

VALUE ENGINEERING TEAM STUDY

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VALUE ENGINEERING TEAM STUDY

PROJECT DESCRIPTION AND BACKGROUND

These two projects are part of the Governor’s Road Improvement Program (GRIP). It is also proposed to serve as part of the proposed Atlanta to Memphis corridor. The Southeast Rome Bypass, in conjunction with the South Rome Bypass, is essential to the effort to reduce the travel demands on the existing U.S. 27 corridor to and through Rome.

The EDS 27 (127) project would begin at the intersection of S.R. 101/Rockmart Highway and C.R. 96 Preacher Smith Road and would proceed Northeastward and bridge over U.W. 411/S.R.20 with a full diamond interchange before tying into the East Rome Bypass at S.R. 746/Loop 1. The EDS – 27 (154), project would begin at the intersection of U.S. 27/S.R. 1 and Booze Mountain Road and would end at-grade full access intersection with S.R. 101. This project termini design and construction needs coordination with the proposed Southwest Rome Bypass (NH-012-1{86}) west of U.S. 27/S.R. 1. It is anticipated that the interchange will be included in the (NH-012-1{86}) LP.

The typical road section for this project is a rural 4-lane divided highway with 12 foot lanes separated by a 44’ wide depressed median. Ten foot wide outside shoulders and 6 foot wide inside shoulders will be provided. Proposed right-of-way (ROW) varies from 250’ to a maximum of 300’, with intersections ROW being wider as necessary.

The major structures are included in these projects are as follows:

- Two parallel bridges over Reeceburg Road approximately 1425 LF feet long (154)
- Two parallel bridges over Old Rockmart Road approximately 725 LF feet long (154)
- Two parallel bridges over US. 411/S.R. 20 with a full diamond interchange (127)
- Two parallel bridges over Collier Springs Road approximately 562 LF feet long (127)
- Two parallel roads of several box culverts-still under design

On grade intersections are proposed at the following locations:

Project EDS – 27 (154)	Project EDS – 27 (127)
• Marion Dairy Road	• Isabel Road
• Huges Dairy Road	• Misty Ridge Road
• Old Cedar Town Road	• McBurnett Road
• Preacher Smith Road	• Pleasant Valley Road
• State Route #101	• Ladell Road
	• Chulio Road
	• U.S. 411 & S.R. 20

There is currently one National Register eligible property along the project corridor. These resources consist of the Reeceburg Road property which includes a Southern RR corridor in the State that is considered eligible for the National Register of Historic Places.

Wetlands, historical and, landfill sites were identified along the proposed corridor. A natural gas line requires relocation in several areas, and cost impact has not been identified at this time

The Design Cost Estimates for the two projects indicate the following:

- South Bypass Highway (127) with an ECC of \$31.3 Mil plus ROW cost of \$16.5 Mil
- Southeast Bypass Highway(154) with an ECC of \$25 Mil plus ROW cost of \$22.5 Mil

VALUE ENGINEERING TEAM STUDY

PROJECT DESCRIPTION AND BACKGROUND

CONCERNS AND OBJECTIVES:

These two projects are part of an overall scheme to construct a circular bypass highway system around Rome, Georgia. Over the past twenty years, the pieces of this system have been slowly coming together, spurred by the increased heavy truck traffic that crosses through the general area of the City. The rivers and topographic terrain dictate local traffic patterns; historic sites in the area; and residential growth; and development of commercial and industrial properties make the roadway (Bypass) development a complex and costly project.

The following are some of the highlighted concerns and objectives noted by the VE team for the two projects:

SOUTHEAST ROME BYPASS HIGHWAY – EDS – 27 (127)

CONCERNS	OBJECTIVES
On-grade intersections	High speed rural traffic and traffic lights in a city environment
No topographic survey at this time	No true cost can be established
Material haul distances	Cost and location of disposal site
Construction sequence/Constructibility	Coordination of the two projects plus other segments {NH -012-1 (85 & 86) LP}
Layout of termini	Not an ideal layout
Excessive amount of fill	Cost and location of disposal site unidentified
Natural Gas line relocation Cost	Road layout and profile were relocated
Interchange design	Should be relocated further west
Schematic design phase	No survey and no detail cost estimate

SOUTH ROME BYPASS HIGHWAY – EDS -27 (154)

CONCERNS	OBJECTIVES
On-grade intersections	High speed traffic in a city environment
Construction haul distances	No haul roads except county and city roads
Initial Construction Cost	Excavation cost appears low, especially due to the amount and hardness of rock
Diversion of local traffic during construction	Time delays and interruptions to commerce
Very long (1435 LF) and high bridge over Reeceburg Road and Southern RR	4% current design grade cost driver with deep excavations
Design for 65 mph ilo rural 55 mph	Stop lights and accidents in rolling terrain
Deep cuts and rock excavation	4,000,000 cubic yards of waste/spoil
Bridge Construction	Bridges needed for disposal of excess earth and rock

VALUE ENGINEERING TEAM STUDY

PROJECT DESCRIPTION AND BACKGROUND

Project Objectives:

- Help complete the Atlanta – Memphis Highway
- Reduce travel time
- Help complete the Rome Bypass
- Benefit the local economy
- Reduce congestion and redirect proposed truck traffic

The estimated combined construction cost (ECC) for the Rome Bypass Improvements Projects EDS 27 (127 & 154) is projected to be around \$77.3 Million, with a scheduled advertising date of mid 2007.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Introduction

U.S. Cost Incorporated conducted the Value Engineering and Constructibility Team Study on Rome Bypass Improvements Projects –127 & 154 to be constructed in Floyd County, GA. The V.E. study was conducted for three (3) days, 02-04 December 2003, at the Georgia Department of Transportation Conference Room #344 in Atlanta, GA. The study team was furnished with project EDS –27 (154) which was a 90% Design submittal package, and a concept Design submittal on project EDS 127. The 154 project documents included project drawings; site plans, road cross-sections, bridge details and layout, complete road alignment drawing, and a concept cost estimate. The EDS –27 (127) project concept package provided a narrative scope of work, brief concept cost estimate, and a road alignment plotted on an aerial photograph.

The following individuals were members of the V.E. team:

<u>Name</u>	<u>Firm</u>	<u>Discipline</u>
Lindsey Gardner, P.E., CVS	U.S. Cost, Inc.	VETL
Alex Stone, P.E.	MAAI	Roadway Design
Sam Deeb, P.E.	MAAI	Bridge Eng
Laland Owens	MAAI	Construction
Lisa Myers	GDOT	Value Engineer
George Bradfield	GDOT	Cost Engineer
Thomas Hodges, P.E.	GDOT	Project Liaison

Information Phase/Function Analysis

The V.E. team was first briefed on the project design by GDOT and Williams, Sweitzer and Barnum, INC. (A/E) representatives in an orientation meeting the morning of the first day of the V.E. Study. The briefing gave insight into the current design, and also into the aspects of the Rome Bypass Improvement Projects (127 & 154) urban plan, which impact the site. The briefing included a review of the design requirements and rationale for the location and arrangement of the major functional areas in addition to information on the replacement bridge structural systems. Discussions regarding project funding, required functions, and project criteria followed the design presentation

As a basic part of the V.E. process, the team conducted a partial function analysis session on Rome Bypass Improvement Projects EDS –27 (127 & 154) 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.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

The Basic Function of the project is to *Enhance Economy*. A strong secondary function is to *Enhance Travel* by construction of the Rome Bypass. A detailed project function analysis of the characteristics of the project and their relationships is presented in Appendix A.

Risk Analysis

The group identified the following project risk elements, which may impact the construction of Rome Bypass Improvement Projects EDS – 27 (154 & 127). This exercise served as a catalyst for the Creative Phase of the study, when several ideas were suggested which would mitigate these project construction risks.

