DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: NHS-0001-00(760) Douglas/Cobb/Fulton
P.I. No. 0001760
I-20 HOV from S.R. 6 to S.R. 280

OFFICE: Engineering Services

DATE: July 5, 2006

FROM: Brian K. Summers, PE, State Project Review Engineer

TO: James B. Buchan, PE, State Urban Design Engineer

SUBJECT: **IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES**

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

ALT #	Description	Potential Savings/LCC	Implement	Comments
ROADWAY/PROFILE (RW) (with HOV Barrier)				
1.0	Increase the roadway pavement design section.	Design Suggestion	Yes	However, the final determination on pavement structure will be determined by the Pavement Design Committee.
2.0	Consider/evaluate using Concrete Pavement for the mainline and ramps in lieu of Asphalt Pavement.	-$5,000,000 (Cost Increase)	Yes	However, the final determination on pavement structure will be determined by the Pavement Design Committee.
3.0	Review North Blairs Bridge Road alignment due to planned housing development north of I-20.	Design Suggestion	No	This would result in additional impacts to an existing development and would be a more circuitous route.
4.0	Evaluate emergency access and response to barrier separated HOV lanes.	Design Suggestion	Yes	This will be done.
5.0	Consider pedestrian access at Thornton Road and Riverside Parkway Interchanges.	Design Suggestion	Yes	This will be done.

ALT #	Description	Potential Savings/LCC	Implement	Comments
ROADWAY/PROFILE (RW) (with HOV Barrier)				
6.0	Evaluate a two lane reversible barrier separated HOV in lieu of two lanes in each direction.	$3,700,000	No	Would not be consistent with other planned HOV systems in the metro Atlanta area. The traffic on this corridor seems to be split evenly in the EB and WB directions thus making this scenario not very desirable.
6.1	Evaluate/consider a single lane barrier separated HOV in lieu of two HOV lanes barrier separated in each direction	$4,600,000	No	The projected future HOV volumes show that two lanes are required. Two lane barrier separated HOV systems provide added safety into the corridor.
9.0**	Defer I-285 HOV to and from North Ramp to future I-285/I-20 Interchange Project	$16,900,000	No	A Cost-Benefit Analysis justifies building the HOV Flyover Ramp now.
STRUCTURAL/BRIDGES (SB)				
1.0***	Combine Thornton Road Bridge with North Blairs Road HOV Interchange @ Thornton Road location.	$3,700,000	No	Doesn't satisfy the project's intent of separating HOV traffic with general use traffic.
2.0	Combine Six Flags Parkway Bridge with Six Flags HOV Interchange @ Six Flags Parkway.	$3,350,000	No	Doesn't satisfy the project's intent of separating HOV traffic with general use traffic.
3.0	Replace the existing CSX Railroad Bridge instead of widening it.	$2,600,000	Yes	This will be done.
4.0	Replace the existing Chattahoochee River Bridge instead of widening it.	$5,700,000	Yes	This will be done.
5.0	Replace the existing Fulton Industrial Boulevard Bridge instead of widening it.	$2,500,000	Yes	This will be done.

ALT #	Description	Potential Savings/LCC	Implement	Comments
STRUCTURAL/BRIDGES (SB)				
6.0***	Straighten Blairs Road HOV Bridge	$4,800,000	No	Results in additional Right of Way impacts that may offset much of the savings.
7.0**	Utilize chorded HPC-Bulb Tee Beams in lieu of Cast in Place Concrete Box Girder @ I-285 Flyover Bridge.	$5,400,000	No	HPC Bulb-Tee Beams are not applicable in curved alignments with span lengths over 200 feet.
CONSTRUCTABILITY/OTHER (CM)				
1.0	Close Riverside Parkway during the construction of the new bridge.	$360,000	Yes	This will be done.
2.0	Construct two bridges over MLK Jr. Drive instead of three bridges.	$3,600,000	Defer	A decision will be made once the concept for I-20 at MLK Jr. Drive is complete.
3.0	Propose lucrative incentives for early completion in the construction contract.	Design Suggestion	Yes	This will be done.
4.0	Utilize Price-Indexing in Construction Contract.	Design Suggestion	Yes	This will be done for Asphaltic Concrete Pavement items.
5.0	Study the staging of the Thornton Road Bridge over I-20.	Design Suggestion	Yes	This will be done.

