
SOUTH CAROLINA
73
PATHWAY TO PROGRESS
SCDOT
Value Engineering Study
I-73 Southern Section
Right-of-Way Plans

VE Recommendation 1

I-95/I-73 Interchange

Widen the two main interchange ramps from one, 16’ lane to two, 12’ lanes.

Discussion:

Traffic projections show that the two main interchange fly-over's may fail in 25 to 30 years according to the high DHV’s (based on a non-tolled facility). The next pages show the results of the traffic operational analysis, followed by the pros and cons of widening the northbound and southbound ramps.

Design Year (2035) Peak Hour Traffic Operational Analysis

(non-tolled facility)

Location	Scenario 1: Single Lane Concept		Scenario 2: Two-Lane Concept	
	Density (pc/mi/lane)	LOS	Density (pc/mi/lane)	LOS
I-95 northbound to I-73 northbound	28.19	D	14.09	B
I-95 southbound to I-73 southbound	16.25	B	8.13	A

LOS is defined as a quality measure describing the operational conditions within a traffic stream. Six LOS Letter Grades (A through F) are designated to evaluate the condition of the facility, where 'LOS A' representing the best operating condition and 'LOS F' the worst.

Maximum density for LOS D is 34 pc/mi/lane (ref: Exhibit 25-4, HCM)

VE Recommendation 1

I-95/I-73 Interchange: Widen the two main interchange ramps from one, 16’ lane to two, 12’ lanes.

PROS	CONS
Two lanes will better accommodate truck traffic	Additional, initial cost of $3.2 million
Ease of maintenance (will allow lane closures)	Over-design for toll road scenario (60% reduction in traffic with tolls)
Achieve **LOS B** for design year 2035	Increased right-of-way costs (estimated at $10,000)
Longer service life.	
Eliminate future widening	
Accommodate emergency services	
Improve hurricane evacuation	

Northbound Ramp

VE Recommendation 1

I-95/I-73 Interchange: Widen the two main interchange ramps from one, 16’ lane to two, 12’ lanes.

PROS	CONS
Two lanes will better accommodate truck traffic	Additional, initial cost of $3.2 million
Ease of maintenance (will allow lane closures)	Over-design for toll road scenario (60% reduction in traffic with tolls)
Achieve **LOS A** for design year 2035 (**LOS B** for single lane)	Increased right-of-way costs (estimated at $10,000)
Longer service life	
Eliminate future widening	
Accommodate emergency services	
Improve hurricane evacuation	

Southbound Ramp

VE Recommendation 1

I-95/I-73 Interchange

Widen the two main interchange ramps from one, 16’ lane to two, 12’ lanes.

Action

- Accept
- Reject
- Other

VE Recommendation 2

I-73/SC 22 Interchange

Revise current three-level, multiple structure interchange to a T-type, trumpet design.

Discussion:

I-73 adjoins SC 22 just east of the SC 22/SC319 interchange and will continue eastward towards Conway. The VE Study Team discussed the possibility of revising the I-73/SC 22 Interchange to a one-lane or two-lane trumpet design instead of a system-to-system directional interchange. The VE Study Team requested that the Design Team evaluate the possibility of using a compound curvature for the loop ramp.