Risk Elements

- Maintaining uninterrupted flow of traffic of existing roads
- Disposal of $\pm 5,000,000$ cubic yards of excess earth and rock material
- Delays and impact on the traveling/commuting public
- Contractor Phasing Coordination and traffic control
- Poor Progress/Quality By A Low Bid Construction Contractor
- Accidents at at-grade intersections
- Contractor interface with connecting segments of the new Rome Bypass
- Limited bidders/tenders
- Gas Utility Company Relocation Interface and associated cost
- Quality of excavated rock and potential use for base course material
- Contractors concrete pavement option cost vs. asphalt pavement
- Failure to meet GDOT Schedule
- Accidents and potential lawsuits during construction
- Increase stormwater flow and potential flooding

Project Criteria

During the meeting, project goals, criteria and sensitivities were also identified. The following prioritized listing identifies the key items of which the V.E. team should be aware. Criteria with a score of 5 or higher were considered of prime importance, and those criteria therefore must be considered in the review of any design alternative. The ranking below is the V.E. teams' impression of the sensitivity of the criteria from discussions held with Georgia DOT and the A/E representatives.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Project Criteria Analysis

Life Safety	10
Operational Issues	10
No additional ROW purchases	10
Constructibility	8
GDOT Criteria Compliance	8
ADA and Bike Compliance	8
Functionality	8
Life Cycle Cost (Analysis)	8
AASHTO 2001 Compliance	7
Local Code Restrictions	7
Maintenance and Operations	6
Cost Savings Impact	2

Creative Phase

The Creative Phase of the V.E. study was initiated the morning of the second day of the study. A total of thirty-two (32) creative ideas were generated for further investigation by the team. Many of the creative ideas focused on enhancements to the roadway safety, line of site, excavation techniques, ramp storage, utility locations, and drainage impact, plus various other design elements of the Project. Additional ideas were generated reflecting alternative materials based on an understanding of local construction products and materials and the relative costs of installing them.

A listing of all creative ideas on Rome Bypass Improvements Projects EDS – 27 (127 & 154) are included in Appendix A.

Evaluation Phase

The ideas generated during the Creative Phase were reviewed and evaluated by the VE team during a meeting held on the morning of the second study day. The intent of the meeting was to allow the V.E. team to briefly present the idea, the attendees an opportunity to discuss the feasibility (fatal flaw) of that idea, and the group to decide if that idea is worthy of further development. A number of the V.E. ideas were dropped at that time as being conceptually unacceptable or in conflict with established Criteria, Right of Way (ROW) conflicts, previous agreements, or local construction methods. The ranking system consisted of VE team representatives assigning a designation to each idea. Those ideas, which the V.E. Team felt had the most promise, were given a designation of 1-5 on acceptability and 1-5 on cost impact, for a maximum rating of 10 points. This is a time management tool to identify those proposals that have the greatest potential. Approximately twenty (20) out of the original thirty-two (32) creative ideas were deemed promising for further investigation and analysis by the V.E. team.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

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

FEASIBILITY OF IDEA

- 5 points - Excellent Idea
- 4 points - Good Idea
- 3 points - Fair Idea
- 2 points – Marginal Idea
- 1 point - Poor Idea –do not develop

COST IMPACT

- 5 points - > \$1,000,000
- 4 points - \$750,000 to 999,999
- 3 points - \$500,000 to 749,999
- 2 points - \$250,000 to 499,999
- 1 point – zero to \$249,990
- DS – Design Suggestion – sometimes reflects an increase in cost

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 Rome Bypass Improvements Projects EDS –27 (127 & 154). 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.

Many of the V.E. proposals may require some level of redesign on specific portions of the project to implement the modification. Further, several of the V.E. ideas may involve modifications to the Criteria, or current goals, of Rome Bypass Improvements Projects EDS - 27(127 & 154). These ideas are presented to initiate additional discussion and investigation during the next phase of design.

Presentation Phase

A final presentation was not scheduled for the last day of the study.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Resolution Phase

Upon receipt of the Final Value Engineering Report, Rome Bypass Improvements Projects EDS -27 (127 & 154), Georgia DOT and Williams, Sweitzer and Barnum, Inc. representatives are requested to prepare written comments on the acceptability of each of the V.E. proposals. Responses should include the rationale for accepting, rejecting, or modifying the V.E. proposal.

Basis of V.E. Cost Savings

The cost information for proposals in this report are based on the parametric cost data prepared by the design A/E Williams, Sweitzer and Barnum, Inc. engineering firm. Therefore, 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 Dec. 2003 dollars (escalated to the mid-point of construction). All life cycle cost analyses are prepared utilizing Present Worth methodology, a 25-year economic period, a 4.0% net discount factor (inclusive of inflation), and 3% escalation in the cost of utilities. The current estimate appears to be \$3 million dollars low due to: Low quantities (cy) of rock excavation; Low rock excavation cost (\$9/cy); Low clearing and grubbing cost; Low unit cost on earthwork, Low cost for erosion control & traffic control; and specifying asphalt pavement in lieu of Georgia DOT more costly request for concrete pavement.

Sustainable/Green Design Proposals

Sustainable design incorporates energy conservation, increased use of renewable energy sources, the reduction or elimination of toxic and harmful substances in facilities, efficiency in resource and material utilization, recycling of building materials, the use of recycled material, the reduction of waste products during both the construction and operation of the facility, and facility maintenance practices that reduce or eliminate harmful effects on people and the natural environment. In keeping with the National Policy objective of building all new facilities with sustainable design features, the VE team proposed sustainable design elements and/or practices. The sustainable proposals in this report are: RW -11 & RW -12 Use of excavated rock for base course, rip -rap, ditch and slope protection, and aggregate for PCC concrete pavement contractors option.

VALUE ENGINEERING TEAM STUDY

SUMMARY OF RECOMMENDATIONS

NUMBER	PROPOSAL DESCRIPTION	CAPITAL SAVINGS	OP. & MAINT. (PW)	TOTAL SAVINGS (LCC)	GDOT RECOM.	A/E WSB	RECOM.	FINAL
	ROADWAY/PROFILE (RW)							
1.0	Re-design project North Termni EDS -27 (127)	2,092,000		2,092,000				
1.1	Re-design grade separation at SR-1 Loop & SR - 20	2,500,000		2,500,000				
1.2	Re-configure ramps at SR-1 Loop & SR - 20	842,000		842,000				
1.4	Provide for grade separated interchange at the current intersection at SR - 20/US411 and SR 1 Loop	Design Suggestion		DS				
3.0	Eliminate all at grade crossings EDS-27 (127 & 154)	Design Suggestion		DS				
4.0	Reduce roadway median width in high cut sections from 44' wide to 20' wide with barrier separator	3,600,000		3,600,000				
4.1	Reduce median width from 44' wide to 20 wide and include barrier for the total length of both projects.	±10.0 mil		10,000,000				
5.0	Adjust profile to meet/comply with 55 mph speed and increase the maximum grade to 6%	10,600,000		10,600,000				
7.0	Steepen fill slopes using "Geogrid" fabric	Design Suggestion		DS				

VALUE ENGINEERING TEAM STUDY

SUMMARY OF RECOMMENDATIONS

NUMBER	PROPOSAL DESCRIPTION	CAPITAL SAVINGS	OP. & MAINT. (PW)	TOTAL SAVINGS (LCC)	GDOT RECOM.	A/E WSB	RECOM.	FINAL
	ROADWAY/PROFILE (RW)							
8.0	Use a vertical cut section in areas where hard rock is encountered ilo a 2:1 slope	12,200,000		12,200,000				
9.0	Design retaining walls in deep cut sections in lieu of 2:1 slope	Design Suggestion		DS				
11.0	Allow excavated rock to be re-used as base course and as aggregate in PCC pavement	2,240,000		2,240,000				
12.0	Use excavated rock as rip-rap, ditch and slope paving in lieu of purchase of new materials	Design Suggestion		DS				
13.0	Include ramps to/from US 27 in this project scope	Design Suggestion		DS				
15.0	Install concrete pavement at signalized intersections in lieu of Superpave asphalt	Design Suggestion		DS				
	STRUCTURAL/BRIDGES (SB)							
1.0	Shorten bridge over CR 48, Norfolk Railroad, and Chambers Mill Road – (855 LF vs. 1435 LF)	5,900,000		5,900,000				
2.0	Open cut tunneling	Design Suggestion		DS				

VALUE ENGINEERING TEAM STUDY

SUMMARY OF RECOMMENDATIONS

NUMBER	PROPOSAL DESCRIPTION	CAPITAL SAVINGS	OP. & MAINT. (PW)	TOTAL SAVINGS (LCC)	GDOT RECOM.	A/E WSB	RECOM.	FINAL
	STRUCTURAL/BRIDGES (SB)							
3.0	Eliminate bridge with culvert at Old Rockmart Road –EDS –27 (154)	4,300,000		4,300,000				
4.0	Reduce median at bridge from 44' wide to zero feet wide and construct a single bridge	3,400,000		3,400,000				
8.0	Construct Arch and or slanted leg bridges ilo multi-span bridges	Design Suggestion		DS				

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	1 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: SHORTER BRIDGE #1 LENGTH EDS-27.

