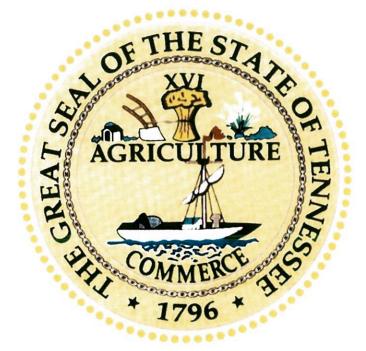
TENNESSEE DEPARTMENT OF TRANSPORTATION



TRANSPORTATION INVESTMENT REPORT Special Bridge Replacement Program

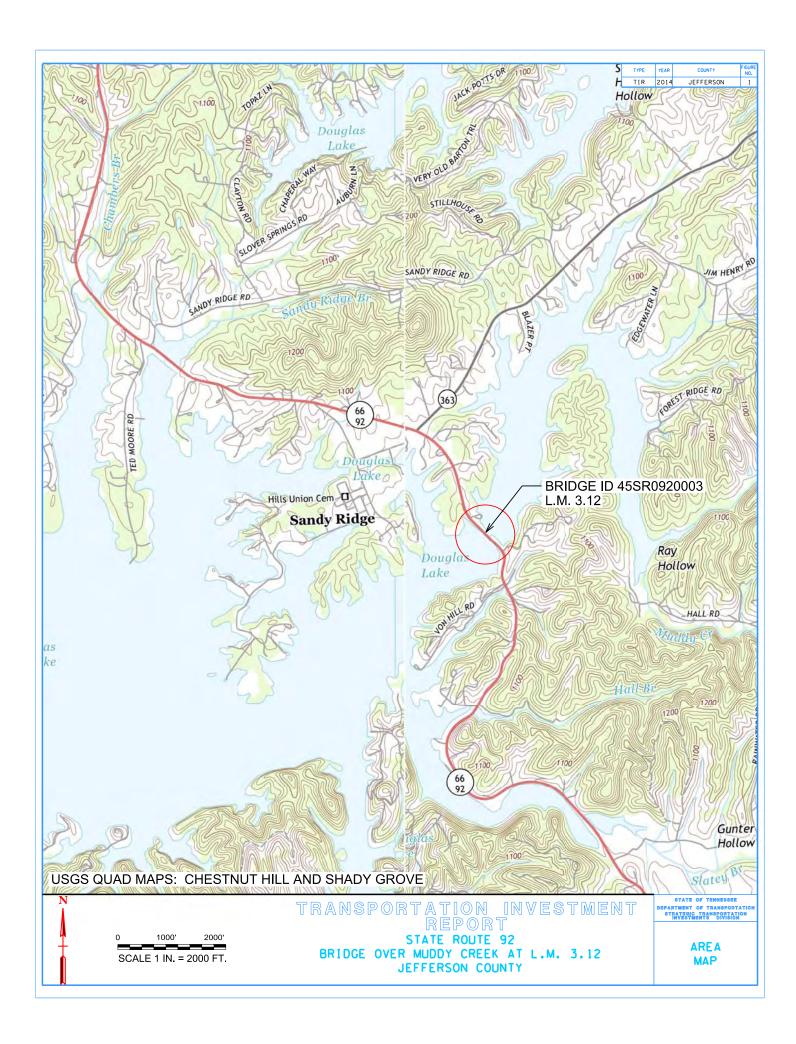
STATE ROUTE 92 Bridge over Muddy Creek (Log Mile 3.12) Jefferson County PIN 119812.00