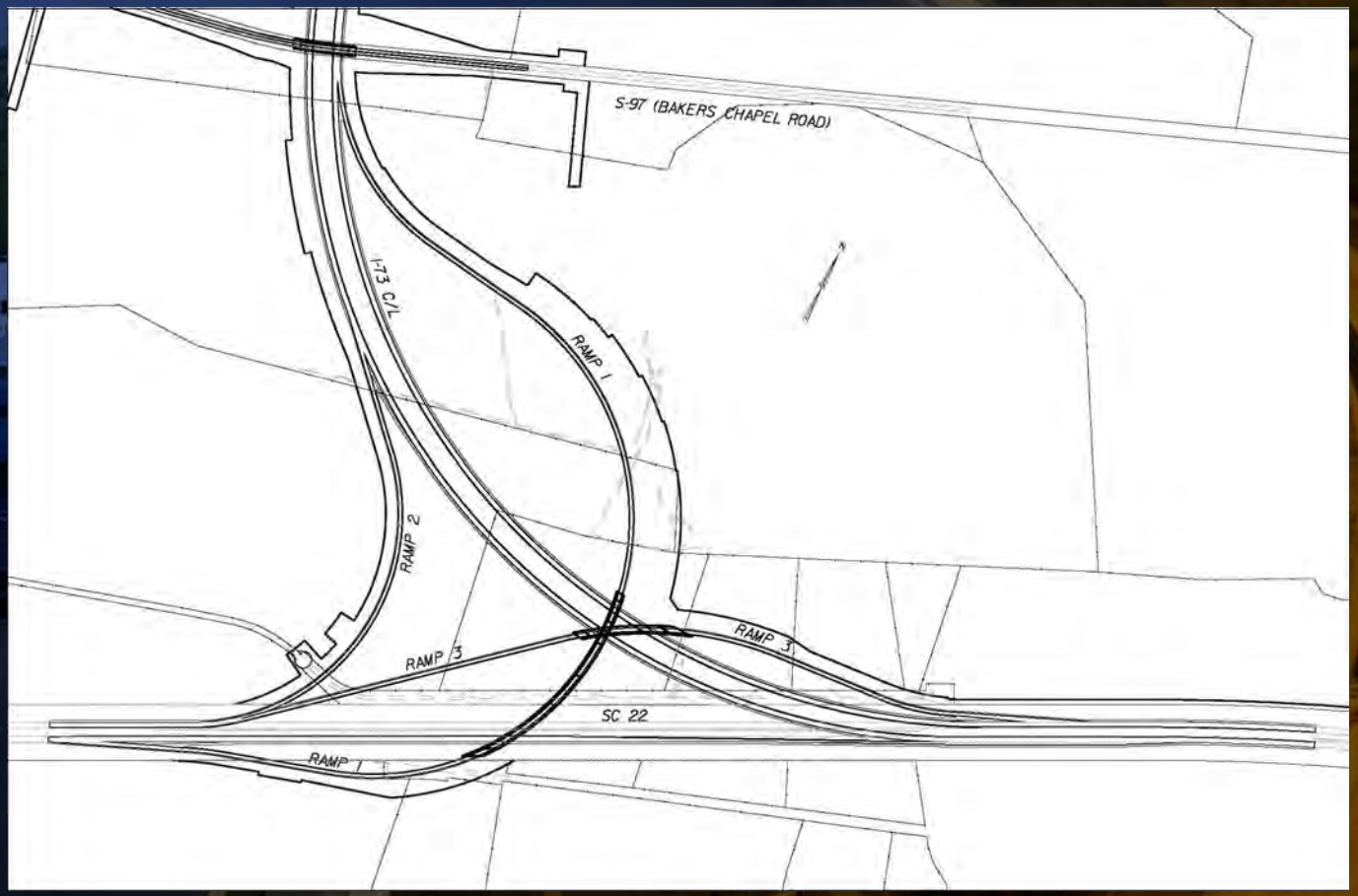
VE Recommendation 2

PROS	CONS
Reduce ramp fill heights and bridge requirements for a cost savings estimated at $31.1 million	Safety issues with loop design
Lessen length of Bakers Chapel Road crossing bridge (end acceleration lane prior to crossing under the Bakers Chapel Road bridge)	Two of the four ramps will have reduced (60-40-60 mph) design speeds – directional ramps are all 55 mph
No conflict with hurricane evacuation	May require reopening the EIS to assess impacts
Handle estimated volumes at design year (with projected SELL project volumes)	

I-73/SC 22 Interchange: Revise current three-level, multiple structure interchange to a T-type, trumpet design.