ORIGINAL DESIGN: The original design contains a bridge of 1435’-0” in length as a viable grade crossing over CR 48, Norfolk Railroad and Chambers Mill Road, a wetland and a historic rail area with an average profile elevation of 770 ft and. The original design utilizes 74 in bulb tees and 145’-0” spans on average.

PROPOSED CHANGE: The proposed change recommends modifying the profile at Bridge #1 to reduce the change in elevation by 50 ft and thereby allowing for the begin bridge area to be filled with the cut material from adjacent areas, elevating Reeceburg to @ mainline grade elevation and reducing the bridge length by 855’-0”. The new begin bridge will be at station 274+00 and the end of bridge station will be at 280+00 for a total length of 600’-0” to cross Norfolk railroad, the historic rail area, Chambers Mill Road and the wetlands.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 8,977,000		\$ 8,977,500
PROPOSED CHANGE:	\$ 3,095,513		\$ 3,095,513
		SAVINGS:	\$ 5,881,986

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	2 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Less bridge area.

Less construction time.

Less foundations and footings.

Esthetically advantageous.

Total construction cost reductions.

Waste fill is reused and dumped on the same alignment.

DISADVANTAGES:

Reeceburg profile is elevated to @ mainline grade of bridge.

JUSTIFICATION:

Esthetically advantageous and total construction cost reductions.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	3 of 6

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridge #1	1	LS	1	8.55 mil	8,550,000
SUBTOTAL:					8,550,000
5% MARK UP:					427,500
TOTAL:					8,977,500

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridge #1	4	SF	49,500	70	3,465,000
Waste Fill Re-used	4	CY	2.32	2.32	(818,767)
End Bent Walls	4	SF	8625	35	301,875
SUBTOTAL:					2,948,108
5% MARK UP:					147,405
TOTAL:					3,095,513

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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:	SB-1.0
PAGE NUMBER:	4 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

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PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: SB-1.0

PAGE NUMBER: 5 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	6 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

Empty rectangular box for sketch or detail.

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER: SB-1.0

PAGE NUMBER: 7 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

1. Bridge Cost

L= 274+00 minus 280+00

= 600'-0"

W= 41'-3" x 2

= 82'-6"

Total SF of Bridge= 600' x 82.5'

= 49,500 SF

Unit /SF= \$70

Total Bridge Cost= \$70* 49,500' = \$3,465,000

2. Area of Fill Ravine to be Filled=

$(90'+0')/2 * (274+00 \text{ minus } 267+00)=31,500 \text{ SF}$

For 90 high fill a 2;1 slope of 2*90' is required. =180'

Twin bridge widths + median= 41.25*2 + 40'= 122.5'

Total Widths=180'+122.5'= 302.5'

Total Fill Cu Yds= 31500*302.5/27=352,917 cy

Total Hauling Savings= 352,917*\$2.32/cy=\$818,767

3. Wall Area

Total Width per side=122.5'

Total height per side=25'

Total length per side= 2*25'=50'

Total wall area per bent= 25*122.5+ 2*((25*50)*1/2)=4312SF

Total wall for bridge=8625SF

Total Wall Cost=8625*\$35/sf=\$301,875

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: DESIGN SUGGESTION -OPEN CUT TUNNELING EDS- 27.

ORIGINAL DESIGN: The original design contains two bridge locations with dual bridges of 1435' and 725' in length as a viable grade crossing over CR 48, Norfolk RR and CR 633 (Old Rockmart Road) and on grade approaches through cut sections. The original design utilizes 74 in bulb tees and 145'-0" spans.

PROPOSED CHANGE: The proposed change recommends modifying the profile at Bridge #1 to reduce the change in elevation by 50 ft and at bridge #2 by 10-20 ft., tapering the roadway section to 0' median between the tunnels and on the bridge sections, and utilizing open cut tunneling for the roadway approaches and re-using the waste fill as backfill. As on some previous projects in Washington, the cost per linear foot of 71.25 foot tunneling is 6000/lf. But the waste reusability may offset the other costs.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Less waste to dispose of.

Probable total construction cost reductions.

Less disruption to existing conditions.

Reduces cut distances.

Environmentally sensitive.

DISADVANTAGES:

Roadway taper from 40' to 0' at bridge which could cause a bottleneck effect.

Tunnel maintenance.

JUSTIFICATION:

Esthetically and environmentally advantageous. Waste material re-utilization ilo expense hauling.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	1 of 6

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: ELIMINATE BRIDGE @ OLD ROCKMART RD. EDS- 27.

ORIGINAL DESIGN: The original design contains a bridge of 725'-0" in length as a viable grade crossing over CR 633 (Old Rockmart Road) with an average profile elevation of 830 ft. The original design utilizes 74 in bulb tees and 145'-0" spans.

PROPOSED CHANGE: The proposed change recommends modifying the profile at Bridge #2 to reduce the change in elevation by 10-20 ft and the ravine filled with cut material from adjacent areas whereby CR 633 is punched through with a culvert or a conspan and a retaining wall on the south side is constructed to protect the properties.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 4,567,500		\$ 4,567,500
PROPOSED CHANGE:	\$ 288,653		\$ 288,653
		SAVINGS:	\$ 4,278,847

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	2 of 6

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$4,300,000.

No bridge crossing.

Less construction time.

No foundations and footings.

Roadway is advantageous maintenance wise.

Total construction cost reductions.

Waste fill is reused and dumped on the same alignment.

DISADVANTAGES:

CR 633 is covered in that area and punched through fill for a distance of 150'±.

Increased right-of-way cost.

JUSTIFICATION:

Esthetically advantageous, total construction cost reductions, and reusing waste fill instead of incurring cost of hauling.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-3.0
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PAGE NUMBER:	3 of 6
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PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridge #2	1	EA	1	4.35 mil	4,350,000
SUBTOTAL:					4,350,000
5% MARK UP:					217,500
TOTAL:					4,567,500

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Waste Fill Re-used	4	CY	456,641	2.32	(1,059,407)
Culvert	7	LF	150	3200	480,000
Wall Area	4	SF	8700	35	304,500
SUBTOTAL:					274,907
5% MARK UP:					13,745
TOTAL:					288,653

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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:	SB-3.0
PAGE NUMBER:	4 of 6

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

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PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: SB-3.0

PAGE NUMBER: 5 of 6

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:

SB-3.0

PAGE NUMBER:

6 of 6

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

4. Area of Fill Ravine to be Filled--

$$(725' + 145') / 2 * (100.33') = 43,643 \text{ SF}$$

For 80 high fill a 2;1 slope of 2*80' is required. =160'

Twin bridge widths + median= 41.25*2 + 40' = 122.5'

Total Widths=160'+122.5' = 282.5'

Total Fill Cu Yds= 43,643*282.5/27=456,641 cy

Total Hauling Savings= 456,641*\$2.32/cy=-\$1,059,407

5. Wall Area

Total height per side=30'

Total length of N-S quadrant side= 2*145'=290'

Total wall area = 30*290=8700SF

Total Wall Cost=8700*\$35/sf=\$304,500

6. Special Culvert

Total Length=150' @ a skew

Total width= 40'

Punit Price/LF= 3200/lf

Total Cost=3200*150=\$480,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-4.0
PAGE NUMBER:	1 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: REDUCE MEDIAN AT BRIDGE FROM 44' WIDE TO ZERO FT AND UTILIZE ONE SINGLE BRIDGE INSTEAD OF DUAL BRIDGES EDS- 27.

ORIGINAL DESIGN: The original design contains two bridge locations with dual bridges of 1435' and 725' in length as viable grade crossings over CR 48, Norfolk RR and CR 633 (Old Rockmart Road). The original design utilizes 74 in bulb tees and 145'-0" spans.

PROPOSED CHANGE: The proposed change recommends reducing the grass median from 44' wide to 0' (zero) wide median at the bridges and utilizing a single a bridge, modifying the profile at Bridge #1 to reduce the change in elevation by 50 ft and at bridge #2 by 10-20 ft.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 14,691,600		\$ 14,691,600
PROPOSED CHANGE:	\$ 11,311,650		\$ 11,311,650
		SAVINGS:	\$ 3,379,950

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-4.0
PAGE NUMBER:	2 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$3,400,000.

Less construction time.

Less foundations and footings.

Roadway is advantageous maintenance wise.

Total construction cost reductions.

DISADVANTAGES:

Roadway taper from 40' to 0' wide at bridge which could cause a bottleneck effect and slow traffic.

