

VALUE ENGINEERING STUDY

Project # CSSTP-0007-00(692) PI No. 0007692

SR 92 from SR 120 to CR 473/Cedarcrest Road
Cobb/Paulding County, Georgia

Prepared for:



One Georgia Center
600 West Peachtree NW
Atlanta, Georgia 30308

31 January 2013



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31 January 2013

Mr. Matt Sanders, AVS
Value Engineering Specialist
GDOT - Engineering Services
One Georgia Center - 5th Floor
600 W. Peachtree Street NW
Atlanta, GA 30308

Re: V.E. Workshop – S.R. 92 from S.R. 120 to C.R. 473/Cedarcrest Road, Cobb/Paulding County, GA
Project #: CSSTP-0007-00(692) - PI#: 0007692

Dear Mr. Sanders:

U.S. Cost, Inc. is pleased to submit two (2) hard copies and one (1) CD of the Value Engineering Study Report on the above referenced project. We appreciate the assistance and participation of the GDOT management personnel as well as the GDOT design team.

This Workshop resulted in the development of twenty (20) value-enhancing proposals. We hope that incorporation of some of these value improvement alternatives provided herein results in an enhanced project in relation to cost, constructability and long-term performance of the project features.

Please feel free to contact me to discuss any information within this report. We look forward to the next opportunity to be of service to the Georgia Department of Transportation.

Sincerely,

U.S. COST INCORPORATED



Tom Orr, P.E., CVS
V.E. Team Leader

CC: L. Myers, GDOT

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VALUE MANAGEMENT CONSULTANTS

VALUE ENGINEERING TEAM STUDY

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VALUE ENGINEERING STUDY

PROJECT DESCRIPTION

This SR 92 from SR 120 to CR 473/Cedarcrest Road project involves widening of SR 92 in Cobb and Paulding Counties in Georgia. The project will widen the existing two-lane roadway to a 4-lane divided highway.

The proposed project involves work along a 5.5 mile section of SR 92 beginning North of the intersection with SR 120 and ending South of CR 473/Cedarcrest Road. The new roadway consists of a four-lane roadway (two lanes in each direction) with 12' travel lanes, a 20' raised median and 22.5' shoulders with 10' wide multi-use paths along each side of the roadway. The right-of-way width varies as needed for earthwork tie-ins throughout the corridor.

There are 4 roundabouts proposed in the current design; one at Antioch Road Spur, one at Due West Road (South), one at Due West Road (North) and one at Old Burnt Hickory Road.

Project components include:

- New 4-lane (12' travel lanes) divided highway
- 5 intersections with 4 Roundabouts and 1 traffic signal

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Introduction

U.S. Cost conducted the Value Engineering Team Study on SR 92 from SR 120 to CR 473/Cedarcrest Road. The V.E. study was conducted for three and ½ days, 28 - 31 January 2013, at the Georgia Department of Transportation 5th floor Conference Room in Atlanta, GA. The study team was furnished with concept design documents for use in conducting the VE workshop. The following individuals were members of the V.E. team:

Name	Firm	Discipline
Tom Orr, P.E., CVS	U.S. Cost, Inc.	VE Team Leader (VETL)
Jerry Brooks, P.E.	Kimley-Horn	Roadway Engineer
Lenor Bromberg, P.E., AVS	KEA Group	Construction

Value Engineering Study Process

The Value Engineering Study followed the Value Engineering Job Plan as certified by SAVE International as follows:

- Information Phase (Monday)
- Function Analysis Phase (Monday)
- Creative Phase (Monday)
- Evaluation Phase (Monday)
- Development Phase (Tuesday - Wednesday)
- Presentation Phase (Thursday AM)

Information Phase

The V.E. team was first briefed on the project design by Georgia DOT management and URS Corporation design team representatives in a Design Presentation the morning of the first day of the V.E. Study. The briefing included a review of the design requirements and rationale for the selection and arrangement of the major project features. Discussions regarding alternatives considered, adjacent properties/facilities, and project criteria and constraints were included in the design presentation.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Project Design Criteria

During the meeting, project design criteria were identified. The following listing identifies the design criteria with which the project must comply:

AASHTO Design Policies
FHWA Design Policies
Other Environmental Restrictions (EA Requirements TBD)

Project Constraints

Project constraints were discussed; however, at the time of the V.E. workshop agreements had not been reached with any stakeholders, thus it was determined that the project approach did not contain any constraints that could not be altered.

Function Analysis

As a basic part of the V.E. process, the team conducted a Function Analysis session on the SR 92 from SR 120 to CR 473/Cedarcrest Road project to identify the needs and goals of the project and facilitate the creative idea session, by addressing functions as opposed to the specific design elements.

The Basic Functions of the project are to “*Improve Operations*” and “*Relieve Congestion*”. A detailed project function analysis of the characteristics of the project and the project features is presented in the Appendix.

Risk Analysis

The group identified the following project risk elements, which may impact the SR 92 from SR 120 to CR 473/Cedarcrest Road project. This exercise served as a catalyst for the Creative Phase of the study when several ideas were suggested which would mitigate these project risks.

Risk Elements/Concerns

- Impacts to Historical Properties
- Impacts to Property Owners
- Utility Impacts
- Stream Impacts
- Multiple Roundabouts in Close Proximity
- Impacts from Retention Ponds (MS-4)
- Staging at Road Lowering at Church Location
- Impacts to Travelling Public

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Creative Phase

The Creative Phase of the V.E. study was initiated the afternoon of the first day of the study. A total of twenty-five (25) creative ideas were generated for further investigation by the team. The creative ideas focused on areas of the project which the VE Team felt had the most opportunity for value improvement, including:

- Revising Typical Roadway Section to Minimize Required Corridor Width
- Revising Approach to Multi-use Trails
- Eliminating the design variance for the Distance Between Intersections at Due West Road (South) and Due West Road (North)
- Reducing Right-of-way acquisition required
- Maintaining Use of Roundabouts Where Most Necessary for Operations
- Reducing Impacts of MS-4 Pond Placements

Additional ideas were generated reflecting alternative project components based on an understanding of local construction products and materials and the relative costs of installing them.

A listing of all creative ideas on this project is included in the Appendix.

Alternative Idea Evaluation Criteria

The session participants identified the characteristics for evaluating the V.E. ideas for which alternatives would be the most acceptable for incorporation in the project. The highest ranked ideas would satisfy several of these criteria. The evaluation criteria for V.E. ideas are as follows:

V.E. Idea Evaluation Criteria

Improves Operations, or Maintains Operations at a Reduced Cost
Reduces Construction Time
Improves Constructability
Reduces Impacts
Improves Traffic Control During Construction
Reduces Costs
Improves Service Life/Reduces Maintenance

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Evaluation Phase

The ideas generated during the Creative Phase were reviewed and evaluated by the VE session participants during an Analysis/Judgment Phase session at the end of the first study day. The intent of the meeting was to allow the participants an opportunity to discuss and evaluate the ideas. A few of the V.E. ideas were dropped at that time as being conceptually unacceptable. The ranking session consisted of the VE team members assigning a ranking for each idea. The Acceptability ranking was based on how each idea improves the value of the project when considered against the evaluation criteria listed previously. Those ideas, which the V.E. Team felt had the most promise were given a designation of 1-5 on acceptability. This is a time management tool to identify those proposals that have the greatest potential. Approximately twenty (20) out of the original twenty-five (25) creative ideas were deemed promising for further investigation and analysis by the V.E. team.

The time management ranking system used by the VE team is as follows:

ACCEPTABILITY OF IDEA

- 5 points - Excellent Idea
- 4 points - Very Good Idea
- 3 points - Good Idea
- 2 points - Fair Idea
- 1 point - Do Not Develop

Development Phase

The specific proposals found in the body of this report represent the positive results of investigations by the V.E. team on the SR 92 from SR 120 to CR 473/Cedarcrest Road project. Each proposal represents a quality enhancing or cost saving alternative, which is documented by words, drawings and numbers. The proposal format presents the idea, describes the original design element proposed for change and the proposed change, lists the perceived advantages and disadvantages of the proposed change and supports the idea with a detailed cost estimate for the original and proposed design. Where necessary for clarity, the proposal also includes thumbnail design drawings and supporting engineering calculations.

Presentation Phase

A presentation to the GDOT and design team representatives was conducted 31 January 2013 at 9 AM.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Basis of V.E. Cost Savings

The cost information for proposals in this report are based on the cost data prepared by the design team, GDOT Item Mean Summary (Jan. 9, 2012), VE Team member experience, and discussions with vendors/Contractors. Overhead and profit are included in the project cost estimate and the GDOT Item Mean. Therefore, no additional markups are applied. The savings presented in the proposals is a general order of magnitude (estimate of the potential savings) if the idea were to be accepted. These figures are solely intended to identify the most attractive design solution, and are not prepared to represent a net deduction to the overall project budget. The costs are in 2013 dollars.

Evaluation of Alternatives

When reviewing the value engineering proposals, consider each part of an alternative on its own merit. There may be a tendency to disregard an entire alternative because of a concern about one aspect of it. We encourage partial acceptance of ideas; thus, each aspect of an alternative should be considered for incorporation into the design, even if the entire alternative is not implemented. Variations of these proposed alternatives are encouraged.

Several of these alternatives are either “mutually exclusive”/or have overlapping cost savings with other alternatives. These are indicated in the Proposal Summary Table. Items indicated as mutually exclusive indicates that acceptance of one alternative, precludes acceptance of the related proposal. Decision-makers are encouraged to evaluate these alternatives carefully in order to select the combination of alternatives that provides the greatest benefits to the project.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

The VE Team generated 25 creative ideas and developed 20 proposals for consideration by GDOT. Brief outlines of the VE proposals are as follows:

Proposal Highlights

R-1.0 – Use 11’ Lane Widths in lieu of 12’ for All Lanes on SR 92. The current design of the SR 92 typical roadway section includes two 12’ travel lanes in each direction. Proposal R-1.0 proposes to reduce all travel lanes on SR 92 from 12’ to 11’. This alternative will save \$678,000 in construction costs and provides an acceptable design for the classification of this roadway.

R-1.1 - Use 11’ Wide Inside Lane and 12’ Outside Lane on SR 92. As an alternative to proposal R-1.0, Proposal R-1.1 proposes to reduce only the inside travel lanes from 12’ to 11’ while maintaining the 12’ width on the outside lanes. This proposal results in a savings of \$339,000 and matches the roadway section on the SR 92 project to the North of this project (PI #0006857) which includes 11’ wide inside lanes.

R-2.0 – Reduce Median Width from 20’ to 16’ Along SR 92. In the current design, the Typical Roadway Section includes a 20’ raised median. Proposal R-2.0 proposes to change the width of the raised median from 20 feet to 16 feet for this corridor. A 16’ raised median is being used on other GDOT projects (SR 9, PI #121690-) and AASHTO Chapter 7 (2011) allows a median width of 16’ for Arterial roadways. This proposal will require a design variance, however it will minimize impacts to properties, reduce right of way acquisition and result in a savings of approximately \$205,000.

R-3.0 – Use 10’ Wide Multi-use Trail on West Side Only and Include 5’ Wide Sidewalk on East Side. The current design includes a 10-foot wide multi-use trail on both sides of SR 92. Proposal R-3.0 proposes to include a 10-foot wide multi-use trail on the West side of SR 92 and a 5-foot sidewalk on the East side. This proposal still provides amenities for cyclists and pedestrians, achieves compliance with the Complete Streets policy and results in a savings of approximately \$640,000.

R-3.1 - Use 8-foot Multi-use Trails on Both Sides of SR 92 in lieu of 10-foot Multi-use Trails. As an alternative to proposal R-3.0, Proposal R-3.1 proposes to include an 8-foot multi-use trail on both sides of the roadway. Also, this proposal reduces the grass strips in front and behind trail from 5-foot to 3-foot width. AASHTO allows an 8-foot width when bicycle and/or pedestrian traffic is expected to be low, when horizontal and vertical alignments allow frequent passing opportunities, or when the path will not be subjected to maintenance vehicle loading conditions. This proposal results in a savings of approximately \$825,000.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

R-3.2 - Use Asphalt in lieu of Concrete for 10' Wide Multi-use Trail. The current design includes a 10-foot multi-use trail constructed of 4-inch concrete on both sides of the roadway. In R-3.2, it is proposed to utilize an asphalt concrete pavement section for the 10-foot multi-use trail on both sides of the roadway. This alternative saves approximately \$300,000.

R-5.0 - Eliminate Construction of the Antioch Road Spur and the Associated Roundabout with SR 92 and the Antioch Road Spur. The current design includes a new 1400' 2-lane connection from Antioch Road, crossing a stream and intersecting SR 92 with a roundabout located at approximate Sta 601+00. In R-5.0, it is proposed to eliminate all construction and right of way associated with the Antioch Road Spur and the roundabout at Sta 601+00 and continue to allow existing Antioch Road to intersect SR 92 at Sta 585+00 as a right in/right out movement. The VE Team suggests that improving access to this local County road may be beyond the scope of the SR 92 project. This alternative results in a reduced project cost of approximately \$1,320,000.

R-5.1 - Use 11' Lane Widths in lieu of 12' on Antioch Road Spur. In the current design, the section for the Antioch Road Spur includes 12' wide travel lanes in each direction. In R-5.1, it is proposed to reduce all travel lanes on the Antioch Road Spur from 12' wide to 11'. This proposal meets GDOT policies for local roads, while saving an estimated \$16,000 in construction costs.

R-5.2 - Eliminate Paved Shoulders on Antioch Road Spur. The current design approach for the Antioch Road Spur includes 2' wide paved shoulders. In R-5.2, it is proposed to eliminate the paved shoulders on this new local road. This proposal satisfies GDOT design policies and reduces project costs by approximately \$33,000.

R-5.3 - Reduce the Required Right of Way Width from 120' to 80' on the new Antioch Road Spur. The original design has a required right of way corridor of approximately 120' along the new Antioch Road Spur. It is proposed to reduce the required right of way for the Antioch Road Spur to 80'. The reduced width is sufficient for construction of the roadway and results in a cost savings of approximately \$65,000.

R-6.0 - Reduce Right-of-Way Widths on SR 92 to Only that Required for Construction. The current concept plans show a right of way width that varies from approximately 200' to more than 300' along SR 92. In R-6.0, it is proposed to reduce the right of way corridor to an area that is no more than 10' beyond the construction limits of the project in lieu of a wide corridor. This alternative is a standard GDOT approach, results in a significant reduction in right of way acquisition time and costs, and provides a savings to the project of approximately \$4,600,000.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

R-6.1 - Use a Maximum 120' Right of Way Corridor Along SR 92 with Easements as Necessary Beyond the Right of Way Limits. As an alternative to R-6.0, Proposal R-6.1 proposes to use a maximum right of way corridor of 120' along SR 92 with easements beyond the right of way in lieu of a right of way corridor of 200' to 300'. This alternative is a standard GDOT approach, results in a significant reduction in right of way acquisition time and costs, and provides a savings to the project of approximately \$5,547,000.

R-7.0 - Use Signalized Intersection at Antioch Road Spur in lieu of a Multi-lane Roundabout. The original design proposes to install a roundabout at the intersection of Antioch Road Spur and SR 92 (Approximate Sta 601+00). In R-7.0, it is proposed to install a signalized intersection in lieu of a multi-lane roundabout at this location. The traffic study for this location states that a signal is a viable alternative at this location, and would provide an estimated \$199,000 savings in construction costs.

R-8.0 - Use Signalized Intersection at Old Burnt Hickory Road in lieu of a Multi-lane Roundabout. The original design proposes to install a roundabout at the intersection of Old Burnt Hickory Road and SR 92 (Approximate Sta 831+00). In R-8.0, it is proposed to install a signalized intersection in lieu of a multi-lane roundabout at this location. The traffic study for this location states that both a signal and a roundabout would provide generally comparable performance at this location, and the signalized option would provide an estimated \$199,000 savings in construction costs.

R-9.0 - Relocate Roundabout at Due West Road (South) to the South to Allow Greater Separation Between Roundabouts and Minimize Construction over Colonial Pipeline Facilities. In the current design, the roundabout for Due West Road (South) is located at approximate Sta 710+00 and the roundabout for Due West Road (North) is located at approximate Sta 716+00. In R-9.0, it is proposed to relocate the roundabout for Due West Road (South) approximately 800' South to approximate Sta 702+00 to obtain proper separation between intersections and to eliminate construction activities from the Colonial Pipeline easement (except area within the SR 92 right of way). This proposal reduces the utility impacts and coordination involved, eliminates the design variance for the separation between the intersections, and would provide an estimated \$2,500,000 savings to the project.

R-9.1 - Relocate Intersection at Due West Road (South) to the South and Change to a Signalized Intersection to Allow Greater Separation Between Intersections and Minimize Construction over Colonial Pipeline Facilities. As an alternative to R-9.0, Proposal R-9.1 proposes to relocate the intersection for Due West Road (South) approximately 730' South to approximate Sta 702+70 and construct as a signalized intersection to obtain proper separation between intersections and to eliminate construction activities from the Colonial Pipeline easement (except area within the SR 92 right of way). This proposal reduces the utility impacts, eliminates the design variance for the separation between the intersections, and provides an estimated \$2,674,000 savings.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

R-11.0 - Reduce Cut for New Vertical Alignment from Sta 568+00 to Sta 576+00 to Meet 45 MPH Design Speed. The original design utilizes a 950-foot vertical (K value = 130.14) crest curve to improve sight distance between Sta 568+00 to Sta 576+00. This design results in a six foot lowering of the vertical profile from the existing ground at approximate Sta 573+00. In R-11.0, it is proposed to utilize a 500-foot vertical (K value = 68.49) crest curve; the vertical profile grades of 6.999% and -1.100% from the original design are maintained. This design meets the 45 mph design speed and provides approximately 500 feet of intersection sight distance along the vertical profile. This proposal results in a two foot lowering of the vertical profile from the existing ground at approximate Sta 573+00 and would provide an estimated \$50,000 savings in construction costs.

R-13.0 - Follow Existing Horizontal Alignment from Sta 720+00 to Sta 740+00. The original design replaces a series of reverse curves with a straight tangent between approximate Sta 720+00 to Sta 740+00. In R-13.0, it is proposed to maintain the existing horizontal alignment from Sta 720+00 to Sta 740+00. The existing two lanes would be maintained as the southbound lanes and new northbound lanes would be constructed to the East. This proposal results in a reduction in right of way impacts and would provide an estimated \$314,000 savings in construction costs.

R-16.0 - Relocate or Eliminate Pond Locations Where Causing Displacements. The concept plans show proposed MS4 ponds at various locations along the project corridor. The ponds at Sta 635+00 left, Sta 678+00 left, and Sta 823+00 left will require a residential displacement. In R-16.0, it is proposed to relocate or eliminate the proposed ponds which currently require a displacement. This proposal avoids right of way displacements and would provide an estimated \$555,000 savings to the project.

R-18.0 - Utilize Grassing at Roundabouts and Eliminate Landscaping. Based on the project estimate, the current design of the 4 roundabouts along SR 92 includes landscaping. In R-18.0, it is proposed to eliminate the landscaping and utilize permanent grassing in the project. The local Counties can then decide whether to add landscaping or artwork to the roundabouts to provide the local flair. This proposal would provide an estimated \$175,000 savings to the project.

