

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: MSL-0003-00(165) Douglas
P.I. No. 0003165
I-20 HOV from Bright Star Rd. to S.R. 6

OFFICE: Engineering Services

DATE: August 30, 2006

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

TO: Ben 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
1	Do not build the bridge at Bright Star Road to its ultimate width	\$691,200	Yes	This will be done.
3	Do not build the diversion of Douglas Blvd. at Bright Star Road	\$2,551,575	No	The traffic study (which the VE Team did not have) calls for a minimum of 450' of storage for dual left turn lanes which requires that Douglas Blvd. be relocated.
9	Cul-de-sac North County Line Road	\$1,375,449	Defer	This decision should be pursued and additional justification concerning traffic flow patterns should be obtained to justify permanently closing North County Line Road. Additionally, input from the local government should be obtained.

ALT #	Description	Potential Savings/LCC	Implement	Comments
13	Develop Dorris Road for access to the Douglas County Multi-Modal Center and relocate HOV Interchange to Prestley Road	\$1,434,340	No	There would be operational concerns with having 4 intersections on Prestley Mill Road within 1200 feet. Additionally, the hospital has developed or will develop the property along Dorris Road thus making this option not feasible.
14/16	Shorten Bridges by using MSE Walls with outside shoulders	\$3,333,787	No	This would limit future expansion along this corridor.
17	Close Midway and Burnt Hickory Road over I-20 and detour existing traffic.	\$180,434	No	Because of the existing sharp skew, steel beams would have to be used which is more costly than a concrete beam bridge.
18	Build only one bridge between center and full drop ramps at proposed Multi-Modal HOV only interchange	\$1,441,476	No	Limits the overall connectivity and effectiveness of the HOV System.

A meeting was held on August 10, 2006 to discuss the above recommendations. Wayne Fedora of FHWA, Dan Bodycomb with DMJM Harris, Jan Hilliard, and Teresa Lannon of Urban Design, and Ron Wishon and Lisa Myers of Engineering Services were in attendance. Additional information was provided by the Design Consultant on August 30, 2006.

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

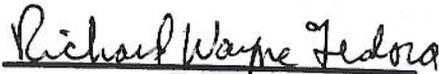
Approved:  Date: 8/30/06
 David E. Studstill, Jr., P. E., Chief Engineer

Approved:  Date: 9/8/06
 For Robert Callan, P. E., FHWA Division Administrator

BKS/REW

Attachments

Recommended for Approval


 DATE 9/7/2006

MSL-0003-00(165) Douglas

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Implementation of Value Engineering Study Alternatives

Page 3.

c: Gus Shanine, FHWA
R. Wayne Fedora, FHWA
Jan Hilliard
Teresa Lannon
Paul Liles
Vince Wilson
Ken Werho
Keisha Jackson
Michael Lankford
Lisa Myers

DMJM Harris

DMJM HARRIS | AECOM

JOB TITLE I-20 Hwy VG Study At1 #1

JOB NO. 60003069

CALCULATION NO. _____

ORIGINATOR DB

DATE 8-21-06

SHEET _____

OF _____

REVIEWER _____

DATE _____

Bright Star Road Bridge

- Proposed 5 lane bridge

$$360' \text{ (total length)} \times 88' 5'' \text{ (out to out)} = 31,830 \text{ ft}^2$$

Future 7 lane bridge \times 112' 5" (out to out)

$$360' \times 112' 5'' =$$

$$40,470 \text{ ft}^2$$

$$\text{diff } 8,640 \text{ ft}^2$$

Cost difference

$$8640 \text{ ft}^2 \times \frac{\$80}{\text{ft}^2} = \$691,200$$

Value Engineering Study Response

for

**GDOT PROJECT MSL-0003-00(165)
I-20W HOV LANES FROM BRIGHT STAR ROAD TO
SR 6/THORNTON ROAD**

P.I. No. 0003165

DMJM HARRIS JOB NO. 60003069

DMJM HARRIS | AECOM

June 30, 2006

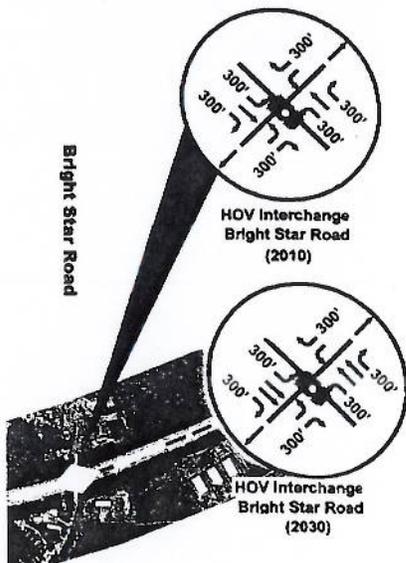
Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 1
Description:	DO NOT BUILD BRIDGE AT BRIGHT STAR ROAD TO ITS ULTIMATE WIDTH	
Original Design:	The original design is to build the Bright Star Road Bridge over I-20 four lanes wide to accommodate design year traffic.	
Alternative:	Build a two-lane bridge at this time to match the two-lane roadway. Widen the bridge at the same time the roadway is widened. Construct the bridge to accommodate future widening.	
Advantages:	<ul style="list-style-type: none">• Saves bridge cost now• Future widening may not be necessary• Not needed for the immediate future	
Disadvantages:	<ul style="list-style-type: none">• The cost of the bridge will increase in the future	
Discussion:	Build only what is needed to accommodate opening day traffic. Upgrades can be completed when needed at a later date.	

Response to Alternate No. 1

We agree with the Value Engineering recommendation to accommodate opening day traffic. However, the opening day traffic (2010) for the Bright Star Road Bridge requires a five (5) lane bridge. The layout is as follows: One shared left turn lane in the center of the bridge and two through lanes in each direction.

This bridge configuration meets the build year (2010) recommendation. The design year (2030) recommendation is for a seven (7) lane bridge as seen in the figure below.