JUSTIFICATION:

Aesthetically advantageous and total construction cost reductions.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-4.0
PAGE NUMBER:	3 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridge #1	1	EA	1	8.55 mil	8,550,000
Bridge #2	1	EA	1	4.35 mil	4,350,000
SUBTOTAL:					13,992,000
5% MARK UP:					699,600
TOTAL:					14,691,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridge #1	4	SF	102,244	70	7,157,080
Bridge #2	4	SF	51,656	70	3,615,920
SUBTOTAL:					10,773,000
5% MARK UP:					538,650
TOTAL:					11,311,650

SOURCES

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB-4.0
PAGE NUMBER:	4 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: SB-4.0

PAGE NUMBER: 5 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	SB-4.0
PAGE NUMBER:	6 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

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PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: SB-4.0

PAGE NUMBER: 7 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER: SB-4.0

PAGE NUMBER: 8 of 8

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

Width of required bridges= $2 * 10' \text{ shlds} + 4 * 12' \text{ lanes} + 2 * (1' - 7 \frac{1}{2}'' \text{ Barrier})$
=71'-3"

Bridge #1 Length=1435'-0"

Bridge #2 Length=725'-0"

Bridge #1 Area= $71.25' * 1435' = 102,244 \text{ SF}$

Bridge #2 Area= $71.25' * 725' = 51,656 \text{ SF}$

Bridge #1 Cost= $102,244 * \$70/\text{sf} = \$7,157,080$

Bridge #2 Cost= $51,656 * \$70/\text{sf} = 3,615,920$

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-8.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: CONSTRUCT ARCH AND OR SLANTED LEG BRIDGES EDS- 27.

ORIGINAL DESIGN: The original design contains two bridges of 1435'-0" and 725'-0" lengths as viable grade crossings with an average profile elevation of 770 ft and 835 ft at bridges 1 & 2 respectively. The original design utilizes 74 in bulb tees and 145'-0" spans on average.

PROPOSED CHANGE: The proposed change recommends modifying the profile at bridge #1 to reduce the change in elevation by 50 ft and thereby allowing for the begin bridge area to be filled with the cut material from adjacent areas, elevating Reeceburg to @ mainline grade elevation and reducing the bridge length by 855'-0". The new begin bridge will be at station 274+00 and the end of bridge station will be at 280+00 for a total length of 600'-0". Similarly, Bridge #2 begin bridge station at 296+50 and end of bridge station at 300+50 for a total length of 400 ft and the ends of ravines filled with cut material from adjacent areas as well. Two design suggestions are proposed for bridges, a slanted leg concrete bridge and a concrete arch bridge that could span the gorges without incorporating numerous high hammerhead piers in either location and drastically shortening the bridges.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-8.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Less construction time on foundations.

Less foundations and footings.

Single span openings.

Two foundations per bridge only.

Esthetically advantageous.

Possible total construction cost reductions.

DISADVANTAGES:

Construction time.

Forming.

Construction crew expertise availability.

JUSTIFICATION:

Esthetically advantageous and possible total construction cost reductions.

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: SB-8.0

PAGE NUMBER: 3 of 5

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB-8.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

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PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	SB-8.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

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VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	1 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (127)

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

PROPOSAL DESCRIPTION: REDESIGN PROJECT NORTH TERMINI.

ORIGINAL DESIGN: The original design grades separates at us 411/SR20 by bridging over US411/SR20 with parallel ridges 1200ft. east of the existing intersection of SR1 Loop and construct a diamond interchange.

PROPOSED CHANGE: The proposed change recommendation is to realign the North termini to intersect the existing SR1 Loop/SR20 intersection, bridge over SR20 and modify the interchange design by providing close in diamond ramps in the NW & SW quadrants and diamond and loop ramps in the SE quadrant.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 0		\$ 0
PROPOSED CHANGE:	\$ (2,091,616)		\$ (2,091,616)
SAVINGS:			\$ (2,091,616)

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	2 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$2,158,462.

Reduces right-of-way acquisition area and residential relocations.

Provides improved horizontal alignment.

Increased utilization of existing SR 1 Loop roadbed.

Reduces conflict with Southern Natural Gas Line & station.

Reduces total project length.

Shortens relocation of Wilbanks Road.

DISADVANTAGES:

Requires acquisition of additional commercial property.

Possible encroachment on adjacent stream.

Construction phasing under traffic becomes more complex on North bridge approach.

JUSTIFICATION:

This solution achieves grade separation, reduces ROW acquisition & relocation and effectively incorporates a larger portion of SR 1 Loop into the work thereby reducing cost.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	3 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Asph Conc 12.5mm	Dot Est.	Ton	1,067	39.51	(65,863)
Asph Conc 19mm	Dot Est.	Ton	2,222	36.18	(80,392)
Asph Conc 25mm	Dot Est.	Ton	6,666	35.76	(238,376)
GAB	Dot Est.	Ton	12,740	13.70	(174,538)
SUBTOTAL:					(559,169)
10% MARK UP:					(55,917)
TOTAL:					(615,086)

SOURCES

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	4 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right-of-Way, Residential	Dot Est.	AC	36	10,000	(360,000)
Right-of-Way, Commercial	Dot Est.	AC	2	150,000	300,000
Right-of-Way, Improvements	Dot Est.	EA	3	100,000	(300,000)
Right-of-Way, Commercial	Dot Est.	EA	1	500,000	500,000
SUBTOTAL:					140,000
155% MARK UP:					217,000
TOTAL:					357,000

SOURCES

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|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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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COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	5 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Utility Protection	DOT	Crossing	2	300,000	(600,000)
Utility Station	DOT	EA	1	1,000,000	(1,000,000)
Unclass Excavation	DOT	CY	28,445	2.35	(66,846)
SUBTOTAL:					(1,666,846)
10% MARK UP:					(166,684)
TOTAL:					(1,833,530)

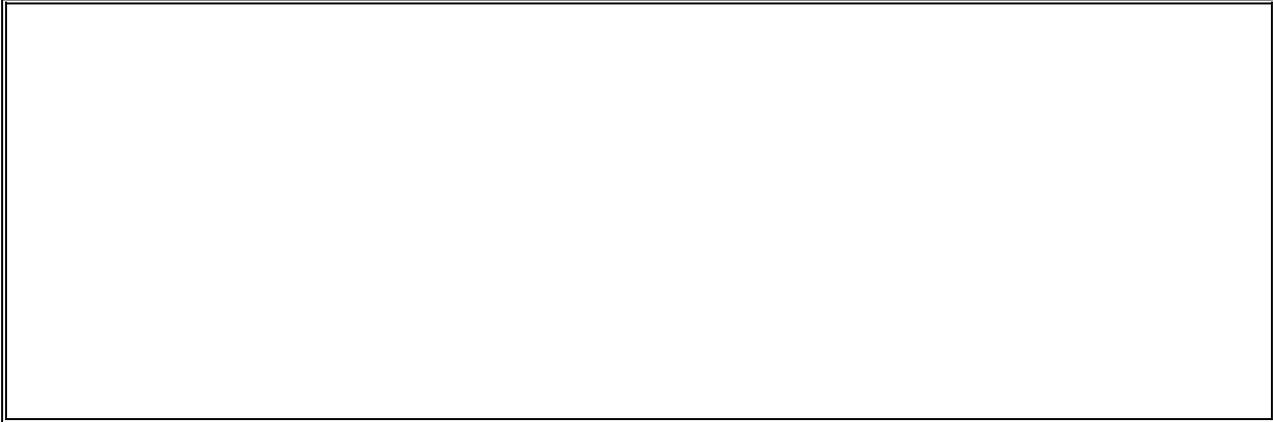
SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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:	RW-1.1
PAGE NUMBER:	6 of 7