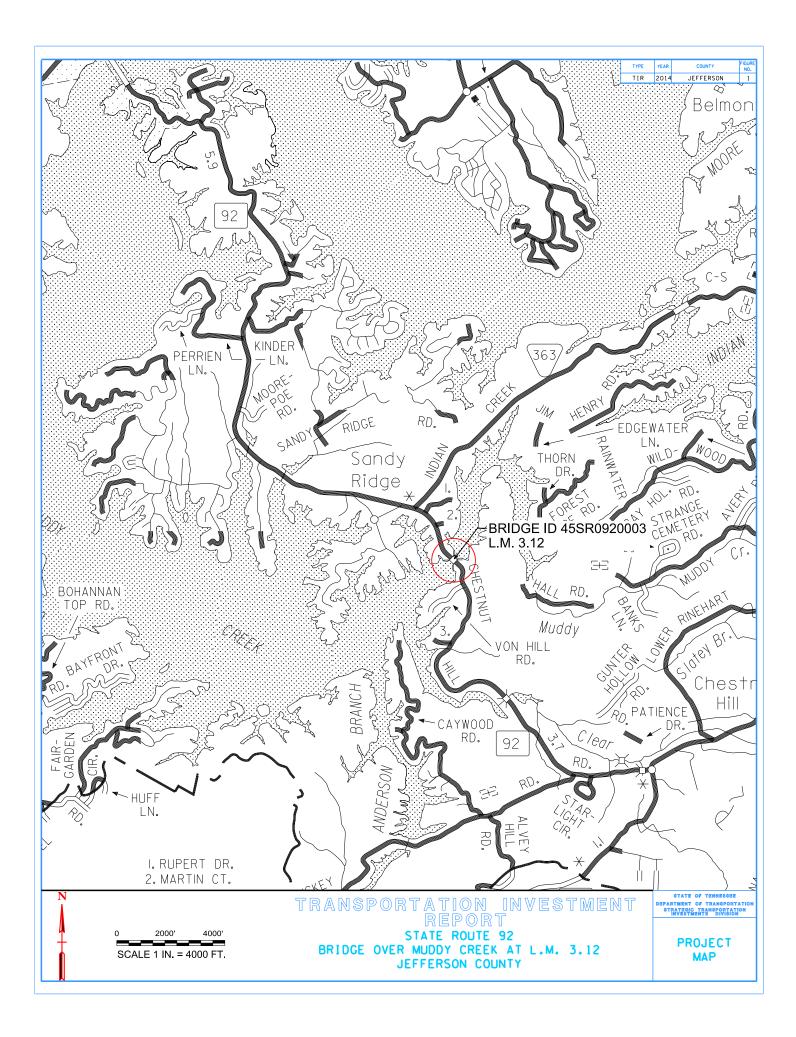
PREPARED BY THE CORRADINO GROUP for the

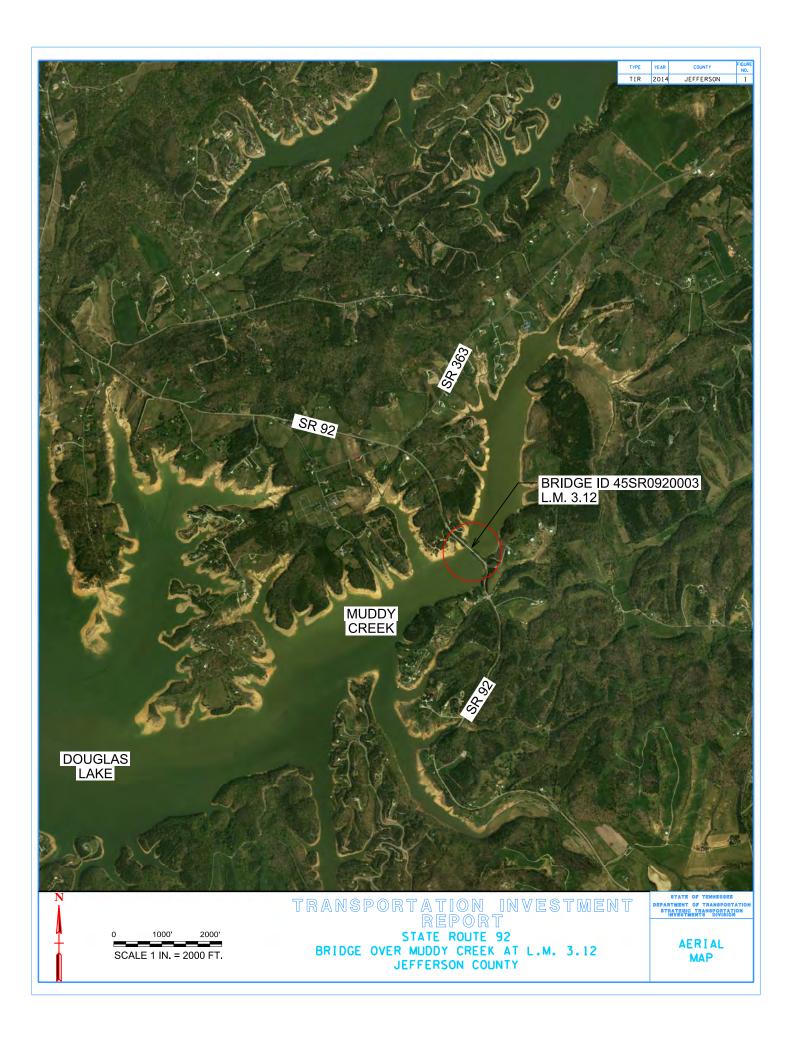
Approved by Chief of Environment and Elemning Deputy Commissioner and Chief Engineer

Approved by:	Signature	DATE
TRANSPORTATION DIRECTOR STRATEGIC TRANSPORTATION INVESTMENTS DIVISION	Sten Olla	8-14-14
ENGINEERING DIRECTOR DESIGN DIVISION	Jennifer Llayd	8-22-14
ENGINEERING DIRECTOR STRUCTURES DIVISION	Wayne J. Seger	9-2-14

This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.







TRANSPORTATION PLANNING WORKSHEET BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS													
County: Jefferson Route:	State Rou	ite 92	Log N	/ile: 3.12									
Feature Crossed: Muddy Cre			05-S										
Functional Class: Rural Sta			45-SR09										
		_ 0											
EXISTING CONDITIONS													
	ss Section:	18'/20'/60'	No. Lar	nes: 2									
Approach Alignment: Curve In Approach #													
Width (out to out): 21'-7" Sidewa	alks: Right None	Left No	ne Len	gth: 217'									
No. Spans: Approach: N/			3										
Substructure: Steel I-Beam				ing: 50.9									
Other: The approach guardrails, guardrail en													
to the Jefferson Cocke County Utility District (JC	CUD) is attached und	derneath the b	ridge.										
PR	OPOSED IMPROVE	MENTS											
STANDARDS FROM RD01-TS- 3	Type of Work	: Replace											
Design Year: 2039 Design AADT: 3,650				(R):									
Project Length: 540' Brid													
Design Speed (MPH): 50 Pos	ted Speed (MPH):	45											
Approach Width: 24'/44'/60' Bridge Width (O to O): 47.5 ft No. Lanes: 2													
Right-of-Way Required: N/A Trac													
N/A Acre													
MA	INTENANCE OF TR	AFFIC											
Temporary Detour: 🔽 👔 Temporary R	unaround: 🗌	Stage Con	struct:										
Alternate Route: State Route 35 (U.S. 411) to S	State Route 9 (U.S. 2	5W) to State I	Route 363 (Indian Cr	eek Road)									
i	·			i									
Remarks: The construction activities should beg	in during the winter s	eason when t	he water levels are a	t their lowest.									
The State Route 92 bridge detour is approximate													
bridge. Detour signs should be located on the so	uth side at the State	Route 92 / Sta	ite Route 35 (U.S. 41	1) intersection									
in Chestnut Hill and on the north side at the State													
detour also utilizes State Route 9 (U.S. 25W) on													
	ESTIMATED COS	T											
Right-of-Way: \$0 Ap	proaches: \$39	90,000	Structure:	\$1,780,000									
Preliminary Engineering: \$260,000	Utilities: \$2	0,000	Misc./Cont.:	\$350,000									
Mobilization: \$110,000			Total:	\$2,910,000									
Remarks: The roadway width will increase from	18 feet to 24 feet and	the shoulder	width on each side c	of the roadway									
will increase from 0 feet to 10 feet. The propose													
Field Investigation by: Nathan Vatter, Jack Qual	s, Doug Shook, Tom	Lindquist, Ro	n Campbell, Paige H	larris, Jeremy									
Bowlan, Jay Morgan, Stephanie Wallis (TDOT); Carrie Mays (TVA); Steve Bryan, Kristen Taylor (Corradino)													