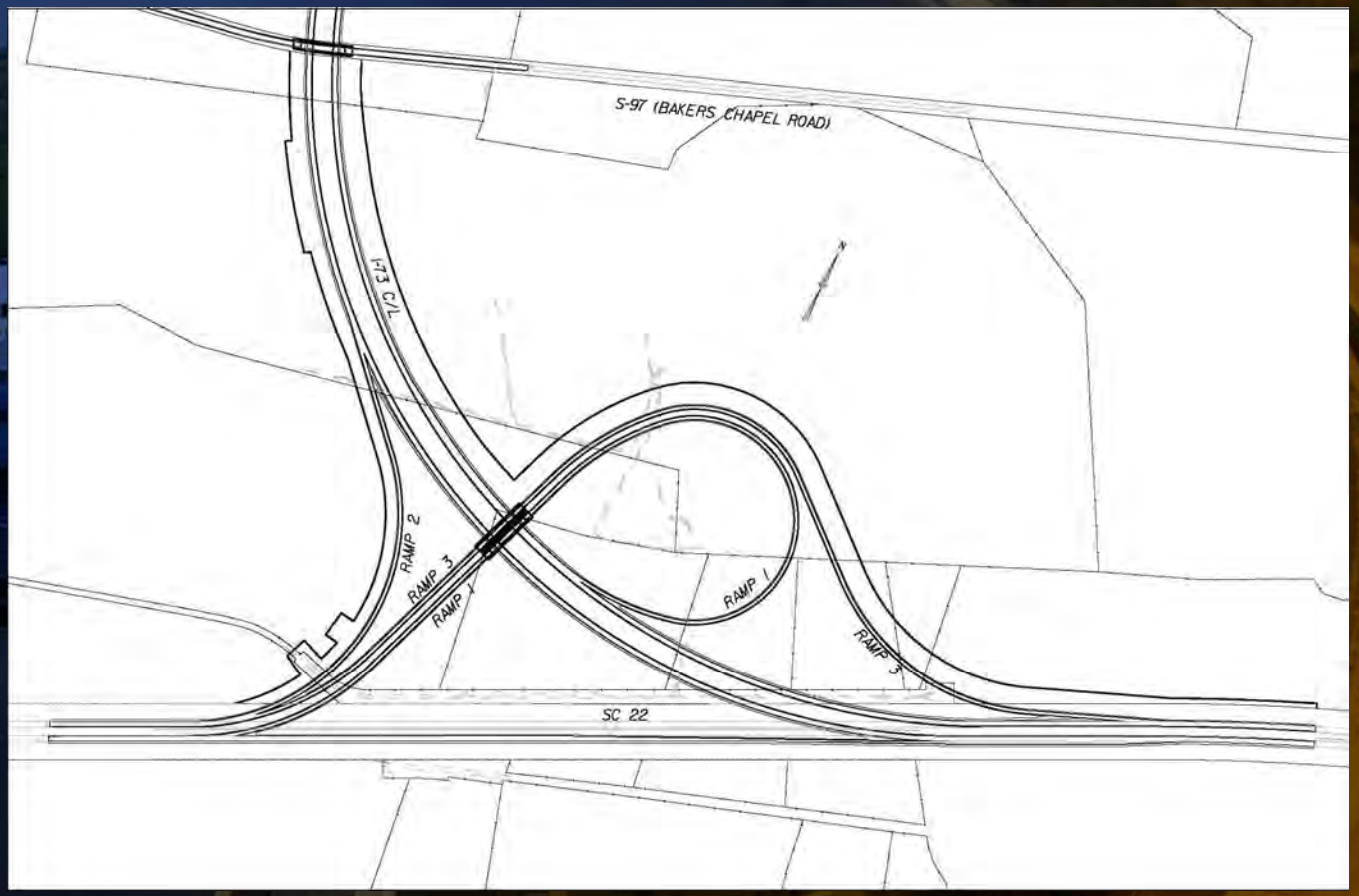
VE Recommendation 2

I-73/SC 22 Interchange: Original Directional Interchange



VE Recommendation 2

I-73/SC 22 Interchange: Proposed option, one-lane trumpet interchange.



VE Recommendation 3

Rest Area: Eliminate Rest Area on I-73 currently proposed to be located near Harry Martin Road.

PROS	CONS
Save initial cost of approximately $20 Million	No Rest Area on I-73
Eliminate maintenance costs	Will need to find alternative location for ITS Sub Station and SHEP Maintenance Shed along I-73
Eliminate potential wetlands impacts	
Eliminate a potential utility conflict	
Allow potential for private development truck stop	
Decrease SCDOT liability	
Shorten bridge crossing length at Harry Martin Road	

VE Recommendation 3

Rest Area

Eliminate Rest Area on I-73 currently proposed to be located near Harry Martin Road.