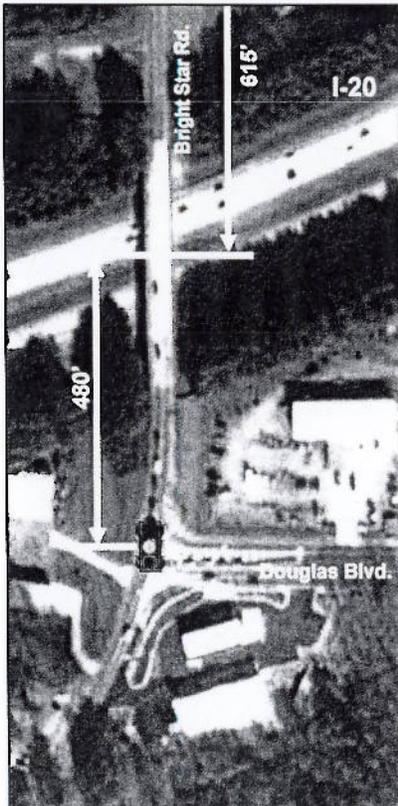
Day Wilburn, who performed the corridor traffic analysis writes, "In order to accommodate the proposed HOV interchange, accommodate future traffic demand and maintain acceptable levels of service the following roadway improvements are recommended: Widen Bright Star Road from two to four lanes from north of John West Road to south of Douglas Boulevard. Ultimately Bright Star Road should be widened to four lanes from SR 5 to US 78. The bridge over I-20 should have a minimum cross section of five lanes with a preferred cross section of seven lanes."

Our recommendation is to build only what is needed for opening day traffic which is a five lane bridge. If needed in the future this bridge can be widened.

Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 3
Description:	DO NOT BUILD DIVERSION OF DOUGLAS ROAD AT BRIGHT STAR ROAD	
Original Design:	The current design shows the intersection of Douglas Road and Bright Star Road relocated 600 ft. south of its current location due to the Bright Star Road bridge being raised approximately 5 ft. over I-20. Approximately 1,700 linear ft. of Douglas Road will be relocated.	
Alternative:	Keep Douglas Road in its current location. Tie Bright Star Road to meet its existing profile as soon as possible. The existing intersection is 300 ft. south of bridge. Assume at least 2 ft. of the 5-ft. elevation difference can be made up. Reconstruct Douglas road to tie into Bright Star Road at its proposed elevation.	
Advantages:	Disadvantages:	
<ul style="list-style-type: none"> ● Reduces reconstruction ● Reduces right-of-way costs/takes 	<ul style="list-style-type: none"> ● None apparent 	
Discussion:	The diversion of Douglas Road can be avoided by adjusting the proposed profile of Bright Star Road to meet the existing road profile sooner. This will reduce the amount of grade adjustment necessary on Douglas Road at Bright Star Road and save significant cost.	

Response to Alternate No. 3



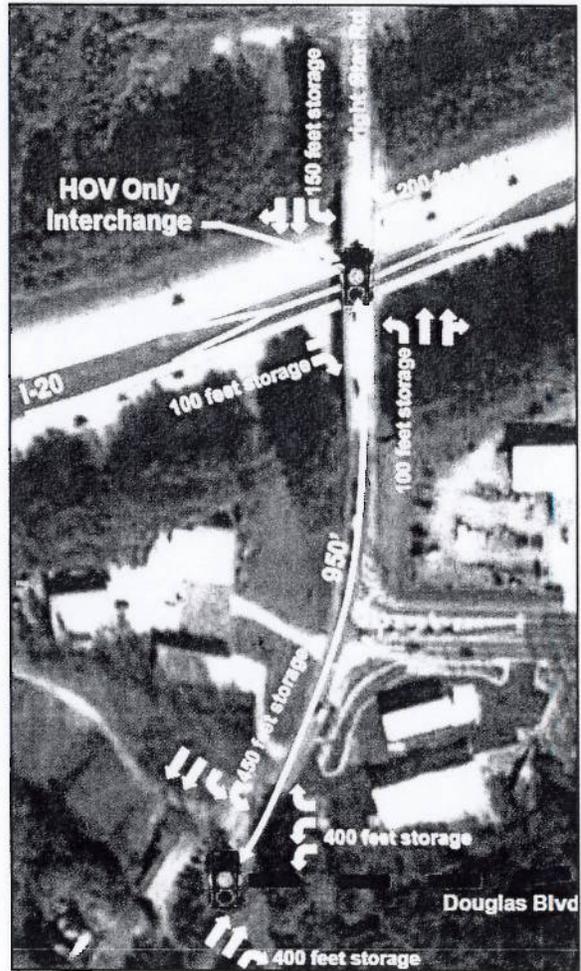
The current location of the intersection of Bright Star Road and Douglas Boulevard is 480 feet from the proposed HOV ramps at Bright Star Road. Geometrically it is possible to tie the profile at the new bridge over I-20 with the existing ground before Douglas Boulevard. The concern with this intersection is how it will perform operationally due to the close in proximity to the proposed ramps and the high traffic volumes.

The traffic study recommends dual left turn lanes onto Douglas Boulevard with a minimum of 450 feet of storage, or 820 feet for a single left turn lane. The existing intersection is only 480 feet from the ramps (Appendix A, Figure 1). Storage is also needed on the bridge to accommodate left turns onto I-20 West, thus there would be an overlap of storage space.

From the recommendation of the traffic study, DWA writes, "In order to accommodate the proposed HOV interchange, accommodate future traffic demand and maintain acceptable levels of service the following roadway improvements are recommended: at the approach on Bright Star Road intersection with Douglas Boulevard; the southbound

approach on Bright Star Road should be widened to include two through lanes and dual left turn lanes. The northbound approach on Bright Star Road should be widened to include two through lanes and a dedicated right turn lane. Douglas Boulevard should be realigned further to the south to provide additional storage room between Douglas Boulevard and the HOV interchange. Based on the analysis, the southbound left turn movement (with dual lefts) at Douglas Boulevard will have queues extending back 425 feet during the PM peak hour. Based on single southbound left turn lane the queues will extend back over 820 feet. Douglas Boulevard should be widened to include dual left turn lanes and a dedicated right turn lane.”

