

Value Engineering Study Report

SR 520 BUSINESS

NHS-0002-00(415), P.I. No. 0002445

Dougherty County



Value Management Team



August 2007



August 30, 2007

Ms. Lisa Myers
Design Review Engineer Manager
Georgia Department of Transportation
#2 Capitol Square, Room 266
Atlanta, GA 30334

RE: Submittal of the final Value Engineering Report
Project -NHS-0002-00(445)
Dougherty County
P.I. No. - 0002445
SR 520
PBS&J Project Task Order No. 16

Dear Ms. Myers:

Please find enclosed four (4) hard copies and a CD of our final Value Engineering Report for SR 520 in Dougherty County, as referenced above.

This Value Engineering Study, which was performed during the period August 20 through August 23, 2007, identified **10 Alternative Ideas** which are recommended for implementation. The VE Team also identified **11 Design Suggestion Ideas** which are recommended for the Engineer to consider in his final design. We believe that the **10 Alternative Ideas** recommended may have a significant positive affect on the project.

We trust that you will find this report to be in proper order. It should be noted that the results of this workshop are volatile in that they can be overcome by the events that accompany the expeditious continuance of the design process. Accordingly, we encourage an equally expeditious implementation meeting to design the disposition of the contents of this report.

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

Yours truly,

PBS&J

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

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

Value Engineering Study Report

Project –NHS-0002-00(445)

Dougherty County

PI No. 0002445

SR 520

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EXECUTIVE SUMMARY

INTRODUCTION

This report summarizes the analysis and conclusions by the PBS&J Value Engineering workshop team as they performed a VE study during the period of August 20 – August 23, 2007 in Atlanta, at the office of the Georgia Department of Transportation. The subject of the Value Engineering study was the NHS-0002-00(445) P.I. 0002445 SR 520 Business from Jefferson Street to Thornton Drive, Dougherty County. The concept design for the project has been prepared by GDOT. At the time of the workshop the plans had advanced to the concept design level.

PROJECT DESCRIPTION

This project consists of improvements along 2.91 miles of SR 520 Business from Jefferson Street to Thornton Drive, City of Albany, Dougherty County, Georgia. The improvements include: widening from four lanes to six lanes; new bike lanes; sidewalks; and a raised median. There are three bridges along the route which will be widened accordingly. They include the Flint River Bridge, the CSX and the Norfolk and Southern Bridges. The project has been designed to minimize Right of Way acquisition.

The projected construction cost is \$28,017,674.16, plus a 10% E & C and Right of Way acquisition of \$8,208,660.00; for a total project budget of \$39,028,071.88.

This project is rather fully described in the documentation that is located in Tab 5 of this report, entitled *Project Description*.

PROJECT CONCERNS AND OBJECTIVES

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

- The project has been designed to limit R-O-W acquisition by using 11 foot travel lanes in the downtown portion of the project. A design exception will be requested for this design.
- The existing bridge over the Flint River has experienced flooding in 1994 and 1998. The current design does not propose replacement as it is believed that it cannot be constructed within the existing roadway nor accommodate the adjacent users.
- Entrance drives onto the proposed roadway have not been delineated at this time as it is being considered to make all drives right in and right out.
- The MPO is requiring sidewalks and bike lanes.

VALUE ENGINEERING PROCESS

The Value Engineering team followed the seven step Value Engineering job plan as promulgated by the Georgia Department of Transportation. This seven step job plan includes the following:

- Investigative
- Analysis
- Speculation
- Evaluation
- Development
- Recommendation
- Presentation

This report is a component of the Presentation Phase. As part of the VE workshop in Atlanta, the team made an informal presentation of their results on the last morning of the workshop. This report is intended to formalize the workshop results and set the stage for a formal implementation meeting in which alternatives and design suggestions will typically be accepted, accepted with modifications, or rejected for cause. The worksheet that follows, along with the formally developed alternatives and design suggestions can be used as a “score sheet” for the implementation meeting. It is also included in this report to identify, on a summary basis, the results of the workshop. The reader is encouraged to visit the third tabbed section of this report entitled *Study Results* for a review of the details of the developed alternatives. The tabbed section *Project Description* includes information about the project itself and the tabbed section *Value Engineering Process* presents the detail process of the Value Engineering Study.

CONCLUSIONS AND RECOMMENDATIONS

During the speculation phase the VE Team identified **28 Alternative Ideas** that appeared to hold potential for reducing the construction cost, improving the end product and/or reducing the difficulty and time of project construction.

After the evaluation phase was completed, **10 Alternative Ideas** and **11 Design Suggestions** remained for further consideration. These Alternative Ideas and Design Suggestions may be found, in their documented form, in the section of this report entitled *Study Results*. The following *Summary of Alternatives and Design Suggestions* coupled with the documentation of the developed alternatives should provide the reader with the information required to fully evaluate the merits of each of the alternatives.

These and the other alternatives and design suggestions may be reviewed more thoroughly where they are documented in the third tab of this report entitled *Study Results*.

SUMMARY OF ALTERNATIVES & DESIGN SUGGESTIONS



Georgia Department of Transportation

SR 520 - Dougherty County -NHS-0002-00445) - P.I. No. 0002445

Alternative Number	Description of Alternative	Initial Cost Savings
	BRIDGE-FLINT RIVER (BRF)	
BRF-1	Provide separate new structures for pedestrians and bikes; modify design for 6 travel lanes	\$996,875
BRF-2	Provide a 10' multi-use trail in lieu of 10' sidewalk and 4' bike lane	\$1,084,600
BRF-3	Provide a new bridge for 100 year event	Design Suggestion
BRF-5	Give consideration to possible negative effects of widening bridge - it may increase it's risk of floating	Design Suggestion
BRF-6	Provide a "free right turn" onto Front Street	Design Suggestion
BRF-7	Extend Front Street right turn storage to top of bridge to decrease potential for rear end collisions	Design Suggestion
	BRIDGE #2 - CSX RAILROAD (BR2)	
BR2-1	Provide a single span bridge of CSX Railroad with walled abutments	\$648,819
BR2-2	Combine bike lane and sidewalk as a 10' multi-use trail with special markings	\$162,316
BR2-3	Use a 14' median (10' raised) and 11' travel lanes	324,632
BR2-5	Combine BR2 and BR3 and construct one new bridge	Design Suggestion
	BRIDGE #3 - NORFOLK & SOUTHERN RAILROAD (BR3)	
BR3-1	Provide a single span bridge with walled abutments	\$648,819
BR3-2	Combine bike lane with sidewalk into a 10' multi-use trail	\$113,696
BR3-3	Use a 14' median (10' raised) and 11' travel lanes	\$227,392
	ROADWAY (RD)	
RD-1	Construct 11' travel lanes throughout the project	\$834,665
RD-2	Move 4' bike path to a 10' multi-use trail from Front Street to the project terminus	\$2,024,131
RD-4	Consider pavement design alternatives regarding thickness build-ups	Design Suggestion
RD-5	Consider reducing the number of median openings and provide additional signals	Design Suggestion
RD-8	Co-ordinate traffic control plan with "new Clark Street" "local traffic only"	Design Suggestion
RD-9	Verify the Norfolk & Southern Railroad is still an active line	Design Suggestion
RD-10	Consider using double left turn/"u" turn at signals to calm traffic	Design Suggestion
RD-11	Redesign Radium Springs Road to decrease intersection angle	Design Suggestion

Study Results

Study Results

Introduction

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

The documented alternatives also include Design Suggestions (DS). As their name implies, these are short write-ups making note of VE perspectives on technical issues and sharing some thoughts for consideration as the design moves forward.

This introductory sheet is followed by a *Summary of Alternatives & Design Suggestions* table. It should be noted that the alternatives that are included, which have cost estimates attached are not necessarily representative of the final cost outcome for each alternative. Some of these alternatives have components that are mutually exclusive so they may not be added together.

The users of this report are asked to consider these alternatives and design suggestions as a smorgasbord of choices for selection and use as the project moves forward. The following *Summary of Alternatives & Design Suggestions* may also be used as a “score sheet” within the bounds of an implementation meeting.

Cost Calculations

The cost calculations are intended only as a guide to the approximate results that might be expected from implementation of the alternatives. They should be helpful in making clear choices as to the pursuit of individual alternatives.

A composite mark-up of 10% for the construction cost comparisons was derived from the cost estimate for the project. This estimate can be found in the section of this report entitled *Project Description*.

SUMMARY OF ALTERNATIVES & DESIGN SUGGESTIONS



Georgia Department of Transportation

SR 520 - Dougherty County -NHS-0002-00445) - P.I. No. 0002445

Alternative Number	Description of Alternative	Initial Cost Savings
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BR3-1	Provide a single span bridge with walled abutments	\$648,819
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RD-10	Consider using double left turn/"u" turn at signals to calm traffic	Design Suggestion
RD-11	Redesign Radium Springs Road to decrease intersection angle	Design Suggestion

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	BRF-1
DESCRIPTION:	PROVIDE SEPARATE NEW STRUCTURE FOR PEDESTRIANS AND BIKE; MODIFY DESIGN FOR 6 TRAVEL LANES	SHEET NO.:	1 of 5

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the widening of the existing 720' long X 69' wide bridge over the Flint River built in 1953. The existing bridge with a structural sufficiency rating of 71.19, is proposed to be widened by 25' on either side to provide a total width of 120'. The existing bridge is built up concrete column bents and wide flange beams on rocker/plate bearings supporting a concrete deck.

It has been observed that the existing bridge has been submerged during flood conditions in 1994 and 1998.

The 120' bridge cross section accommodates three (3) 11' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 14' median (10' raised and 2' buffers on either side).

Alternative:

The alternative proposes the use of separate pre-manufactured pedestrian cum bicycle bridges alongside the existing bridge in-lieu of providing sidewalks and bike lanes on the road bridges. The resulting required cross section of the road bridge will be less than that in the current design.

All other geometry is maintained as in the original design.

Opportunities:

- Bridge cost savings by reducing total bridge width
- May provide an opportunity for reduced Right-of-way requirements
- May provide opportunity to overcome flood conditions and render safe structures
- May provide opportunity to totally replace the existing bridge at a future time

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

With separate structures provided for pedestrians and bicyclists, the required cross section for six (6) 11' travel lanes, 4' raised median and buffers will be approximately 80'. This can be achieved by widening the existing travel way by about 5' on either side, which is essentially flattening the raised side walk area on either of the existing deck and adding another 5' of deck.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,389,375	\$	\$ 3,389,375
ALTERNATIVE	\$ 2,392,500	\$	\$ 2,392,500
SAVINGS	\$ 996,875	\$	\$ 996,875

Illustrations

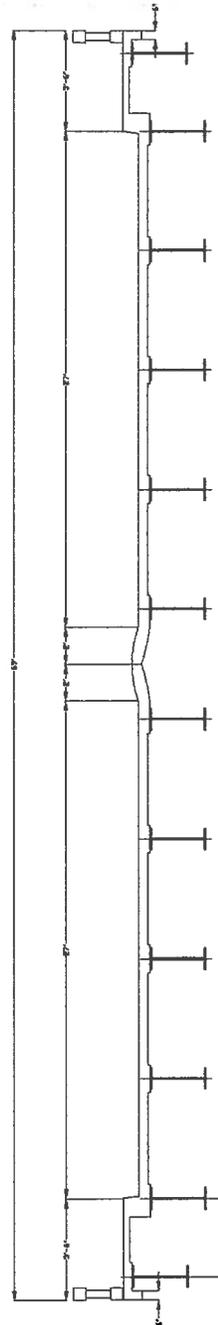


PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

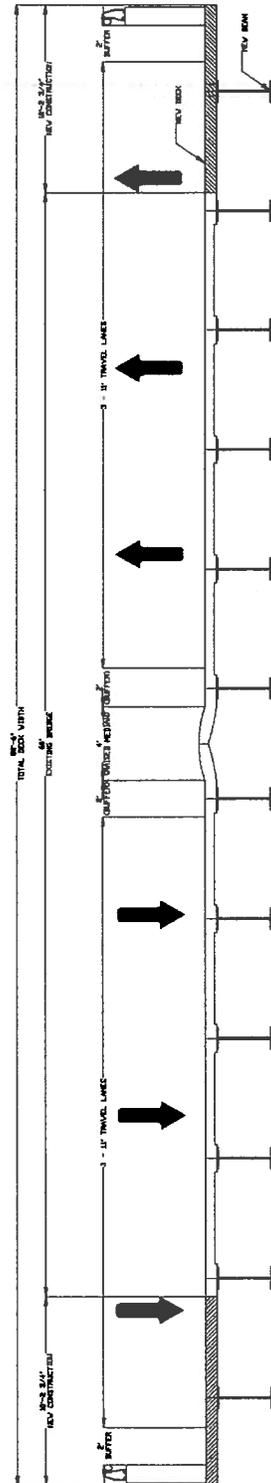
ALTERNATIVE NO.: **BRF-1**

DESCRIPTION: **PROVIDE SEPARATE NEW STRUCTURE FOR PEDESTRIANS AND BIKE, MODIFY DESIGN FOR 6 TRAVEL LANES**

SHEET NO.: 2 of 5



CROSS SECTION
EXISTING BRIDGE



CROSS SECTION
ALTERNATIVE

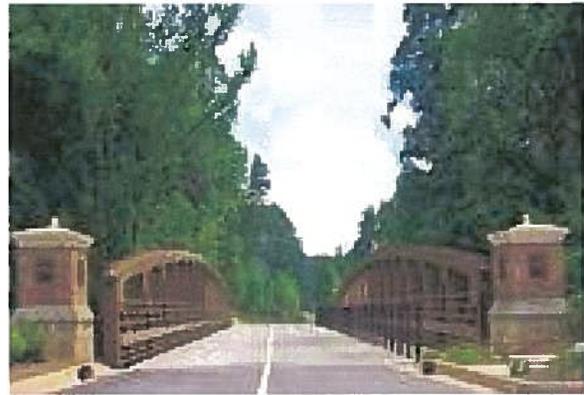
PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445**

ALTERNATIVE NO.: **BRF-1**

DESCRIPTION: **PROVIDE SEPARATE NEW STRUCTURE FOR
PEDESTRIANS AND BIKE, MODIFY DESIGN FOR 6
TRAVEL LANES**

SHEET NO.: **3 of 5**

SAMPLE PEDESTRIAN CUM BICYCLE PATH STRUCTURES



Calculations



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BRF-1**

DESCRIPTION: **PROVIDE SEPARATE NEW STRUCTURE FOR
PEDESTRIANS AND BIKE, MODIFY DESIGN FOR 6
TRAVEL LANES**

SHEET NO.: 4 of 5

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

50 widening of existing bridge, 725' long.

Area of bridge deck widening = $725' \times 50' = 36,250$ SF

Alternative BR-1:

This alternative proposes providing separate structures for pedestrians and bicyclists and modifying existing bridge deck section to accommodate six (6) 11' travel lanes.

Area of bridge deck modification = $725' \times 20' = 14,500$ SF

Length of Pedestrian cum Bicyclist structures = $2 \times 725' = 1450'$

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	BRF-2
DESCRIPTION:	PROVIDE A 10' MULTI-USE TRAIL IN-LIEU OF 10' SIDEWALK AND 4' BIKE LANE	SHEET NO.:	1 of 4

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the widening of the existing 720' long X 69' wide, bridge over the Flint River built in 1953. The existing bridge with a structural sufficiency rating of 71.19, is proposed to be widened by 25' on either side to provide a total width of 120'. The existing bridge is built up concrete column bents and wide flange beams on rocker/plate bearings supporting a concrete deck.

It has been observed that the existing bridge has been submerged during flood conditions in 1994 and 1998.

The 120' bridge cross section accommodates three (3) 11' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 14' median (10' raised and 2' buffers on either side).

Alternative:

The alternative proposes a 10' multi-use trail in-lieu of a 10' sidewalk and 4' bike lane as proposed in the original design. The resulting required cross section of the Road Bridge will be less than that in the current design.

All other geometry is maintained as in the original design.