Action

- Accept
- Reject
- Other

VE Recommendations for Reducing Skew of Crossing Bridges

Discussion:

The VE Study Team reviewed bridge crossings at SC 917, US501, S198, S27, and S309 and determined that each of these bridges have heavy skews that have resulted in continuous structural steel superstructures. The VE Team requested that the design team review each of these bridges to determine if the skews could be reduced such that the span length is 140’ or less. The reduction in length would allow the bridges to be constructed with the more cost effective Prestressed Concrete Girders rather than Structural Steel Girders. Additionally, reduction of skew would enhance the performance of the structure during a seismic event.

The bridge crossings recommended for evaluation are discussed on the following pages.

VE Recommendation 4

Bridge 7D Crossing at SC917: Reconfigure the bridge to reduce the heavy skew.

PROS	CONS
Cost savings of $1.6 million in bridge construction	Would require reopening the EIS document to assess the impacts
Avoid displacement	Less desirable roadway alignment
Significantly reduce skew	Multiple horizontal curves introduced on SC 197
Concrete girders require less maintenance than steel girders	Anything changed at this point will be controversial with the community
More predictable seismic behavior	Increased wetland impact of 0.7 acres.

VE Recommendation 4

Bridge 7D Crossing at SC917

Reconfigure the bridge to reduce the heavy skew.

Action

- Accept
- Reject
- Other

VE Recommendation 5

Bridge 14D Crossing at S198: Reconfigure the bridge to reduce the heavy skew.

PROS	CONS
Cost savings of $2.3 million in bridge construction	Would require reopening the EIS document to assess the impacts
Eliminate need for run-around	Additional wetlands impact (.8 acres)
Skew improved	Some total-take tracts have already been acquired by SCDOT
Concrete girders require less maintenance than steel girders	
More predictable seismic behavior	

VE Recommendation 5

Bridge 14D Crossing at S198

Reconfigure the bridge to reduce the heavy skew.

Action

- Accept
- Reject
- Other

VE Recommendation 6

Bridge 15D Crossing at S27: Reconfigure the bridge to reduce the heavy skew.

PROS	CONS
Cost savings of $1.3 million in bridge construction	Would require reopening the EIS document to assess the impacts
Skew improved	Additional wetlands impact (.3 acres)
Concrete girders require less maintenance than steel girders	Less desirable horizontal alignment for S27
More predictable seismic behavior	May cause additional displacement (Structures on Tract 150)

VE Recommendation 6

Bridge 15D Crossing at S27

Reconfigure the bridge to reduce the heavy skew.

Action

- Accept
- Reject
- Other

VE Recommendation 7

Bridge 56D Crossing at S309: Reconfigure the bridge to reduce the heavy skew.

PROS	CONS
Cost savings of $1.1 million in bridge construction	Would require reopening the EIS document to assess the impacts
Skew improved	Additional wetlands impact of 3.2 acres
Concrete girders require less maintenance than steel girders	
More predictable seismic behavior	

VE Recommendation 7

Bridge 56D Crossing at S309

Reconfigure the bridge to reduce the heavy skew.

Action

- Accept
- Reject
- Other

VE Recommendation 8

Secondary Road Footprints

Revise secondary road footprints from 12’ lanes and 10’ shoulders to 11’ lanes and 6’ shoulders.

Discussion:

The VE Study Team was informed that the EIS committed to 10’ shoulders over the interstate. It was agreed that if the EIS is reopened, then consideration should be given to redesign for functional classifications. It is recognized that some locations may require widths greater than the functional classification in order to accommodate specialized farm equipment.

VE Recommendation 8

Secondary Road Footprints: Revise secondary road footprints from 12’ lanes and 10’ shoulders to 11’ lanes and 6’ shoulders.

PROS	CONS
Cost savings of $791,000 per mile	Would require reopening the EIS document to assess the impacts
	Bridge crossings would need to be evaluated individually to determine the need to accommodate specialized farm equipment

VE Recommendation 8

Secondary Road Footprints

Revise secondary road footprints from 12’ lanes and 10’ shoulders to 11’ lanes and 6’ shoulders.

