000. Truck access would remain as it presently is accommodated.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 550,000	$ 0	$ 550,000
ALTERNATIVE	$ 0	$ 0	$ 0
SAVINGS	$ 550,000	$ 0	$ 550,000

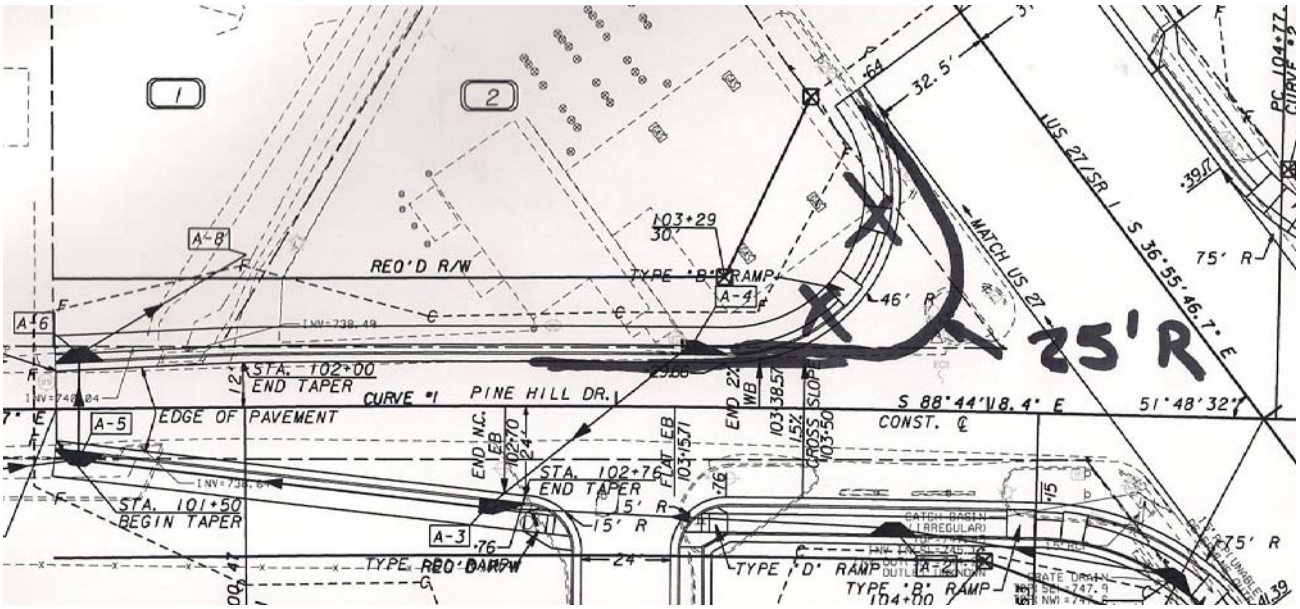
Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-19**
DESCRIPTION:	**Reduce ROW required for Pine Hill Drive to avoid the taking of the existing Conoco gas station**	SHEET NO.: **2** of **4**

CURRENT DESIGN



ALTERNATIVE DESIGN:



PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-19**
DESCRIPTION:	**Reduce ROW required for Pine Hill Drive to avoid the taking of the existing Conoco gas station**	SHEET NO.: **3** of **4**

Right of Way:

The documents provided did not identify an estimate for the taking of the Conoco. The VE Team made an assumption that the cost for the Conoco would conservatively be $500,000.

Cost Worksheet

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-19**

DESCRIPTION: **Reduce ROW required for Pine Hill Drive to avoid the taking of the existing Conoco gas station**

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
Right of Way	LS	1	$ 500,000.00	$ 500,000	0	$ -	$ -
Sub-total				$ 500,000			$ -
Mark-up at 10.00%				$ 50,000			$ -
TOTAL				**$ 550,000**			**$ -**

Estimated Savings: $550,000

Value Analysis Design Alternative

PROJECT:	**Georgia Department of Transportation STP00-1111-00(011)- P.I. No. 642220 SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road Catoosa County**	ALTERNATIVE NO.: **RD-21**
DESCRIPTION:	**Modify the alignment for the reconstruction of Fant Drive**	SHEET NO.: **1** of **4**

Original Design:

The original design proposes re-aligning 600 LF of Fant Drive to match up with McDonald Drive.

Alternative Design:

The alternative design proposes making a minor adjustment to the existing Fant Drive intersection to improve it to a 90° intersection.

Opportunities:

- Reduction in construction costs
- Reduction in stream and wetland impacts
- Reduction in ROW costs

Risks:

- None apparent

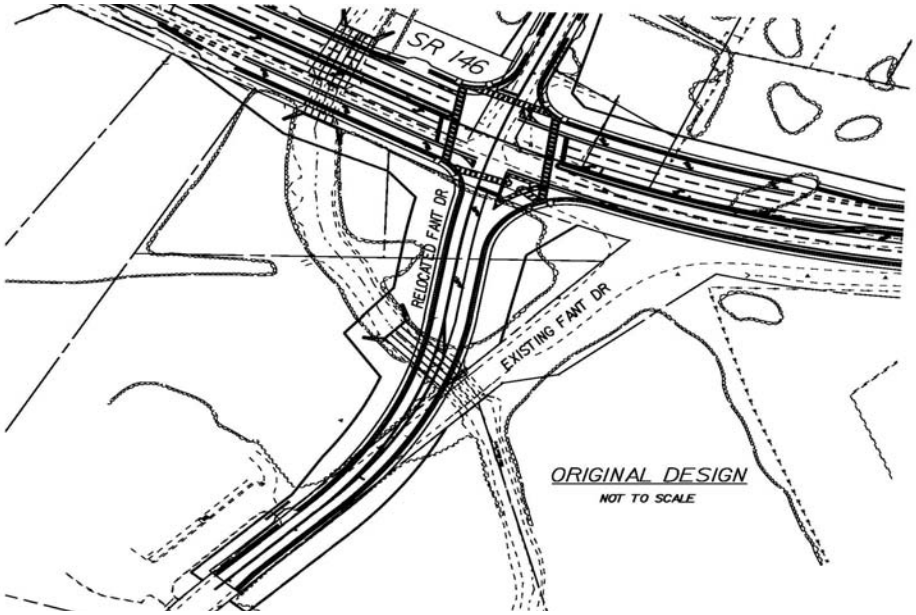
Technical Discussion:

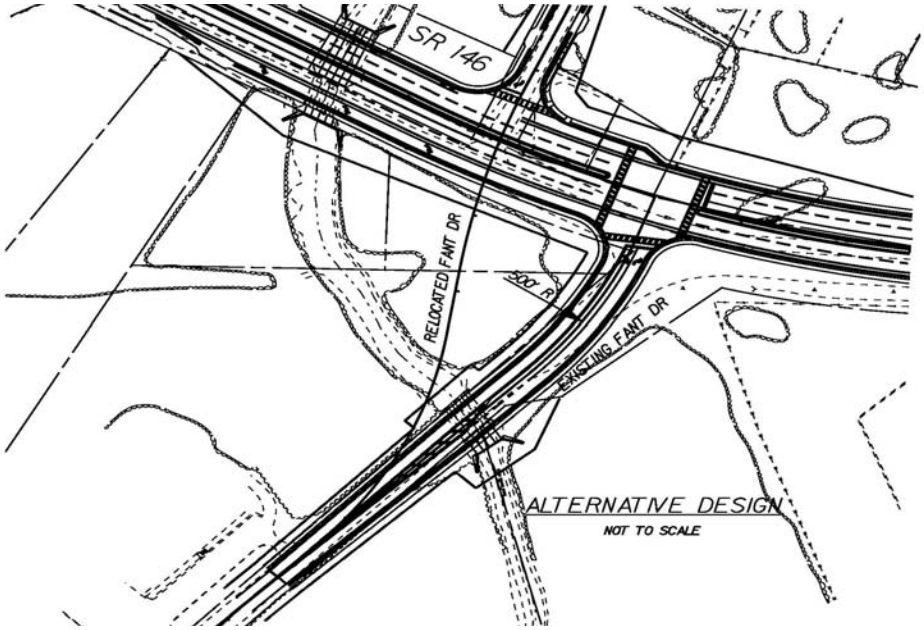
The proposed design improves the intersection angle of Fant Drive and realigns it with McDonald Drive. Aligning side roads to reduce the number of intersections is normally desirable. Traffic counts were not provided for McDonald Drive but it is anticipated that they would be much less than CR 57 which had a Design Year (2032) DHV of 680 VPD. Realigning Fant Drive to provide a median opening for McDonald Drive would provide minimal operational benefit and has notable impacts to R.O.W. costs, a major drainage structure, and wetlands. By simply improving the Fant Drive intersection angle and more closely following the existing alignment without matching McDonald Drive, these impacts are greatly reduced.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	$ 322,694	$ 0	$ 322,694
ALTERNATIVE	$ 5,806	$ 0	$ 5,806
SAVINGS	$ 316,888	$ 0	$ 316,888

Illustrations

PROJECT:	**Georgia Department of Transportation** **STP00-1111-00(011)- P.I. No. 642220** **SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road** **Catoosa County**	ALTERNATIVE NO.: **RD-21**
DESCRIPTION:	**Modify the alignment for the reconstruction of Fant Drive**	SHEET NO.: **2** of **4**





Calculations

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-21**

DESCRIPTION: **Modify the alignment for the reconstruction of Fant Drive**

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

Assume the paving on Fant Drive remains the same.
Reduce the paving on SR-146 for the elimination of the median opening at Linda Lane.

Paving Area:

Linda Lane –	Tapers	(50+50)x((12+0)/2)	= 600 SF
	Storage	(150+240)x12	= 4,680 SF
	Median	(100 x 20)	= 2,000 SF
Total-			7,280 SF / (9SF / SY) => 810 SY

Reduced Paving-

Superpave	12.5mm	= [(810 SY) x 165#/SY-IN / (2000#/Ton)] =>	67 TN
Superpave	19.0mm	= [(810 SY) x 220#/SY-IN / (2000#/Ton)] =>	89 TN
Superpave	25.0mm	= [(810 SY) x 440#/SY-IN / (2000#/Ton)] =>	178 TN
12" GAB			= >810 SY

Curb & Gutter:
1 location x 2 sides x 100 LF => 200 LF

Concrete Median:
Linda Lane – (200 LF + 290 LF) x (3 FT wide) = 1,470 SF

Assume a reduction in the extension of the quad 8'x 6' RCB from 75' to 20'
Concrete- 4 CY / LF x(75'-20) =>220 CY
Steel- 120# / LF x(75'-20) =>6,600 LB

Right of Way-
Assume 35,000 SF / 43,560 SF/AC => 0.80 Acres
0.80 AC x $50,000=> $40,000

Right of way:	Net cost	= $40,000
	Scheduling @ 55%	= $22,000
		= $62,000
	Court cost @ 60%	= $37,200
	Total	= $99,200

Assume a reduction in wetland mitigation cost of $10,000 for the additional disturbance on Black Branch Creek.

Cost Worksheet

PBS&J

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011)- P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

ALTERNATIVE NO.: **RD-21**

DESCRIPTION: **Modify the alignment for the reconstruction of Fant Drive**

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
				$ -			$ -
12.5 mm Superpave	TN	67	$ 56.36	$ 3,776		$ 56.36	$ -
19.0 mm Superpave	TN	89	$ 57.93	$ 5,156		$ 57.93	$ -
25.0 mm Superpave	TN	178	$ 53.81	$ 9,578		$ 53.81	$ -
GAB	SY	810	$ 13.24	$ 10,724		$ 13.24	$ -
Curb & Gutter Type-7	LF	0	$ 11.87	$ -	200	$ 11.87	$ 2,374
Concrete Median 7.5"	SY	1,470	$ 45.19	$ 66,429		$ 45.19	$ -
Permenant Grassing	AC	0	$ 699.78	$ -	1	$ 699.78	$ 700
Fertilizer	TN	0	$ 400.19	$ -	1.5	$ 400.19	$ 600
Agricultural Lime	TN	0	$ 52.05	$ -	2	$ 52.05	$ 104
Nitrogen	LB	50	$ 2.24	$ 112		$ 2.24	$ -
Class A Concrete	CY	220	$ 361.01	$ 79,422	0	$ 361.01	$ -
Bar Reinf Steel	LB	6,600	$ 0.60	$ 3,960	0	$ 0.60	$ -
R.O.W.	LS	1	$ 99,200	$ 99,200	0	$ -	$ -
Clearing and Grubbing	LS	1	$ 5,000	$ 5,000	1	$ 1,500.00	$ 1,500
Wetland Mitigation	LS	1	$ 10,000	$ 10,000	0	$ -	$ -
Sub-total				$ 293,358			$ 5,278
Mark-up at 10.00%				$ 29,336			$ 528
TOTAL				**$ 322,694**			**$ 5,806**
Estimated Savings:							$316,888

PROJECT DESCRIPTION

INTRODUCTION

The subject of this Value Engineering study is project STP00-1111-00-(011) – P.I. No. 642220. This project is for the widening of SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road in Catoosa County, Georgia. The length of the project is 2.2 miles.

