



Widening of Jonesboro Road From US 19/US 41 to I-75

Project Number: STP00-1583-00(012), P.I. No. 342970
Clayton/Henry Counties

Value Engineering Study Report

Concept Design Stage

May 2009

Designer



Value Engineering Consultant





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Ms. Lisa L. Myers
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GA DOT - Engineering Services
One Georgia Center – 5th Floor
Atlanta, Georgia 30308

Re: Project No.STP00-1583-00(012) Clayton/Henry, P.I. No.: 342970
Widening of Jonesboro Road From US 19/US 41 to I-75
Value Engineering Study Report

Dear Ms. Myers:

Date:
May 5, 2009

Lewis & Zimmerman Associates, Inc. is pleased to submit two hard copies and one electronic copy of the referenced value engineering study report that took place on April 20 – April 23, 2009. The objective of the VE effort was to identify opportunities to reduce costs and enhance the value of the project.

Contact:
Stephen Havens

Phone:
608.438.8227

The VE workshop team developed 24 ideas that will yield significant cost savings and add value to the project. Of particular interest are alternatives to use one-way pairs, reduce pavement and right-of-way requirements, and eliminate up to three median openings to reduce turning conflicts. The team is also suggesting retaining the existing wall adjacent to BJ's by widening Jonesboro Road to the south and using 10-ft-wide shoulders.

Email:
shavens@lza.com

Our ref:
LZ083346.0000

We thank you for your assistance during the course of the VE team's work. Please do not hesitate to call upon us if you or any of the reviewers have any questions regarding the information presented in this report.

Sincerely yours,

LEWIS AND ZIMMERMAN ASSOCIATES, INC.

A handwritten signature in black ink that reads 'Stephen G. Havens'.

Stephen G. Havens, PE, CVS
Senior Project Manager

Attachment

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EXECUTIVE SUMMARY

INTRODUCTION

This value engineering (VE) study report documents the events and results of the VE study conducted by Lewis & Zimmerman Associates, Inc. (LZA) for the Georgia Department of Transportation (GDOT). The subject of the study is Project STP00-1583-00(012), P.I. # 342970, Widening of Jonesboro Road from US 19/US 41 to I-75, Clayton/Henry Counties, Georgia. The project is being planned for GDOT District 3 by a design team led by Wolverton & Associates.

The VE workshop was conducted April 20 - 23, 2009 at GDOT's Atlanta Headquarters at One Georgia Center with a team comprised of a highway engineer, bridge engineer, construction specialist, a Certified Value Specialist team leader. The team followed the six-phase VE Job Plan:

- Information Phase
- Function Identification and Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation Phase

PROJECT DESCRIPTION

This project widens the existing two-lane Jonesboro Road to a four-lane roadway with turn lanes as needed from mile 3.29 to mile 5.52 in Clayton County and from milepost 0 to mile 5.36 in Henry County for a total of 7.70 miles. The new, divided four-lane facility includes:

- Four 12-ft-wide lanes
- A raised concrete/grass median varying from 20 to 32 feet in width
- 4-ft-wide bicycle lanes on both sides of the mainline
- 12-ft-wide to 16-ft-wide shoulders that include curb and gutter on both sides of the mainline
- A 2-ft-wide to 6-ft-wide grass strip on both sides of the mainline
- 5-ft-wide sidewalks on both sides of the mainline
- A right-of-way that varies from 108 to 168 feet

Structures requiring construction include:

- Bridges
 - A new 118 ft 5 in x 141 ft bridge over Central of Georgia Railroad
 - Widening the existing bridge over Walnut Creek by 54 ft
- Gravity Wall
 - A 400 ft gravity wall at Town Center Village in Henry County to protect parking lot and commercial developments
- Retaining Walls
 - A 350 ft retaining wall at the bridge over Central of Georgia Railroad in Clayton County

- A 325 ft retaining wall at Homebanc in Henry County to protect parking lot and commercial developments
- A 600 ft retaining wall at Quizno's in Henry County to protect parking lot and commercial developments
- A 1,000 ft retaining wall at BJ's in Henry County to replace the existing wall
- A 200 ft retaining wall extension at Truett's in Henry County to protect parking lot and commercial developments

The project will be constructed under traffic with no detours anticipated, and traffic will be maintained at all times. The two bridges on the project will require staged construction.

No design exceptions or variances are anticipated.

The proposed posted speed will remain at 45 mph.

The estimated total cost of construction for P.I. Number 342970 is \$53,337,341 based upon the estimate dated June 13, 2008. The estimated right-of-way cost is \$35,960,000 and the estimated reimbursable utilities cost is \$2,174,500 bringing the total project cost to \$91,471,841 at the start of the VE workshop.

CONCERNS AND OBJECTIVES

Concerns

- Approximately 3.5 miles of the existing McDonough Road/Jonesboro Road corridor from US 19/US 41 to Pates Lake Way lies within a Historical Civil War Battlefield. Extensive coordination has been done with GDOT, SHPO and FHWA to ensure that no adverse impacts will be incurred by the widening of McDonough Road/Jonesboro Road. As a result, two sections of McDonough Road/Jonesboro Road will be realigned to avoid adverse impacts to historic resources, and therefore should not be eliminated as a cost savings.
- The proposed road widening must occur on the south side of the existing road adjacent to Historical Boundary H-1 to avoid adverse impacts to the property. This will require the potential displacement of the Lovejoy Fuel Mart, which is located at the proposed intersection of McDonough Road and East Lovejoy Road.
- The realignment of McDonough Road to the north of the existing roadway between US 19/US 41 and the railroad will require a mechanically stabilized earth retaining wall to minimize impacts to the adjacent property.
- The railroad bridge over Central of Georgia Railroad is being realigned to minimize archeological/environmental impacts. The Norfolk Southern Corporation has requested that the proposed bridge be widened to accommodate three tracks: one existing track and two future tracks.
- A new 1,000 ft retaining wall is being proposed to replace the existing retaining wall south of BJ's in Henry County. This is required to add space for widening Jonesboro Road in this area. The existing wall is near enough to BJ's Gas Station to require removal of an existing fuel tank.

Objectives

The VE team was tasked with the following key objectives:

- Recommend cost reduction ideas
- Recommend ideas to add value by improving roadway design

To meet these objectives, the VE team focused on the key functions associated with the project, paying particular attention to roadway design including typical sections, right-of-way requirements, use of existing pavement, drainage requirements, sidewalk requirements, and retaining wall requirements.

RESULTS

Research of the ideas identified as having potential for enhancing the value of the project resulted in the development of 23 VE alternatives and 1 design suggestion for consideration by the project team. If the following list of recommended VE alternatives is accepted, a total present worth cost savings of approximately \$11.9 million could be realized.

- Construct a one-way pair using the existing roadway for eastbound traffic from US 19/US 41 to Freeman Road to save \$1,360,658 (Alt. No. P-1).
- Change the intersection to a right-in/right-out at the west connector near Nash Farms and eliminate the median opening to improve traffic flow and save \$83,306 (Alt. No. P-4).
- Eliminate the median opening at Station Drive to reduce turning conflicts and save \$91,991 (Alt. No. P-7).
- Reduce the median width from 20 ft to 18 ft and save \$758,032 (Alt. No. P-9).
- Use 11-ft-wide through lanes from US 19/US 41 to Chambers Road and save \$1,746,872 (Alt. No. P-10).
- Use 11-ft-wide inside lanes from Chambers Road to I-75 and save \$393,254 (Alt. No. P-11).
- Reduce the mainline right-turn lane deceleration lengths to save \$233,730 (Alt. No. P-12).
- Provide a 10-ft multi-use trail on the north side of the mainline in lieu of two 4-ft bicycle lanes from Hastings Bridge Road to Mitchell Road and save \$684,855 (Alt. No. P-13).
- Eliminate the median opening at Sta. 141+00 and provide a right-in/right-out drive to save \$91,991 (Alt. No. P-15).
- Use 12-ft-wide urban shoulders from Chambers Road to I-75 and save \$1,196,868 (Alt. No. ROW-2).
- Use 24-in-wide curb-and-gutter in lieu of 30-in-wide curb-and-gutter to save \$1,082,605 (Alt. No. D-2).
- Use HDPE pipe in lieu of concrete pipe for longitudinal storm drain piping to save \$367,523 (Alt. No. D-3).
- Construct the entire wall parallel to the railroad at the west end of the railroad bridge to save \$256,400 (Alt. No. W-1).
- Retain the existing wall adjacent to BJ's by widening Jonesboro Road to the south and by using 10-ft-wide shoulders to save \$2,239,149 (Alt. No. W-2).
- Use a mechanically stabilized earth wall in lieu of an end span for the railroad bridge to save \$437,129 (Alt. No. B-1).
- Eliminate sidewalks on both sides of the mainline between US 19/US 41 and McCullough Road and save \$903,594 (Alt. No. S-1).

This VE report is a formalization of the draft materials provided to the project team during the out-briefing discussion which occurred on April 23, 2009. The Summary of Potential Cost Savings worksheet following this narrative outlines all of the alternatives and the design suggestion developed by the VE team. Some of the alternatives are mutually exclusive or interrelated, so that addition of all project cost savings does not equal total savings for the project. A full listing of all of the ideas considered by the VE team can be found on the Creative Idea Listing in the Value Analysis and Conclusions section of the report.



SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>		PRESENT WORTH OF COST SAVINGS				
ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL COST SAVINGS	RECURRING COST SAVINGS	TOTAL PW LCC SAVINGS
PAVEMENT (P)						
P-1	Construct a one-way pair using the existing roadway for eastbound traffic from US 19/US 41 to Freeman Road.	\$1,650,038	\$289,380	\$1,360,658		\$1,360,658
P-2	Use the existing roadway for eastbound traffic by constructing a one-way pair at Nash Farm.	\$808,228	\$44,675	\$763,553		\$763,553
P-3	Provide a cul-de-sac at the west end of the existing road at Nash Farm and eliminate the connector road.	\$94,605	\$48,582	\$46,023		\$46,023
P-4	Change the intersection to a right-in/right-out at the west connector near Nash Farms and eliminate the median opening to improve traffic flow.	\$86,552	\$3,246	\$83,306		\$83,306
P-6	Relocate the cul-de-sac to the east end of Jonesboro Road and access LaCosta at Lovejoy from Hastings Bridge Road.	\$101,389	\$3,246	\$98,143		\$98,143
P-7	Eliminate the median opening at Station Drive to reduce turning conflicts.	\$94,912	\$2,921	\$91,991		\$91,991
P-9	Reduce the median width from 20 ft to 18 ft.	\$758,032	\$0	\$758,032		\$758,032
P-10	Use 11-ft-wide through lanes from US 19/US 41 to Chambers Road.	\$1,746,872	\$0	\$1,746,872		\$1,746,872
P-11	Use 11-ft-wide inside lanes from Chambers Road to I-75.	\$393,254	\$0	\$393,254		\$393,254
P-12	Reduce the mainline right-turn lane deceleration lengths.	\$667,800	\$434,070	\$233,730		\$233,730
P-13	Provide a 10-ft multi-use trail on the north side of the mainline in lieu of two 4-ft bicycle lanes from Hastings Bridge Road to Mitchell Road.	\$1,137,709	\$452,854	\$684,855		\$684,855
P-15	Eliminate the median opening at Sta. 141+00 and provide a right-in/right-out drive.	\$94,912	\$2,921	\$91,991		\$91,991
P-16	Use 11-ft-wide inside lanes from US 19/US 41 to Chambers Road.	\$869,764	\$0	\$869,764		\$869,764

STUDY RESULTS

INTRODUCTION

The results of this value engineering study portray the benefits that can be realized by GDOT and the users. The results will directly affect the project's design and require coordination amongst the GDOT project team to determine the disposition of each alternative.

During the course of the study, many ideas for potential value enhancement were conceived and evaluated by the team for technical feasibility, applicability to the project, and the ability to meet the owner's project value objectives. Research performed on those ideas considered to have potential to enhance the value of the project resulted in the development of individual alternatives identifying specific changes to the project as a whole, or individual elements that comprise the project. These may be in the form of VE alternatives (accompanied by cost estimates) or design suggestions (without cost estimates). For each alternative developed, the following information has been provided:

- A summary of the original design;
- A description of the proposed change to the project;
- Sketches and design calculations, if appropriate;
- A capital cost comparison and life cycle discounted present worth cost comparison of the alternative and original design, if appropriate;
- A descriptive evaluation of the advantages and disadvantages of selecting the alternative; and
- A brief narrative to compare the original design and the proposed change and provide a rationale for implementing the change into the project.

The capital cost comparisons for each alternative use unit quantities from the Estimate Report for file "342970," prepared by District 3, State of Georgia Department of Transportation, dated 6/13/2008. If unit quantities were not available, GDOT databases were consulted. A composite markup of 11.3%, as described in the Value Analysis and Conclusions section of the report, was used to generate the project cost for the construction items being compared.

Each design suggestion contains the same information as the VE alternatives, except that no cost information is included. Design suggestions are presented to bring attention to areas of the design that, in the opinion of the VE team, should be changed for reasons other than cost. Examples of these reasons may include improved operations, reduced maintenance, improved constructability, improved safety, and reduced project risk. In addition, some ideas cannot be quantified in terms of cost with the design information provided; these are also presented as design suggestions and are intended to improve the quality of the project.

Each alternative or design suggestion developed is identified with an alternative number (Alt. No.) that can be tracked through the value analysis process and facilitate referencing between the Creative Idea Listing and Evaluation worksheets, the alternatives, and the Summary of Potential Cost Savings table. The Alt. No. includes a prefix that refers to one of the major project elements:

PROJECT ELEMENT	PREFIX
Pavement	P
Right-of-Way	ROW
Drainage	D
Walls	W
Bridges	B
Sidewalks	S
General	G

Summaries of the alternatives are provided on the Summary of Potential Cost Savings table. The table is divided into project elements for the reviewer’s convenience and is used to divide the results section. The complete documentation of the developed alternatives and design suggestions follows the Summary of Potential Cost Savings tables.

KEY ISSUES

The project team summarized the following key design issues to the VE Team during the design overview:

- Approximately 3½ miles of the existing McDonough Road/Jonesboro Road corridor from US 19/US 41 to Pates Lake Way lies within a Historical Civil War Battlefield. Extensive coordination has been done with GDOT, SHPO and FHWA to ensure that no adverse impacts will be incurred by the widening of McDonough Road/Jonesboro Road. As a result, two sections of McDonough Road/Jonesboro Road will be realigned to avoid adverse impacts to historic resources, and therefore should not be eliminated as a cost savings.
- The proposed road widening must occur on the south side of the existing road adjacent to Historical Boundary H-1 to avoid adverse impacts to the property. This will require the potential displacement of the Lovejoy Fuel Mart, which is located at the proposed intersection of McDonough Road and East Lovejoy Road.
- The proposed road widening must occur on the south side of the existing road adjacent to Historical Boundary H-10 to avoid adverse impacts to the property. This will cause impacts to three parcels.
- The realignment of McDonough Road to the north of the existing roadway between US 19/US 41 and the railroad will require a mechanically stabilized earth retaining wall to minimize impacts to the adjacent property.
- The railroad bridge over Central of Georgia Railroad is being realigned to minimize archeological/environmental impacts. The Norfolk Southern Corporation has requested that the proposed bridge be widened to accommodate three tracks: one existing track and two future tracks.

- A new 1,000 ft retaining wall is being proposed to replace the existing retaining wall south of BJ's in Henry County. This is required to add space for widening Jonesboro Road in this area. The existing wall is near enough to BJ's Gas Station to require removal of an existing fuel tank.

STUDY OBJECTIVES

The VE team was tasked with the following key objectives:

- Recommend cost reduction ideas
- Recommend ideas to add value by improving roadway design

To meet these objectives, the VE team focused on the key functions associated with the project, paying particular attention to roadway design including typical sections, right-of-way requirements, use of existing pavement, drainage requirements, sidewalk requirements, and retaining wall requirements.

RESULTS OF THE STUDY

Research of the ideas identified as having potential for enhancing the value of the project resulted in the development of 23 VE alternatives and 1 design suggestion for consideration by the project team. Several of the design suggestions have cost savings potential which should be easy to quantify as the project development effort progresses. The greatest opportunity for cost reduction and added value centers on the use of existing pavement, lane width, median width, shoulder width, right-of-way requirements, and retaining wall requirements.

Each of the alternatives should be given careful consideration for the potential cost savings and/or value improvement that they offer compared to the tradeoffs.

EVALUATION OF ALTERNATIVES AND DESIGN SUGGESTIONS

When reviewing the study results, the project team should consider each part of an alternative or design suggestion on its own merit. There may be a tendency to disregard an alternative because of a concern about one part of it. Each area within an alternative or design suggestion that is acceptable should be considered for use in the final design, even if the entire alternative or design suggestion is not implemented. Variations of these alternatives and design suggestions by the owner or designer are encouraged.

All alternatives and design suggestions were developed independently of each other to provide a broad range of options to consider for implementation. Therefore, some of them are "mutually exclusive," so acceptance of one may preclude the acceptance of another. In addition, some of the alternatives may be interrelated, so acceptance of one or more may not yield the total of the cost savings shown for each alternative. Design suggestions could also be interrelated thus precluding a

part of one or more suggestions from being implemented if another design suggestion is also implemented.

GDOT and Wolverton & Associates should evaluate all alternatives carefully in order to select the combination of ideas with the greatest beneficial impact on the project. Once this has been accomplished, the total cost savings resulting from the VE study can be calculated based on implementing a revised, all-inclusive design solution.



SUMMARY OF POTENTIAL COST SAVINGS

PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>		PRESENT WORTH OF COST SAVINGS				
ALT. NO.	DESCRIPTION	ORIGINAL COST	ALTERNATIVE COST	INITIAL SAVINGS	RECURRING COST SAVINGS	TOTAL PW LCC SAVINGS
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P-1	Construct a one-way pair using the existing roadway for eastbound traffic from US 19/US 41 to Freeman Road.	\$1,650,038	\$289,380	\$1,360,658		\$1,360,658
P-2	Use the existing roadway for eastbound traffic by constructing a one-way pair at Nash Farm.	\$808,228	\$44,675	\$763,553		\$763,553
P-3	Provide a cul-de-sac at the west end of the existing road at Nash Farm and eliminate the connector road.	\$94,605	\$48,582	\$46,023		\$46,023
P-4	Change the intersection to a right-in/right-out at the west connector near Nash Farms and eliminate the median opening to improve traffic flow.	\$86,552	\$3,246	\$83,306		\$83,306
P-6	Relocate the cul-de-sac to the east end of Jonesboro Road and access LaCosta at Lovejoy from Hastings Bridge Road.	\$101,389	\$3,246	\$98,143		\$98,143
P-7	Eliminate the median opening at Station Drive to reduce turning conflicts.	\$94,912	\$2,921	\$91,991		\$91,991
P-9	Reduce the median width from 20 ft to 18 ft.	\$758,032	\$0	\$758,032		\$758,032
P-10	Use 11-ft-wide through lanes from US 19/US 41 to Chambers Road.	\$1,746,872	\$0	\$1,746,872		\$1,746,872
P-11	Use 11-ft-wide inside lanes from Chambers Road to I-75.	\$393,254	\$0	\$393,254		\$393,254
P-12	Reduce the mainline right-turn lane deceleration lengths.	\$667,800	\$434,070	\$233,730		\$233,730
P-13	Provide a 10-ft multi-use trail on the north side of the mainline in lieu of two 4-ft bicycle lanes from Hastings Bridge Road to Mitchell Road.	\$1,137,709	\$452,854	\$684,855		\$684,855
P-15	Eliminate the median opening at Sta. 141+00 and provide a right-in/right-out drive.	\$94,912	\$2,921	\$91,991		\$91,991
P-16	Use 11-ft-wide inside lanes from US 19/US 41 to Chambers Road.	\$869,764	\$0	\$869,764		\$869,764

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-1

DESCRIPTION: **CONSTRUCT A ONE-WAY PAIR USING THE EXISTING ROADWAY FOR EASTBOUND TRAFFIC FROM US 19/US 41 TO FREEMAN ROAD**

SHEET NO.: **1 of 6**

ORIGINAL DESIGN:

The current design proposes to build a new four-lane facility from Central of Georgia Railroad to Freeman Road.

ALTERNATIVE: (see attached sketch)

Retain the existing roadway (McDonough Road) for the eastbound traffic and build two new lanes for the westbound traffic. Incorporate a roundabout at the intersection of Hastings Bridge Road and McDonough Road to facilitate turning movements.

ADVANTAGES:

- Reduces construction cost
- Reduces construction duration
- Uses existing railroad bridge

DISADVANTAGES:

- The existing railroad bridge might still require replacement in the future to accommodate new rail lines

DISCUSSION:

The alternative design requires a smaller, new bridge over the railroad for westbound traffic only and retains the existing bridge for eastbound traffic. The new bridge would be built to accommodate the existing track and two new tracks.