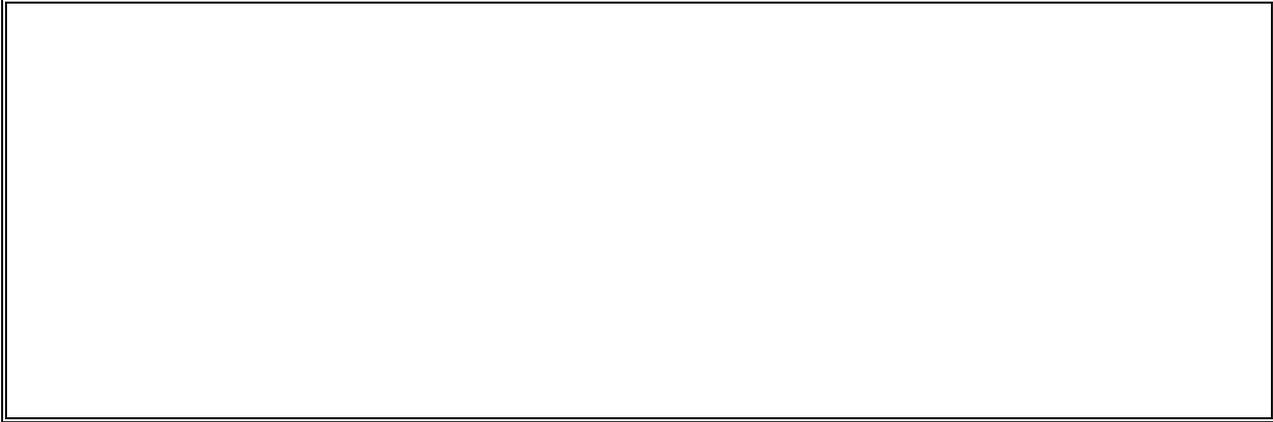
PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

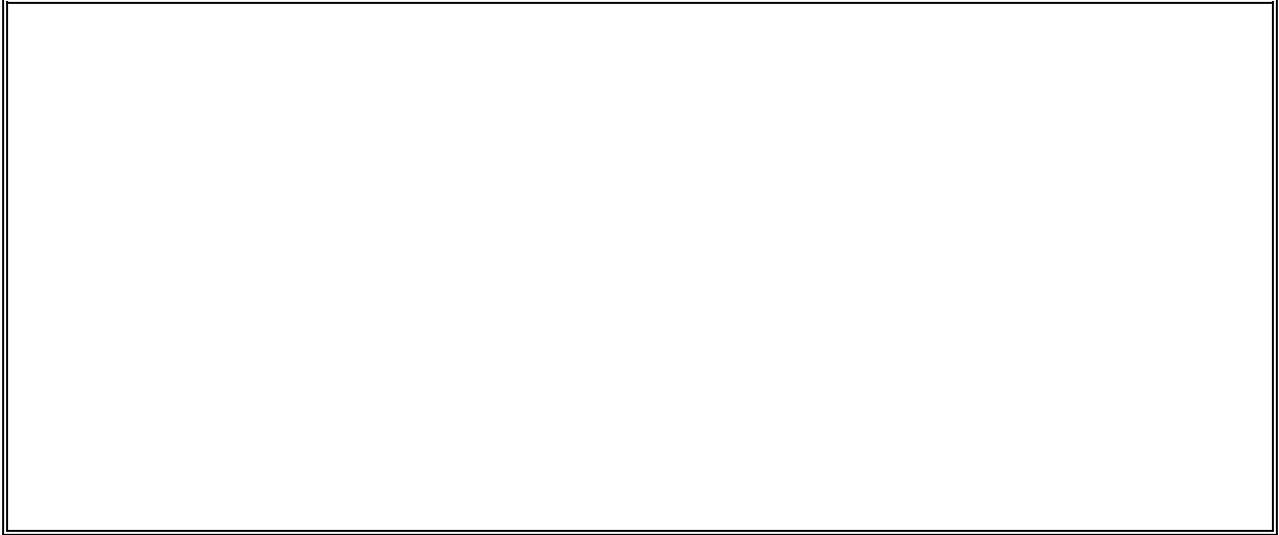


PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	7 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia





VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	1 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (127)

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

PROPOSAL DESCRIPTION: REDESIGN GRADE SEPARATION OAT SR1 LOOP & SR20.

ORIGINAL DESIGN: The original design provides for a diamond interchange on new location \pm 1200ft. east of the existing intersection of SR20/US411 and SR1 Loop.

PROPOSED CHANGE: The proposed change recommendation is to construct a half clover leaf interchange at the concept location in lieu of the diamond interchange.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 0		\$ 0
PROPOSED CHANGE:	\$ (2,510,413)		\$ (2,510,413)
		SAVINGS:	\$ 2,510,413

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	2 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ADVANTAGES:

Reduces ROW acquisition area & relocation of commercial property.

Reduces footprint thereby reducing erodible area.

DISADVANTAGES:

Merge on SR20 is short resulting in conflict between decel and accel merges on SR20/US411.

Reduces design speed of ramps.

JUSTIFICATION:

This solution achieves the desired grade separation & reduces ROW acquisition.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	3 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Asph Conc 12.5mm	Dot Est.	Ton	330	39.51	(13,038)
Asph Conc 19mm	Dot Est.	Ton	440	36.18	(15,919)
Asph Conc 25mm	Dot Est.	Ton	1,320	35.76	(47,203)
GAB	Dot Est.	Ton	2,240	13.70	(30,688)
SUBTOTAL:					(106,848)
% MARK UP:					(10,685)
TOTAL:					(117,533)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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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COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	4 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Unclass Excavation	Dot	CY	28,000	2.35	(65,800)
SUBTOTAL:					(65,800)
10% MARK UP:					(6,580)
TOTAL:					(72,380)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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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COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	5 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right-of-Way, Residential	Dot Est.	AC	20	10,000	(200,000)
Right-of-Way, Commercial	Dot Est.	AC	4	150,000	(600,000)
Right-of-Way, Improvements	Dot Est.	EA	1	60,000	(60,000)
Right-of-Way, Commercial	Dot Est.	EA	1	50,000	(50,000)
SUBTOTAL:					(910,000)
155% MARK UP:					(1,410,500)
TOTAL:					(2,320,500)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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:	RW-1.1
PAGE NUMBER:	6 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia



VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-1.2
PAGE NUMBER:	1 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (127).

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

PROPOSAL DESCRIPTION: RECONFIGURE RAMPS AT SR1 LOOP/SR20
GRADE SEPARATION

ORIGINAL DESIGN: The original design provides for a diamond interchange on new location ± 1200ft east of the existing intersection of SR20/US411 and SR1 Loop.

PROPOSED CHANGE: The proposed change recommendation is to construct a partial or two quadrant clover leaf interchange with ramps in opposite quadrants.

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:	\$ 0		\$ 0
PROPOSED CHANGE:	\$ (841,902)		\$ (841,902)
SAVINGS:			\$ 841,902

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-1.2
PAGE NUMBER:	2 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ADVANTAGES:

Reduces ROW acquisition area.

Reduces erodible area.

DISADVANTAGES:

Potential wrong way movements.

Ramp lengths are curved & shorter with increased grades therefore reducing enter/exit speeds.

JUSTIFICATION:

Reduction in construction cost and in right-of-way.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.2
PAGE NUMBER:	3 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Asph Conc 12.5mm	Dot Est.	Ton	413	39.51	(16,318)
Asph Conc 19mm	Dot Est.	Ton	550	36.18	(19,899)
Asph Conc 25mm	Dot Est.	Ton	1,650	35.76	(59,004)
GAB	Dot Est.	Ton	3,136	13.70	(42,963)
SUBTOTAL:					(138,184)
10% MARK UP:					(13,818)
TOTAL:					(152,002)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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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COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.2
PAGE NUMBER:	4 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Unclass Excavation	Dot Est.	CY	40,000	2.35	(94,000)
SUBTOTAL:					(94,000)
10% MARK UP:					(9,400)
TOTAL:					(103,400)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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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COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.2
PAGE NUMBER:	3 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
ROW Residential	Dot Est.	AC	23	10,000	(230,000)
SUBTOTAL:					(230,000)
155% MARK UP:					(356,500)
TOTAL:					(586,500)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 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:	RW-1.2
PAGE NUMBER:	6 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia



PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-1.2
PAGE NUMBER:	7 of 7

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia



VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-1.4
PAGE NUMBER:	1 of 4

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (127)

PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

PROPOSAL DESCRIPTION: PROVIDE FOR GRADE SEPARATED INTERCHANGE AT THE CURRENT INTERSECTION OF SR20/US411 AND SR1 LOOP.

ORIGINAL DESIGN: The original design concept is for bridging the Rome Bypass over SR20/US411 by constructing a full diamond interchange on new location ± 1200ft east of the current intersection of SR20/US411 and SR1 Loop.

PROPOSED CHANGE: The proposed recommendations provide for maintaining SR1 Loop at its existing location and tie the bypass into the existing intersection at grade. SR20/US411 would shift slightly north and bridge SR1 Loop with double parallel bridges. Diamond ramps would be constructed to provide a full diamond interchange.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-1.4
PAGE NUMBER:	2 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia

ADVANTAGES:

Reduces total project length.

Provides conventional diamond interchange.