PROJECT DESCRIPTION

SR 146 is classified as an urban minor arterial roadway. The AADT for 2006 indicated 23,400 vehicles with an estimated 29,300 vehicles for the 2026 design year.

The current roadway consists of two lanes with substandard rural ditches. The right-of-way is very narrow. The proposed typical section will consist of four 12 ft. through lanes, curb and gutter, a 20' median, a 4' bike lane and a 5' sidewalk on both sides of the roadway. The proposed design speed will be posted at 45 mph.

The new alignment will not be symmetrical to avoid impacts to historical properties. Twenty-two residential properties and four commercial properties will be displaced.

Environmental concerns include impacts to Black Branch Creek. Box culverts will need to be replaced.

NEED AND PURPOSE

The proposed project is primarily needed to provide additional capacity to meet projected growth requirements.

CONSTRUCTION COSTS

The estimated construction cost for the project is projected at $12,295,439. In addition, Right-of-Way costs are projected at $25,556,000 and reimbursable utilities at $3,571,733. The projected total cost for the project is $41,423,172.

REPRESENTATIVE DOCUMENTS

- Georgia Department of Transportation
    - Construction Cost Estimate
    - Right-of-Way Cost Estimate
    - Revised Concept Report
    - Project Location Map
    - Environmental Commitments
    - Typical Road Section

The VE Team utilized the GDOT supplied project materials noted above plus the preliminary plans provided by QK4.

RECEIVED
JUL 3 1 2006
BY:

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE: STP-1111(11)Catoosa County
P.I. No. 642220
SR 146/Cloud Springs Road
From SR 1/US 27 East To CR 553/Lakeview RD.

OFFICE: Atlanta, Georgia

DATE: July 10, 2006

FROM: M. Babs Abubakari
Mohammed (Babs) Abubakari, P.E.,
State Consultant Design and Program Delivery Engineer

TO: Meg Pirkle, Assist. Director of Preconstruction

SUBJECT: REVISED Project Concept Report

Attached is the original copy of the revised Concept Report for you further handling for approval in accordance with the Plan Development Process (PDP).

The SR 146 typical section has been revised since the original concept was approved. The original typical section consisted of two 12-ft through lanes in each direction with a 20-foot median, plus curb and gutter and 5-ft sidewalks on each side of the roadway. The revised concept typical section consists of two 12-ft through lanes plus a 4-foot bike lane in each direction with a 20-foot median, plus curb and gutter and 5-foot sidewalks on both sides. The bike lanes have been added, because this section of SR 146 has been designated as a bikeway by the Chattanooga MPO.

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

DATE 8/4/06

State Transportation Planning Administrator

Distribution:

Brian Summers - State Project Review Engineer
Harvey Keepler - State Environmental/Location Engineer
Keith Golden - State Traffic, Safety, & Design Engineer
Joe Palladi - State Transportation Planning Administrator
Jamie Simpson - State Financial Management Administrator
Kent L. Sager - District 6 Engineer

REVISED PROJECT CONCEPT REPORT
PROJECT NUMBER STP-1111(11)
P.I. NO 642220

Project Location: SR 146 is located in Catoosa County, partially within the City of Ft. Oglethorpe. This project will begin at the intersection of SR 1/US 27 and continue 2.3 miles east to the intersection with Lakeview Drive, which is the western terminus of Project Number STP-1111(7).

Description of the approved concept:

PDP Classification:
Full Oversight ( ), Exempt(X), SF( ), Other( )

Functional Classification: Urban Minor Arterial

U.S. Route Number(s): none **State Route Number(s):** 146

Traffic (AADT) as shown in the approved concept:
Current Year: 23,400 (2006 AADT) **Design Year:** 29,300 (2026 AADT)

Proposed Features to be revised:

- Typical Section: The revised typical section consists of four 12-ft through lanes, two 4-foot bike lanes, curb and gutter, and ADA compliant 5-foot sidwalks on both sides of the roadway.

Updated Traffic Data:
Current Year: 21,600 (2012 AADT) **Design Year:** 38,980 (2032 AADT)

Programmed/Schedule:
P.E. 2000 R/W: 2008 Construction: 2012

Revised cost estimates:

CONSTRUCTION:	$6,307,800	RIGHT-OF-WAY:	$39,816,025
INFLATION: *	$1,004,669	ACQUIRED BY:	Georgia DOT
G E & C (10%):	$630,780	UTILITIES:	$3,571,733
* 3% forFive Years		ADJUSTED BY:	