Route:	State Route 92									
	Bridge TIR at L.M. 3.12									
Description:	Bridge ID: 45-SR092-03.12									
County:	Jefferson									
Length:	540 feet									
Date:	August 8, 2014									
Duto										
	DESCRIPTION	LOCAL		STATE		FEDERAL		TOTAL		
Right-of-Way		\$ -	\$	-	\$	-	\$	-		
Clearing and	Grubbing	\$ -	\$	-	\$	-	\$	-		
Earthwork	C	\$ -	\$	-	\$	-	\$	-		
Railroad Cros	ssing or Separation	\$-	\$	-	\$	-	\$	-		
Drainage	- .	\$ -	\$	-	\$	-	\$	-		
Utilities		\$-	\$	1,900	\$	17,100	\$	19,000		
Structures		\$-	\$	178,000	\$	1,602,300	\$	1,780,300		
Pavement Re	moval	\$-	\$	700	\$	6,500	\$	7,200		
Paving		\$-	\$	2,400	\$	21,700	\$	24,100		
Roadway and	Pavement Appurtenances	\$-	\$	-	\$	-	\$	-		
Retaining Wa	lls	\$-	\$	-	\$	-	\$	-		
Topsoil		\$-	\$	-	\$	-	\$	-		
Seeding		\$-	\$	-	\$	-	\$	-		
Sodding		\$-	\$	-	\$	-	\$	-		
Rip-Rap or SI	ope Protection	\$-	\$	-	\$	-	\$	-		
Fencing		\$-	\$	-	\$	-	\$	-		
Signing ¹					\$	53,400	\$	53,400		
Pavement Ma	rkings ¹				\$	-	\$	-		
Lighting ¹					\$	-	\$	-		
Signalization	1				\$	-	\$	-		
Guardrail ¹					\$	14,700	\$	14,700		
	tity Adjustment (15%) ²	\$-	\$	27,500	\$	257,400	\$	284,900		
	of Traffic (5%)		\$	10,500	\$	98,700	\$	109,200		
Mobilization (\$	10,500	\$	98,700	\$	109,200		
	N COST (rounded)		\$	231,500	\$	2,170,500	\$	2,402,000		
	and Contingency (10%)		\$	23,200	\$	217,000	\$	240,200		
	RUCTION COST (rounded)		\$	254,700	\$	2,387,500	\$	2,642,200		
Preliminary E	ngineering (10%)		\$	25,500	\$	238,700	\$	264,200		
PROJE	ECT COST ³ (rounded)	\$-	\$	280,200	\$	2,626,200	\$	2,906,400		

This safety item is 100% eligible and does not require a 10% funding match by the local agency.

For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.

³ For estimating future project costs, a compounded inflation rate of 10% should be applied from the date of this estimate.

Route:State Route 92County:JeffersonSection:Log Mile 3.12

ltem	Quantity	Unit	2013	Unit Cost	Sı	ub-Total	Т	otal Cost	Ro	ounded Cost	Description/Quantity Calculation
Pavement Re	moval										•
202-03.01	600	SY	\$	12.07	\$	7,242	\$	7,242	\$	7,200	
Utilities											
	1	Lump Sum	N/A				\$	19,000	\$	19,000	See separate calculations
Structures											
	11400	SF	\$	150.00	\$1	,710,000					Estimate for simple bridges (47'-6" x 240')
	4687.2	SF	\$	15.00	\$	70,308					Estimate for bridge removal (21'-7" x 217')
		Total					\$	1,780,308	\$	1,780,300	
Paving	-				-		-				
	6300	SF	\$	3.82	\$	24,074					local street asphalt paving - see separate calcs
		Total					\$	24,074	\$	24,100	
Signing							l				
	26.7	Mile	\$	2,000.00	\$5	3,400.00					\$1000/mile rural or \$2000/mile urban (or \$250/sign for
							\$	53,400	\$	53,400	· · · · · · · · · · · · · · · · · · ·
Guardrail	-		-		_		_	-			
705-02.02	108	LF	\$	15.78	\$	1,704					Guardrail (End Terminals Not Included in Price)
705-04.07	4	Each	\$	2,107.76	\$	8,431					Guardrail Terminal (Type 38)
705-04.09	4	Each	\$	1,037.25	\$	4,149					Type 38 Earth Pad
706-01	400	LF	\$	1.05	\$	420					Guardrail Removed
		Total					\$	14,704	\$	14,700	
Rip Rap or Sl	ope Protec	tion									
709-05.06	0	Ton	\$	28.42			\$	-	\$	-	1.5 ft deep, 1.75 Tons/CY
Total:									\$	1,898,700	