Reduces area of land disturbing activities.

DISADVANTAGES:

Encroaches on parallel creek requiring retaining walls.

Requires substantial lengthening of culvert under SR20/US411.

Requires ± 1500ft. reconstruction of SR1 Loop under traffic.

Requires purchase of two additional commercial properties.

Requires obliteration of ± 3000ft of serviceable SR20/US411.

Makes construction phasing more difficult increase disruption to motorist.

JUSTIFICATION:

The proposed recommendation improves alignment of the Rome Bypass and more closely follows planning for the corridor.

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	RW-1.4
PAGE NUMBER:	3 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS
PROJECT LOCATION: Georgia DOT – Floyd County, Georgia



VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-3.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: ELIMINATE ALL AT-GRADE CROSSINGS.

ORIGINAL DESIGN: The original design includes 10 at-grade intersections, with 3 of those being right-in/out intersections.

PROPOSED CHANGE: The proposed change recommendation is to eliminate all at-grade intersections by either cutting off access or designing grade separations, with or without ramp access.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-3.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Increases safety of the highway by eliminating all stopping, turning and crossing traffic.

Could be used as future interstate corridor.

Higher traffic capacity.

Reduced travel time to drive the corridor.

DISADVANTAGES:

Eliminates access to/from local neighborhoods, if no ramp access is provided.

Costs of providing grade separations and additional ramps will be expensive.

Total limited access facility will need to be designed at 65 to 70 mph speeds, thus increasing costs.

ROW and/or providing access costs would be increased, when small neighborhoods, and individual houses are cut off from any access.

Possible environmental / historical impacts if more interchanges are designed.

JUSTIFICATION:

Providing a limited access freeway will ensure that this facility will handle future traffic volumes while providing a safer alternative.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-4.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: REDUCE ROADWAY WIDTH IN HIGH CUT SECTIONS WITH 20' MEDIAN SECTION WITH BARRIER ILO 44' DEPRESSED MEDIAN.

ORIGINAL DESIGN: The original design has 2 lanes in each direction with a 44' depressed median.

PROPOSED CHANGE: The proposed change recommendation is to install 2 lanes in each direction with a 20' median, including a barrier to separate traffic. Will include 7.5' wide left hand shoulders.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 77,500,000		\$ 77,500,000
PROPOSED CHANGE:	\$ 73,904,068		\$ 73,904,068
		SAVINGS:	\$ 3,595,932

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-4.0
PAGE NUMBER:	2 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$3,595,932.

Reduces Right-of-way impacts along high cut sections.

DISADVANTAGES:

Typical section will not be as pleasing and consistent to the driver.

Will have to be several tapers designed to traverse from one typical section to the other.

Barrier section is not as safe as the depressed 44' median section.

JUSTIFICATION:

The cost savings more than outweighs any disadvantages a narrow section might have.

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-4.0
PAGE NUMBER:	3 of 4

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-4.0
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PAGE NUMBER:	4 of 4
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PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-4.1
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: REDUCE ROADWAY WIDTH FOR ENTIRE PROJECT WITH 20' MEDIAN SECTION WITH BARRIER ILO 44' DEPRESSED MEDIAN.

ORIGINAL DESIGN: The original design has 2 lanes in each direction with a 44' wide depressed median.

PROPOSED CHANGE: The proposed change recommendation is to construct 2 lanes in each direction with a 20' wide median, including a barrier to separate traffic. Will include 7.5' wide left hand shoulders. Near intersections, barrier would be attenuated, and a 20' raised median section would be designed, with left turns as needed.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:		\$	
PROPOSED CHANGE:		\$	
SAVINGS:			± \$ 10,000,000

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-4.1
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

By referencing the cost savings of proposal SB-4.0 and RW-4.0, the approximate savings for the entire project would be in excess of \$10,000,000.

Reduces ROW and environmental impacts.

Consistent typical section throughout.

Would require only one bridge per crossing instead of two.

Design speeds might have to be reduced, but would make for a safer design with the presence of at-grade intersections.

DISADVANTAGES:

Non-standard typical section near intersections: would need attenuator for barrier, and could have short 20' raised median sections.

Would be costly to upgrade to interstate standards in the future.

Would resemble more of an urban-type section in a predominantly rural area.

Reduced design speeds needed.

Section not consistent with existing loop road on East / North terminus and proposed project on western terminus.

JUSTIFICATION:

The cost savings more than outweighs any disadvantages a narrow section could have.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-5.0
PAGE NUMBER:	1 of 4

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: ADJUST PROFILE TO MEET 55 MPH SPEED AND INCREASE THE MAXIMUM GRADE TO 6%.

ORIGINAL DESIGN: The original design profile is based on a 65 mph design speed and 4.5% maximum grade.

PROPOSED CHANGE: The proposed change recommendation is to design the road profile based on a 55mph design speed, which matches the concept, and allow for steeper grades, up to 6%, which is allowable in AASHTO Green Book, (Exhibit 7-2, and P.450).

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 77,500,000		\$ 77,500,000
PROPOSED CHANGE:	\$ 66,909,272		\$ 66,909,272
		SAVINGS:	\$ 10,590,728

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-5.0
PAGE NUMBER:	2 of 4

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$10,590,728.

Reduces Right-of-way impacts along high cut sections.

Balances earthwork, allowing for less waste of excavated materials.

Allows for shortening of proposed 1400' bridge.

DISADVANTAGES:

Adds to fill sections, might need additional ROW in these areas.

Profile is designed for a lesser design speed, could never be used to interstate standards.

Potential problems with Booze Mountain Road profile next to mainline.

Grades will be slightly more difficult for trucks to climb at design speeds.

JUSTIFICATION:

The cost savings of over \$10M, plus the ability to balance the earthwork and reduce the waste, is justified, considering the approved concept allows for the 55 mph design speed. It is not worth the cost in order to have a conservative design.

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-5.0
PAGE NUMBER:	4 of 4

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-7.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: STEEPEN FILL SLOPES USING GEOGRID FABRIC.

ORIGINAL DESIGN: The original design uses 2:1 maximum fill slopes.

PROPOSED CHANGE: The proposed change recommendation would include 1:1 or 1.5:1 fill slopes reinforced with geogrid fabric.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-7.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Reduced ROW impacts.

Smaller roadway footprint.

DISADVANTAGES:

More expense to purchase geogrid reinforcement.

Takes more time to construct steeper slopes.

Reduces fill, will increase waste quantities.

JUSTIFICATION:

Since there is no terrain information on EDS-27 (127), there could be more fill sections on that portion of the project compared to EDS-27 (154). If so, this option might be a benefit.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-8.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: USE A VERTICAL CUT SECTION IN AREAS WHERE ROCK IS ENCOUNTERED ILO A 2:1 SLOPE.

ORIGINAL DESIGN: The original design reflects/assumes a 2:1 slope in all cut areas.

PROPOSED CHANGE: The proposed change recommends that vertical slopes be used in areas where rock is encountered, and then a 2:1 slope will be used to tie in the slope above the rock strata.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 77,500,000		\$ 77,500,000
PROPOSED CHANGE:	\$ 65,311,669		\$ 65,311,669
		SAVINGS:	\$ 12,188,331

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-8.0
PAGE NUMBER:	2 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$12,188,331.

Reduces Right-of-way impacts along high cut sections.

Less rock to blast.

DISADVANTAGES:

Where high areas of earth are above rock strata, typical section will have vertical rock face with 2:1 slope above; it will have a non-standard feel.

Cost savings / time savings are difficult to measure; full extent will not be known until construction.

Future falling rock could be a problem.

Minimizes open feel, will have a more narrow cross section.

JUSTIFICATION:

The ability to reduce the wasted material makes this a justifiable technical option.

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-8.0
PAGE NUMBER:	4 of 4

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-9.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: DESIGN RETAINING WALLS IN DEEP CUT SECTIONS.

ORIGINAL DESIGN: The original design requires 2:1 slopes for all cut sections.

PROPOSED CHANGE: The proposed change recommendation is to install retaining walls to minimize the foot print of the project.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-9.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Minimizes Right-of-way impacts.

Minimizes any possible impacts to environmental / historical / archeological resource.

DISADVANTAGES:

More expensive.

Difficult to install in rock sections (if any type of tieback / MSE / anchored system is used).

Walls could not be built as high as some of the large cuts, multiple terraced walls needed.

JUSTIFICATION:

Only recommended where ROW cost savings are significant.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-11.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: ALLOW EXCAVATED ROCK TO BE REUSED AS BASE COURSE OR PCC.