The existing bridge would require replacement in the future when the additional rail lines are installed.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,650,038	—	\$ 1,650,038
ALTERNATIVE	\$ 289,380	—	\$ 289,380
SAVINGS	\$ 1,360,658	—	\$ 1,360,658

CENTRAL OF GEORGIA RAILROAD

CITY LIMITS

Sketch
Alt. P-1 2/6
Alternate sketch

OMIT SIGNAL

TRENCH 3

TRENCH 4

STREAM 1

One-Way Pair

RELIANCE EQUITIES INC

TRENCH 5

STREAM 10

EPHEMERAL 10

9CN121

CENTRAL OF GEORGIA RAILROAD

37
38
501

CLAYTON HOLDING LLC

EPHEMERAL

HASTINGS BRIDGE RD

COLLIER DEVELOPMENT LLC

4 MILE

CLAYTON HOLDING LLC

LACOSTA AT LOVEJOY INC

BEL AIR BLVD

E LOVEJOY



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
 Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

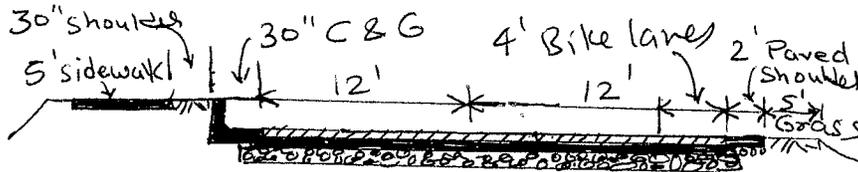
P-1

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

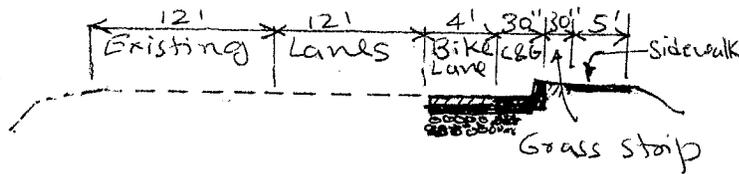
SHEET NO.: 3 of 6

One-way Pair

WB Traffic (New Rdwy)



EB Traffic (Along Exist. Route)



CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-1

SHEET NO.:

4 of 6

Full Depth Pavement Unit Cost:
(per Ton cost from GDOT estimate) \$ / sy

$$1\frac{1}{2}'' (12.5 \text{ mm Mix}): 1.5'' \times \frac{110 \text{ lbs}}{54 \text{ -in}} \times \frac{T}{2,000 \text{ lbs}} \times \frac{\$63.24}{T} = \$5.22 \text{ / sy}$$

$$2'' (19 \text{ mm Mix}): 2'' \times \frac{110 \text{ lbs}}{54 \text{ -in}} \times \frac{T}{2,000 \text{ lbs}} \times \frac{\$63.01}{T} = \$6.93 \text{ / sy}$$

$$6'' (25 \text{ mm Mix}): 6'' \times \frac{110 \text{ lbs}}{54 \text{ -in}} \times \frac{T}{2,000 \text{ lbs}} \times \frac{\$63.18}{T} = \$20.85 \text{ / sy}$$

$$14'' (\text{GAB}): \frac{9 \text{ sf}}{54} \times 1.167' \times \frac{.075 T}{\text{cf}} \times \frac{\$21.59}{T} = \$17.00 \text{ / sy}$$

$$\text{Total: } \frac{\$50.00}{\text{sy}}$$

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-1

SHEET NO.:

5 of 6

SAVINGS OR ORIGINAL DESIGN

$$\Rightarrow 14" \text{ G.A.B. saved: } (3,000' \times 24' \times 1.167') \times \frac{.075 \text{ T}}{\text{CF}} = 6,318 \text{ TN} \leftarrow$$

will only save 24' of pavement will still need 4' of pavement for Bike Lane along E.B. existing Route / pavement.

The pavement evaluation has determined that the overlay required is 9" Asphaltic Concrete. Therefore the only "pavement" savings will be 14" of G.A.B.

$$\Rightarrow \text{Bridge Savings: } (52' + 6' + 4') = 62'$$

use \$ 95/sf for Bridge Unit Cost.

$$62' \times 152' = 9,424 \text{ s.f.} \leftarrow$$

$$\Rightarrow \text{R/W Savings: } (50' \times 3,000') = 150,000 \text{ s.f.} \leftarrow$$

$$\Rightarrow \text{Grading / EARTH work } \approx \frac{(50' \times 3,000' \times 8')}{\frac{27 \text{ CF}}{27} \text{ (avg. ht.)}} = 44,500 \text{ c.y.} \leftarrow$$

$$\text{Alt. Round A Bout Cost (Lump)} = \$ 260,000 \leftarrow$$

COST WORKSHEET



PROJECT: **JONESBORO RD. FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **P-1**

SHEET NO.: **6 of 6**

PROJECT ITEM		ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS	COST/UNIT	TOTAL	NO. OF UNITS	COST/UNIT	TOTAL
GAB	TN	6,318	21.59	136,406			
Bridge	SF	9,424	95.00	895,280			
Earthwork	CY	44,500	6.00	267,000			
Right-Of-Way	SF	150,000	0.55	82,500			
Right-Of-Way Markup (148%)	LS	1	122,100.00	122,100			
Roundabout	LS				1	260,000.00	260,000
Subtotal (less Right-of-Way)				1,298,686			260,000
Markup (%) at 11.3%				146,752			29,380
TOTAL (incl. Right-of-Way)				1,650,038			289,380

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-2

DESCRIPTION: **USE THE EXISTING ROADWAY FOR EASTBOUND TRAFFIC BY CONSTRUCTING A ONE-WAY PAIR AT NASH FARM**

SHEET NO.: **1 of 5**

ORIGINAL DESIGN: (See attached sketch)

The proposed design provides a new four-lane mainline with two connectors and a cul-de-sac on the east side of the existing Jonesboro Road at Nash Farms.

ALTERNATIVE: (See attached sketch)

Make the existing Jonesboro Road a two-lane roadway for eastbound traffic through Nash Farms. Construct a new one-way, two-lane roadway for westbound traffic at the proposed realignment around Nash Farms. Eliminate one west-side connector and cul-de-sac. Construct bike lanes and sidewalks with 30-in-wide curb and gutter on the north side of the new realignment and on the south side of the existing road.

ADVANTAGES:

- Reduces cost
- Reduces construction duration
- Enhances safety

DISADVANTAGES:

- Longer travel distance going westbound for three parcels adjoining Babbs Mill Road

DISCUSSION:

Continued use of the existing roadway through Nash Farms would improve access if future development is considered. However, three existing parcels would incur a longer travel distance for westbound travel.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 808,228	—	\$ 808,228
ALTERNATIVE	\$ 44,675	—	\$ 44,675
SAVINGS	\$ 763,553	—	\$ 763,553

ALT. P-2
ORIGINAL
DESIGN
Sheet 2/5

513

529

GEORGIA GENERAL
PARCELS

6 5

7 1

LARRY
VIVIAN
YOUNG

THE GRESHAM
FAMILY LIMITED
PARTNERSHIP

ALT. P-2
ORIGINAL
DESIGN

SHT. 2 OF 5

CK

INC

BABBS

Construct 30" C&G, 4' bike lane
& sidewalk only on the north side
of the proposed Jonesboro Road
Alignment



← One-way Two Lanes with
Left-turn Lane @ Connector Babbs
Mill Rd

Alternate
R/W

No Right
Turn from
the
Connector

Alternate
R/W

Eliminate
Cul-de-Sac

Eliminate
Connector

Two-way -
Two Lanes

LARRY
VIVIAN
YOUNG

GEORGIA GENERAL
PARCELS

THE GRESHAM
FAMILY LIMITED
PARTNERSHIP

One-way Existing Two Lanes
Construct bike lane, C&G and sidewalk
on the south side of this
existing Jonesboro Road to match
bike lane, C&G & sidewalk on new
one-way two lane road on north side

Existing lanes
12'
4' Bike lane
30" C&G
5' Sidewalk
Grass strip

6 5

5

ALT.
DESIGN
SHT. 3 of 5

CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-2

SHEET NO.: 4 of 5

Cost of Pavement: \$50/sy → See Alt. P-1

Length of new alignment between the two intersections with existing Jonesboro Road is 3,600 feet.

$$\text{Area of pavement saved} = \frac{3,600' \times 24'}{9} = 9,600 \text{ sy}$$

Length of existing Jonesboro Road between the two intersections with the new alignment is 4,200 feet.

$$\text{Area of additional bike length pavement} = \frac{(4,200 - 3,600) \times 4}{9} = 267 \text{ sy}$$

$$\text{Additional 30" C \& G} = 4,200 - 3,600 = 600 \text{ feet}$$

$$\text{Additional sidewalk} = \frac{600 \times 5}{9} = 333 \text{ sy}$$

$$\text{New 2' paved shoulder on new alignment} = \frac{2 \times 3,600}{9} = 800 \text{ sy}$$

(2" 19 mm mix → \$6.93/sy)

$$\text{Eliminate west connector to new alignment: } \frac{300 \times 24}{9} =$$

800 sy of new pavement

$$\text{Eliminate cul-de-sac: } \frac{\pi \times 100^2}{9} / 4 = 872 \text{ sy of new pavement}$$

$$\text{R/W saved: } (3,600' - 200' - 200') \times 24' = 76,800 \text{ sf}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT:	JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	ALTERNATIVE NO.:	P-3
DESCRIPTION:	PROVIDE A CUL-DE-SAC AT THE WEST END OF THE EXISTING ROAD AT NASH FARM AND ELIMINATE THE CONNECTOR ROAD	SHEET NO.:	1 of 4

ORIGINAL DESIGN: (See attached sketch)

The proposed design provides a connector road from the west end of the existing road to the relocated mainline at Nash Farm. A new extension to Babbs Mill Road connects the existing road to the realigned mainline east of Nash Farm.

ALTERNATIVE: (See attached sketch)

Omit the connector road at the west end of the Nash Farm relocation and provide a cul-de-sac.

ADVANTAGES:

- Reduces cost
- Enhances safety

DISADVANTAGES:

- Slightly reduces access

DISCUSSION:

Since there are no residences along the existing road between Babbs Mill Road and the western end of the realigned mainline at Nash Farm, and since the proposed connectors are only 1,800 ft apart, the connector road at the west end can be eliminated and replaced by a cul-de-sac. The median opening can remain in the current location so that opening space does not exceed 1/2 mile.

This alternative removes one intersection from the proposed mainline, which enhances traffic safety.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 94,605	—	\$ 94,605
ALTERNATIVE	\$ 48,582	—	\$ 48,582
SAVINGS	\$ 46,023	—	\$ 46,023

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **P-3**

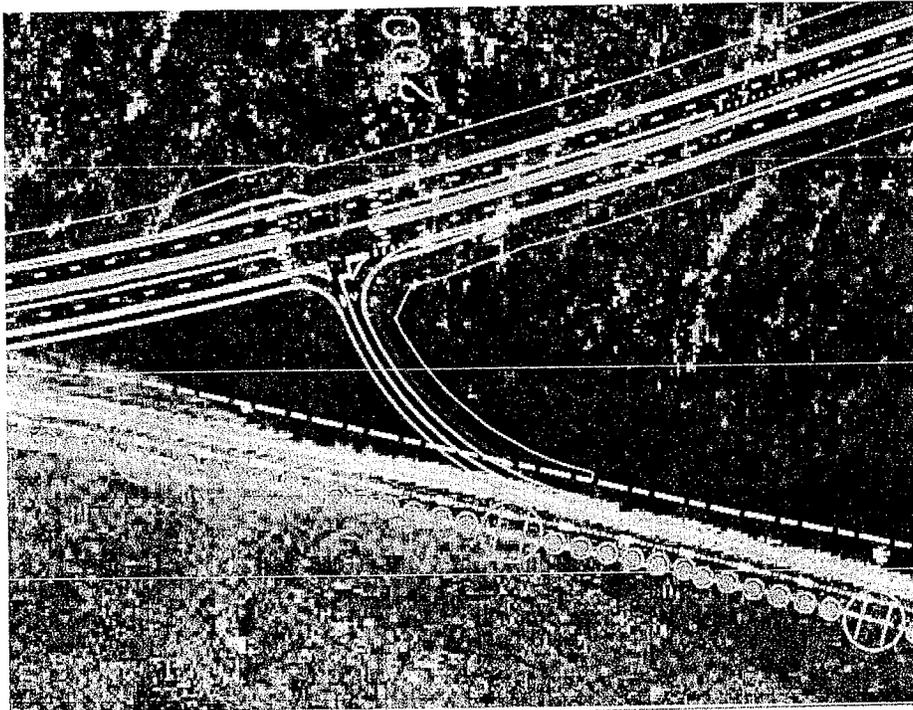
ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH

SHEET NO.:

2 of 4



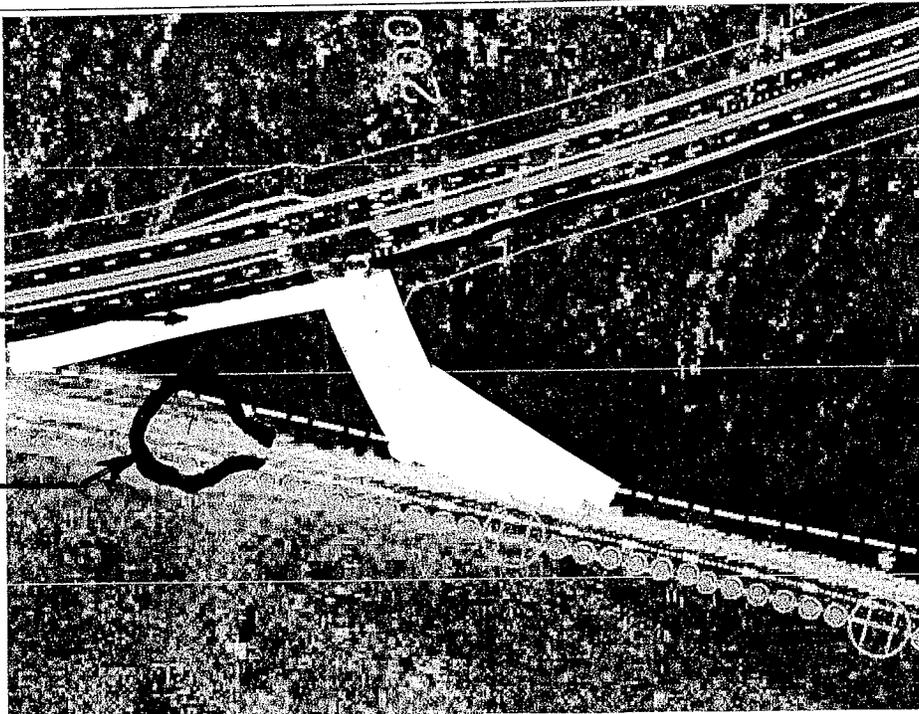
ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH

ELIMINATE
CONNECTOR
ROAD

ADD
CURV. DE
-SAC



CALCULATIONS



PROJECT: **ALRJONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **P-3**

SHEET NO.: **3 of 4**

Proposed design:

Full depth pavement:

Connector length = 200' taper and 275' storage length

Width = 24'

Pavement Area = $450(24)/9 = 1200$ SY

Deceleration lane length = $(1/2 \times 12 \times 200 + 275 \times 12)/9 = 500$ SY

Width = 12'

Pavement Area = $450(12)/9 = 600$ SY

Total = $1200 + 500 = 1700$ SY

Alternative design:

Full depth pavement:

Cul-de-sac 100' diameter

Pavement Area = $3.14159(50 \times 50)/9 = 873$ SY

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-4

DESCRIPTION: **CHANGE THE INTERSECTION TO A RIGHT-IN/RIGHT-OUT AT THE WEST CONNECTOR NEAR NASH FARMS AND ELIMINATE THE MEDIAN OPENING TO IMPROVE TRAFFIC FLOW**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The proposed design provides a median opening on the realigned mainline so that users traveling from the west end of Nash Farms can turn east or west onto the new mainline.

ALTERNATIVE: (See attached sketch)

Close the median and provide a right-in/right-out at the west connector near Nash Farms to improve traffic flow.

ADVANTAGES:

- Reduces cost
- Reduces construction duration
- Enhances safety

DISADVANTAGES:

- Longer travel distance for visitors departing from Nash Farms desiring to travel westbound

DISCUSSION:

Closing the median creates a minor inconvenience for the occasional user desiring to travel westbound after visiting Nash Farms. Westbound travelers would be required to travel an additional 1,800 ft and possibly be required to make a U-turn.

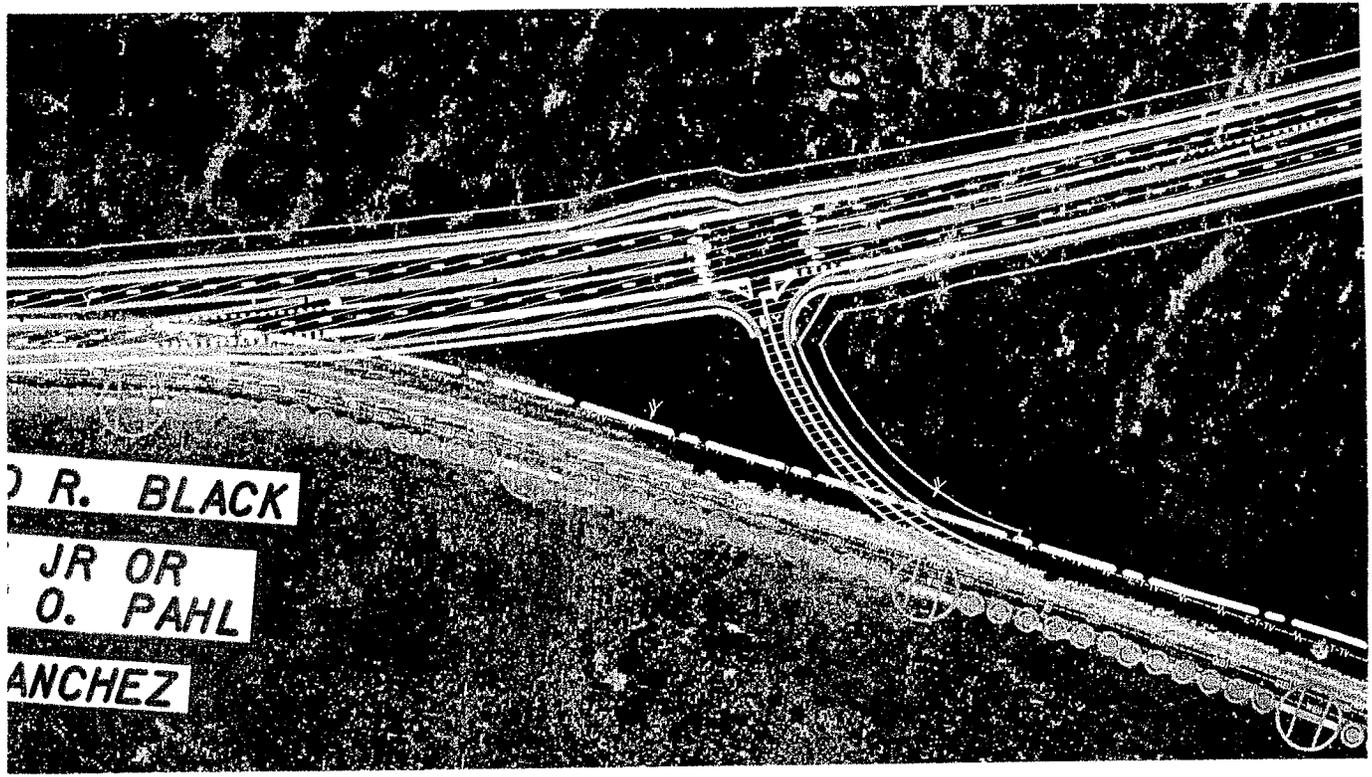
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 86,552	—	\$ 86,552
ALTERNATIVE	\$ 3,246	—	\$ 3,246
SAVINGS	\$ 83,306	—	\$ 83,306

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

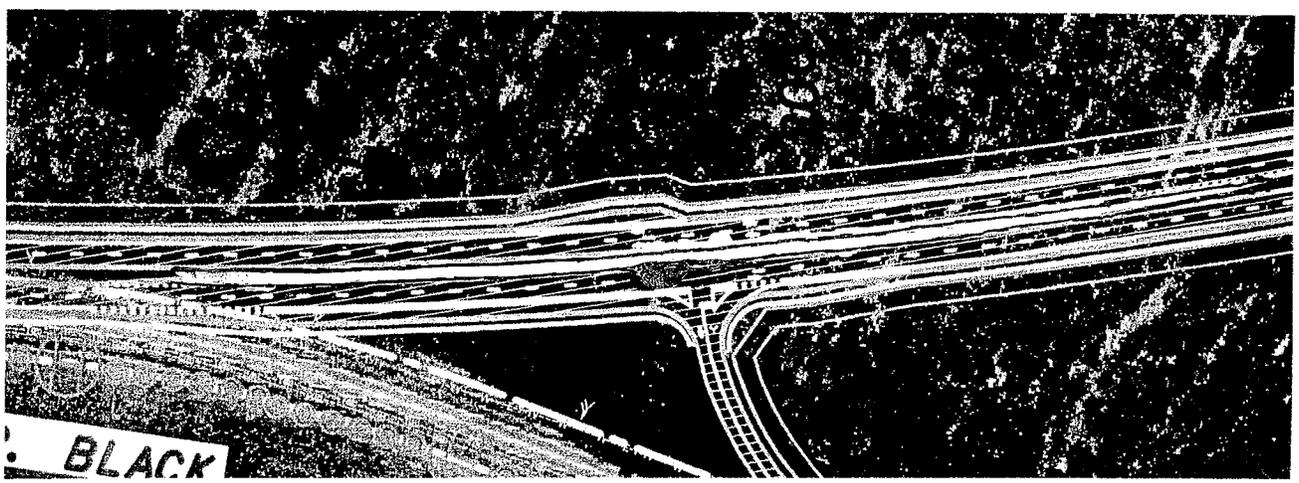
ALTERNATIVE NO.:
P-4

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: *2* of *4*



Original Design



Alternate Design

CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-4

SHEET NO.: 3 of 4

The two left (U-turn) lanes on the realigned Jonesboro road are 400 feet long with 200' taper. Amount of pavement saved by not constructing these turn lanes will be:

$$2[400 \times 12 + \frac{1}{2} \times 12 \times 200] / 9 = 1,333.3 \text{ sy}$$

Length of additional curb & gutter needed to close the median = $2 \times 100 = 200$ feet

FULL DEPTH PAVEMENT REPLACED BY MEDIAN:

$$L = 100'$$

$$W = 20'$$

$$A = 100(20) / 9 = 222 \text{ sy}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-6

DESCRIPTION: **RELOCATE THE CUL-DE-SAC TO THE EAST END OF
 JONESBORO ROAD AND ACCESS LACOSTA AT
 LOVEJOY FROM HASTINGS BRIDGE ROAD**

SHEET NO.: 1 of 5

ORIGINAL DESIGN: (See attached sketch)

The proposed design provides a connector to the new, realigned mainline from the current Jonesboro Road with a cul-de-sac on the west end near LaCosta at Lovejoy.