Route Utility Cost Estimate Calculations

Option:

Route:	
County:	
Length:	

State Route 92 Jefferson Log Mile 3.12

ltem	Quantity	Unit	Un	it Cost	-	Fotal Cost	Description/Quantity Calculation
Gas Line - 4"-100 lb Pressure Line Gas Line - 6"-30 lb Pressure Line	540	FT	\$ \$	50 35	\$ \$	- 19,000	
	540					13,000	
Water Line - 12" Water Line - 6"		FT FT	\$ \$	66 35	\$	-	
Sewer Line		FT	\$	22	\$	-	
Telephone Line (Underground)		FT	\$	35	\$	-	
Street Light Utility (Power) Pole		Each Each	\$ \$	1,765 2,500	\$	-	
Cable TV Pole Attachment		Each	\$	1,000	\$	-	If no better data, 1 pole every 100 yards
			-				
			+				

Total:

\$ 19,000

Costs updated in 2007



STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

STRATEGIC TRANSPORTATION INVESTMENTS DIVISION SUITE 1000, JAMES K. POLK BUILDING 505 DEADERICK STREET NASHVILLE, TENNESSEE 37243-1402 (615) 741-2208

JOHN C. SCHROER COMMISSIONER BILL HASLAM GOVERNOR

MEMORANDUM

- TO: Jeremy Bowlan, Project Manager Strategic Transportation Investments Division
- FROM: Stephen K. Bryan, PE, PTOE The Corradino Group
- **DATE:** August 8, 2014
- SUBJECT: TIR Field Review (Special Bridge Replacement Program) State Route 92 Bridge over Muddy Creek Log Mile 3.12, Bridge ID 45-SR092-03.12 Jefferson County PIN 119812.00

A field review was held for the above referenced project on March 18, 2014. Those in attendance included:

Name	Agency	Phone	E-mail
Jeremy Bowlan	eremy Bowlan TDOT Strategic Transportation Investments Division		Jeremy.Bowlan@tn.gov
Paige Harris	Paige Harris TDOT Strategic Transportation Investments Division		Paige.Harris@tn.gov
Nathan Vatter	TDOT Region 1 Traffic	865-594-2456	Nathan.Vatter@tn.gov
Doug Shook	TDOT Region 1 Right of Way	865-594-2692	Doug.Schook@tn.gov
Jack Qualls	TDOT Region 1 Office of Community Transportation	865-594-2662	Jack.Qualls@tn.gov
Tom Lindquist	TDOT Region 1 Right of Way & Utilities	865-594-2473	Thomas.Lindquist@tn.gov
Ron Campbell	TDOT Bridge	865-594-2416	Ron.Campbell@tn.gov
Jay Morgan	TDOT Region 1 Design	865-594-0714	Jay.Morgan@tn.gov
Stephanie Wallis	TDOT Region 1 Design	865-594-2424	Stephanie.Wallis@tn.gov
Carrie Mays	Tennessee Valley Authority	865-632-2234	ccmays@tva.gov
Kristen Taylor	The Corradino Group	615-372-6972	ktaylor@corradino.com
Steve Bryan	The Corradino Group	615-372-6972	sbryan@corradino.com

The existing structure consists of a three span continuous steel I-beam bridge. The existing bridge is over an embayment to Douglas Lake with a Winter Pool elevation (January 1 Flood Guide) of 954.0 and a Summer Pool elevation (June 1 Flood Guide) of 994.0. The overall bridge length is 217 feet with a maximum span length of eighty-two (82) feet. The vertical clearance is approximately sixteen (16) feet from the Summer Pool elevation to the bottom of the bridge. The out-to-out bridge width is twenty-one-foot seven-inches (21'-7"). The latest bridge inspection occurred on October 1, 2013 that resulted in a sufficiency rating for this bridge of 50.9. The approach guardrails, guardrail end terminals, and bridge rails are substandard. A six-inch (6") gas line belonging to the Jefferson Cocke County Utility District (JCCUD) is attached underneath the bridge. The 100-year and 500-year flood elevations are 1002.6 and 1003.0, respectively.

The proposed horizontal alignment for this structure will remain on the existing centerline and will be designed to meet the TDOT Standard Drawing RD01-TS-3 for a Design Speed of fifty (50) miles per hour. In addition, the proposed vertical alignment for this structure will remain the same. The existing 6" gas line is critical to maintain during construction and reattach to the proposed bridge structure. Since this proposed bridge is over an embayment to Douglas Lake, two criteria are required. One, a fill offset plan will be needed; and two, a six-foot (6') vertical clearance must be maintained above the Summer Pool elevation in the mid span. TDOT Structures Division recommends a three (3) span bridge with Type 4 I-Beams arranged 70'-100'-70' for a total of 240 feet in length. The existing piers cannot be salvaged for the proposed bridge. The Tennessee Valley Authority (TVA) recommended that the construction activities begin during the winter season when the water levels are at their lowest. A TVA Section 26A permit approval will be required for the new bridge design.

The State Route 92 bridge detour is approximately 16.5 miles from the end of the bridge around to the other end of the bridge. Detour signs should be located on the south side at the State Route 92 / State Route 35 (U.S. 411) intersection in Chestnut Hill and on the north side at the State Route 92 / State Route 363 (Indian Creek Road) intersection. The detour also utilizes State Route 9 (U.S. 25W) on the east side to complete the bridge detour route.

State Route 92 has a base year (2019) AADT of 2,120 vehicles per day (vpd) and a design year (2039) AADT of 3,650 vpd. The proposed bridge over Muddy Creek will consist of an out-to-out width of forty-seven-foot six-inches (47'-6") to accommodate a proposed approach roadway width of forty-four (44) feet, as specified in TDOT Standard Drawing RD01-TS-3 for a two (2) lane arterial roadways. On both approaches of the bridge, the roadway will transition to match the existing twenty-foot (20') roadway width.

