

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: STP-004-2(31) Jones
P. I. No.: 322540
North Gray Bypass

OFFICE: Engineering Services

DATE: February 4, 2008

FROM: Brian K. Summers, P.E., Project Review Engineer *REW*

TO: Brent A. Story, P.E. State Road and Airport 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
ROADWAY (RD)				
RD-1	Use 6'-0" paved outside shoulders in lieu of 6'-6" paved outside shoulders	\$141,121	No	A political commitment has been made to provide for a bike route signage evaluation after construction has been completed.
RD-2	Reduce 44' median; utilize a median with positive barrier	\$10,154,132	No	Right of Way Plans have already been approved. A change would require a NEPA revision.
RD-5	Relocate S.R. 11 Connector to South of Bypass	\$324,636	No	Would result in impacts to the Historic Resource southwest of the proposed bridge.
RD-6	Close C.R. 26/Old Highway 18 and eliminate intersection/median break	Design Suggestion	No	Would result in over a two mile spacing between Median Openings.
RD-9	Evaluate realigning the intersection at S.R. 22 and the North Gray Bypass (Both ends)	Design Suggestion	No	Would result in additional Historical impacts would require a NEPA revision.

ALT No.	Description	Savings PW & LCC	Implement	Comments
ROADWAY (RD) - continued				
RD-10	Reduce Right of Way – acquire only that required for construction	\$84,150	Yes	This should be done.
RD-11	Consider locations for Right Turns and “Eyebrow Pavement”	Design Suggestion	Yes	This should be done.
RD-13	Bifurcate roadway to reduce Earthwork	\$387,365	Yes	This should be done.
RD-16	Steepen grade at Norfolk Southern Railroad Bridge Approach to reduce the volume of fill	\$7,133,537	No	The grades were steepened as much as possible without affecting the positive sight distance at the bridge.
RD-17	Reduce median width to a 24’ Raised Median	\$6,775,917	No	Right of Way Plans have already been approved. Would result in significant re-design costs and delays to the project’s schedule.
RD-19	Lower profile in selected areas to reduce Borrow	\$4,701,105	Yes	This should be done.
RD-20	Realign drainage structure at Sta. 263+50	Design Suggestion	Yes	This should be done.
BRIDGES (BR)				
BR-1	Use 2’ inside buffer in lieu of 4’ shoulder	\$92,268	No	Does not meet AASHTO requirements for inside shoulder width.
BR-2	Use 6’ outside shoulder and 2’ inside buffer in lieu of 10’ outside shoulder and 4’ inside shoulders	\$278,804	No	Does not meet AASHTO requirements for inside shoulder width.
BR-4	Use 3 span bridge with MSE Wall Abutments	\$54,855	No	Would result in sub-standard clear zone width on S.R. 11 under the bridge.
BR-6	Use MSE Wall Abutments on West end of bridge	\$105,019	No	Would result in sub-standard clear zone width on S.R. 11 under the bridge.

ALT No.	Description	Savings PW & LCC	Implement	Comments
BRIDGES (BR) - continued				
BR-7	Route farm access road through separate structure such as a culvert or CON/SPAN® type structure	Design Suggestion	No	A commitment had been made to the property owner to keep the Farm Access at the location shown in the plans.

A meeting was held on February 1, 2008 to discuss the above recommendations. Brent Story, Jason McCook, Fletcher Miller, Chandria Brown and Moussa Issa with Road Design and Brian Summers and Ron Wishon with Engineering Services were in attendance.

Approved: *Gerald M. Ross* Date: 2/4/08
Gerald M. Ross, P. E., Chief Engineer

BKS/REW

Attachments

- c: Gus Shanine
Todd Long
Jason McCook
Fletcher Miller
Chandria Brown
Moussa Issa
Paul Liles
Bill Ingalsbe
Bill Duvall
Lyn Clements
James Magnus
Lamar Pruitt
Kevin Ellis
Ken Werho
Nabil Raad
Paul DeNard
Cynthia Burney
Bruce Hart
Lisa Myers

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA



INTERDEPARTMENT CORRESPONDENCE

FILE STP-004-2(31) Jones County
P.I. No. 322540
SR 899/Gray North Bypass from SR 18 NE to SR 22

OFFICE Road Design

DATE January 4, 2008

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 RD-1: Use 6'-0" paved outside shoulders in lieu of 6'-6" paved outside shoulders.