Action

- Accept
- Reject
- Other

VE Recommendation 9

MOT on Secondary Roads

Evaluate the staging of adjacent closures and increasing the detour limit of five miles to six or seven miles, thus reducing the number of temporary run-arounds required during construction.

VE Recommendation 9

Discussion:

The VE Study Team questioned the use of temporary run-arounds in various locations. It was thought that some of these run-arounds could be eliminated by closing the road and showing a detour.

The Team was informed that the District Engineers were evaluating the feasibility of detours and would recommend eliminating the temporary run-arounds when geometrics and length were conducive to detours. The following locations are recommended for this review:

Segment	Secondary Road
A1	SC917
A2	US 301, US 501
A3	S197, S198, S27
A4	41A
B1	S84
B2	SC41, SC31

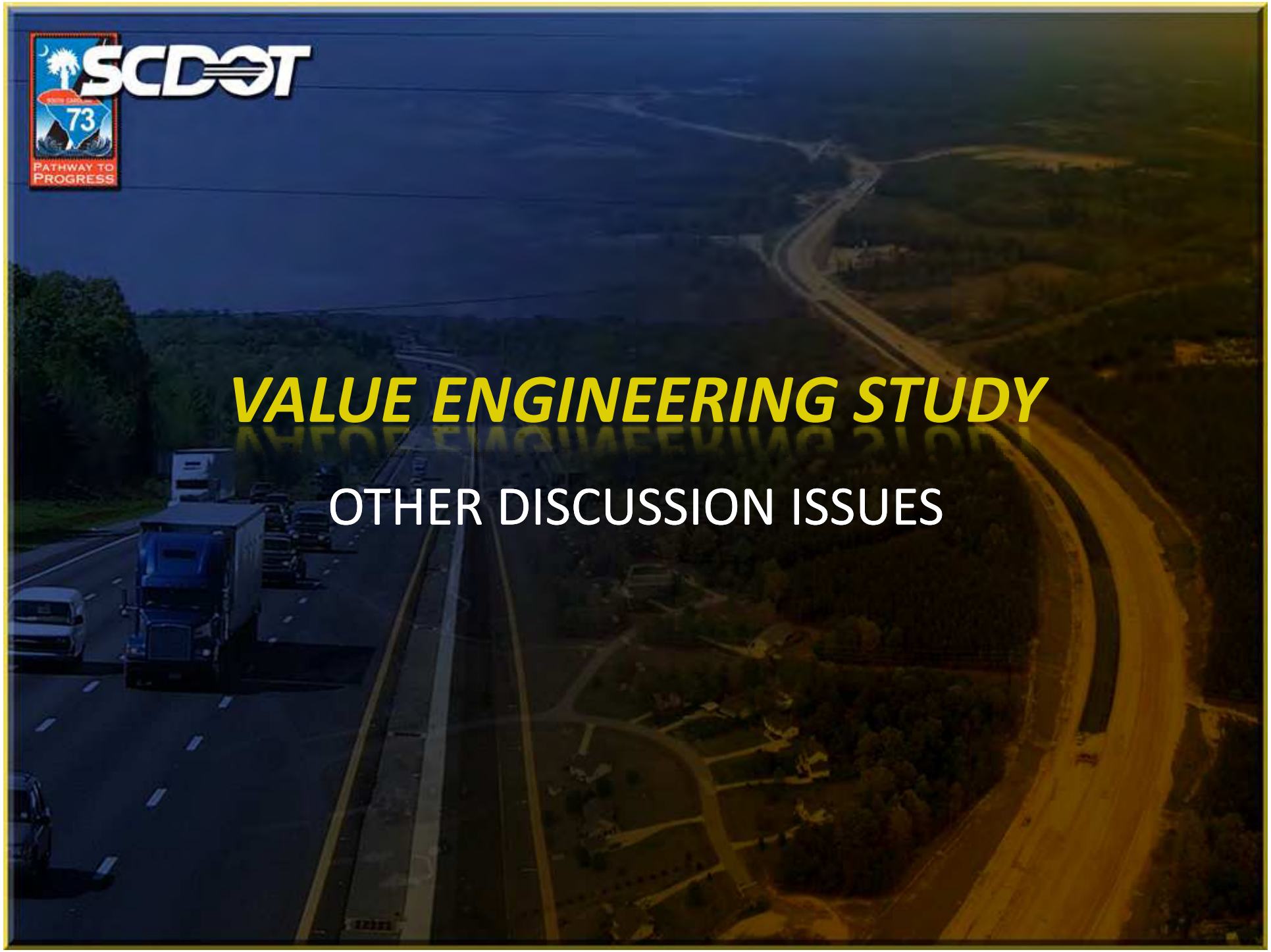
VE Recommendation 9

MOT on Secondary Roads

Evaluate the staging of adjacent closures and increasing the detour limit of five miles to six or seven miles, thus reducing the number of temporary run-arounds required during construction.

Action

- Accept
- Reject
- Other


SCDOT
73
PATHWAY TO PROGRESS
VALUE ENGINEERING STUDY
OTHER DISCUSSION ISSUES

Reviewed, but Rejected by VE Study Team

Bridge 12D Crossing at US501: Reconfigure the bridge to reduce the heavy skew. This option was rejected based on the resulting geometry.

PROS	CONS
Cost savings of $1.9 million in bridge construction	Would require reopening the EIS document to assess the impacts
Skew improved	Increased impacts to wetlands of 0.5 acres