Opportunities:

- Bridge Cost savings by reducing total bridge width
- May provide an opportunity for reduced Right-of-way requirements
- May provide opportunity to overcome flood conditions and render safe structures
- My provide opportunity to totally replace the existing bridge at a future time

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

By providing a multi-use trail, the required cross section for six (6) 11' travel lanes, 14' median and buffers will be approximately 104'. This can be achieved by widening the existing 69' deck by about 17' on either side.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,389,375	\$	\$ 3,389,375
ALTERNATIVE	\$ 2,304,775	\$	\$ 2,304,775
SAVINGS	\$ 1,084,600	\$	\$ 1,084,600

Illustrations

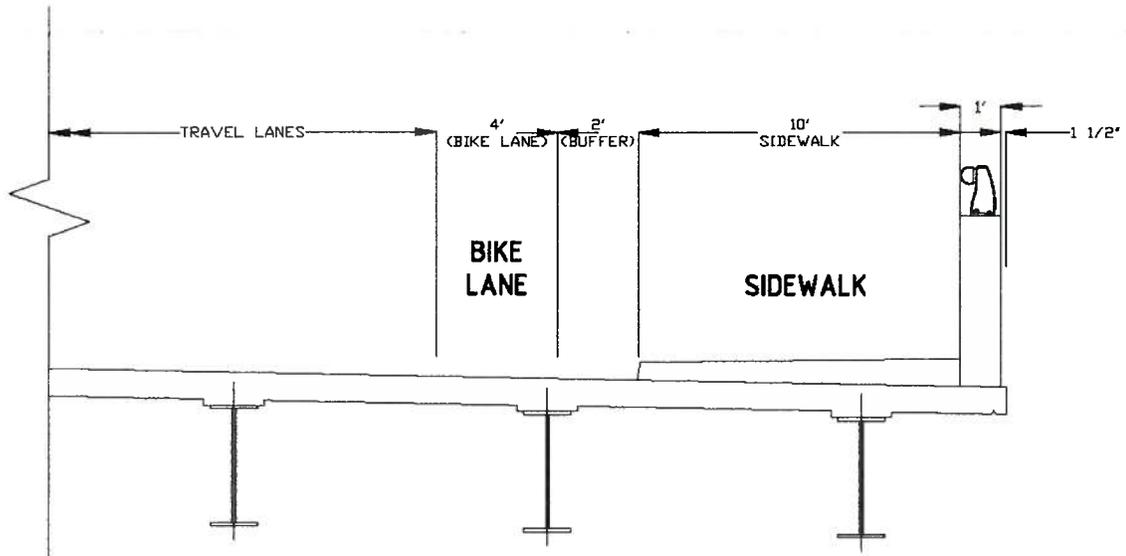


PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

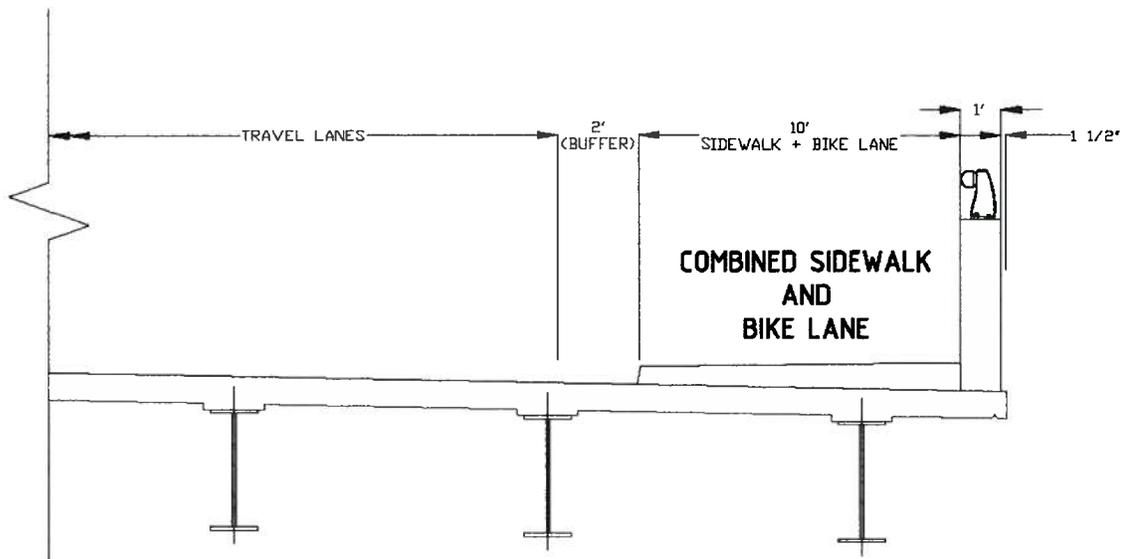
ALTERNATIVE NO.: **BRF-2**

DESCRIPTION: **PROVIDE A 10' MULTI-USE TRAIL IN-LIEU OF 10' SIDEWALK AND 4' BIKE LANE**

SHEET NO.: 2 of 4



TYPICAL PARTIAL CROSS SECTION
CURRENT DESIGN (ASSUMED)



TYPICAL PARTIAL CROSS SECTION
ALTERNATIVE

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BRF-2**

DESCRIPTION: **PROVIDE A 10' MULTI-USE TRAIL IN-LIEU OF 10'**
SIDEWALK AND 4' BIKE LANE

SHEET NO.: 3 of 4

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

50 widening of existing bridge, 725' long.

Area of bridge deck widening = $725' \times 50' = 36,250$ SF

Alternative BR-1:

This alternative proposes providing a 10' multi-use trail for pedestrians and bicyclists in-lieu of a 10' sidewalk and 4' bike lane.

Area of bridge deck modification = $725' \times 34' = 24,650$ SF

Value Analysis Design Suggestion



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BRF-3**

DESCRIPTION: **PROVIDE NEW BRIDGE TO CLEAR 100 YEAR STORM**
EVENT

SHEET NO.: 1 of 5

Original Design:

The original design provides for widening the existing bridge.

Alternative:

The alternative proposed replacing the existing structure with one that will clear the 100 year flood.

Opportunities:

- Improved hydraulics
- Replacement of an aging structure
- Decreased maintenance cost

Risks:

- Increased cost.
- Displacement of the “Albany Arch”
- Minor grade impact to Front Street

Technical Discussion:

Hydraulics: From the FEMA floodplain map the 100 year flood elevation appears to be elevation ~187'. This would seem to indicate that the 1998 and 1994 flood events were very close to the 100 year event. By modifying the project gradeline as shown on the attached profile the clearance can be improved by as much as 6.5'. This profile would only raise the Front Street intersection ~2.6' which should be manageable. The old bridge plans show a low beam elevation of ~184.65, the preliminary plans show a low beam elevation of ~186.55 and the raised profile would provide a low beam elevation of ~193.04.

Bridge Replacement: The existing structure has a sufficiency rating of 71.9 however this was from an inspection dated 12/18/2003. The existing bridge is 53 years old and one would anticipate the bridge will continue to deteriorate and require increasing levels of repair and maintenance. Additional maintenance is also anticipated due to the fact the rocker bearings and steel plate bearings have been inundated by flood waters on at least two occasions.

Replacing the bridge would not provide adequate clearance over the flood plain it would also provide a structure with a full life cycle for the entire cross section.

Illustrations



PROJECT: **Georgia Department of Transportation – NHS-002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445**

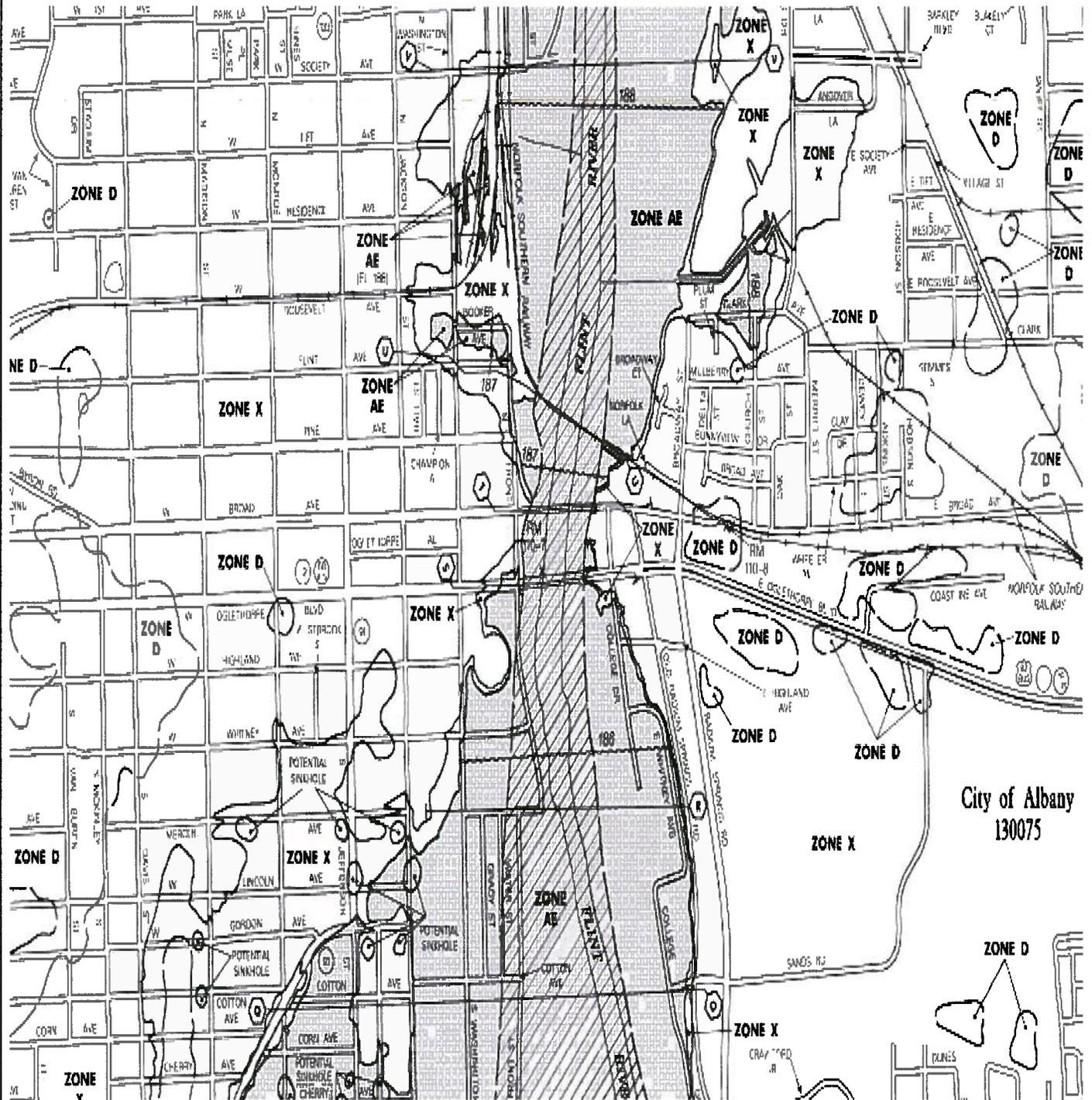
ALTERNATIVE NO.:

BRF-3

DESCRIPTION: **PROVIDE NEW BRIDGE TO CLEAR 100 YEAR STORM EVENT**

SHEET NO.:

2 of 5



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.:

BRF-3

DESCRIPTION: PROVIDE NEW BRIDGE TO CLEAR 100 YEAR STORM EVENT

SHEET NO.:

3 of 5

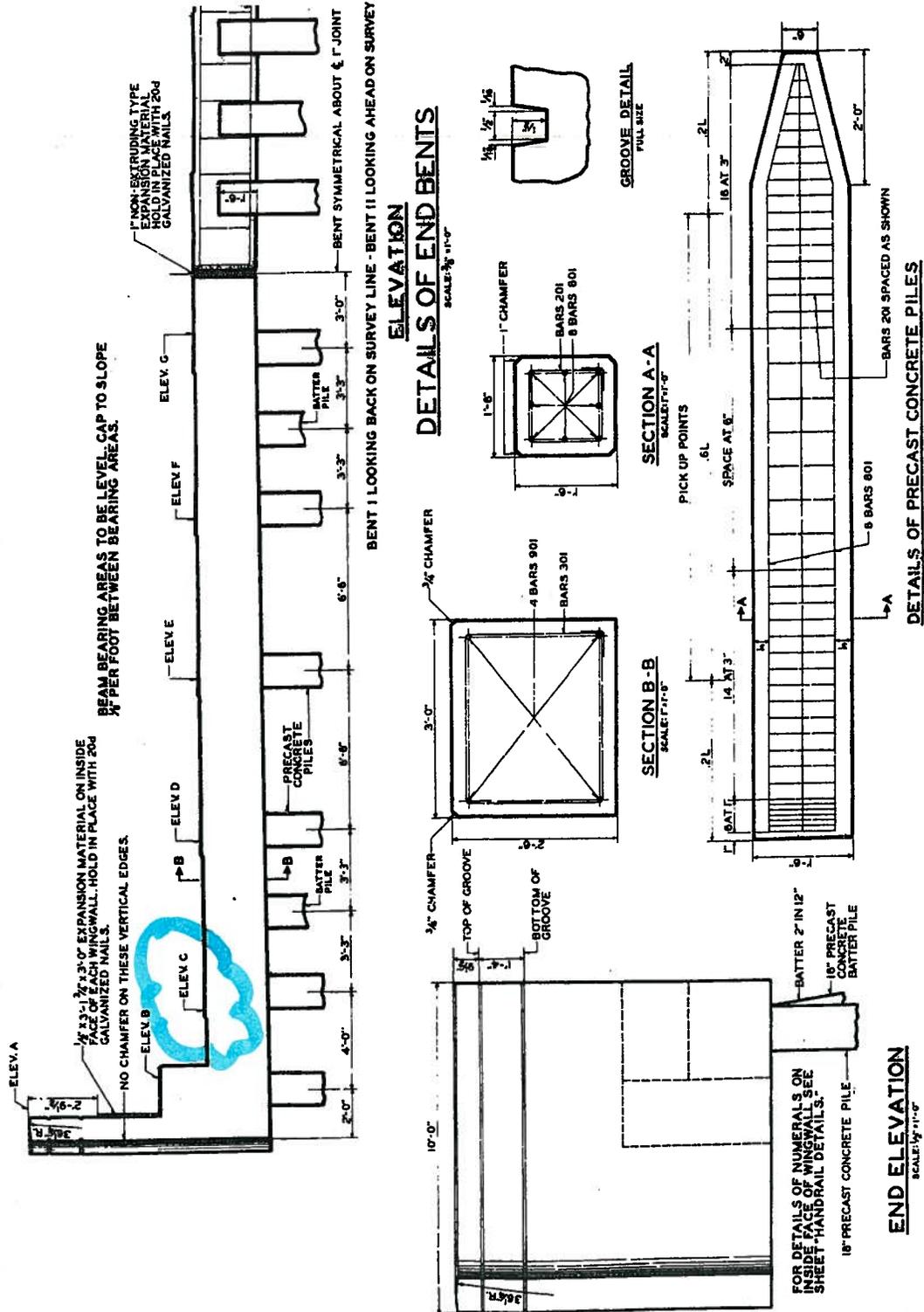


TABLE OF ELEVATIONS
NO SCALE

BENT	ELEV. A	ELEV. B	ELEV. C	ELEV. D	ELEV. E	ELEV. F	ELEV. G
I	185.48	188.53	186.40	188.47	188.54	188.61	188.67
II	188.47	190.23	188.19	189.13	189.26	189.33	189.39

FOR DETAILS OF NUMERALS ON INSIDE FACE OF WINGWALLS SEE SHEET "HANDRAIL DETAILS".

BEAM BEARING AREAS TO BE LEVEL. CAP TO SLOPE 1/4" PER FOOT BETWEEN BEARING AREAS.

1/4" x 1/4" x 3/8" EXPANSION MATERIAL ON INSIDE FACE OF EACH WINGWALL. HOLD IN PLACE WITH 20# GALVANIZED NAILS.

1" NON-EXTRUDING TYPE EXPANSION MATERIAL HOLD IN PLACE WITH 20# GALVANIZED NAILS.

NO CHAMFER ON THESE VERTICAL EDGES.

TOP OF GROOVE

BOTTOM OF GROOVE

GROOVE DETAIL FULL SIZE

PICK UP POINTS

SPACE AT 'E'

Illustrations



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

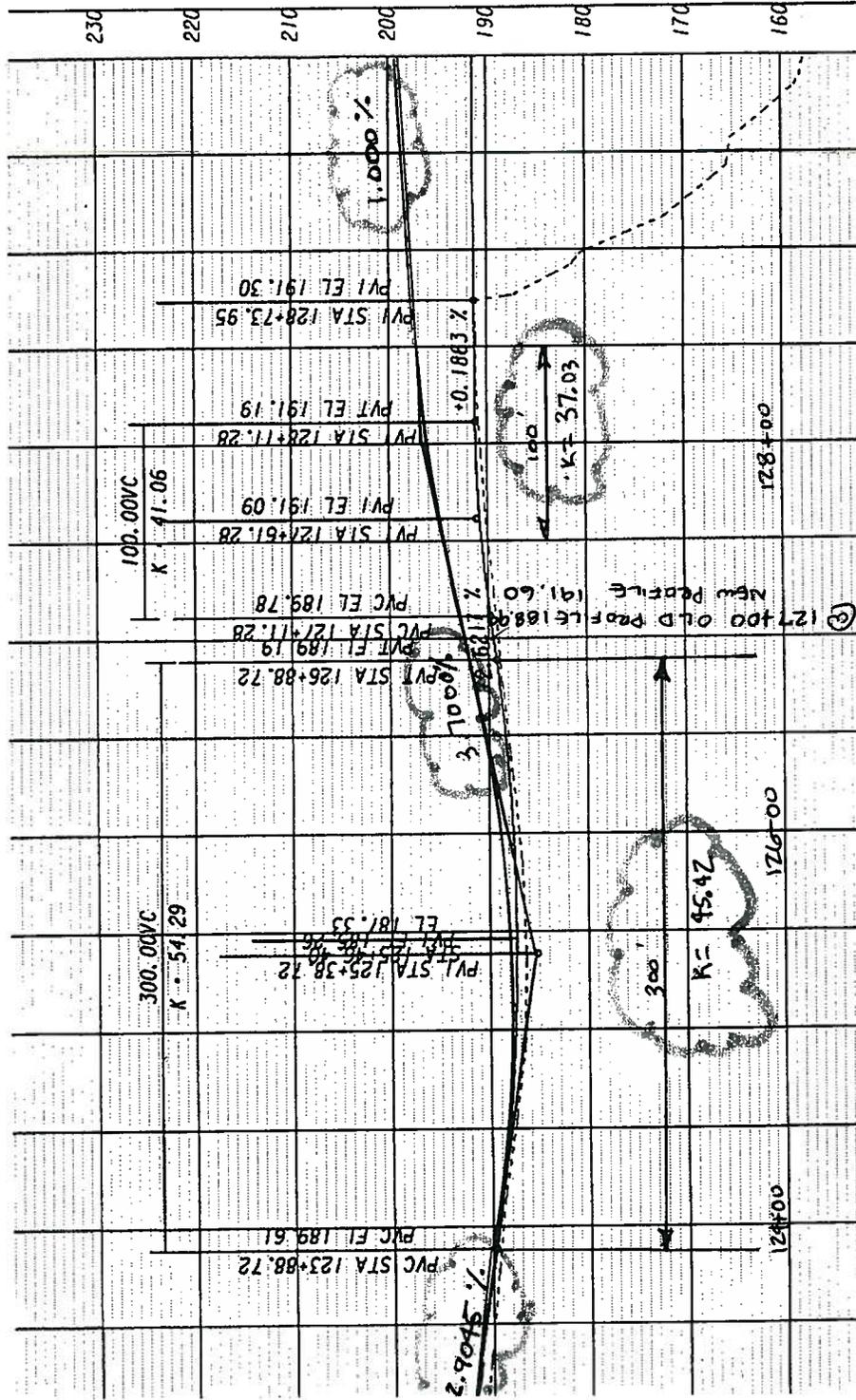
ALTERNATIVE NO.:

BRF-3

DESCRIPTION: PROVIDE NEW BRIDGE TO CLEAR 100 YEAR STORM EVENT

SHEET NO.:

4 of 5



Calculations



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: BRF-3

DESCRIPTION : PROVIDE NEW BRIDGE TO CLEAR 100 YEAR STORM
EVENT

SHEET NO.: 5 of 5

FLOOD PLAIN ELEVATION:

From FEMA Flood Plain Map ~186.75' (see Illustration Sheet 2 of 5)

LOW BEAM ELEVATION:

From old bridge plans (see Illustration Sheet 3 of 5)

Elevation "C"	188.40'
<u>*Structure Depth</u>	<u>-3.67'</u>
	184.65'

From preliminary plans (see Illustration Sheet 4 of 5)

PGL @ Sta. 128+75	191.12'
Cross slope (35x.02'/')	-0.70'
<u>*Structure Depth</u>	<u>-3.67'</u>
	186.55'

From raised profile (see Illustration Sheet 4 of 5)

PGL @ Sta. 128+75	197.75'
Cross slope (52x.02'/')	-1.04'
<u>**Structure Depth</u>	<u>-3.67'</u>
	193.04'

* W36 beam with an 8 inch concrete deck = 44"

** Type 2 concrete beams with an 8 inch deck = 44"

Value Analysis Design Suggestion



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BRF-5**

DESCRIPTION: **CONSIDER NEGATIVE EFFECTS OF WIDENING FLINT RIVER BRIDGE.**

SHEET NO.: 1 of 1

Original Design:

The conceptual design calls for widening the existing Flint River bridge from existing 69' to proposed 120'. This structure has experienced flood events in 1994 and 1998. The most recent bridge inspection graded the bridge at 71.19 in 2003.

