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DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: IM-STP-75-3(208) Whitfield
P. I. No.: 610890
I-75 Interchange at CR 665/Carbondale Road

OFFICE: Engineering Services

DATE: February 25, 2008

FROM: Brian Summers, P.E., Project Review Engineer BSW

TO: Brent Story, P.E. State Road Design Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT No.	Description	Savings PW & LCC	Implement	Comments
RIGHT OF WAY				
A-1	Shorten Project Limits	$826,200	No	The VE Alignment would force a horizontal curve superelevation transition on the bridge as well as a zero percent cross slope which is not desirable. In addition, the Environmental Document as well as the BFI, Bridge Hydraulic Study and many other items would need to be re-done.
A-2	Decrease number of lanes on the west side of the project	$581,500	No	The proposed alignment and typical section transitions from 4 lanes to 2 lanes as soon as possible after the Old Carbondale Road intersection.
BRIDGES				
B-1	Realign crossing of RR and Swamp Creek to the south	$486,000	No	This goes along with "A-1" and would have the same zero percent cross slope and superelevation transition issues.

ALT No.	Description	Savings PW & LCC	Implement	Comments
BRIDGES - continued				
B-3	Reduce the width of the I-75 Bridge from 6 lanes to 5 lanes	$140,000	No	Based on traffic volumes and the amount of truck traffic (27%) separate left turn lanes are needed in each direction because of the storage length that is required.
B-4	Use MSE Walls in lieu of end span/end roll	$389,000	Yes	This should be done.
B-4.1	Use MSE Walls and minimize I-75 spans for outside widening	$620,000	No	Since B-4 is being implemented this one is no longer applicable.
B-4.2	Use MSE Walls and minimize I-75 spans using inside widening	$806,000	No	Since B-4 is being implemented this one is no longer applicable.
B-5	Eliminate 54" Bulb Tee Beams and use Type III Beams	$11,400	No	The costs for re-design would negate the cost savings.
ASPHALT PAVING				
C-1	Widen future mainline lanes on the inside and reduce the ramp taper length	$1,372,000	Yes	This should be done.
EARTHWORK				
D-1	Revise profile to reduce Earthwork	$849,800	Yes	This should be done.

A meeting was held on January 29, 2008 to discuss the above recommendations. Brent Story, Jason McCook, Fletcher Miller, Jan Lystad, and Peter Emmanuel with Road Design, and Brian Summers and Ron Wishon with Engineering Services were in attendance.

Additional information was provided by the Design Office on January 29, 2008, February 8, 2008, and February 25, 2008.

The results above reflect the consensus of those in attendance and those who provided input.

Approved: _____ **Date:** 3/24/08
Gerald M. Ross, P. E., Chief Engineer

Approved: _____ **Date:** 4/10/08
for Rodney Barry, P.E., FHWA Division Administrator

BKS/REW

Attachments

c: Gus Shanine
Christy Poon-Atkins
Todd Long
Brent Story
Paul Liles
Jason McCook
Fletcher Miller
Peter Emmanuel
Jan Lystad
Jenny Harris-Dunham
James Magnus
Kenny Beckworth
Ken Werho
Nabil Raad
Paul DeNard
Paul Condit
Lisa Myers

Recommended for Approval:
_____ 4-10-08
Federal Highway Administration

Wishon, Ron

From: Miller, Fletcher
Sent: Monday, February 25, 2008 10:46 AM
To: Wishon, Ron
Subject: RE: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Ron,

We voted on B-4 over B-4.1 and B-4.2 because the alternate provided a cost savings benefit without either reducing clear zone (B-4.1) or reducing clear zone and preventing future outside widening (B-4.2). Part of our decision was to keep the future option open for widening to the outside.

Only one of the three can be chosen for cost savings. If we vote "Yes" on either of the other two then we have to vote "No" on the remaining two.

By not voting on B-4.1, the cost savings lost is $231,000, not $620,000. By not voting on B-4.2, the cost savings lost is $417,000, not $806,000. The Implementation letter can appear to be misleading of these facts.

Thanks,

Fletcher C. Miller, P.E.
Design Group Manager
Office of Road & Airport Design
Georgia Department of Transportation
(404) 656-5383

From: Wishon, Ron
Sent: Monday, February 25, 2008 9:57 AM
To: Miller, Fletcher
Subject: RE: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Fletcher:
Gerald sent the VE Implementation Letter back to us unsigned at the end of last week and wanted us to explain B4-1 and B4-2 better or in more detail as to why we did not vote to implement. Attached is what I sent down. Can you give a more detailed response for these two VE Alternatives? Thanks!