The proposed design moves the intersection to the south. The new alignment goes behind the existing gas station and through undeveloped land and increases the distance between intersections to 950 feet (Appendix A, Figure 3). Moving the intersection to this location will allow room for the addition of dual left turns and will ensure that this intersection operates at an acceptable Levels of Service.



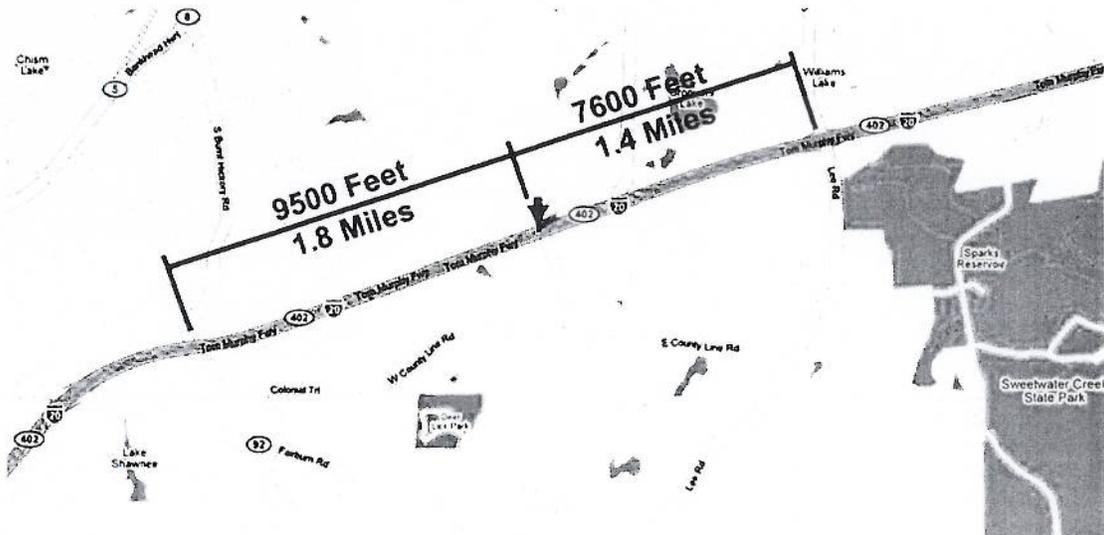
The recommendation is to realign Douglas Boulevard to the south.

Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 9
Description:	CUL-DE-SAC NORTH COUNTY LINE ROAD	
Original Design:	The existing bridge for North County Line Road over I-20 will be replaced due to the addition of HOV lanes along I-20	
Alternative:	Cul-de-sac North County Line Road on either side of I-20 and remove the existing bridge.	
Advantages:	<ul style="list-style-type: none"> • Cost savings • Reduces right-of-way costs/takes 	Disadvantages: <ul style="list-style-type: none"> • Cuts off through traffic over I-20
Discussion:	Existing traffic north of I-20 can cross using Vulcan Drive or South Sweetwater to Lee Road or access Riley Road and/or McKnown Road to Burnt Hickory Road to cross over I-20. Existing traffic south of I-20 can cross using East County Line Road to Lee Road or West County Line road to Midway/Burnt Hickory Road.	

Response to Alternate No. 9

The VE study recommends not replacing the bridge at North County Line Road over I-20 (location shown with an arrow below). Interstate 20 forms a natural barrier between the areas north and south of the highway. Because of this barrier there are limited locations to cross the Interstate.



From North County Line Road the nearest crossing to the west is Burnt Hickory Road which is 1.8 miles along I-20 and further then that when considering the surface streets

required getting to this crossing. The nearest crossing to the east is at Lee Road which is 1.4 miles away. Removing the crossing of I-20 at North County Line Road will create a 3.2 mile gap between North and South crossings of I-20.

The traffic currently utilizing the North County Line Road Bridge, for the most part, is not accessing I-20. Closing this bridge will force this traffic to travel further to get to their destinations as well as adding unnecessary congestion to the I-20 and Lee Road interchange.

The recommendation is to rebuild North County Line Road Bridge in its current location.

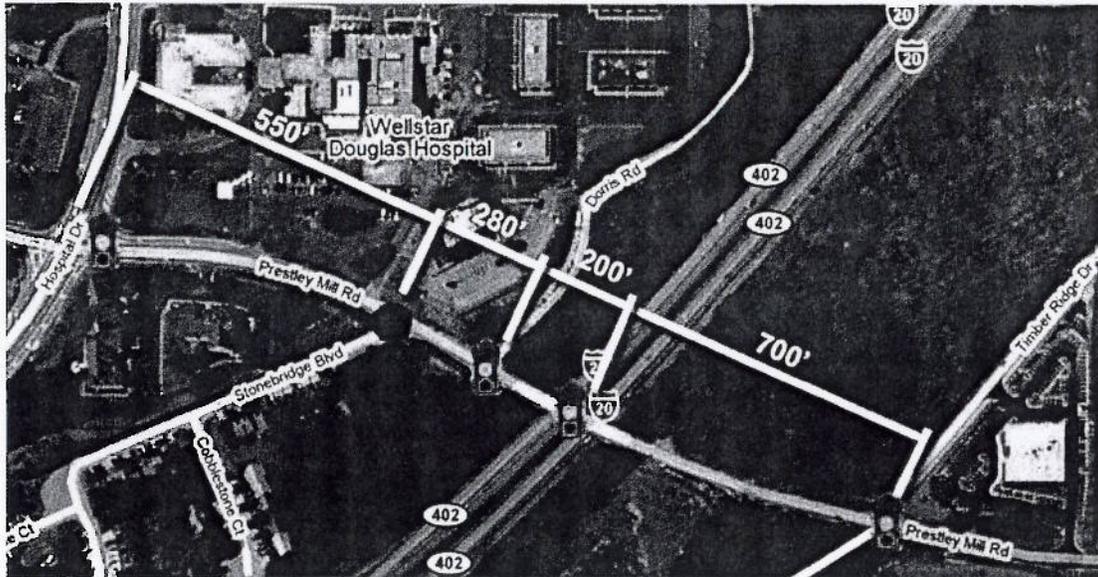
Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 13
Description:	DEVELOP DORRIS ROAD FOR ACCESS TO DOUGLAS COUNTY MULTI-MODAL CENTER AND RELOCATE HOV INTERCHANGE TO PRESTLEY ROAD	
Original Design:	The concept design for the multi-modal facility indicates a four-lane divided road with curb and gutter and 10-ft. sidewalks. The multi-modal road will be designed and constructed on Dorris Road. Dorris Road will extend over I-20 with a new bridge and a full HOV-only, full drop ramp tying into Timber Ridge Drive. Timber Ridge Drive will be improved westwardly to the new Prestley Mill Road/Timber Ridge intersection.	
Alternative:	Develop Dorris Road on the north side of I-20 for the multi-modal center roadway. There exists a dirt road for access to Douglas County Hospital's property located in the southeastern section. Improve and upgrade the current intersection for Prestley Mill Road and Dorris Road to accommodate both HOV and single-occupancy vehicle/local traffic users. Right-of-way for this roadway could be sought from Douglas County Hospital as a donation to reduce cost for the purpose of the roadway improvement.	
Advantages:	<ul style="list-style-type: none">• Eliminates proposed bridge• Uses existing roadway• Eliminates Timber Ridge Drive/Prestley Mill Road relocated intersection	Disadvantages: <ul style="list-style-type: none">• May result in renegotiations with the hospital• Impacts hospital's property• Through traffic on Prestley Road must use center lanes of new bridge/intersection
Discussion:	A higher degree of efficiency will be obtained if Dorris Road is developed to access the multi-modal center from Prestley Mill Road. A shorter driving distance is achieved with less impact on hospital ingress/egress. It is possible that this realignment could reduce the overall right-of-way costs.	