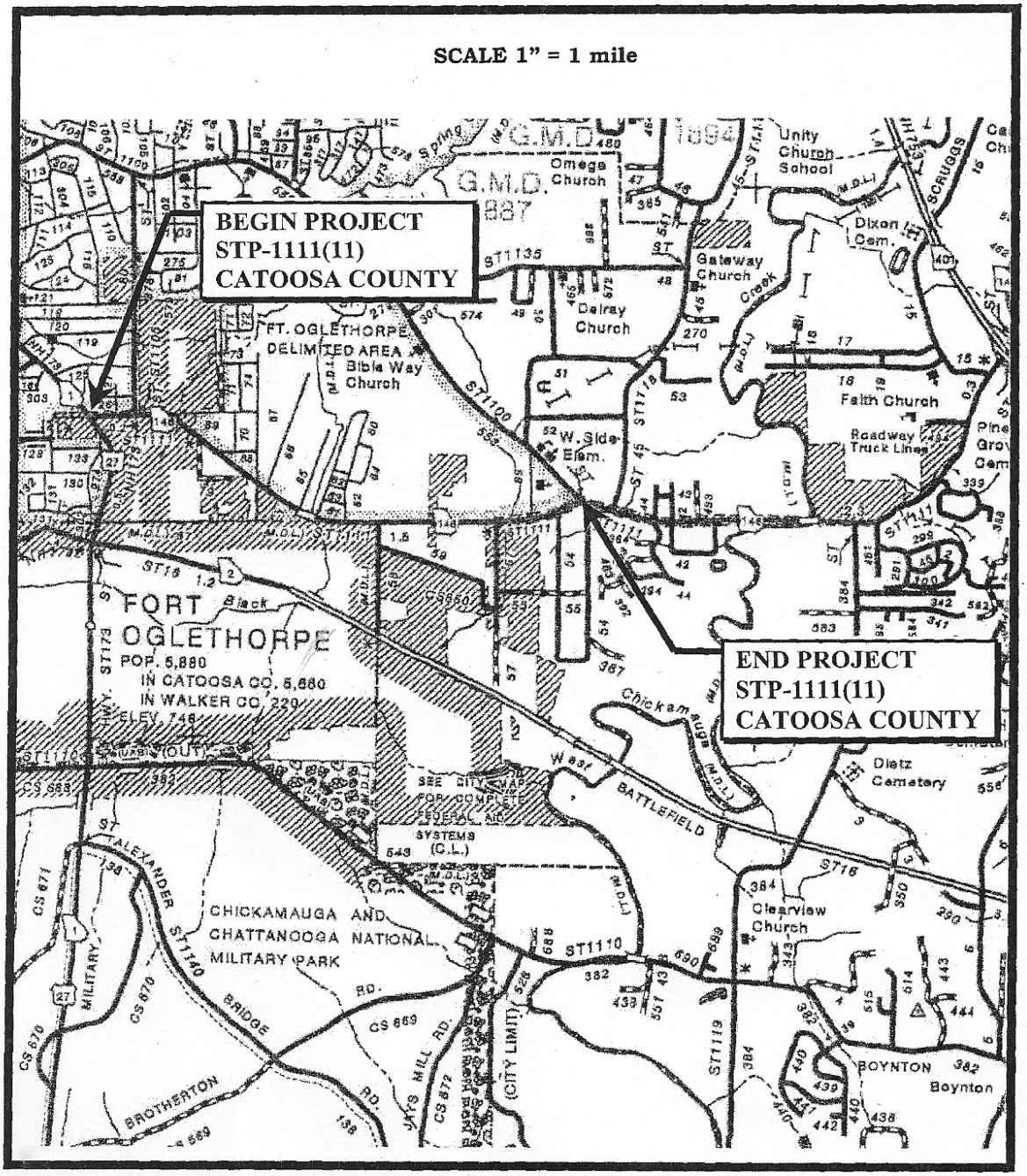
GRAND TOTAL COST: $51,331,007

Is the project located in a Non-attainment area? ___ Yes __X__ No

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

Project Number: STP-1111(11)
P. I. Number: 642220
County: Catoosa

PROJECT MAP - Project No. : STP-1111(11)



SR 146 Updated Annual Cost Estimate 2009-2010
P.I. # 642220

Section Major Structures

Item Number	Quantity	Units	Unit Price	Item Description	Cost
500-3101	1000	CY	$361.01	CLASS A CONCRETE	$361,010.00
511-1000	109000	LB	$0.60	BAR REINF STEEL	$65,400.00
				Section Sub Total	$426,410.00

Section Grading and Drainage

Item Number	Quantity	Units	Unit Price	Item Description	Cost
201-1500	1	LS	$1,800,000.00	CLEARING & GRUBBING -	$1,800,000.00
205-0001	85123	CY	$3.18	UNCLASS EXCAV	$270,691.14
206-0002	4462	CY	$3.79	BORROW EXCAV, INCL MATL	$16,910.98
550-1180	8216	LF	$29.26	STORM DRAIN PIPE, 18 IN, H 1-10	$240,400.16
550-1240	2805	LF	$35.55	STORM DRAIN PIPE, 24 IN, H 1-10	$99,717.75
550-1300	1707	LF	$41.22	STORM DRAIN PIPE, 30 IN, H 1-10	$70,362.54
550-1302	136	LF	$57.46	STORM DRAIN PIPE, 30 IN, H 15-20	$7,814.56
550-1360	500	LF	$49.38	STORM DRAIN PIPE, 36 IN, H 1-10	$24,690.00
550-1420	940	LF	$70.32	STORM DRAIN PIPE, 42 IN, H 1-10	$66,100.80
550-1480	1567	LF	$74.35	STORM DRAIN PIPE, 48 IN, H 1-10	$116,506.45
550-1540	102	LF	$113.00	STORM DRAIN PIPE, 54 IN, H 1-10	$11,526.00
550-1541	172	LF	$104.55	STORM DRAIN PIPE, 54 IN, H 10-15	$17,982.60
550-1600	490	LF	$96.65	STORM DRAIN PIPE, 60 IN, H 1-10	$47,358.50
				Section Sub Total	$2,790,061.48

Section Base and Paving

Item Number	Quantity	Units	Unit Price	Item Description	Cost
310-5080	6900	SY	$11.03	GR AGGR BASE CRS, 8 INCH, INCL MATL	$76,107.00
310-5120	81000	SY	$13.24	GR AGGR BASE CRS, 12 INCH, INCL MATL	$1,072,440.00
402-3147	12000	TN	$56.36	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	$676,320.00
402-3190	16000	TN	$57.93	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	$926,880.00
402-3121	31000	TN	$53.81	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL	$1,668,110.00
413-1000	6476	GL	$1.73	BITUM TACK COAT	$11,203.64
				Section Sub Total	$4,431,060.64

Section Lump Items

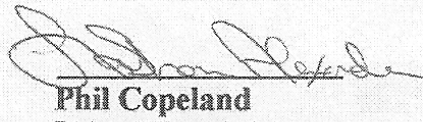
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	$400,000.00	TRAFFIC CONTROL -	$400,000.00
163-0232	1	LS	$70,000.00	TEMPORARY GRASSING	$70,000.00
201-1500	1	LS	$350,000.00	CLEARING & GRUBBING -	$350,000.00
647-1000	1	LS	$90,000.00	TRAFFIC SIGNAL INSTALLATION NO - 1 (SR 146 @ US 27)	$90,000.00
647-1000	1	LS	$90,000.00	St)	$90,000.00
647-1000	1	LS	$90,000.00	Fant Dr.)	$90,000.00
647-1000	1	LS	$90,000.00	Ln)	$90,000.00
				Section Sub Total	$1,180,000.00