Alternative:

The alternative is to consider the negative effects of widening the existing Flint River bridge such as the potential for future flooding absent raising the existing profile grade and the greater deck surface area resulting in low flood clearance at the low beam.

Opportunities:

- Longer functional structure life.
- Decreased maintenance costs.

Risks:

- Moderate design impacts.
- Increased construction costs.

Technical Discussion:

The existing Flint River bridge was constructed in 1953 and has a sufficiency rating of 71.19 as of the last inspection conducted in 2003. The structure is due for an updated inspection in FY 2007. The bridge has experienced flood events in 1994 and 1998.

Consideration should be made to the age and existing condition of the existing structure with respect to the proposed doubling of its width. Increasing the deck surface area on a structure prone to flooding would increase the risk of floating the deck under flood event, and the widening would have the effect of lowering the deck flood clearance on the low beam due to compensation for the deck cross-slope.

Value Analysis Design Suggestion



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445**

ALTERNATIVE NO.: **BRF-6**

DESCRIPTION: **PROVIDE A “FREE RIGHT TURN” ONTO FRONT
STREET**

SHEET NO.: 1 of 1

Original Design:

The original design shows a right turn lane to Front Street from SR 520 with a yield condition at the intersection, with storage on the Flint River bridge.

Alternative:

Construct a free right hand turn lane onto Front Street and move the yield condition down Front Street to facilitate turn movement and to reduce stacking on the Flint River bridge.

Opportunities:

- Reduce traffic stack on the Flint River Bridge
- Improve turn movement from SR 520 onto Front Street

Risks:

- Minimal design impacts
- May require additional R.O.W. acquisition

Technical Discussion:

Provide a free right hand turn movement from SR 520 onto Front Street, pushing the yield condition down the Front Street alignment. This may require R.O.W. to be acquired along Front Street, but would alleviate traffic stacking on the Flint River bridge, and should serve to facilitate the turn movement.

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	BR2-1
DESCRIPTION:	PROVIDE A SINGLE SPAN BRIDGE OVER CSX WITH WALLED ABUTMENTS	SHEET NO.:	1 of 5

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 248' long X 64' wide, structurally deficient bridge (Sufficiency Rating: 48.37) over CSX RR built in 1954, with a new 217' long X 163' wide bridge, assumed to comprise of 3 spans (approximate configuration: 40' + 140' + 40').

Alternative:

The alternative proposes elimination of the end spans and providing walled abutments for a single span, 140' wide X 163' wide. The single span would provide adequate vertical and horizontal clearance for the existing 3 tracks of CSX RR and a future track.

Opportunities:

- Bridge Cost savings by reducing total bridge length
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The horizontal clearance requirements for Rail Road and all other geometry will be maintained as in the current design. The same beam depth and configuration as in the original design can be used for the alternate.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,307,189	\$	\$ 3,307,189
ALTERNATIVE	\$ 2,658,370	\$	\$ 2,658,370
SAVINGS	\$ 648,819	\$	\$ 648,819

Illustrations

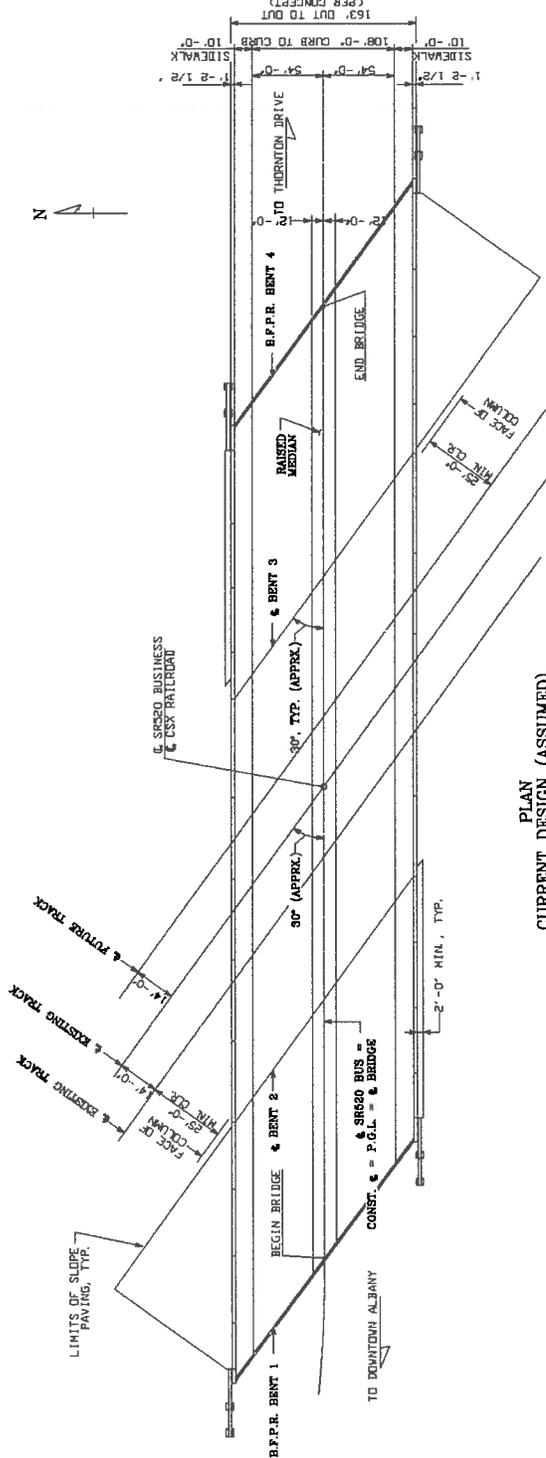


PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

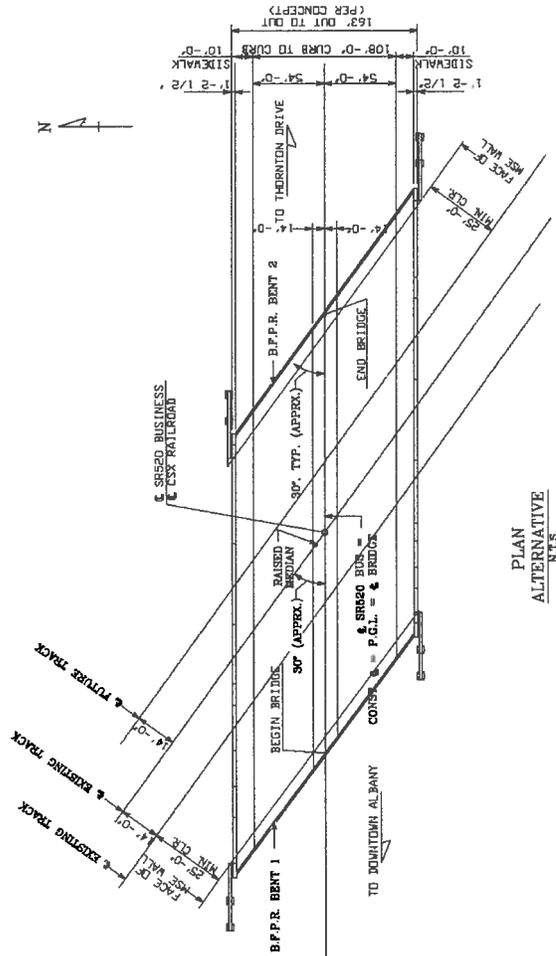
ALTERNATIVE NO.: **BR2-1**

DESCRIPTION: **PROVIDE A SINGLE SPAN BRIDGE OVER CSX WITH**
WALLED ABUTMENTS

SHEET NO.: **2 of 5**



PLAN
 CURRENT DESIGN (ASSUMED)
 N.T.S.



PLAN
 ALTERNATIVE
 N.T.S.

Illustrations

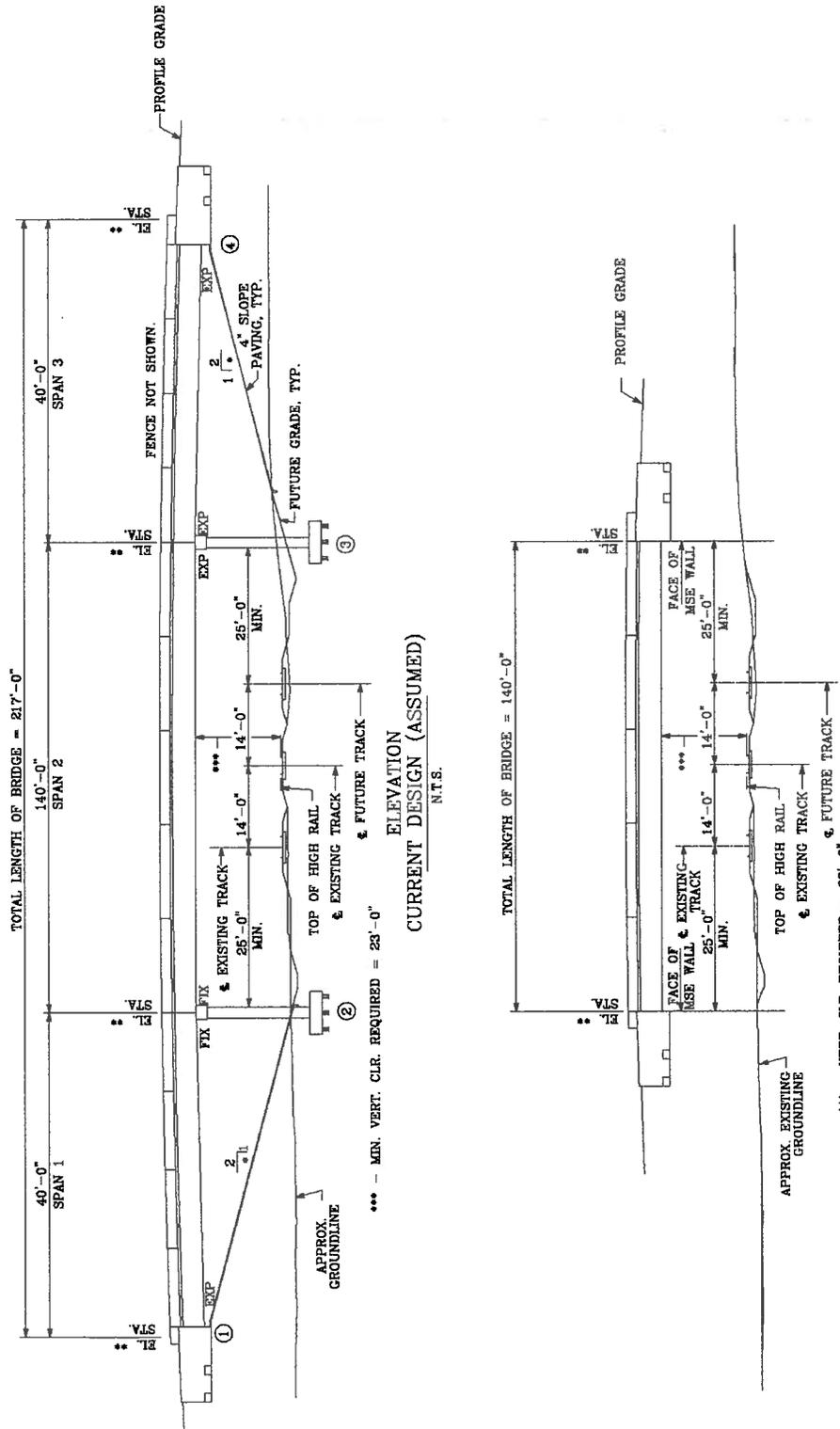


PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR2-1**

DESCRIPTION: **PROVIDE A SINGLE SPAN BRIDGE OVER CSX WITH
 WALLED ABUTMENTS**

SHEET NO.: **3 of 5**



*** - MIN. VERT. CLR. REQUIRED = 23'-0"
 ELEVATION
 CURRENT DESIGN (ASSUMED)
 N.T.S.

*** - VERT. CLR. REQUIRED = 23'-0"
 ELEVATION
 ALTERNATIVE
 N.T.S.

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR2-1**

DESCRIPTION: **PROVIDE A SINGLE SPAN BRIDGE OVER CSX WITH
WALLED ABUTMENTS**

SHEET NO.: 4 of 5

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

3 span (approximate configuration: 40'+140'+40'), 217' long, 163' wide bridge.

Area of bridge deck = 217' X 163' = 35,371 SF

Alternative BR-1:

This alternative proposes the elimination of the end spans and providing walled abutments for a 140' single span bridge.

Area of bridge deck = 140' X 163' = 22,820 SF

Area of MSE walls (assume 30' high along the abutment tapering down parallel to RR along embankment at an average height of 15' = [2 * 30' * 190' (length of wall along skew) + 2 * 2 * 15' * 60' (length of wall along slope of embankment)] = 9000 SF

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445 ALTERNATIVE NO.: **BR2-2**

DESCRIPTION: **COMBINE BIKE LANE AND SIDEWALK AS A 10' MULTI-USE TRAIL** SHEET NO.: 1 of 4

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 248' long X 64' wide, structurally deficient bridge (Sufficiency Rating: 48.37) over CSX RR built in 1954, with a new 217' long X 163' wide bridge, assumed to comprise of 3 spans (approximate configuration: 40' + 140' + 40').

The 163' bridge cross section accommodates three (3) 12' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 24' median (20' raised and 2' buffers on either side).

Alternative:

The alternative proposes combining the bike lane and sidewalk as a 10' multi-use trail thus reducing the bridge cross section to 155'. All other geometry remains the same as in the assumed original design.

Opportunities:

- Bridge Cost savings by reducing total bridge width
- May provide an opportunity for reduced Right-of-way requirements
- May provide an opportunity for improved safety and traffic operations especially with regards to bicyclists' and pedestrians

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The horizontal clearance requirements for Rail Road and all other geometry will be maintained as in the current design. The same beam depth and configuration as in the original design can be used for the alternate. The reduced, 155' bridge cross section will accommodate three (3) 12' travel lanes, 2' buffer and 10' multi-use trail on each half of the bridge and a 24' median (20' raised and 2' buffers on either side).

More detailed cost comparisons, taking into account reduction in concrete requirements for reduced median widths and etc., would result in greater cost savings.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,307,189	\$	\$ 3,307,189
ALTERNATIVE	\$ 3,144,873	\$	\$ 3,144,873
SAVINGS	\$ 162,316	\$	\$ 162,316

Illustrations

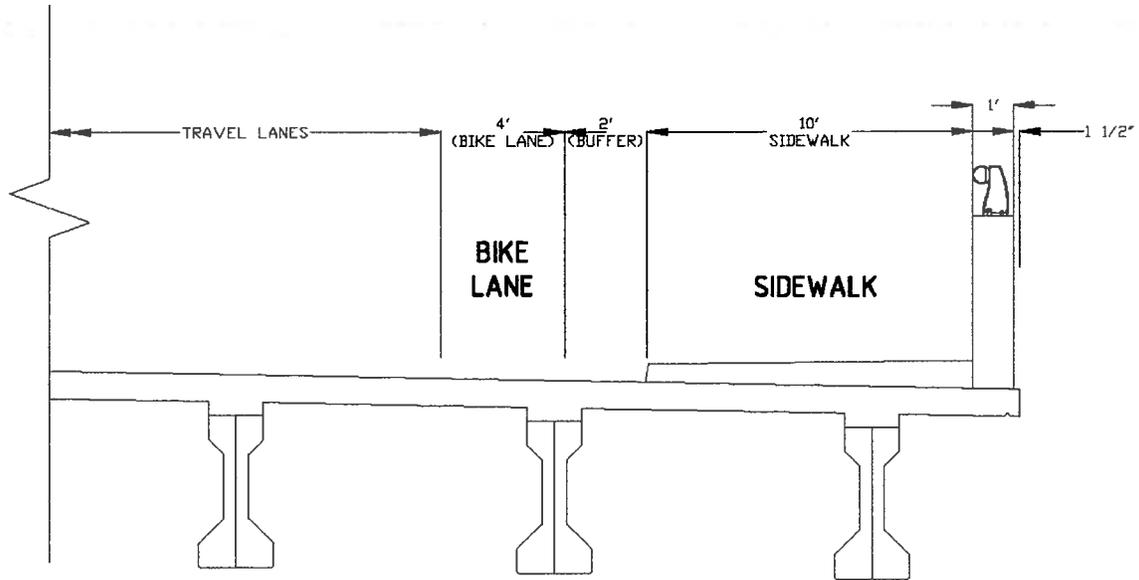


PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

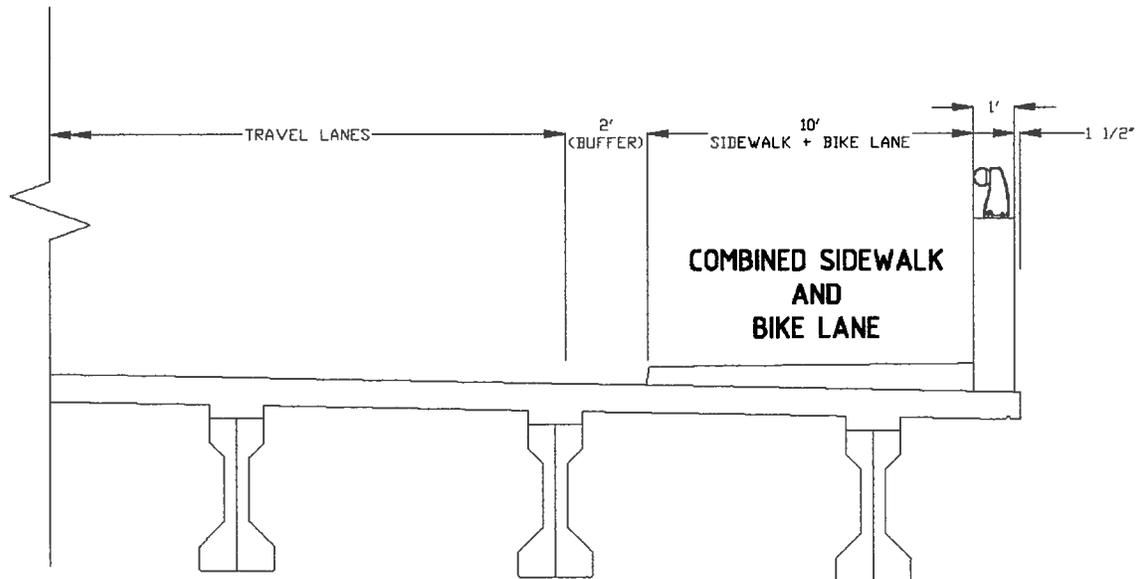
ALTERNATIVE NO.: **BR2-2**

DESCRIPTION: **COMBINE BIKE LANE AND SIDEWALK AS A 10' MULTI-USE TRAIL**

SHEET NO.: **2 of 4**



TYPICAL PARTIAL CROSS SECTION
CURRENT DESIGN (ASSUMED)



TYPICAL PARTIAL CROSS SECTION
ALTERNATIVE

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR2-2**

DESCRIPTION: **COMBINE BIKE LANE AND SIDEWALK AS A 10' MULTI-
USE TRAIL**

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

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

3 span (approximate configuration: 40'+140'+40'), 217' long, 163' wide bridge.