Response to Alternate No. 13

The option of converting Prestley Mill into an HOV interchange was originally considered in the Concept Alternate Report. Improving the dirt road between the Hospital property and I-20 was also considered as an alternate similar to what is described by the VE Study.

This alternative was dismissed for several reasons. The primary reason was the number of intersections along Prestley Mill Road. Adding an HOV interchange on I-20 and an intersection at Dorris Road would create four (4) intersections within 1180 feet of each other. The distance between the HOV ramps and the improved Dorris Road intersection would only be two hundred (200) feet. The projected traffic numbers along Prestley Mill Road indicated that these interchanges would not operate efficiently.



Another reason this alternative was dismissed is because of the Hospital property. Developing Dorris Road from a dirt road to a paved road would require extra Right-of-Way from the Hospital. At the time of the study the Hospital was already building a development on one of the properties and had a future plan for the adjacent property. After several meetings with the Hospital Authority, it was apparent that they would not be willing to donate land and were disturbed by the amount of impacts that were originally proposed. The design team worked with them on reducing the impacts. Obtaining Right-of-Way would have been costly since it would have impacted the Doctors' offices which were under construction at the time.

Our recommendation is that using Prestley Mill as an HOV interchange instead of at the Multi-Modal Center was not a viable option from the standpoint that it would not have worked operationally and would have required major impacts to a Doctor's office building and possible future office building.

Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 14/16
Description:	SHORTEN BRIDGES BY USING MECHANICALLY STABILIZED EMBANKMENT (MSE) WALLS WITH OUTSIDE SHOULDERS	
Original Design:	Bridges at Bright Star Road, SR 5, Midway Road, North county Line Road, and the west abutment of Mt. Vernon Road and the Multi-Modal bridge all have end slopes. Except for the North County Line Road Bridge, all others have end slopes with shorter end spans. The remainder of the bridge ends are on MSE walls with a minimum of 30 ft. as the clear zone from the edge of the travel way.	
Alternative:	Set bridge ends on MSE walls protected by a barrier in front of the wall adjacent to an outside 14-ft. shoulder.	
Advantages:	<ul style="list-style-type: none">• Shorter bridges result in less cost• The short end spans can be eliminated, thereby eliminating the corresponding intermediate bent	Disadvantages: <ul style="list-style-type: none">• Future additional lane expansion is curtailed• 30-ft. clear zone is replaced with 14-ft. shoulder barrier wall
Discussion:	Shortening bridges with vertical MSE walls that match the cross-section of I-20 bridges over streams saves construction costs.	

Response to Alternate No. 14/16

The VE study recommends using MSE walls instead of end slopes at various bridge locations. The Bridge Department within the GA DOT is against using MSE walls as they limit future widening and are not always the most cost effective solution. It is their policy to use endspans and endslopes.

Below is an email correspondence between the DMJM Bridge Department and Bill Ingalsbe the GDOT Assistant Bridge Engineer. The reference to Paul in the email is Paul Liles, the GDOT State Bridge Engineer.

From: Ingalsbe, Bill [mailto:Bill.Ingalsbe@dot.state.ga.us]
Sent: Tuesday, June 20, 2006 3:39 PM
To: McNabb, James
Subject: RE: I-20 HOV Bridges in Douglas County

James,

Paul is not in favor of MSE Wall abutments because they limit widening in the future. In addition, the cost estimates from a VE study can sometimes be suspect. We still want endspans with endslopes.

Thanks,

Bill Ingalsbe

From: McNabb, James [mailto:James.McNabb@dmjmharris.com]
Sent: Tuesday, June 20, 2006 3:02 PM
To: Ingalsbe, Bill
Subject: I-20 HOV Bridges in Douglas County

Bill,

I know at our last meeting that we had discussed keeping the end spans on the bridges instead of putting in MSE wall end bents. I have seen cost estimates that have gone both ways as to which is a cheaper alternate. We got a comment in our VE that says MSE wall end bents are cheaper and that we should look at using them and shortening the bridges, but this comes at a cost of losing additional room for future expansion.

What is GDOT Bridge Design's stance on this?