ALTERNATIVE: (See attached sketch)

Relocate the cul-de-sac to the east end of Jonesboro Road and access LaCosta at Lovejoy from a new intersection at Hastings Bridge Road.

ADVANTAGES:

- Eliminates one intersection on the new mainline
- Reduces construction duration
- Enhances safety

DISADVANTAGES:

- Slightly longer travel distance from LaCosta at Lovejoy to the new mainline for users traveling eastbound

DISCUSSION:

Using this alternative, residents of LaCosta at Lovejoy desiring to travel east on the new mainline can do so via Bel Air Boulevard and E. Lovejoy Road. Residents desiring to travel westbound can do so via the current Jonesboro Road and Hastings Bridge Road.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 101,389	—	\$ 101,389
ALTERNATIVE	\$ 3,246	—	\$ 3,246
SAVINGS	\$ 98,143	—	\$ 98,143

CENTRAL OF GEORGIA RAILROAD

EPHEMERAL 1B

ALTERNATIVE P-6 ORIGINAL DESIGN sheet 2/5

CLAYTON WATER AUTH

TRENCH 4

STREAM 1

TRENCH 5

RELIANCE EQUITIES INC

EPHEMERAL 7C

STREAM 1D

9CN121*

MCDONOUGH RD

31

38

CLAYTON HOLDING LLC

EPHEMERAL 7A

ALT P-6

501

MILE 4

BEL AIR BLVD

E LOVEJOY RD

HASTINGS BRIDGE RD

LACOSTA AT LOVEJOY INC

IER MENT LLC

CLAYTON HOLDING LLC

ORIGINAL DESIGN

SHEET 2 OF 5

LACOSTA

CENTRAL OF GEORGIA
RAILROAD

EPHEMERAL 1B

ALTERNATE P-6
ALTERNATIVE
DESIGN

sheet 3/5

CLAYTON C
WATER AUTH

NO EYE BROW
OR
MEDIAN
OPENING

TRENCH 4

STREAM 1

TRENCH 5

RELIANCE EQUITIES INC

EPHEMERAL 1C

STREAM 1D

96N121

ALTERNATE
CUL-DE-SAC

CLAYTON
HOLDING LLC

ALT. P-6

ALTERNATE DESIGN

SHEET 3 OF 5

CLAYTON
HOLDING
LLC

LIER
MENT LLC

WASTINGS BRIDGE RD

LEGOSTA AT LOVEJOY INC

LACOS

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-6

SHEET NO.:

4 of 5

The two left (U-turn) lanes on the realigned Jonesboro road are 400 feet long with 200' taper. Amount of pavement saved by not constructing these turn lanes will be:

$$2 \left[400 \times 12 + \frac{1}{2} \times 12 \times 200 \right] / 9 = 1,333.3 \text{ sy}$$

Length of additional curb & gutter needed to close the median = $2 \times 100 = 200$ feet

Connector Pavement: $100' \times 24' / 9 = 266.6 \text{ sy}$

The cost of Alternate Cul-de-sac will be affected by not constructing cul-de-sac as designed.

FULL DEPTH PAVEMENT AT MEDIAN OPENING

$$L = 100'$$

$$W = 20'$$

$$\text{AREA} = 100(20) / 9 = 222 \text{ sy}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-7

DESCRIPTION: **ELIMINATE THE MEDIAN OPENING AT STATION DRIVE
 TO REDUCE TURNING CONFLICTS**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The current design includes a median opening with turn lanes onto the mainline at Station Drive.

ALTERNATIVE: (See attached sketch)

Eliminate the median opening and provide a right-in/right out at Station Drive.

ADVANTAGES:

- Reduces cost
- Reduces turning conflicts

DISADVANTAGES:

- Requires Station Drive users to make a u-turn at Hunters Lane for westbound travel

DISCUSSION:

Eliminating the median opening at Station Drive will improve the level of service along the mainline by reducing turning conflicts at this location.

Median openings at E. Lovejoy Road and Hunters Lane will provide for U-turns to facilitate turning traffic leaving and returning to Station Drive.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 94,912	—	\$ 94,912
ALTERNATIVE	\$ 2,921	—	\$ 2,921
SAVINGS	\$ 91,991	—	\$ 91,991

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

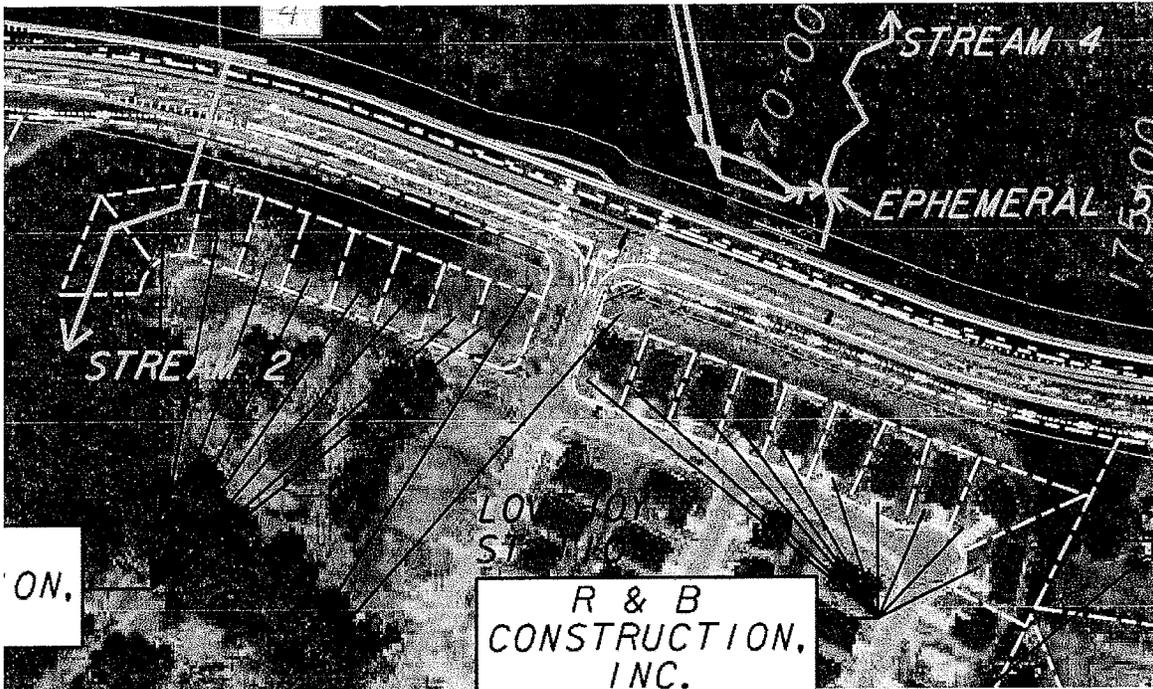
ALTERNATIVE NO.:

P-7

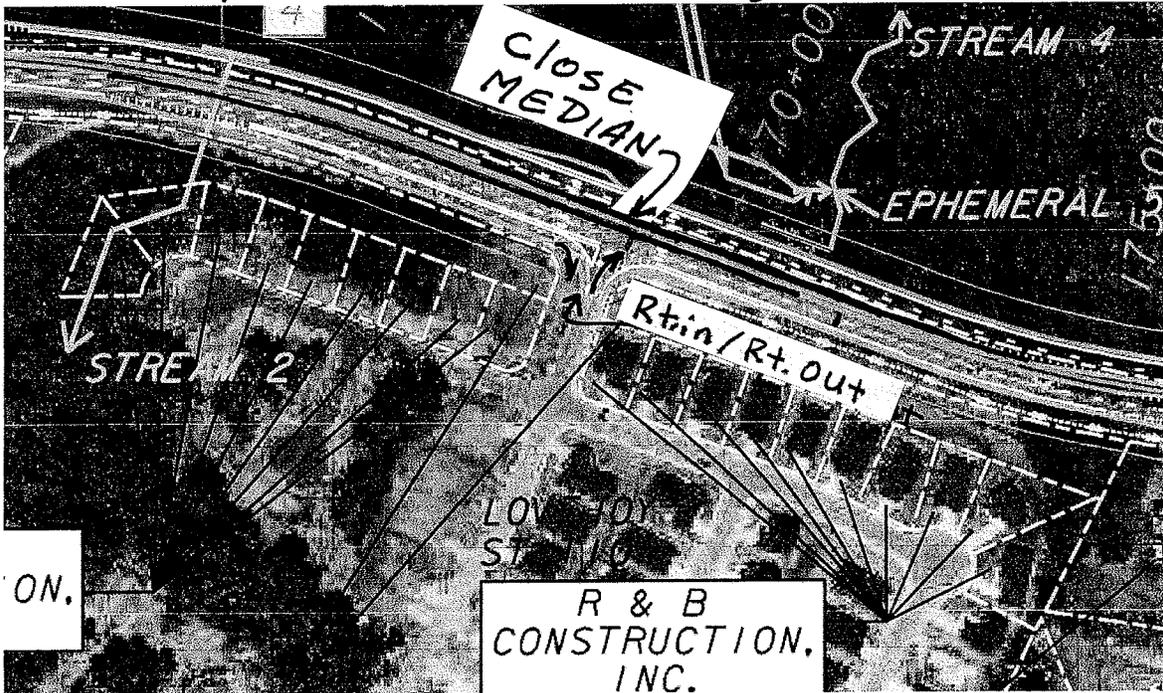
ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: 2 of 4

ORIGINAL DESIGN



Alternate Design



CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-7

SHEET NO.:

3 of 4

Savings of Pavement when closing median opening at Station Drive.

$$\left[12' \times \left(\frac{100}{2} + 400' \right) \right] \times 2 \text{ Left Turns} = 10,800 \text{ s.f.}$$

$$\text{Eyebrow} \left(\frac{125'}{2} + 50' \right) \times 12' = \frac{1,350 \text{ s.f.}}{12,150 \text{ s.f.}}$$

$$\frac{12,150 \text{ s.f.}}{9 \text{ sf/sy}} = 1,350 \text{ s.y.}$$

Alt. Design Requires: more median curb & gutter
90 L.F. x 2 sides = 180 L.F. (of TP7 curb)

Savings of Concrete Median Pavement Required in narrow median Nose w/ median Opening

$$\left[400' \times (8' - (2.5' \times 2)) + (25' \times 4') \right] \times 2 \text{ Nose} = 2,600 \text{ sf}$$

$$\frac{2,600 \text{ sf}}{9 \text{ sf/sy}} = 289 \text{ s.y.}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-9

DESCRIPTION: **REDUCE THE MEDIAN WIDTH FROM 20 FT TO 18 FT**

SHEET NO.: **1 of 3**

ORIGINAL DESIGN:

The current design includes a 20-ft-wide median throughout the length of the project.

ALTERNATIVE:

Provide an 18-ft-wide median throughout the length of the project. Ref. page 474, AASHTO 2004 Edition.

ADVANTAGES:

- Reduces cost
- Reduces construction duration
- Reduces right-of-way requirement

DISADVANTAGES:

- None identified

DISCUSSION:

Reducing the median width from 20 ft to 18 ft will reduce right-of-way requirements and construction costs by reducing the Railroad Bridge width and Walnut Creek Bridge width by 2 ft.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 758,032	—	\$ 758,032
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 758,032	—	\$ 758,032

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-9

SHEET NO.: 2 of 3

Railroad Bridge:

Total Bridge area reduction: $152' \times 2' = 304 \text{ sf}$
Cost/SF: $1,691,000 / (152 \times 118.42) \approx \95

Walnut Creek Bridge:

Total Bridge area reduction: $120' \times 2' = 240 \text{ sf}$
Cost/SF: $790,560 / (120 \times 94.42) \approx \113

R/w area savings:

Average cost of R/w per square foot:

$$\frac{3.02 \times 12 + 5.27 \times 16 + 0.48 \times 0.55 + 13.07 \times 1.50 + (18.05 + 8) \times 0.95}{47.8 \text{ acres}}$$

$$= \$3.45$$

By not acquiring 2 feet in width of R/w throughout the project, the square feet of R/w saved is:

$$7.7 \text{ miles} \times 5,280 \times 2 = 81,312 \text{ sf.}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-10

DESCRIPTION: **USE 11-FT-WIDE LANES FROM US 19/US 41 TO CHAMBERS ROAD**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The current design includes 12-ft-wide through lanes throughout the length of the project.

ALTERNATIVE: (See attached sketch)

Use 11-ft-wide through lanes for the portion of the project from US 19/US 41 to Chambers Road (approximately 5.92 miles). Maintain all turn lanes (LT and RT) at 12-ft-wide.

ADVANTAGES:

- Reduces construction cost
- Reduces earthwork requirements
- Reduces right-of-way requirements

DISADVANTAGES:

- Narrower lanes could affect wide vehicles

DISCUSSION:

Since the adjacent through lanes will be 11-ft-wide with this alternative, it is extremely important that the adjacent turn lanes (LT and RT) remain 12-ft-wide for enhanced safety and maneuverability.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,746,872	—	\$ 1,746,872
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 1,746,872	—	\$ 1,746,872

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-10

ORIGINAL DESIGN

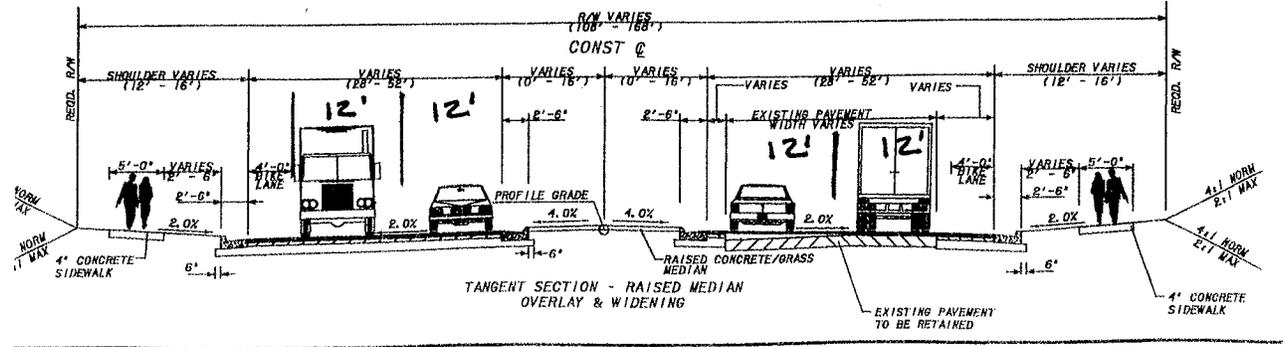
ALTERNATIVE DESIGN

BOTH

SHEET NO.:

2 of 4

12' Lanes

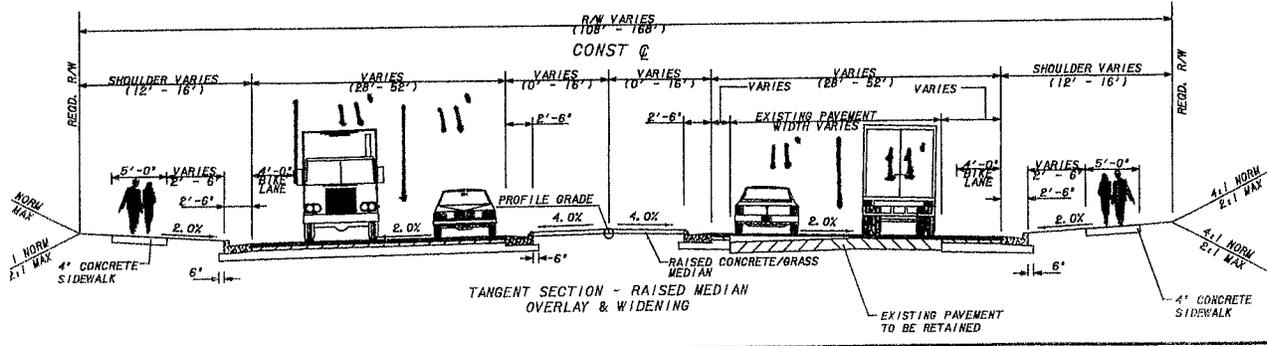


ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH

11' Lanes



From US 19 / US 41 / SR 3 to Chambers Rd

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-10

SHEET NO.:

3 of 4

SAVINGS in Roadway Pavement using
11' through Lanes from US 19/41 to
Chambers Rd.

$$(Sta. 107+50 \rightarrow 420+00) = 31,250 \text{ L.F.}$$

$$\frac{((31,250' - 152') \times 4')}{95 \text{ sf/sy}} = 13,822 \text{ s.y.} \leftarrow$$

Walnut Crk Bridge: $4' \times 120' = 480 \text{ s.f.}$

Bridge Area Saved: $4' \times 152' = 608 \text{ s.f.} \leftarrow$
(over RR)

R/W Saved: $4' \times 31,000' = 124,000 \text{ s.f.} \leftarrow$

Earthwork: $\frac{(31,000' \times 4' \times 6')}{27 \text{ cf/cy}} = 27,550 \text{ c.y.} \leftarrow$

Use: $\left(\frac{\$.55}{\text{sf}} + \frac{\$.75}{\text{sf}} \right) = \$.65 \text{ Residential for R/W}$

Use: $\$.8/\text{sf}$ for Commercial

Residential: $124,000 \text{ sf.} \times .8 = 99,200 \text{ s.f.}$

Commercial: $124,000 \text{ sf.} \times .2 = 24,800 \text{ s.f.}$

ASSUMING 80% RESIDENTIAL AND
20% COMMERCIAL

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-11

DESCRIPTION: **USE 11-FT-WIDE INSIDE LANES FROM CHAMBERS ROAD TO I-75**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The current design includes 12-ft-wide through lanes throughout the length of the project.

ALTERNATIVE: (See attached sketch)

Use 11-ft-wide inside lanes from Chambers Road to I-75 and keep the 12-ft-wide outside lanes.

ADVANTAGES:

- Reduces construction cost
- Reduces earthwork requirements
- Reduces right-of-way requirements

DISADVANTAGES:

- Narrower lanes could affect wide vehicles

DISCUSSION:

Due to the 9% truck traffic from Chambers Road to I-75, this alternative proposes 11-ft-wide inside lanes to reduce costs. The 12-ft-wide outside lanes and 12-ft-wide turning lanes should be kept.