Ron

From: Wishon, Ron
Sent: Friday, February 08, 2008 12:41 PM
To: Miller, Fletcher
Cc: Summers, Brian; Myers, Lisa
Subject: RE: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Fletcher:
Just following up on this --- did you ever get updated information on this one?

Ron

From: Miller, Fletcher
Sent: Tuesday, January 29, 2008 12:08 PM
To: Wishon, Ron

Cc: Summers, Brian; Story, Brent; McCook, Jason; Emmanuel, Peter; Cashin, Ted
Subject: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Ron,

Alternative B-4: To protest implementation, Bridge Design has been requested to provide a cost estimate comparison for the alternative by 2/5/08.

Alternative C-1: After the VE Study Implementation meeting this morning, Peter and I discovered another reason for implementing the suggested alternative. A ditch/stream on one of the ramps will be less impacted with implementation. Also, the original cost savings of $1,372,000 did not include ROW cost savings. Therefore, we will implement this alternative as discussed. We will not provide any additional savings versus cost comparisons for this alternative.

Fletcher C. Miller, P.E.
Design Group Manager
Office of Road & Airport Design
Georgia Department of Transportation
(404) 656-5383

Wishon, Ron

From: Miller, Fletcher
Sent: Friday, February 08, 2008 12:55 PM
To: Wishon, Ron
Cc: Summers, Brian; Myers, Lisa
Subject: FW: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Alternative B-4 should be implemented based on no additional protest from Bridge Design.

Fletcher C. Miller, P.E.
Design Group Manager
Office of Road & Airport Design
Georgia Department of Transportation
(404) 656-5383

From: Cashin, Ted
Sent: Tuesday, January 29, 2008 1:40 PM
To: Miller, Fletcher
Cc: Ingalsbe, Bill; Emmanuel, Peter
Subject: RE: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

We don't have anything to add to our response. Thanks for keeping us in the loop.

Ted Cashin
Bridge Design Group Leader
Georgia DOT, Office of Bridge Design
(404)-656-5302
(404)-651-7076 fax

Please note I have a new e-mail address:
tcashin@dot.ga.gov

From: Miller, Fletcher
Sent: Tuesday, January 29, 2008 11:47 AM
To: Cashin, Ted
Cc: Ingalsbe, Bill; Emmanuel, Peter
Subject: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Ted,

As we discussed today, Engineering Services has asked for cost estimate comparison for the subject VE Study Alternate B-4, which stated:

Use MSE walls in lieu of end span/end roll with slope paving. The alternative concept allows for the elimination of the end spans using MSE walls. The two center spans increase to 106 feet each. The total net savings for the option is $389,000.

Your response was:

MSE wall abutments are generally not recommended by Bridge Design for a number of reasons including losing the ability to add future lanes, utilities or drainage in the end spans. If MSE walls are to be utilized, they must be set back far enough to allow longitudinal drainage along I-75. This drainage cannot be piped behind the MSE wall since it would conflict with the straps. The walls are estimated at 20' high, but if they turn out to be 24' high to get to the bottom of

the wall below the ditch, the wall area would increase by 27% and the savings would dwindle from $389,000 to $304,000.

At the VE Study Implementation meeting today, Engineering Services tentatively directed the implementation of Alternative B-4, unless a cost estimate comparison can be provided. Please provide this cost estimate comparison to me by February 5th.

Thanks,

Fletcher C. Miller, P.E.
Design Group Manager
Office of Road & Airport Design
Georgia Department of Transportation
(404) 656-5383

Wishon, Ron

From: Miller, Fletcher
Sent: Tuesday, January 29, 2008 12:08 PM
To: Wishon, Ron
Cc: Summers, Brian; Story, Brent; McCook, Jason; Emmanuel, Peter; Cashin, Ted
Subject: IM-STP-75-3(208) Whitfield County P.I. No. 610890 - VE Study Implementation

Ron,

Alternative B-4: To protest implementation, Bridge Design has been requested to provide a cost estimate comparison for the alternative by 2/5/08.

Alternative C-1: After the VE Study Implementation meeting this morning, Peter and I discovered another reason for implementing the suggested alternative. A ditch/stream on one of the ramps will be less impacted with implementation. Also, the original cost savings of $1,372,000 did not include ROW cost savings. Therefore, we will implement this alternative as discussed. We will not provide any additional savings versus cost comparisons for this alternative.