Since the subject project is not a designated bike route a minimum 6'-6" paved shoulder is not required.

Initial cost savings is \$142,121

Response from Road Design: DO NOT IMPLEMENT

- Currently, the Department does not plan to designate this route as a "bicycle facility" because it is a limited access facility with a 55 mph speed design and anticipated truck volumes approaching 11%. However, the typical roadway section as designed does provide a safe usable 6'-6" paved shoulder which does not preclude the route from being signed and striped for bicycles in the future. A political commitment has been made to provide for a bike route signage evaluation after construction has been completed.

Recommendation RD-2: Reduce 44' median; utilize a median with positive barrier.

Cost savings achieved with the decrease in median width include minimization of the clearing and grubbing within the construction limits, reduced fill required, reduced ROW acquisition costs, a positive median barrier, reduced wetland impacts and compatibility with other cost saving proposals which provide positive improvements to the project.

Initial cost savings is \$10,154,132

Response from Road Design: DO NOT IMPLEMENT

- The current typical section is consistent with the approved concept. A change of this type would require a NEPA revision to a project with an already critical schedule.

Recommendation RD-5: Relocate SR 11 connector to south of bypass

Cost savings achieved with the alternative alignment include minimization of the clearing and grubbing within the construction limits, reduced fill required, reduced ROW acquisition costs, reduced wetland impacts and compatibility with other cost saving proposals which provide positive improvements to the project.

Initial cost savings is \$324,636

Response from Road Design: DO NOT IMPLEMENT

- Implementing this recommendation may cause impacts to the Historic resource southwest of the proposed bridge.
- Also, the alternative alignment may eliminate positive sight distance for left-turning vehicles from the alternate spur onto SR 11.

Recommendation RD-6: Close CR 25/Old Highway 18 – eliminate intersection/median break

The proposed median break at the CR 25/Old Highway 18 intersection could be eliminated to provide more efficient traffic flow on the North Gray Bypass. As the original intent for the project was to provide limited access to the anticipated heavy truck traffic the study team felt this could be a viable alternative.

Design Suggestion

Response from Road Design: DO NOT IMPLEMENT

- A median break at CR 25/Old Highway 18 (Sta. 48+58) is necessary to meet median spacing requirements. The next closest median breaks are at Relocated SR 18 (Sta. 25+72) and CR 240/Greene Settlement Road (Sta. 133+46). To eliminate this crossing would create a distance of just over 2 miles between median breaks.
- A median break at this location also provides crossing connectivity for future development.

Recommendation RD-9: Evaluate realigning the intersection at SR 22 and the North Gray Bypass (Both Ends)

By providing the free flow movement to the truck traffic, an improvement in traffic operations may be realized. It is unclear if this will provide any real advantage due to the overall higher volumes on SR 22.

Design Suggestion

Response from Road Design: DO NOT IMPLEMENT

- A realignment of this type would require a significant change to the approved concept, requiring a NEPA revision to a project with an already critical schedule.
- The predominant traffic movement along SR 18/22 (west end) is into the City of Gray; therefore, a T-intersection as designed is appropriate.
- Historical impacts to the south of the intersection of SR 899/Gray North Bypass and SR 22 (east end) may influence any type of realignment.

Recommendation RD-10: Reduce ROW – acquire only that required for construction

Further cost savings will be achieved with the decrease in ROW acquisition to include minimization of the clearing and grubbing and reduced wetland impacts.

Initial cost savings is \$84,150

Response from Road Design: WILL IMPLEMENT

- Reduction of the ROW has been implemented with the usage of 2:1 slopes, as well as the adjustment of the profile.
- The ROW will be reduced to that necessary to contain the construction limits and utility relocation.

Recommendation RD-11: Consider locations for right turns and eyebrow pavement

The addition of the right turn lanes would improve the operations at the intersections. Addition of eyebrow pavement to accommodate u-turning trucks would seem prudent due to the fact that a basic function of the roadway is to divert truck traffic from the Gray CBD.

Design Suggestion

Response from Road Design: WILL IMPLEMENT

- Right turn/deceleration lanes will be provided at all crossovers.
- “Eyebrow” pavement will be added in accordance to GA Construction Detail M-3 to accommodate u-turn movements at specified intersections.

Recommendation RD-13: Bifurcate roadway to reduce earthwork

A minor bifurcation (approx. 1 foot) in conjunction with steeper side slopes in the median will allow a reduction of the required fill material.