Section Miscellaneous

Item Number	Quantity	Units	Unit Price	Item Description	Cost
153-1300	1	EA	$66,221.18	FIELD ENGINEERS OFFICE TP 3	$66,221.18
620-0100	1350	LF	$24.48	TEMPORARY BARRIER, METHOD NO. 1	$33,048.00
634-1200	200	EA	$85.92	RIGHT OF WAY MARKERS	$17,184.00
641-1200	800	LF	$14.57	GUARDRAIL, TP W	$11,656.00
641-5012	4	EA	$2,275.35	GUARDRAIL ANCHORAGE, TP 12	$9,101.40
				Section Sub Total	$137,210.58

Section Signing and Marking					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
610-9000	100	EA	$140.00	REM SIGN	$14,000.00
611-5360	25	EA	$61.50	RESET HIGHWAY SIGN	$1,537.50
636-1020	400	SF	$13.47	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	$5,388.00
636-1033	500	SF	$18.20	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING TP 9	$9,100.00
636-2070	1600	LF	$6.94	GALV STEEL POSTS, TP 7	$11,104.00
636-2090	400	LF	$7.59	GALV STEEL POSTS, TP 9	$3,036.00
657-5003	7	EA	$1,224.96	PREFORMED PLASTIC PAVEMENT MARKING, WORD TP 1 , TP PB	$8,574.72
652-5301	18500	LF	$0.15	SOLID TRAF STRIPE, 6 IN, WHITE	$2,775.00
653-1501	41000	LF	$0.31	THERMOPLASTIC SOLID TRAFFIC STRIPE, 5 IN, WHITE	$12,710.00
653-1502	33000	LF	$0.33	THERMOPLASTIC SOLID TRAFFIC STRIPE, 5 IN, YELLOW	$10,890.00
653-3501	28000	GLF	$0.22	THERMOPLASTIC SKIP TRAFFIC STRIPE, 5 IN, WHITE	$6,160.00
653-0120	110	EA	$68.32	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	$7,515.20
653-0170	20	EA	$98.02	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	$1,960.40
654-1001		EA	$2.96	RAISED PVMT MARKERS TP 1	$0.00
654-1003	1800	EA	$3.35	RAISED PVMT MARKERS TP 3	$6,030.00
				Section Sub Total	$100,780.82
Section Erosion Control					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0240	3225	TN	$144.95	MULCH	$467,463.75
165-0010	9500	LF	$0.43	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	$4,085.00
171-0010	19100	LF	$1.33	TEMPORARY SILT FENCE, TYPE A	$25,403.00
700-6910	16	AC	$699.78	PERMANENT GRASSING	$11,196.48
700-7000	81	TN	$52.05	AGRICULTURAL LIME	$4,216.05
700-8000	25	TN	$400.19	FERTILIZER MIXED GRADE	$10,004.75
700-8100	1339	LB	$2.24	FERTILIZER NITROGEN CONTENT	$2,999.36
716-2000	19500	SY	$0.94	EROSION CONTROL MATS, SLOPES	$18,330.00
				Section Sub Total	$543,698.39
Roadway Items					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
441-0018	7152	SY	$41.62	DRIVEWAY CONCRETE, 8 IN TK	$297,666.24
441-0104	18000	SY	$23.65	CONC SIDEWALK, 4 IN	$425,700.00
441-0754	6900	SY	$45.19	CONCRETE MEDIAN, 7 1/2 IN	$311,811.00
441-4030	3367	SY	$37.42	CONC VALLEY GUTTER, 8 IN	$125,993.14
441-6222	31450	LF	$11.87	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	$373,311.50
641-1100	800	LF	$42.46	GUARDRAIL, TP T	$33,968.00
				Section Sub Total	$1,568,449.88
				Subtotal Estimated Construction Cost	$11,177,671.79
				E & C Rate 10.0%	$1,117,767.18
				Total Construction Cost	$12,295,438.97
				Right Of Way	$25,556,000.00
				ReImb. Utilities	$3,571,733.00
				Grand Total Project Cost	**$41,423,171.97**

Preliminary Right of Way Cost Estimate



Phil Copeland
Right of Way Administrator
By: LaShone Alexander

Date: January 22, 2010
Project: STP-1111(11)Catoosa UPDATE
Existing/Required R/W: Varies/Varies
Project Termini : SR 146 from SR 1 to Lakeview Road
Project Description: SR 146 Widening Project

P.I. Number: 642220
No. Parcels: 167

Land:	Commercial R/W 6.54 acres @ $250,000/acre	$ 1,635,000	
	Commercial Esmt .05 acres @ $250,000/acre @ 50%	$ 6,250	
	Residential R/W 14.4 acres @ $ 50,000/acre	720,000	
	Agricultural R/W 3.16 acres @ $ 15,000/acre	47,400	
	Agricultural Esmt 0.02 acres @ $ 15,000/acre @ 50%	150	$ 2,408,800
Improvements :	businesses, houses, buildings, curbing, paving, signs, fencing, and misc. site improvements		6,400,000
Relocation:	Commercial (4)	$ 100, 000	
	Residential (22)	880,000	980,000
Damage :	Proximity ( )	$ 155,750	
	Cost to Cure ( )	160,000	
	Consequential ( )	200,000	515,750
	Net Cost		$ 10,304,550

Net Cost		$ 10,304,550
Scheduling Contingency	55 %	5,667,502
Adm/Court Cost	60	9,583,231
		$ 25,555,284

Total Cost $25,556,000

Note: Accuracy of estimate is the sole responsibility of the Preparer. This update based on consultant estimate dated 5/19/06.

Note: The Market Appreciation (40%) is not included in this updated Preliminary Cost Estimate.