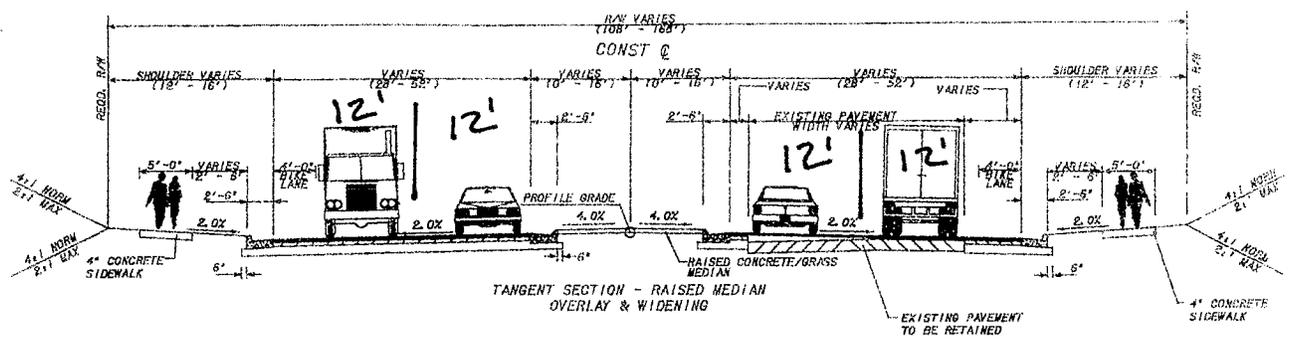
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 393,254	—	\$ 393,254
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 393,254	—	\$ 393,254

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **P-11**
 SHEET NO.: **2 of 4**

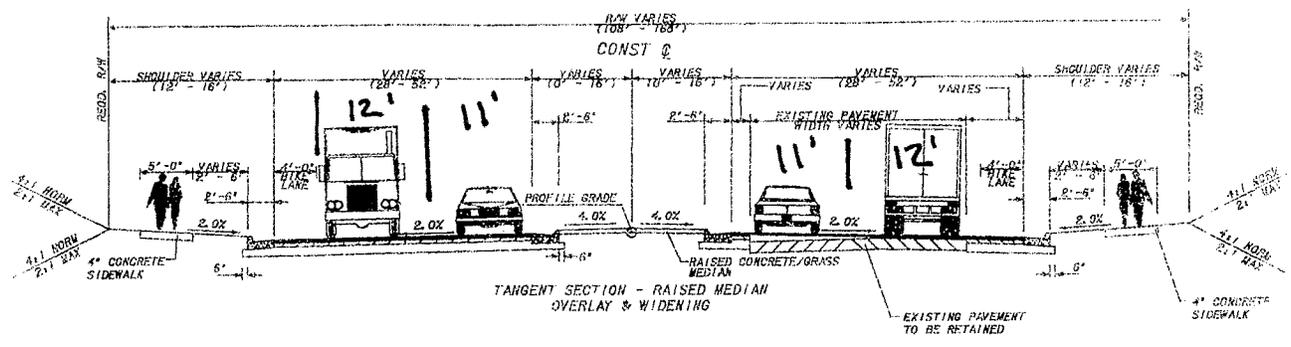
ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

4 - 12' Lanes



ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

11' Inside Lanes



CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-11

SHEET NO.:

3 of 4

Savings in Roadway Pavement Section
using two - 11' Lanes (inside) from
Chambers Rd to I-75.

$$(STA 420+00 \rightarrow 482+00) = 6,200'$$

$$\frac{(6,200' \times 2')}{9 \text{ sf/sy}} = \frac{12,400}{9 \text{ sf/sy}} = 1,378 \text{ s.y.} \leftarrow$$

$$\text{Earthwork} = \frac{(6,200' \times 2' \times 5')}{27 \text{ cf/sy}} = 2,300 \text{ c.y.} \leftarrow$$

use: Avg. of \$0.65/sy for Residential R/W.
Henry Co.

use: Avg. of \$12/s.f. for Comm. R/W.

$$(R/W) 6,200 \times 2' = 12,400 \text{ s.f.}$$

$$\text{Residential: } 12,400 \text{ s.f.} \times .2 = 2,480 \text{ s.f.} \leftarrow$$

$$\text{Commercial: } 12,400 \text{ s.f.} \times .8 = 9,920 \text{ s.f.} \leftarrow$$

→ this Area is more Commercial than
the remainder of the Project.

ASSUMES 80% COMMERCIAL AND 20% RESIDENTIAL.

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-12

DESCRIPTION: **REDUCE THE RIGHT-TURN DECELERATION LANE LENGTHS**

SHEET NO.: **1 of 3**

ORIGINAL DESIGN: (See attached sketch)

The current design includes a 200-ft taper and 400-ft storage length for all right-turn lanes.

ALTERNATIVE: (See attached sketch)

Provide a minimum of 100-ft taper and 275-ft storage length (for design speed of 45 mph at $\leq 3\%$ slope) at all right turn lanes except those that are signalized. Ref. AASHTO 2004 Edition, [pages 714, 715]. A total of 18 right turn lanes should qualify for reduction.

ADVANTAGES:

- Reduces construction cost
- Reduces earthwork requirements

DISADVANTAGES:

- None identified

DISCUSSION:

When the road profile exceeds 3%, the length of the storage for right-turn lanes should be increased proportionately.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 667,800	—	\$ 667,800
ALTERNATIVE	\$ 434,070	—	\$ 434,070
SAVINGS	\$ 233,730	—	\$ 233,730

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-12

SHEET NO.:

2 of 3

^{ORIGINAL}
Area of Pavement : 200' taper & 400' storage length :

$$\left[\frac{1}{2} \times 12 \times 200 + 12 \times 400 \right] \times \frac{18}{9} = 12,000 \text{ SY}$$

^{ALTERNATIVE}
Area of Pavement : 100' taper & 275' storage length :

$$\left[\frac{1}{2} \times 12 \times 100 + 12 \times 275 \right] \times \frac{18}{9} = 7,800 \text{ SY}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-13

DESCRIPTION: **PROVIDE A 10-FT MULTI-USE TRAIL ON THE NORTH SIDE OF JONESBORO ROAD IN LIEU OF TWO 4-FT BICYCLE LANES FROM HASTINGS BRIDGE ROAD TO MITCHELL ROAD**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The original design provides one 4-foot bike lane on each side of Jonesboro Road.

ALTERNATIVE: (See attached sketch)

Omit the 4 ft bike lanes and provide a 10 ft multi-use trail on the north side of Jonesboro Road from Hastings Bridge Road to Mitchell Road.

ADVANTAGES:

- Reduces cost
- Removes bicycle traffic from mainline traffic
- Enhances safety for cyclists

DISADVANTAGES:

- Slightly more right-of-way required

DISCUSSION:

Relocating the bicycle traffic to a separate facility will save 8 ft of full-depth pavement and remove the bicycle traffic from the travel lanes, enhancing safety both for motorists and for cyclists. Two additional feet of right-of-way will be required, most of which will be from the Clayton Water Authority property. There are few driveways on the north side of Jonesboro Road, so there will be few conflicts. At each end of the multi-use trail, there are signalized intersections which will facilitate access to the bike lanes.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,137,709	—	\$ 1,137,709
ALTERNATIVE	\$ 452,854	—	\$ 452,854
SAVINGS	\$ 684,855	—	\$ 684,855

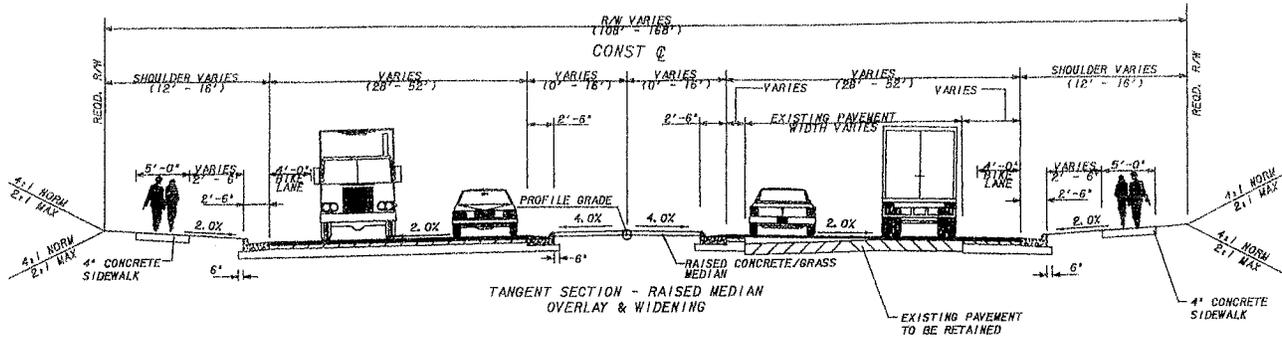
PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

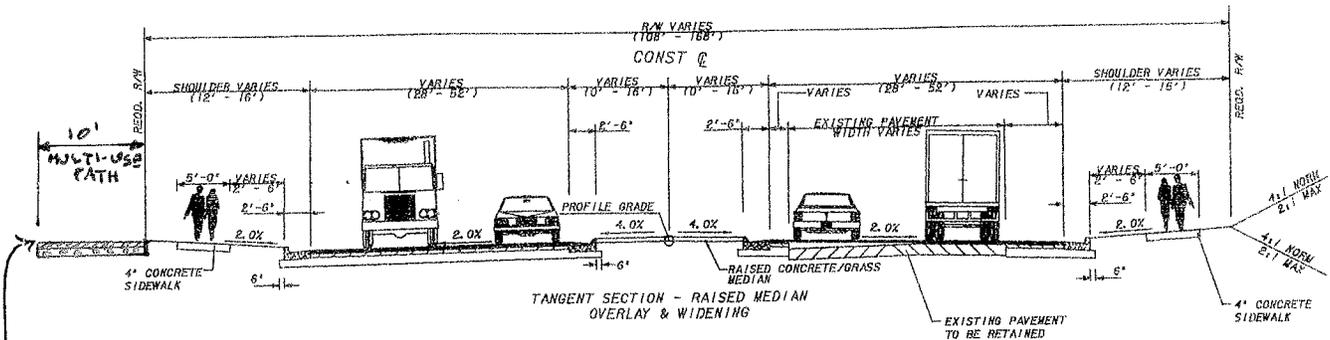
P-13

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: **2 of 4**



ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH



2" of 19mm mix over 4" G.A.B.

CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **P-13**

SHEET NO.: **3 of 4**

Original design:

Hastings Bridge Road is at Station 117+00; Mitchell Road is at Station 347+00

Full-depth pavement: $2(4)(34700-11700)/9 = 20,444$ SY

Alternative design:

Asphalt-surface multi-use trail consists of 2" of 19mm mix and 4" of Graded Aggregate Base (GAB)

Pavement cost = $2(110/2000)(\$63.01) + (4/12)(9)(0.075)(\$21.59) = \$11.79/\text{SY}$

Area = $10(34700-11700)/9 = 25,556$ SY

Additional right-of-way = $2(34700-11700) = 46,000$ SF

Since additional R/W is about half in Clayton and half in Henry County, use average price

R/W Price = $0.5(0.55 + 1.50) = \$1.03/\text{SF}$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-15

DESCRIPTION: **ELIMINATE THE MEDIAN OPENING AT STA. 141+00 AND
 PROVIDE A RIGHT-IN/RIGHT-OUT DRIVE**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN:

The current design proposes a median opening with turn lanes at Sta. 141+00 to the abandoned Jonesboro Road.

ALTERNATIVE:

Eliminate the median opening at Sta. 141+00 and provide a right-in/right-out access at this drive.

ADVANTAGES:

- Reduces cost
- Reduces turning conflicts at the new mainline

DISADVANTAGES:

- Requires vehicles at this drive to make a U-turn at the new Babbs Mill Road intersection for westbound travel

DISCUSSION:

The elimination of the median opening at Sta. 141+00 should improve the level of service along the new mainline by reducing turning conflicts at this location.

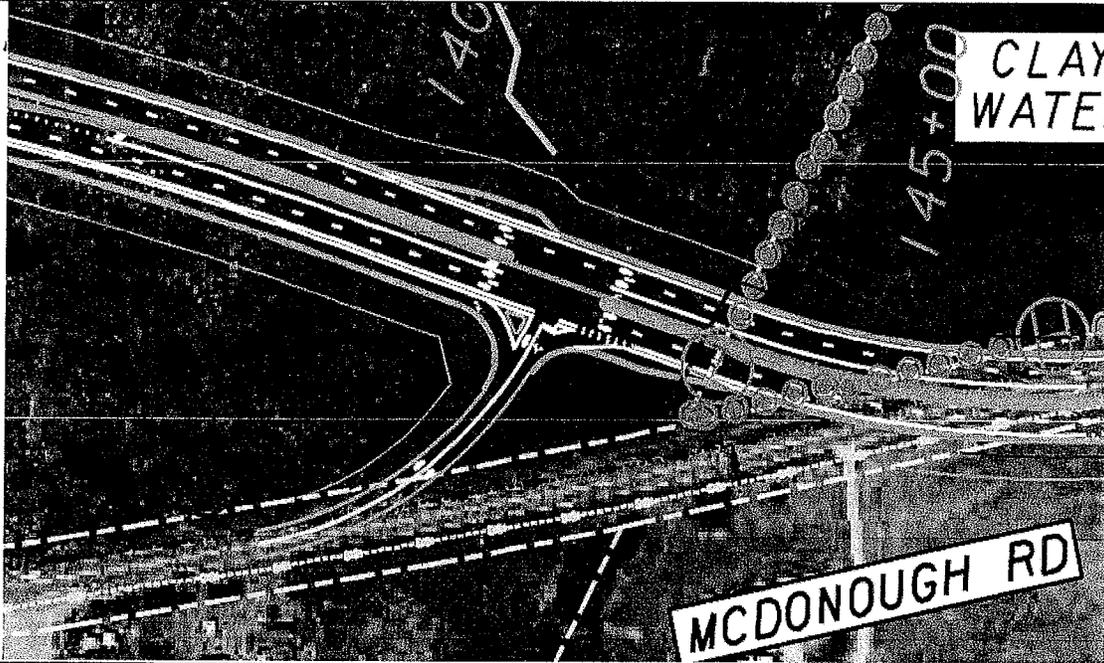
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 94,912	—	\$ 94,912
ALTERNATIVE	\$ 2,921	—	\$ 2,921
SAVINGS	\$ 91,991	—	\$ 91,991

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

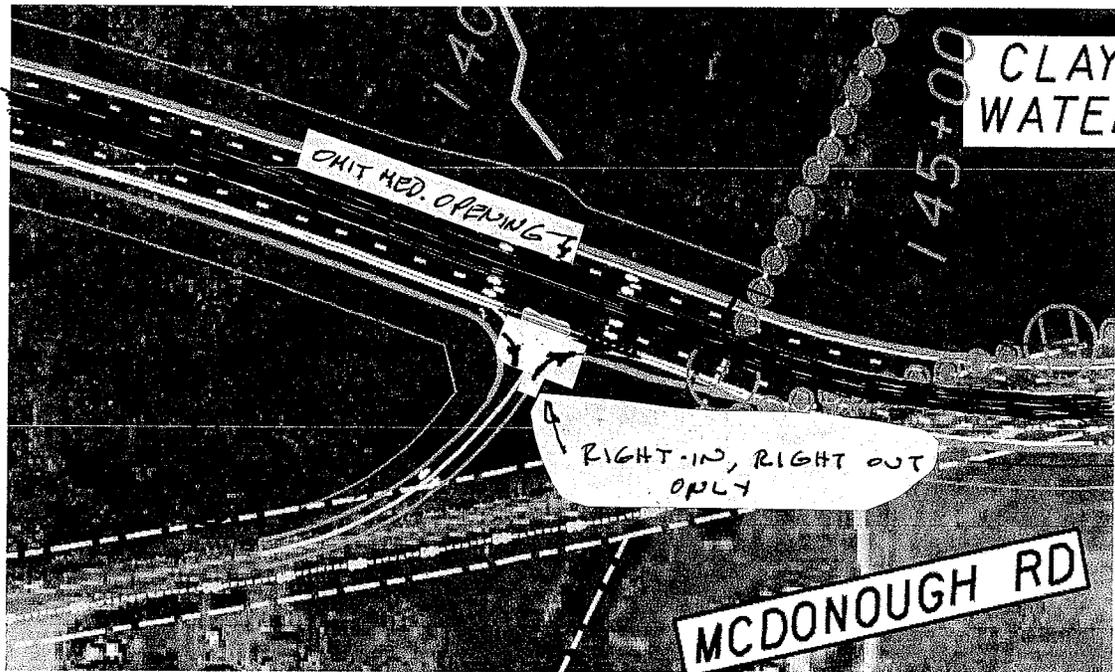
ALTERNATIVE NO.: P-15

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: 2 of 4



ALTERNATIVE DESIGN



CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-15

SHEET NO.:

3 of 4

Savings of Pavement when closing median opening at Station 141+00.

$$\left[12' \times \left(\frac{100'}{2} + 400' \right) \right] \times 2 \text{ Left Turns} = 10,800 \text{ s.f.}$$

$$\text{Eyebrow } \left(\frac{125'}{2} + 50' \right) \times 12' = \frac{1,350 \text{ s.f.}}{12,150 \text{ s.f.}}$$

$$\frac{12,150 \text{ s.f.}}{9 \text{ s.f./sy}} = 1,350 \text{ s.y.}$$

Alt. Design Requires: more median curb & gutter
90 L.F. x 2 sides = 180 L.F. (of TP7 curb & gutter)

Savings of Concrete Median Pavement
Required in narrow median Nose w/ median Opening

$$\left[400' \times (8' - (2.5' \times 2)) + (2.5' \times 4') \right] \times 2 \text{ Nose} = 2,600 \text{ sf}$$

$$\frac{2,600 \text{ sf}}{9 \text{ s.f./sy}} = 289 \text{ s.y.}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
P-16

DESCRIPTION: **USE 11-FT-WIDE INSIDE LANES AND 12-FT-WIDE
 OUTSIDE LANES FROM US 19/US 41 TO CHAMBERS
 ROAD**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The current design includes 12-ft-wide through lanes throughout the length of the project.

ALTERNATIVE: (See attached sketch)

Use 11-ft-wide inside lanes and 12-ft-wide outside lanes from US 19/US 41 to Chambers Road (approximately 5.92 miles). Maintain all turn lanes (LT and RT) at 12-ft-wide.

ADVANTAGES:

- Reduces construction cost
- Reduces earthwork requirements
- Reduces right-of-way requirements

DISADVANTAGES:

- Narrower lanes could affect wide vehicles

DISCUSSION:

Since the inside through lanes will be 11-ft-wide with this alternative, it is extremely important that the adjacent turn lanes (LT and RT) remain 12-ft-wide for enhanced safety and maneuverability.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 869,764	—	\$ 869,764
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 869,764	—	\$ 869,764



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

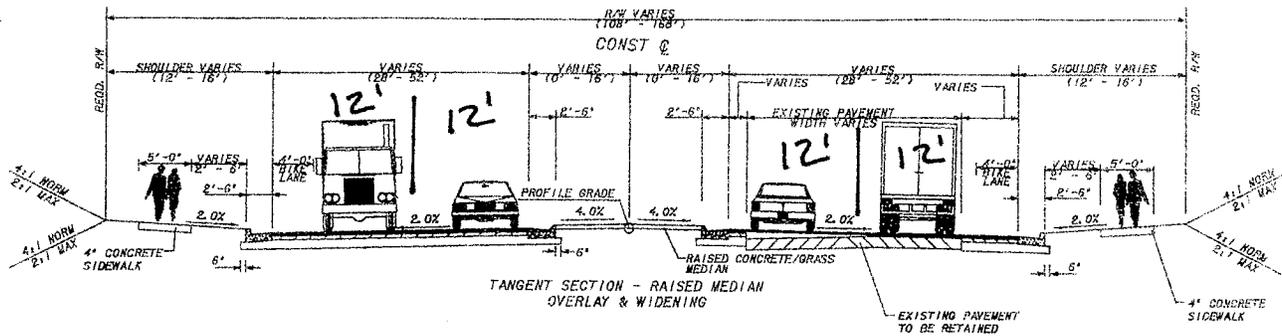
ALTERNATIVE NO.:

P-16

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

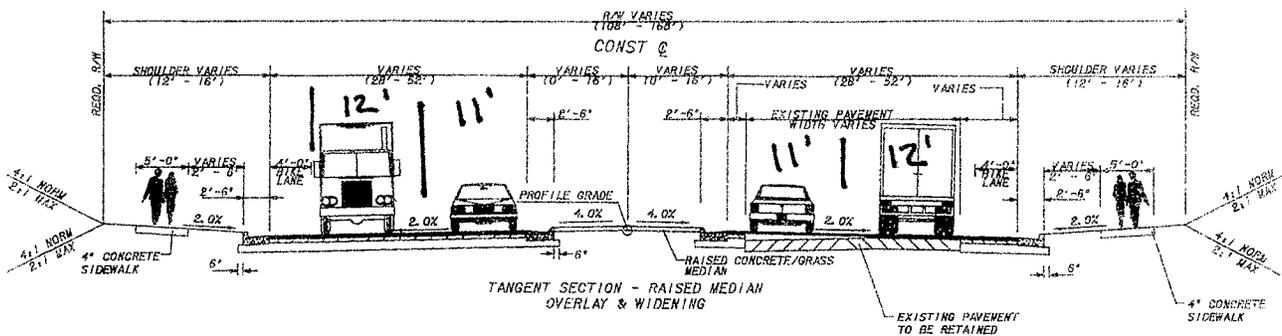
SHEET NO.: 2 of 4

4- 12' Lanes



ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

11' Inside Lanes



CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

P-16

SHEET NO.:

3 of 4

Savings in Roadway Pavement Section
Using two-11' Lanes. From US 19/41 to
Chambers Rd.

$$(STA. 107+50 \rightarrow 420+00) = 31,250$$

$$\frac{(31,250 - 152 - 120) \times 2'}{95 \text{ sf/sy}} = 6,884 \text{ s.y.} \leftarrow$$

$$\text{Walnut Crk BR.} : 2' \times 120' = 240 \text{ s.f.} \leftarrow$$

$$\text{BR. over R/R} : 2' \times 152' = 304 \text{ s.f.} \leftarrow$$

$$\text{Earthwork} : \frac{(31,000 \times 2' \times 6')}{27 \text{ cf/cy}} = 13,775 \text{ c.y.} \leftarrow$$

USE: Avg. of \$.65/s.f. for Residential R/W

USE: Avg. of \$ 8/s.f. for comm. R/W

$$\text{Residential} : 62,000 \text{ s.f.} \times .8 = 49,600 \text{ s.f.}$$

$$\text{Commercial} : 62,000 \text{ s.f.} \times .2 = 12,400 \text{ s.f.}$$

ASSUMES 80% RESIDENTIAL AND 20% COMMERCIAL

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

ROW-2

DESCRIPTION: **USE 12-FT-WIDE URBAN SHOULDERS FROM CHAMBERS ROAD TO I-75**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The current design includes a 16-ft-wide urban shoulder from Chambers Road to I-75.