SUMMARY OF VALUE ENGINEERING PROPOSALS

**Project # CSSTP-0007-00(692) PI No. 0007692
SR 92 from SR 120 to CR 473/CEDARCREST ROAD
COBB/PAULDING COUNTY, GEORGIA**

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
	Note: Brackets mean additional cost		
	ROADWAY (R)		
1.0	Use 11' Lane Widths in lieu of 12' for All Lanes on SR 92	678,000	Mutually exclusive with 1.1
1.1	Use 11' Wide Inside Lane and 12' Outside Lane on SR 92	339,000	Mutually exclusive with 1.0
2.0	Reduce Median Width from 20' to 16' Along SR 92	205,594	
3.0	Use 10' Wide Multi-use Trail on West Side Only and Include 5' Wide Sidewalk on East Side	638,485	Mutually exclusive with 3.1; cost savings overlap with 3.2
3.1	Use 8' Wide Multi-use Trails on Both Sides in lieu of 10' Wide Trails. Reduce Grass Strips in Front and Behind Trail from 5' to 3' Wide.	824,886	Mutually exclusive with 3.0
3.2	Use Asphalt in lieu of Concrete for 10' Wide Multi-use Trail	300,800	Cost Savings overlap with 3.0
5.0	Eliminate Construction of the Antioch Road Spur and the Associated Roundabout with SR 92 and the Antioch Road Spur	1,320,415	Mutually exclusive with 5.1, 5.2, 5.3, & 7.0
5.1	Use 11' Lane Widths in lieu of 12' on Antioch Road Spur	16,350	Mutually exclusive with 5.0
5.2	Eliminate Paved Shoulders on Antioch Road Spur	32,800	Mutually exclusive with 5.0
5.3	Reduce the Required Right of Way Width from 120' to 80' on the new Antioch Road Spur	64,500	Mutually exclusive with 5.0
6.0	Reduce Right of Way Widths on SR 92 to Only that Required for Construction	4,599,000	Mutually exclusive with 6.1
6.1	Use a Maximum 120' Right of Way Corridor on SR 92 with Easements as Necessary Beyond the Right of Way Limits	5,547,000	Mutually exclusive with 6.0

SUMMARY OF VALUE ENGINEERING PROPOSALS

**Project # CSSTP-0007-00(692) PI No. 0007692
SR 92 from SR 120 to CR 473/CEDARCREST ROAD
COBB/PAULDING COUNTY, GEORGIA**

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
	ROADWAY (R) - continued		
7.0	Use Signalized Intersection at Antioch Road Spur in lieu of a Multi-lane Roundabout	199,000	Mutually exclusive with 5.0 & 18.0
8.0	Use Signalized Intersection at Old Burnt Hickory Road in lieu of a Multi-lane Roundabout	199,000	Mutually exclusive with 18.0
9.0	Relocate Roundabout at Due West Road (South) to the South to Allow Greater Separation Between Roundabouts and Minimize Construction over Colonial Pipeline Facilities Located at Approximate Sta 706+00	2,500,000	Mutually exclusive with 9.1
9.1	Relocate Intersection at Due West Road (South) to the South and Change to a Signalized Intersection to Allow Greater Separation Between Intersections and Minimize Construction over Colonial Pipeline Facilities	2,674,000	Mutually exclusive with 9.0 & 18.0
11.0	Reduce Cut for New Vertical Alignment from Sta 568+00 to Sta 576+00 to Meet 45 MPH Design Speed	49,592	
13.0	Follow Existing Horizontal Alignment from Sta 720+00 to Sta 740+00	314,380	
16.0	Relocate or Eliminate Pond Locations Where Causing Displacements	555,000	
18.0	Utilize Grassing at Roundabouts and Eliminate Landscaping	174,920	Mutually exclusive with 5.0, 7.0, 8.0 & 9.1

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-1.0	PAGE NUMBER:	1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE 11' LANE WIDTHS IN LIEU OF 12' FOR ALL LANES ON SR 92.

ORIGINAL DESIGN: The current design of the SR 92 typical roadway section includes two 12' travel lanes in each direction.

PROPOSED CHANGE: It is proposed to reduce all travel lanes on SR 92 from 12' to 11'.

JUSTIFICATION: The roadway is classified as "Urban Minor Arterial" with a 45 MPH Design Speed and GDOT policy allows 11' lanes as indicated on Table 6.6 of the Design Policy Manual.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for classification of roadway
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 678,000		\$ 678,000
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 678,000		\$ 678,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-1.0	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SY	12,889	\$42.29	\$545,000
Right-of-Way (reduction)	1	AC	2.66	\$50,000	\$133,000
SUBTOTAL – COST TO PRIME					\$678,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$678,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$678,000**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Attached Calculation Sheet |
|---|---|

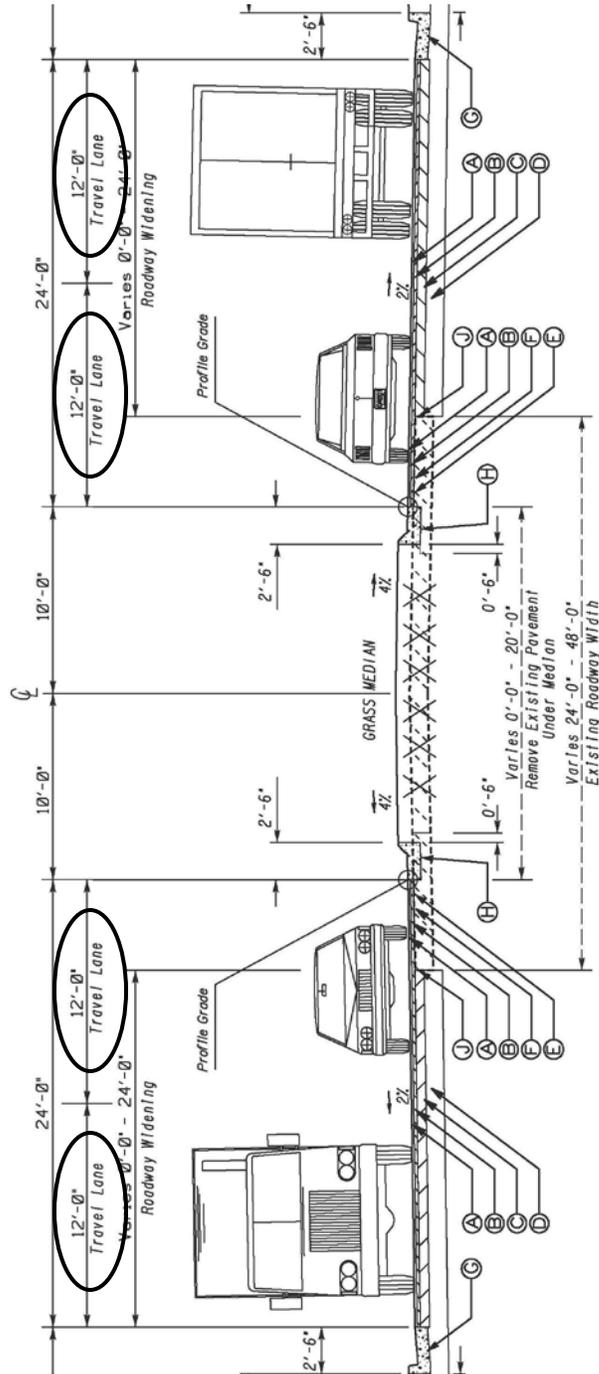
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-1.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Change: Revise 12'0" travel lanes to 11'0"



TS-01

APPLIES TO SR 92

CALCULATIONS

PROPOSAL NUMBER: R-1.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Current Design Pavement Cost Calculations:

310-1101: 12" GAB = 0.68 tons/SY x \$14.61/ton = \$9.93/SY

402-3121: 6" Asph 25MM = (6")(110#sy-in/2000#)(\$60.00/T) = \$19.80/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

402-3113: 1.5" Asph 12.5MM = (1.5")(110#sy-in/2000#)(\$70.00/T) = \$5.78/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = **\$42.29/SY**

Pavement Area Reduction

Section length = 29,000 LF total project

29,000 LF x 1' width reduction/lane x 4 lanes = 116,000 SF / 9 = 12,889 SY

Right-of-Way Reduction

Footprint reduced by 4' by reducing each of 4 lanes by 1'

Right-of-Way savings of 4' over project length = 29000 x 4 = 116,000 SF / 43560 = 2.66 ac
Majority of property is Residential; thus, \$50,000/ac for partial property (Preliminary ROW Estimate)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-1.1	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE 11' WIDE INSIDE LANE AND 12' OUTSIDE LANE ON SR 92.
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ORIGINAL DESIGN: The current design of the typical roadway section along SR 92 includes two 12' travel lanes in each direction.

PROPOSED CHANGE: As an alternative to proposal R-1.0, it is proposed to reduce the inside travel lanes from 12' to 11' while maintaining the 12' width on the outside lanes.

JUSTIFICATION: The roadway is classified as "Urban Minor Arterial" with a 45 MPH Design Speed and GDOT policy allows 11' lanes as indicated on Table 6.6 of the Design Policy Manual. The SR 92 project to the North of this project (PI #0006857) includes 11' wide inside lanes, as proposed and approved in the VE Implementation dated September 14, 2009.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for classification of roadway
- Less impervious area
- Would match lane widths for SR 92 project to the North

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 339,000		\$ 339,000
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 339,000		\$ 339,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-1.1	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SY	6,445	\$42.29	\$272,500
Right-of-Way (reduction)	1	AC	1.33	\$50,000	\$66,500
SUBTOTAL – COST TO PRIME					\$339,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$339,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$339,000**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Attached Calculation Sheet |
|---|---|

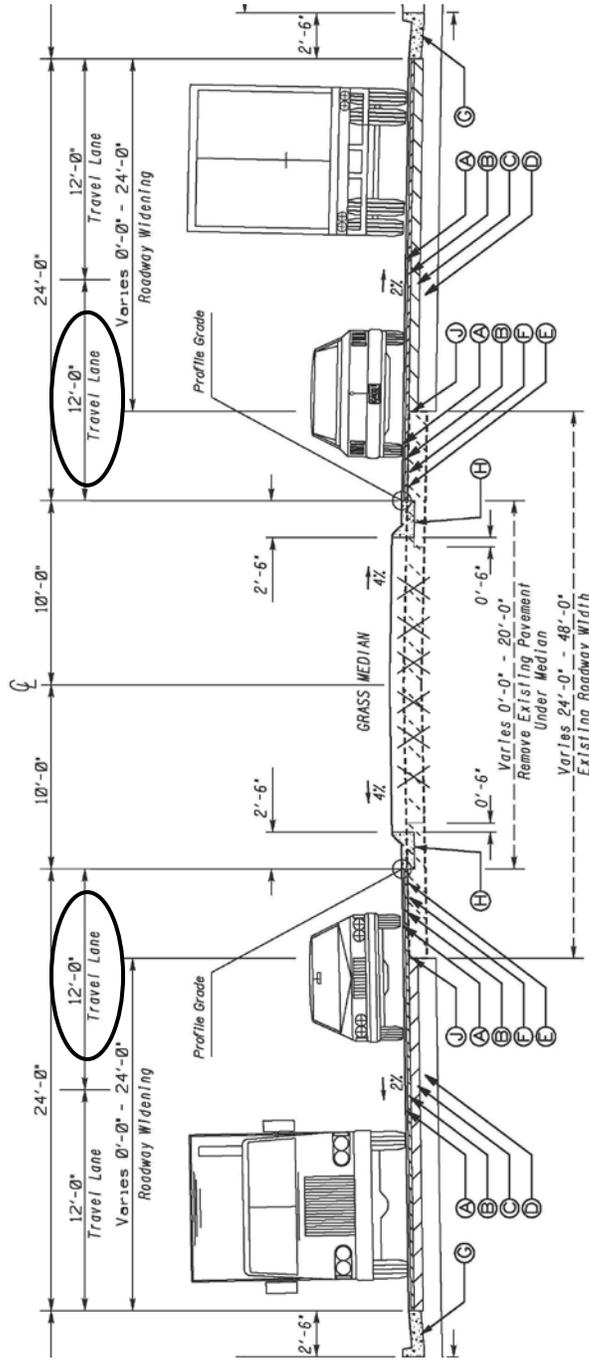
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-1.1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Change: Reduce inside travel lanes from 12'0" to 11'0"



TS-01

APPLIES TO SR 92

CALCULATIONS

PROPOSAL NUMBER: R-1.1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Current Design Pavement Cost Calculations:

310-1101: 12" GAB = 0.68 tons/SY x \$14.61/ton = \$9.93/SY

402-3121: 6" Asph 25MM = (6")(110#sy-in/2000#)(\$60.00/T) = \$19.80/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

402-3113: 1.5" Asph 12.5MM = (1.5")(110#sy-in/2000#)(\$70.00/T) = \$5.78/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = **\$42.29/SY**

Pavement Area Reduction

Section length = 29,000 LF total project

29,000 LF x 1' width reduction/lane x 2 lanes = 58,000 SF / 9 = 6,445 SY

Right-of-Way Reduction

Footprint reduced by 2' by reducing 2 lanes by 1'

Right-of-Way savings of 2' over project length = 29000 x 2 = 58,000 SF / 43560 = 1.33 ac

Majority of property is Residential; thus, \$50,000/ac for partial property (Preliminary ROW Estimate)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-2.0	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: REDUCE MEDIAN WIDTH FROM 20' TO 16'.

ORIGINAL DESIGN: In the current design, the Typical Roadway Section includes a 20' raised median.

PROPOSED CHANGE: It is proposed to change the width of the raised median from 20 feet to 16 feet for this corridor.

JUSTIFICATION: A 16' raised median is being used on other GDOT projects (SR 9, PI #121690-) and AASHTO Chapter 7 (2011) allows a median width of 16' for Arterial roadways. Median with turn lane will be 4' per GDOT Detail A2. This does, however, require a design variance from GDOT.

ADVANTAGES:

- Reduces project cost
- Less impact to adjacent properties
- Allows use of minimum right of way in critical areas

DISADVANTAGES:

- Requires a Design Variance from GDOT

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 205,594		\$ 205,594
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 205,594		\$ 205,594

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-2.0	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right-of-Way (reduction)	1	AC	2.66	\$50,000	\$133,000
206-0002 Borrow Excav (red.)	1	CY	4,605	\$3.86	\$17,775
205-0001, Unclass Exc (red.)	1	CY	8,588	\$2.89	\$24,819
201-1500, Clear & Grubbing (red.)	1	LS	1	\$30,000	\$30,000
SUBTOTAL – COST TO PRIME					\$205,594
MARKUP					--
TOTAL CONTRACT COST					\$205,594

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					--
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$205,594**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

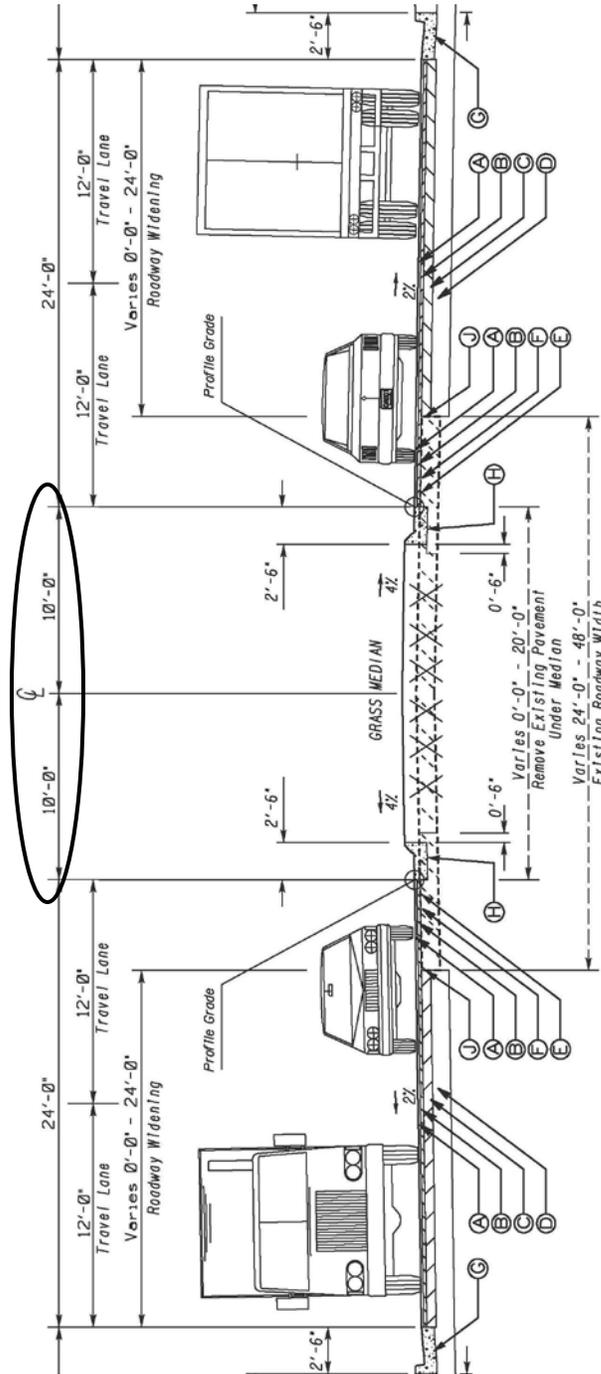
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-2.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Change: Reduce 20'0" median to 16'0"



TS-01

APPLIES TO SR 92

CALCULATIONS

PROPOSAL NUMBER: R-2.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Typical Section for project length = 29,000 lf

- Footprint reduced by 4' by using 16' median in lieu of 20'

Right-of-Way savings of 4' over project length = $29000 \times 4 = 116,000$ SF / $43560 = 2.66$ ac
Majority of property is Residential; thus, \$50,000/ac for partial property (Preliminary ROW Estimate)

- Assume saving 2% of Earthwork and Clear & Grub

Item 205-0001, Unclassified Excavation, 2% reduction = $429,408$ CY x $0.02 = 8,588$ CY
Item 206-0002, Borrow Excavation, 2% reduction = $230,232$ CY x $0.02 = 4,605$ CY
Item 201-1500, Clearing & Grubbing, 2% reduction = $\$1,500,000$ x $0.02 = \$30,000$

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-3.0	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE 10 FOOT WIDE MULTI-USE TRAIL ON WEST SIDE OF SR 92 WITH 5 FOOT SIDEWALK ON EAST SIDE.

ORIGINAL DESIGN: The design includes a 10-foot wide multi-use trail on both sides of SR 92.

PROPOSED CHANGE: It is proposed to include a 10-foot wide multi-use trail on the West side of SR 92 and a 5-foot sidewalk on the East side.

JUSTIFICATION: The Paulding County Trails and Greenways Master Plan recommends SR 92 as a multimodal corridor and suggests accommodating bicycles and pedestrians. Since the majority of the subdivisions and the majority of the destinations (high school, middle school, and Picket’s Mill Battlefield Park) are located on the West side of the road it is likely more users would be present on the West side of the roadway. Pedestrian access would be provided by the 5-foot sidewalk and cross access would be provided at the roundabouts and signalized intersection.