James McNabb, P.E.
Bridge Engineer
DMJM+HARRIS | AECOM
900 Circle 75 Parkway, Suite 1750
Atlanta, GA 30339
P:770.980.6258
F:770.980.6048
james.mcnabb@dmjmharris.com

Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 17
Description:	MIDWAY ROAD AND BURNT HICKORY ROAD BRIDGE DETOUR OVER I-20	
Original Design: The original bridge design for Midway Road and Burnt Hickory Road shifts the new bridge approximately 100 ft. east on the new alignment. This will allow bridge construction to proceed while maintaining traffic. Required additional right-of-way is indicated on concept map. The Vasant Road and Midway Road intersection skew will be improved and adjusted to the northeast.		
Alternative: Close Midway Road and Burnt Hickory Road Bridge over I-20 and detour existing traffic. Remove the existing bridge and install the proposed bridge in the existing location. This alternative will reduce or eliminate additional right-of-way requirements along both Midway Road and Burnt Hickory Road.		
Advantages:		
<ul style="list-style-type: none">● Reduces construction cost for roadway● Reduces right-of-way impact,● Reduces project schedule● Reduces overall right-of-way cost● Construction materials reduced● Safer work environment		
Disadvantages:		
<ul style="list-style-type: none">● Closes Midway/Burnt Hickory Roads for a specific period of time● Inconveniences local users		
Discussion: This alternative will allow construction to be performed within the existing right-of-way, reducing project cost. Local county roads facilitate detour routes common to residents in the area and currently used by residents. It is always advantageous to allow the construction contractor to complete the required construction without having to maintain traffic and perform work-arounds. Turning the site over to the contractor for the required construction period is safer for both construction personnel and public travelers and will reduce the amount of time required for completion of the work at hand.		

Response to Alternate No. 17

The existing bridge at Midway Road over I-20 is a curved steel bridge. In order to meet the Department's request for a less costly concrete bridge at this location it was necessary to reduce the skew over the interstate. Because of the sharp curves both north and south of the bridge it was necessary to shift the alignment to the east to improve the skew and allow for the use of PSC Beams.

Keeping the alignment in its original location would have meant a curved bridge which would require the construction of a steel girder bridge. The cost of a steel bridge is approximately \$2.1 million. The cost of a concrete bridge is approximately \$1.4 million. The cost savings of proposing a concrete bridge is over \$670,000 (see Appendix B). The VE study calculated a Right-of-Way savings of \$180,434 but assumed that the cost of the bridge would be the same.

The option for a detour is still available. The 2010 DHV for Midway Road is over 700 vehicles per hour. The detour consists of Midway Road, Bankhead Hwy, SR-92 Fairburn Road, and Vansant Road. This detour is 5.3 miles in length.

Our recommendation is to not replace the bridge in its current location but to build a concrete bridge on new location which is less expensive than a steel bridge being replaced on the current alignment.

A detour can be proposed at the next Public Meeting.

Value Engineering Recommendation

Project:	HOV LANES ON I-20 WESTSIDE FROM BRIGHT STAR ROAD TO SR6/THORNTON ROAD <i>Georgia Department of Transportation</i>	Alternate No.: 18
Description:	BUILD ONLY ONE BRIDGE BETWEEN CENTER AND FULL DROP RAMPS AT PROPOSED MULTI-MODAL HOV-ONLY INTERCHANGE	
Original Design: The current design proposes to build multi-modal bridges over I-20 eastbound and westbound and develop access roads to Timber Ridge Drive.		
Alternative: Build only the bridge over I-20 westbound connecting the center with the full drop ramps and do not build the access road to Timber Ridge Drive.		
Advantages: <ul style="list-style-type: none">• Saves cost by not building bridge over I-20 eastbound and associated roadway• Bridge may not be needed		Disadvantages: <ul style="list-style-type: none">• Lengthens travel between multi-modal center and Prestley Mill Road• Eliminates an amenity
Discussion: Not building the bridge over I-20 eastbound and the associated roadway to Timber Ridge Drive translates into a large cost savings with minimal impact to traffic flows.		

Response to Alternate No. 18

One of the key components to the Need and Purpose for the I-20 HOV project is to facilitate transit. The Douglas County Multi-Modal Center is a main destination for bus routes, van pools, and car pools. Providing access to this facility is a necessity as it promotes the use of the HOV system.

Without a bridge over the eastbound I-20 lanes, access to the Multi-Modal Center is severely limited for those people who are South and West of I-20.

If this bridge is not built then a person wishing to access the Multi-Modal Center is forced to drive west on Prestley Mill Road for 0.4 miles, then turn right on Hospital Drive for 0.6 miles, and then turn right of Dorris Road for 0.4 miles. Along this 1.4 mile route are several traffic signals, a major hospital, government buildings, and businesses.

The time required to travel these surface streets will have an impact on those wishing to use the Multi-Modal Center and the HOV lanes. If there is not enough of a perceived time savings for the commuter then they will not use the system. This goes against our Need and Purpose of facilitating transit.

Our recommendation is to keep the bridge over the eastbound I-20 travel lanes and provide better access to the Multi-Modal Center.

Appendix A

To: Dan Bodycomb, P.E., DMJM Harris

From: David Kasbo, P.E., Day Wilburn Associates., Inc. (DWA)

Date: May 8, 2006

Subject: I-20 HOV Lane Project – Bright Star Road Recommendations
MSL-0003-00(165), P.I. No. 0003165

cc: Jim Littleton, DMJM Harris
Rick Day, DWA
Jeff VanDyke, DWA

In late 2005, the original I-20 HOV Lane project limits were extended further west from SR-5 to the Bright Star Road overpass. An HOV only interchange is now proposed at Bright Star Road. The purpose of the Bright Star Road HOV only interchange is to provide a direct connection between the I-20 HOV system and the surrounding population centers; including the Arbor Place Mall area and rural Douglas County. The HOV only interchange will also provide access to a proposed park-n-ride lot to be located off Bright Star Road.

In order to determine roadway improvements to accommodate the proposed HOV interchange and future traffic demand, DWA performed a traffic analysis of the Bright Star Road corridor between Douglas Boulevard and John West Road. Figure 1 shows existing conditions within the study area.