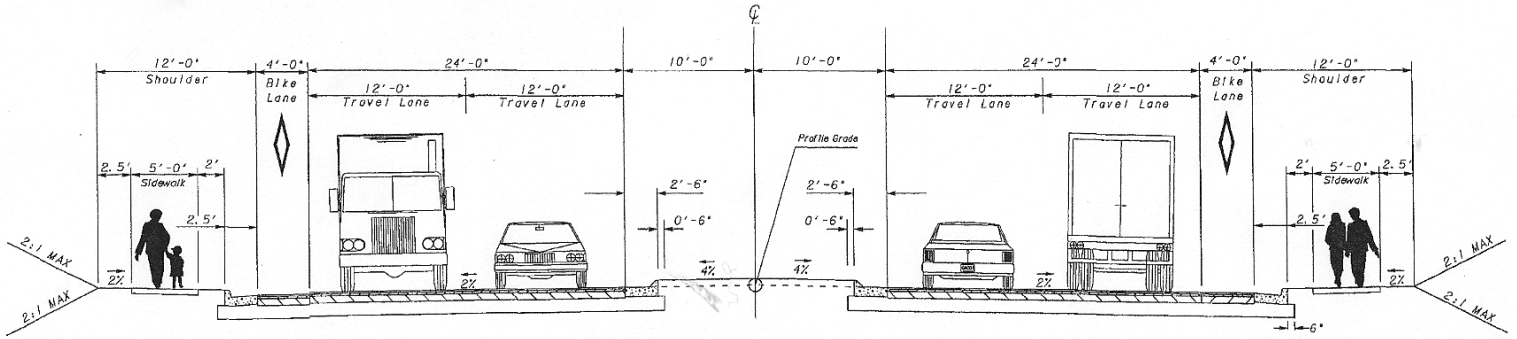
ENVIRONMENTAL COMMITMENTS/REQUIREMENTS

	Project Information	Project Manager Review		Specialist Review
Project No. :	STP-1111(11)	☐ I have reviewed these commitments and verified their feasibility.		
County:	Catoosa	☐ All delineations are marked on the plans.	Air/Noise	
P.I. No.:	642220		Archaeology	
Status:	Draft Environmental Assessment	_____	Ecology/404	
Date Updated	10/19/2009	PM Signature	History	

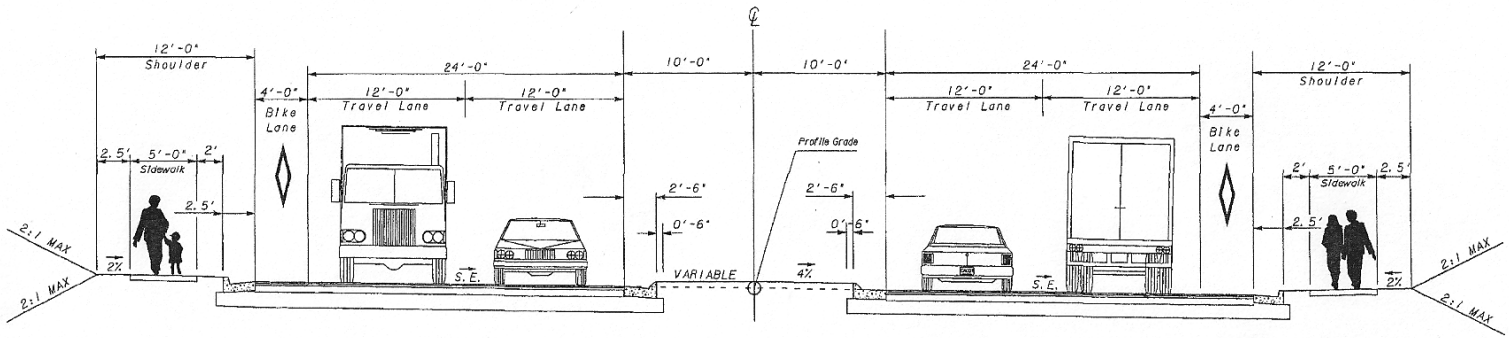
COMMITMENT/REQUIREMENT *Please separate out commitments by PI#*	DOCUMENT STIPULATED IN	RESPONSIBLE OFFICE	PLACE ON PLANS? (Yes or No)	REQUIRES A SPECIAL PROVISION? (Yes or No)	STATUS (Complete/ Incomplete) (During Construction: Signature Required) *See below for instructions*
Pre-Construction Commitments					
Identify eligible historic resources on project plans: The William-Smith House (Resource#12) The Melvin Eshew House (Resource #16) The Troy Potter House (Resource #19) Resource #20 (no name assigned) The Hobert Elkins House (Resource #24) The Cloud Springs Baptist Church (Resource #41) Resource #52 (no name assigned)	EA	GDOT Office of Program Delivery & OEL	Yes	No	Incomplete
Waters of the US placed on plans	EA	GDOT Office of Program Delivery & OEL	Yes	No	Incomplete
Delineate stream buffers on plans	EA	GDOT Office of Program Delivery & OEL	Yes	No	Incomplete
Prepare application for, and obtain approval of, US Army NW 14 Permit & PCN.	EA	GDOT Office of Program Delivery & OEL	No	No	Incomplete
Obtain stream mitigation for 417 linear feet of impact and wetland mitigation for 0.60 acres of impact.	EA	OEL	No	No	Incomplete
Prepare application for, and obtain approval of, a "Letter of No Objection" from the Tennessee Valley Authority for the crossing of Black Branch.	EA	OEL	No	No	Incomplete
Inventory existing vegetation and prepare landscape plans per MOA for the Melvin Eshew House, the Troy Potter House and Resource #20.	EA	OEL	No	No	Incomplete

During Construction Commitments

Construction or Area Engineer signature required for all other During Construction Commitments.



MAINLINE SR 146
TANGENT SECTION



MAINLINE SR 146
SUPERELEVATED SECTION

3/21/06

		STP-1111(11)	S.R. 146 WIDENING REVISED TYPICAL SECTIONS

DRAWING No. ___

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 February 15 through February 18, 2010 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, PE, CVS-Life	Team Leader
Luke Clarke, PE, AVS	Senior Highway Design Engineer
Kevin Martin, Esq., AVS	Highway Construction Specialist
Randy S. Thomas, CVS	Assistant Team Leader

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 Georgia Department of Transportation (GDOT) staff and Mulkey Engineers and Consultants. 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. A FAST diagram was prepared highlighting the projects required functions.

- The important functions of the project were identified as follows:

    - **Project Objective/Goals**

        - **Increase capacity**
        - **Minimize impacts to historical properties**

    - **Project Basic Functions**

        - **Increase capacity**
        - **Improve operations**
        - **Separate traffic**

- **Speculation Phase -** The VE team performed a brainstorming session to identify ideas that might help meet the project objectives.

  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
- Improve value
- 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.

VALUE ENGINEERING STUDY AGENDA

for
Georgia Department of Transportation

Project No. STP00-1111-00(011) – P.I. No. 64220

SR 146/Cloud Springs Road from SR 1/US 27
East to CR 553/Lakeview Road
Catoosa County

February 15-18, 2010

Pre-Workshop Activities

VE Team Leader coordinates with the Owner and Designer to organize 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.