Concrete girders require less maintenance than steel girders	Greater impact on residences
More predictable seismic behavior	Less desirable geometry to mainline and US501

Reviewed, but Rejected by VE Study Team

US 301

Shift the alignment of US 301 to the east in order to eliminate a structure.

PROS	CONS
Cost savings of $3.97 million in bridge construction	Would require reopening the EIS document to assess the impacts
Only one bridge to maintain	Additional wetlands impact (4.4 acres)
	Additional 6 acres of ROW impacts.
	Possible impacts for truck access to Signode and Smurfit Container.
	Possible impacts to apartment complex
	Maintenance of frontage road and US 301

Reviewed by the VE Study Team

Interchange at S308:

The VE Study Team asked the Design Team to provide justification for the S308 interchange and for the location chosen for that interchange.

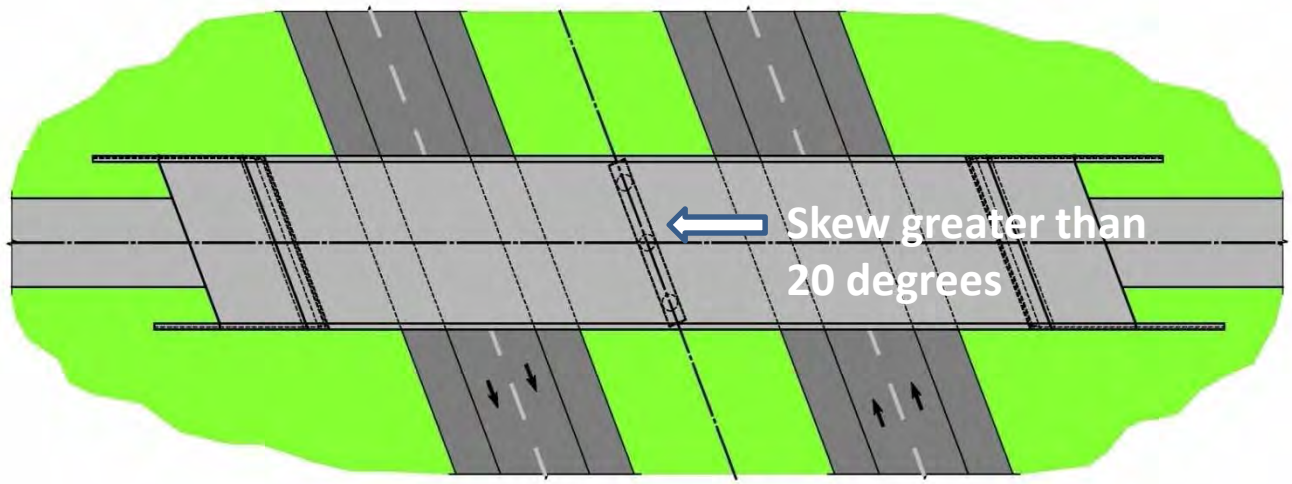
- Without the S308 interchange, there was no access between US 701 and US 76 interchange, a distance of over 25 miles.
- Other potential locations are at S23 (South Nichols Highway) or S99 (Lake Swamp Road). The communities at S23 and S99 did not want the interchange at those locations, fearing an interchange would alter the character of the community.
- There would be additional relocation impacts at either S23 or S99.
- Ketchup Town, located on S99, is considered to be a local landmark and would be impacted significantly by the interchange.
- Horry County requested the S308 location for the interchange to provide more direct access to the Cool Springs Industrial Park.