ALTERNATIVE: (See attached sketch)

Use a 12-ft-wide urban shoulder from Chambers Road to I-75.

ADVANTAGES:

- Reduces construction cost
- Reduces right-of-way costs
- Less severe commercial impacts

DISADVANTAGES:

- Narrower area for utilities behind sidewalk, if required

DISCUSSION:

12-ft-wide urban shoulders would significantly reduce the impact in the commercial area between Chambers Road and I-75 and reduce costs. Utility requirements behind the proposed sidewalks need to be carefully reviewed.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,196,868	—	\$ 1,196,868
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 1,196,868	—	\$ 1,196,868



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

ROW-2

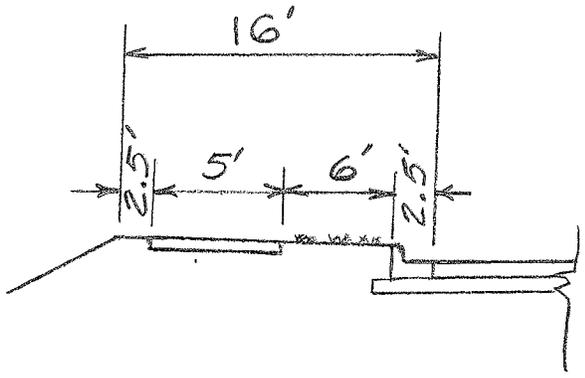
ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH

SHEET NO.:

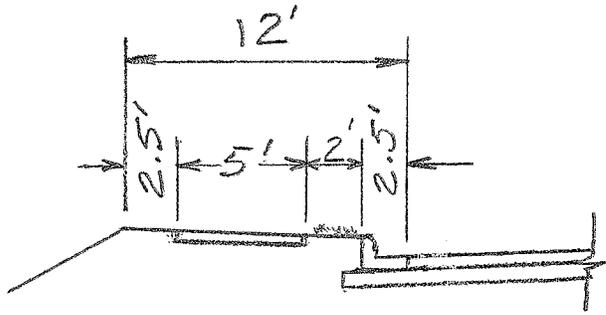
2 of 4



ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH



CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

ROW-2

SHEET NO.:

3 of 4

16' vs 12' S Aves 8' = (4'+4') of R/W
from Chambers Rd to I-75.

(Sta 420+00 → 482+00) = 6,200'

(6,200' x 8') = 49,600 s.f.

use: \$ 0.65/sf. Residential R/W (Average)

use: \$ 12/s.f. Commercial R/W (Average)

Residential = 49,600 s.f. x .2 = 9,920 s.f.

Commercial = 49,600 s.f. x .8 = 39,680 s.f.

Assumes 20% Residential and
80% Commercial.

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
D-1

DESCRIPTION: **ELIMINATE CURB-AND-GUTTER AND SIDEWALKS
 (URBAN SHOULDER) FROM THE NORTH SIDE OF THE
 MAINLINE BETWEEN HASTINGS BRIDGE ROAD AND
 PATES LAKE WAY**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The current design proposes urban shoulders with curb-and-gutter through the entire length of the project.

ALTERNATIVE: (See attached sketch)

Eliminate the curb-and-gutter (urban shoulder) from the north side of the new mainline between Hastings Bridge Road and Pates Lake Way.

ADVANTAGES:

- Reduces construction cost
- Less urban drainage to install

DISADVANTAGES:

- None identified

DISCUSSION:

The surrounding property on the north side of the new mainline from Hastings Bridge Road to Pates Lake Way is owned by the Clayton County Water Authority. Since this property will likely never become a commercial development, the expense for an urban shoulder drainage system is not justifiable. Therefore, it is recommended using a 10-ft-wide rural type shoulder with a 4-ft-wide paved shoulder. The sidewalk would also be eliminated.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 882,173	—	\$ 882,173
ALTERNATIVE	\$ 105,014	—	\$ 105,014
SAVINGS	\$ 777,159	—	\$ 777,159



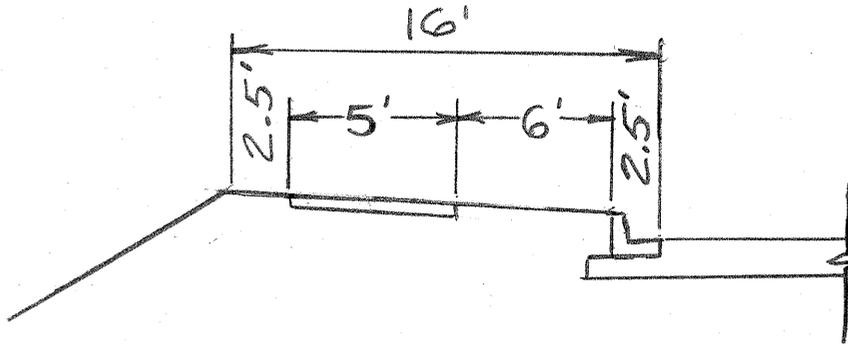
PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

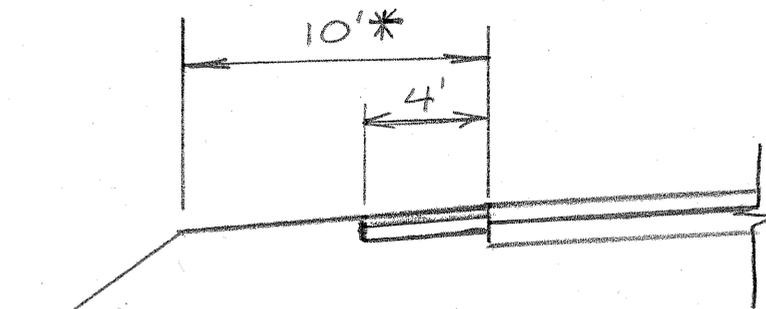
D-1

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: 2 of 4



ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH



shldr. Pavement 1 1/2" (12.5mm) Mix
 2" (19mm) Mix
 6" G.A.B.

* 15'6" where G'rail is required due to high fills @ 2:1 slopes.

CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

D-1

SHEET NO.:

3 of 4

"Original" Savings (Sta 117+00 → 225+00)

Sidewalk: $\frac{(10,800' \times 5')}{9 \text{ sf/sy}} = 6,000 \text{ s.y.}$

curb & gutter: 10,800'

Longitudinal Drainage: \$200,000/mi. (on one side)

Alternate: Extra Cost
should be Pavement Area.

$\frac{(4' \times 10,800')}{9 \text{ sf/sy}} = 4,800 \text{ s.y.}$

Tack Coat = 520 gal.

Unit Price for Asph. Sh Pavement

$1\frac{1}{2}'' (12.5 \text{ mm Mix}) = \$5.22/\text{sy}$

$2'' (19 \text{ mm Mix}) = \$6.93/\text{sy}$

$6'' (GAB) = \$7.29/\text{sy}$

$\text{Unit Price/sy} = \frac{\$5.22 + \$6.93 + \$7.29}{\text{sy}} = \$19.44/\text{sy}$

VALUE ENGINEERING ALTERNATIVE



PROJECT:	JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	ALTERNATIVE NO.:	D-2
DESCRIPTION:	USE 24-IN-WIDE CURB-AND-GUTTER IN LIEU OF 30-IN-WIDE CURB-AND-GUTTER SECTION	SHEET NO.:	1 of 3

ORIGINAL DESIGN: (See attached sketch)

The current design includes Type 7, 30-in-wide curb-and-gutter in the median and Type 2, 30-in-wide curb-and-gutter on the outside lanes throughout the project.

ALTERNATIVE: (See attached sketch)

Use Type 7, 24-in-wide curb and gutter in the median and Type 2, 24-in-wide curb-and-gutter on the outside lanes throughout the project.

ADVANTAGES:

- Reduces construction cost
- Reduces right-of-way costs

DISADVANTAGES:

- Higher gutter spread may offset some of the savings

DISCUSSION:

On any roadway design project, one finds gutter spread in excess of 8 ft at very few places. This project has the benefit of 4-ft-wide outside bicycle lanes, effectively allowing as much as a 12-ft-wide gutter spread. Also, a 24-in-wide curb-and-gutter will reduce right-of-way requirements by 2 ft for the entire length of the new mainline.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,635,351	—	\$ 2,635,351
ALTERNATIVE	\$ 1,552,746	—	\$ 1,552,746
SAVINGS	\$ 1,082,605	—	\$ 1,082,605

CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

D-2

SHEET NO.:

2 of 3

R/w area savings:

Average cost of R/w per square foot:

$$\frac{3.02 \times 12 + 5.27 \times 16 + 0.48 \times 0.55 + 13.07 \times 1.50 + (18.05 + 8.00) \times 0.95}{47.8 \text{ acres}}$$

$$= \$3.45$$

By not acquiring 2 feet in width of R/w throughout the project, the square feet of R/w saved is:

$$7.7 \text{ miles} \times 5,280 \times 2 = 81,312 \text{ sf.}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT:	JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	ALTERNATIVE NO.:	D-3
DESCRIPTION:	USE HDPE PIPE IN LIEU OF CONCRETE PIPE FOR LONGITUDINAL STORM DRAIN PIPING	SHEET NO.:	1 of 3

ORIGINAL DESIGN: (See attached sketch)

The current design proposes concrete storm drain pipe for the longitudinal urban drainage system.

ALTERNATIVE: (See attached sketch)

Use High Density Polyethylene (HDPE) pipe for the longitudinal storm drainage piping.

ADVANTAGES:

- Reduces construction cost
- Reduces construction time due to easier installation requirements

DISADVANTAGES:

- None identified

DISCUSSION:

Since the drainage system design is not completed, the longitudinal pipe requirement is estimated to be approximately 75% of the listed 18-in, 24-in, 30-in, and 36-in concrete storm drain pipe. The HDPE pipe is lightweight, and much easier and faster to install than the conventional concrete storm drain pipe. HDPE pipe comes in 20-ft sections. However, a 6-in Type II backfill material is required for a foundation.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,048,317	—	\$ 2,048,317
ALTERNATIVE	\$ 1,680,794	—	\$ 1,680,794
SAVINGS	\$ 367,523	—	\$ 367,523

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

D-3

SHEET NO.: 2 of 3

Estimate of Required Longitudinal pipe for urban drainage system.

18" STR. DR. Pipe: 39,020 L.F. x .75 = 29,265 L.F.

24" STR. DR. Pipe: 11,470 L.F. x .75 = 8,603 L.F.

30" STR. DR. Pipe: 140 L.F. x .75 = 105 L.F.

36" STR. DR. Pipe: 4,290 L.F. x .75 = 3,218 L.F.

Alt. Materials:

Unit Prices: for HDPE pipes

$$18'' = \frac{\$12}{\text{L.F.}} + \frac{\$18}{\text{L.F.}} = \frac{\$30.00}{\text{L.F.}} \quad (\text{MATERIAL} + \text{INSTALLATION})$$

$$24'' = \frac{\$15}{\text{L.F.}} + \frac{\$24}{\text{L.F.}} = \frac{\$39.00}{\text{L.F.}}$$

$$30'' = \frac{\$20}{\text{L.F.}} + \frac{\$30}{\text{L.F.}} = \frac{\$50.00}{\text{L.F.}}$$

$$36'' = \frac{\$28}{\text{L.F.}} + \frac{\$36}{\text{L.F.}} = \frac{\$64.00}{\text{L.F.}}$$

Foundation: Backfill MAT' (Tp 2 (6"))

$$\frac{1}{5} \times \left[(2' \times 29,265') + (2.5' \times 8,603') + (3' \times 105') + (3.5' \times 3,218') \right]$$

27 cf/cy

$$= 1,696 \text{ c.y.}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75** ALTERNATIVE NO.:
Clayton/Henry Counties, Georgia **W-1**

DESCRIPTION: **CONSTRUCT THE ENTIRE RETAINING WALL PARALLEL TO THE RAILROAD AT THE WEST END OF THE RAILROAD BRIDGE** SHEET NO.: 1 of 6

ORIGINAL DESIGN: (see attached sketch)

On the north side of Jonesboro Road, the retaining wall begins approximately 350' west of the beginning of the bridge, runs parallel to Jonesboro Road to the beginning of the bridge, then turns and runs under the bridge and tapers down to original ground running parallel to the railroad.

ALTERNATIVE: (see attached sketch)

Construct the entire length of the wall parallel to the railroad

ADVANTAGES:

- Less wall area to construct
- Cost reduction
- Eliminates potential future maintenance issues at the bridge-wall interface
- Simpler bridge and wall construction

DISADVANTAGES:

- None identified

DISCUSSION:

The parcel in the northeast corner of the intersection of US 19/US 41 and Jonesboro Road is to be acquired. The only reason for the retaining wall to extend parallel to Jonesboro Road is to protect this parcel. Since that is not necessary, the wall should be built parallel to the railroad for its entire length. This will reduce the wall area and simplify the wall construction since there will be no corners. The bridge will be simpler to construct since the soil reinforcement will only extend in one direction.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 290,450	—	\$ 290,450
ALTERNATIVE	\$ 34,050	—	\$ 34,050
SAVINGS	\$ 256,400	—	\$ 256,400



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

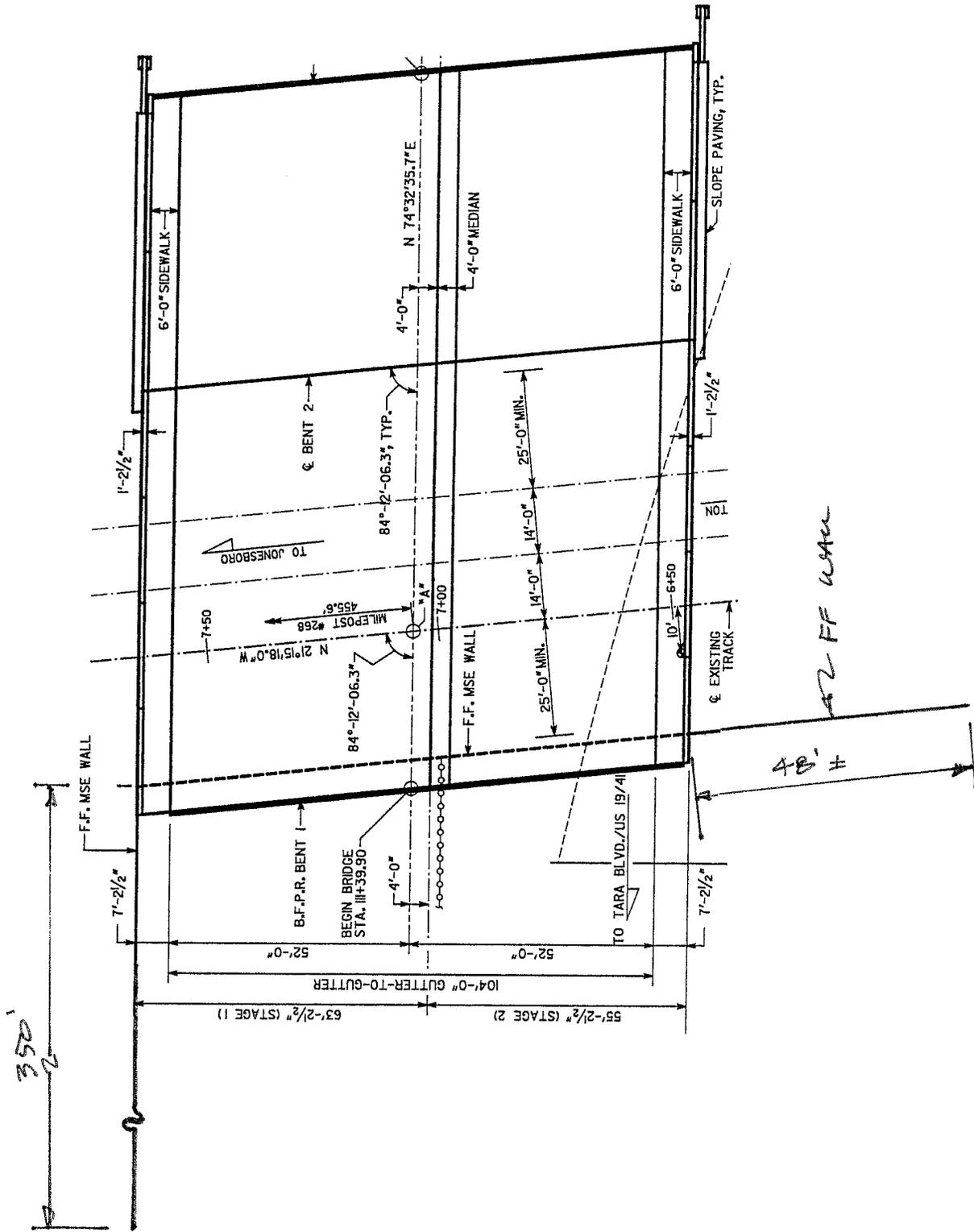
W-1

ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH

SHEET NO.: **2** of **6**



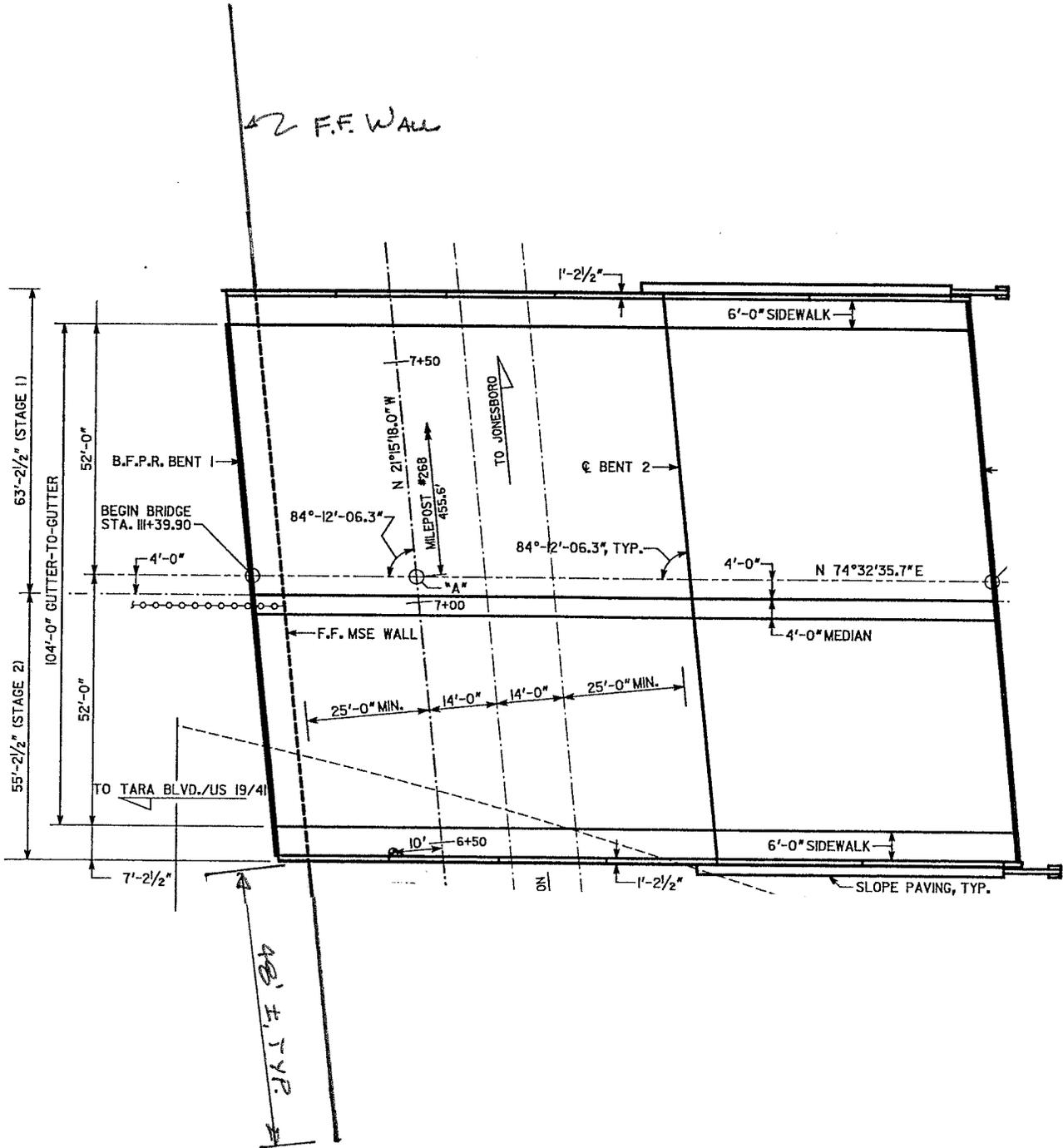
PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

W-1

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: **4 of 6**



CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **W-1**

SHEET NO.: **5 of 6**

Original design:

Wall area parallel to Jonesboro Road:

$$A = 60(6) + 45(6) + 50(7) + 115(9) + 35(15) + 25(20) + 30(29.5) = 3925 \text{ SF}$$

Coping length = 360 LF

Alternative design:

Wall length = 48'

$$\text{Average Height} = .5(24 + 4) = 14'$$

$$\text{Wall area} = .5(48)(14) = 336 \text{ SF}$$

Coping length = 48'

$$\begin{aligned} \text{Additional embankment} &= L[.5(2H)(H)] = L(HXH) = 60(6)(6) + 45(6)(6) + 50(7)(7) \\ &\quad + 115(9)(9) + 25(20)(20) + 30(29.5)(29.5) \\ &= 51653 \text{ CF}/27 = 1913 \text{ CY} \end{aligned}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

W-2

DESCRIPTION: **RETAIN THE EXISTING WALL AT BJ'S, WIDEN
 JONESBORO ROAD TO THE SOUTH, AND USE 10-FT
 WIDE SHOULDERS**

SHEET NO.: 1 of 5

ORIGINAL DESIGN: (See attached sketch)

The original design calls for the replacement of the retaining wall on the south side of BJ's with a larger wall.