Area of bridge deck = 217' X 163' = 35,371 SF

Alternative BR-1:

This alternative proposes combining the bike-lane and sidewalk to a 10' multi-use trail resulting in an 8' reduction in the total deck width.

Area of bridge deck = 217' X 155' = 33,635 SF

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	BR2-3
DESCRIPTION:	USE 14' MEDIAN WITH 10' RAISED AND 11' TRAVEL LANES	SHEET NO.:	1 of 4

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 248' long X 64' wide, structurally deficient bridge (Sufficiency Rating: 48.37) over CSX RR built in 1954, with a new 217' long X 163' wide bridge, assumed to comprise of 3 spans (approximate configuration: 40' + 140' + 40').

The 163' bridge cross section accommodates three (3) 12' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 24' median (20' raised and 2' buffers on either side).

Alternative:

The alternative proposes reducing the median to 14' (10' raised and 2' buffers on either side) and reducing the travel lanes to 11' thus reducing the bridge cross section to 147'. All other geometry remains the same as in the assumed original design.

Opportunities:

- Bridge Cost savings by reducing total bridge width
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The horizontal clearance requirements for Rail Road and all other geometry will be maintained as in the current design. The same beam depth and configuration as in the original design can be used for the alternate. The reduced, 147' bridge cross section will accommodate three (3) 11' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 14' median (10' raised and 2' buffers on either side).

More detailed cost comparisons, taking into account reduction in concrete requirements for reduced median widths and etc., would result in greater cost savings.

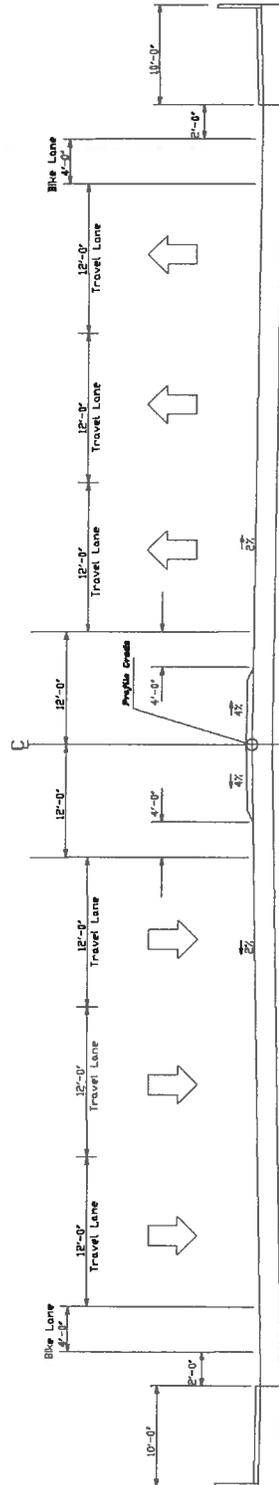
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 3,307,189	\$	\$ 3,307,189
ALTERNATIVE	\$ 2,982,557	\$	\$ 2,982,557
SAVINGS	\$ 324,632	\$	\$ 324,632

PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445**

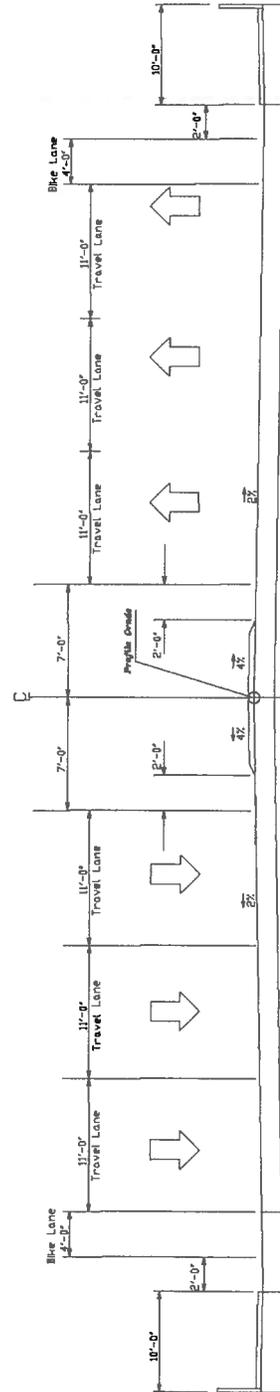
ALTERNATIVE NO.: **BR2-3**

DESCRIPTION: **USE 14' MEDIAN WITH 10' RAISED AND 11' TRAVEL
LANES**

SHEET NO.: **2 of 4**



TYPICAL BRIDGE SECTION
CURRENT
DESIGN



TYPICAL BRIDGE SECTION
ALTERNATIVE

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR2-3**

DESCRIPTION: **USE 14' MEDIAN WITH 10' RAISED AND 11' TRAVEL**
LANES

SHEET NO.: 3 of 4

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

3 span (approximate configuration: 40'+140'+40'), 217' long, 163' wide bridge.

Area of bridge deck = 217' X 163' = 35,371 SF

Alternative BR-1:

This alternative proposes reducing the median to 14' (10' raised) and travel lanes to 11'.

Area of bridge deck = 217' X 147' = 31,899 SF

Value Analysis Design Suggestion



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: BR2-5

DESCRIPTION: COMBINE BR #2 AND BR #3 AND COSTRUCT ONE NEW
BRIDGE

SHEET NO.: 1 of 1

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 248' long X 64' wide, structurally deficient bridge (Sufficiency Rating: 48.37) over CSX RR built in 1954, with a new 217' long X 163' wide bridge, assumed to comprise of 3 spans (approximate configuration: 40' + 140' + 40').

The existing, 160' long X 64' wide, structurally deficient bridge (Sufficiency Rating: 54.93) over Norfolk Southern RR built in 1954, is proposed to be replaced with a new 152' long X 163' wide bridge, assumed to comprise of 3 spans (approximate configuration: 40' + 75' + 40').

The two bridges are separated by approximately 120' with an earth embankment.

Alternative:

The alternative proposes combining both the bridges and providing a single bridge 490' long.

Opportunities:

- Improved clearances for the Rail Roads (CSX & Norfolk Southern)
- Additional room for future Rail Road expansion
- Continuity in the structure
- Elimination of paved slope at interior bents

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The combined bridge, 490' long X 163' wide, may be configured as 40' end spans and three 136' (approx.) intermediate spans with a total of 6 intermediate bents.

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	BR3-1
DESCRIPTION:	PROVIDE A SINGLE SPAN BRIDGE OVER NORFOLK SOUTHERN WITH WALLED ABUTMENTS	SHEET NO.:	1 of 5

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 160’ long X 64’ wide, structurally deficient bridge (Sufficiency Rating: 54.93) over Norfolk Southern RR built in 1954, with a new 152’ long X 163’ wide bridge, assumed to comprise of 3 spans (approximate configuration: 40’ + 75’ + 40’).

Alternative:

The alternative proposes elimination of the end spans and providing walled abutments for a single span, 75’ long X 163’ wide. The single span would provide adequate vertical and horizontal clearance for the existing single track of Norfolk Southern RR and a future track.

Opportunities:

- Bridge Cost savings by reducing total bridge length
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The horizontal clearance requirements for Rail Road and all other geometry will be maintained as in the current design. The same beam depth and configuration as in the original design can be used for the alternate.

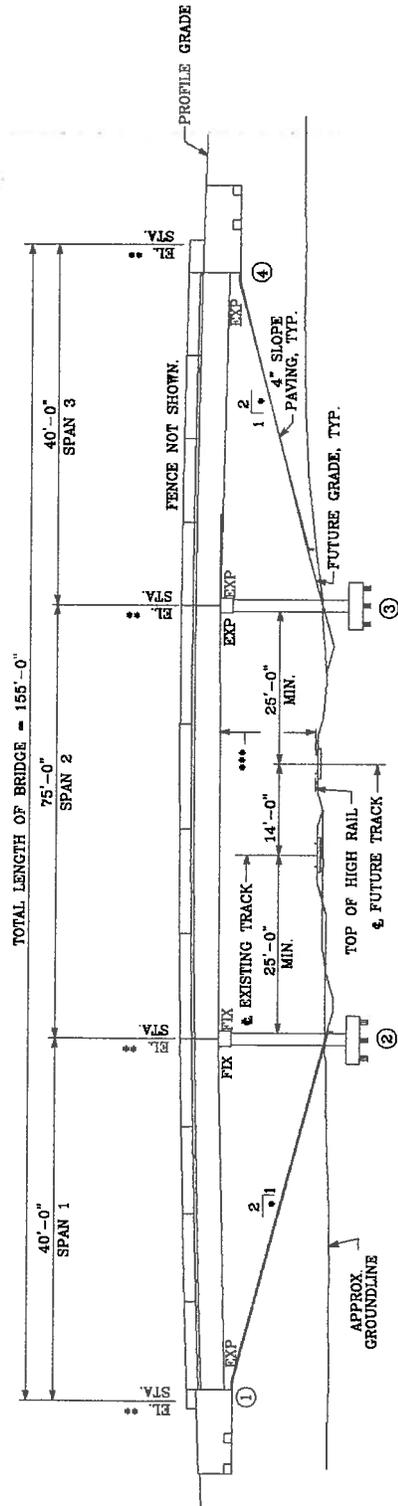
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,316,556	\$	\$ 2,316,556
ALTERNATIVE	\$ 1,667,738	\$	\$ 1,667,738
SAVINGS	\$ 648,819	\$	\$ 648,819

PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

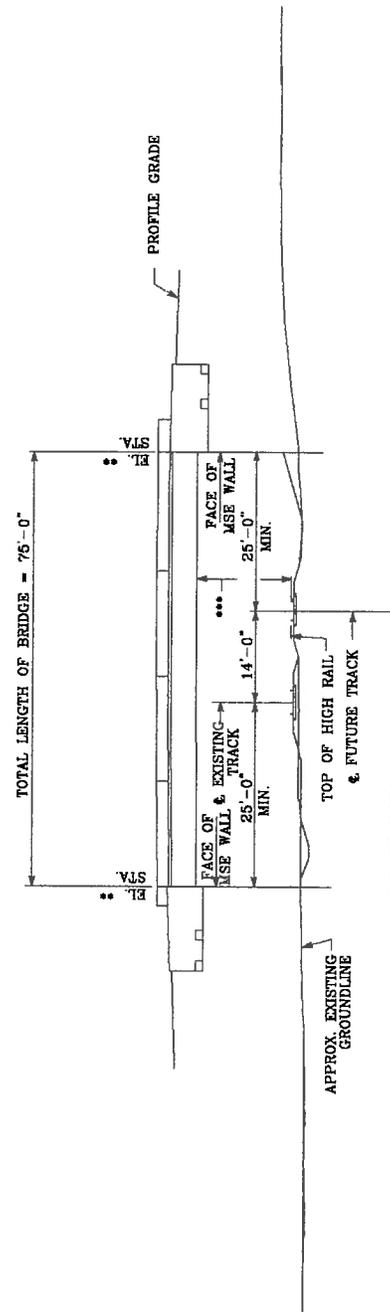
ALTERNATIVE NO.: **BR3-1**

DESCRIPTION: **PROVIDE A SINGLE SPAN BRIDGE OVER NORFOLK SOUTHERN WITH WALLED ABUTMENTS**

SHEET NO.: **3 of 5**



*** - MIN. VERT. CLR. REQUIRED = 23'-0"
 ELEVATION
 CURRENT DESIGN (ASSUMED)
 N.T.S.



*** - VERT. CLR. REQUIRED = 23'-0"
 ELEVATION
 ALTERNATIVE
 N.T.S.

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR3-1**

DESCRIPTION: **PROVIDE A SINGLE SPAN BRIDGE OVER NORFOLK**
SOUTHERN WITH WALLED ABUTMENTS

SHEET NO.: 4 of 5

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

3 span (approximate configuration: 40'+75'+40'), 152' long, 163' wide bridge.

Area of bridge deck = 152' X 163' = 24,776 SF

Alternative BR-1:

This alternative proposes the elimination of the end spans and providing walled abutments for a 75' single span bridge.

Area of bridge deck = 75' X 163' = 12,225 SF

Area of MSE walls (assume 30' high along the abutment tapering down parallel to RR along embankment at an average height of 15' = [2 * 30' * 190' (length of wall along skew) + 2 * 2 * 15' * 60' (length of wall along slope of embankment)] = 9000 SF

Value Analysis Design Alternative



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445 ALTERNATIVE NO.: **BR3-2**

DESCRIPTION: **COMBINE BIKE LANE AND SIDEWALK AS A 10’ MULTI-USE TRAIL ON THE NORFOLK SOUTHERN BRIDGE** SHEET NO.: 1 of 4

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 160’ long X 64’ wide, structurally deficient bridge (Sufficiency Rating: 54.93) over Norfolk Southern RR built in 1954, with a new 152’ long X 163’ wide bridge, assumed to comprise of 3 spans (approximate configuration: 40’ + 75’ + 40’).

The 163’ bridge cross section accommodates three (3) 12’ travel lanes, a 4’ bike lane, 2’ buffer and 10’ raised sidewalk on each half of the bridge and a 24’ median (20’ raised and 2’ buffers on either side).

Alternative:

The alternative proposes combining the bike lane and sidewalk as a 10’ multi-use trail thus reducing the bridge cross section to 155’. All other geometry remains the same as in the assumed original design.

Opportunities:

- Bridge Cost savings by reducing total bridge width
- May provide an opportunity for reduced Right-of-way requirements
- May provide an opportunity for improved safety and traffic operations especially with regards to bicyclists’ and pedestrians

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The horizontal clearance requirements for Rail Road and all other geometry will be maintained as in the current design. The same beam depth and configuration as in the original design can be used for the alternate. The reduced, 155’ bridge cross section will accommodate three (3) 12’ travel lanes, 2’ buffer and 10’ multi-use trail on each half of the bridge and a 24’ median (20’ raised and 2’ buffers on either side).

More detailed cost comparisons, taking into account reduction in concrete requirements for reduced median widths and etc., would result in greater cost savings.

COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,316,556	\$	\$ 2,316,556
ALTERNATIVE	\$ 2,202,860	\$	\$ 2,202,860
SAVINGS	\$ 113,696	\$	\$ 113,696

Illustrations

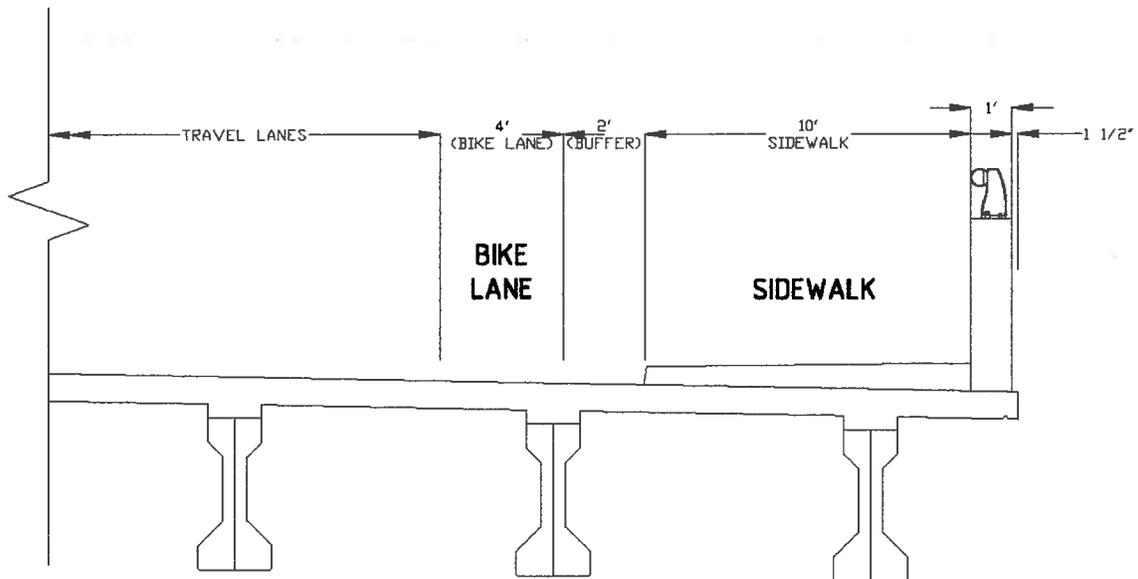


PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

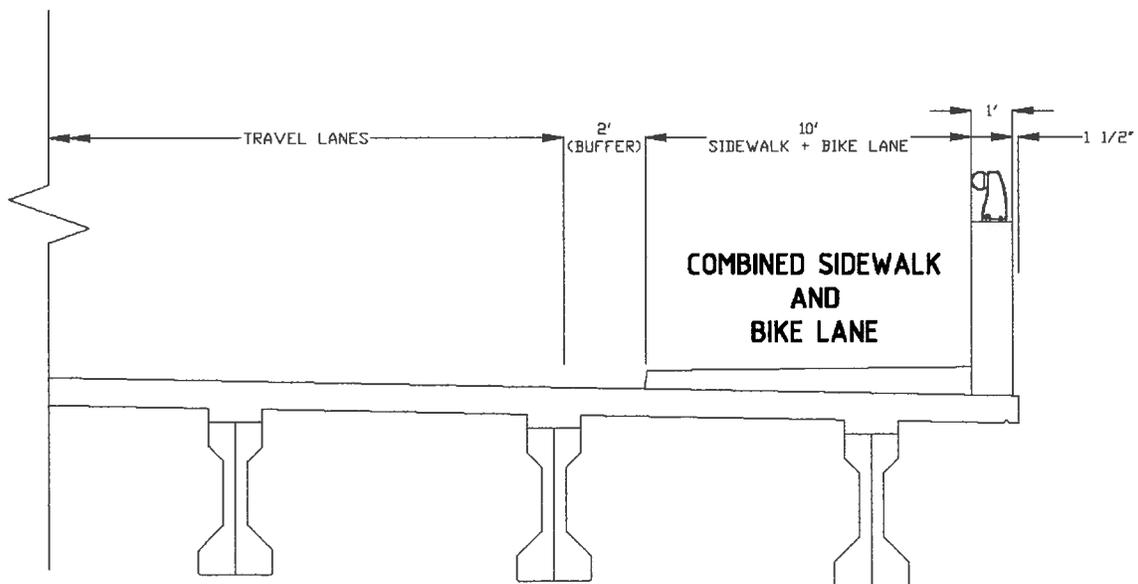
ALTERNATIVE NO.: **BR3-2**

DESCRIPTION: **COMBINE BIKE LANE AND SIDEWALK AS A 10' MULTI-
USE TRAIL ON THE NORFOLK SOUTHERN BRIDGE**

SHEET NO.: **2 of 4**



TYPICAL PARTIAL CROSS SECTION
CURRENT DESIGN (ASSUMED)



TYPICAL PARTIAL CROSS SECTION
ALTERNATIVE

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR3-2**

DESCRIPTION: **COMBINE BIKE LANE AND SIDEWALK AS A 10' MULTI-
USE TRAIL ON THE NORFOLK SOUTHERN BRIDGE**

SHEET NO.: 3 of 4

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

3 span (approximate configuration: 40'+ 72'+40'), 52' long, 163' wide bridge.

Area of bridge deck = 152' X 163' = 24,776 SF

Alternative BR-1:

This alternative proposes combining the bike-lane and sidewalk to a 10' multi-use trail resulting in an 8' reduction in the total deck width.

Area of bridge deck = 152' X 155' = 23,560 SF

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	BR3-3
DESCRIPTION:	USE 14' MEDIAN WITH 10' RAISED AND 11' TRAVEL LANES ON NORFOLK SOUTHERN BRIDGE	SHEET NO.:	1 of 4

Original Design:

(The VE Team is cognizant of the fact that at the time of the Study, the project was in its concept stage. Preliminary plans and layout of the proposed bridge design/modifications had not yet been developed. Assumptions have been made on the most feasible layout of the bridges.)

The original design calls for the replacement of the existing, 160' long X 64' wide, structurally deficient bridge (Sufficiency Rating: 54.93) over Norfolk Southern RR built in 1954, with a new 152' long X 163' wide bridge, assumed to comprise of 3 spans (approximate configuration: 40' + 75' + 40').

The 163' bridge cross section accommodates three (3) 12' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 24' median (20' raised and 2' buffers on either side).

Alternative:

The alternative proposes reducing the median to 14' (10' raised and 2' buffers on either side) and reducing the travel lanes to 12' thus reducing the bridge cross section to 147'. All other geometry remains the same as in the assumed original design.

Opportunities:

- Bridge Cost savings by reducing total bridge width
- May provide an opportunity for reduced Right-of-way requirements

Risks:

- Re-design effort will require minimal or no additional time as it is currently in the concept phase
- Roadway alignments may require minor modifications

Technical Discussion:

The horizontal clearance requirements for Rail Road and all other geometry will be maintained as in the current design. The same beam depth and configuration as in the original design can be used for the alternate. The reduced, 147' bridge cross section will accommodate three (3) 11' travel lanes, a 4' bike lane, 2' buffer and 10' raised sidewalk on each half of the bridge and a 14' median (10' raised and 2' buffers on either side).

More detailed cost comparisons, taking into account reduction in concrete requirements for reduced median widths and etc., would result in greater cost savings.

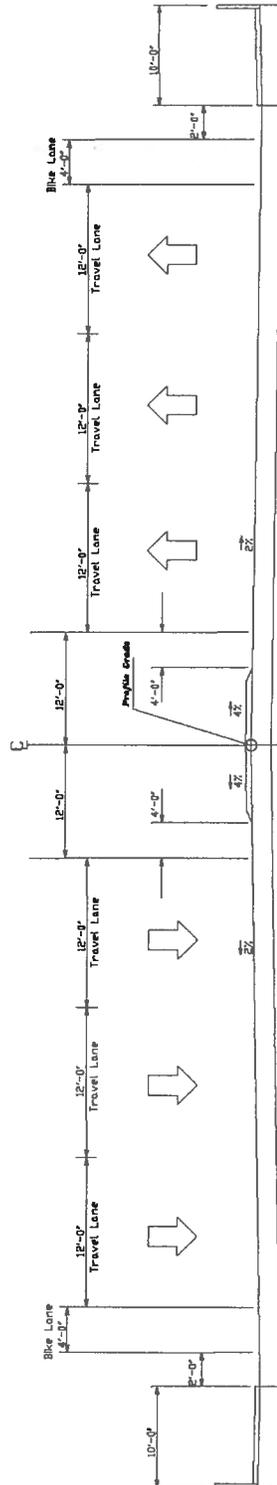
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$ 2,316,556	\$	\$ 2,316,556
ALTERNATIVE	\$ 2,089,164	\$	\$ 2,089,164
SAVINGS	\$ 227,392	\$	\$ 227,392

PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

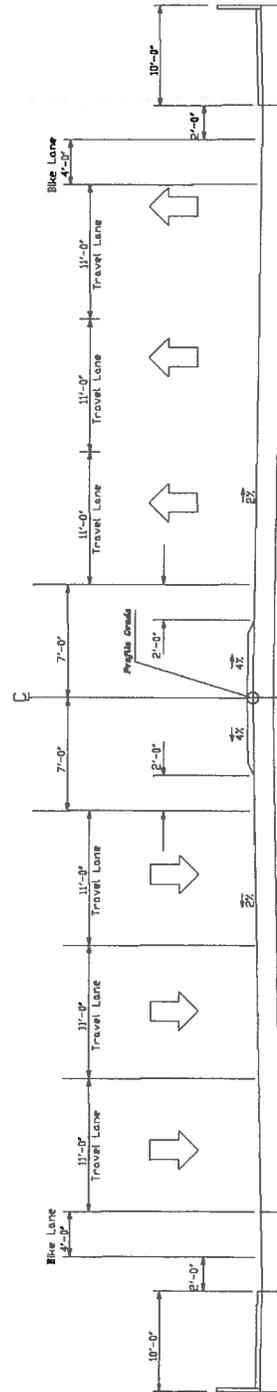
ALTERNATIVE NO.: **BR3-3**

DESCRIPTION: **USE 14' MEDIAN WITH 10' RAISED AND 11' TRAVEL LANES ON NORFOLK SOUTHERN BRIDGE**

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



TYPICAL BRIDGE SECTION
CURRENT DESIGN



TYPICAL BRIDGE SECTION
ALTERNATIVE

Calculations



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **BR3-3**

DESCRIPTION: **USE 14' MEDIAN WITH 10' RAISED AND 11' TRAVEL**
LANES ON NORFOLK SOUTHERN BRIDGE

SHEET NO.: 3 of 4

Note:

- 1) The VE team is cognizant of the fact that the project design is in its concept phase.
- 2) Calculations below are based on the Project Concept Plan provided at the time of the VE study.
- 3) Costs savings are based on reduction of structure width from the current design.
- 4) Further cost savings may be realized due to reduction in sub structure components but these components were not addressed since the substructure design had not been completed at the time of the VE study.

Current Design: (Assumed)

3 span (approximate configuration: 40'+75'+40'), 152' long, 163' wide bridge.

Area of bridge deck = 152' X 163' = 24,776 SF

Alternative BR-1:

This alternative proposes reducing the median to 14' (10' raised) and travel lanes to 11'.

Area of bridge deck = 152' X 147' = 22,344 SF

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	RD-1
DESCRIPTION:	CONSTRUCT 11' TRAVEL LANES THROUGHOUT THE PROJECT.	SHEET NO.:	1 of 4

Original Design:

Original design calls for construction of 12' travel lanes from Radium Springs Road to Thornton Drive.

Alternative:

Reduce width of travel lanes from 12' to 11' from Radium Springs Road to Thornton Drive, including bridges over the Norfolk & Southern and CSX rail lines.

Opportunities:

- Reduction in pavement buildup costs.
- Reduction in costs of bridge construction over CSX and Norfolk Southern rail lines.
- Provides consistent typical section throughout the project.

Risks:

- Minimal design impacts.
- Requires an exception to GDOT policy.

Technical Discussion:

Reduction of width of travel lanes from Radium Springs Road to Thornton Drive would result in 6' of full build-up widening that would not have to be constructed, resulting in significant cost savings. The typical sections for the project west of Radium Springs Road have proposed lane widths of 11', constructing the project with 11' lanes would result in a consistent typical section.

Although 11' lanes would require an exception to GDOT policy, AASHTO's "Policy on Geometric Design of Highways 2004" states that 11' lanes are permissible. It also states that under interrupted-flow operating conditions at low speeds (45 mph or less), narrower lanes are normally adequate and have some advantages. (See Pages 472-473)

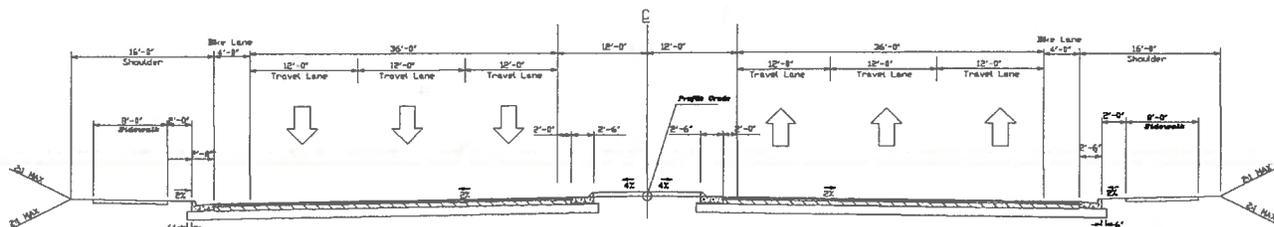
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$17,589,755	\$	\$17,589,755
ALTERNATIVE	\$16,755,166	\$	\$16,755,166
SAVINGS	\$834,665	\$	\$834,665

PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

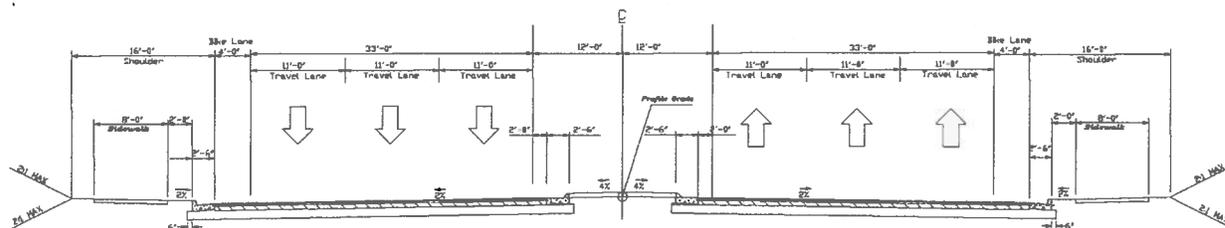
ALTERNATIVE NO.: RD-1

DESCRIPTION: CONSTRUCT 11' TRAVEL LANES THROUGHOUT THE PROJECT

SHEET NO.: 2 of 4



ROADWAY TYPICAL SECTION
ORIGINAL DESIGN



ROADWAY TYPICAL SECTION
ALTERNATIVE DESIGN

Calculations



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: RD-1

DESCRIPTION: CONSTRUCT 11' TRAVEL LANES THROUGHOUT THE PROJECT.

SHEET NO.: 3 of 4

ROADWAY SAVINGS UTILIZING 11' LANES.

AFFECTED PAY ITEMS:

Original Estimate

A- GAB	\$2,891,340
B- 25.0 mm SUPERPAVE	\$5,166,174
C- 19.0 mm SUPERPAVE	\$1,291,566
D- 12.5 mm SUPERPAVE	\$1,029,180
E- GRADING	\$ 500,000

REDUCE ROADWAY LANE WIDTHS TO 11' FROM RADIUM SPRINGS ROAD EAST TO THE PROJECT TERMINUS STATION 148+50 TO 255+00.

- 255+00 TO 148+50 = 10,650 LF LESS 350' OF BRIDGES =>10,300'
- 1'/LANE, 3 LANES PER SIDE, 2 SIDES = 6' TOTAL WIDTH
- PERCENT OF AFFECTED PROJECT LENGTH 10,300'/14,300' TOTAL = 72.03%
- PERCENT OF ROADWAY SAVED = 6' SAVED / 80' TOTAL WIDTH = 7.50%

BRIDGE SAVINGS UTILIZING 11' LANES.

Original Estimate(From BR2-2 andBR3-2)

CSX and Norfolk & Southern Railroad Bridges: \$2,105,960 + \$3,006,535 = \$5,112,495
(3 lanes/roadway) x (1'/lane) x (2 roadways) x (336 LF) = 2016 SF
2016 SF X (\$85 / SF) = \$171,360

Proposed Estimate

CSX and Norfolk & Southern Railroad Bridges: \$5,112,495 + \$171,360 = \$4,941,135

Value Analysis Design Alternative



PROJECT:	Georgia Department of Transportation – NHS-0002-00(445) SR 520 – Dougherty County – P.I. Number 0002445	ALTERNATIVE NO.:	RD-2
DESCRIPTION:	: MOVE 4' BIKE PATH TO A 10' MULTI USE TRAIL FROM FRONT STREET TO THE PROJECT TERMINUS	SHEET NO.:	1 of 4

Original Design:

The original design provides a 4" bike lane as part of the travel way throughout the entire limits of the project.

Alternative:

The alternative design would propose accommodating bike traffic by relocating it to a 10' multi use trail along both sides of the roadway from Front Street to the project terminus.

Opportunities:

- Reduced bridge and pavement costs.
- Remove bike traffic from “merge movements in the interchange.

Risks:

- Increase sidewalk/trail cost
-

Technical Discussion:

Accommodating bike traffic on the roadway is generally considered more desirable than on a multi-use trail. However, this corridor may have some distinct benefits to the multi-use trail concept. One would anticipate both pedestrian and bike traffic outside of the downtown area would be primarily associated with the college so the issues associated with mixing bike with older and younger pedestrians would be lessened. This configuration would also present the opportunity to segregate the multiuse trail on a separate structure over the Flint River. This would lessen the negative effects of widening the existing bridge and provide enhanced pedestrian and bike access to the riverfront/park areas.

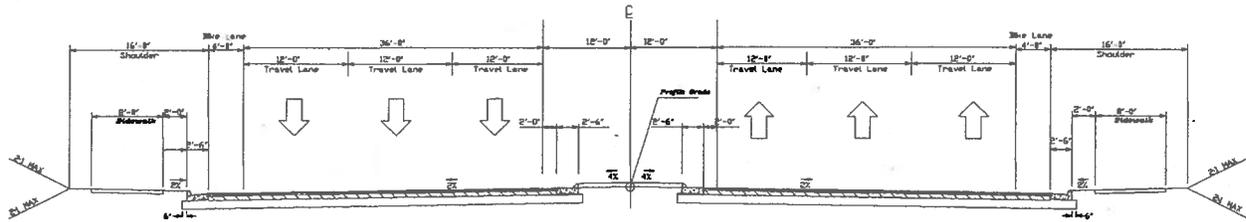
COST SUMMARY	INITIAL COST	PRESENT WORTH RECURRING COSTS	PRESENT WORTH LIFE-CYCLE COST
ORIGINAL DESIGN	\$13,889,209	\$	\$13,889,209
ALTERNATIVE	\$11,875,078	\$	\$11,875,078
SAVINGS	\$2,024,131	\$	\$ 2,024,131

PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

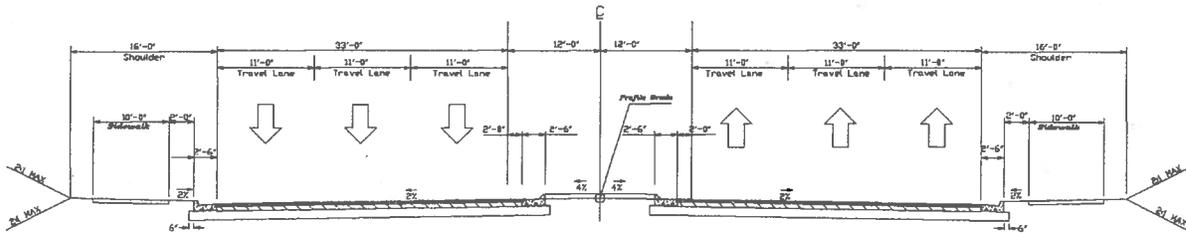
ALTERNATIVE NO.: **RD-2**

DESCRIPTION: **MOVE 4' BIKE PATH TO A 10' MULTI USE TRAIL FROM FRONT STREET TO THE PROJECT TERMINUS**

SHEET NO.: **2 of 4**



ROADWAY TYPICAL SECTION
ORIGINAL DESIGN



ROADWAY TYPICAL SECTION
ALTERNATIVE DESIGN

Calculations



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: RD-2

DESCRIPTION: MOVE 4' BIKE PATH TO A 10' MULTI USE TRAIL FROM
FRONT STREET TO THE PROJECT TERMINUS

SHEET NO.: 3 of 4

ROADWAY SAVINGS:

AFFECTED PAY ITEMS-

A- GAB	\$2,891,340
B- 25.0 mm SUPERPAVE	\$5,166,174
C- 19.0 mm SUPERPAVE	\$1,291,180
D- 12.5 mm SUPERPAVE	\$1,029,180
E- GRADING	\$ 500,000

REDUCE ROADWAY WIDTH BY 4' EACH DIRECTION FROM STATION 127+00 TO STATION 255+00
AND RELOCATE THE BIKE PATH TO A 10' MULTI-USE TRAIL.