ADVANTAGES:

- Reduces quantities/cost
- Reduces right-of-way impacts
- Meets Complete Streets policy

DISADVANTAGES:

- Bicycle access not directly provided along East side of roadway.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 8,407,742		\$ 8,407,742
PROPOSED CHANGE:	\$ 7,768,999		\$ 7,768,999
SAVINGS:	\$ 638,485		\$ 638,485

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-3.0	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
CONC SIDEWALK, 4 IN	1	SY	64,000	16.45	\$1,052,800
UNCLASS EXCAV	1	CY	429,408	2.89	\$1,240,989
BORROW EXCAV, INCL MATL	1	CY	230,232	3.86	\$888,695
RIGHT-OF-WAY, RESIDENTIAL	1	AC	29.5	50,000	\$1,475,000
RIGHT-OF-WAY, COMMERCIAL	1	AC	30.0	125,000	\$3,750,000
SUBTOTAL – COST TO PRIME					\$8,407,484
MARKUP					--
TOTAL CONTRACT COST					\$8,407,484

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
CONC SIDEWALK, 4 IN	1	SY	48,000	16.45	\$789,000
UNCLASS EXCAV	1	CY	412,232	2.89	\$1,191,350
BORROW EXCAV, INCL MATL	1	CY	221,023	3.86	\$853,149
RIGHT-OF-WAY, RESIDENTIAL	1	AC	27.86	50,000	\$1,393,000
RIGHT-OF-WAY, COMMERCIAL	1	AC	28.34	125,000	\$3,542,500
SUBTOTAL – COST TO PRIME					\$7,768,999
MARKUP					--
TOTAL CONTRACT COST					\$7,768,999

Difference [Original-Proposed] **\$638,485**

SOURCES

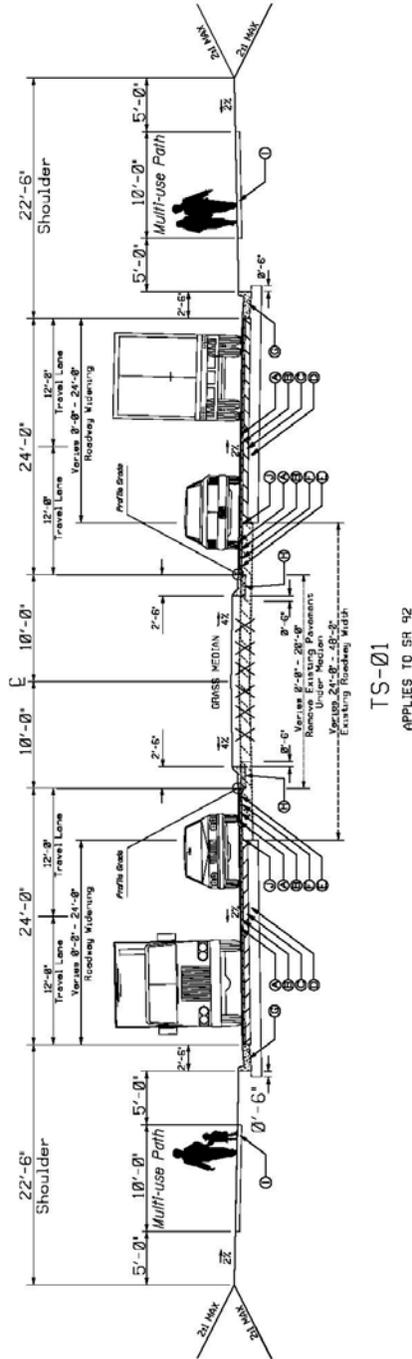
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-3.0

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



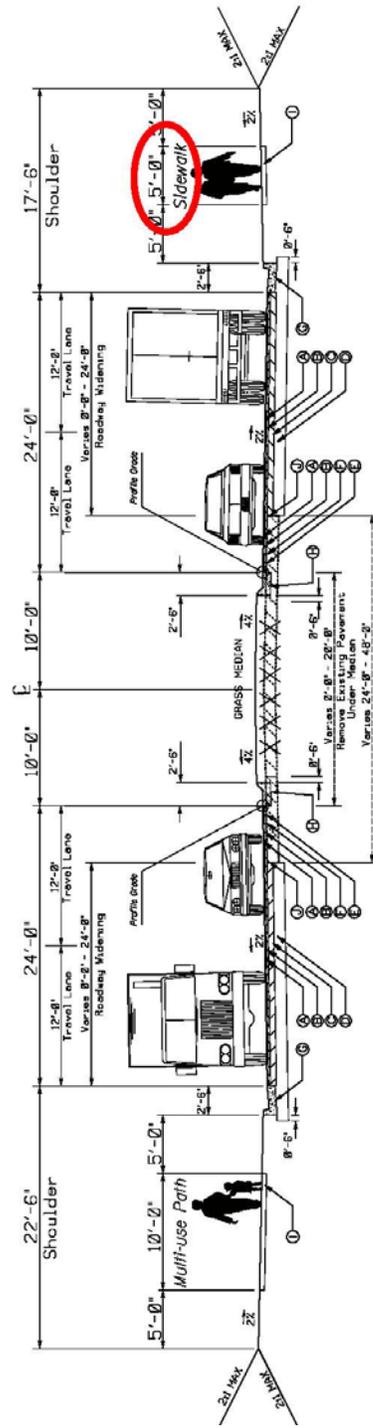
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-3.0

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Change: Use 10 foot trail on West side of Road and 5 foot Sidewalk on East side of Road



CALCULATIONS

PROPOSAL NUMBER: R-3.0

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Multi-use Trail:

Original:

10 FT width x 2 x 28,800 FT roadway = 576,000 SF = 64,000 SY, at \$16.45/SY = \$1,052,800

Proposed:

(10 FT width x 28,800 FT)+(5 FT width x 28,800 FT) = 432,000 SF = 48,000 SY = \$789,600

Earthwork:

Original:

Unclassified excavation = 429,408 CY at \$2.89/CY = \$1,240,989

Borrow excavation = 230,232 CY at \$3.86/CY = \$888,695

Proposed:

Reduction in typical section from shoulder break to shoulder break = 5 FT out of 113 FT (4%)

Unclassified excavation = (429,408 CY – (429,408 x 4%) = 412,232 CY = \$1,191,350

Borrow excavation = (230,232 CY – (230,232 x 4%) = 221,023 CY = \$853,149

Right-of-way:

Original:

Fee simple, 59.5 AC = \$5,225,000

29.5 AC residential = \$1,475,000; 30.0 AC commercial = \$3,750,000

Proposed:

\$50,000/ac for residential property (Preliminary ROW Estimate)

\$125,000/ac for commercial property (Preliminary ROW Estimate)

Reduction in total R/W = 5 FT width x 28,800 FT = 144,000 SF = 3.3 AC

Assume overall reduction from both residential and commercial.

Residential = 29.5 AC out of 59.5 AC total or 49.6% of total.

Commercial = 30.0 AC out of 59.5 AC total or 50.4% of total.

3.3 AC x 49.6% = 1.64 AC at \$50,000/AC = \$82,000 reduction

3.3 AC x 50.4% = 1.66 AC at \$125,000/AC = \$207,500 reduction

Residential = \$1,475,000 - \$82,000 = \$1,393,000

Commercial = \$3,750,000 - \$207,500 = \$3,542,500

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-3.1	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE 8-FOOT MULTI-USE TRAILS ON BOTH SIDES OF SR 92 IN LIEU OF 10-FOOT MULTI-USE TRAIL. REDUCE 5-FOOT GRASS STRIPS IN FRONT AND BEHIND TRAIL FROM 5-FOOT TO 3-FOOT WIDTH.

ORIGINAL DESIGN: The current design includes a 10-foot multi-use trail on both sides of the roadway.

PROPOSED CHANGE: It is proposed to include an 8-foot multi-use trail on both sides of the roadway. Also, reduce the grass strips in front and behind trail from 5-foot to 3-foot width.

JUSTIFICATION: Although the 2012 Edition of the AASHTO Guide for the Development of Bicycle Facilities recommends a minimum width of 10 feet for a bi-directional multi-use trail, an 8-foot width can be used when bicycle and/or pedestrian traffic is expected to be low, when horizontal and vertical alignments allow frequent passing opportunities, or when the path will not be subjected to maintenance vehicle loading conditions. The provision of an 8-foot multi-use trail to each side of the roadway would allow continuous bicycle and pedestrian access along the corridor and could be signed as one-way for cyclists. Kathy Stallard with Paulding County DOT stated at the Initial Concept Team Meeting that an 8 foot multi-use trail was the preferred bicycle accommodation on this corridor.

ADVANTAGES:

- Reduces quantities/cost
- Reduces right-of-way impacts
- Meets Complete Streets policy

DISADVANTAGES:

- Bi-directional minimum recommended by AASHTO is not met.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 8,407,484		\$ 8,407,484
PROPOSED CHANGE:	\$ 7,582,598		\$ 7,582,598
SAVINGS:	\$ 824,886		\$ 824,886

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-3.1	PAGE NUMBER: 2 of 5
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
CONC SIDEWALK, 4 IN	1	SY	64,000	16.45	\$1,052,800
UNCLASS EXCAV	1	CY	429,408	2.89	\$1,240,989
BORROW EXCAV, INCL MATL	1	CY	230,232	3.86	\$888,695
RIGHT-OF-WAY, RESIDENTIAL	1	AC	29.5	50,000	\$1,475,000
RIGHT-OF-WAY, COMMERCIAL	1	AC	30.0	125,000	\$3,750,000
SUBTOTAL – COST TO PRIME					\$8,407,484
MARKUP					--
TOTAL CONTRACT COST					\$8,407,484

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
CONC SIDEWALK, 4 IN	1	SY	51,200	16.45	\$842,240
UNCLASS EXCAV	1	CY	399,349	2.89	\$1,154,120
BORROW EXCAV, INCL MATL	1	CY	214,116	3.86	\$826,488
RIGHT-OF-WAY, RESIDENTIAL	1	AC	26.87	50,000	\$1,343,500
RIGHT-OF-WAY, COMMERCIAL	1	AC	27.33	125,000	\$3,416,250
SUBTOTAL – COST TO PRIME					\$7,582,598
MARKUP					--
TOTAL CONTRACT COST					\$7,582,598

Difference [Original-Proposed] **\$824,886**

SOURCES

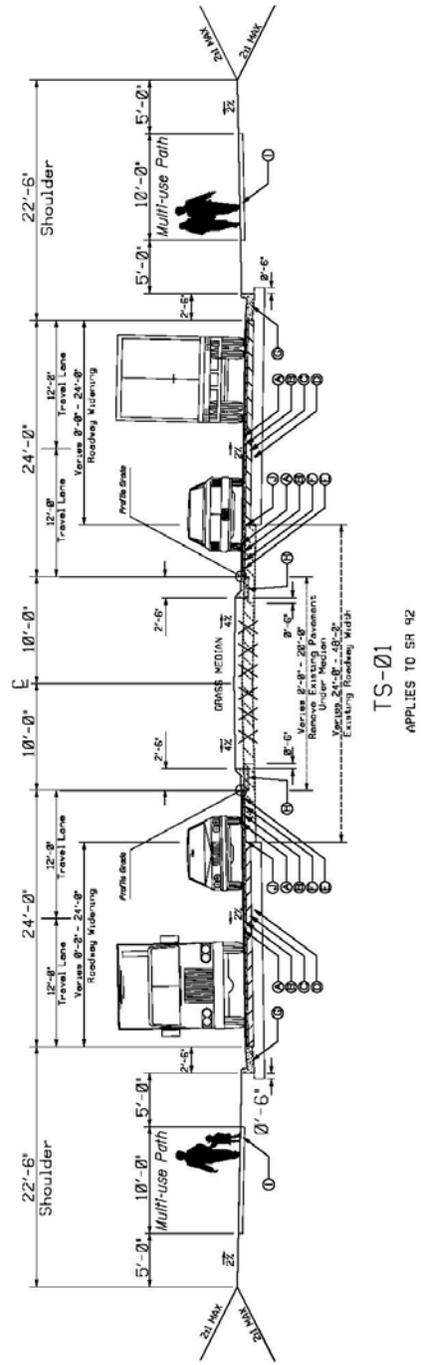
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|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-3.1

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



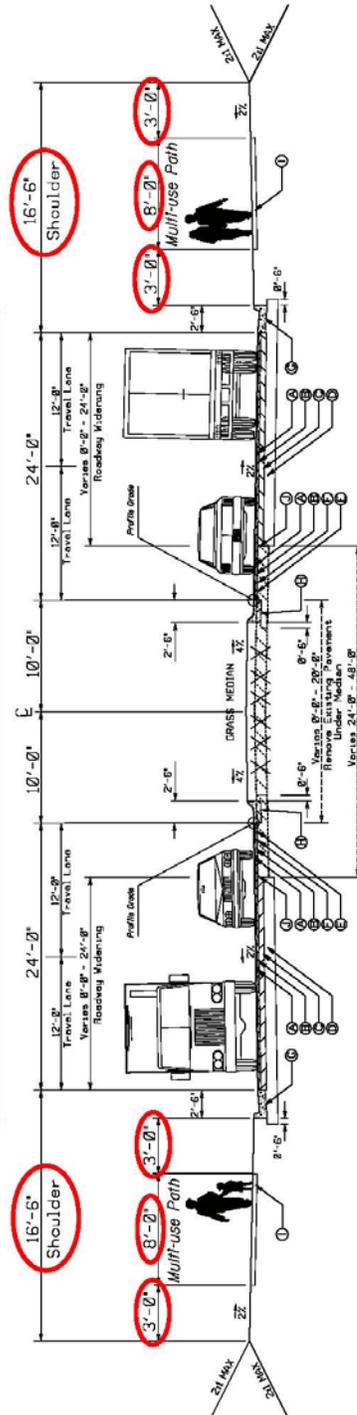
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-3.1

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Change: Use 8 Foot Multi-use Trail on each side of Roadway;
Reduce 5 Foot Grassed Shoulder area to 3 Foot Grassed Shoulder



TS-01
APPLIES TO SR 92

CALCULATIONS

PROPOSAL NUMBER: R-3.1

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Multi-use Trail:

Original:

10 FT width x 2 x 28,800 FT roadway = 576,000 SF = 64,000 SY, at \$16.45/SY = \$1,052,800

Proposed:

(8 FT width x 2 x 28,800 FT roadway) = 460,800 SF = 51,200 SY = \$842,240

Earthwork:

Original:

Unclassified excavation = 429,408 CY at \$2.89/CY = \$1,240,989

Borrow excavation = 230,232 CY at \$3.86/CY = \$888,695

Proposed:

Reduction in typical section from shoulder break to shoulder break = 8 FT out of 113 FT (7%)

Unclassified excavation = (429,408 CY – (429,408 x 7%) = 399,349 CY = \$1,154,120

Borrow excavation = (230,232 CY – (230,232 x 7%) = 214,116 CY = \$826,488

Right-of-way:

Original:

Fee simple, 59.5 AC = \$5,225,000

29.5 AC residential = \$1,475,000; 30.0 AC commercial = \$3,750,000

Proposed:

\$50,000/ac for residential property (Preliminary ROW Estimate)

\$125,000/ac for commercial property (Preliminary ROW Estimate)

Reduction in total R/W = 8 FT width x 28,800 FT = 230,400 SF = 5.3 AC

Assume overall reduction from both residential and commercial.

Residential = 29.5 AC out of 59.5 AC total or 49.6% of total.

Commercial = 30.0 AC out of 59.5 AC total or 50.4% of total.

5.3 AC x 49.6% = 2.63 AC at \$50,000/AC = \$131,500 reduction

5.3 AC x 50.4% = 2.67 AC at \$125,000/AC = \$333,750 reduction

Residential = \$1,475,000 - \$131,500 = \$1,343,500

Commercial = \$3,750,000 - \$333,750 = \$3,416,250

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-3.2	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION:	USE ASPHALT IN LIEU OF CONCRETE FOR 10' WIDE MULTI-USE TRAIL.
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ORIGINAL DESIGN: The current design includes a 10-foot multi-use trail constructed of 4-inch concrete sidewalk on both sides of the roadway.

PROPOSED CHANGE: It is proposed to utilize an asphalt concrete pavement section for the 10-foot multi-use trail on both sides of the roadway.

JUSTIFICATION: The use of asphalt for multi-use trails is a common practice in Georgia as well as other parts of the country. It is an acceptable surface treatment per the guidelines provided by AASHTO and FHWA. The smooth riding surface due to lack of joints that are required for the concrete pavement section, as well as the “give” of asphalt as compared to concrete are generally more appealing to trail users.

ADVANTAGES:

- Reduces cost
- Without joints in concrete, asphalt is smoother surface for running/biking

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,052,800		\$ 1,052,800
PROPOSED CHANGE:	\$ 752,000		\$ 752,000
SAVINGS:	\$ 300,800		\$ 300,800

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-3.2	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
CONC SIDEWALK, 4 IN	1	SY	64,000	16.45	\$1,052,800
SUBTOTAL – COST TO PRIME					\$1,052,800
MARKUP					--
TOTAL CONTRACT COST					\$1,052,800

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
CONC SIDEWALK, 4 IN	1	SY	0	16.45	0
TRAIL PAVEMENT	1	SY	64,000	11.75	\$752,000
SUBTOTAL – COST TO PRIME					\$752,000
MARKUP					--
TOTAL CONTRACT COST					\$752,000

Difference [Original-Proposed] **\$300,800**

SOURCES

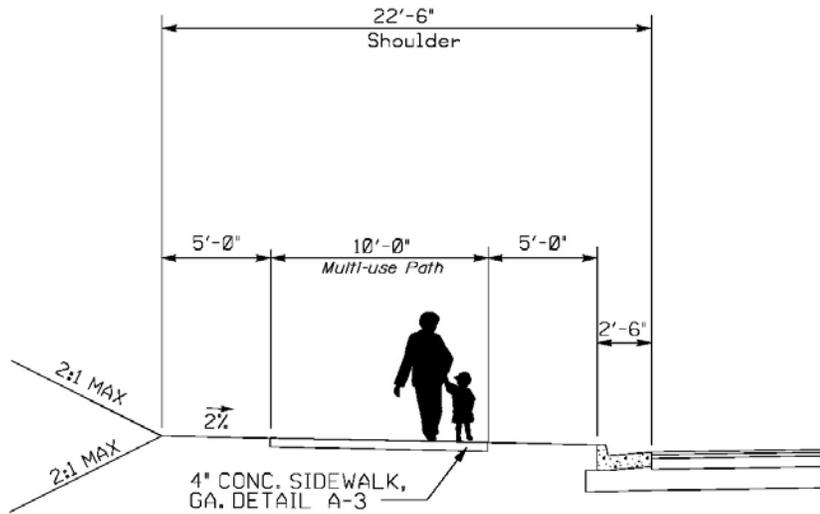
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|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-3.2

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

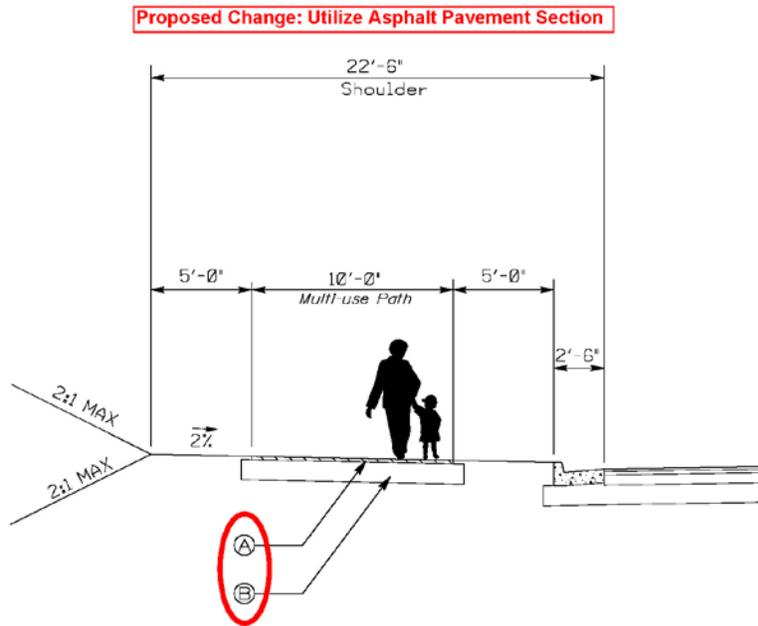


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-3.2

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



- Ⓐ RECYCLED ASPH CONC 19 mm SUPERPAVE, GP1 OR 2, INCL BITUM MATL & H LIME (220 LB/SY)
- Ⓑ GRADED AGGREGATE BASE CRS, 6", INCL MATL

CALCULATIONS

PROPOSAL NUMBER: R-3.2

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Design Pavement Cost Calculations:

310-1101: 6" GAB = 0.34 tons/SY x \$14.61/ton = \$4.97/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = \$11.75/SY

Multi-use Trail:

Original (per unit cost provided by design):

10 FT width x 2 x 28,800 FT roadway = 576,000 SF = 64,000 SY, at \$16.45/SY* = \$1,052,800

Proposed:

10 FT width x 2 x 28,800 FT roadway = 576,000 SF = 64,000 SY, at \$11.75/SY = \$752,000

* Because of the large volume of concrete proposed, the unit cost is significantly discounted. This value will likely vary and may not be as discounted when the project is left to construction. Additional savings may be possible using the asphalt pavement section.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-5.0	PAGE NUMBER:	1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION:	ELIMINATE CONSTRUCTION OF THE ANTIOCH ROAD SPUR AND THE ASSOCIATED ROUNDABOUT WITH SR 92 AND THE ANTIOCH ROAD SPUR.
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ORIGINAL DESIGN: The original concept design proposes to construct a 1400' 2-lane connection from Antioch Road located approximately 1300' east of the existing intersection with SR 92, crossing a stream and intersecting SR 92 with a roundabout located at approximate Sta 601+00. Existing Antioch Road connects to SR 92 at approximate Sta 585+00 as a right in/right out due to the proposed median on SR 92.