ALTERNATIVE: (See attached sketch)

Retain the existing wall at BJ's. Use 10-ft-wide shoulders in lieu of the 16-ft-wide shoulders by reducing the curb-and-gutter width to 2 ft, reducing the grass strip to 2 ft, and using 1 ft from the back of the sidewalk to the shoulder point.

ADVANTAGES:

- Cost savings
- Reduces construction time
- Reduces disruption to businesses
- Minimizes environmental impact

DISADVANTAGES:

- May impact restaurant parking areas to the south of Jonesboro Road

DISCUSSION:

Replacement of the retaining wall on the north side of Jonesboro Road at BJ's would be time consuming, expensive, and disruptive to BJ's business, particularly at the gas pumps. The existing wall is a modular block wall at the east end, and a reinforced concrete wall at the west end. Removal of the wall will require substantial shoring to support Jonesboro Road while the existing wall is removed and the new wall constructed. Using 10-ft-wide shoulders will reduce the overall roadway width by 12 ft. Widening the road to the south may impact the restaurant's parking areas to the south of Jonesboro Road. It may be necessary to construct gravity walls along this side of the road to protect the restaurant parking.

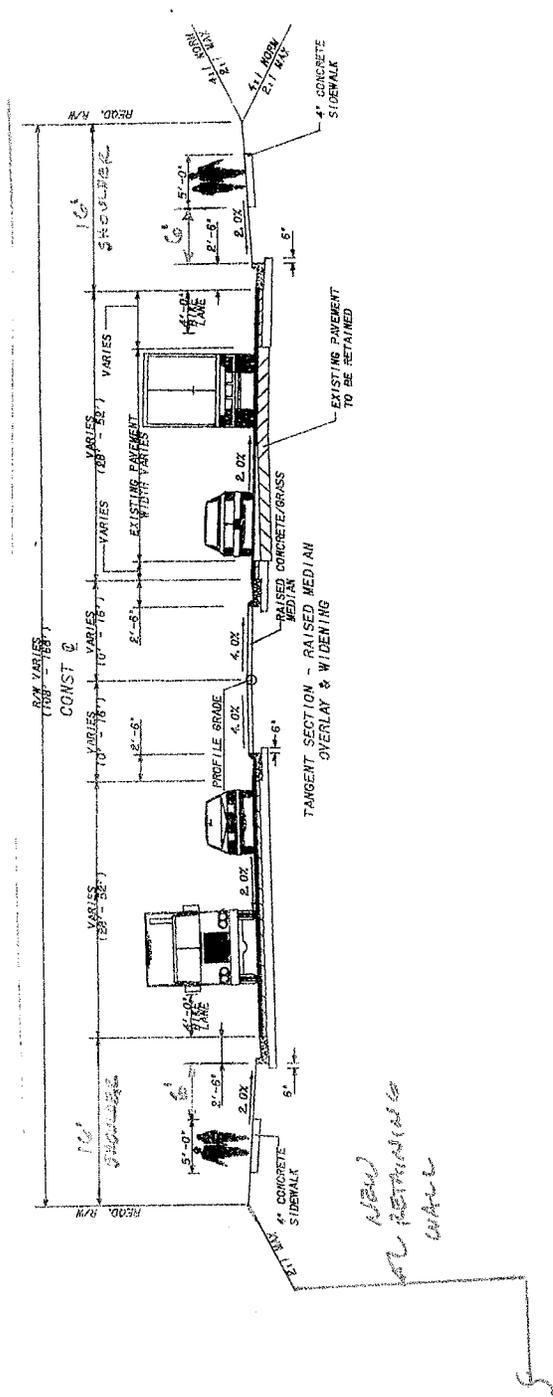
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,336,712	—	\$ 2,336,712
ALTERNATIVE	\$ 97,563	—	\$ 97,563
SAVINGS	\$ 2,239,149	—	\$ 2,239,149

PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: *W-2*

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

SHEET NO.: **2 of 5**



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

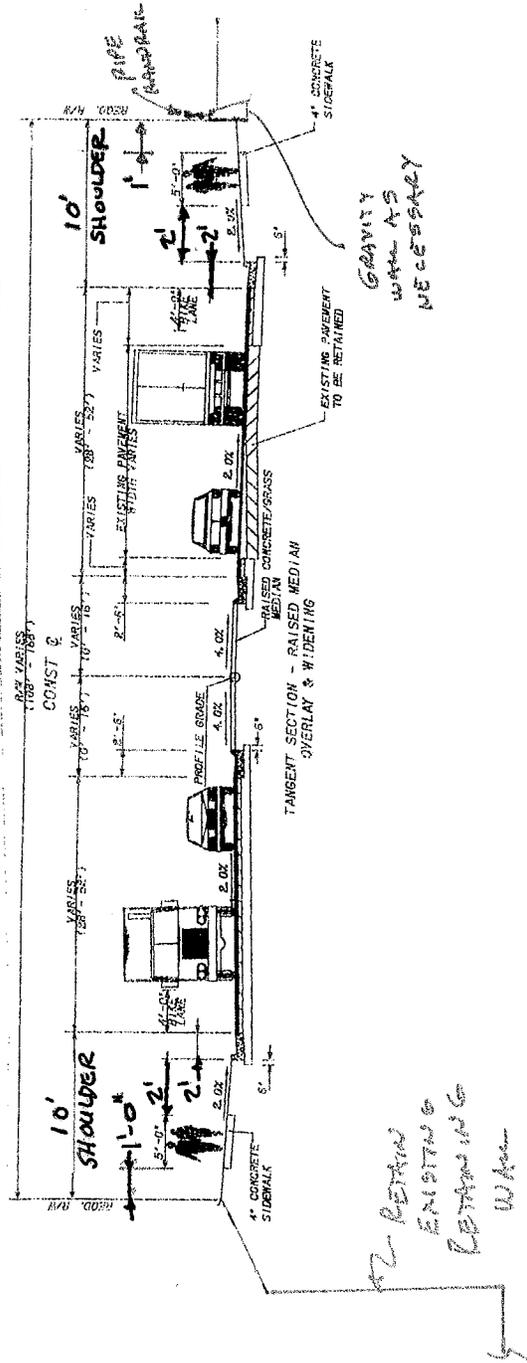
w-2

ORIGINAL DESIGN

ALTERNATIVE DESIGN

BOTH

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



CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **W-2**

SHEET NO.: **4 of 5**

Original design:

Remove and replace existing retaining wall on the north side of Jonesboro Road

Alternative design:

Typical section is narrower by $2(16 - 10) = 12'$

Commercial R/W reduction is $700(12) = 8400$ SF

Assume gravity wall with an average height of 6' and a total length of 550 feet

Concrete volume = $550(6)(.5)(.6667 + 3.6667)/27 = 265$ CY

Pipe handrail length = 550 LF

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

B-1

DESCRIPTION: **USE A MECHANICALLY STABILIZED EARTH WALL IN LIEU OF AN END SPAN FOR THE RAILROAD BRIDGE**

SHEET NO.: **1 of 4**

ORIGINAL DESIGN: (See attached sketch)

The original design calls for a spill-through abutment with a 2:1 end slope with an end span for the railroad bridge.

ALTERNATIVE: (See attached sketch)

Use a mechanically stabilized earth (MSE) wall with a stub abutment in lieu of the bridge end span.

ADVANTAGES:

- Reduces bridge cost
- Shortens bridge construction time
- Requires no intermediate bents

DISADVANTAGES:

- None identified

DISCUSSION:

Omitting the end span of the bridge and constructing a single span bridge will result in simpler, quicker, and less costly bridge construction. Also, since there will be no intermediate bents, there will be fewer potential maintenance problems with the bridge. The wall will be built parallel to the railroad, and will taper down to existing ground beginning at the edges of the bridge.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 1,903,124	—	\$ 1,903,124
ALTERNATIVE	\$ 1,465,995	—	\$ 1,465,995
SAVINGS	\$ 437,129	—	\$ 437,129

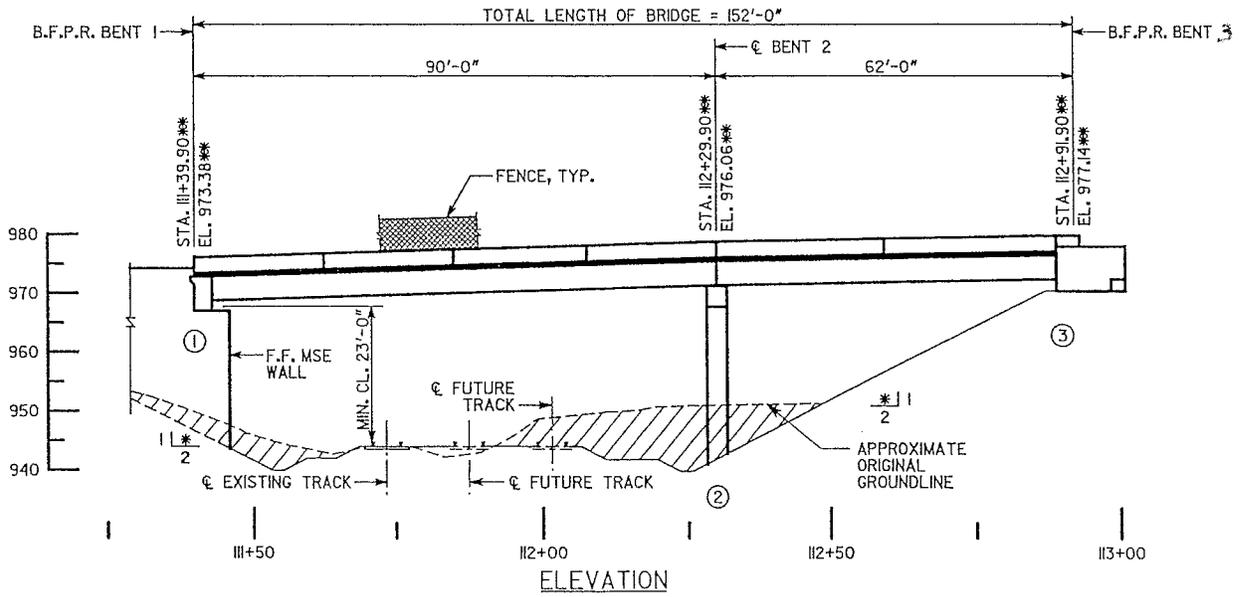
PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

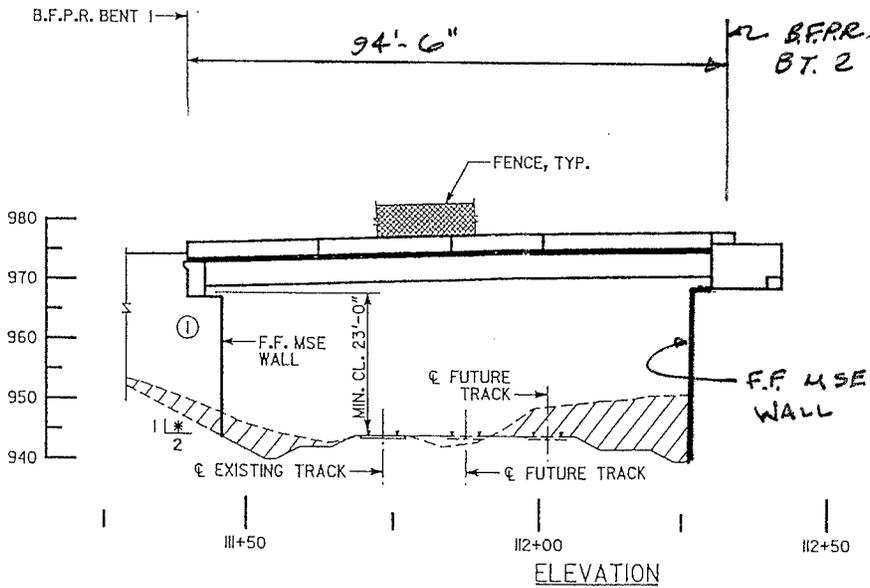
B-1

ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH

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



ORIGINAL DESIGN ALTERNATIVE DESIGN BOTH



CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.: **B-1**

SHEET NO.: **3 of 4**

Proposed design:

Bridge Area = $118.4167(152) = 17999$ SF

Alternative design:

Bridge Area = $118.4167(94.5) = 11190$ SF

Wall height = 29' under the bridge

Tapers down to 2' height over 54'-6" on each side

Wall Area = $29(118.4167) + 2(27)(54.5)(0.5) = 4906$ SF

Additional Backfill:

Height = $(2 + .25 + 3.75 + 1) - 0.83 = 6.12'$

Width = 118.42

Length = $0.7(29 + 7) - 6 = 19.2$ Use 20'

Volume = $6.12(118.42)(20)/27 = 537$ CY

Coping length = $118.42 + 2(54.5) = 227.42$ Use 228 LF

VALUE ENGINEERING ALTERNATIVE



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
S-1

DESCRIPTION: **ELIMINATE SIDEWALKS ON BOTH SIDES OF THE
 MAINLINE BETWEEN US 19/US 41 AND MCCULLOUGH
 ROAD**

SHEET NO.: 1 of 3

ORIGINAL DESIGN:

The current design proposes 5-ft-wide, 4-in-thick concrete sidewalks on both sides of the new mainline throughout the project.

ALTERNATIVE:

Construct 5-ft-wide, 4-in-thick concrete sidewalks on both sides of the new mainline from McCullough Road to I-75 only. Do not construct sidewalks from US 19/US 41 to McCullough Road, however construct sidewalks on the bridge decks. Prepare and grade the ground and shoulders for future construction of sidewalks as needed with future development.

ADVANTAGES:

- Reduces construction cost
- Reduces construction duration

DISADVANTAGES:

- No sidewalk available for an occasional pedestrian

DISCUSSION:

The property on both sides of the new mainline remains undeveloped to a large extent from US 19/US 41 to McCullough Road. When future development occurs, the developer can fund the construction of the sidewalks as needed to save costs.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 903,594	—	\$ 903,594
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 903,594	—	\$ 903,594

CALCULATIONS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:

S-1

SHEET NO.:

2 of 3

Railroad Bridge length: 152' - 6' wide sidewalk
Walnut Creek Bridge length: 120' - 6' wide sidewalk
Length of sidewalk from US 19/US 41 to McCullough Road
(330+08) - (107+00) = 22,308' - 5' wide sidewalk

Total area of sidewalk saved:

$$\left[(22,308 \times 5) - (152 \times 6) - (120 \times 6) \right] \frac{2}{9} = 24,424 \text{ SY}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT:	JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	ALTERNATIVE NO.:	S-2
DESCRIPTION:	ELIMINATE SIDEWALKS ON THE NORTH SIDE OF THE MAINLINE BETWEEN US 19/US 41 AND MCCULLOUGH ROAD	SHEET NO.:	1 of 3

ORIGINAL DESIGN:

The current design proposes 5-ft-wide, 4-inch thick concrete sidewalks on both sides of the new mainline throughout the project.

ALTERNATIVE:

On the south side of the new mainline, construct 5-ft-wide, 4-inch thick concrete sidewalks from US 19/US 41 to I-75. On the north side of the new mainline, construct sidewalks from McCullough Road to I-75 only. Do not construct a sidewalk on the north side from US 19/US 41 to McCullough Road, however construct a sidewalk on both sides of the Railroad Bridge. Grade shoulders for future sidewalk construction on the north side.

ADVANTAGES:

- Reduces construction cost
- Reduces construction duration

DISADVANTAGES:

- No sidewalk available for an occasional pedestrian

DISCUSSION:

The property on the north side of the new mainline remains undeveloped to a large extent from US 19/US 41 to McCullough Road. When future development occurs, the developer can fund the construction of the sidewalks as needed to save costs.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 451,797	—	\$ 451,797
ALTERNATIVE	\$ 0	—	\$ 0
SAVINGS	\$ 451,797	—	\$ 451,797

CALCULATIONS



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75
Clayton/Henry Counties, Georgia

ALTERNATIVE NO.:
S-2

SHEET NO.: 2 of 3

Railroad Bridge length: 152' - 6' wide sidewalk
Walnut Creek Bridge length: 120' - 6' wide sidewalk
length of sidewalk from US 19/US 41 to McCullough Road
 $(330+08) - (107+00) = 22,308'$ - 5' wide sidewalk

Total area of sidewalk saved:

$$\left[(22,308 \times 5) - (152 \times 6) - (120 \times 6) \right] / 9 = 12,212 \text{ SY}$$

VALUE ENGINEERING ALTERNATIVE



PROJECT:	JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	ALTERNATIVE NO.:	G-1
DESCRIPTION:	SYNCHRONIZE TRAFFIC SIGNALS FROM MCCULLOUGH ROAD TO I-75 IN LIEU OF FROM CHAMBERS ROAD TO I-75	SHEET NO.:	1 of 1

ORIGINAL DESIGN:

The Traffic Engineering Report states that the traffic signals from Mt. Olive Road to I-75 should be coordinated. At the Designer's Presentation, the consultant stated that the signals would be synchronized from Chambers Road to I-75.

ALTERNATIVE:

Synchronize the signals from McCullough Road to I-75.

ADVANTAGES:

- Smoother traffic flow
- Shorter travel times

DISADVANTAGES:

- More expensive due to fiber-optic connection

DISCUSSION:

The current plan is to synchronize the traffic signals from either Mt. Olive Road or Chambers Road to I-75. It is 6,350 feet from I-75 to Chambers Road, and an additional 9,000 feet to McCullough Road. From McCullough Road to Chambers Road, there are three signalized intersections. These intersections should be synchronized with the intersections to the east. It is 4,950 feet from Mt. Carmel Road to Chambers Road. If it is undesirable to synchronize the signals west of Chambers Road with those at Chambers Road and further east, then the signals at McCullough Road, Mitchell Road and Mt. Carmel Road should be synchronized.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN			
ALTERNATIVE	DESIGN SUGGESTION		
SAVINGS			

PROJECT DESCRIPTION

Project STP00-1583-00(012), P.I. No. 342970, Widening of Jonesboro Road from US 19/US 41 to I-75, widens, reconstructs and relocates Jonesboro Road from 0.25 miles west of US 19/US 41 in Clayton County to I-75 in Henry County, a total of 7.70 miles. The project is being design by Wolverton & Associates in concert with GDOT District 3.

Existing Conditions

The existing roadway consists of one 12-ft-wide lane in each direction with 10 ft grass shoulders. The right-of-way varies between 60-ft and 80-ft throughout the corridor. There is no median and the posted speed limit is 45 mph. The maximum grade for the mainline is 6% with a maximum super-elevation rate for curves of 6% and a minimum radius of curve of 500 ft. This section of roadway includes a total of nineteen intersections, of which 7 are signal-controlled and twelve are two-way, stop controlled (TWSC).

Major structures include an existing bridge over Central of Georgia Railroad with a sufficiency rating of 99.21, an existing bridge over Walnut Creek with a sufficiency rating of 90.36, and an existing 1,000 ft retaining wall at BJ's in Henry County.

The truck percentage increases from 4% between US 19/US 41 and Chambers Road to 9.5% between Chambers Road and I-75.

A 3½ mile portion of the corridor between US 19/US 41 and Pates Lake Way in Clayton County is within the Archeological/Historical Boundary for the Civil War Battlefield. Additionally, this corridor contains a number of other historic resources which require careful coordination between GDOT, SHPO, and FHWA to ensure that no adverse impacts are incurred by the widening of McDonough/Jonesboro Road.

Need and Purpose

Increasing capacity is the primary purpose for the proposed project, while safety and operational improvements are secondary purposes. The base year (2013) average daily traffic (ADT) along the project corridor is 18,750 VPD. By the design year (2033), the ADT is projected to be 37,750 VPD. With no improvements to the corridor, the design year level of service (LOS) ranges from "D" to "F." This section of roadway has a crash rate that greatly exceeds the statewide average for this classification of roadway for the years 2003, 2004, and 2005. Widening Jonesboro Road and adding signal control at seven additional intersections plus the addition of medians and turning lanes will improve the design year LOS ranges from "C" to "E" and deliver the needed safety and operational improvements.

Additionally, the Atlanta Regional Commission's (ARC) Atlanta Region Bicycle Transportation & Pedestrian Walkways Plan Final Report (2007) identifies Jonesboro Road as part of its regional Strategic Transportation System (RSTS) network. The ARC Bicycle Study identifies the corridor as currently having Bicycle Levels of Service (LOS) of D, E, and F within the project limits. The Needs

Assessment Report states that an accommodation equivalent to a Bicycle LOS of “B” is desired. The policy and Program Recommendations propose the inclusion of bicycle lanes and sidewalks along the corridor.