The required approach work, estimated replacement, and preliminary engineering costs for this bridge are approximately \$2.88 million. No right-of-way acquisition is anticipated for this project. A maintenance agreement will not be required since the proposed bridge is located along State Route 92.

jb

cc: file

CHECK LIST OF DETERMINANTS FOR LOCATION STUDY

If any of the following facilities or ESE categories are located within the project area or corridor, place an "x" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

1.	Agricultural land us			
2.	Airport (existing or			
3.	Commercial area,	shopping center		
4.	Floodplains			X
5.	Forested land			X
6.		or natural landmark		
7.	Industrial park, fac			
8.	Institutional usages			
		r educational institution		
		er religious institution (Cemetery)		
		er medical facility		
	d. Public building	· • • • • • • • • • • • • • • • • • • •		
	e. Defense instal			
9.	Recreation usages a. Park or recrea			Y
	a. Park or recreated b. Game preserv	X		
10	Y			
	Residential establis			<u> </u>
 ''	Urban area, town,			
12	Waterway lake no	ond, river, stream, spring		x
12	Permit required:	Coast Guard		
	r chint required.	Section 404	x	
		TVA Section 26a review	<u> </u>	
		NPDES	<u> </u>	
		Aquatic Resource Alteration	<u> </u>	
13	Other			
_		ed with local officials		
	Railroad crossings			
	Hazardous materia			
1				

TENNESSEE DEPARTMENT OF TRANSPORTATION LONG RANGE PLANNING DIVISION

PROJECT NO .:	45011-02	26-94	ROUTE:	SR-92		
COUNTY:	JEFFERS	ON	CITY:	SANDY RIDGE		
PROJECT PIN N	UMBER:	119812.00				
PROJECT DESC	RIPTION:	BRIDGE AND APPROAD	CHES OVER M	IUDDY CREEK, SR-92 @ LM 3.12		

DIVISION REQUESTING:

		PAVEMENT DESIGN
MAINTENANCE		STRUCTURES
PLANNING	\boxtimes	SURVEY & ROADWAY DESIGN
PROG. DEVELOPMENT & ADM.		TRAFFIC SIGNAL DESIGN
PUBLIC TRANS. & AERO.		OTHER
YEAR PROJECT PROGRAMMED FOI	R CONSTRUC	CTION:
PROJECTED LETTING DATE:		

TRAFFIC ASSIGNMENT:

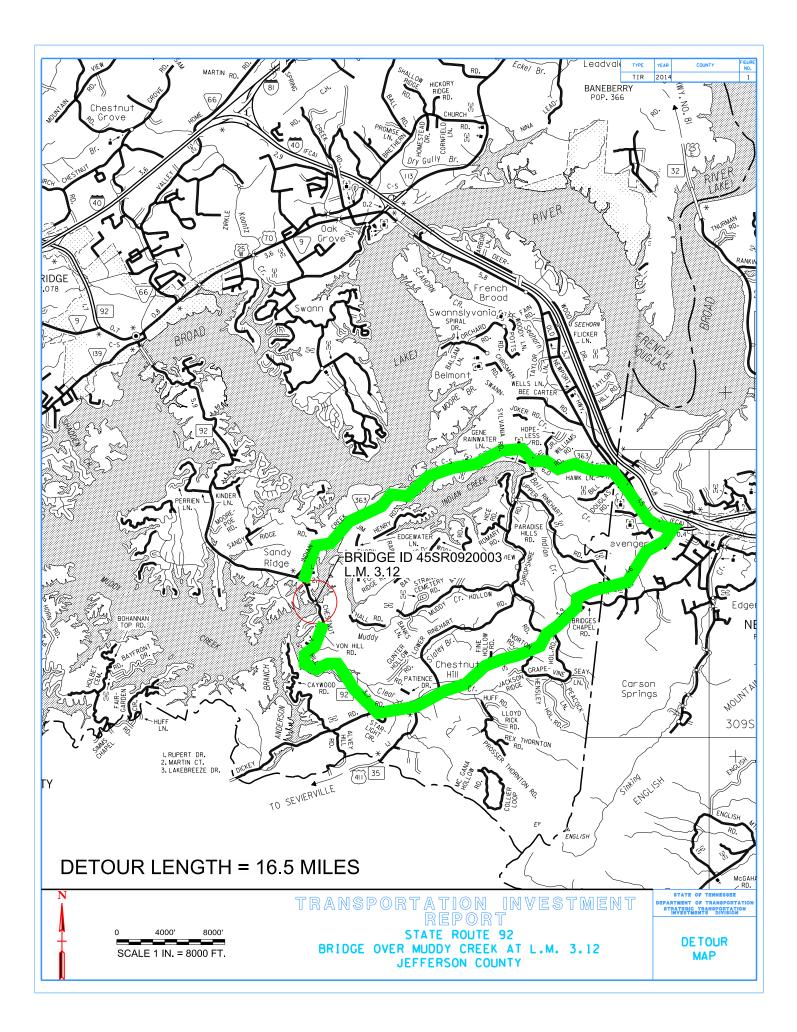
BASE	'EAR		DES	IGN Y	'EAR		DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS		
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID	
2120	2019	3650	402	11	2039	65-35	2	3			
				-	-						
				-							