PROPOSED CHANGE: It is proposed to eliminate all construction and right of way associated with the Antioch Road Spur and the roundabout at Sta 601+00 and continue to allow existing Antioch Road to intersect SR 92 at Sta 585+00 as a right in/right out movement.

JUSTIFICATION: Improving access to this local County road may be beyond the scope of the SR 92 project. Vehicles using Antioch Road have other local roads to connect to SR 92 or East Paulding Drive and can still connect to SR 92 at the right in/right out location. Elimination of this connection and roundabout will improve operations on SR 92. A median break can be added at Sta 608+00 for Meryton Park subdivision.

ADVANTAGES:

- Reduces construction cost
- Reduces right of way cost
- Allows median break for Meryton Park subdivision
- Reduces stream impacts by eliminating a stream crossing
- Eliminates a residential displacement

DISADVANTAGES:

- Vehicles will not be able to turn left to or from Antioch Road due to the median on SR92

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,320,415		\$ 1,320,415
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 1,320,415		\$ 1,320,415

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-5.0	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Lighting (Roundabout)	1	EA	10	\$10000	\$100,000
PC Conc (Truck apron)	1	SY	400	\$40	\$16,000
Overhead HAWK signal	1	LS	1	\$150,000	\$150,000
Landscaping (Roundabout)	1	LS	1	\$58,000	\$58,000
Right of way	1	AC	3.85	\$172,000	\$662,200
Asphalt Pavement	1/7	SY	4356	\$42.29	\$184,215
Earthwork and Misc items	7	LS	1	\$150,000	\$150,000
SUBTOTAL – COST TO PRIME					\$1,320,415
MARKUP					--
TOTAL CONTRACT COST					\$1,320,415

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0.00
MARKUP					--
TOTAL CONTRACT COST					0.00

Difference [Original-Proposed] **\$1,320,415**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Calculation Sheet |
|---|--|

CALCULATIONS

PROPOSAL NUMBER: R-5.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

- Assume Asphalt Pavement quantities are approximately the same for SR 92
- Assume Sidewalk/Trail quantities are approximately the same for SR 92
- Assume Drainage quantities are approximately the same for SR 92

Current Design Pavement Cost Calculations:

310-1101: 12" GAB = 0.68 tons/SY x \$14.61/ton = \$9.93/SY

402-3121: 6" Asph 25MM = (6")(110#sy-in/2000#)(\$60.00/T) = \$19.80/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

402-3113: 1.5" Asph 12.5MM = (1.5")(110#sy-in/2000#)(\$70.00/T) = \$5.78/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = **\$42.29/SY**

Residential R/W Cost Calculations:

\$50,000/ac for partial property (Preliminary ROW Estimate)

\$172,000 /ac if complete parcel is eliminated (ROW Cost Estimate Summary by VE Team based on 1 Ac @ \$50,000)

Use project concept report estimate for:

- Truck apron @ \$40/sy
- Overhead HAWK signal @ \$150,000
- Landscaping @ \$175,000/3 = Approximately \$58,000
- Lighting 10ea @ \$10,000ea

Use right of way cost estimate for residential property value of \$172,000/ac (Parcel removed)

- Estimate right of way reduction at 1400' x 120' = 168,000 SF or approximately 3.85Ac

Antioch Road Spur 1400LF x 28' (TS-03) = 39200SF = 4356 SY

4356 SY asphalt pavement @ \$42.29/SY = \$184,215

Earthwork, Clear and Grub, Erosion Control, Drainage, etc. assumed = \$150,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-5.1	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE 11' LANE WIDTHS IN LIEU OF 12' ON ANTIOCH ROAD SPUR.

ORIGINAL DESIGN: In the current design, the section for the Antioch Road Spur includes 12' wide travel lanes in each direction.

PROPOSED CHANGE: It is proposed to reduce all travel lanes on the Antioch Road Spur from 12' wide to 11'.

JUSTIFICATION: GDOT design policy allows 11' lanes for local roads as indicated in Table 6.4 of the Design Policy Manual. This revision will provide acceptable road widths for local roads and result in a cost savings to the project.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for local roads
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 16,350		\$ 16,350
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 16,350		\$ 16,350

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-5.1	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SY	311	\$42.29	\$13,150
Right-of-Way (reduction)	1	AC	0.064	\$50,000	\$3,200
SUBTOTAL – COST TO PRIME					\$16,350
MARKUP					Incl.
TOTAL CONTRACT COST					\$16,350

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$16,350**

SOURCES

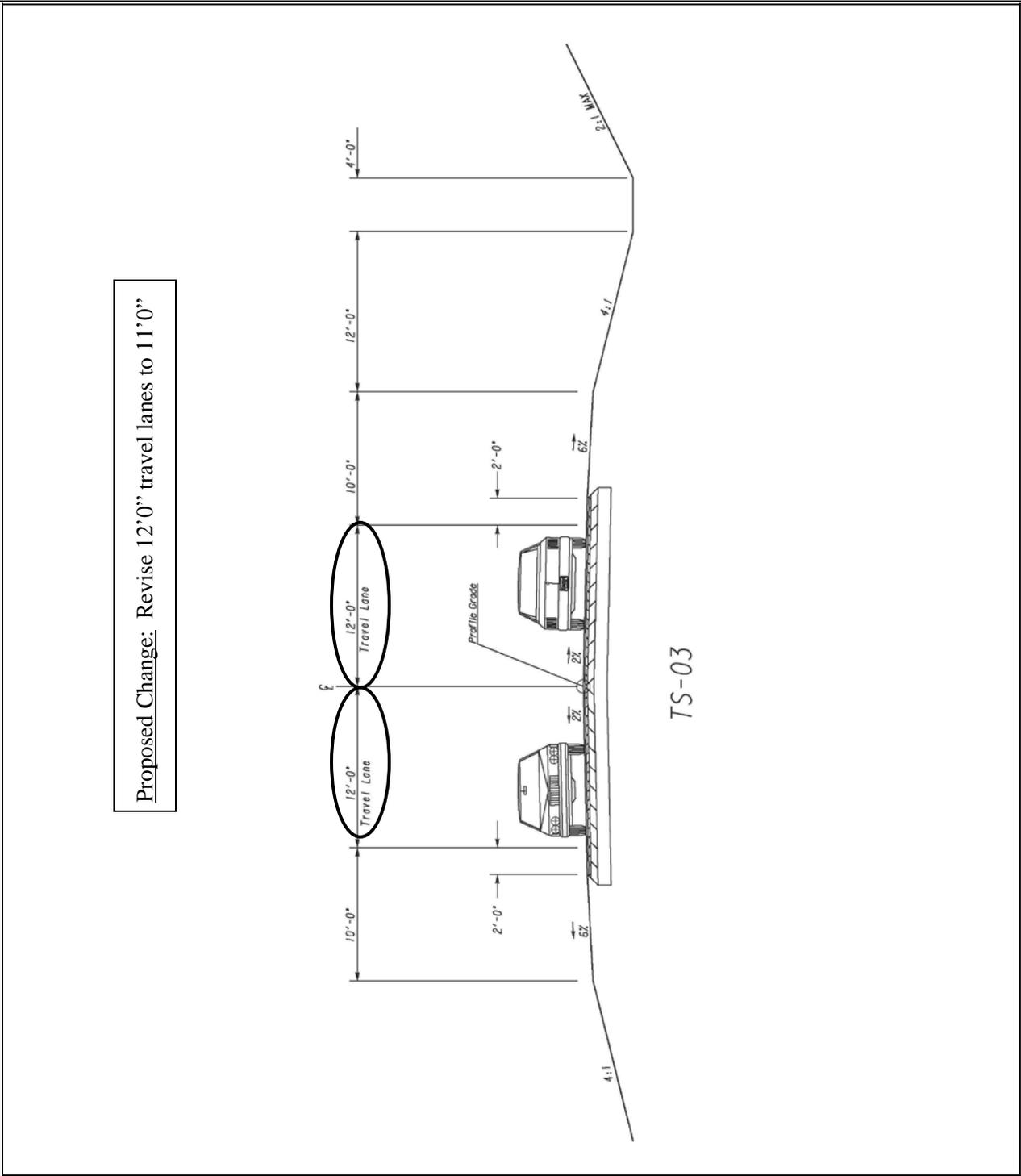
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Attached Calculation Sheet |
|---|---|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-5.1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



CALCULATIONS

PROPOSAL NUMBER: R-5.1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Current Design Pavement Cost Calculations:

310-1101: 12" GAB = 0.68 tons/SY x \$14.61/ton = \$9.93/SY

402-3121: 6" Asph 25MM = (6")(110#sy-in/2000#)(\$60.00/T) = \$19.80/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

402-3113: 1.5" Asph 12.5MM = (1.5")(110#sy-in/2000#)(\$70.00/T) = \$5.78/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = **\$42.29/SY**

Pavement Area Reduction

Section length = 1,400 LF for Antioch Road Spur

1,400 LF x 1' width reduction/lane x 2 lanes = 2,800 SF / 9 = 311 SY

Right-of-Way Reduction

Footprint reduced by 2' by reducing each of 2 lanes by 1'

Right-of-Way savings of 2' over Antioch Spur length = 1,400 x 2 = 2,800 SF / 43560 = 0.064 ac

Majority of property is Residential; thus, \$50,000/ac for partial property (Preliminary ROW Estimate)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-5.2	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION:	ELIMINATE PAVED SHOULDERS ON ANTIOCH ROAD SPUR.
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ORIGINAL DESIGN: In the current design, the section for the Antioch Road Spur includes 2' wide paved shoulders.

PROPOSED CHANGE: It is proposed to eliminate the paved shoulders on this new local road.

JUSTIFICATION: Based on GDOT design policy, rural side streets do not require a paved shoulder.

ADVANTAGES:

- Reduction in construction cost
- Acceptable design for local roads
- Less impervious area

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 32,800		\$ 32,800
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 32,800		\$ 32,800

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-5.2	PAGE NUMBER: 2 of 4
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pavement (reduction)	1/7	SY	622	\$42.29	\$26,300
Right-of-Way (reduction)	1	AC	0.13	\$50,000	\$6,500
SUBTOTAL – COST TO PRIME					\$32,800
MARKUP					Incl.
TOTAL CONTRACT COST					\$32,800

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					Incl.
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$32,800**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Attached Calculation Sheet |
|---|---|

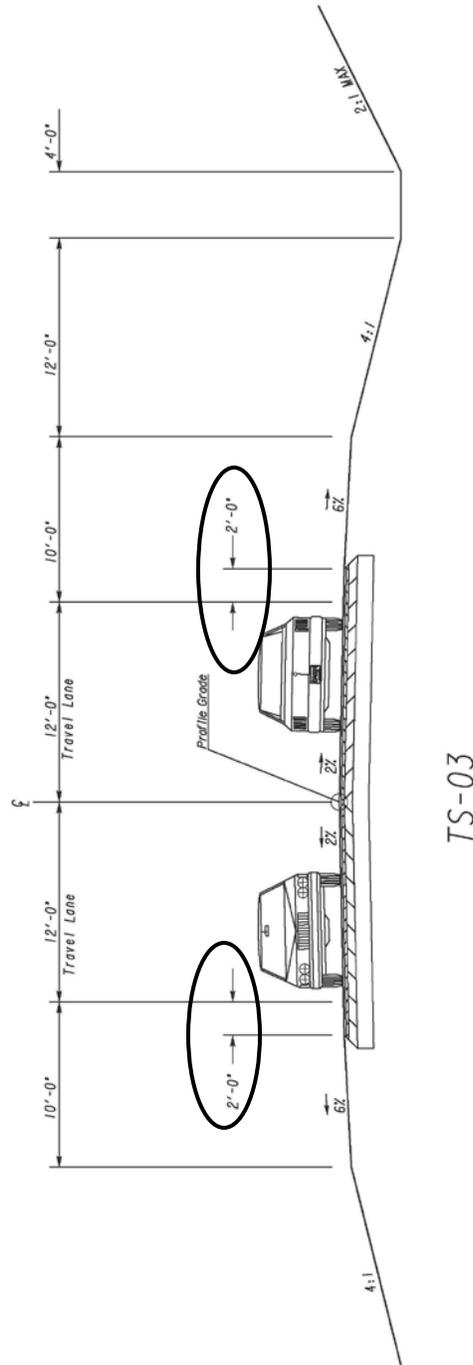
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-5.2

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Proposed Change: Eliminate 2'-0" Paved Shoulders



CALCULATIONS

PROPOSAL NUMBER: R-5.2

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Current Design Pavement Cost Calculations:

310-1101: 12" GAB = 0.68 tons/SY x \$14.61/ton = \$9.93/SY

402-3121: 6" Asph 25MM = (6")(110#sy-in/2000#)(\$60.00/T) = \$19.80/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

402-3113: 1.5" Asph 12.5MM = (1.5")(110#sy-in/2000#)(\$70.00/T) = \$5.78/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = **\$42.29/SY**

Pavement Area Reduction

Section length = 1,400 LF for Antioch Road Spur

1,400 LF x 2' width reduction x 2 sides = 5,600 SF / 9 = 622 SY

Right-of-Way Reduction

Footprint reduced by 4' by reducing each of 2 sides by 2'

Right-of-Way savings of 4' over Antioch Spur length = 1,400 x 4 = 5,600 SF / 43560 = 0.13 ac

Majority of property is Residential; thus, \$50,000/ac for partial property (Preliminary ROW Estimate)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-5.3	PAGE NUMBER: 1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: REDUCE THE REQUIRED RIGHT OF WAY WIDTH FROM 120' TO 80' ON THE NEW ANTIOCH ROAD SPUR.

ORIGINAL DESIGN: The original design has a required right of way corridor of approximately 120' along the new Antioch Road Spur.

PROPOSED CHANGE: It is proposed to reduce the required right of way for the Antioch Road Spur to 80'.

JUSTIFICATION: An 80' right of way along this new local road will be sufficient to construct the roadway section. Limiting the right of way to only that required to construct the roadway features will provide a construction cost savings.

ADVANTAGES:

- Reduces project cost
- Reduces property impacts

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 64,500		\$ 64,500
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 64,500		\$ 64,500

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-5.3	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right-of-Way (reduction)	1/7	AC	1.29	\$50,000	\$64,500
SUBTOTAL – COST TO PRIME					\$64,500
MARKUP					--
TOTAL CONTRACT COST					\$64,500

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					\$0
MARKUP					--
TOTAL CONTRACT COST					\$0

Difference [Original-Proposed] **\$64,500**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Revised ROW Cost Estimate Summary) |
|---|--|

CALCULATIONS

PROPOSAL NUMBER: R-5.3	PAGE NUMBER: 4 of 4
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Right-of-Way Reduction

Right-of-way corridor reduced by 40' total along Antioch Spur

Right-of-Way savings of 40' over Antioch Spur length = $1,400 \times 40 = 56,000 \text{ SF} / 43560 = 1.29$ acres

Majority of property is Residential; thus, \$50,000/ac for partial property (Preliminary ROW Estimate)

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-6.0	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: REDUCE RIGHT OF WAY WIDTHS TO ONLY INCLUDE WHAT IS REQUIRED FOR CONSTRUCTION.

ORIGINAL DESIGN: The current concept plans show a right of way width that varies from approximately 200' to more than 300'. The draft concept report on page 5 indicates the proposed right of way width varies from 180' to 700'.

PROPOSED CHANGE: It is proposed to reduce the right of way corridor to an area that is no more than 10' beyond the construction limits of the project in lieu of a wide corridor.

JUSTIFICATION: Acquiring only the right of way necessary to construct a project is a standard GDOT method and in the case of condemnations is all that can be acquired.

ADVANTAGES:

- Reduces right of way cost
- Reduces acquisition time with fewer parcels
- Reduces impacts to ESAs
- Better acceptance of the project by property owners

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 17,211,000		\$ 17,211,000
PROPOSED CHANGE:	\$ 12,612,000		\$ 12,612,000
SAVINGS:	\$ 4,599,000		\$ 4,599,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-6.0	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of way	1				\$17,211,000
SUBTOTAL – COST TO PRIME					\$17,211,000
MARKUP					--
TOTAL CONTRACT COST					\$17,211,000

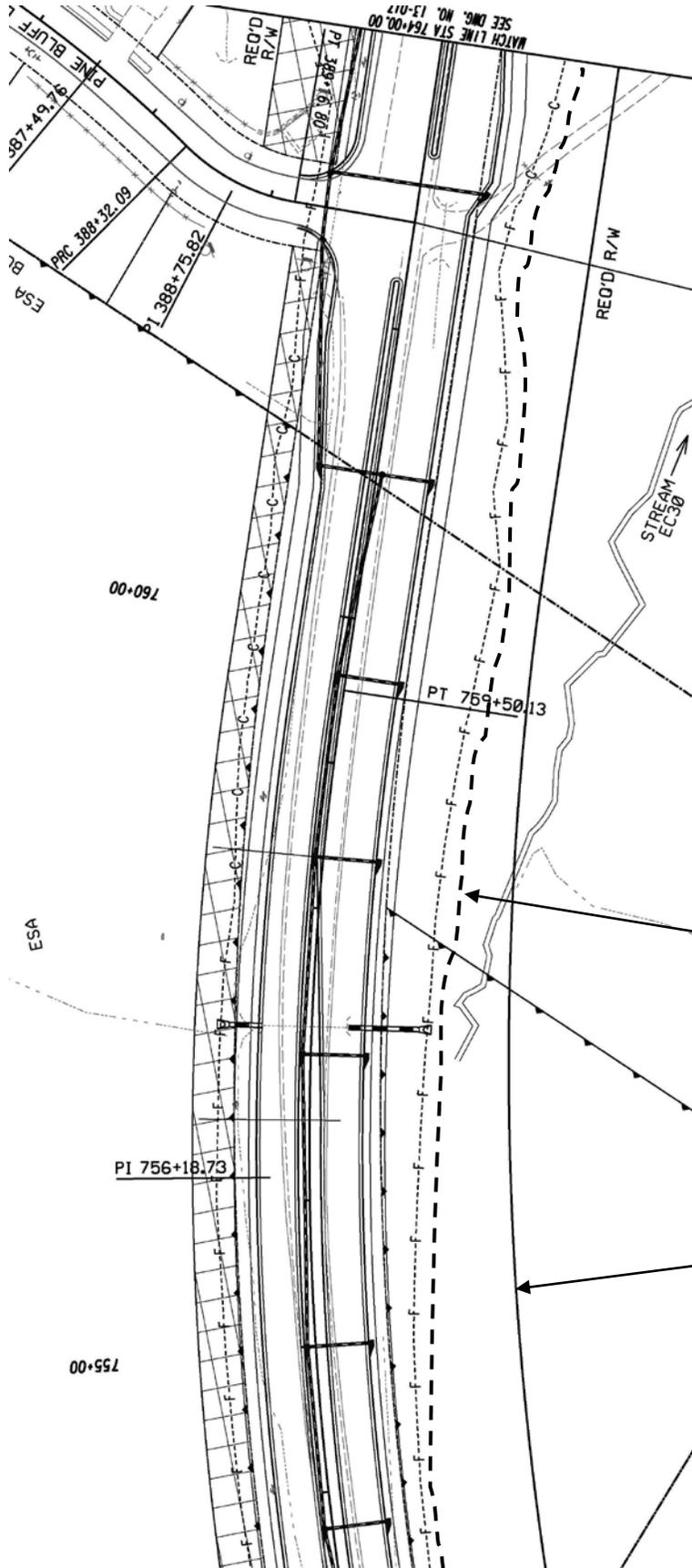
PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of way	7				\$12,612,000
SUBTOTAL – COST TO PRIME					\$12,612,000
MARKUP					--
TOTAL CONTRACT COST					\$12,612,000

Difference [Original-Proposed] **\$4,599,000**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Revised GDOT right of way spread sheet |
|---|---|



Proposed Right-of-Way
(±10' Beyond Fill Line)

Current Right-of-Way

R-6.0 – Proposed Change 1 of 1

CALCULATIONS

PROPOSAL NUMBER: R-6.0

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Review of the plan sheets shows several parcels with required right of way lines across the parcel with the construction limits not encroaching within the property.