** RW-9.0 is mutually exclusive to SB-7.0
*** SB-1.0 is mutually exclusive to SB-6.0

A meeting was held on June 21, 2006 to discuss the above recommendations. R. Wayne Fedora of FHWA, Bruce Schmith with Earth Tech, Jan Hilliard and Teresa Lannon of Urban Design, and Brian Summers and Ron Wishon of Engineering Services were in attendance. Additional information was provided on July 5, 2006.

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

NOTE: Once the decision is made concerning the I-20/MLK Jr. Interchange, the Project Manager should contact Lisa Myers of this Office so that our records can be updated.

Approved: **signed by David E. Studstill** **Date: July 7, 2006**
David E. Studstill, Jr., P. E., Chief Engineer

Approved: **signed by Gus Shanine** **Date: July 20, 2006**
for **Robert Callan, P. E., FHWA Division Administrator**

BKS/REW

Attachments

c: Gus Shanine, R. Wayne Fedora, FHWA
Jan Hilliard
Teresa Lannon
Mickey McGee
Michael Lankford
Randy Hart
Keisha Jackson
Bill Ingalsbe
Lyn Clements
Lisa Myers

Approved: _____ **Date:** 7/7/06
David E. Studstill, Jr., P. E., Chief Engineer

Approved: _____ **Date:** 7/20/06
For: **Robert Callan, P. E., FHWA Division Administrator**

BKS/REW

Attachments

c: Gus Shanine, Floyd Moore, FHWA
Brad Saxon
Will Murphy
C.R. Jackson
Clay Bastian
Steve Gaston
Nabil Raad
Lisa Myers

Recommended for Approval
_____
DATE 7/20/2006

Wishon, Ron

From: Lannon, Teresa
Sent: Monday, July 03, 2006 2:24 PM
To: Wishon, Ron
Cc: Hilliard, Jan
Subject: OUTSTANDING ITEMS FROM THE VE IMPLEMENTATION MEETING JUNE 21, 2006 - EarthTech
Attachments: Cost Benefit Analysis for Attachment to Concept Report_Revised.xls

Ron,

Attached are the outstanding items from the VE Implementation meeting on June 21, 2006 from Bruce Schmith. Please let me know if you have any questions or need additional information.

Thanks.

Teresa Lannon
Assistant Design Group Manager
GDOT Urban Design Group 1
404-656-5441
Teresa.Lannon@dot.state.ga.us

From: Schmith, Bruce [mailto:bruce.schmith@earthtech.com]
Sent: Thursday, June 29, 2006 9:41 AM
To: Lannon, Teresa
Subject: RE: Updating Scheduled Activities for TPRO

Regarding the left-hand merge at MLK vs. a right-hand merge, we need to make an exception for all of the HOV interchanges because to construct a right-hand merge for all of the HOV interchanges will require two bridges instead of one, will create two intersections (closely spaced together) instead of one, and cause the mainline lanes to have to bow out further to create the HOV interchange. Also, the left-hand merge is recommended in the "AASHTO Guide for HOV Facilities" (see Figure 3-10).

The Benefit Cost Analysis for the HOV System Ramp to the north is attached.

Let me know if you need anything else.

Bruce

From: Lannon, Teresa [mailto:Teresa.Lannon@dot.state.ga.us]
Sent: Thursday, June 29, 2006 7:52 AM
To: Schmith, Bruce
Subject: RE: Updating Scheduled Activities for TPRO

In reviewing the VE Study notes, you were to provide an updated copy of the Cost Benefit for Roadway/Profile alt #9 and also give a better explanation of the left hand vs right hand exit hov merge – 2 bridges vs 3 bridges for Constructability/Other alt #2.

Thanks.

Teresa Lannon
Assistant Design Group Manager
GDOT Urban Design Group 1
404-656-5441
Teresa.Lannon@dot.state.ga.us

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE NHS-0001-00(760), Cobb, Fulton, Douglas
P.I. No. 0001760
I-20 West HOV Lanes from
Thornton Road to H.E.Holmes Drive

OFFICE Urban Design

DATE May 5, 2006

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

TO Brian Summers, P.E., State Project Review Engineer

SUBJECT **Value Engineering Study Responses**

This Office has reviewed the alternatives presented in the Value Engineering Report prepared for the above referenced project. Responses to each alternative are attached and we concur with these responses.

If you have any questions, please contact Jan Hilliard or Teresa Lannon at (404) 656-5441.