Initial cost savings of \$387,365

Response from Road Design: WILL IMPLEMENT

- The VE Study team only had access to the PFPR plans, which contained the proposed profile and cross-sections for the PFPR. During and after the VE Study, the profile was lowered and shoulder side slopes were steepened to address the PFPR comments to reduce required fill material.

- The civil engineering design software utilized for the design of the cross-sections essentially creates a “split grade” as recommended. Superelevation rotation is about the inside edges of pavement (EOP) on the mainline as projected from one mainline profile for earthwork conservation.

Recommendation RD-16: Steepen grade at NSRR bridge approach to reduce the volume of fill

The proposed grade seems to be artificially high for a long way on either approach to the NSRR Bridge. The grade could be lowered significantly from Station 205+00 to Station 259+00.

Initial cost savings is \$7,133,537

Response from Road Design: DO NOT IMPLEMENT

- The VE Study team only had access to the PFPR plans, which contained the proposed profile for the PFPR. During and after the VE Study, the profile was lowered and shoulder side slopes were steepened to address the PFPR comments to reduce the volume of fill.
- The approach side of the bridge has a spur which is a control for the mainline/bridge profile.
- To steepen the grade further on either approach would eliminate the positive sight distance of the profile as designed.

Recommendation RD-17: Reduce median width to 24' raised median

Cost savings achieved with the decrease in median width include minimization of the clearing and grubbing within the construction limits, reduced fill required, reduced ROW acquisition costs, reduced wetland impacts and compatibility with other cost saving proposals which provide positive improvements to the project.

Initial cost savings is \$6,775,917

Response from Road Design: DO NOT IMPLEMENT

- Implementing this recommendation will increase costs due to the addition of median concrete paving, curb & gutter, backfill, drainage structures and maintenance. These items were not included in the initial cost savings for this recommendation.

Recommendation RD-19: Lower profile in selected areas to reduce borrow

The proposed grade seems to be artificially high at locations. The grade was lowered as the result of the comments from the field plan review but could still be lowered quite a bit in some areas.

Initial cost savings is \$4,701,105

Response from Road Design: WILL IMPLEMENT

- The VE Study team only had access to the PFPR plans, which contained the proposed profile for the PFPR. During and after the VE Study, the profile was lowered and shoulder side slopes were steepened to address the PFPR comments to reduce borrow.

- The profile grade line has been established in accordance with the bridge and culvert requirements.

Recommendation RD-20: Realign drainage structure at Station 263+50

By realigning the proposed drainage structure to be parallel with the natural channel the hydraulic efficiency can be improved and the roadway ditch and natural channel will be subject to less erosion.

Design Suggestion

Response from Road Design: WILL IMPLEMENT

- The proposed drainage structure has been revised to be parallel with the natural channel.
- All drainage structures will be reviewed for accuracy.

Recommendation BR-1: Use 2' inside buffer in lieu of a 4' shoulder

A 2' buffer on the inside between the inside travel lanes and the bridge rail may be adequate. Additionally, the inside buffer width will closely match the typical roadway cross section.

The out-to-out bridge width in the Alternative will measure 39'-3".

Initial cost savings is \$92,268

Response from Bridge Design: DO NOT IMPLEMENT

- The VE Alternative No. BR-1 which suggests the use of 2-ft inside shoulder in-lieu of the 4-ft shoulder violates GDOT MOG 4265-10 and AASHTO Policy.

Recommendation BR-2: Use 6' outside shoulder and 2' inside buffer in lieu of 10' outside and 4' inside shoulders

A 6' outside shoulder and 2' buffer on the inside between the inside travel lanes and the bridge rail may be adequate. Additionally, the shoulder and buffer widths will closely match the typical roadway cross section.

The out-to-out bridge width in the Alternative will measure 35'-3".

Initial cost savings is \$276,804

Response from Bridge Design: DO NOT IMPLEMENT

- The VE Alternative No. BR-2 which suggests the use of 6-ft outside shoulder in-lieu of 10-ft shoulder and 2-ft inside shoulder in-lieu of the 4-ft shoulder violates GDOT MOG 4265-10 and AASHTO Policy.

Recommendation BR-4: Use 3 span bridge with MSE wall abutments

The 190' long 3 span bridge would accommodate SR 11 with sufficient clearance under the 55' end span on the West side, the RR with provision for a future track and required clearances under the 70' intermediate span and the Farm Access road under the 55' end span on the East side.