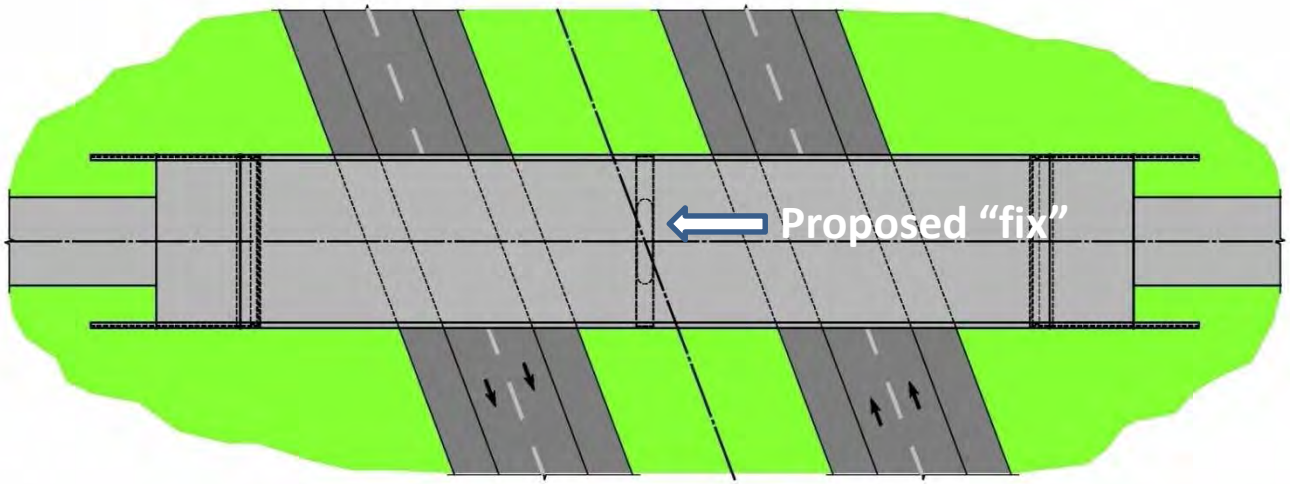
Reviewed by the VE Study Team

Bridge Skew:

The VE Study Team discussed instances of bridge locations with skew greater than 20 degrees, but less than the skew considered in Recommendations 4 through 7.

- It was suggested that the designers “square up” the ends of the bridges to increase performance in case of a seismic event. (See figures, next page)
- After evaluating the economics of reducing the skew, it appears that the costs outweigh the benefits.


Skew greater than
20 degrees


Proposed “fix”

Rest Area Options Reviewed by the VE Study Team

The VE Study Team considered the following options for a Rest Area on I-73:

1. One suggestion was to combine the two rest areas into one that would service both northbound and southbound traffic.
   a) A costly interchange would be required
   b) Cost savings on building size would be minimal
   c) The savings on maintenance costs would not be sufficient to justify the cost of the interchange
   d) Wetlands impacts would be increased by approximately 10 acres.
   e) **The VE Study Team does <u>not</u> recommend this option.**

Rest Area Options Reviewed by the VE Study Team

2. Another suggestion was to move the Rest Area closer to Floydale, approximately three miles down the highway.

a) Initially, it was thought that this location might have sewer capacity available to service the Rest Area. However, there is no sewer line available at this location.