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
- Visit project site if time permits

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

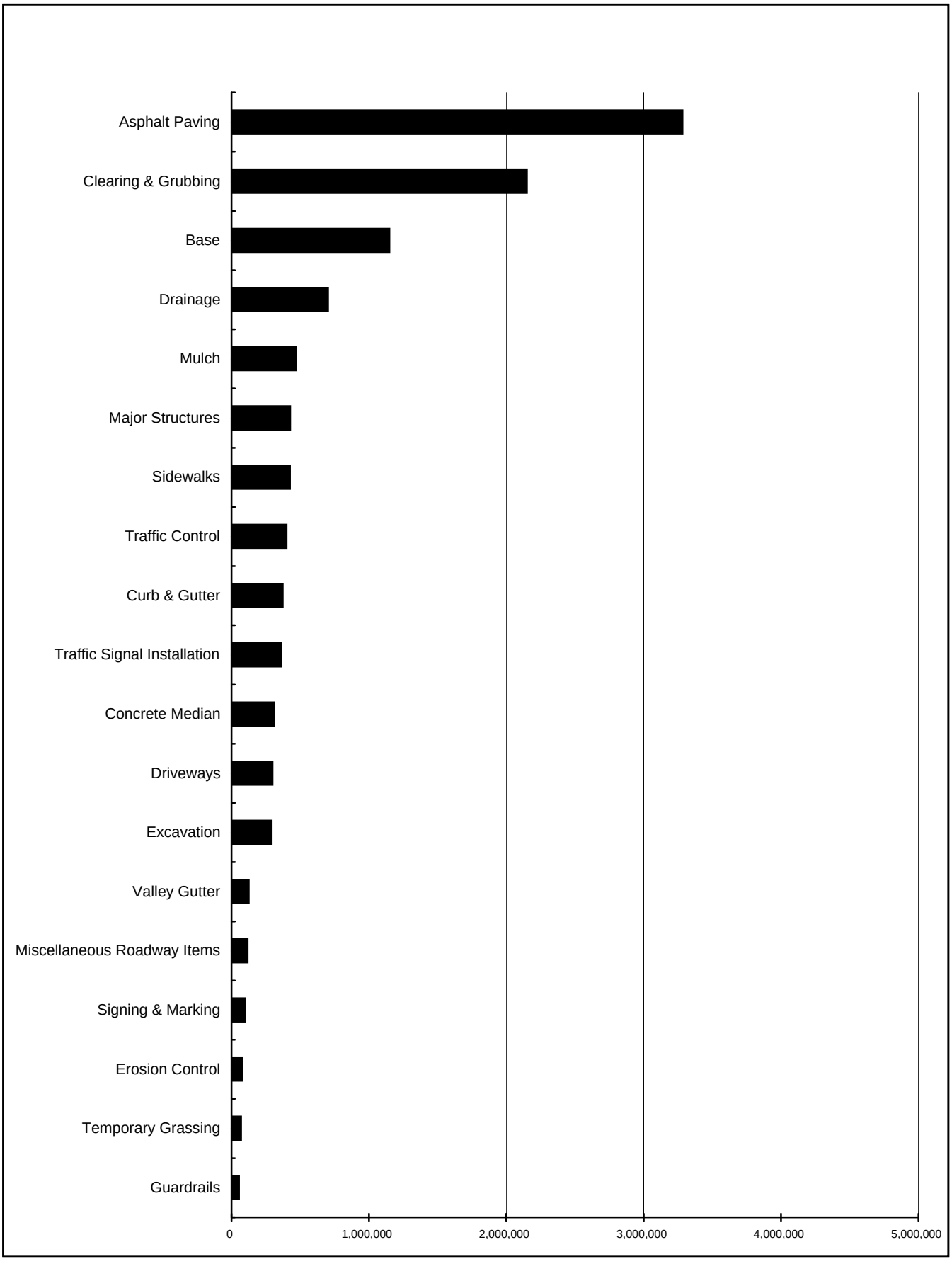
Day Four

8:00-9:00 Prepare Presentation
9:00-10:00 VE Team Presentation

PARETO CHART - COST HISTOGRAM

PROJECT: **Georgia Department of Transportation**
STP00-1111-00(011) - P.I. No. 642220
SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road
Catoosa County

PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Asphalt Paving	3,282,514	29.37%	29.37%
Clearing & Grubbing	2,150,000	19.23%	48.60%
Base	1,148,547	10.28%	58.88%
Drainage	702,459	6.28%	65.16%
Mulch	467,464	4.18%	69.34%
Major Structures	426,410	3.81%	73.16%
Sidewalks	425,700	3.81%	76.97%
Traffic Control	400,000	3.58%	80.55%
Curb & Gutter	373,312	3.34%	83.89%
Traffic Signal Installation	360,000	3.22%	87.11%
Concrete Median	311,811	2.79%	89.90%
Driveways	297,666	2.66%	92.56%
Excavation	287,602	2.57%	95.13%
Valley Gutter	125,993	1.13%	96.26%
Miscellaneous Roadway Items	116,454	1.04%	97.30%
Signing & Marking	100,781	0.90%	98.20%
Erosion Control	76,234	0.68%	98.88%
Temporary Grassing	70,000	0.63%	99.51%
Guardrails	54,725	0.49%	100.00%
Construction Cost less ROW & Utilites	**$ 11,177,672**		
E & C Rate @10%	**$ 1,117,767**		
Total Construction Costs	**$ 12,295,439**		
Right-of-Way	**$ 25,556,000**		
Utilities Reimbursement	**$ 3,571,733**		
TOTAL	**$ 41,423,172**		