PROPOSED CONCEPT

This project widens the existing two-lane Jonesboro Road to a four-lane roadway with turn lanes as needed from mile 3.29 to mile 5.52 in Clayton County and from milepost 0 to mile 5.36 in Henry County for a total of 7.70 miles. The proposed urban typical section consists of four 12-ft-wide lanes with a 20-ft to 32-ft raised median (grass/concrete), 4-ft-wide bicycle lanes, and 12-ft-wide through to 16-ft-wide urban shoulders that include curb-and-gutter, a 2-ft-wide to 6-ft-wide grass strip, and 5-ft-wide sidewalks. The widening of the existing roadway shifts from one side to the other in a number of places and includes two relocated sections of roadway to avoid environmental resources and minimize property impacts. The right-of-way varies between 108-ft and 168-ft throughout the corridor. The proposed design speed is to remain at 45 mph.

A new bridge will be constructed over Central of Georgia Railroad and the existing bridge over Walnut Creek will be widened.

The following walls are required to protect structures, parking lots and commercial developments:

- A 400 ft gravity wall at Town Center Village in Henry County
- A 350 ft retaining wall at the bridge over Central of Georgia Railroad
- A 325 ft retaining wall at Homebanc in Henry County
- A 600 ft retaining wall at Quizno’s in Henry County
- A 1,000 ft retaining wall at BJ’s in Henry County to replace the existing wall
- A 200 ft retaining wall extension at Truett’s in Henry County

Intersection improvements, including turning lane additions and intersection realignments, are also included for a number of side roads along the project corridor. I-75 interchange improvements consist of roadway restriping, the addition of turn lanes on the exit ramps and the addition of auxiliary lanes from Mill Road to I-75.

The project will be constructed under traffic with no detours anticipated, and traffic will be maintained at all times. The two bridges on the project will require staged construction.

No design exceptions or variances are anticipated.

The estimated total cost of construction for P.I. No. 342970 is \$53,337,341 based upon the estimate dated June 13, 2008. The estimated right-of-way cost is \$35,960,000 and the estimated reimbursable utilities cost is \$2,174,500 bringing the total project cost to \$91,471,841 at the start of the VE workshop.

Selected project drawings follow.

TRAFFIC DATA
 US 19/41 TO
 HASTINGS BRIDGE RD.
 2007 - 17,000 ADT
 2013 - 21,000 ADT
 2033 - 35,100 ADT
 TRUCK % - 4.0%

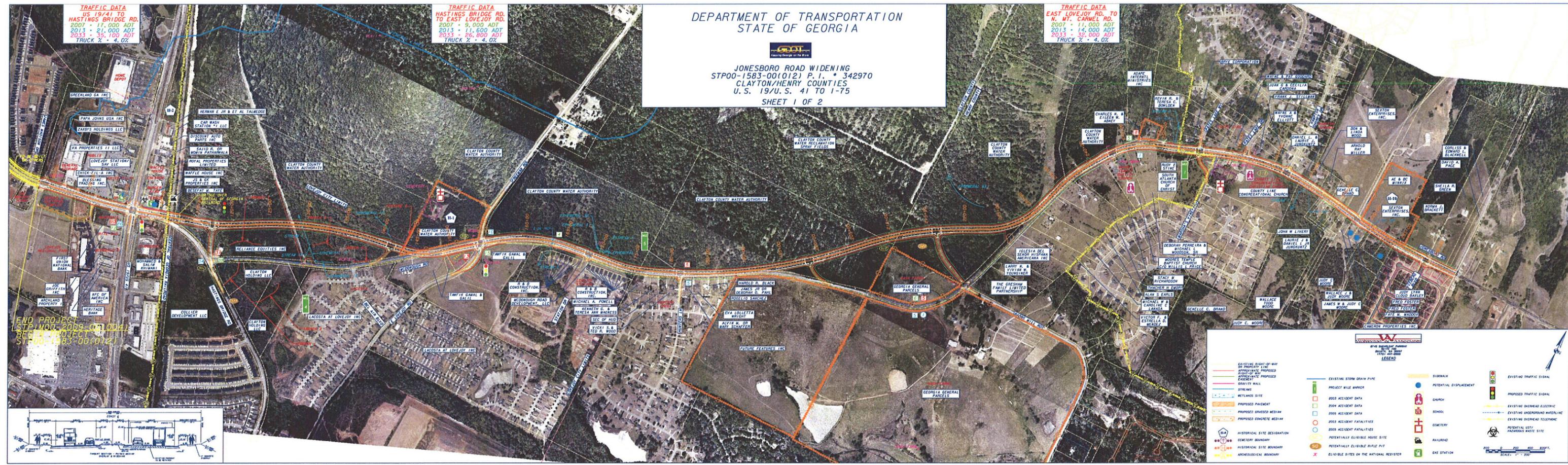
TRAFFIC DATA
 HASTINGS BRIDGE RD.
 TO EAST LOVEJOY RD.
 2007 - 9,000 ADT
 2013 - 11,600 ADT
 2033 - 26,800 ADT
 TRUCK % - 4.0%

TRAFFIC DATA
 EAST LOVEJOY RD. TO
 N. MT. CARMEL RD.
 2007 - 11,000 ADT
 2013 - 14,000 ADT
 2033 - 32,000 ADT
 TRUCK % - 4.0%

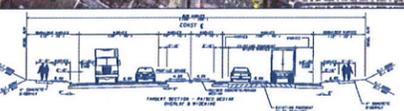
DEPARTMENT OF TRANSPORTATION
 STATE OF GEORGIA



JONESBORO ROAD WIDENING
 STP00-1583-00(012) P. 1. • 342970
 CLAYTON/HENRY COUNTIES
 U. S. 19/U. S. 41 TO I-75
 SHEET 1 OF 2



END PROJECT
 STP1000-2009-001088
 BEETLE PROJECT # 1011
 STP00-1583-00(012)



LEGEND

<ul style="list-style-type: none"> EXISTING RIGHT-OF-WAY PROPERTY LINE APPROXIMATE PROPOSED RIGHT-OF-WAY PROPOSED DRIVEWAY PROPOSED GRASSED MEDIAN PROPOSED CONCRETE MEDIAN HISTORICAL SITE DESIGNATION CEREMETARY BOUNDARY HISTORICAL SITE BOUNDARY ARCHAEOLOGICAL BOUNDARY 	<ul style="list-style-type: none"> EXISTING STORM DRAIN PIPE PROJECT WIDE BANDER 2003 ACCIDENT DATA 2004 ACCIDENT DATA 2005 ACCIDENT DATA 2005 ACCIDENT FATALITIES POTENTIALLY ELIGIBLE NOISE SITE POTENTIALLY ELIGIBLE BATTLE PIT ELIGIBLE SITES ON THE NATIONAL REGISTER 	<ul style="list-style-type: none"> SIDEWALK POTENTIAL DISPLACEMENT CHURCH SCHOOL CEREMETARY RAILROAD GAS STATION 	<ul style="list-style-type: none"> EXISTING TRAFFIC SIGNAL PROPOSED TRAFFIC SIGNAL EXISTING UNDERGROUND WATERLINE EXISTING UNDERGROUND TELEPHONE POTENTIAL LOST HAZARDOUS WASTE SITE
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SCALE: 1" = 200'

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA



JONESBORO ROAD WIDENING
STPOO-1583-001(012) P. I. 342970
CLAYTON/HENRY COUNTIES
U.S. 19/U.S. 41 TO I-75
SHEET 2 OF 2

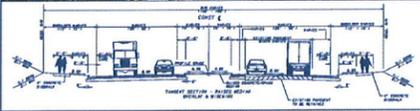
TRAFFIC DATA
EAST LOVEJOY RD. TO
N. MT. CARMEL RD.
2007 - 14,000 ADT
2013 - 14,000 ADT
2033 - 32,000 ADT
TRUCK % = 4.0%

TRAFFIC DATA
MT. CARMEL RD. TO
CHAMBERS RD.
2007 - 14,500 ADT
2013 - 16,000 ADT
2033 - 37,000 ADT
TRUCK % = 4.0%

TRAFFIC DATA
CHAMBERS RD. TO
MT. OLIVE RD.
2007 - 20,000 ADT
2013 - 24,350 ADT
2033 - 46,750 ADT
TRUCK % = 9.5%

TRAFFIC DATA
MT. OLIVE RD. TO
I-75 SOUTH BOUND
2007 - 27,000 ADT
2013 - 31,900 ADT
2033 - 52,400 ADT
TRUCK % = 9.5%

TRAFFIC DATA
I-75 SOUTH BOUND TO
I-75 NORTH BOUND
2007 - 25,000 ADT
2013 - 28,400 ADT
2033 - 43,400 ADT
TRUCK % = 9.5%



END PROJECT
STPOO-1583-001(012)

VALUE ANALYSIS AND CONCLUSIONS

INTRODUCTION

This section describes the procedures used during the VE study. It is followed by separate narratives and conclusions including:

- Value Engineering Study Agenda
- Value Engineering Workshop Participants
- Economic Data
- Cost Estimate Summary and Cost Model
- Function Analysis
- Creative Idea Listing and Evaluation of Ideas

A systematic approach was used in the VE study and the key procedures involved were organized into three distinct parts: 1) preparation; 2) VE workshop; and 3) post-study. A Task Flow Diagram that outlines each of the procedures included in the VE study is attached for reference.

PREPARATION EFFORT

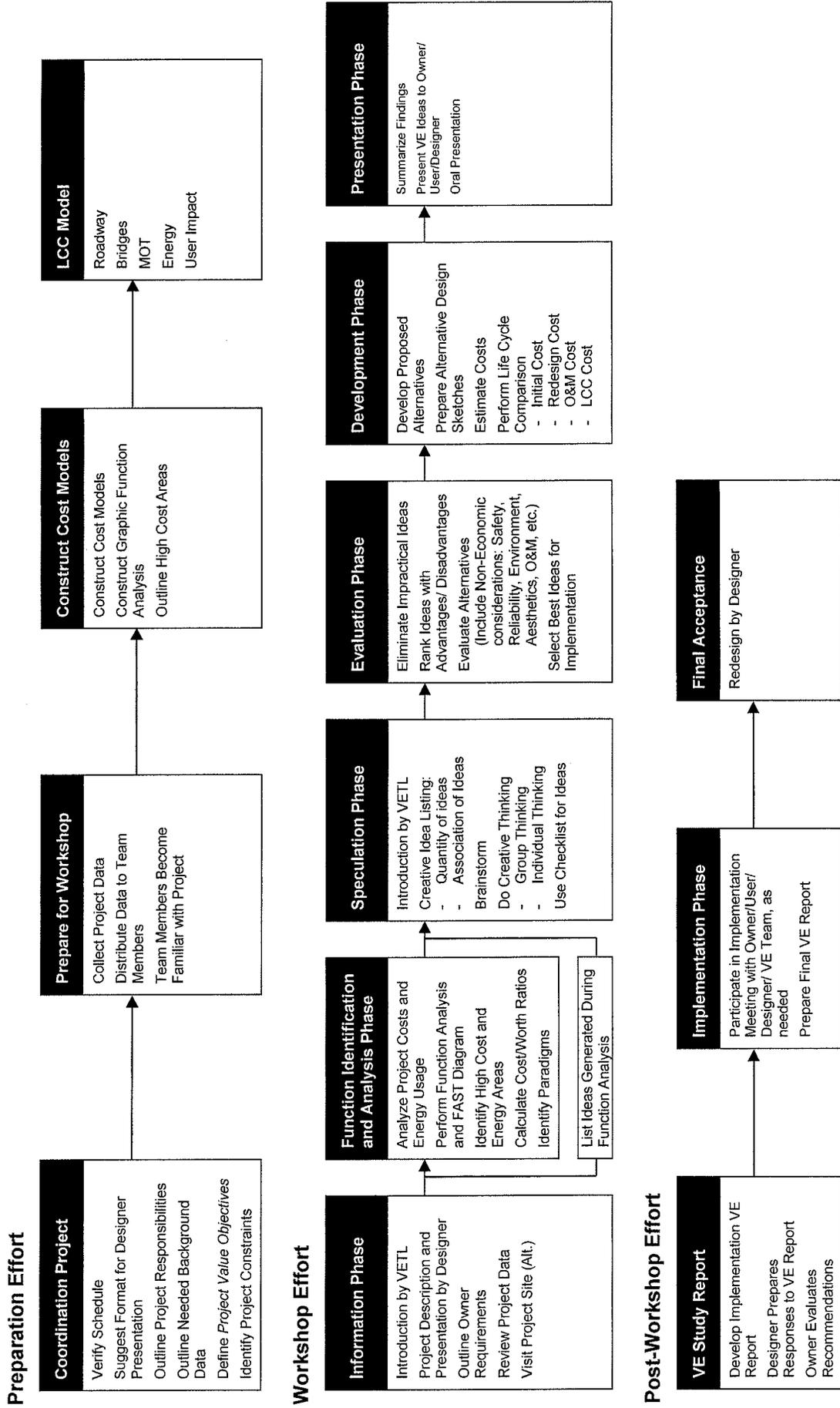
Pre-study preparation for the VE effort consisted of scheduling study participants and tasks, gathering necessary background information on the facility, and compiling project data into a cost model and graphic cost histogram. Information relating to the design, construction, and operation of the facility is important as it forms the basis of comparison for the study effort. Information relating to funding, project planning operating needs, systems evaluations, basis of cost, soil conditions, and construction of the facility was also a part of the analysis.

VALUE ENGINEERING WORKSHOP EFFORT

The VE workshop was a three and a half-day effort (see attached agenda). During the workshop, the VE job plan was followed. The job plan guides the search for high cost areas in the project and includes procedures for developing alternative solutions for consideration. It has six phases:

- Information Phase
- Function Identification and Analysis Phase
- Creative Phase
- Evaluation Phase
- Development Phase
- Presentation Phase

Value Engineering Study Task Flow Diagram



Information Phase

At the beginning of the study, the conditions and decisions that have influenced the development of the project must be reviewed and understood. For this reason, the design team presented information about the project to the VE team on the first day of the session. Following the presentation, the VE team discussed the project using the following documents:

- Concept Drawings entitled Jonesboro Road Widening, STP00-1583-00(012), P.I. # 342970, Clayton/Henry Counties, US 19/US 41 to I-75, 2 sheets;
- Project Profile entitled Jonesboro Road Widening, STP00-1583-00(012), P.I. # 342970, Clayton/Henry Counties, US 19/US 41 to I-75, 3 sheets;
- Preliminary Layout, SR 920 (McDonough Rd) over Central of GA R.R., Clayton County, STP00-1583-00(012), March 2009.
- Construction Sequence, SR 920 (McDonough Rd) over Central of GA R.R., Clayton County, STP00-1583-00(012), March 2009.
- Preliminary Layout, SR 920 (Jonesboro Rd) over Walnut Creek, Clayton County, STP00-1583-00(012), March 2009.
- Construction Sequence, SR 920 (Jonesboro Rd) over Walnut Creek, Clayton County, STP00-1583-00(012), March 2009.
- Approved Project Concept Report, Department of Transportation, State of Georgia, Office of Preconstruction, P.I. No. 342970, Clayton/Henry Counties, STP00-1583-00(012), Widening of McDonough/Jonesboro Road from US 41/SR 3 to I-75, dated December 19, 2008;
- Estimate Report for file “342970”, prepared by District 3, State of Georgia Department of Transportation; dated 6/13/2008;
- Preliminary Right of Way Cost Estimate, Project STP-1583(12), P.I. Number 342970, Jonesboro Road from US19/41 to I-75, dated April 4, 2008.
- VE Package dated March 27, 2009, Project # STP00-1583-00(012), P.I. # 342970, Clayton/Henry Counties, Jonesboro Road Widening from US 19/US 41 to I-75;
- Bridge and Structures Design Policy Manual, prepared by the Georgia Department of Transportation, Office of Bridge and Structural Design, dated October 2005, revised April 2007;
- Item Mean Summary for 07/2007 to 06/2008 compiled by the State of Georgia Department of Transportation; dated June 26, 2008;
- Standards and Construction Details Binder; prepared by the Department of Transportation, State of Georgia; undated;
- Standard Specifications Construction of Transportation Systems; prepared by the Department of Transportation, State of Georgia; 2001 Edition;
- Design Policy Manual; A Georgia Department of Transportation Publication; Version 2.0; revised June 1, 2007; and
- A Policy on Geometric Design of Highway and Streets; prepared by the American Association of State Highway and Transportation Officials; dated 2004.

Function Identification and Analysis Phase

Based on historical and background data, a cost model and graphic function analysis were developed for this project by major construction elements. They were used to distribute costs by project element, serve as a basis for alternative functional categorization, and assign worth to the categories, where worth is the least cost to provide the required function, as determined by the VE team. The VE team identified the functions of the various project elements and subsystems by using random function generation techniques resulting in the attached Random Function Analysis worksheet.

Creative Phase

This VE study phase involved the creation and listing of ideas. Creative idea worksheets were organized by project element. During this phase, the VE team developed as many ideas as possible to provide the necessary functions within the project at a lower cost to the owner, or to improve the quality of the project. Judgment of the ideas was restricted at this point. The VE team was looking for a large quantity of ideas and association of ideas.

GDOT District 3 and Wolverton & Associates may wish to review the creative list since it may contain ideas that can be further evaluated for potential use in the design.

Evaluation Phase

During this phase of the workshop, the VE team judged the ideas generated during the creative phase. Advantages and disadvantages of each idea were discussed to find the best ideas for development. Ideas found to be irrelevant or not worthy of additional study were discarded. Those that represented the greatest potential for cost savings or improvement to the project were then developed further.

Each idea was compared with the present schematic design concepts, in terms of how well it met the design intent. Advantages and disadvantages were discussed, and each team member rated the ideas on a scale of zero to five, with the best ideas rated 4 or 5. Only those ideas rated 4 or 5 were developed into alternatives. In cases where there was little cost impact but an improvement to the project was anticipated, the designation DS, for design suggestion, was used. The design team should review this listing for possible incorporation of ideas into the project.

The creative listing was re-evaluated frequently during the process of developing alternatives. As the relationship between creative ideas became more clearly defined, their importance and ratings may have changed, or they may have been combined into a single alternative. For these reasons, some of the originally high-rated items may not have been developed into alternatives.

Development Phase

During the development phase, each highly rated idea was expanded into a workable solution. The development consisted of a description of the alternative, life cycle cost comparisons, where applicable, and a descriptive evaluation of the advantages and disadvantages of the proposed alternatives. Each alternative was written with a brief narrative to compare the original design to the proposed change. Sketches and design calculations, where appropriate, were also prepared in this part of the study. The VE alternatives are included in the Study Results section.

Presentation Phase

The last phase of the VE study was the presentation of the findings. The VE alternatives were screened by the VE team before draft copies of the Summary of Potential Cost Savings worksheets were provided to GDOT District 3 and Wolverton & Associates representatives during an informal presentation on the last day of the workshop. The VE alternatives were arranged in the same order as the idea listing sheets to facilitate cross-referencing.

POST-WORKSHOP EFFORT

The post-study portion of the VE study includes the preparation of this report. It is recommended that personnel from GDOT District 3 and Wolverson & Associates analyze each alternative and prepare a short response, recommending either incorporating the alternative into the project, offering modifications before implementation, or presenting reasons for rejection.



VALUE ENGINEERING WORKSHOP AGENDA

Lewis & Zimmerman Associates, Inc. (LZA) will conduct a 3-1/2 day Value Engineering (VE) workshop on Project Number STP00-1583-00(012), Widening of Jonesboro Road from US 19/US 41 to I-75. The project is located in Clayton and Henry Counties, Georgia. The workshop will be held April 20-23, 2009 at the following location:

Georgia Department of Transportation
One Georgia Center (OGC)
5th Floor Conference Room
600 West Peachtree Street
Atlanta, Georgia 30308

The point of contact is Ms. Lisa L. Myers, Design Review Engineer Manager, and Value Engineering Coordinator, who can be reached at 404-631-1770.

The design consultants from Wolverton & Associates will provide an overview of the project at the beginning of the workshop and be available to answer questions during the VE study effort.

AGENDA

Monday, April 20, 2009

8:30 am - 9:00 am **VE Team Gathers for Introductions**

9:00 am - 9:15 am **Introduction to the Workshop**

- Welcome and opening remarks by GDOT and District 3
- Team member introductions
- VE process, workshop organization and agenda
- Objectives of the workshop

9:15 am - 11:00 am **Designer's Overview**

Representatives from the design team from Wolverton & Associates will provide an overview of the project. After the overview, the design team will answer VE team questions.

11:00 am - 12:00 pm **Function Analysis Phase**

The VE team will perform function analysis by defining the function of each project element or system in the cost model, selecting the primary or basic functions, and determining the worth, or least cost, to provide the function. The goal is to identify those functions or project elements which offer the greatest opportunity for cost reduction or value improvement.

12:00 pm - 1:00 pm **Lunch**



1:00 pm - 2:00 pm **Conclude Function Analysis Phase**

2:00 pm – 5:00 pm **Creative Phase**

The team will conduct a brainstorming session and list as many ideas as possible for consideration. The aim is to obtain a large quantity of ideas through free association, by eliminating roadblocks to creativity and deferring judgment. The VE Team Leader will be responsible for developing an idea listing for the team.