REQUESTED BY:	NAME	JEREMY BOWLAN	DATE	1/21/14
	DIVISION	PROJECT INITIATION		
	ADDRESS	10 th FLOOR, J.K. POLK BLDG.		
		NASHVILLE, TN.		
REVIEWED BY:		ATION MANAGER 1	DATE	1.22.14
	SUITE 1000,	JAMES K. POLK BUILDING		
APPROVED BY:	DUDLEY DA		DATE	1.22.14
		TATION MANAGER 2		
	SUITE 1000,	JAMES K. POLK BUILDING		

COMMENTS:

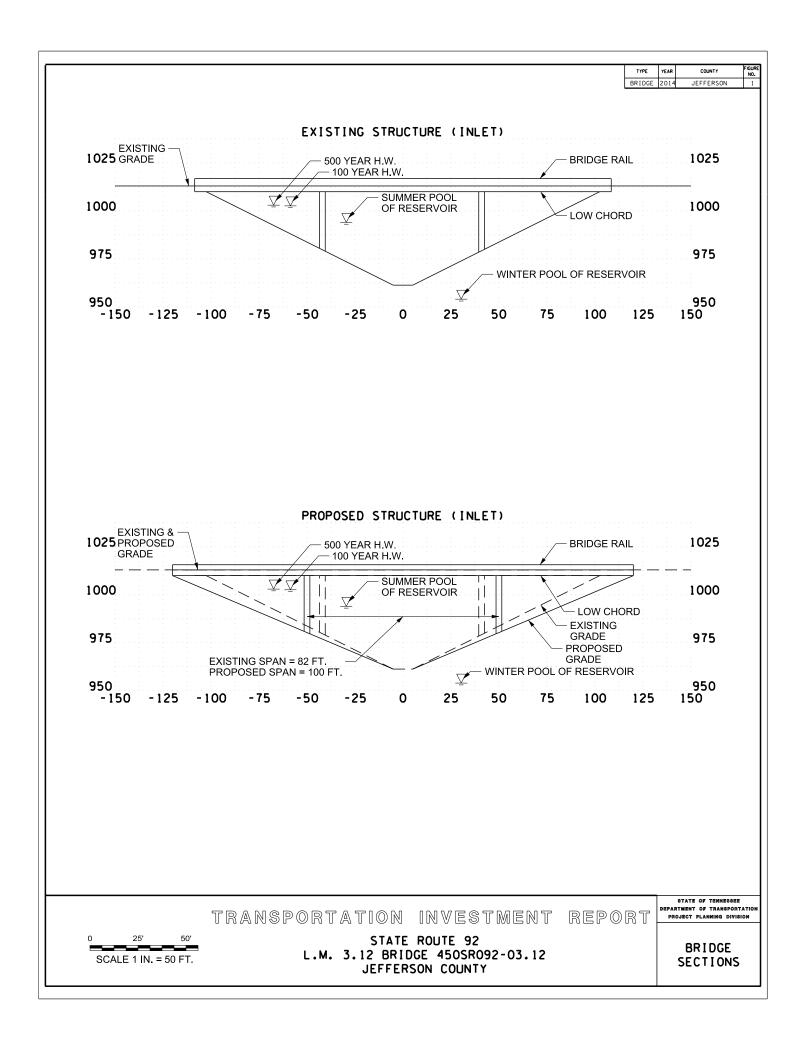
THIS TRAFFIC IS BASED ON 2013 CYCLE COUNTS. THE FUTURE TRAFFIC IS BASED ON GROWTH RATE FROM THE KNOXVILLE TPO COMPUTER ASSIGNMENT MODEL.

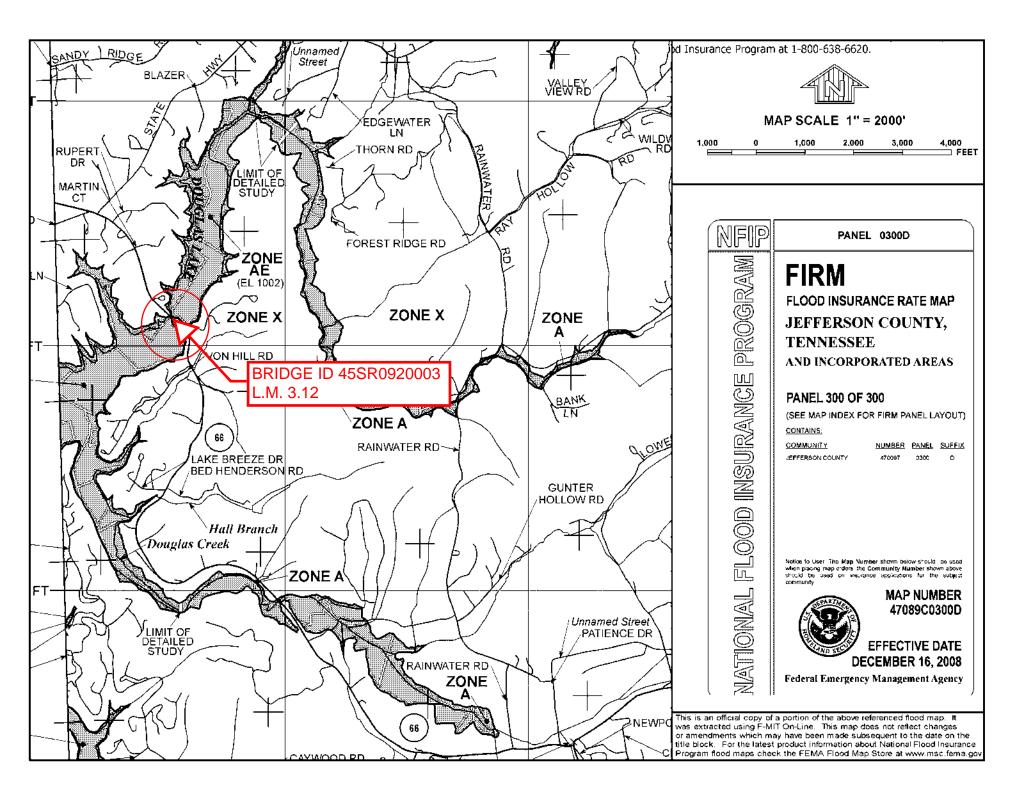
DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT. NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLS ARE NOT REQUIRED FOR ADTS OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS. SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 12/2/13)