Asphalt Paving
Clearing & Grubbing
Base
Drainage
Mulch
Major Structures
Sidewalks
Traffic Control
Curb & Gutter
Traffic Signal Installation
Concrete Median
Driveways
Excavation
Valley Gutter
Miscellaneous Roadway Items
Signing & Marking
Erosion Control
Temporary Grassing
Guardrails
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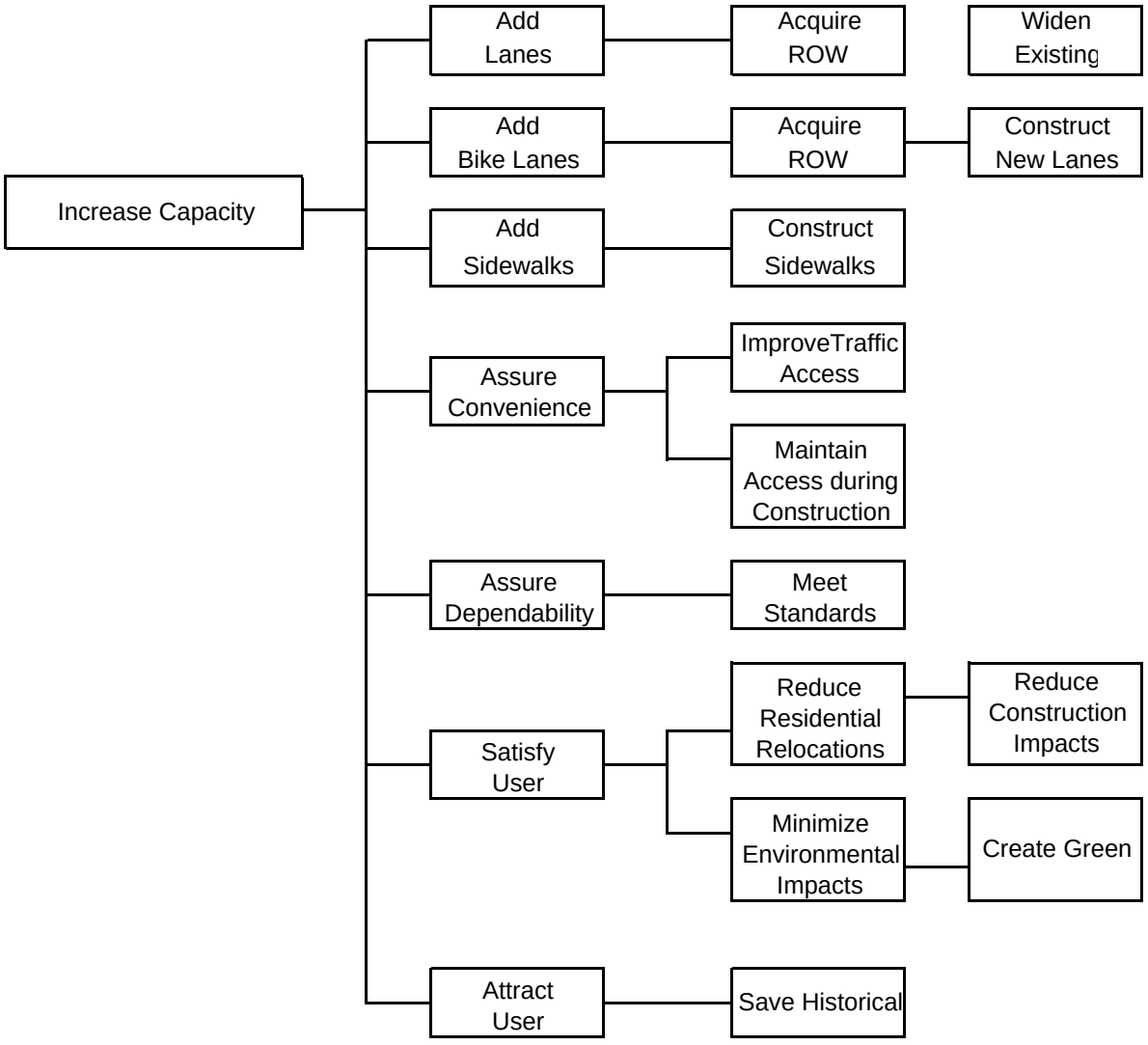
CUSTOMER FUNCTION/TASK DIAGRAM
Project No. STP00-1111-00(011)
P.I. No. P.I. No. P.I. No. 642220
Catoosa County

SR 146/Cloud Springs Road from SR 1/US 27 East to CR 553/Lakeview Road



DESIGNER PRESENTATION

MEETING PARTICIPANTS

Geogia Department of Transportation **February 15, 2010**

STP00-1111-00(011) - P.I. No. 642220

Catoosa County

NAME	ORGANIZATION & TITLE	E-MAIL	PHONE
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Jeff Dyer	Qk4	jdyer@qk4.com	404-417-3024
Matt Houser	Qk4	mhouser@qk4.com	404-417-3021
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Michael Murdoch	GDOT-Environmental Services	michael.murdoch@dot.ga.gov	404-631-1178

VE TEAM PRESENTATION

MEETING PARTICIPANTS

Geogia Department of Transportation **February 18, 2010**

STP00-1111-00(011) - P.I. No. 642220

Catoosa County

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CREATIVE IDEA LISTING

PROJECT: **Georgia Department of Transportation**
SR 146/Cloud Springs Road from SR 1/US 27 East to
CR 553/Lakeview Road
Catoosa County

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

NO.	IDEA DESCRIPTION	RATING
	ROADWAY (RD)	
RD-1	Eliminate bike lanes	4
RD-2	Construct travel lanes at 11’ width	2
RD-3	Construct outside travel lanes at 12’ wide and inside lanes at 11’ wide	4
RD-4	Construct one 10' multi-use trail in-lieu of one 5' sidewalk and two 4' bike lanes	4
RD-5	Do not re-align Fant Drive	2
RD-6	Selectively reduce work on side streets	2
RD-7	Between Colony Circle and Westside Drive shift alignment north	2
RD-8	Minimize improvement s on Cross Street	4
RD-9	Between US 27 and Cross Street shift alignment to the north	2
RD-10	Between Colony Circle and Westside Drive shift alignment to the south	2
RD-11	Construct sidewalks on one side only	1
RD-12	Close median openings at CR-57/Beaver Road, the entrance to Park Lake Apartments, and Linda Lane	4
RD-13	Use a median barrier in-lieu of 20’ raised median	2
RD-14	Use a 4” concrete median instead of a 7 ½” concrete median	4
RD-15	Use a raised grassed median	3
RD-16	Use Type 7 curb and gutter for concrete median	3
RD-17	Utilize existing pavement where applicable	2
RD-18	Eliminate sidewalks on side streets: Cross Street, Fant Drive and Cedar Lane.	4
RD-19	Reduce ROW required for Pine Hill Drive to avoid the taking of the existing Conoco gas station	4
RD-20	Use 30” combo curb and gutter saving 2’ width for typical	2
RD-21	Modify the alignment for the reconstruction of Fant Drive	4
RD-22	Adjust P.G.L. to minimize cut/fill	2
RD-23	Reduce quantity of unsuitable material removal	2

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; OB= Observation