ORIGINAL DESIGN: The original design does not account for any reuse of excavated rock.

PROPOSED CHANGE: The proposed change recommendation would include reusing excavated rock as base course and/or aggregate for PCC pavement.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 11,641,350		\$ 11,641,350
PROPOSED CHANGE:	\$ 9,400,770		\$ 9,400,770
		SAVINGS:	\$ 2,240,580

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-11.0
PAGE NUMBER:	2 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)
PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$2,240,580.

Can avoid any off-site coordination for acquisition of specified materials.

Less rock to waste.

DISADVANTAGES:

Difficult to crush rock to specifications.

JUSTIFICATION:

The re-use of excavated rock will be beneficial to the project budget and eliminate the need for disposal rock waste.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-11.0
PAGE NUMBER:	3 of 3

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ORIGINAL DESIGN (Combination of concept cost estimates)

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Graded Aggregate Base	1	TONS	173,420	10.30	1,787,000
PCC – 10” Thick (estimated)	1	SY	310,000	30.00	9,300,000
SUBTOTAL:					11,087,000
5% MARK UP:					554,350
TOTAL:					11,641,350

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Graded Aggregate Base	1	TONS	173,420	5.15	893,113
PCC – 10” thick	1	SY	310,000	26.00	8,060,000
SUBTOTAL:					8,953,113
5% MARK UP:					447,657
TOTAL:					9,400,770

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-12.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: USE EXCAVATED ROCK AS RIP-RAP , DITCH AND SLOPE PAVING IN LIEU OF PURCHASE OF NEW MATERIALS.

ORIGINAL DESIGN: The original design does not account for alternative uses of excavated rock.

PROPOSED CHANGE: The proposed change recommendation would use excavated rock for rip-rap, ditch and slope paving throughout the project.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-12.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Would reduce the amount of wasted rock on the project (although very little compared to total amount of earthwork).

Would reduce the cost of purchasing new materials from outside the project limits.

DISADVANTAGES:

Contractor might have to provide special equipment to grind the rock to the correct specifications.

JUSTIFICATION:

Using the excavated rock for alternative uses on the project will save costs and reduce waste.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-13.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: INCLUDE RAMPS TO /FROM US 27 IN PROJECT SCOPE.

ORIGINAL DESIGN: In the current design the western project terminus ties to proposed SW Rome Bypass, just east of interchange with US27.

PROPOSED CHANGE: The proposed change recommendation is to include ramps to and from US 27 in this project.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-13.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)
PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

If these projects are built before SW Rome Bypass projects, the ramps will provide access to US27 in the interim.

If eastern ramps are included in these projects and the western ramps are included in the SW Rome Bypass projects, it eliminates future confusion on how to program each project to ensure access is provided once construction is completed.

DISADVANTAGES:

Will add costs to this project (but not add costs to overall corridor).

JUSTIFICATION:

Ensures that completed roadways can be opened for use by the public.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-15.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)
PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

PROPOSAL DESCRIPTION: INSTALL CONCRETE PAVEMENT AT SIGNALIZED INTERSECTIONS IN LIEU OF ASPHALT.

ORIGINAL DESIGN: The original design provides for asphalt pavement on all roadways.

PROPOSED CHANGE: The proposed change recommendation includes concrete pavement on all intersections where trucks will be turning, crossing, and/or stopping.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-15.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dot – Floyd County, Georgia

ADVANTAGES:

Concrete pavement is more resistant to rutting under horizontal truck loadings (during stop, start, and turning movements).

Reduced maintenance costs.

DISADVANTAGES:

Concrete pavement is more expensive to construct.

Joints between asphalt and concrete will need to be provided.

Inconsistent pavement design.

JUSTIFICATION:

By installing concrete pavement in the specified locations, it would lessen the possibility of having to tear out the asphalt pavement when rutting occurs.

VALUE ENGINEERING TEAM STUDY

CONTACT DIRECTORY

VALUE ENGINEERING TEAM STUDY

FUNCTION ANALYSIS

The following functions for Rome Bypass Improvements Projects (127 & 154), Rome, GA. were identified during discussions with the Georgia DOT and Williams, Sweitzer and Barnum, INC. representatives (design team consultants) 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 Rome Bypass Improvements Projects (127 & 154), and assist the V.E. team in becoming familiar with the needs of the project and the long-term goals for this expansion of the Rome Bypass Improvements Projects (127 & 154). The Basic Function of the project is to “Enhance Economy”. The following are considered by the V.E. team to be Secondary and Supporting Functions.

Verb	Noun	Verb	Noun
Meet	Budget	Improve	Commuting
Reduce	Cost	Maintain	Surface
Optimize	Resources	Reduce	Risk
Expand	Development	Identify	Centerline
Adjust	Grade	Identify	Edge
Serve	Communities	Reuse	Materials
Serve	Public	Package	Contracts
Protect	Rivers	Develop	Options
Satisfy	Users	Develop	Alternatives
Support	Councils	Define	Performance
Minimize	Lawsuits	Develop	Specification
Improve	Access	Reduce	Liability
Enhance	Image	Re-cycle	Materials
Enhance	Signage	Drain	Median
Reduce	Risk	Enhance	Maintainability
Relieve	Traffic	Minimize	Relocations
Enhance	Economy	Expedite	Travel
Reduce	Delays	Improve	Functions
Maintain	Passage	Improve	Drainage
Improve	Constructibility	Correct	Drainage
Benefit	Community	Protect	Environment

VALUE ENGINEERING TEAM STUDY

FUNCTION ANALYSIS

Verb	Noun	Verb	Noun
Improve	Flow	Accommodate	Traffic
Increase	Capacity	Reduce	Risks
Add	Lanes	Accommodate	Breakdowns
Increase	Speeds	Protect	Species
Reduce	Delays	Minimize	Mitigation
Straighten	Alignment	Segregate	Materials
Improve	Line-of-Sight	Store	Materials
Improve	Visibility	Access	Materials
Enhance	Visibility	Access	Storage
Straighten	Road	Remove	Soils
Reduce	Interruptions	Remove	Rock
Reduce	Delays	Relocate	Soils
Identify	Passing	Re-use	Rock
Accommodate	Passing	Minimize	Erosion
Minimize	Intersections	Contain	Flow
Improve	Intersections	Control	Flow
Reduce	Accidents	Stage	Materials
Improve	Safety	Complete	Corridor
Separate	Lanes	Reduce	Congestion
Install	Barriers	Satisfy	Codes
Install	Medians	Meet	Schedules
Enhance	Definition	Meet	Budget
Communicate	Changes	Reduce	Cost
Assure	Safety	Improve	Functions
Accommodate	Hauling	Satisfy	Agencies
Expedite	Hauling	Utilize	Guidelines
Minimize	Hauling	Encourage	Competition
Control	Traffic	Increase	Storage
Maintain	Passage	Support	Tourism
Phase	Construction	Access	Recreation
Utilize	Resources	Protect	Species
Maximize	Utilization	Improve	Weaving
Protect	Landmarks	Help	Commuters
Guide	Traffic	Satisfy	Public
Transmit	Information	Satisfy	Commuters
Manage	Traffic	Support	Weight

VALUE ENGINEERING TEAM STUDY

COST DRIVER ANALYSIS

The V.E. team reviewed the project cost elements and identified the controlling element or cost driver for the Rome Bypass Improvements Projects (154 & 127). The cost drivers are used in the brainstorming process as a focal point of discussion and for idea generation.