- 255+00 TO 127+00 = 12,800 LF LESS 1150' OF BRIDGES =>11,650'
- 4' PER SIDE, 2 SIDES = 8' TOTAL WIDTH
- PERCENT OF AFFECTED PROJECT LENGTH 11,650'/14,300' TOTAL = 81.47%
- PERCENT OF ROADWAY SAVED = 8' SAVED / 80' TOTAL WIDTH = 10.00%

BRIDGE SAVINGS:

See BRF-2

F. Bridge savings	= \$ 1,084,600
Sub-Total	\$ 1,084,600

MUTIUSE TRAIL COST:

G- SIDEWALK \$ 28.19 / SY

WIDEN THE SIDEWALK/MULTI USE TRAIL 2' EACH DIRECTION
-(2' PER SIDE x 2 SIDES TOTAL x 11,650 LF) / (9SF/SY) = 5178 SY

G. Additional Multi-Use Trail Cost	5178 SY x \$ 28.19 = \$145,968
Sub-Total	\$ 145,968

COST WORKSHEET



PROJECT: Georgia Department of Transportation-NHS-0002-00(445)					ALTERNATIVE NO.: RD-2			
SR 520 -Dougherty County - P.I. Number 0002445								
DESCRIPTION: Move 4' bike path to a 10' multi-use trail from Front Street to the Project terminus					SHEET NO.: 4 of 4			
CONSTRUCTION ITEM			ORIGINAL ESTIMATE			PROPOSED ESTIMATE		
ITEM	UNITS	NO. OF UNITS*	COST/ UNIT	TOTAL	NO. OF UNITS	COST/ UNIT	TOTAL	
GAB	LS	0.8147	\$ 2,891,340.00	\$2,355,575	0.73323	\$ 2,891,340.00	\$2,120,017	
25 mm	LS	0.8147	\$ 5,166,174.00	\$4,208,882	0.73323	\$ 5,166,174.00	\$3,787,994	
19 mm	LS	0.8147	\$ 1,291,566.00	\$1,052,239	0.73323	\$ 1,291,566.00	\$947,015	
12.5 mm	LS	0.8147	\$ 1,029,180.00	\$838,473	0.73323	\$ 1,029,180.00	\$754,626	
Grading	LS	0.8147	\$ 500,000.00	\$407,350	0.73323	\$ 500,000.00	\$366,615	
4" concrete sidewalk	LS	0.8147	\$ 709,514.00	\$578,041	0.8147	\$ 709,514.00	\$578,041	
Bridges 1,2,3, (BRF-2)	SF	36250	\$ 85.00	\$3,081,250	24650	\$ 85.00	\$2,095,250	
10' multi-use trail (widen SW)	SY	0		\$0	5178	\$ 28.19	\$145,968	
<p>* The roadway is 81.47% of the total project length</p> <p>Proposed Estimate is 90% of original estimate (bike lanes are 10%) or $0.90 \times 81.47 = 0.73323$</p>								
Sub-total				\$12,521,809			\$10,795,525	
Mark-up at 10.00%				\$1,252,181			\$1,079,553	
TOTAL				\$13,773,990			\$11,875,078	
Estimated Savings:							\$1,898,912	

Value Analysis Design Suggestion



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)**
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: **RD-4**

DESCRIPTION: **CONSIDER PAVEMENT DESIGN ALTERNATIVES**
REGARDING THICKNESS BUILD-UPS.

SHEET NO.: 1 of 1

Original Design:

There are no typical sections given for pavement and graded aggregate base thicknesses to use for the project.

Alternative:

Provide a proposed pavement design that can be reviewed to determine optimal build-up at the most economical cost.

Opportunities:

- Material cost savings
- Reduced construction time

Risks:

- None, pavement design must be completed for the design of the project.
-

Technical Discussion:

Determination of an initial pavement design and thickness will allow analysis to determine if the proposed design will be optimal in terms of cost and performance.

Value Analysis Design Suggestion



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445**

ALTERNATIVE NO.: **RD-5**

DESCRIPTION: **CONSIDER REDUCING THE NUMBER OF MEDIAN
OPENINGS AND PROVIDE ADDITIONAL SIGNALS**

SHEET NO.: 1 of 1

Original Design:

The original design proposes a total of 12 median openings on the project. The 3000' between Station 170+00 and Station 200+00 has 4 median openings.

Alternative:

The alternative suggestion is to reduce the number of median openings and limit the "Full Median Breaks" to only the signalized intersections. If it is determined that additional access between signalized intersections is necessary, channelized / partial median opening should be considered.

Opportunities:

- Improve operations/access management
- Reduce paving cost
- Conform to GDOT policy

Risks:

- Resistance from the local merchants

Technical Discussion:

The median openings in the area of Station 170+00 to Station 200+00 have a spacing of 800' to 850', which is less than the desirable minimum of 1000'. These median opening also violate GDOT policy by providing full median breaks at unsignalized locations on a 6-lane roadway. These guidelines are outlined in Section 7.3- Median Openings in the GDOT Design Policy Manual.

Value Analysis Design Suggestion



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: RD-8

DESCRIPTION: COORDINATE TRAFFIC CONTROL PLAN WITH “NEW
CLARK STREET LOCAL TRAFFIC ONLY”

SHEET NO.: 1 of 1

Original Design:

Conceptual design does not address traffic control schemes to be utilized during construction.

Alternative:

The alternative suggests exploring and utilizing alternate routes during construction to minimize traffic congestion along SR 520.

Opportunities:

- Promotes safety in work zones.
- Potential to reduce M.O.T. costs.
- Reduce construction time.

Risks:

- Minimal design impacts
- Analyze connector roads for sufficiency.

Technical Discussion:

The use of alternate routes and designation of SR 520 for local traffic use only temporarily during construction could help ease traffic congestion as outside widening will necessitate outside lane closures of SR 520 in both directions. Clark Street, on the north side of the project, may be a viable alternative to redirect traffic from SR 520 during construction periods in which outside lane closures are required. Broad Street, also on the north side of the project, may also be utilized to alleviate through traffic on SR 520. All logical alternative routes should be evaluated for sufficiency to ensure that the routes will be able to withstand additional traffic volume.

Value Analysis Design Suggestion



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: RD-9

DESCRIPTION: VERIFY THE NORFOLK SOUTHERN RAILROAD IS
STILL AN ACTIVE LINE

SHEET NO.: 1 of 1

Original Design:

The original design provides a 152' span on SR 520 over the NSRR Right of Way.

Alternative:

The alternative would be to confirm the NSRR spur line is still operational and pursue the possibility of eliminating the existing grade separation.

Opportunities:

- Reduce bridge widening costs.
- Reduce bridge maintenance cost.

Risks:

- Additional embankment cost.

Technical Discussion:

It was noted on some mapping sources viewed by the project team that the NSRR was no longer shown. From an inspection of the aerial photography of the area it appeared that this rail line may not be currently in use. The study team felt that confirmation that the rail line was still active is recommended.

Value Analysis Design Suggestion



PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: RD-10

DESCRIPTION: CONSIDER USING DOUBLE LEFT TURN/”U” TURN AT
SIGNALS TO CALM TRAFFIC.

SHEET NO.: 1 of 1

Original Design:

Conceptual design calls for single left turns and no “U” turn outlets at traffic signals.

Alternative:

Consider using double left turn lanes and “U” turn outlets at signals to calm traffic, and reduce cycle times for traffic crossing SR 520.

Opportunities:

- More efficient traffic flow.
- Shorter signal cycle times for SR 520.

Risks:

- Minimal design impacts.

Technical Discussion:

Adding double left turn lanes at signalized intersections could benefit the project by reducing traffic stack on SR 520 and reducing signal cycle times for SR 520. U-turn outlets should be evaluated for merit of inclusion at specific interchanges. Traffic counts should indicate where these proposed improvements may have the greatest impact.

Value Analysis Design Suggestion

**PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445**

ALTERNATIVE NO.: RD-11

**DESCRIPTION: REDESIGN RADIUM SPRINGS ROAD TO DECREASE
INTERSECTION ANGLE.**

SHEET NO.: 1 of 2

Original Design:

The original design proposes an ~ 1500' radius on SR520 at the intersection of Radium Springs Road. The Radium Springs Road alignment consists of two tangents with a deflection angle of ~ 25 ^.

Alternative:

The alternative would be to increase the radius of the curve on SR520 and introduce a curve on Radium Springs Road in order to “flatten” the angle of the intersection.

Opportunities:

- Improve intersection geometry
- Improve intersection operations
- Reduce angle intersection accidents

Risks:

- Increased Right of Way cost
- Increased paving costs

Technical Discussion:

Angle Intersection accidents have been identified as an issue within the project corridor. The geometry of the Radium Springs Road (RSR) intersection can be improved with little impact to the implementation of the project.

By introducing a curve on RSR to replace the proposed/existing P.I., the horizontal approach angle on both the north and south legs of the intersection can be improved. This will result in additional Right of Way in both the NE and SE quadrants of the intersection. Both quadrants are already showing required Right of Way. The modification will require displacement of the structure in the NR quadrant which is already damaged or potentially displaced by the original design.

Increasing the radius on SR-520 will improve the intersection angle. It appears that this modification can be done without impacting any improvements on the properties in the SE and SW quadrants.

Illustrations

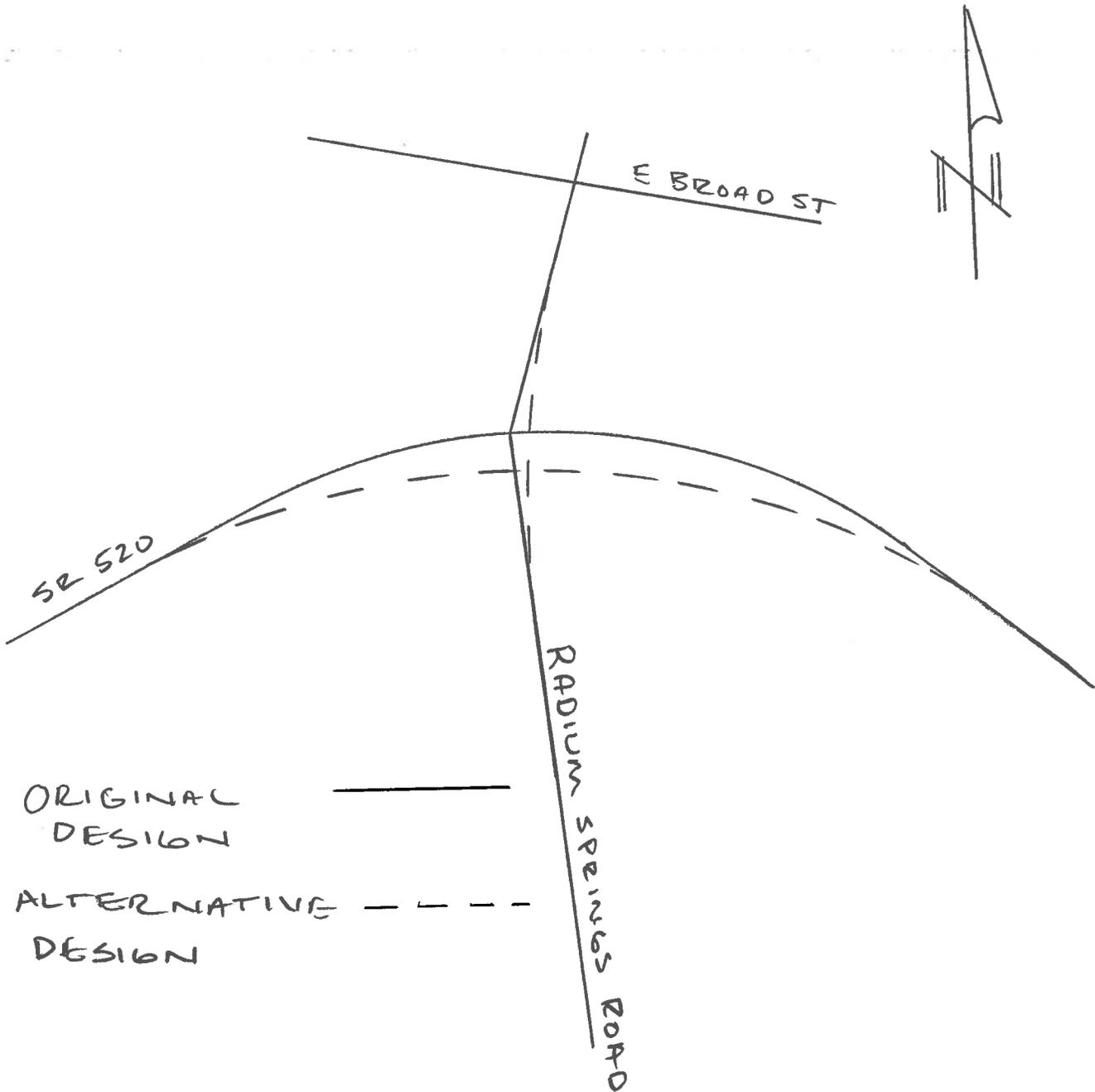


PROJECT: Georgia Department of Transportation – NHS-0002-00(445)
SR 520 – Dougherty County – P.I. Number 0002445

ALTERNATIVE NO.: RD-11

DESCRIPTION: REDESIGN RADIUM SPRINGS ROAD TO DECREASE
INTERSECTION ANGLE

SHEET NO.: 2 of 2



N.T.S.

Project Description

PROJECT DESCRIPTION

This project consists of improvements along 2.91 miles of SR 520 Business from Jefferson Street to Thornton Drive, City of Albany, Dougherty County, Georgia. The improvements include: widening from four lanes to six lanes; new bike lanes; sidewalks; and a raised median. There are three bridges along the route which will be widened accordingly. They include the Flint River Bridge, the CSX and the Norfolk and Southern Bridges. The project has been designed to minimize Right of Way acquisition.

The projected construction cost is \$28,017,674.16, plus a 10% E & C and Right of Way acquisition of \$8,208,660.00; for a total project budget of \$39,028,071.88.

REPRESENTATIVE DOCUMENTS

- Georgia Department of Transportation
 - The Concept Report and Plans
 - Construction Cost Estimates

The VE Team utilized the supplied project materials noted above and the current GDOT standard drawings, details and specifications.

Estimate Report for file "P.I. #0002445 SR 520 Business"

Section Roadway Items					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
153-1300	1	EA	90000.00	FIELD ENGINEERS OFFICE TP 3	90000.00
210-0100	1	LS	500000.00	GRADING COMPLETE -	500000.00
310-1101	96378	TN	30.00	GR AGGR BASE CRS, INCL MATL	2891340.00
402-3121	64577	TN	80.00	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM	5166174.40
402-3130	12108	TN	85.00	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	1029180.00
402-3190	16144	TN	80.00	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM	1291556.00
413-1000	17612	GL	2.00	BITUM TACK COAT	35224.00
441-0104	25169	SY	28.19	CONC SIDEWALK, 4 IN	709514.11
441-0740	3460	SY	34.95	CONCRETE MEDIAN, 4 IN	120927.00
441-6720	21495	LF	10.75	CONC CURB & GUTTER, 6 IN X 30 IN, TP 7	231071.25
441-6725	31382	LF	12.20	CONC CURB & GUTTER, 12 IN X 30 IN, TP 2	382860.40
634-1200	70	EA	100.00	RIGHT OF WAY MARKERS	7000.00
641-1100	100	LF	40.00	GUARDRAIL, TP T	4000.00
641-1200	2000	LF	35.00	GUARDRAIL, TP W	70000.00
641-2200	250	LF	40.00	DBL FACED GUARDRAIL, TP W	10000.00
641-5001	8	EA	650.00	GUARDRAIL ANCHORAGE, TP 1	5200.00
641-5012	8	EA	2100.00	GUARDRAIL ANCHORAGE, TP 12	16800.00
Section Sub Total:					\$12,560,847.16

Section Drainage					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
xxx-xxxx	3	mi	250000.00	DRAINAGE	750000.00
Section Sub Total:					\$750,000.00

Section Erosion Control					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
xxx-xxxx	1	Lump Sum	1500000.00	Erosion Control	1500000.00
Section Sub Total:					\$1,500,000.00

Section Traffic Control					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
xxx-xxxx	1	Lump Sum	2500000.00	TRAFFIC CONTROL	2500000.00
Section Sub Total:					\$2,500,000.00

Section Signalization					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
639-4004	20	EA	3800.00	STRAIN POLE, TP IV	76000.00
647-1000	1	LS	74000.00	TRAFFIC SIGNAL INSTALLATION NO - 1	74000.00
647-1000	1	LS	74000.00	TRAFFIC SIGNAL INSTALLATION NO - 2	74000.00
647-1000	1	LS	74000.00	TRAFFIC SIGNAL INSTALLATION NO - 3	74000.00
647-1000	1	LS	74000.00	TRAFFIC SIGNAL INSTALLATION NO - 4	74000.00
647-1000	1	LS	74000.00	TRAFFIC SIGNAL INSTALLATION NO - 5	74000.00
xxx-xxxx	1	Lump Sum	56000.00	STRIPING	56000.00
xxx-xxxx	1	Lump Sum	99000.00	ROADSIDE SIGNS	99000.00
Section Sub Total:					\$601,000.00

Section Major Structures					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
xxx-xxxx	83077	SF	75.00	Bridge #1	6230775.00
xxx-xxxx	30318	SF	75.00	Bridge #2	2273850.00

xxx-xxxx	21349	SF	75.00	Bridge #3	1601175.00
Section Sub Total:					\$10,105,800.00

Total Estimated Cost: \$28,017,647.16

Subtotal Construction Cost \$28,017,647.16

E&C Rate 10.0 % \$2,801,764.72

Inflation Rate 0.0 % @ 3.0 Years \$0.00

Total Construction Cost \$30,819,411.88

Right Of Way \$8,208,660.00

ReImb. Utilities \$0.00

Grand Total Project Cost \$39,028,071.88

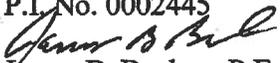
**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: NHS-0002-00(445), Dougherty County
SR 520 Business from Washington St.
To Thornton Drive
P.I. No. 0002445

OFFICE: Urban Design

DATE: January 17, 2006

FROM: 
James B. Buchan, P.E., State Urban Design Engineer

TO Meg Pirkle, P.E., Assistant Director of Preconstruction

SUBJECT **Project Concept Report**

Submitted via PDF format to conceptreport@dot.state.ga.us is the original copy of the Concept Report for your further handling for approval in accordance with the Plan Development Process (PDP). Please distribute to the appropriate offices for approval.