Bright Star Road is an existing two-lane urban collector extending from SR-5 to US-78 (Bankhead Highway). The intersection of Bright Star Road and Douglas Boulevard is currently signalized. As shown in Figure 1 the intersection at Douglas Boulevard is located approximately 480 feet south from the center of the I-20 overpass. John West Road is located approximately 615 feet to the north.

Based on 2005 traffic counts Bright Star Road carries 11,380 vehicles per day (vpd) at the I-20 overpass. Future traffic projections with the proposed HOV only interchange estimate Bright Star Road will carry over 17,400 vpd by 2010 and 33,200 vpd by 2030 between I-20 and Douglas Boulevard. To the north, Bright Star Road will carry 14,160 vpd in 2010 and 31,590 vpd by 2030 between I-20 and John West Road.

Design hourly (2030) volumes are shown in Figure 2 for the AM and PM peak periods. Bright Star Road is projected to have over 1,530 vehicles per hour (vph) on the northbound approach to the HOV only interchange and 1,620 vph on the southbound approach during the AM peak hour. Bright Star Road will carry 1,360 vph on the northbound approach and 1,940 on the southbound approach during the PM peak hour.

At the intersection of Bright Star Road and Douglas Boulevard, the southbound approach will have 642 vph going straight on Bright Star Road and 713 vph turning left onto Douglas Boulevard. During the PM peak hour, the southbound approach will have 988 vph going straight and 917vph turning left onto Douglas Boulevard. The northbound right turn movement is also heavy with over 830 vph turning right onto Douglas Boulevard during the AM peak hour and 651 vph during the PM peak hour.

The northbound left from Bright Star Road onto John West Road is also heavy during the morning and afternoon peak hours. The estimated design hourly volumes for the northbound left turn from Bright Star Road to John West Road is 634 vph during the AM peak hour and 649 vph for the PM peak hour. Northbound through movements will carry 926 vph in the AM peak hour and 971 vph during the PM peak hour. The southbound through movement will have 810 vph during the AM peak hour and 1494 vph during the PM peak hour.

Based on the design year (2030) hourly traffic projections, the existing (two-lane) Bright Star Road will operate at unacceptable levels of service along the corridor unless major roadway improvements are implemented. Southbound queues at Douglas Boulevard will extend back over 2,800 feet from the intersection. Northbound queues at John West Road will extend back to the south over 1,200 feet from the intersection.

Recommendations

In order to accommodate the proposed HOV interchange, accommodate future traffic demand and maintain acceptable levels of service the following roadway improvements are recommended:

- Widen Bright Star Road from two to four lanes from north of John West Road to south of Douglas Boulevard. Ultimately Bright Star Road should be widened to four lanes from SR 5 to US 78. The bridge over I-20 should have a minimum cross section of five lanes with a preferred cross section of seven lanes.
- At the Bright Star Road intersection with Douglas Boulevard; the southbound approach on Bright Star Road should be widened to include two through lanes and dual left turn lanes. The northbound approach on Bright Star Road should be widened to include two through lanes and a dedicated right turn lane. Douglas Boulevard should be realigned further to the south to provide additional storage room between Douglas Boulevard and the HOV interchange. Based on the analysis, the southbound left turn movement (with dual left lefts) at Douglas Boulevard will have queues extending back 425 feet during the PM peak hour. Based on single southbound left turn lane the queues will extend back over 820 feet. Douglas Boulevard should be widened to include dual left turn lanes and a dedicated right turn lane.
- The intersection of Bright Star Road and the HOV only intersection should include two through lanes and dedicated left turn lanes in each direction on Bright Star Road. The



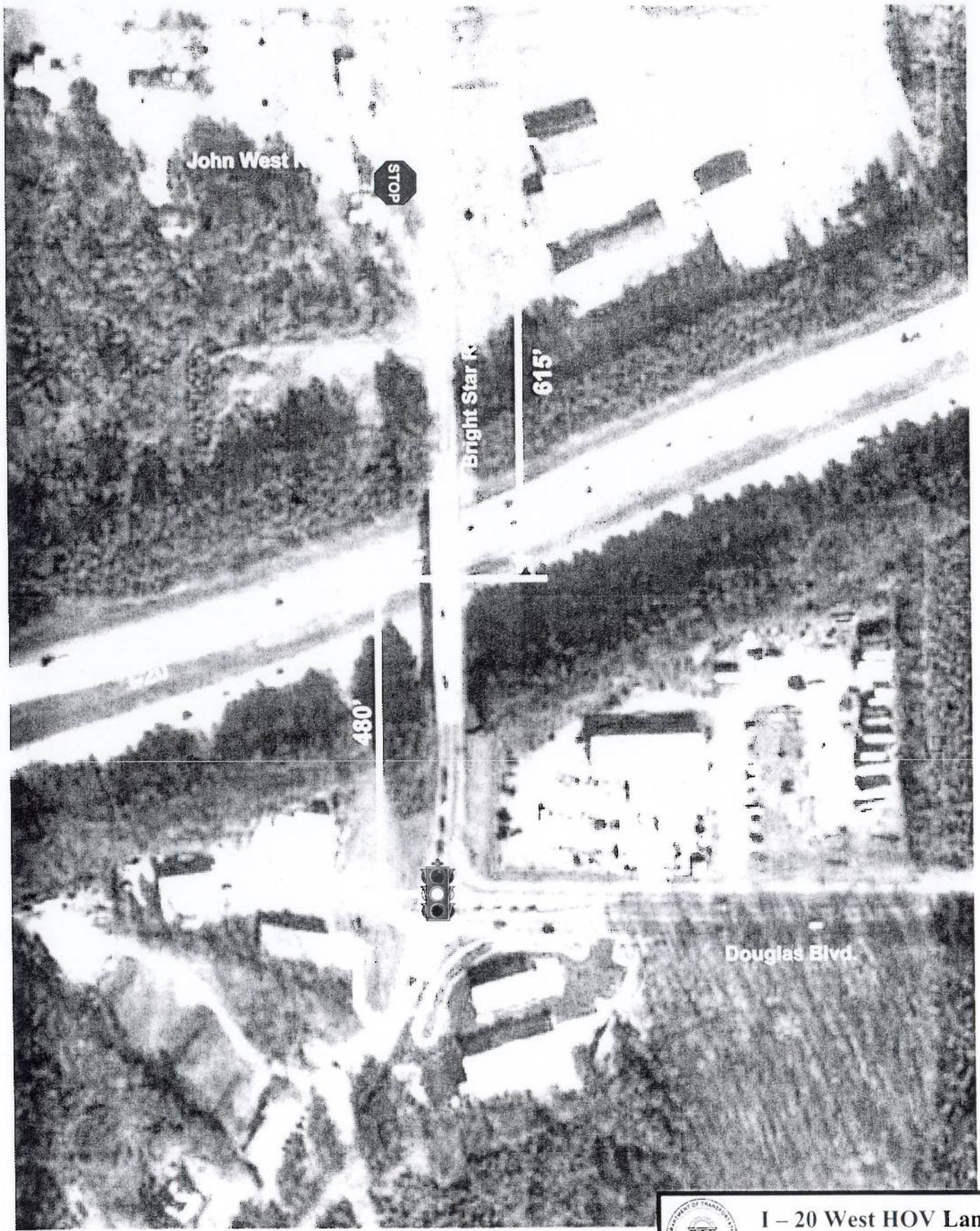
Day Wilburn Associates, Inc.