Element	Function	Cost Driver
Excavation & Drainage \$21,115,000	Widen road Relieve Congestion Adjust Grade Improve Alignment Improve Drainage	Disposal Sites Time Limits Demolition/Removal Road Width Shoulder Width Road Length
Road Section \$5,029,000	Support Weight Maintain Surface Support Vehicles Distribute Load Overlay Road Lengthen Ramps Prevent Rutting	Base Course Materials Source of Materials Wearing Surface Drainage System Road Length Road Width Median Width Shoulder Width
Bridge & Box Culverts \$16,930,000	Bridge Ravines Improve Safety Support Weight Support Vehicles Connect Communities	Bridge Heights Foundation Protection Materials Used Structural Design Length of Beam Lengths of Bridge Number of Spans
Earth Stabilization & Erosion Control \$1,005,000	Insure Safety Reduce Risk Minimize Lawsuits	Require Methods Material Types Material Quantities Areas of Application Frequency of Use
Traffic Management \$109,000	Insure Safety Maintain Passage Avoid Delays Assist Commuters Assist Tourist	Methods of Control Frequency of Control Duration of Control

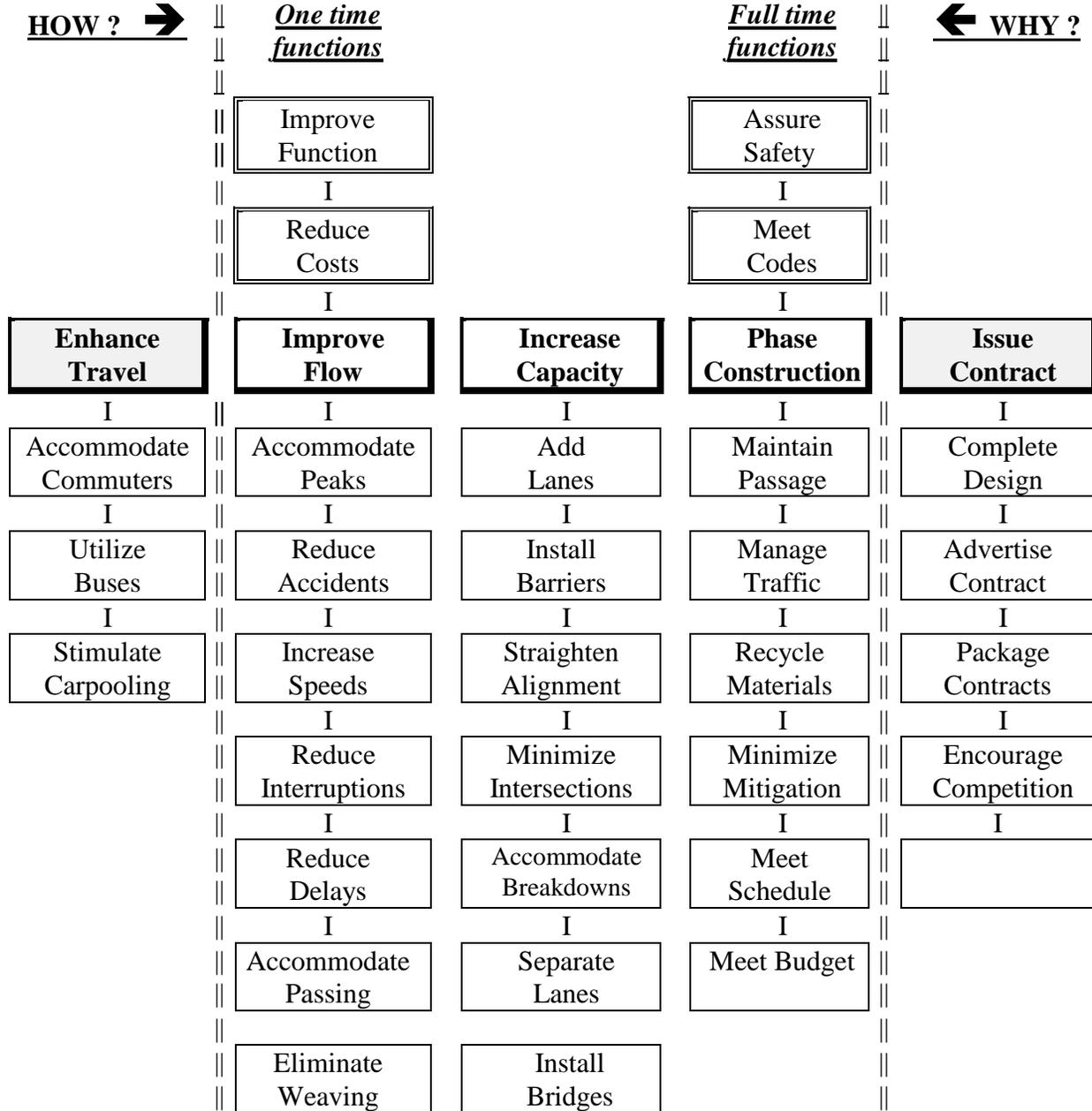
VALUE ENGINEERING TEAM STUDY

F.A.S.T. DIAGRAM

Note: For those unfamiliar with F.A.S.T. diagrams, the functional critical path is shown by the row of heavily lined boxes. Moving to the right should answer HOW the functions are being accomplished; moving to the left should answer the WHY question. Vertical dashed lines define the Project Scope addressed by the V.E. Team. Upper left functions in dotted boxes are Design/Team objectives, and upper right functions in the dotted boxes are inherent project requirements. Functions shown vertically under each heavy box are those, which are intended to be accomplished concurrently with their respective critical path functions. The F.A.S.T. Diagram shown represents only a few key functions extracted from the above list of functions developed by the V.E. Team. There are numerous secondary functions identified in the above list that are necessary and support the primary function of IMPROVE FLOW.

VALUE ENGINEERING TEAM STUDY

F.A.S.T. DIAGRAM



BRAINSTORMING OR SPECULATION

PROJECT TITLE: ROME BYPASS IMPROVEMENTS PROJECTS

PROJECT LOCATION: Georgia Dept of Transportation, Atlanta, GA

NUMBER	IDEA STRUCTURAL (S)	RANK
1.0	Reduce dual bridge length and height on (157) from 1435 LF	5/5
1.1	Construct one bridge less and reduce the length and height on (157) from the current 1435 LF bridge. Eliminates the median	5/5
2.0	Evaluate open cut tunneling from “Old Cedar Town Road” to “Preacher Smith Road” ilo cut and construction of 1435 LF bridge	5/5
3.0	Eliminate new bridge @ “Old Rock Mart Road”	Drop
3.1	Install a concrete box culvert and eliminate new bridge @ “Old Rock Mart Road”	5/5
4.0	Construct single bridge ilo two parallel bridges by necking down median (same as 1.1 above)	4/3
5.0	Raise elevation of Reeceburg Road to be on grade and lower bridge profile	4/2
6.0	Relocate new bridge to end of State Loop Road (Westward) SR 746	4/2
7.0	Close road @ Callier Road & eliminate new bridge by installing a concrete culvert	4/5
8.0	Construct a steel or concrete arch bridges in lieu of multi-span bridges	DS
9.0	Construct a slanted leg steel or concrete bridges ilo multi-span bridges	DS
ROADWAY/PROFILE (RW)		
1.0	(127) Relocate new intersection to Loop Rd. & SR 746 ilo current design of new intersection to the South	4/2
1.1	(127) Construct/install half clover leaf interchange at new intersection & eliminate new ramps and reduce ROW purchase (West Side)	4/2
1.2	(127) Construct/install half clover leaf interchange on NW and SE quadrant	4/2
1.3	(127) Construct/install compressed ramp on North side of existing intersection SR 1 & US 411	4/2
1.4	(127) Leave existing intersection SR-1 & US 411 at grade and construct overpass for traffic on US 411	4/2

BRAINSTORMING OR SPECULATION

PROJECT TITLE: ROME BYPASS IMPROVEMENTS (154 & 127)

PROJECT LOCATION: Georgia Dept of Transportation, Atlanta, GA

NUMBER	IDEA	RANK
2.0	(127) Relocate entire road layout further West from current layout	4/5
3.0	(127) Eliminate all at grade crossings	DS
4.0	(127 & 154) Reduce median width from 44' to 20' with concrete barriers in high cut areas.	5/5
5.0	(127 & 154) Adjust/change profile to reflect a true 55 mph design speed ilo current 65 mph design profile	4/5
6.0	(127 & 154) Increase grades to 6% maximum from the current design of 4%	4/5
7.0	Vertical cut in rock sections (deep cut areas) ilo sloping 1/1 or 2/1	4/5
8.0	Install retaining walls in deep cut areas ilo sloping 1/1 or 2/1 (depends of type of rock encountered)	DS
9.0	Use AASHTO 2001 standards in lieu of 1996	Drop
10.0	Allow excavated rock to be crushed and used as base course, subbase and aggregate in PCC pavements. (assuming stone is classified as Group 2 quality stone)	5/5
11.0	Use excavated rock as rip rap and or armor protection as needed	DS
12.0	Include South End ramps in EDS 27 (154) project scope to ensure coordination and construction of interchange	DS
13.0	(154) Evaluate dual tunneling through deep cut areas in lieu of open cut	DS
13.1	(154) Evaluate single large four lane tunnel through deep cut areas in lieu of open cut	DS
14.0	Install concrete pavement at on grade intersections to prevent raveling of proposed Superpave asphalt pavement as designed	
15.0	Evaluate if the current type "B" mix design will be adequate for proposed road parameters.	DS