The parcels are not numbered on the VE plans however an approximate location and a scaled reduced area is shown below:

Residential

Sheet 13-008, 2 Parcels, 0.21 Ac

Sheet 13-013, 8 Parcels, 0.46 Ac

Sheet 13-019, 4 Parcels, 0.44 Ac

Sheet 13-020, 6 Parcels, 0.94 Ac

Sheet 13-021, 4 Parcels, 0.49 Ac

Sheet 13-022, 5 Parcels, 0.37 Ac

Total = 29 Parcels and 2.91 Ac

Commercial

Sheet 13-012, 1 Parcel, 0.15 Ac

Remaining right of way areas was estimated to be 50% more than necessary to construct the project

Using GDOT right of way spread sheet provided in the VE package, reducing the number of parcels from 222 to 192, reducing the right of way area (shown as 29.50 ac residential and 30.00 ac commercial) by 50% and leaving all other associated cost the same results in a revised total right of way cost of \$12,612,000 (See following "Calculations" sheet for summary page of GDOT right of way spreadsheet).

CALCULATIONS

PROPOSAL NUMBER: R-6.0

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Summary page of GDOT right of way spreadsheet:

PI: 0007692

Description: Removed 30 parcels and 50% R/W

Project Termini:

Parcels: 192 Existing ROW:
Required ROW:

Land and Improvements _____ \$8,638,125.00

Proximity Damage	\$0.00
Consequential Damage	\$0.00
Cost to Cures	\$0.00
Trade Fixtures	\$0.00
Improvements	\$3,225,000.00

Valuation Services _____ \$378,750.00

Legal Services _____ \$1,217,100.00

Relocation _____ \$739,000.00

Demolition _____ \$25,000.00

Administrative _____ \$1,614,000.00

TOTAL ESTIMATED COSTS _____ \$12,611,975.00

TOTAL ESTIMATED COSTS (ROUNDED) _____ \$12,612,000.00

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-6.1	PAGE NUMBER: 1 of 6
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE A MAXIMUM 120' RIGHT OF WAY CORRIDOR WITH EASEMENTS AS NECESSARY BEYOND THE RIGHT OF WAY LIMITS.

ORIGINAL DESIGN: The current concept plans show a right of way width that varies from approximately 200' to more than 300'. The draft concept report on page 5 indicates the proposed right of way width varies from 180' to 700'.

PROPOSED CHANGE: It is proposed to use a maximum right of way corridor of 120' with easements beyond the right of way in lieu of a right of way corridor of 200' to more than 300'.

JUSTIFICATION: Using a typical right of way corridor with easements beyond the right of way is a standard GDOT method especially in urban or developed areas.

ADVANTAGES:

- Reduces right of way cost
- Reduces impacts to ESAs
- Better acceptance of the project by property owners

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 17,211,000		\$ 17,211,000
PROPOSED CHANGE:	\$ 11,664,000		\$ 11,664,000
SAVINGS:	\$ 5,547,000		\$ 5,547,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-6.1	PAGE NUMBER:	2 of 6
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of way	1				\$17,211,000
SUBTOTAL – COST TO PRIME					\$17,211,000
MARKUP					--
TOTAL CONTRACT COST					\$17,211,000

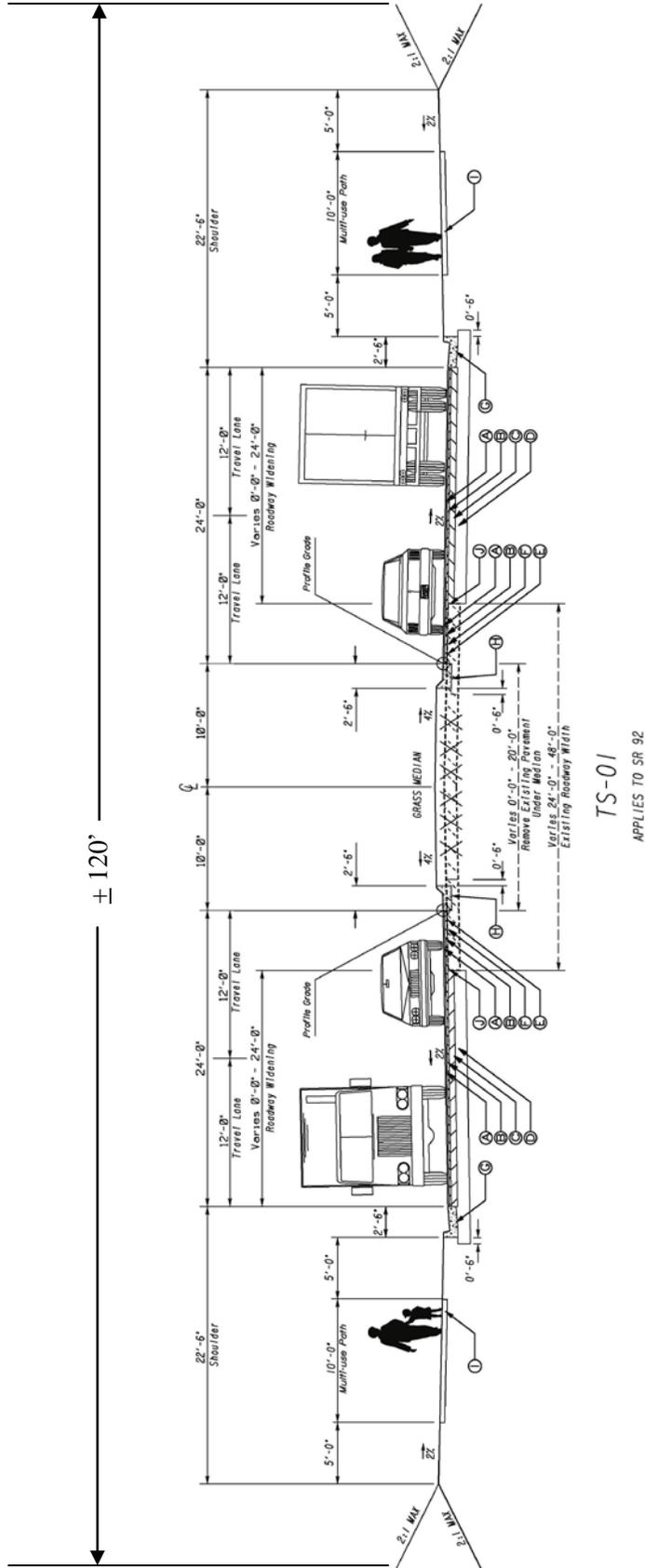
PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right of way	7				\$11,664,000
SUBTOTAL – COST TO PRIME					\$11,664,000
MARKUP					--
TOTAL CONTRACT COST					\$11,664,000

Difference [Original-Proposed] **\$5,547,000**

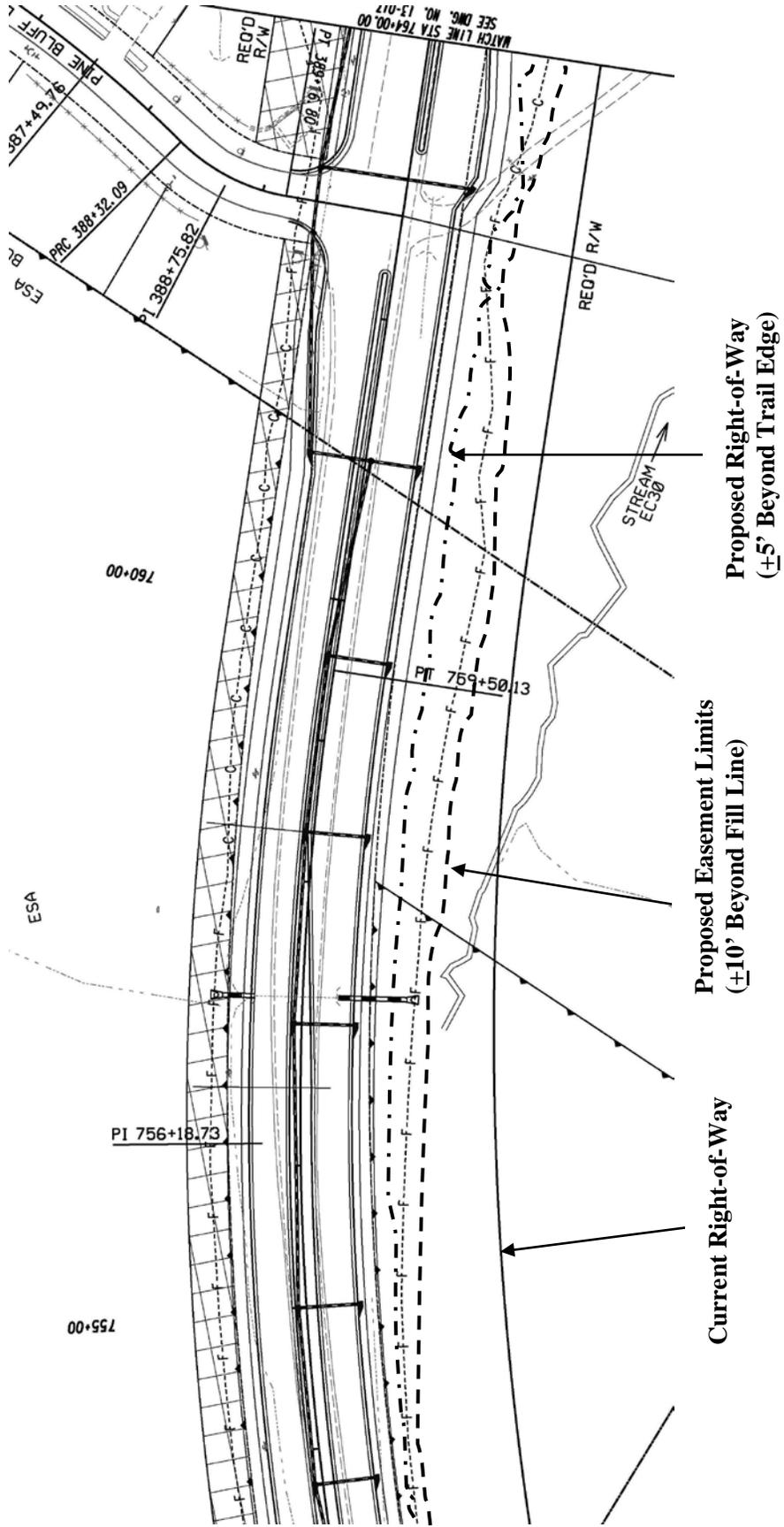
SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Revised GDOT Right of way spread sheet |
|---|---|



TS-01
APPLIES TO SR 92

R-6.1 – Proposed Change 1 of 2



R-6.1 – Proposed Change 2 of 2

CALCULATIONS

PROPOSAL NUMBER: R-6.1

PAGE NUMBER: 5 of 6

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Review of the plan sheets shows several parcels with required right of way lines across the parcel with the construction limits not encroaching within the property.
The parcels are not numbered on the VE plans however an approximate location and a scaled reduced area is shown below:

Residential

Sheet 13-008, 2 Parcels, 0.21 Ac
Sheet 13-013, 8 Parcels, 0.46 Ac
Sheet 13-019, 4 Parcels, 0.44 Ac
Sheet 13-020, 6 Parcels, 0.94 Ac
Sheet 13-021, 4 Parcels, 0.49 Ac
Sheet 13-022, 5 Parcels, 0.37 Ac
Total = 29 Parcels and 2.91 Ac

Commercial

Sheet 13-012, 1 Parcel, 0.15 Ac

Remaining right of way areas was estimated to be 50% more than necessary to construct the project.

By using a 120' right of way corridor it was estimated that 50% of the required area would be right of way and 50% would be easement

Using GDOT right of way spread sheet provided in the VE package, reducing the number of parcels from 222 to 192, reducing the total area (shown as 29.50 ac residential and 30.00 ac commercial) by 50%, using half as right of way and half as easement and leaving all other associated cost the same results in a revised total right of way cost of \$11,664,000 (See following "Calculations" sheet for summary page of GDOT right of way spreadsheet).

CALCULATIONS

PROPOSAL NUMBER: R-6.1

PAGE NUMBER: 6 of 6

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Summary page of GDOT right of way spreadsheet:

PI: 7692

Description: Removed 30 parcels and used 120' corridor and easements

Project Termini:

Parcels: 192

Existing ROW:

Required ROW:

Land and Improvements _____ \$7,689,375.00

Proximity Damage \$0.00

Consequential Damage \$0.00

Cost to Cures \$0.00

Trade Fixtures \$0.00

Improvements \$3,225,000.00

Valuation Services _____ \$378,750.00

Legal Services _____ \$1,217,100.00

Relocation _____ \$739,000.00

Demolition _____ \$25,000.00

Administrative _____ \$1,614,000.00

TOTAL ESTIMATED COSTS _____ \$11,663,225.00

TOTAL ESTIMATED COSTS (ROUNDED) _____ \$11,664,000.00

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-7.0	PAGE NUMBER:	1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION:	USE A SIGNALIZED INTERSECTION AT ANTIOCH ROAD SPUR IN LIEU OF A MULTI-LANE ROUNDABOUT.
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ORIGINAL DESIGN: The original design proposes to install a roundabout at the intersection of Antioch Road Spur and SR 92. (Approximate Sta 601+00)

PROPOSED CHANGE: It is proposed to install a signalized intersection in lieu of a multi-lane roundabout.

JUSTIFICATION: The traffic study that was a portion of the VE package performed by Kittelson & Associates dated January 2013 stated in the Summary and Conclusions for SR 92 at Antioch Road that “Both a roundabout and traffic signal are viable alternatives.” It also states “The roundabout does have marginally higher delays for the northbound and southbound through movements during the peak hours”.

Based on the Operations Analysis, the roundabout primarily improves operations for the minor street approach and southbound left turn movements. The through movements along SR 92 are only improved during off-peak hours. Thus, the VE team proposes to utilize a signalized intersection in lieu of the roundabout at this location.

ADVANTAGES:

- Reduces construction cost
- Reduces right of way cost

DISADVANTAGES:

- Requires stop & go operation even in off peak conditions unlike a roundabout

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 349,000		\$ 349,000
PROPOSED CHANGE:	\$ 150,000		\$ 150,000
SAVINGS:	\$ 199,000		\$ 199,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-7.0	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Lighting (Roundabout)	1	EA	10	\$10,000	\$100,000
PC Conc (Truck apron)	1	SY	400	\$40	\$16,000
Overhead HAWK signal	1	LS	1	\$150,000	\$150,000
Landscaping (Roundabout)	1	LS	1	\$58,000	\$58,000
Right of way	1	AC	0.5	\$50,000	\$25,000
SUBTOTAL – COST TO PRIME					\$349,000
MARKUP					--
TOTAL CONTRACT COST					\$349,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Traffic Signal	1	LS	1	\$150,000	\$150,000
SUBTOTAL – COST TO PRIME					\$150,000
MARKUP					--
TOTAL CONTRACT COST					\$150,000

Difference [Original-Proposed] **\$199,000**

SOURCES

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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CALCULATIONS

PROPOSAL NUMBER: R-7.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

- Assume Asphalt Pavement quantities are approximately the same for roundabout and signal
- Assume Sidewalk/Trail quantities are approximately the same for roundabout and signal
- Assume Drainage quantities are approximately the same for roundabout and signal

Use project concept report estimate for:

- Truck apron @ \$40/sy
- Overhead HAWK signal @ \$150,000
- Landscaping @ \$175,000/3 = Approximately \$58,000
- Lighting 10ea @ \$10,000ea

Use right of way cost estimate for residential property value of \$50,000/ac for partial take

- Estimate right of way reduction at 350' x 60' = 21,000 SF or approximately 0.5 Ac

Use project concept report estimate for:

- Traffic Signal @ \$150,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-8.0	PAGE NUMBER:	1 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: USE A SIGNALIZED INTERSECTION AT OLD BURNT HICKORY ROAD IN LIEU OF A MULTI-LANE ROUNDABOUT.

ORIGINAL DESIGN: The original design proposes to install a roundabout at the intersection of Old Burnt Hickory Road and SR 92. (Approximate Sta 831+00)

PROPOSED CHANGE: It is proposed to install a signalized intersection in lieu of a roundabout.

JUSTIFICATION: The traffic study performed by Kittelson & Associates dated January 2013 states in the Summary and Conclusions for SR 92 at Old Burnt Hickory Road that “Either a roundabout or traffic signal are needed to serve the 2037 design traffic volumes. Both options provide generally comparable performance and both are expected to be near capacity during the 2037 AM and PM peak hours.” Based on these statements in the Intersection Operations Analysis, the VE Team proposes to utilize a signalized intersection which provides comparable performance to a roundabout while also providing a cost savings to the project.