Memorandum

northbound left turn lane should have a minimum storage length of 100 feet and the southbound left turn lane 150 feet of storage. The HOV ramps should have separate left and right turn lanes. The intersection will require a traffic signal to maintain acceptable levels of service.

- The intersection of Bright Star Road at John West Road will ultimately require two through lanes in each direction with a dedicated northbound left turn lane. In addition, the southbound approach should include a dedicated right turn lane. John West Road should include a separate left turn lane and channelized right turn lane at the intersection. The intersection will require a future traffic signal to maintain acceptable levels of service.

Figure 3 depicts the necessary improvements along the corridor.



John West Rd

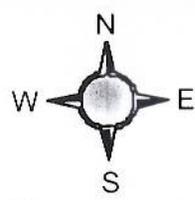
STOP

Bright Star Rd

615'

480'

Douglas Blvd.



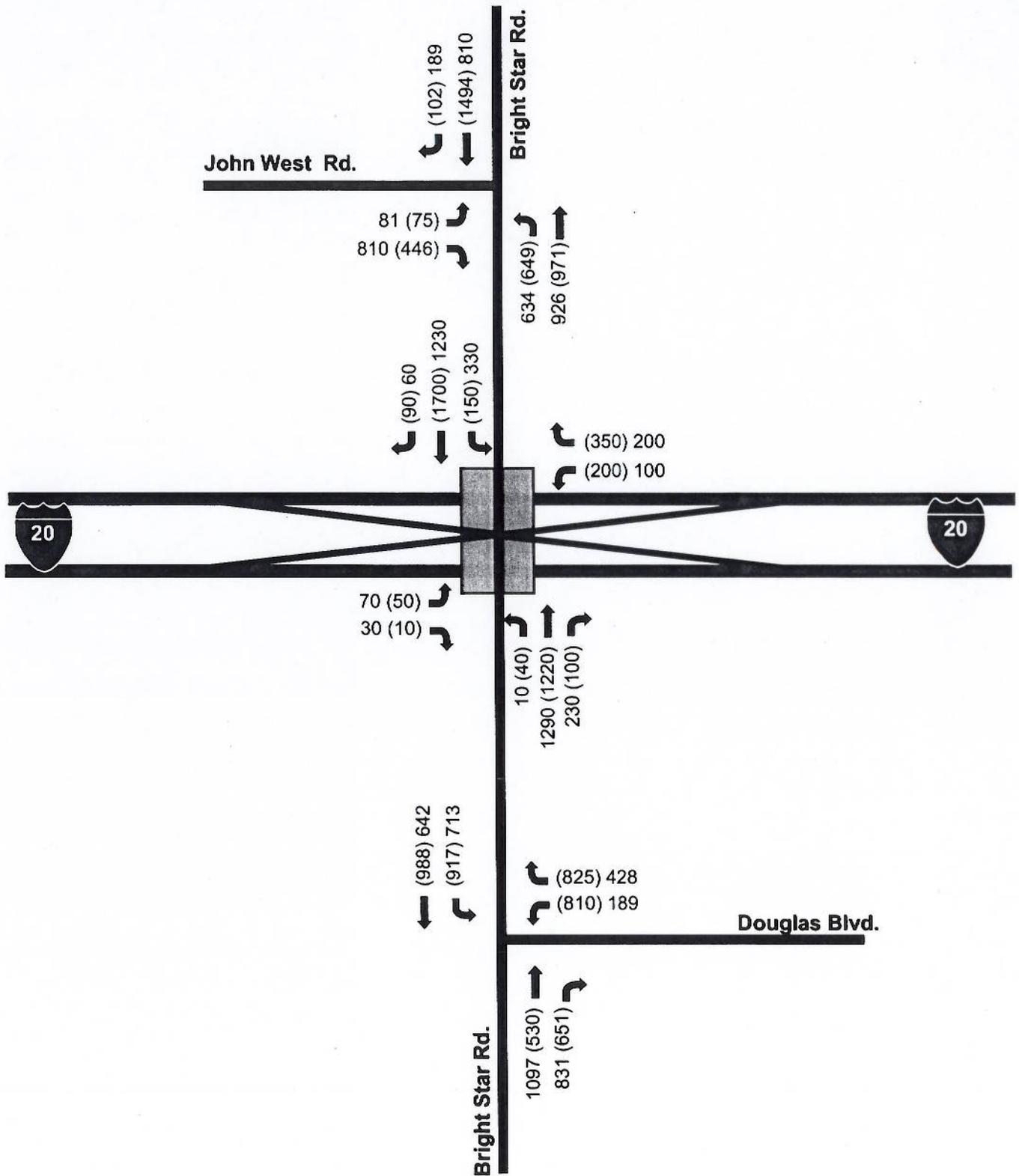
I - 20 West HOV Lane Project

Figure 1

Existing Conditions

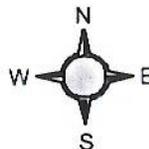
May 2006





Legend

- 000 AM Design Hourly Volume
- (000) PM Design Hourly Volume



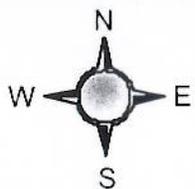
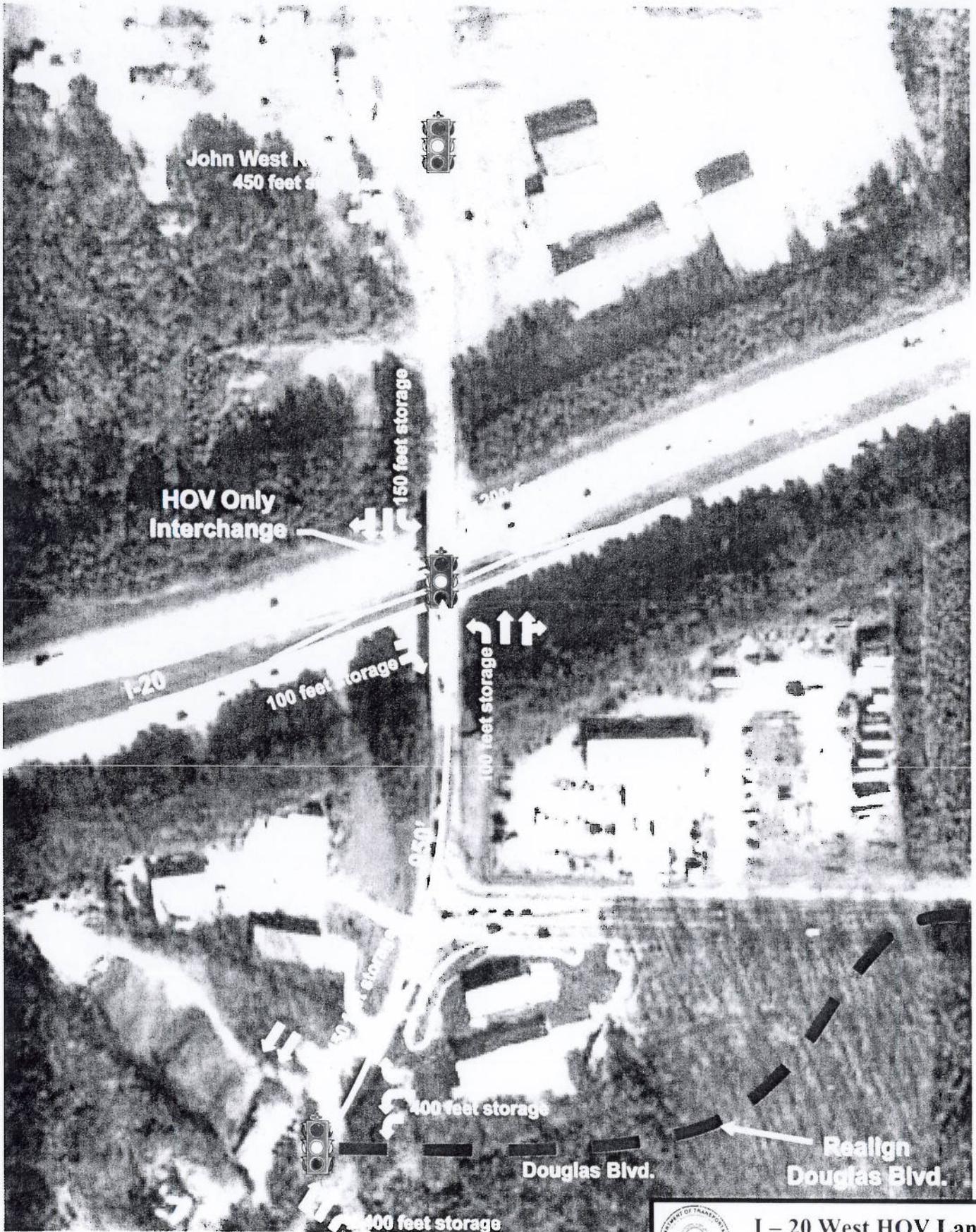
I - 20 West HOV Lane Project

Figure 2

2030 Design Hourly Volumes