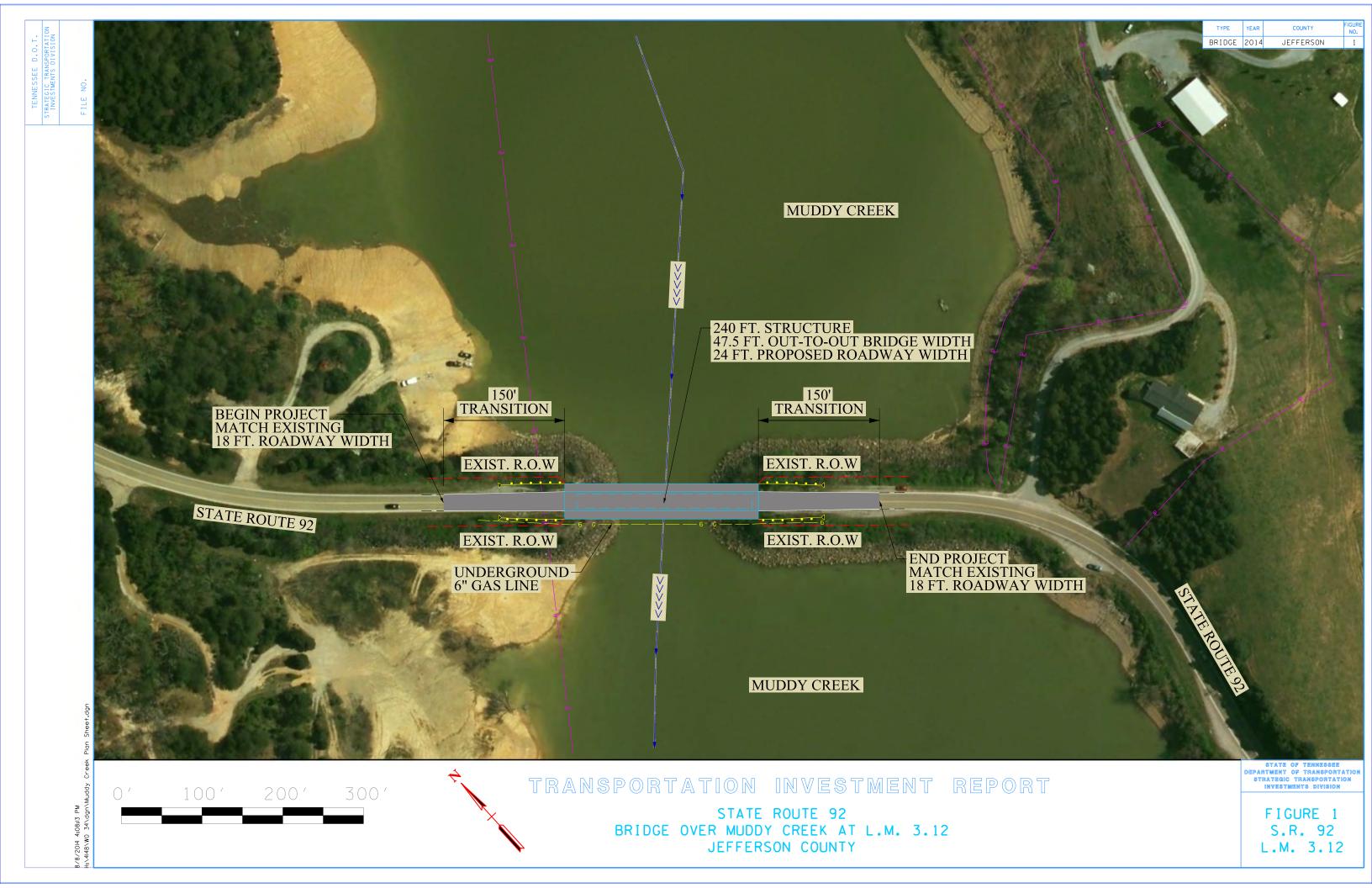


SITE INSPECTION		
INSPECTION MADE BY: Steve Bryan/Kristen Taylor BRIDGE ID: 45-SR092-03.12 COUNTY: Jefferson Date: 3/18/14 Route Name: State Route 92 Stream Name: Muddy Creek @ L.M. 3.12		
CHANNEL		
Approx depth and width of channel: Horizontal: 205' Vertical: 49'		
Depth of normal flow:N/AIn Reservoir: \checkmark YesNoDepth of Ordinary High Water:994.0 (Summer Pool)Type of material in stream bed:Silt and bouldersType of vegetation on banks:Mix of trees, bushes, and clear banks"N" factor of the channel:0.05Are channel banks stable: \checkmark YesIf the streambed is gravel: $D_{30} = $		
Skew of the channel with the roadway: 90° Channel Shape Sketch		
FLOODPLAIN		
Is the skew same as the channel? Ves No		
Type of vegetation in the floodplain and "N" factors Left U.S.: 0.10 (Mix vegetation) Right U.S.: 0.10 (Mix vegetation) Left D.S.: 0.10 (Mix vegetation) Right D.S.: 0.10 (Mix vegetation) Are roadway approaches lower than the structure? Yes No Are there any buildings in the floodplain? Yes No Approx. floor elevations: 961.0 Flood information from local residents: (elevations & dates) 954.0 (Winter Pool) and 994.0 (Summer Pool) 1002.6 (100-year Flood) and 1003.0 (500-year Flood) Floodplain Sketch		
EXISTING STRUCTURE		
Length: 217 No. of spans: 3 Structure type: Steel I-Beam No. of lanes: 2 Skew: 90 ° Width (out to out): 21'-7" Width (curb to curb): 18'-0" Approach: Paved graveled Sidewalks on Structure: Yes No Bridgerail type: Conc. Parapet w/ St. Handrail Bridgerail height = 46" Superstructure depth: 70" Finished Grade to low girder = N/A Girder depth = 32" Are any substructures in the channel? Yes No Vertical Clearance= N/A Indications of overtopping: None None None None		
High water marks: None		
Local scour: Yes, No Any signs of stream aggradation or degradation? No		
Any signs of stream I aggradation or I degradation? <u>No</u> Any drift or drift potential? Yes, I degradation? <u>No</u> No		
Any obstructions (pipes,stock fences,etc.)? None observed		
PROPOSED STRUCTURE		
Option 1: Replacement Option 2:		
Bridge length: 240 ft Bridge type: 3-Span Span arrangement: 70'-100'-70' Skew: 90 ° Bridge width: 44.0 ft Sidewalks: N/A Design Speed (MPH): 50 ADT (2039) = 3,650 Proposed grade: Same as existing		
Option 2B:		
Cost of proposed Structure: 150 per ft ² X 240 / 47.5 length (ft) / width (ft) Cost = $1,710,000$		