Fletcher C. Miller, P.E.
Design Group Manager
Office of Road & Airport Design
Georgia Department of Transportation
(404) 656-5383

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	IM-STP-75-3(208) Whitfield County P.I. No. 610890 I-75 Interchange at CR665/Carbondale Road	**OFFICE** **DATE**	Road Design December 27, 2007

FROM Brent A. Story, P.E., State Road and Airport Design Engineer

TO Brian Summers, P.E., Project Review Engineer
Attn: Lisa Myers, Design Review Engineer Manager/VE Coordinator

SUBJECT **VE Study: Responses to Recommendations**

These are the responses to the Value Engineering Alternatives recommended by the Value Engineering Team:

Recommendation Highlights

Recommendation A-1: Shorten project limits on Carbondale Road

This recommendation includes shifting the alignment of the bridge to the south of the existing railroad trestle crossing of Swamp Creek and the RR. This allows for a shorter segment for Carbondale and a shorter connection on Old Dug Gap Road. Cost shown is for roadway savings only. See Item B-1 for bridge savings.

Potential savings is $826,200

Response from Road Design: DO NOT IMPLEMENT

- This recommendation appears to be worth considering; however, past correspondence yields that this alternative was previously considered by both the Office of Road Design and the Office of Bridge Design. The alternative was discarded because an alignment at this location would force horizontal curve superelevation to be in transition on the bridge, which is undesirable because the transition would place a "flat" zero percent cross-slope on the bridge deck (see Bridge Design response to Recommendation B-1).
- To perform the preliminary engineering development of the recommended area would require the revision of the following completed tasks: survey and mapping, aquatic study for environmental document, bridge foundation investigation, bridge hydraulic report, bridge layout, road design and preliminary construction and ROW plans.

Recommendation A-2: Decrease number of lanes on west side of I-75

This recommendation includes reducing the number of lanes to two on the west side of the I-75 bridge. The traffic figures indicate minimum traffic in this area.

Potential savings is $581,500

Response from Road Design: DO NOT IMPLEMENT

- The current plans provide a transition from 4 lanes to 2 lanes as soon as possible after the intersection of Old Carbondale Road, which is approximately 892 feet from the ramp centerline.
- To revise the plans to transition sooner would potentially create conflicts with truck traffic and passenger vehicles coming from the Carbondale community.

Recommendation B-1: Realign the crossing of the Norfolk Southern RR and Swamp Creek to the south

This recommendation includes shifting the alignment of the bridge to the south of the existing railroad trestle crossing of Swamp Creek to where they are in closer proximity to each other (same as Item A-1). This allows a shortening of the bridge and a crossing that is much closer to 90°. Savings shown is for the bridge costs only.

Proposed initial savings is $486,000

Response from Bridge Design: DO NOT IMPLEMENT

- Because the superelevation transition may not be moved off of the bridge, costs will increase since the bridge deck will have to be poured in separate left and right stages. It is hard to put a cost on this work, but in the spans where the deck is transitioning from normal crown to reverse crown, costs will probably increase by $10-$20 per square foot. This average increase amounts to approximately $236,000.
- Although a transition from reverse crown to full super could be accommodated with little increase in cost, the recommended design does not provide for this as an alternative. As stated previously, this alternative has been considered and rejected during concept development.

Recommendation B-2: Widen existing I-75 bridge to accommodate proposed increased lanes

This analysis compared widening the existing structure in lieu of building a new structure as the existing bridge is structurally sound with a sufficiency rating of 73.86. The proposal was not cost effective and is therefore not recommended.

Not Recommended by the VE Study Team

Recommendation B-3: Reduce the width of the I-75 bridge from 6 lanes to 5 lanes

The proposed concept is to have back to back left turn lanes in lieu of separate left turns in each direction thus reducing the width by 12 feet. This is acceptable because of the low volumes of traffic making this movement.

The total potential savings if accepted is $342,000

Response from Road Design: DO NOT IMPLEMENT

- The following future traffic volumes have been provided:
  Left-turn to SB I-75 DHV = 275 (AM) 430 (PM)
  Left-turn to NB I-75 DHV = 160 (AM) 110 (PM)
  The length of the bridge is 296 feet and the length of a WB-50 truck is 55 feet.
- With a turn lane reduction, the left-turn storage length would be reduced by half (148 feet < 3 WB-50 trucks stacked end to end).
- At 27% trucks, for the worst case (PM) DHV = (430 + 110 = 540) x 0.27 = 146. This yields approximately 2.4 trucks per minute (2.4 x 55' = 134 feet < 148 feet). This would be acceptable only if passenger cars are neglected. However, this assumption is not realistic. Therefore, a reduction of the turn lanes to one lane would not provide for capacity or efficiency of the interchange.
- Also, there is included in the VE study recommendation the need for a design exception for implementation.

Recommendation B-4: Use MSE walls in lieu of end span/end roll with slope paving

This concept allows for the elimination of the end spans using MSE walls. The two center spans increase to 106 feet each.