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I - 20 West HOV Lane Project

Figure 3

Recommended Improvements

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Appendix B

Midway / Burnt Hickory Road Bridge Over I-20

Quantities for Cost Analysis of Replacement - Steel Girder vs. PSC Beam

Bridge Dimensions

dollars = 1

$$\text{Bridge_Length} := 368\text{ft}$$

$$\text{Bridge_Width} := 42\text{ft} + 5\text{in}$$

$$\text{Deck_area} := \text{Bridge_Length} \cdot \text{Bridge_Width}$$

$$\text{Deck_area} = 15609.33 \text{ft}^2$$

Steel Girder Bridge

$$\text{Steel_bridge_cost} := 110.00 \frac{\text{dollars}}{\text{ft}^2} \cdot 1.03^7$$

$$\text{Steel_bridge_cost} = 135 \frac{\text{dollars}}{\text{ft}^2}$$

Cost inflation from 2000
to 2007

$$\text{Total_Steel_Bridge_Cost} := \text{Steel_bridge_cost} \cdot \text{Deck_area}$$

$$\text{Total_Steel_Bridge_Cost} = 2111726 \text{dollars}$$

STEEL GIRDER BRIDGE COST = \$2,111,726

PSC Beam Bridge

$$\text{PSC_bridge_cost} := 75 \frac{\text{dollars}}{\text{ft}^2} \cdot 1.03^7$$

$$\text{PSC_bridge_cost} = 92 \frac{\text{dollars}}{\text{ft}^2}$$

Cost inflation from 2000
to 2007

$$\text{Total_PSC_Bridge_Cost} := \text{PSC_bridge_cost} \cdot \text{Deck_area}$$

$$\text{Total_PSC_Bridge_Cost} = 1439813 \text{dollars}$$

PSC BEAM BRIDGE COST = \$1,439,813