JCH
JBB:TLL

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A tyco International Ltd. Company

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March 24, 2006

Ms. Jan Hilliard
Georgia Department of Transportation
Office of Urban Design
No. 2 Capitol Square
Atlanta, GA 30334

Re: I-20 West HOV Lanes (Thornton Road to H.E. Holmes Drive)
NHS -0001-00(760)/P.I. No. 0001760, Cobb, Douglas, Fulton
Responses to VE Study recommendations

Dear Jan:

Earth Tech's responses to the recommendations of the VE Study for the I-20 West (Thornton Road to H.E. Holmes Drive) HOV Lanes project are listed below:

ROADWAY/PROFILE

1.0 Increase Roadway Pavement Design Section – We agree....a thicker pavement section is warranted for this project. Using Tom Turner's Superpave Mix Design memo dated 10/7/04 (as revised by the OMR memo dated 1/30/06) and the recommendations from the VE Study, the following asphalt section for the travel lanes, shoulders (since the shoulder may become a future travel lane) and directional ramps (except for the rebuilt portion of the ramp at the interface between the ramp and mainline pavement which should be concrete) in the I-20/I-285 Interchange is warranted (but would still need to be approved by OMR and the Pavement Design Committee):

a. 2" - 12.5 mm PEM Surface Course (220lb/sy)
b. 2" – 19 mm Superpave Intermediate Course (220lb/sy)
c. 8" – 25 mm Superpave Base Course in two 4" lifts (440lb/sy)
d. 16" GAB

For all other ramps, the following asphalt section should be used:

a. 1.5" - 12.5 mm Superpave Surface Course (165lb/sy)
b. 2" – 19 mm Superpave Intermediate Course (220lb/sy)
c. 8" – 25 mm Superpave Base Course in two 4" lifts (440lb/sy)
d. 12" GAB

STRUCTURAL

1.0 **Combine N. Blairs Bridge HOV "Only" Interchange with Thornton Road Interchange** – Recommendation deviates from the project intent of providing an HOV system with separate utility (i.e., separating the HOV traffic from the general use traffic) and therefore not considered. Additionally, adding an HOV interchange at Thornton Road would create a traffic "nightmare" since another signalized intersection (between the signalized intersections at the ramps) and additional traffic would be added to an already overburdened Thornton Road.

2.0 **Combine Six Flags HOV "Only" Interchange with Six Flags Pkwy. Interchange** - Recommendation deviates from the project intent of providing an HOV system with separate utility (i.e., separating the HOV traffic from the general use traffic) and therefore not considered. Additionally, because this interchange is a very tight urban diamond, the SOV ramps would probably have to be constructed further out to provide enough storage between the 3 signalized intersections.....impacts and construction costs that would probably be as expensive as constructing an HOV "Only" interchange.

3.0 **Complete replacement of I-20 Bridge over the CSX Railroad** – This existing bridge is proposed to be replaced.

4.0 **Complete replacement of I-20 Bridge over the Chattahoochee River** – This existing bridge is proposed to be replaced.

5.0 **Complete replacement of I-20 Bridge over Fulton Industrial Blvd.** – This existing bridge is proposed to be replaced.

6.0 **Straighten the N. Blairs Bridge HOV Interchange Bridge** – The 75 degree maximum skew at this interchange is required to minimize impacts to the proposed development north of I-20. Even though N. Blairs Bridge is on a 75 degree skew with I-20, PSC beams can still be used because there are two separate bridges, one over the westbound SOV + HOV lanes and one over the eastbound SOV + HOV lanes.

7.0 **Utilize chorded HPC Bulb-Tee Beams in lieu of CIP Concrete Box for HOV Flyover Ramp** – HPC Bulb-Tee Beams are not applicable in curved alignments with spans over 200 feet.

CONSTRUCTABILITY/OTHER

1.0 **Close Riverside Parkway during construction of new bridge** – Both the Riverside Parkway and Six Flags Parkway bridges will be closed (alternatively) during construction to facilitate replacement of the bridges. Traffic will be routed to the access roads (that parallel I-20) and the proposed Six Flags HOV connector road.

2.0 **Construct two bridges over MLK instead of three bridges** – We are now doing this because we have changed the drop ramps to left-hand merge drop ramps rather than the right-hand merge drop ramps that were shown in the concept.

3.0 **Propose lucrative incentives for early completion in the construction contract** – We agree this should be done.

4.0 **Utilize price indexing in construction contract** – If, at the time of construction, prices are still volatile we recommend this alternate be implemented.