JBB:AAJ 
Attachment

C: Johnny Quarles

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

Office of Urban Design

PROJECT CONCEPT REPORT

Project Number: NHS-0002-00 (445)

County: Dougherty

P. I. Number: 0002445

Federal Route Number: US 82 Business/ US 19 Business

State Route Number: SR 520

Recommendation for approval:

DATE 1/23/06

Albert Shelby
Project Manager

DATE 1-23-06

Daniel Hill
for State Urban Design Engineer

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

DATE _____

State Transportation Planning Administrator

DATE _____

State Transportation Financial Management Administrator

DATE _____

State Environmental/Location Engineer

DATE _____

State Traffic Safety & Design Engineer

DATE _____

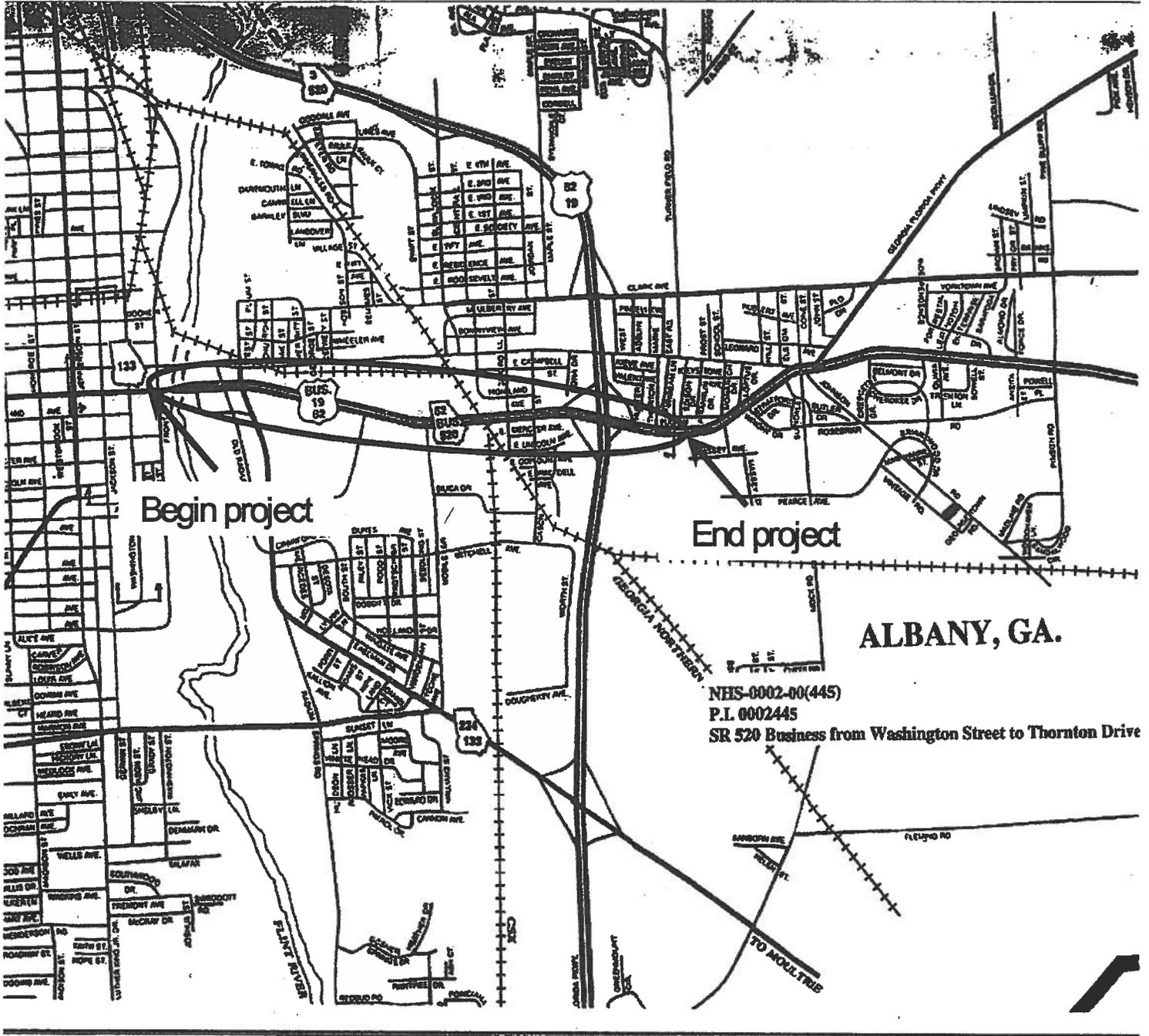
District Engineer – District 4

DATE _____

Project Review Engineer

DATE _____

State Bridge Design Engineer



Project Concept Report Page 3
Project Number: NHS-0002-00 (445)
P. I. Number: 0002445
County: Dougherty

Location: This project is located in the City of Albany in Dougherty County. The project includes 2.91 miles from Jefferson Street (MP 4.17) to Thornton Drive (MP 7.08) on SR 520 Business (Oglethorpe).

Need and Purpose: See attachment #1

Description of the proposed project: The project consists of improvements along 2.91 miles of SR 520 Business from Jefferson Street (MP 4.17) to Thornton Drive (MP 7.08); the improvements include widening from four lanes (2 in each direction) to six lanes (three in each direction), the addition of bike lanes, sidewalks and a raised median.

Is the project located in a Non-attainment area? _____ Yes X No.

PDP Classification: Major X Minor

Federal Oversight: Full Oversight (), Exempt(X), State Funded (), or Other ()

Functional Classification: Urban Principal Arterial

U. S. Route Number(s): US 19 Bus., US 82 Bus. **State Route Number(s):** 520

Traffic (AADT):

Current Year: (2010) 41050 Design Year: (2030) 52400

Existing design features:

- **Typical Section:**
 - From Jefferson Street to Front Street: five 12' travel lanes with 5' sidewalks and urban shoulders.
 - From Front Street to Radium Springs Road, including the bridge over the Flint River, two 12' travel lanes and a 14' raised median
 - From Radium Springs Road to Thornton Road: four 12' travel lanes with 6' – 10' rural shoulders and a 30' depressed median
- **Posted speed:** From Jefferson Street to Radium Springs Road the posted speed is 35 mph. From Radium Springs road to Thornton Road the posted speed limit is 50 mph
- **Maximum radius:** 5000'
- **Maximum grade:** 5%
- **Width of right of way:** 120 ft from Washington Street to the SR 133/SR520 bus interchange. 200ft from the interchange to Thornton Road.
- **Major structures:**
 - A four lane bridge carrying SR 520 Business over the Flint River built in 1953.
Bridge Structure I.D. No.: 095-0003-0
Sufficiency Rating: 71.19 **Length:** 720' **Width:** 69'
To be widened
 - A four lane bridge carrying SR 520 Business over the CSX rail line built in 1954.
Bridge Structure I.D. No.: 095-0033-0
Sufficiency Rating: 48.37 **Length:** 248' **Width:** 64'
To be replaced

- A four lane bridge carrying SR 520 Business over the Norfolk Southern rail line built in 1954.
Bridge Structure I.D. No.: 095-0033-0
Sufficiency Rating: 54.93 **Length:** 160' **Width:** 64'
To be replaced
- Two, two lane bridges carrying SR 133 Business over SR 520 Business built in 1974.
Bridge Structure I.D. Nos.: 095-0026-0 and 095-0026-0
Sufficiency Rating: 94.82 **Length:** 153' **Width:** 49.10'
To remain in place
- **Major interchanges or intersections along the project:** Liberty Expressway (SR 133) at Oglethorpe Road (SR 520 Business) Interchange; Signalized intersections at SR 520 Business at Washington Street, Front Street, Radium Springs Road, Cason Street and Thornton Road.
- **Existing length of roadway segment and the beginning mile logs for each county segment.** The project includes 2.91 miles from Jefferson Street (MP 4.17) to Thornton Drive (MP 7.08) on SR 520 Business (Oglethorpe).

Proposed Design Features:

- **Proposed typical section(s):**
 - From Jefferson Street to Jackson Street: six 12' travel lanes, 4' bike lanes with 16' urban shoulders, a 14' median (10' raised) and 8' sidewalks.
 - From Jackson Street to Washington Street: six 11' travel lanes, 4' bike lanes with 12' urban shoulders, a 14' median (10' raised) and 8' sidewalks on the north side of the block and 5' sidewalks on the south side of the block
 - From Washington Street to Radium Springs Road, including the bridge over the Flint River: six 12' travel lanes (three in each direction), 4' bike lanes, a 14' median (10' raised) and 10' sidewalks.
 - From Radium Springs Road to Thornton Road: six 12' travel lanes, 4' bike lanes with 16' urban shoulders, a 24' median (16' raised) and 8' sidewalks
- **Proposed Design Speed Mainline** From Jackson Street to Radium Springs Road 35 mph & from Radium Springs Road to Thornton Road 50 mph
- **Proposed Maximum grade Mainline** 5 % **Maximum grade allowable** 5 %.
- **Proposed Maximum grade Side Street** 5 % **Maximum grade allowable** 5 %.
- **Proposed Maximum grade driveway** 5 %
- **Proposed Maximum radius** 5000'.
- **Right of way**
 - Width Varies 128' to 172'.
 - Easements: Temporary (), Permanent (X), Utility (X), Other ().
 - Type of access control: Full (), Partial (), By Permit (X), Other ().
 - Number of parcels: 40 Number of displacements: 3
 - Business: 2
 - Residences: 1
 - Mobile homes: none

- **Structures:**
 - **Bridges:** The Bridge over the Flint River will be widened to 725' by 120' in order to accommodate the new roadway footprint and the two structurally deficient bridges over the two railroads are proposed to be replaced. The bridge over the CSX railroad is estimated to be 163' by 217' and the bridge over the Norfolk Southern railroad is estimated to be 163' by 152'.
- **Major interchanges or intersections along the project:** Liberty Expressway (SR 133) at Oglethorpe Road (SR 520 Business) Interchange. There will be no change of the interchange geometry.
 Signalized intersections include:
 SR 520 Business at Washington Street, Front Street, Radium Springs Road, Cason Street and Thornton Road.
- **Traffic control during construction:** To maintain traffic during construction parallel bridge structures will be built over the railroads and traffic will be shifted to maintain traffic.

Design Exceptions to controlling criteria anticipated:

	<u>UNDETERMINED</u>	<u>YES</u>	<u>NO</u>
HORIZONTAL ALIGNMENT:	()	()	(X)
ROADWAY WIDTH:	()	()	(X)
SHOULDER WIDTH:	()	()	(X)
VERTICAL GRADES:	()	()	(X)
CROSS SLOPES:	()	()	(X)
STOPPING SIGHT DISTANCE:	()	()	(X)
SUPERELEVATION RATES:	()	()	(X)
HORIZONTAL CLEARANCE:	()	()	(X)
SPEED DESIGN:	()	()	(X)
VERTICAL CLEARANCE:	()	()	(X)
BRIDGE WIDTH:	()	()	(X)
BRIDGE STRUCTURAL CAPACITY:	()	()	(X)

- **Design Variances:**
 - A design variance will be needed for the median width of 14' between Jefferson Street and Radium Springs Road including the bridge over the Flint River. As a result of limited Right-of-Way width (120') between the Health & Human Services Building and the new Albany Police station, the proposed typical sections between Jefferson Street and Radium Springs Road vary from standard GDOT practices. This portion of the corridor was designed with a 35 mph speed design. The median is narrower than GDOT policy allows.
 - A design variance will be needed for the distance between median openings which is approximately 590' west of the intersection of SR 520 business and Thornton Road. This violates the urban spacing distance for median openings of 660'.
- **Environmental concerns:** USTs, Flint River encroachment and possibly endangered/threatened species

- **Level of environmental analysis:**
 - Are Time Savings Procedures appropriate? Yes (), No (X),
 - Categorical exclusion (),
 - Environmental Assessment/Finding of No Significant Impact (FONSI) (X), or
 - Environmental Impact Statement (EIS) ().
- **Utility involvements:** CSX Rail Company, Norfolk Southern Rail Company, and others to be identified

Project responsibilities:

- Design, - GDOT
- Right of Way Acquisition, - GDOT
- Relocation of Utilities, - GDOT
- Letting to contract, - GDOT
- Supervision of construction, - GDOT
- Providing material pits, - Contractor
- Providing detours. – None anticipated

Coordination

- Initial Concept Meeting was held on 9/15/05.
- Concept meeting was held on 10/19/05; Minutes attached.

Other projects in the area:

- Clarke Avenue Extension, STP-0134(6)
- Liberty Expressway at Moultrie, NH-006-2 (57)
- Liberty Expressway at North Jefferson, NH-006-2(55)
- Liberty Expressway at Clarke Avenue, NH-006-2(56).

Scheduling – Responsible Parties' Estimate

According to the TPRO schedule agreed upon by the project team:

- Time to complete the environmental process: 12 Months.
 - **January 2007 R/W plans submission**
- Time to complete preliminary construction plans: 12 Months.
- Time to complete right of way plans: 3 Months.
- Time to complete the Section 404 Permit: 6 Months.
- Time to complete final construction plans: 6 Months.
 - **Final Plans submission September 2008**
- Time to complete to purchase right of way: 18 Months.
- List other major items that will affect the project schedule: Railroad Coordination

Other alternates considered: The no build Alternate was considered. This alternate would result in an unacceptable level of service for the corridor in the design year and would not address the safety or operational issues in the corridor.

Comments: none

Project Concept Report Page 7
Project Number: NHS-0002-00 (445)
P. I. Number: 0002445
County: Dougherty

Attachments:

1. Need and Purpose
2. Cost Estimates:
 - a. Construction including E&C,
 - b. Right of Way, and
 - c. Utilities.
3. Typical sections,
4. Accident summaries,
5. Capacity analysis,
6. Traffic Diagrams,
7. Bridge inventory,
8. Minutes of Concept meeting, (Concept team meeting held 10-19-05)

BUCHAN _____
BOWMAN _____
RICHARDS *Shelby*
OTHER _____
GROUPS _____
FILE _____

RECEIVED
JUL 15 2005
URBAN DESIGN

D.O.T. 66

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE NHS-0002-00(445) Dougherty County **OFFICE** Planning
P.I. 0002445
DATE July 15, 2005
FROM *for Matthew Jaula*
Joseph P. Palladi, P.E., State Transportation Planning Administrator
TO Ben Buchan, P.E., State Urban Design Engineer
Attn.: Albert Shelby
SUBJECT Need and Purpose Statement – Dougherty County NHS-0002-00(445)

As requested, please find the attached Need and Purpose Statement for the proposed widening of SR520BU in Dougherty County.

Please provide the Office of Planning AADT for SR520BU in Albany between Washington Street and Madison Street for 2005 and estimates for 2010 and 2030. This information will be used for further evaluation of the western logical termini.

If you have any questions, please contact Robert Hughes at (404)657-6699.

JPP: rmh

Attachment

**Concept Need and Purpose Statement
 NHS-0002-00(445), Dougherty County
 PI No 0002445 Widening of SR 520 Business**

Corridor Description

The section of SR 520 BU/ Oglethorpe Boulevard between Washington Street and Thornton Drive is a four lane section of road with a median of various width. The most current traffic data (2002) indicates that the total traffic volume varies from 23,000 to 37,400 vehicles per day (VPD). SR 520BU is also known as Oglethorpe Boulevard and is a vital east-west corridor of the Albany

Metropolitan areas transportation system. This section of SR 520BU is designated by the DART's 2030 Transportation Plan as a local bicycle and pedestrian route.

Land Use and Community Issues

Land use immediately along the project limits are mainly commercial use and undeveloped areas. Commercial use is concentrated on the western half of SR 520BU (closest to the Albany Downtown area) while the undeveloped areas are concentrated on the eastern portion of SR520BU.

According to 2000 census, in Dougherty county 62.2% of the residents were classified by the census as minority. In the state of Georgia, the 2000 census reported 34.9% of the residents were classified as minorities. 96%, 71%, 100% and 80% residents of the census tracts 1309502, 1309513, 1309514.01 and 13095107, respectively, were classified by the 2000 census as minority. The entire population of Dougherty County has declined by 0.3% from 96,354 residents in 1990 to 96,065 residents in 2000.

Safety

This section of SR520BU (from Washington Street to Thornton Drive) is functionally classified as an Urban Principal Arterial. The tables below provide a comparison of the accident rates on this section of the road with the state average for the similar functionally classified road for the years 2000-2002.

Traffic Count Station #23 (Mile point 4.45-4.59)

SR 520BU	2000		2001		2002	
	SR 520BU	State	SR 520BU	State	SR 520BU	State
Accident Rate	2,050	430	2,505	473	1,647	504
Injury Rate	1,653	172	1,252	191	1,252	197
Fatality Rate	0	1.34	0.00	1.32	0	1.45

Traffic Count Station #21 (Mile point 4.60-4.98)

SR 520BU	2000		2001		2002	
	SR520BU	State	SR520BU	State	SR520BU	State
Accident Rate	955	430	1,160	473	972	504
Injury Rate	754	172	939	191	486	197
Fatality Rate	0	1.34	0.00	1.32	0	1.45

Traffic Count Station #107 (Mile point 4.99-6.54)

SR 520BU	2000		2001		2002	
	SR520BU	State	SR520BU	State	SR520BU	State
Accident Rate	248	430	253	473	303	504
Injury Rate	178	172	156	191	186	197
Fatality Rate	0	1.34	0.00	1.32	0	1.45

Traffic Count Station #109 (Mile point 6.55-6.87)

SR 520BU	2000		2001		2002	
	SR520BU	State	SR520BU	State	SR520BU	State
Accident Rate	0	430	0	473	40	504
Injury Rate	0	172	0	191	0	197
Fatality Rate	0	1.34	0	1.32	0	1.45

Traffic Count Station #67 (Mile point 6.88-7.13)

SR 520BU	2000		2001		2002	
	SR520BU	State	SR520BU	State	SR520BU	State
Accident Rate	724	430	574	473	718	504
Injury Rate	258	172	209	191	96	197
Fatality Rate	0	1.34	0.00	1.32	0	1.45

The accident and injury rates typically far exceed the statewide average in most sections as indicated above. However, there were no reported fatalities in those years.