ADVANTAGES:

- Reduces construction cost
- Reduces right of way cost

DISADVANTAGES:

- Requires stop & go operation even in off peak conditions unlike a roundabout

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 349,000		\$ 349,000
PROPOSED CHANGE:	\$ 150,000		\$ 150,000
SAVINGS:	\$ 199,000		\$ 199,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-8.0	PAGE NUMBER:	2 of 4
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Lighting (Roundabout)	1	EA	10	\$10000	\$100,000
PC Conc (Truck apron)	1	SY	400	\$40	\$16,000
Overhead HAWK signal	1	LS	1	\$150,000	\$150,000
Landscaping (Roundabout)	1	LS	1	\$58,000	\$58,000
Right of way	1	AC	0.5	\$50,000	\$25,000
SUBTOTAL – COST TO PRIME					\$349,000
MARKUP					--
TOTAL CONTRACT COST					\$349,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Traffic Signal	1	LS	1	\$150,000	\$150,000
SUBTOTAL – COST TO PRIME					\$150,000
MARKUP					--
TOTAL CONTRACT COST					\$150,000

Difference [Original-Proposed] **\$199,000**

SOURCES

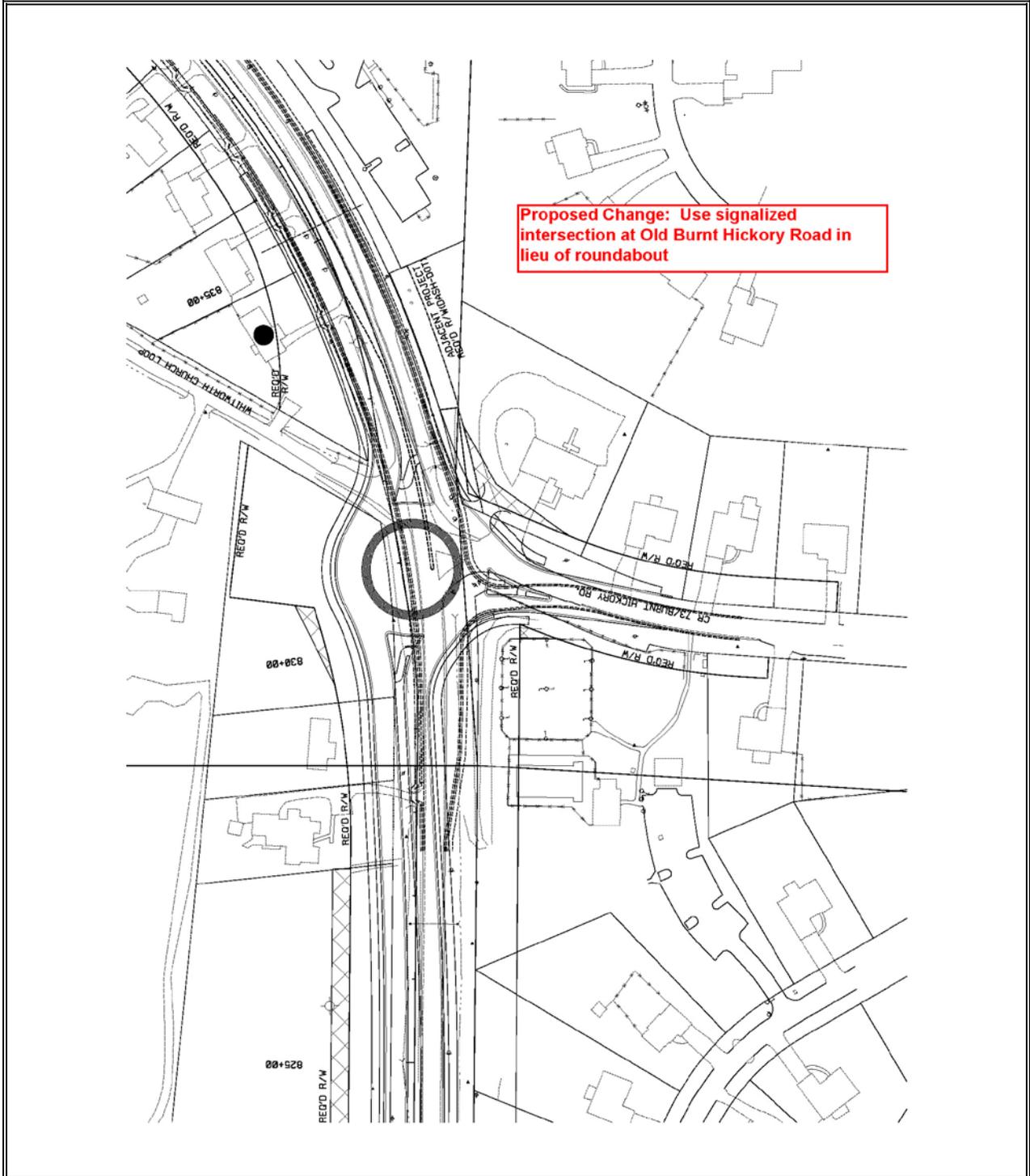
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| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-8.0

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



CALCULATIONS

PROPOSAL NUMBER: R-8.0

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

- Assume Asphalt Pavement quantities are approximately the same for roundabout and signal
- Assume Sidewalk/Trail quantities are approximately the same for roundabout and signal
- Assume Drainage quantities are approximately the same for roundabout and signal

Use project concept report estimate for:

- Truck apron @ \$40/sy
- Overhead HAWK signal @ \$150,000
- Landscaping @ \$175,000/3 = Approximately \$58,000
- Lighting 10ea @ \$10,000ea

Use right of way cost estimate for residential property value of \$50,000/ac

- Estimate right of way reduction at 370' x 60' = 22,200 SF or approximately 0.5 Ac

Use project concept report estimate for:

- Traffic Signal @ \$150,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-9.0	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: RELOCATE ROUNDABOUT AT DUE WEST ROAD (SOUTH) TO THE SOUTH TO ALLOW GREATER SEPARATION BETWEEN ROUNDABOUTS AND MINIMIZE CONSTRUCTION OVER COLONIAL PIPELINE FACILITIES LOCATED AT APPROXIMATE STA 706+00.

ORIGINAL DESIGN: In the current design, the roundabout for Due West Road (South) is located at approximate Sta 710+00 and the roundabout for Due West Road (North) is located at approximate Sta 716+00.

PROPOSED CHANGE: It is proposed to relocate the roundabout for Due West Road (South) approximately 800' South to approximate Sta 702+00 to obtain proper separation between intersections and to eliminate construction activities from the Colonial Pipeline easement (except area within the SR 92 right of way).

JUSTIFICATION: Moving the roundabout for Due West Road (South) would develop the required separation of 1000' between intersections and would eliminate additional construction activities on the Colonial Pipeline easement. The project concept cost estimate shows \$2,500,000 as reimbursable utility cost for Colonial Pipeline.

ADVANTAGES:

- Obtains intersection separation distance
- Removes utility conflict
- Reduces utility cost
- Eliminates the need for a Design Variance for intersection separation distance
- Will have less impacts to the properties at the existing intersection

DISADVANTAGES:

- Will have additional impacts to Mobile Home Park

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,500,000		\$ 2,500,000
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 2,500,000		\$ 2,500,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-9.0	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Colonial Pipeline Utility reimbursement	1	LS	1	\$2,500,000	\$2,500,000
SUBTOTAL – COST TO PRIME					\$2,500,000
MARKUP					--
TOTAL CONTRACT COST					\$2,500,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0.00
MARKUP					--
TOTAL CONTRACT COST					0.00

Difference [Original-Proposed] **\$2,500,000**

SOURCES

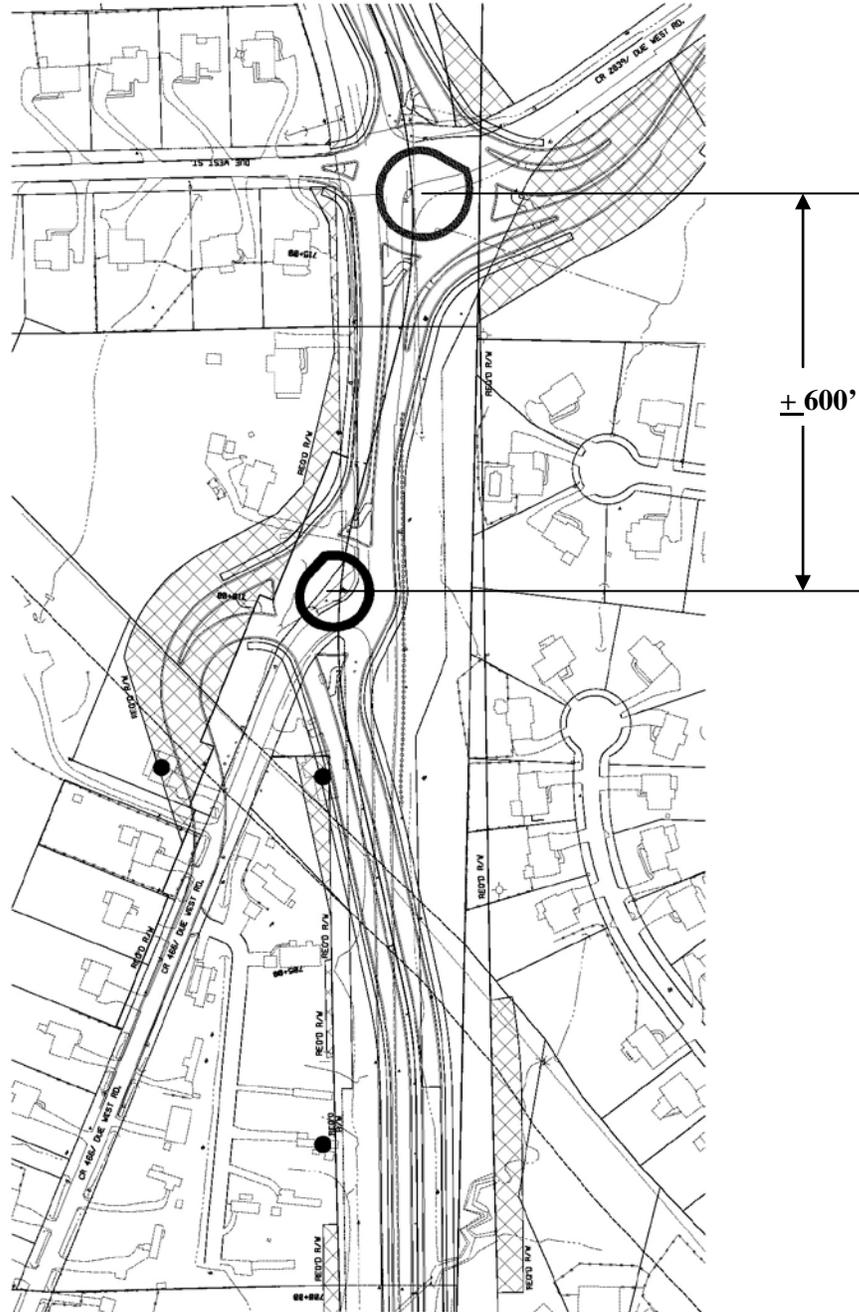
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| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-9.0

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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



CALCULATIONS

PROPOSAL NUMBER: R-9.0	PAGE NUMBER: 5 of 5
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Construction cost for the south roundabout is assumed to be the same if the roundabout is moved approximately 800'. Right of way and acquisitions will move from one location to the other and will be similar.

This is the only crossing of the Colonial Pipeline and if the construction remains within the right of way for SR 92 there should be no impacts to the pipeline and therefore no associated utility cost of \$2,500,000.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-9.1	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION:	RELOCATE INTERSECTION AT DUE WEST ROAD (SOUTH) TO THE SOUTH AND CHANGE TO A SIGNALIZED INTERSECTION IN LIEU OF A MULTI-LANE ROUNDABOUT TO ALLOW GREATER SEPARATION BETWEEN INTERSECTIONS AND MINIMIZE CONSTRUCTION OVER COLONIAL PIPELINE FACILITIES.
------------------------------	---

ORIGINAL DESIGN: In the current design, the roundabout for Due West Road (South) is located at approx. Sta 710+00 and the roundabout for Due West Road (North) is located at approx. Sta 716+00. Existing Colonial Pipeline facilities are located at approximate Sta 706+00.

PROPOSED CHANGE: It is proposed to relocate the intersection for Due West Road (South) approximately 730' South to approximate Sta 702+70 and construct as a signalized intersection to obtain proper separation between intersections and to eliminate construction activities from the Colonial Pipeline easement (except area within the SR 92 right of way).

JUSTIFICATION: Moving the intersection for Due West Road (South) would exceed the required separation of 1000' between intersections and would eliminate additional construction activities on the Colonial Pipeline easement. The project concept cost estimate shows \$2,500,000 as reimbursable utility cost for Colonial Pipeline. A signalized intersection allows for a smaller footprint and would have less impact on the adjacent properties and utilities. Also, the Intersection Operations Analysis states that a signalized intersection at Due West Road (South) would have a Level of Service C under Year 2037 build conditions, which is acceptable.

ADVANTAGES:

- Obtains intersection separation distance
- Removes utility conflict & reduces costs
- Eliminates the need for a Design Variance for intersection separation distance
- Will have less impacts to the properties at the existing intersection

DISADVANTAGES:

- Will have additional impacts to Mobile Home Park

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,824,000		\$ 2,824,000
PROPOSED CHANGE:	\$ 150,000		\$ 150,000
SAVINGS:	\$ 2,674,000		\$ 2,674,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: R-9.1	PAGE NUMBER: 2 of 5
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Colonial Pipeline Utility reimbursement	1	LS	1	\$2,500,000	\$2,500,000
Lighting (Roundabout)	1	EA	10	\$10,000	\$100,000
PC Conc (Truck apron)	1	SY	400	\$40	\$16,000
Overhead HAWK signal (Roundabout)	1	LS	1	\$150,000	\$150,000
Landscaping (Roundabout)	1	LS	1	\$58,000	\$58,000
SUBTOTAL – COST TO PRIME					\$2,824,000
MARKUP					--
TOTAL CONTRACT COST					\$2,824,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Traffic Signal	1	LS	1	\$150,000	\$150,000
SUBTOTAL – COST TO PRIME					\$150,000
MARKUP					--
TOTAL CONTRACT COST					\$150,000

Difference [Original-Proposed] **\$2,674,000**

SOURCES

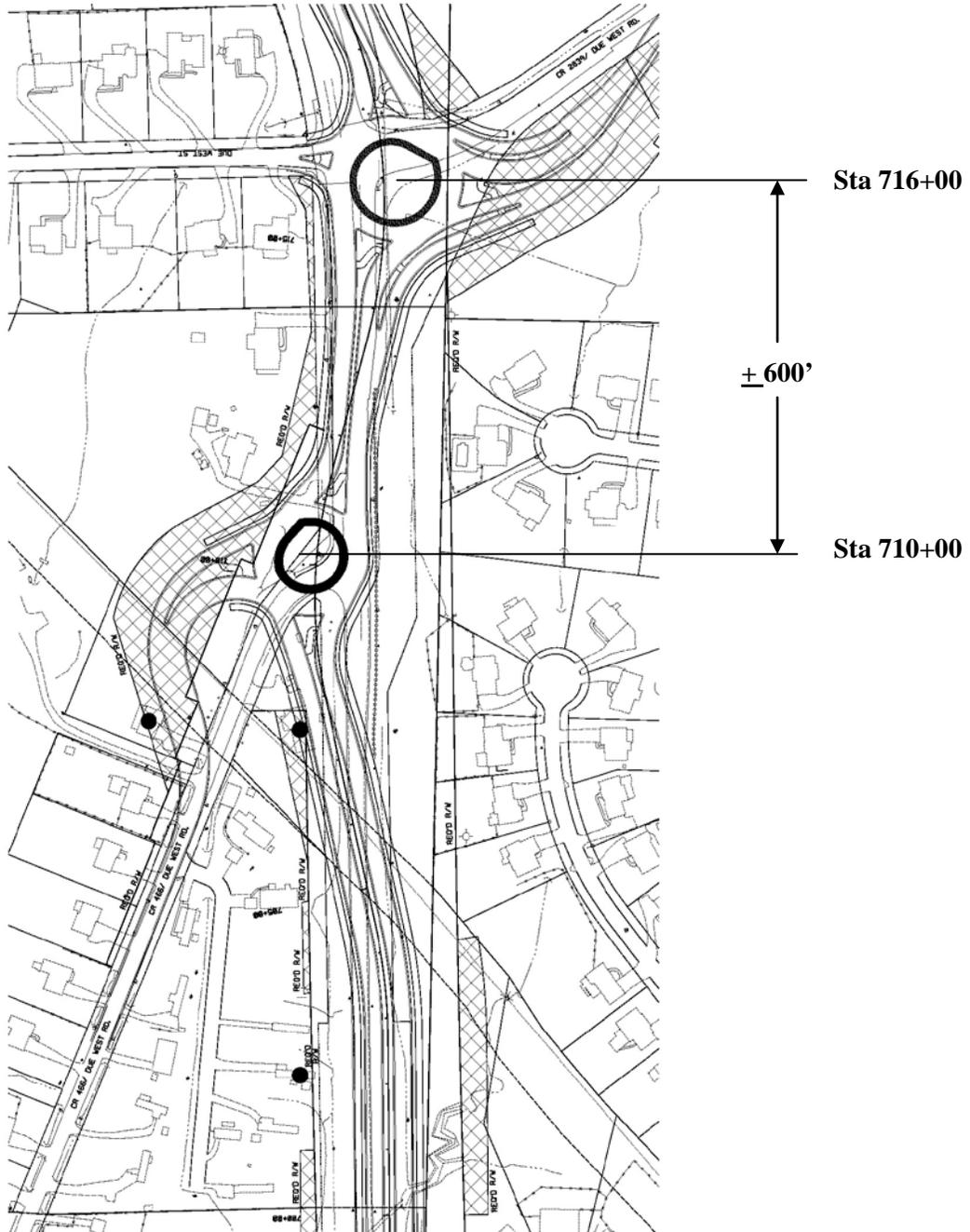
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|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-9.1

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

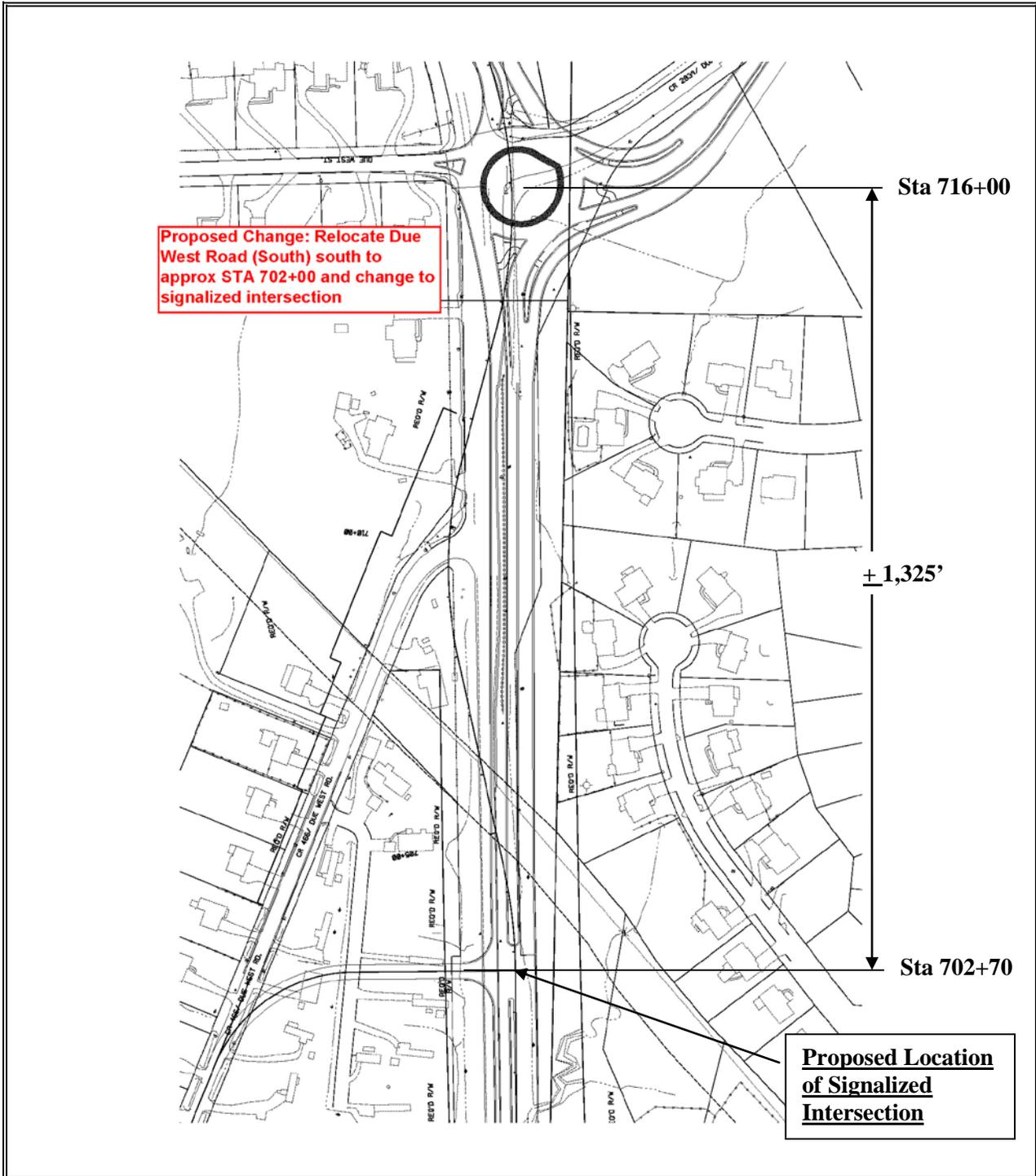


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-9.1

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



CALCULATIONS

PROPOSAL NUMBER: R-9.1

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

This is the only crossing of the Colonial Pipeline and if the construction remains within the right of way for SR 92 there should be no impacts to the pipeline and therefore no associated utility cost of \$2,500,000.

- Assume Asphalt Pavement quantities are approximately the same for roundabout and signal
- Assume Sidewalk/Trail quantities are approximately the same for roundabout and signal
- Assume Drainage quantities are approximately the same for roundabout and signal
- Assume right of way cost are approximately the same for roundabout and signal

Use project concept report estimate for:

- Truck apron @ \$40/sy
- Overhead HAWK signal @ \$150,000
- Landscaping @ \$175,000/3 = Approximately \$58,000
- Lighting 10ea @ \$10,000ea

Use project concept report estimate for:

- Traffic Signal @ \$150,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-11.0	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION:	REDUCE CUT FOR NEW VERTICAL ALIGNMENT FROM STA 568+00 TO STA 576+00 TO MEET 45 MPH DESIGN SPEED.
------------------------------	---

ORIGINAL DESIGN: The original design utilizes a 950-foot vertical (K value = 130.14) crest curve to improve sight distance between Sta 568+00 to Sta 576+00. This design results in a six foot lowering of the vertical profile from the existing ground at approximate Sta 573+00.