Tuesday, April 21, 2009

8:00 am – 10:00 am **Conclude Creative Phase**

10:00 am - 11:00 am **Evaluation Phase**

The VE team will analyze the ideas listed in the creative phase and select the best ideas based on project criteria obtained during the design overview and a discussion of the ideas advantages and disadvantages. This will be accomplished by assigning each idea a *Gut Feel Index* rating between 1 and 5, with 5 being the best, based on the team's consensus of how well the idea meets the noted criteria.

The team selects the highly rated ideas for research and development.

11:00 am - 12:00 pm **Development Phase**

The VE team will develop creative ideas into alternate designs. Initial and life cycle cost estimates comparing original and proposed alternatives will be prepared. Selected alternatives will be developed and supported with sketches, calculations and substantiation for change. Suppliers of materials and equipment will be contacted and specialists consulted.

12:00 noon - 1:00 pm **Lunch**

1:00 pm - 5:00 pm **Continue Development Phase**

Wednesday, April 22, 2009

8:00 am - 8:30 am **Review Status and Progress of the Team**

The VE team will assess its status and plan for completion of the alternatives development.

8:30 am - 12:00 noon **Continue Development Phase**

12:00 noon - 1:00 pm **Lunch**

1:00 pm - 3:00 pm **Continue Development Phase**



3:00 pm - 5:00 pm

Completion of Development Phase

The VE team will wrap up and complete the development effort. The VE Team Leader will be responsible for reviewing each developed idea for completion and preparing a summary of the VE alternatives in preparation for the out-briefing presentation.

Thursday, April 23, 2009

8:00 am - 9:00 am

Preparation for Presentation Phase

The VE team will finalize a summary of the VE alternatives with descriptions and initial and life cycle costs for a verbal presentation to interested parties. Summary of Potential Cost Saving worksheets will be copied for distribution to VE presentation attendees.

9:00 am – 10:15 am

Presentation Phase

The VE team will present its alternatives to GDOT, District 7, and URS Corporation and is available to clarify any points. The process for accepting/rejecting VE alternatives is described and a target schedule for meeting to finalize implementation decisions is established.

10:15 am – 10:30 am

Workshop “Post Mortem” and Closing Remarks

10:30 am

Adjourn

VALUE ENGINEERING WORKSHOP PARTICIPANTS

The VE team was organized to provide specific expertise on the unique project elements involved. Team members consisted of a multidisciplinary group with professional planning, design, and construction experience and a working knowledge of VE procedures. The VE team included the following professionals:

Joseph A. Leoni, PE	Roadway QA/QC Manager	ARCADIS-US, Inc.
John P. Tiernan, PE	Structural Engineer	ARCADIS-US, Inc.
Paresh J. Parikh, PE	Construction/Civil Engineer	Delon Hampton & Associates
Stephen G. Havens, PE, CVS	VE Team Leader	Lewis & Zimmerman Associates

OWNER/DESIGNER PRESENTATION

Representatives from GDOT and Wolverton & Associates presented an overview of the project on Monday, April 20, 2009. The purpose of this meeting, in addition to being an integral part of the Information Gathering Phase of the VE study, was to bring the VE team “up-to-speed” regarding the overall project. Additionally, the meeting afforded the design team the opportunity to highlight in greater detail, those areas of the project requiring additional or special attention.

VALUE ENGINEERING TEAM PRESENTATION

The VE team conducted an informal presentation on Thursday, April 23, 2009 to GDOT District 3 and Wolverton & Associates. Copies of the draft Summary of Potential Cost Savings worksheets were provided for interim use.

A copy of the meeting participants is attached for reference.

ECONOMIC DATA

The VE team developed economic criteria used for evaluation with information gathered from the State of Georgia Department of Transportation, Wolverton & Associates, and District 3 (D3). To express costs in a meaningful manner, the VE team alternatives are presented on the basis of discounted present worth. Criteria for planning project period interest rates are based on the following parameters:

Year of Analysis:	2009
Construction Start-Up:	2013
Economic Planning Life:	30 years for Pavement
Economic Planning Life:	50 years for Bridges
Discount Rate/Interest:	0% (Per GDOT)
Inflation/Escalation Rate:	0.00% (Per GDOT)

A combined markup of 11.3% to cover the following was used for calculating costs associated with the VE proposals developed during the workshop.

Engineering and Inspection:	5.00% (Per GDOT)
Construction Contingency:	6.00% (Per GDOT)

COST ESTIMATE SUMMARY AND COST MODEL

The VE team prepared the attached cost model for the project prior to the workshop. The cost model is arranged in the Pareto Charting/Cost Histogram format to aid in identifying high cost areas. As can be expected, judgments at this stage of the study are based on experience and intuition rather than facts, which are not uncovered until well along in the analysis of function. As a result of these qualified hypotheses, there appears to be a potential for initial savings in the following areas:

- Pavement
 - Lane widths
 - Medians
- Right-of-Way
 - Shoulder Widths
- Drainage
 - Curb-and-Gutter
 - Drainage Piping Material
- Walls
 - Wall Requirements
- Bridges
 - End Span Requirements
- Sidewalks
 - Sidewalk Requirements

In order to facilitate the cost developments of the selected ideas, the VE team generated numerous “unit” prices for specific pavement and bridge costs that are noted below:

Asphaltic Concrete (1 1/2’)	Asphaltic Concrete (2’)	Asphaltic Concrete (6’)	Graded Aggregate Base (14’)	Total Cost of Full Depth Pavement Section
Per Square Yard \$5.22*	Per Square Yard \$6.93*	Per Square Yard \$20.85*	Per Square Yard \$17.00*	Per Square Yard \$50.00*

Railroad Bridge:	\$95/Square Foot**
Walnut Creek Bridge:	\$113/Square Foot**

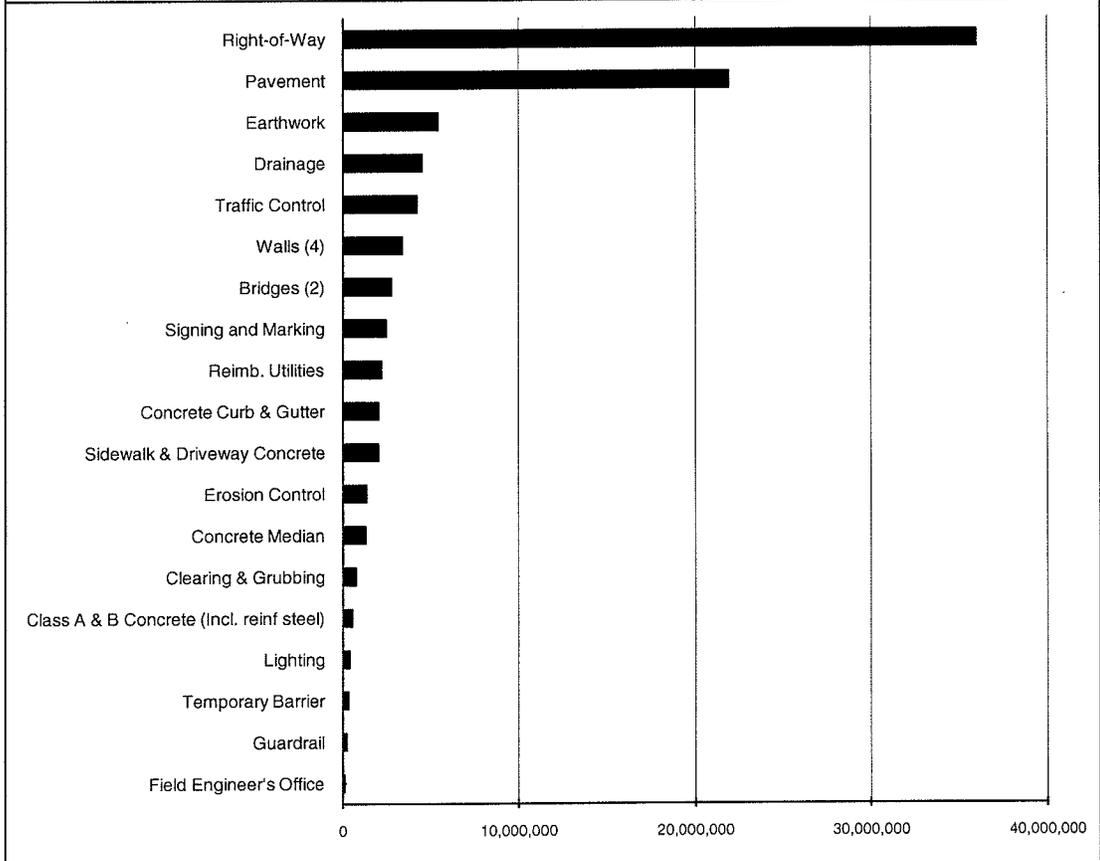
*Reference Value Engineering Alt. No. P-1 for Pavement unit pricing calculations.

**Reference Value Engineering Alt. No. P-9 for Bridge Area unit pricing calculations.

COST HISTOGRAM

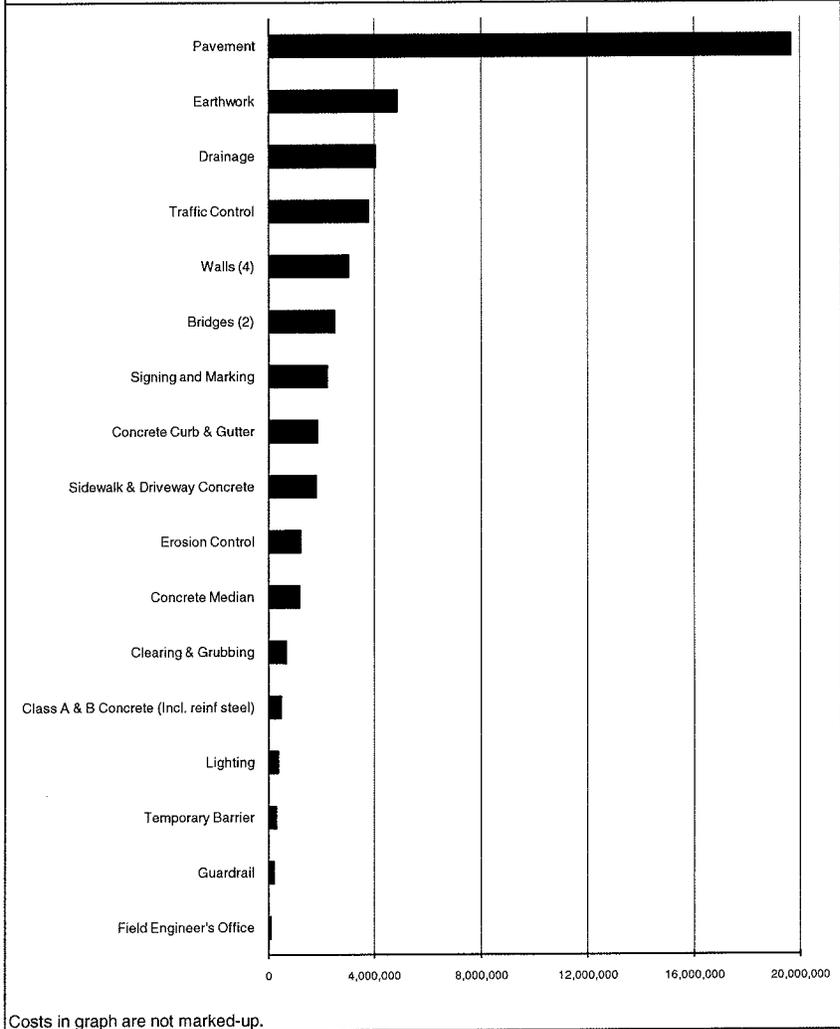
PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75

PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Right-of-Way	35,960,000	39.31%	39.31%
Pavement	21,874,781	23.91%	63.23%
Earthwork	5,399,294	5.90%	69.13%
Drainage	4,484,983	4.90%	74.03%
Traffic Control	4,194,675	4.59%	78.62%
Walls (4)	3,351,800	3.66%	82.28%
Bridges (2)	2,761,976	3.02%	85.30%
Signing and Marking	2,449,139	2.68%	87.98%
Reimb. Utilities	2,174,500	2.38%	90.36%
Concrete Curb & Gutter	2,026,798	2.22%	92.57%
Sidewalk & Driveway Concrete	1,994,114	2.18%	94.75%
Erosion Control	1,324,533	1.45%	96.20%
Concrete Median	1,285,691	1.41%	97.61%
Clearing & Grubbing	723,450	0.79%	98.40%
Class A & B Concrete (Incl. reinf steel)	513,692	0.56%	98.96%
Lighting	378,420	0.41%	99.37%
Temporary Barrier	293,276	0.32%	99.69%
Guardrail	203,225	0.22%	99.92%
Field Engineer's Office	77,496	0.08%	100.00%
TOTAL	\$ 91,471,842	100.00%	



COST HISTOGRAM

PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75			
PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Pavement	19,653,891	41.01%	41.01%
Earthwork	4,851,118	10.12%	51.14%
Drainage	4,029,634	8.41%	59.54%
Traffic Control	3,768,801	7.86%	67.41%
Walls (4)	3,011,500	6.28%	73.69%
Bridges (2)	2,481,560	5.18%	78.87%
Signing and Marking	2,200,484	4.59%	83.46%
Concrete Curb & Gutter	1,821,023	3.80%	87.26%
Sidewalk & Driveway Concrete	1,791,657	3.74%	91.00%
Erosion Control	1,190,057	2.48%	93.48%
Concrete Median	1,155,158	2.41%	95.89%
Clearing & Grubbing	650,000	1.36%	97.25%
Class A & B Concrete (Incl. reinf steel)	461,538	0.96%	98.21%
Lighting	340,000	0.71%	98.92%
Temporary Barrier	263,500	0.55%	99.47%
Guardrail	182,592	0.38%	99.85%
Field Engineer's Office	69,628	0.15%	100.00%
Subtotal	\$ 47,922,140	100.00%	
Engineering & Inspection @ 5.00%	\$ 2,396,107		
Construction Contingency @ 6.00%	\$ 3,019,095		
TOTAL	\$ 515,720	Comp Mark-up:	95.72%



FUNCTION ANALYSIS

A random function analysis was performed to (1) understand the project purpose and need, (2) define the requirements for each project element, (3) ensure a complete and thorough understanding by the VE team of the basic functions needed to attain the given project purpose and need, (4) identify other goals, and (5) identify secondary functions that should be addressed by the VE team. The Random Function Analysis worksheet completed by the team for the project in its entirety and the various elements follow.

The key opportunity areas for potential cost reduction and value improvement established during the function analysis session (including input from the design team during the design overview) includes the following:

- Pavement
 - Increase Space
 - Use Existing Pavement
 - Add Lanes
 - Accommodate Bicyclists
- Drainage
 - Control Runoff
 - Transfer Stormwater
- Bridges
 - Use Existing Bridges
 - Span Railroad Tracks
- Walls
 - Retain Earth
 - Reduce Right-of-Way
- Sidewalks
 - Accommodate Pedestrians

RANDOM FUNCTION ANALYSIS



PROJECT: **JONESBORO ROAD FROM US 19/US 41 TO I-75**
Clayton/Henry Counties, Georgia

SHEET NO.: **1 of 2**

DESCRIPTION	FUNCTION		
	VERB	NOUN	KIND
Total Project Purpose and Need	Increase	Capacity	B
	Improve	Access	RS
	Enhance	Safety	HO
	Improve	Level of Service	HO
	Protect	Historic Resources	RS
	Accommodate	Bicyclists	S
	Accommodate	Pedestrians	S
Right-of-Way \$36M	Increase	Space	RS
	Acquire	Land	RS
Pavement \$22M	Support	Loads	B
	Increase	Space	B
	Utilize	Existing Pavement	RS
	Add	Lanes	RS
Earthwork \$5.4M	Increase	Sight Distance	B
	Improve	Truck Access	RS
	Raise	Elevation	RS
	Increase	Space	RS
Drainage \$4.5M	Control	Runoff	B
	Control	Erosion	B
	Transfer	Stormwater	RS

Function defined as:	Action Verb	Kind:	B = Basic	HO = Higher Order
	Measurable Noun		S = Secondary	LO = Lower Order
			RS = Required Secondary	G = Goal

CREATIVE IDEA LISTING AND EVALUATION OF IDEAS

During the Creativity Phase, numerous ideas were generated using conventional brainstorming techniques. These ideas were recorded and are shown with their corresponding ranking on the attached Creative Idea Listing Worksheets. For the convenience of tracking an idea through the VA process, the ideas were grouped according to the following categories and numbered in the order in which they were conceived. The following letter prefixes were used to identify the categories.

PROJECT ELEMENT	PREFIX
Pavement	P
Right-of-Way	ROW
Drainage	D
Walls	W
Bridges	B
Sidewalks	S
General	G

Creative Idea Evaluation

After discussing each idea, the team evaluated the ideas by consensus. This effort produced 23 ideas rated 4 or 5 to research and develop into formal VE alternatives and 1 idea to develop as a design suggestion to be included in the Study Results section of the report. Ideas that were not developed further may have been combined with another related idea or discarded as a result of additional research indicating the concept as not being cost effective or technically feasible. The project team is encouraged to review the Creative Idea Listing and Evaluation worksheet since it may suggest additional ideas that can be applied to the design.

CREATIVE IDEA LISTING



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	SHEET NO.:	1 of 2
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NO.	IDEA DESCRIPTION	RATING
	PAVEMENT (P)	
P-1	Construct a one-way pair using the existing roadway for eastbound traffic from US 19/US 41 to Freeman Road.	4
P-2	Use the existing roadway for eastbound traffic by constructing a one-way pair at Nash Farm.	4
P-3	Provide a cul-de-sac at the west end of the existing road at Nash Farm and eliminate the connector road.	5
P-4	Change the median to a right-in/right-out at the west connector near Nash Farm and eliminate the median opening to improve traffic flow.	5
P-5	Provide a cul-de-sac at McCullough Road and eliminate the connector to improve traffic flow.	2
P-6	Relocate the cul-de-sac to the east end of Jonesboro Road and access LaCosta at Lovejoy from Hastings Bridge Road.	4
P-7	Eliminate the median opening at Station Drive to reduce turning conflicts.	4
P-8	Use the existing roadway for the eastbound bicycle path.	3
P-9	Reduce the median width from 20 ft to 18 ft.	4
P-10	Use 11-ft-wide through lanes from US 19/US 41 to Chambers Road.	4
P-11	Use 11-ft-wide inside lanes from Chambers Road to I-75.	4
P-12	Reduce the mainline right-turn lane deceleration lengths.	4
P-13	Provide a 10-ft-wide multi-use trail on the north side of the mainline in lieu of two 4-ft-wide bicycle lanes from Hastings Bridge Road to Mitchell Road.	4
P-14	Review traffic turn movements for possible improvements.	ABD
P-15	Eliminate the median opening at Sta. 141+00 and provide a right-in/right-out drive.	4
P-16	Use 11-ft-wide inside lanes from US 19/US 41 to Chambers Road.	4
	RIGHT-OF-WAY (ROW)	
ROW-1	Widen the mainline to the north between Sta. 280 and Sta. 290 to save three displacements.	2
ROW-2	Use 12-ft-wide urban shoulders from Chambers Road to I-75.	4

Rating: 1→2 = Not to be developed 3→4 = Varying degrees of development potential 5 = Most likely to be developed DS = Design suggestion ABD = Already being done
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CREATIVE IDEA LISTING



PROJECT: JONESBORO ROAD FROM US 19/US 41 TO I-75 <i>Clayton/Henry Counties, Georgia</i>	SHEET NO.:	2 of 2
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NO.	IDEA DESCRIPTION	RATING
	EARTHWORK (E)	
E-1	Review the profile at the railroad bridge and elsewhere to reduce borrow requirements.	ABD
	DRAINAGE (D)	
D-1	Eliminate curb-and-gutter and sidewalks (urban shoulder) from the north side of the mainline between Hastings Bridge Road and Pates Lake Way.	5
D-2	Use 24-in-wide curb-and-gutter in lieu of 30-in-wide curb-and-gutter.	5
D-3	Use HDPE pipe in lieu of concrete pipe for longitudinal storm drain piping.	5
	WALLS (W)	
W-1	Construct the entire wall parallel to the railroad tracks at the west end of the railroad bridge.	4
W-2	Retain the existing wall adjacent to BJ's by widening the mainline to the south and using 10-ft-wide shoulders.	4
	BRIDGES (B)	
B-1	Use a mechanically stabilized earth wall in lieu of an end span for the railroad bridge.	4
B-2	Span US 19/US 41 with a new bridge to improve traffic flow.	2
B-3	Use pre-stressed beams in lieu of reinforced concrete at the Walnut Creek Bridge.	3
	SIDEWALKS (S)	
S-1	Eliminate sidewalks on both sides of the mainline between US 19/US 41 and McCullough Road.	4
S-2	Eliminate sidewalks on the north side of the mainline between US 19/US 41 and McCullough Road.	5
	GENERAL (G)	
G-1	Synchronize traffic signals from McCullough Road to I-75.	DS

Rating: 1→2 = Not to be developed 3→4 = Varying degrees of development potential 5 = Most likely to be developed DS = Design suggestion ABD = Already being done
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