5.0 **Study the staging of the Thornton Road bridge** – The concept is to first build the extension of N. Blairs Bridge Road, and then construct the northbound side of the Thornton Road bridge, detouring the northbound traffic onto Blairs Bridge Road via Interstate Parkway West. The southbound lanes would remain open as well as all four ramps. The NB to WB I-20 traffic would use the existing ramp by turning south at the N. Blairs Bridge Road/Thornton Road intersection and then west on the existing ramp.

If you have any questions or need additional information, please do not hesitate to contact me at (770) 990-1426.

Sincerely,

Earth Tech, Inc.

Bruce A. Schmith, P.E.
Senior Project Manager

2.0 **Consider/evaluate concrete pavement alternate** - There may be a life cycle cost advantage to using concrete pavement. This will be investigated in the Preliminary Design Phase.

3.0 **Review N. Blairs Bridge Road Alignment due to planned development** – Two alternates were evaluated: a new alignment traversing the east property line of the proposed development and moving the HOV Interchange. An alternate alignment extending along the east side of the property line of the proposed development would lessen the impact to the proposed development but it would impact another existing development before we could tie it back into Thornton Road. In summary, the alternate we considered would cause the same impacts and be more circuitous so it was not further considered. Moving the HOV Interchange also was not feasible because of its close proximity to the Thornton Road Interchange.

4.0 **Evaluate emergency access to barrier-separated HOV Lanes** – A method for allowing access to the barrier-separated HOV lanes needs to built into the system. We were thinking that a retractable-type barrier could be designed that would operate using a hydraulic winch system that could only be operated by emergency personnel. This will be evaluated further in the Final Design Phase.

5.0 **Consider pedestrian access at the Thornton Road & Riverside Parkway Interchanges** – Both new bridges at these interchanges will have sidewalks and we will install pedestrian crosswalks and ADA ramps at any ramp intersections we are reconstructing.

6.0 **Evaluate a 2-lane reversible, barrier-separated HOV lane system** – A 2-lane reversible, barrier-separated HOV lane system is applicable for corridors where the commute pattern is primarily one-way. However, in this corridor, and for many other highway corridors in the metro area, the traffic volumes are already now, or are expected to be nearly an even split in each direction. Consequently, a 2-lane reversible, barrier-separated HOV lane system is not applicable. Also, to meet driver expectancy as drivers travel on other HOV lanes systems throughout the metro area, one type of system should be used.

6.1 **Evaluate a single lane barrier-separated HOV lane system** – Future HOV traffic volumes show that 2 HOV lanes are required. Additionally, since the system is barrier-separated, 2 lanes provide added safety.

9.0 **Defer HOV Direct Access Flyover Ramp to future project** – A cost vs. benefit analysis (attached) justified building the HOV flyover ramp. Additionally, the flyover ramp gives priority to HOV users and the proposed BRT system.

Benefit Cost Analysis Worksheet
NHS-0001-00(760)
Douglas, Cobb, and Fulton Counties
I-20 HOV Lanes
HOV I-20/I-285 DIRECT ACCESS FLYOVER RAMP
PI 0001760

Congestion Benefit = Tb + CMb			
Time Benefit (Tb)			
Tb ($)		$152.9 M	
Commercial Benefit (CMb)			
CMb		-	

Total Congestion Benefit	**$152.9 M**
Construction Cost	**$40.0 M**
B/C Ratio	**3.8**

Note:

1. Tb is based on 1727 hours/day x 250 days/year x 20 years x $17.71/hr = $152.9 M
2. $17.71/hr takes the 2002 value of time of $13.45/hr and applies 3.5% inflation rate to 2010 dollars
3. Though there is commercial benefit in the general use lanes due to the HOV system, trucks will not utilize the HOV system and were therefore not directly measured in this analysis.
4. Total Congestion benefit = Tb + CMb = $152.9 M
5. Construction Costs include the following:
   $22.3 M for the bridge
   $2.75 M for MSE walls
   $2.5 for adding a lane on I-285 and tapering it back
   $8.0 M to shift SB lanes on I-285 to accommodate flyover
6. Total Construction Cost = ($22.3 M + $2.75 M + $2.5 M + $8.0 M)*1.04**3 = $40.0 M in 2009 dollars (let year)
7. B/C ratio = $152.9 M / $40.0 M = 3.8
8. The following values were taken from accepted GDOT sources:
   2002 Value of Time = $13.45/hour
   2002 Commercial Cost = $71.05/hour
   Measure of High Volume Days = 250