Cost of bridge removal:\$15per ft² X 217 / 21.6 length (ft) / width (ft)Cost =\$70,300Detour structure:Type and size =Cost =\$0		
Total Structure Cost = \$1,780,300		

Bridge TPR Flow Calculations For Hydrologic Area 1		
Area > 230 Acres		
County: Jefferson	By: <u>JHS</u>	
Bridge ID: <u>45-SR092-03.12</u>	Date: <u>5/12/14</u>	
Route: State Route 92	PIN: <u>119812.00</u>	
Feature Crossed: Muddy Creek		
Log Mile: <u>3.12</u>		
DRAINAGE BASIN		
Measurement from quad =	293,759 acres	
Contributing Drainage Area, CDA = acres/640 =	459.00 sq. mi.	
USGS REGRESSION EQUATIONS FOR FLOW		
Q ₂ = 119(CDA)^0.756 =	12,243 cfs	
Q ₅ = 197(CDA)^0.740 =	18,374 cfs	
Q ₁₀ = 258(CDA)^0.731 =	22,772 cfs	
Q ₂₅ = 343(CDA)^0.721 =	28,475 cfs	
Q ₅₀ = 412(CDA)^0.715 =	32,968 cfs	
Q ₁₀₀ = 485(CDA)^0.709 =	37,408 cfs	
DEPTH OF FLOW EQUATIONS	107#	
10-Year Flood Depth = $4.11(CDA)^{0.184}$ =	12.7 ft 16.6 ft	
100-Year Flood Depth = 5.32(CDA)^0.186 =	10.0 11	
AREAS		
Existing Area Below Low Chord =	5,240 ft ²	
Proposed Area Below Low Chord =	6,093 ft ²	
Proposed 10-Year Flood Area, A ₁₀ =	N/A ft ²	
Proposed 100-Year Flood Area, A ₁₀₀ =	4,446 ^{ft²}	
VELOCITIES		
Proposed 10-Year Flood Velocity, $V_{10} = Q_{10}/A_{10} =$	N/A fps	
Proposed 100-Year Flood Velocity, $V_{100} = Q_{100}/A_{100} =$	8.4 fps	
Note: Location is an embayment of Douglas Lake, calculations are not applicable.		









BRIDGE ID NUMBER



INLET SIDE LOOKING SOUTH TOWARDS THE BRIDGE



INLET SIDE LOOKING NORTH AWAY FROM THE BRIDGE



OUTLET SIDE LOOKING NORTH TOWARDS THE BRIDGE



OUTLET SIDE LOOKING SOUTH AWAY FROM THE BRIDGE



WEST APPROACH LOOKING EAST TOWARDS THE BRIDGE



WEST APPROACH LOOKING WEST AWAY FROM THE BRIDGE



EAST APPROACH LOOKING WEST TOWARDS THE BRIDGE



EAST APPROACH LOOKING EAST AWAY FROM THE BRIDGE



CENTER OF BRIDGE LOOKING EAST



CENTER OF BRIDGE LOOKING WEST



VIEW OF INLET SIDE FROM THE BRIDGE DECK



VIEW OF OUTLET SIDE FROM THE BRIDGE DECK



VIEW OF BRIDGE FROM THE INLET SIDE (LOOKING LEFT)



VIEW OF BRIDGE FROM THE INLET SIDE (LOOKING RIGHT)



VIEW OF BRIDGE FROM THE OUTLET SIDE (LOOKING LEFT)



VIEW OF BRIDGE FROM THE OUTLET SIDE (LOOKING RIGHT)



VIEW OF 6" GAS LINE LOOKING SOUTH UNDER THE BRIDGE DECK



VIEW OF 6" GAS LINE LOOKING EAST UNDER THE BRIDGE DECK



VIEW OF NARROW BRIDGE SIGN LOOKING WEST (EAST OF BRIDGE)



VIEW OF NO SWIMMING OR FISHING SIGN LOOKING EAST (WEST OF BRIDGE)



VIEW OF REVERSE CURVE SIGN LOOKING EAST (WEST OF BRIDGE)