The MSE walls would run continuous along the face of the abutments and (for the purpose of the Alternative) wrap around and extend to about 20'.

Note: Cost savings, of substantial order, that would be realized from lowering the Profile Grade by at least 18" thus reducing earthwork quantities, have not been included in the savings below.

Initial cost savings is \$54,855

Response from Bridge Design: DO NOT IMPLEMENT

- The VE Alternative No. BR-4 which suggests the use of a three span bridge (55-ft, 77-ft and 55-ft) with MSE Wall abutments violates the clear zone requirements along SR 11. This alternative would also prevent any future widening of SR 11.

Recommendation BR-6: Use MSE wall abutments on west end of bridge

The 60' long west span would accommodate SR 11 with sufficient clearance. The 137' East span would remain the same as in the current design to accommodate Norfolk Southern RR and the Farm Access road.

The MSE wall would run continuous along the face of the West abutment and (for the purpose of the Alternative) wrap around and extend to about 20' parallel to the roadway.

Initial cost savings is \$105,019

Response from Bridge Design: DO NOT IMPLEMENT

- The VE Alternative No. BR-6 which suggests the use of MSE Wall abutment on the west end of the bridge and shorten span 1 to 60-ft in-lieu of 96-ft violates the clear zone requirements along SR 11. This alternative would also prevent any future widening of SR 11.

Recommendation BR-7: Route farm access road through separate structure such as a culvert of ConSpan-type structure

The relocation of the Access road to cross the North Gray Bypass under a separate culvert structure may provide an opportunity for reduction of the East side span of the current bridge from 137' to approximately 110'. The reduction in span length may allow the use of a shallower beam (perhaps a BT 54) which in turn would allow lowering the Profile Grade by at least 18". Lowering of the Profile Grade would significantly reduce earthwork required for the embankments on the bridge approaches.

Note: Exact savings/costs can be determined by comparing more detailed itemized costs after performing a preliminary design.

Design Suggestion

Response from Bridge Design and Road Design: DO NOT IMPLEMENT

- The VE Alternative No. BR-7 suggests the routing of the Farm Access road through a separate culvert structure. It does not appear that building two bridges will be cheaper than building one bridge. Due to the length of the culvert, concern is raised about proper ventilation inside the culvert.
- A commitment has been made to the property owner to route the Farm Access road in the proposed location.

BAS:FCM

Cc: Todd Long
Brent Story/Jason McCook/Fletcher Miller/Chandria Brown – Road Design
Paul Liles/Ron Grimes/Lyn Clements – Bridge Design
Bruce Hart – OEL
Jerry Milligan – ROW
James Magnus – GO Construction
Lamar Pruitt/Clinton Ford – District 3 Construction
Ken Werho/Cynthia Burney/Paul DeNard – Traffic Safety and Design
General Files

Wishon, Ron

From: Miller, Fletcher
Sent: Friday, February 01, 2008 4:32 PM
To: Wishon, Ron
Cc: Summers, Brian; Story, Brent; McCook, Jason; Brown, Chandria; Clements, Lyn
Subject: STP-004-2(31) Jones County P.I. 322540 - VE Study Implementation

Ron,

Here is the further explanation for the responses to the VE Study Alternatives BR-1 and BR-2 with regard to the AASHTO policy violation.

Both VE Study Alternatives BR-1 and BR-2 recommend the use of a 2 ft. inside buffer in lieu of a 4 ft. shoulder across the bridge.

According to the Alternative BR-1 typical section, there is a 4 ft. width between the edge of travel lane to the barrier. The 2 ft. inside "buffer" is in addition to another 2 ft. width; that is misleading.

TOPPS Policy 4265-10 states that geometric design standards shall be in accordance with the AASHTO publication "A Policy on Geometric Design of Highways & Streets," Collector Roads and Streets, 2001, p. 430. For minimum bridge widths (multilane rural - divided), use 4 ft. inside shoulders and 10 ft. outside.

Additionally, the 2004 AASHTO "Green Book", Rural and Urban Arterials (Rural), p.447 states, "On long bridges (overall length in excess of 200 ft.), offsets to parapet, rail or barrier should be at least 4 ft. measured from the edge of the traveled way on both sides of the roadway". The current bridge design length is 233 ft.

All said, I would say that the alternative BR-1 is acceptable and BR-2 is unacceptable.

Fletcher C. Miller, P.E.
Design Group Manager
Office of Road & Airport Design
Georgia Department of Transportation
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