The total net savings for this option is $389,000

Response from Bridge Design: DO NOT IMPLEMENT

- MSE wall abutments are generally not recommended by Bridge Design for a number of reasons including losing the ability to add future lanes, utilities, or drainage in the end spans. If MSE walls are to be utilized, they must be set back far enough to allow longitudinal drainage along I-75. This drainage cannot be piped behind the MSE wall since it would conflict with the straps. The walls are estimated at 20' high, but if they turn out to be 24' high to get the bottom of the wall below the ditch, the wall area would increase by 27% and the savings would dwindle from $389,000 to $304,000.

Recommendation B-4.1: Use MSE walls and minimize I-75 spans for outside future widening

This concept includes the concept in B-4 plus reducing the center spans by not using the 30 foot clear zone shown in the original concept. In lieu of the clear zone, use a guardrail/barrier to protect the MSE wall which results in a center span revised length of 90 feet each.

Total potential savings of this option is $620,000

Response from Bridge Design: DO NOT IMPLEMENT

- MSE wall abutments are generally not recommended by Bridge Design for a number of reasons including losing the ability to add future lanes, utilities, or drainage in the end spans.

Recommendation B-4.2: Use MSE walls and minimize I-75 spans for inside future widening

This concept includes the concept included in B-4.1 plus assumes the future lane widening on I-75 can be performed on the inside not the outside. This results in a minimal center span length of 78 feet each.

Total potential savings of $806,000

Response from Bridge Design: DO NOT IMPLEMENT

- MSE wall abutments are generally not recommended by Bridge Design for a number of reasons including losing the ability to add future lanes, utilities, or drainage in the end spans.

Recommendation B-5: Use Type III in lieu of bulb Ts

This idea compares the original 5 span structure with the proposed 6 span facility using theproposed beams which save approximately 9 inches in profile height.

Proposed savings is $11,400

Response from Bridge Design: DO NOT IMPLEMENT

- This suggestion would lower the mainline profile of the roadway to achieve savings. Actual bridge costs would increase due to the addition of a cast-in-place concrete bent. The cost to redesign the roadway would exceed the savings of only $11,400 and this is not recommended.

Recommendation C-1: Widen the future mainline lanes on the inside and reduce the ramp taper length

By relocating the future lane widening to the inside, substantial tapering can be reduced which in turn saves substantial quantities of pavement.

Potential savings is $1,372,000

Response from Road Design: DO NOT IMPLEMENT

- According to the approved revised concept report (6/23/03), this interchange is a rural major arterial (I-75)/rural minor arterial (CR 665/Carbondale Road) and not an "Urban Principal Arterial", which was used as the justification for this recommendation. Therefore, the justification is not valid.
- The ramp configuration as currently designed will provide for the ultimate footprint of the widened I-75 corridor, thus reducing future required ROW costs. To implement a decision to construct an interchange bridge to only provide for future widening of I-75 to the inside would not only be limiting, but also premature as the concept for the future widening project has yet to begun.

Recommendation D-1: Revise the profile along Carbondale Road to reduce earthwork

Lowering the profile somewhat and rolling the grade allows for a substantial reduction in earthwork.

Savings is estimated at 849,800

Response from Road Design: WILL IMPLEMENT

- The profile will be revised west of the interchange to reduce earthwork, construction limits and required ROW.

Recommendation E-1: Use Asphalt in lieu of PCCP on the ramps

The concept is to use AC in lieu of concrete pavement. Although the idea was initially less expensive, over a 30 year design life cycle, concrete proved to be more economical.

Not Recommended by the VE Study Team

BAS:JLM:FCM

Cc: Gus Shanine/Christy Poon-Atkins – FHWA
Todd Long
Brent Story/Jason McCook/Fletcher Miller/Peter Emmanuel – Road Design
Paul Liles/Bill Ingalsbe/Jenny Harris-Dunham/Ted Cashin – Bridge Design
Paul Condit – OEL
James Magnus – GO Construction
Kent Sager/Patrick Bowers/Kenny Beckworth – District 6 Construction
Ken Werho/Nabil Raad/Paul DeNard – Traffic Safety and Design
General Files

Department of Transportation

ROUTING SLIP

Date 3/3/08

TO:

	ROOM NO.	OUT
(1) ~~Christy Poon-Atkins, Federal Highway Administration~~	FHWA	4/10
(2) Brian K. Summers	266	
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TO FORWARD, STRIKE YOUR NAME, INITIAL AND DATE

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- ☒ FOR SIGNATURE
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- ☐ FOR ACTION
- ☐ FOR DISCUSSION ON

_____ (Date)

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- ☐ PREPARE REPLY
- ☐ FILE
- ☐ MAIL
- ☐ PLEASE ANSWER
- ☐ RETURN TO

_____ BY

_____ (Date)

OTHER: Please contact Ron Wishon at 404-651-7470 if there are any questions.

FROM: rew

FM0095