About 80% of the accidents that occurred each year were angle intersection and rear end type accidents. These accidents occurred at intersecting streets and curb cuts for driveway and business entrances.

Year	Angle (Number/%)	Rear End (Number/%)	Side Swipe (Number/%)	Not A Collision with another vehicle (Number/%)	Hit and Run (Number/%)	Fatality (Number/%)
2000	29 / 25%	66 / 57%	12 / 10%	7 / 7%	1 / 1%	0
2001	26 / 22%	72 / 61%	19 / 15%	2 / 2%	0 / 0%	0
2002	30 / 28%	55 / 52%	13 / 12%	7 / 7%	1 / 1%	0

Travel Demand and Operational Conditions

The volume of traffic on this section of SR520BU has grown significantly in the last few years. Below is a table listing current and future traffic as provided by the Georgia Department of Transportation's Office of Environment and Location. Traffic volumes are reported as total AADT (average annual daily traffic) in both directions.

roadway Segment	Existing AADT (2005)	Future AADT (2030)	Existing LOS	Future LOS (No Build)
SR520BU from Washington Street to Thornton Drive	23,000 to 37,400	31,700 to 51,500	C to E	D to E

Level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic streams. There are six defined LOS tiers at which a roadway can operate. Each of the six tiers are identified by a letter, "A" represents the best operating conditions and LOS "F" represents the worst. If a roadway is operating at LOS "A", "B", or "C", that is considered acceptable operating conditions.

Project Description

The proposed improvement will provide a six lane section with turn lanes as needed on SR520BU from MP 4.45 (Washington Street) to MP 7.08 (Thornton Drive), for a distance of approximately 2.63 miles.

The project is identified and included in the Dougherty Area Regional Transportation Study (DARTS) 2005-2030 Long Range Transportation Plan, which was adopted in December 2004. It is also shown in the DARTS Fiscal Year 2006-2008 Transportation Improvement Program as project number HR-99-11 (PE authorized, Right of Way is in FY 2007, and Construction is in Long Range).

The proposed addition of one lane in each direction will add capacity and will help reduce the opportunity for rear end collisions to occur by decreasing the lengths of queues in terms of time and size. It will also provide greater opportunity for vehicles to change lanes, avoid slower drivers preparing to make turns onto or off the roadway, and provide better management of access points, thus reducing the angle intersection and rear end type accidents.

Logical Termini

The Office of Planning proposes that Jefferson Street be considered for the western terminus of this widening project and the recommended eastern terminus is at Thornton Drive. ~~The western terminus is logical because traffic volumes drop by approximately 26% between Washington Street and Jefferson Street based upon available traffic data.~~ The eastern terminus is logical because the proposed project is joining with an existing six lane section and future (2030) operating conditions are forecasted to operate at a LOS "D".

Projects in the Area

The following projects are located within the area and are programmed in the Department's Construction Work Program and Long Range Program.

Project Number	Project Description	Project Schedule
450500	CS 836/RIVERSIDE DR FM OAKRIDGE DR TO PHILEMA RD & NEW LOC	PE - Authorized ROW - Local CST - LR
422560	SR 3/LIBERTY PKWY @ CLARK AVE - RAMPS & TURN LANES/ALBANY	PE - Authorized ROW - 2006 CST - 2008

Need and Purpose

The accident and injury rates along this section of SR520BU exceed the statewide average for similar facilities, furthermore, this section of SR520BU is projected to operate at an unacceptable level-of-service in the year 2030. The need exists to alleviate traffic congestion and decrease accidents on SR520BU between Washington Street and Thornton Drive.

Value Engineering Process

VALUE ENGINEERING PROCESS

Introduction

This report summarizes the analysis and conclusions by the PBS&J Value Engineering team as they performed a VE Study during the period of Aug. 20 - Aug. 23, 2007 in Atlanta, Georgia, for the Georgia Department of Transportation.

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

Les M. Thomas, P.E., CVS-Life	Certified Value Specialist
Luke Clarke, P.E.	Highway Design Engineer
Ramesh Kalvakaalva, P.E.	Bridge Structural Engineer
Kevin Martin, P.E.	Highway Construction Specialist
Randy S. Thomas, AVS	Assistant Team Leader

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

- **Investigation/Information Phase** – during this phase of the VE Team’s work, the team received a briefing from the Georgia Department of Transportation (GDOT) design team and staff. This briefing included discussions of the design intent behind the project, the cost concerns, the physical project limitations. In the working session that followed, the VE Team developed cost models from the cost data provided by the designers and familiarized themselves with the construction drawings and other data that was available to the team. Some of the representative project information (concept report, cost estimate, and special provisions) may be found in the tabbed section of this report entitled ***Project Description***. Following this current narrative the reader will also find a cost model done in the Pareto fashion, i.e., identifying the highest costs down to the lowest costs for the larger construction cost elements. This cost model, developed by the VE Team, was used by the VE Team to help focus their week of work. The headings on the Pareto Chart also were used as headings for creative phase activities.
- **Analysis Phase** – during this phase the VE Team determined the “**Functions**” of the project. This was accomplished by reviewing the project from the simplest format in asking the questions of “What is the project suppose to do?”, and “How is it suppose to accomplish this purpose? In the Value Engineering vernacular, the answers to these questions are cast in the form of active verbs and measurable nouns. These verb/noun pairs form the basis of the function analysis which distinguishes a Value Engineering effort from a potentially damaging cost cutting exercise.

- The important functions of the project were identified as follows:
 - **Project Objective/Goals**
 - **Improve Level of Service**
 - **Increase Capacity**
 - **Separate Traffic**
 - **Provide for pedestrian and bike traffic**
 - **Provide for future growth**
 - **Project Basic Functions**
 - **Construct Additional Traffic Lanes**
 - **Construction Additional Turn Lanes**
 - **Widen Bridges**
 - **Provide Raised Median**
 - **Provide Bike Lanes**
 - **Provide Sidewalks**
- **Speculation Phase** - The VE team performed a brainstorming session to identify ideas that might help meet the project objectives:
 - Improve Level of Service
 - Improve Safety
 - Increase Capacity
 - Reduce construction and life cycle costs
 - Reduce the time of construction

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

- **Evaluation Phase** – Once the VE Team identified the creative ideas, it was necessary to decide which alternatives should be carried forward. This is the work of the Evaluation or Judgment Phase. The VE Team reflected back on the project constraints and objectives shared with the team by the owner's representatives, in the kick-off meeting on the first day of the workshop. From that guidance, the team selected ideas that they believed would improve the project by a vote process.

- Following that selection process, the VE Team used the following values as measures of whether or not an alternative had enough merit to be carried forward in the VE process:
 - Construction Cost Savings
 - Maintainability
 - Ability to Implement the Idea
 - General Acceptability of the Alternatives
 - Constructability

Based on these measurement sticks, the VE Team evaluated the alternatives and graded them from 5 (Excellent) down to 1 (Poor). Other notes about the alternatives are annotated at the bottom of the enclosed creative and evaluation sheets.

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

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

PARETO CHART - COST HISTOGRAM

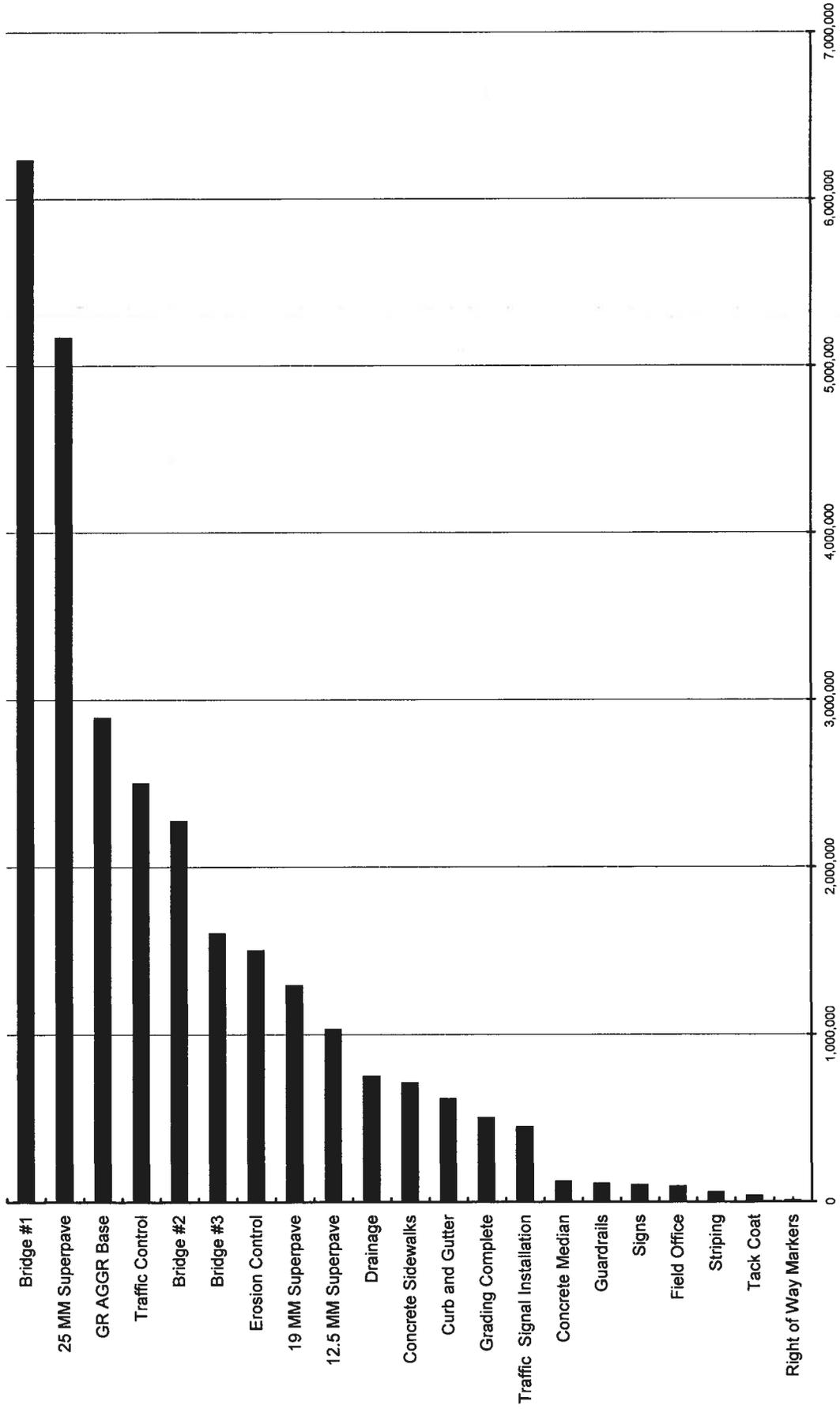
PROJECT: Widening of SR 520 Business NHS-0002-00(445) PI #0002445

Dougherty County, Georgia

PROJECT ELEMENT	COST	PERCENT	CUM. PERCENT
Bridge #1	6,230,775	22.24%	22.24%
25 MM Superpave	5,166,174	18.44%	40.68%
GR AGGR Base	2,891,340	10.32%	51.00%
Traffic Control	2,500,000	8.92%	59.92%
Bridge #2	2,273,850	8.12%	68.04%
Bridge #3	1,601,175	5.71%	73.75%
Erosion Control	1,500,000	5.35%	79.10%
19 MM Superpave	1,291,556	4.61%	83.71%
12.5 MM Superpave	1,029,180	3.67%	87.39%
Drainage	750,000	2.68%	90.06%
Concrete Sidewalks	709,514	2.53%	92.60%
Curb and Gutter	613,931	2.19%	94.79%
Grading Complete	500,000	1.78%	96.57%
Traffic Signal Installation	446,000	1.59%	98.16%
Concrete Median	120,927	0.43%	98.60%
Guardrails	106,000	0.38%	98.97%
Signs	99,000	0.35%	99.33%
Field Office	90,000	0.32%	99.65%
Striping	56,000	0.20%	99.85%
Tack Coat	35,224	0.13%	99.98%
Right of Way Markers	7,000	0.02%	100.00%
Subtotal	\$ 28,017,646	100.00%	
E & C Rate @ 10% INCL	\$ 2,801,765		
Subtotal =	\$ 30,819,411		
Total Construction Cost =	\$ 30,819,411		
Right-of-Way =	8,208,660		
Reimb. Utilities =	0		
TOTAL	\$ 39,028,071	Comp Mark-up:	39%

Pareto Chart 2

NHS-0002-00(445) - PI #0002445





FUNCTION ANALYSIS AND COST-WORTH

SHEET NO.: 1 of 2

PROJECT: GEORGIA DEPARTMENT OF TRANSPORTATION
 Proj. No. NHS-0002-00(415) Dougherty County PI No.: 0002445

NO.	ELEMENT	FUNCTION			COST (000)	WORTH (000)	COMMENTS
		VERB	NOUN	KIND			
1	OVERALL PROJECT	Increase	Traffic Capacity	B	39,028	34,000	C/W = 1.15
		Separate	Traffic	S			
		Enhance	Safety	S			
		Enhance	Property Access	S			
2	ROADWAY(RD)	Increase	Capacity	B	12,560	10,000	C/W = 1.26
		Enhance	Safety	S			
		Provide	Bicycle Access	B			
		Provide	Pedestrian Access	B			
3	DRAINAGE (DR)	Minimize	Accidents	G	750	750	C/W = 1.00
		Protect	Pavement Integrity	S			
		Convey	Storm Water	S			
		Accommodate	Widening	B	6,208	6,208	C/W = 1.0
4	RIGHT-OF-WAY (RW)	Facilitate	Utilities	RS			
		Accommodate	Amenities	S			

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



FUNCTION ANALYSIS AND COST-WORTH

SHEET NO.: 2 of 2

PROJECT: GEORGIA DEPARTMENT OF TRANSPORTATION
 Proj. No. NHS-0002-00(415) Dougherty County PI No.: 0002445

NO.	ELEMENT	FUNCTION			COST (000)	WORTH (000)	COMMENTS
		VERB	NOUN	KIND			
5	Signalization	Increase	Traffic Capacity	B	601	601	C/W = 1.00
		Enhance	Safety	B			
6	BRIDGES (BRF, BR2, BR3)	Increase	Capacity	B	10,105	8,000	C/W = 1.26
7	TRAFFIC CONTROL (TC)	Facilitate	Safe Construction	RS	264	264	C/W = 1.00
8	SIGNING & MARKING (SM)	Enhance	Wayfinding	S	302	302	C/W = 1.00
		Maintain	Safe Traffic Operations	RS			
		Channelize	Traffic	S			

Function defined as: Action Verb
 Measurable Noun

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

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

DESIGNER'S PRESENTATION MEETING PARTICIPANTS



20-Aug-07

Georgia Department of Transportation

NHS-0002-00(415) - PI No. 0002445 County: Dougherty

NAME	ORGANIZATION & TITLE	E-MAIL	PHONE
Lisa Myers	 GDOT - Engineering Services	lisa.myers@dot.state.ga.us	(404)651-7468
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**VE TEAM PRESENTATION
MEETING PARTICIPANTS**



Georgia Department of Transportation		23-Aug-07	
[NHS-0002-00(445) - P.I. No. 0002445 - Dougherty County			
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Albert Shelby	 GDOT - Urban	aalbert.shelby@dot.state.ga.us	(404)656-5440
Clayton Bennett	 GDOT - GDOT Bridge	clayton.bennett@dot.state.ga.us	(404)656-5283
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CREATIVE IDEA LISTING & EVALUATION



PROJECT: **Georgia Department of Transportation – NHS-0002-00(445)** SHEET NO.: **1 of 2**
SR 520 – Dougherty County – P.I. Number 0002445

NO.	IDEA DESCRIPTION	RATING
BRIDGE- FLINT RIVER (BRF)		
BRF-1	Provide separate new structures for pedestrians and bikes; modify design for 6 travel lanes	5
BRF-2	Provide a 10' multi-use trail in lieu of 10' sidewalk and 4' bike lane	4
BRF-3	Provide a new bridge for 100 year event	DS
BRF-4	Design pedestrian/bike separate structure to be above 100 year and to carry vehicles	1
BRF-5	Give consideration to possible negative effects of widening bridge – it may increase it's risk of floating	DS
BRF-6	Provide a "free right turn" onto Front Street	DS
BRF-7	Extend Front Street right turn storage to top of bridge to decrease potential for rear end collisions	DS
BRIDGE #2 – CSX RAILROAD (BR2)		
BR2-1	Provide a single span bridge over CSX with walled abutments	4
BR2-2	Combine bike lane and sidewalk as a 10' multi-use with special markings	4
BR2-3	Use a 14' median (10' raised) and 11' travel lanes	4
BR2-4	Use an 8' median (4' raised)	2
BR2-5	Combine BR#2 and BR#3 and construct one new bridge	DS
BRIDGE #3 – NORFOLK & SOUTHERN RAILROAD (BR3)		
BR3-1	Provide a single span bridge with walled abutments	4
BR3-2	Combine bike lane with sidewalk into a 10' multi-use trail	4
BR3-3	Use a 14' median (10' raised)	4
BR3-4	Locate bikes and pedestrians on a new separate structure	1
ROADWAY – (RD)		
RD-1	Construct 11' travel lanes throughout the project	5
RD-2	Move 4' bike path to a 10' multi-use trail from Front Street to the project terminus	5
RD-3	Use asphalt in-lieu of concrete walks	1

Rating: 1→2 = Generally not acceptable; 3 = Little Opportunity for Positive Change; 4→5 = Most likely to be Developed;
 DS = Design Suggestion; ABD = Already Being Done