b) It appears that this location will allow for the ramp to be constructed of Prestressed Concrete Girders in lieu of Structural Steel.

c) One of the drawbacks to the current location is its close proximity to an interchange. This location would place it farther away.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PATHWAY TO PROGRESS
SCDOT
Value Engineering Study
I-73 Southern Section
Right-of-Way Plans

Appendix B
SHPO Correspondence

South Carolina
Department of Transportation

MULT
13612
10-DK0037
NHPA

March 10, 2009

Ms. Elizabeth Johnson
Deputy State Historic Preservation Officer
South Carolina Department of Archives & History
8301 Parklane Road
Columbia, South Carolina 29223-4905

Re: Brockington and Associates' Draft Report ***Cultural Resources Survey of the Proposed I-73 Southern Corridor, Dillon, Marion and Horry Counties, South Carolina, Volume III; Draft Addendum Report III,*** PIN 36358_RD01.

Dear Ms. Johnson:

The Department's sub-consultant, Brockington and Associates, Inc., has completed three volumes of cultural resources reports of the selected alternate corridor for the above referenced project. Since the submission of Volume III, there have been two subsequent addendum reports for design changes and omissions. This third addendum report addresses additional recent design changes. There are six (6) new design shifts including Catfish Church Road in Dillon County; S-309, J H Martin Road, Good Luck Road and SC 22 in Horry County; and Watermill Road in Marion County. These six design shifts brought portions of the I-73 Southern Corridor outside of the previously surveyed survey universe prompting additional cultural resources investigations.

Additional cultural resources investigations were conducted July 20-28, 2009 and September 3-4, 2009 to determine whether any known historic properties, listed in or eligible for the National Register of Historic Places (NRHP), exist within or near the new design shifts. One NRHP listed property, the Catfish Creek Baptist Church (Site 0002.00, NRIS Number 75001697) and two NRHP eligible properties, the Catfish Creek Baptist Church Cemetery (Site 0002.01) and the Dalcho School and Lodge (Site 71), are located in the area of the design shifts. The rural setting of the church, cemetery and school were previously disturbed by the construction of existing I-95, located 350 to 1,000 feet to the north of these resources. The alignment shifts will not result in any takings from these properties. There are no new effects to the viewshed. Therefore, it is recommended that the project will have no effect on these three properties. No newly identified architectural sites were discovered. No additional investigations are recommended.

Two newly identified archaeological sites were discovered. One newly identified archaeological site, 38DN167, is located at the Catfish Church Road alignment shift. Site 38DN167 consists of a late nineteenth/early twentieth occupation represented by a scatter of artifacts and architectural debris. This site is recommended not eligible for the NRHP. No previously identified archaeological sites are affected. No additional investigations are recommended. A second newly identified archaeological site, 38MA218, is located on the Watermill Road shift. This late nineteenth/early twentieth century site is not eligible for the NRHP. No additional investigations are recommended. There are no historic properties affected by any of these design shifts and no additional investigations are recommended for these sites.

In accordance with the memorandum of agreement approved by the Federal Highway Administration, March 16, 1993, the Department is providing this information as agency official designee, as defined under 36 CFR 800.2, to ensure compliance with Section 106 of the National Historic Preservation Act.

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It is requested that you review the enclosed material and, if appropriate, indicate your concurrence in the Department's findings, thus initiating the formal Section 106 consultation process. Please respond within 30 days if you have any objections or if you have need of additional information.

Sincerely,

Wayne D. Roberts

Wayne D. Roberts
Chief Archaeologist

WDR:edb

Enclosure

I (~~do not~~) concur in the above determination.

Signed: [signature] SCDAH Date: 3/31/10
SCDOT Project Coordinator

cc: Patrick Tyndall, FHWA
Wenonah Haire, Catawba THPO
Environmental Management (Phillips)
Mitchell Metts, Director of Pre-Construction
Mike Barbee, Regional Production Engineer
Keith Derting, SCIAA
Joshua Fletcher, Brockington & Associates, Inc.
Skip Johnson, LPA Group, Inc.

File: Env/WDR