PROPOSED CHANGE: It is proposed to utilize a 500-foot vertical (K value = 68.49) crest curve; the vertical profile grades of 6.999% and -1.100% from the original design are maintained. This design meets the 45 mph design speed and provides approximately 500 feet of intersection sight distance along the vertical profile. This design results in a two foot lowering of the vertical profile from the existing ground at approximate Sta 573+00.

JUSTIFICATION: Reducing the amount of cut between the existing ground and the proposed vertical profile grade would reduce earthwork and would simplify traffic control by eliminating significant grade changes.

ADVANTAGES:

- Reduces quantities/cost
- Simplifies traffic control
- Meets design standards

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:	\$ 205,863		\$ 205,863
PROPOSED CHANGE:	\$ 163,040		\$ 163,040
SAVINGS:	\$ 49,592		\$ 49,592

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-11.0	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
UNCLASS EXCAV	1	CY	14,883	2.89	\$43,013
RIGHT-OF-WAY, RESIDENTIAL	1	AC	3.257	50,000	\$162,850
SUBTOTAL – COST TO PRIME					\$205,863
MARKUP					--
TOTAL CONTRACT COST					\$205,863

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
UNCLASS EXCAV	1	CY	2,343	2.89	\$6,771
RIGHT-OF-WAY, RESIDENTIAL	1	AC	2.99	50,000	\$149,500
SUBTOTAL – COST TO PRIME					\$156,271
MARKUP					--
TOTAL CONTRACT COST					\$156,271

Difference [Original-Proposed] **\$49,592**

SOURCES

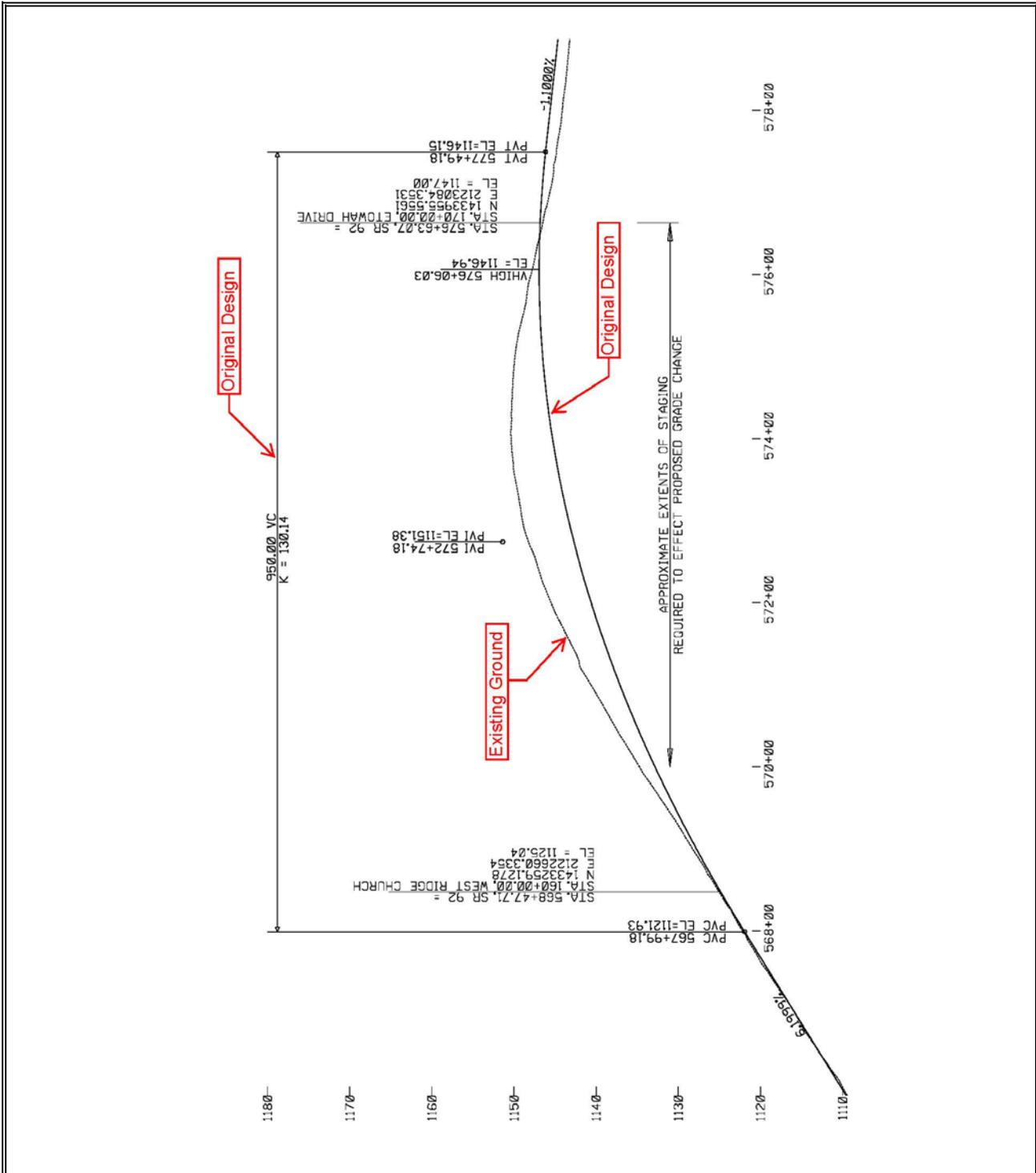
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-11.0

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

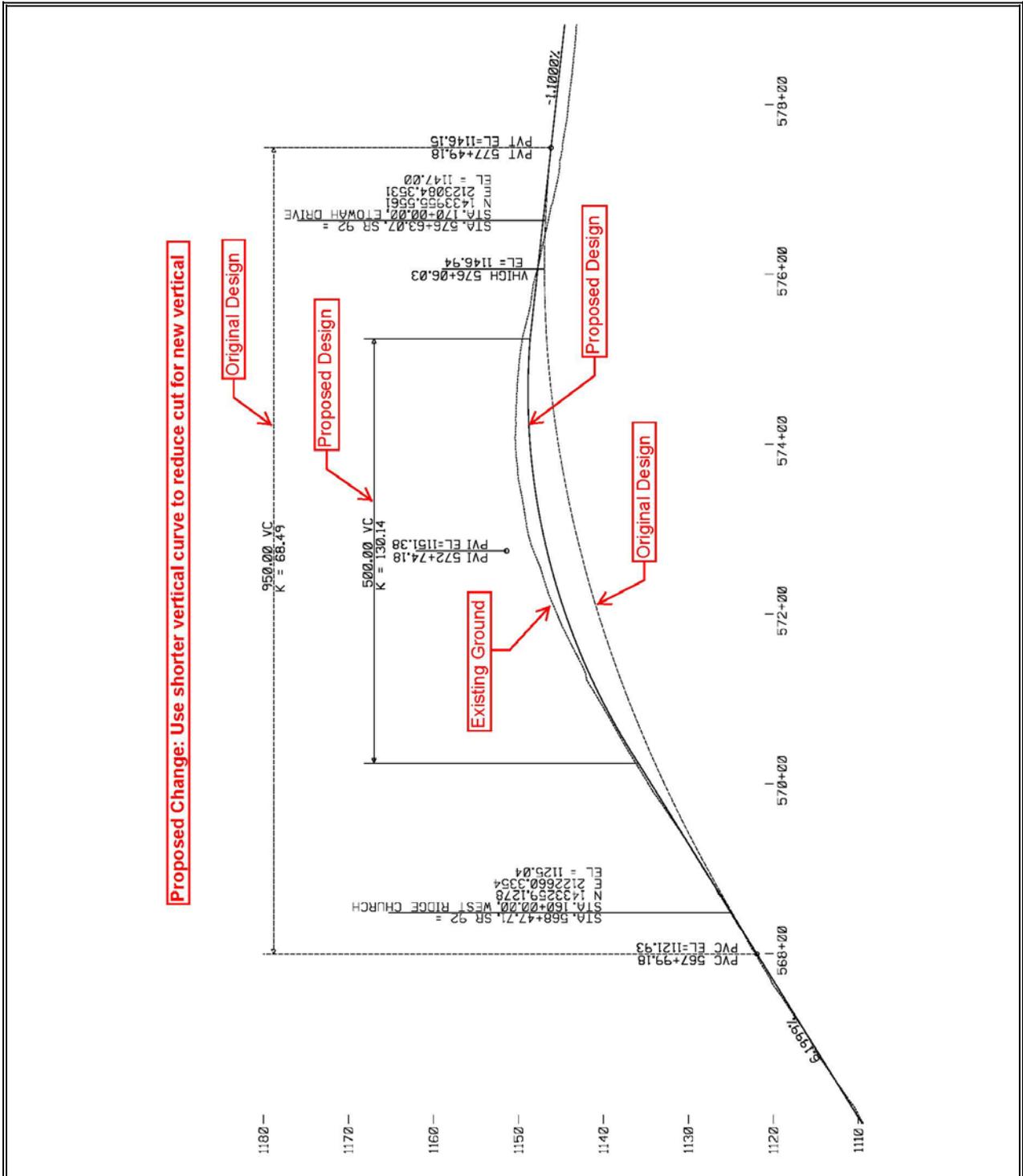


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-11.0

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



CALCULATIONS

PROPOSAL NUMBER: R-11.0

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Assumptions:

Change is limited to Sta 568+00 to Sta 576+00.

Utilize existing and proposed (original) profile information as provided by designers.

Earthwork Calculations:

Original:

At Sta 573+00, elevation difference between existing and proposed grade = 6 FT

At Sta 573+00, cross section width (toe of slope to toe of slope) = 141 FT

From profile, vertical curve length = 950 FT

$(950 \text{ FT} \times 0.5) \times 6 \text{ FT} \times 141 \text{ FT} = 401,850 \text{ CF} = 14,883 \text{ CY}$. At \$2.89/CY = \$43,013

Proposed:

At Sta 573+00, elevation difference between existing and proposed grade = 2 FT

At Sta 573+00, cross section width (toe of slope to toe of slope) = 126.5 FT

From profile, vertical curve length = 500 FT

$(500 \text{ FT} \times 0.5) \times 2 \text{ FT} \times 126.5 \text{ FT} = 63,250 \text{ CF} = 2,343 \text{ CY}$. At \$2.89/CY = \$6,771

Residential R/W Calculations:

Original:

From plans, 200 FT width for 75 FT and 175 FT width for 725 FT

$(200 \text{ FT} \times 75 \text{ FT}) + (175 \text{ FT} \times 725 \text{ FT}) = 141,875 \text{ SF} = 3.257 \text{ AC}$

At \$50,000/AC for property (Preliminary ROW Estimate) = \$162,850

Proposed:

From original = 3.26 AC

Reduce foot print from average 141 FT width to 126.5 width, reduction of 14.5 FT

Length = 800 FT

$(14.5 \text{ FT} \times 800 \text{ FT}) = 11,600 \text{ SF} = 0.267 \text{ AC}$

Original less proposed = 3.257 AC - 0.267 AC = 2.99 AC

At \$50,000/AC for partial property take (Preliminary ROW Estimate) = \$149,500

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: R-13.0	PAGE NUMBER: 1 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: FOLLOW EXISTING HORIZONTAL ALIGNMENT FROM STA 720+00 TO STA 740+00.
--

ORIGINAL DESIGN: The original design replaces a series of reverse curves with a straight tangent between approximate Sta 720+00 to Sta 740+00.

PROPOSED CHANGE: It is proposed to maintain the existing horizontal alignment from Sta 720+00 to Sta 740+00. The existing two lanes would be maintained as the southbound lanes and new northbound lanes would be constructed to the East.

JUSTIFICATION: Maintaining the existing alignment would allow more existing pavement to be retained and would reduce the amount of required right-of-way to the East of the existing corridor. A review of the topo file provided for this study does not indicate the existing horizontal curves or tangent sections between are substandard for a 45 mph design speed.

ADVANTAGES:

- Reduces quantities/cost
- Reduces right-of-way impacts

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 773,648		\$ 773,648
PROPOSED CHANGE:	\$ 459,268		\$ 459,268
SAVINGS:	\$ 314,380		\$ 314,380

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-13.0	PAGE NUMBER:	2 of 5
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
MILL ASPH CONC PVMT 1.5" DEP	1	SY	0	0.75	0
FULL DEPTH PAVEMENT	1	SY	11,200	42.29	\$473,648
RIGHT-OF-WAY	1	AC	6	50,000	\$300,000
SUBTOTAL – COST TO PRIME					\$773,648
MARKUP					--
TOTAL CONTRACT COST					\$773,648

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
MILL ASPH CONC PVMT 1.5" DEP	1	SY	4,889	0.75	\$3,667
FULL DEPTH PAVEMENT	1	SY	6,044	42.29	\$255,601
RIGHT-OF-WAY	1	AC	4	50,000	\$200,000
SUBTOTAL – COST TO PRIME					\$459,268
MARKUP					--
TOTAL CONTRACT COST					\$459,268

Difference [Original-Proposed] **\$314,380**

SOURCES

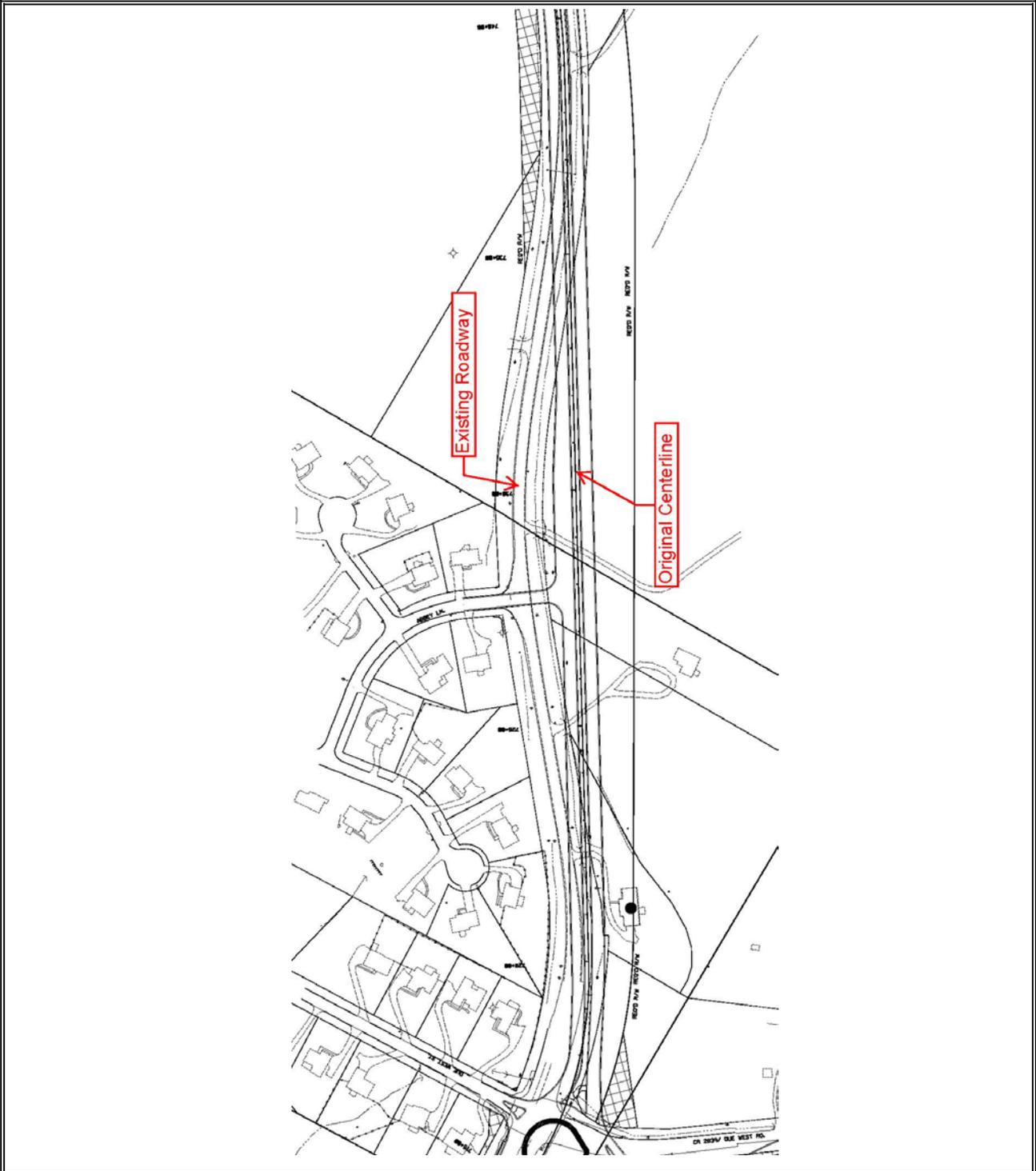
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| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: R-13.0

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

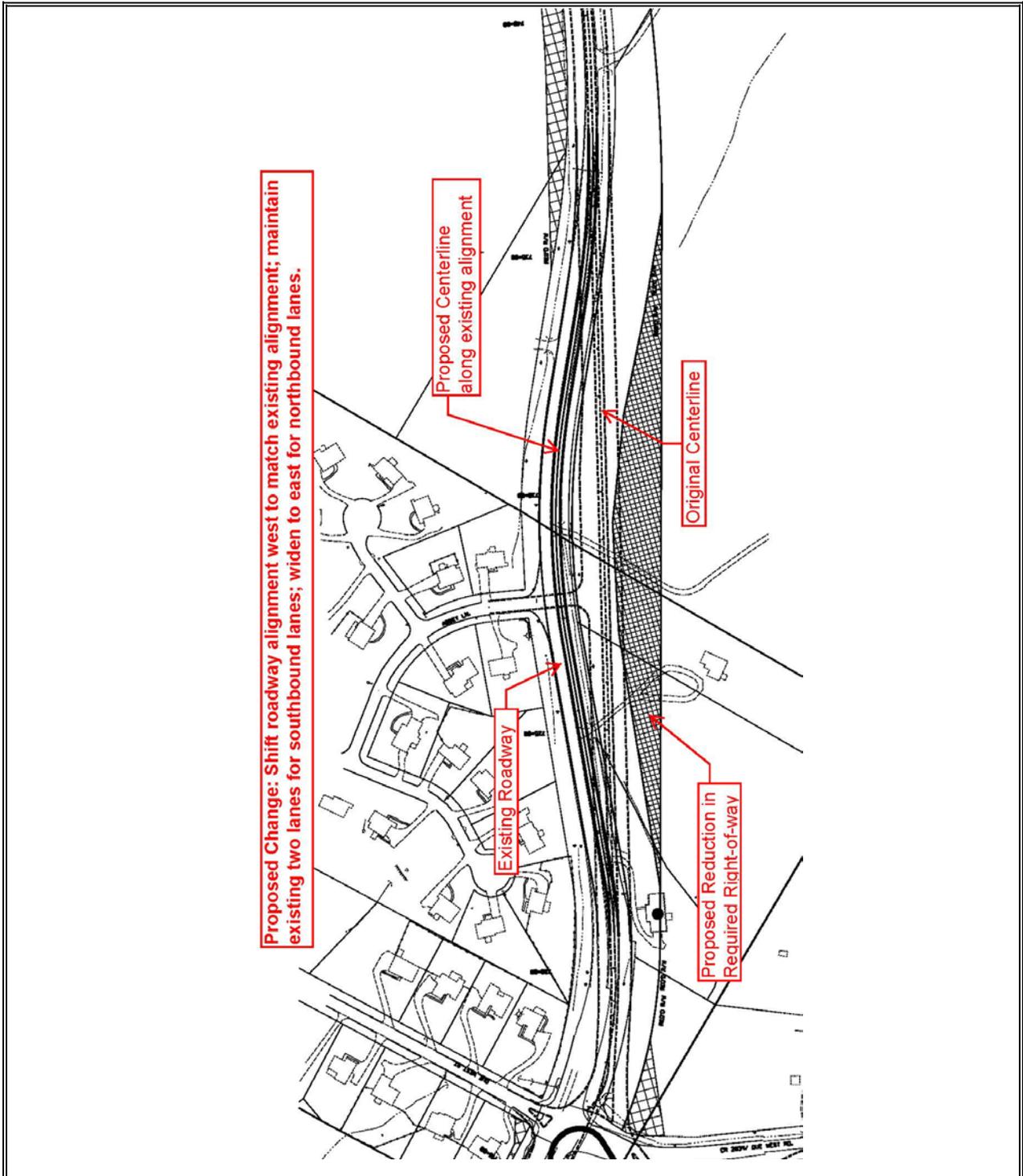


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: R-13.0

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692



CALCULATIONS

PROPOSAL NUMBER: R-13.0

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Assumptions:

Change is isolated to Sta 720+00 to Sta 740+00 for total length of 2000 FT.

Existing two travel lanes total 22 FT width.

Profile grade and typical section would remain as proposed.

Earthwork changes would be marginal so no calculations are included.

Full Depth Pavement Cost Calculations:

310-1101: 12" GAB = 0.68 tons/SY x \$14.61/ton = \$9.93/SY

402-3121: 6" Asph 25MM = (6")(110#sy-in/2000#)(\$60.00/T) = \$19.80/SY

402-3190: 2" Asph 19MM = (2")(110#sy-in/2000#)(\$60.00/T) = \$6.60/SY

402-3113: 1.5" Asph 12.5MM = (1.5")(110#sy-in/2000#)(\$70.00/T) = \$5.78/SY

413-1000: 2 layers tack coat = 0.035 gals/SY/layer x 2 x \$2.50/gal = \$0.18

Total pavement cost = \$42.29/SY

Original:

From Sta 720+00 to Sta 740+00 for total length of 2000 FT; 4-12 FT lanes, total of 48 FT.

Side Road (Abbey Lane) = 200 LF at 24 FT width.

(2000 FT x 48 FT) + (200 LF x 24 LF) = 100,800 SF = 11,200 SY. At \$42.29/SY = \$473,648

Proposed:

From Sta 720+00 to Sta 740+00 for total length of 2000 FT.

Widen 22 FT existing lanes to 24 FT (2 FT full depth) plus 24 FT new lanes, total of 26 FT.

Side Road (Abbey Lane) = 200 LF at 24 FT width.

(2000 FT x 26 FT) + (100 LF x 24 LF) = 54,400 SF = 6,044 SY. At \$42.29/SY = \$255,601

Milling & Resurfacing (MILL ASPH CONC PVMT, 1.5" DEPTH):

Original:

None = \$0

Proposed:

Existing travel lanes at 22 FT width over 2000 FT area length.

22 FT x 2000 FT = 44,000 SF = 4,889 SY, at \$0.75/SY = \$3,667

Residential R/W Calculations:

Original:

Design file measurement = 6 AC, at \$50,000/AC (Preliminary ROW Estimate) = \$300,000

Proposed:

Design file measurement = 4 AC, at \$50,000/AC (Preliminary ROW Estimate) = \$200,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-16.0	PAGE NUMBER:	1 of 3
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 From SR120 to Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: RELOCATE OR ELIMINATE POND LOCATIONS WHERE CAUSING DISPLACEMENTS.

ORIGINAL DESIGN: The concept plans show proposed MS4 ponds at various locations along the project corridor. The ponds at Sta 635+00 left, Sta 678+00 left, and Sta 823+00 left will require a residential displacement.

PROPOSED CHANGE: It is proposed to relocate or eliminate the 3 proposed ponds which would require a displacement.

JUSTIFICATION: The Municipal Separate Storm Sewer System (MS4) Permit (GAR041000) lists factors to consider when determining infeasibility for implementation of MS4 (page 21 of 39 in the permit). One of the factors is when implementation results in the displacement of a residence or business. Thus, it is suggested that the ponds at these 3 locations, which require displacements, are infeasible and should be either relocated or eliminated.

ADVANTAGES:

- Avoids right of way displacements
- Reduces right of way cost

DISADVANTAGES:

- Requires approval from EPD if eliminated

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 555,000		\$ 555,000
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 555,000		\$ 555,000

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-16.0	PAGE NUMBER:	2 of 3
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Residential relocation	7	EA	3	\$185,000	\$555,000
SUBTOTAL – COST TO PRIME					\$555,000
MARKUP					--
TOTAL CONTRACT COST					\$555,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0.00
MARKUP					--
TOTAL CONTRACT COST					0.00

Difference [Original-Proposed] **\$555,000**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Revised GDOT right of way spread sheet |
|---|---|

CALCULATIONS

PROPOSAL NUMBER: R-16.0	PAGE NUMBER: 3 of 3
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Assume the pond would have to be built at a different location and therefore no savings in construction.

Using the GDOT right of way spread sheet and assuming 1 residential relocation on a 1 acre parcel at \$50,000/ac produces a cost of \$185,000. The Summary Page of the GDOT Spreadsheet is as follows:

Description: ASSUMED 1 ACRE COMMERCIAL
Project Termini:

Parcels:	1	Existing ROW:
		Required ROW:

Land and Improvements _____ \$75,000.00

<i>Proximity Damage</i>	<i>\$0.00</i>
<i>Consequential Damage</i>	<i>\$0.00</i>
<i>Cost to Cures</i>	<i>\$0.00</i>
<i>Trade Fixtures</i>	<i>\$0.00</i>
<i>Improvements</i>	<i>\$0.00</i>

Valuation Services _____ \$1,000.00

Legal Services _____ \$38,175.00

Relocation _____ \$42,000.00

Demolition _____ \$15,000.00

Administrative _____ \$14,500.00

TOTAL ESTIMATED COSTS _____ \$185,675.00

TOTAL ESTIMATED COSTS (ROUNDED) _____ \$186,000.00

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	R-18.0	PAGE NUMBER:	1 of 3
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
PROJECT TITLE:	SR 92 from SR 120 to CR 473/Cedarcrest Road Cobb/Paulding Counties

PROPOSAL DESCRIPTION: UTILIZE GRASSING AT ROUNDABOUTS AND ELIMINATE LANDSCAPING.

ORIGINAL DESIGN: Based on the project estimate, the current design of the 4 roundabouts along SR 92 includes landscaping.

PROPOSED CHANGE: It is proposed to eliminate the landscaping and utilize permanent grassing in the project. The local Counties can then decide whether to add landscaping or artwork to the roundabouts to provide the local flair.

JUSTIFICATION: Local Counties may prefer to include their own artwork or statues at the roundabouts in lieu of the permanent landscaping included in the project design. Elimination of the landscaping would provide a construction cost savings to the project.

ADVANTAGES:

- Reduction in construction cost
- Roundabouts are a nice location for local artwork or other features

DISADVANTAGES:

- If artwork not included, landscape elimination reduces aesthetics

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 175,000		\$ 175,000
PROPOSED CHANGE:	\$ 80		\$ 80
SAVINGS:	\$ 174,920		\$ 174,920

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	R-18.0	PAGE NUMBER:	2 of 3
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PROJECT #/PI #:	CSSTP-0007-00(692) / 0007692
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ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Landscaping	1	LS	1	175,000	\$175,000
SUBTOTAL – COST TO PRIME					\$175,000
MARKUP					Incl.
TOTAL CONTRACT COST					\$175,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Grassing	1/7	AC	0.72	110	80
SUBTOTAL – COST TO PRIME					\$80
MARKUP					Incl.
TOTAL CONTRACT COST					\$80

Difference [Original-Proposed] **\$174,920**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Attached Calculation Sheet |
|---|---|

CALCULATIONS

PROPOSAL NUMBER: R-18.0	PAGE NUMBER: 3 of 3
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PROJECT #/PI #: CSSTP-0007-00(692) / 0007692

Permanent Grassing Area

Interior Area of Roundabout approximately 100' in diameter.

Area = $3.14 \times 50 \times 50 = 7850 \text{ SF} \times 4 \text{ roundabouts} = 31,400 \text{ SF} / 43560 = 0.72 \text{ acres}$

VE STUDY SIGN-IN SHEET

Project No.: CSSTP-0007-00(692)

County: Paulding/Cobb

PI No.: 0007692

Date: January 28-31, 2013

Days

FIRST	LAST	NAME	GDOT OFFICE OR COMPANY NAME	PHONE NUMBER	EMAIL ADDRESS
✓	✓	Lisa L. Myers	Engineering Services	404-631-1770	lmyers@dot.ga.gov
✓	✓	Matt Sanders	Engineering Services	404-631-1752	msanders@dot.ga.gov
✓	○	Ken Werho	Traffic Operations	404-635-8144	kwerho@dot.ga.gov
✓	✓	Tom Orr	U.S. Cost	770-481-1638	torr@uscost.com
✓	✓	Lenor Bromberg	KEA Group	404-805-8244	lbromberg@keagroup.com
✓	✓	Jerry Brooks	Kimley-Horn	678-502-1864	jerry.brooks@kimley-horn.com
✓	✓	Jeremy Busby	PM, Program Delivery	404-631-1154	jbusby@dot.ga.gov
✓	○	Chandria Brown	Program Delivery	404-631-1580	chbrown@dot.ga.gov
✓	○	Gretel Sims	Office of Research	404-608-4802	gsims@dot.ga.gov
✓	○	Erick Fry	URS	678-808-8850	erick.fry@urs.com
✓	○	Joe Tiernan	URS	678-808-8864	joe.tiernan@urs.com
○	✓	Sean Pharr	URS	678-808-8839	sean.pharr@urs.com
		<u>Via Video Conf.:</u>			
✓	✓	Patrick Bowers	D6 Construction Engineer	770-387-3609	pbowers@dot.ga.gov
✓	✓	Bill Dungan	D6 Area Engineer	770-646-5522	bdungan@dot.ga.gov

Check all that attend
 Did Not Attend
 13 Attended Project Overview (Day 1)
 9 Attended Project Presentation (Day 4)

VALUE ENGINEERING STUDY

FUNCTION ANALYSIS

The following functions for the SR 92 from SR 120 to CR 473/Cedarcrest Road project were identified during discussions with the VE participants on the first day of the study. These two-word functions consist of an active verb, and a quantifiable (measurable) noun. The functions represent the proposed capital improvement expenditures of the project, and assist the V.E. team in becoming familiar with the needs and long-term goals for the project. The Basic Functions of the project are to “Improve Operations” and “Relieve Congestion”. The following are considered by the V.E. team to be Secondary and Supporting Functions.

Verb	Noun		Verb	Noun
Accommodate	Pedestrians		Maintain	Access
Accommodate	Cyclists		Span	Water
Support	Commerce		Protect	Environment
Control	Movements		Convey	Water
Manage	Flows		Re-establish	Vegetation
Correct	Deficiencies		Separate	Traffic
Manage	Access		Control	Erosion
Eliminate	Conflicts		Control	Traffic
Illuminate	Roundabout		Minimize	Delays
Direct	Drainage		Maintain	Sight Distance
Support	Vehicles		Inform	Traveler
Retain	Water		Improve	Aesthetics
Treat	Water		Excavate	Earth
Limit	Outflows			

VALUE ENGINEERING STUDY

COST MODEL/DISTRIBUTION

**SR 92 from SR 120 to CR 473/Cedarcrest Road
Cobb/Paulding County, Georgia**

ITEM	COST \$	% OF TOTAL
RIGHT-OF-WAY	17,211,000	41.67%
ASPHALT CONCRETE PAVING	6,203,662	15.02%
EARTHWORK	6,132,914	14.85%
DRAINAGE SYSTEM	3,411,350	8.26%
CLEARING AND GRUBBING	1,500,000	3.63%
CURB & GUTTER	1,205,439	2.92%
AGGREGATE BASE COURSE	1,184,106	2.87%
GRASSING/EROSION CONTROL	1,123,669	2.72%
SIDEWALKS	1,052,859	2.55%
SIGNALS	750,000	1.82%
TRAFFIC CONTROL	500,000	1.21%
LIGHTING	400,000	0.97%
CONCRETE SLABS/APRONS/MEDIANS	265,703	0.64%
SIGNAGE/MARKING	183,452	0.44%
LANDSCAPING	175,000	0.42%
BRIDGES/STRUCTURES	0	0.00%
GUARDRAILS	0	0.00%
DEMOLITION	0	0.00%
RETAINING WALLS	0	0.00%
*TOTAL - PROJECT	41,299,154	100.00%
*Does not include Engrg & Inspection, Fuel Adjustment or Liquid AC Adjustment		

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: SR 92 FROM SR 120 TO CR 473/CEDARCREST ROAD

PROJECT LOCATION: COBB/PAULDING COUNTY, GEORGIA

NO.	IDEA	RANK
ROADWAY (R)		
1.0	Use 11' Lane Widths in lieu of 12' for All Lanes on SR-92	5
1.1	Use 11' Wide Inside Lane and 12' Outside Lane on SR-92	5
2.0	Reduce Median Width from 20' to 16' Along SR 92	4
3.0	Use 10' Wide Multi-use Trail on West Side Only and Include 5' Wide Sidewalk on East Side	4
3.1	Use 8' Wide Multi-use Trails on Both Sides in lieu of 10' Wide Trails. Reduce Grass Strips in Front and Behind Trail from 5' to 3' Wide.	5
3.2	Use Asphalt in lieu of Concrete for 10' Wide Multi-use Trail	4
4.0	Reduce Grass Strips to 3' Inside and Outside of Multi-use Trail	w/ 3.1
5.0	Eliminate Construction of the Antioch Road Spur and the Associated Roundabout with SR 92 and the Antioch Road Spur	3
5.1	Use 11' Lane Widths in lieu of 12' on Antioch Road Spur	5
5.2	Eliminate Paved Shoulders on Antioch Road Spur	5
5.3	Reduce the Required Right of Way Width from 120' to 80' on the new Antioch Road Spur	4
6.0	Reduce Right-of-Way Widths to Only that Required for Construction	4
6.1	Use a Maximum 120' Right of Way Corridor with Easements as Necessary Beyond the Right of Way Limits	4
7.0	Use Signalized Intersection at Antioch Road Spur in lieu of a Multi-lane Roundabout	4
8.0	Use Signalized Intersection at Old Burnt Hickory Road in lieu of a Multi-lane Roundabout	4
9.0	Relocate Roundabout at Due West Road (South) to the South to Allow Greater Separation Between Roundabouts and Minimize Construction over Colonial Pipeline Facilities Located at Approximate Sta 706+00	4
9.1	Relocate Intersection at Due West Road (South) to the South and Change to a Signalized Intersection to Allow Greater Separation Between Intersections and Minimize Construction over Colonial Pipeline Facilities	3

The rankings indicated as "Drop" were ideas that were investigated by the VE Team during the workshop but did not prove to be feasible for consideration.

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: SR 92 FROM SR 120 TO CR 473/CEDARCREST ROAD

PROJECT LOCATION: COBB/PAULDING COUNTY, GEORGIA

NO.	IDEA	RANK
ROADWAY (R) – cont.		
10.0	Use Signalized Intersection at Due West Road (North) in lieu of Multi-lane Roundabout	2
11.0	Reduce Cut for New Vertical Alignment from Sta 568+00 to Sta 576+00 to Meet 45 MPH Design Speed	4
12.0	Adjust Vertical Alignments to Better Balance Earthwork	3
13.0	Follow Existing Horizontal Alignment from Sta 720+00 to Sta 740+00	4
14.0	Construct Retaining Walls at Specific Locations to Reduce Right-of-Way Acquisition	3
15.0	Utilize Drainage Piping Parallel to Roadway to Minimize Road Crossings	3
16.0	Relocate or Eliminate Pond Locations Where Causing Displacements	3
17.0	Eliminate Lighting at Roundabouts	Drop
18.0	Utilize Grassing at Roundabouts and Eliminate Landscaping	4

The rankings indicated as “Drop” were ideas that were investigated by the VE Team during the workshop but did not prove to be feasible for consideration.

VALUE ENGINEERING WORKSHOP AGENDA

For GEORGIA DEPARTMENT OF TRANSPORTATION

Project # CSSTP-0007-00(692) PI No. 0007692
SR 92 from SR 120 to CR 473/CEDARCREST ROAD
COBB/PAULDING COUNTY, GEORGIA

28 HOUR - V.E. STUDY

28-31 January 2013

The value engineering workshop for the subject project will be conducted for 3-1/2 days from 28-31 January 2013, **in the Engineering Services Conference Room (5CR1L2) on the 5th floor of the GDOT General Office Facility located at 600 W. Peachtree Street NW, Atlanta GA 30308; POC – Matt Sanders @ (404)631-1752 voice**

Pre-workshop Activities

The V.E. Team Leader coordinates logistics with GDOT, and confirms project objectives and any unique requests, and develops a cost model for the project. The V.E. Team receives and reviews all project documents.

MONDAY

0800 - 0900

V.E. Team Introduction Phase

Tom Orr, P.E., CVS
Team Leader, U.S. Cost, Inc.
(V.E. Team Only)

The VETL will review previous events along with activities planned for the week and outline several areas which may be investigated by the V.E. team.

The team members will discuss their initial impression and understanding of the project with other team members based on their pre-study review of the project plans, cost estimates, and available calculations. The V.E. Team Leader will provide cost models, and cost bar graphs to help the team identify the high-cost features of the project.

0900 - 1100

Project Design Briefing

V.E. Team; A/E, GDOT

The A/E project design manager will discuss the project constraints/requirements and the proposed design solution(s) in detail. The V.E. team members will ask questions as appropriate to completely understand the project requirements and the proposed design solution (both alternatives considered and those recommended by the design team).

MONDAY (CONTINUED)

1100 - 1200 **Function Analysis Phase** V.E. Team

The V.E. team will discuss the required functions of the project. The project cost model will be analyzed to identify functions provided by all project features.

1200 - 1300 **Lunch**

1300 - 1600 **Creative Phase** V.E. Team

The V.E. team will creatively review, Brainstorm, and tabulate possible design alternatives for the project. While the designer's solution will serve as the "baseline", the team will identify alternatives not in the recommended solution, but deserving of further investigation. Each project feature will be carefully analyzed with the basic questions in mind:

What is the system/item?

What does it do (what is its basic function)?

What must it do?

What does it cost?

What is the item worth?

What else will do the same, or a better job?

What does that alternative cost?

During the creative phase, the team will not judge the ideas. The essential requirements for the project, however, must always be considered.

1600 - 1700 **Analysis Phase** V.E. Team

During this phase, all of the ideas or alternatives will be ranked according to their potential for life-cycle (25-year) cost reduction and the potential for acceptance by GDOT, Engineering Designers, and other appropriate parties.

TUESDAY

0800 - 1700 **Development Phase** V.E. Team

During the development phase, each team member will gather information and prepare written proposals for those ideas assigned to him/her. These may require additional discussions with the designer, GDOT representatives, outside contractors and suppliers, and other specialists to fully define the alternative. The team members will prepare sketches, perform calculations and develop other data to support each proposal. In addition, each team member will prepare estimates of costs for each alternative as originally designed, and as proposed by the V.E. team.

WEDNESDAY

0800 - 1200 **Development Phase** V.E. Team

1200 - 1300 Lunch

1300 - 1700 **Development Phase & Quality Review** V.E. Team

THURSDAY

0800 – 0900 **Prepare for Presentation** V.E. Team

0900 – 1000 **V.E. Presentation** V.E. Team Members, Design Team & GDOT Reps

The Value Engineering Team will present the proposals developed in the course of the study to the design team representatives and any participating stakeholders. The intent of the presentation is to give a clear understanding of the basis of the proposals rather than to reach a conclusion as to their acceptability. A summary table of results will be distributed at the presentation. The formal V.E. Reports will be issued within 8 business days of the workshop conclusion.

1000 – 1200 **V.E. Team Wrap-up & Final QC/QA** V.E. Team Members only

The Value Engineering Team will have a wrap-up session consisting of a final review of proposals to ensure consistency and clarity of content.