TRANSPORTATION PLANNING REPORT

SPECIAL BRIDGE REPLACEMENT PROGRAM

SR-14/US-61 (Third Street)
Bridge over ICRR and Nonconnah Creek
Log Mile 7.13
Shelby County
PIN #108883.00

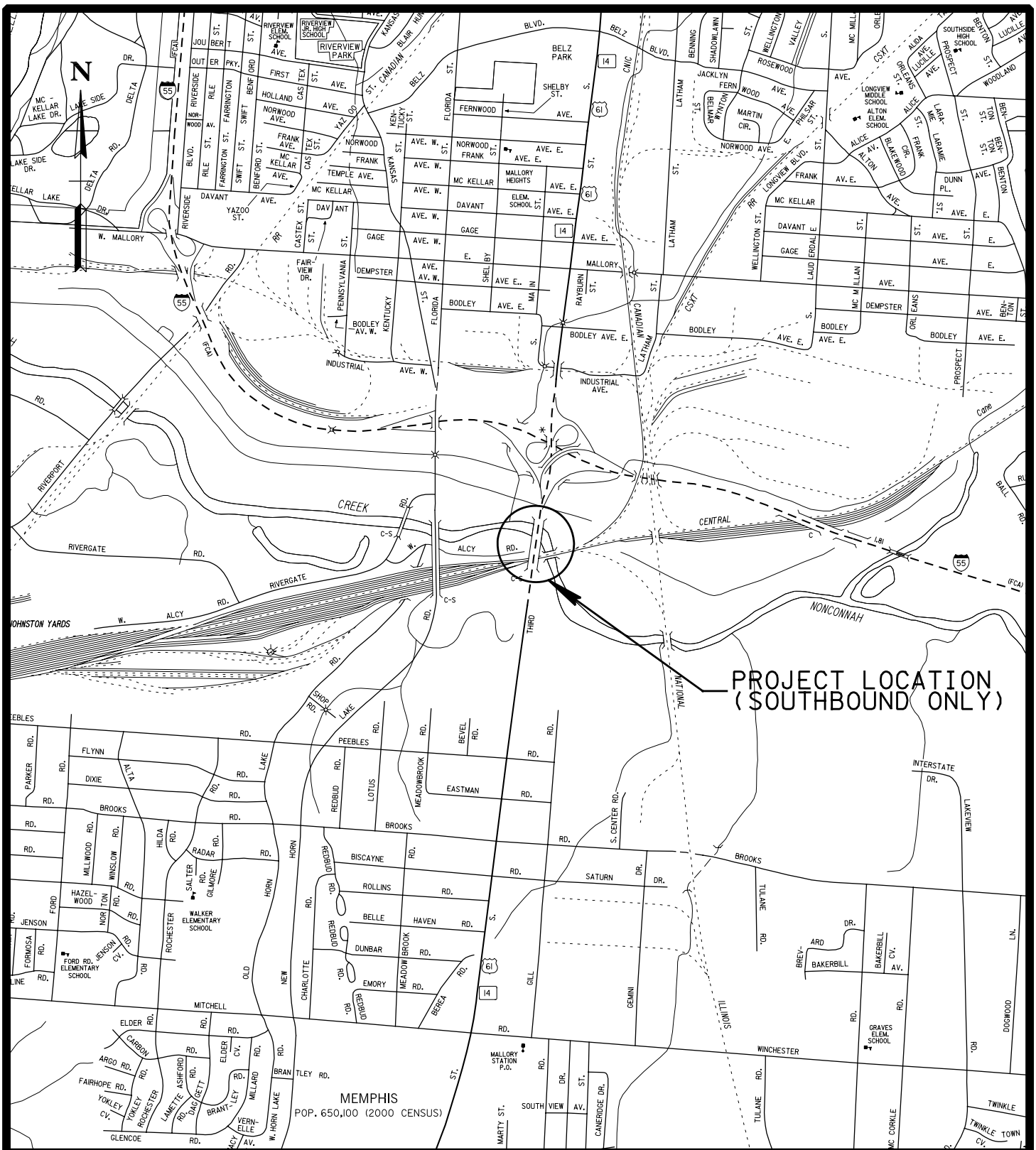
PREPARED BY
Kimley-Horn and Associates, Inc.

FOR THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

Approved by: _____ 10/25/07 _____ 11/6/07
Chief of Env. & Pln. Date Chief Engineer Date

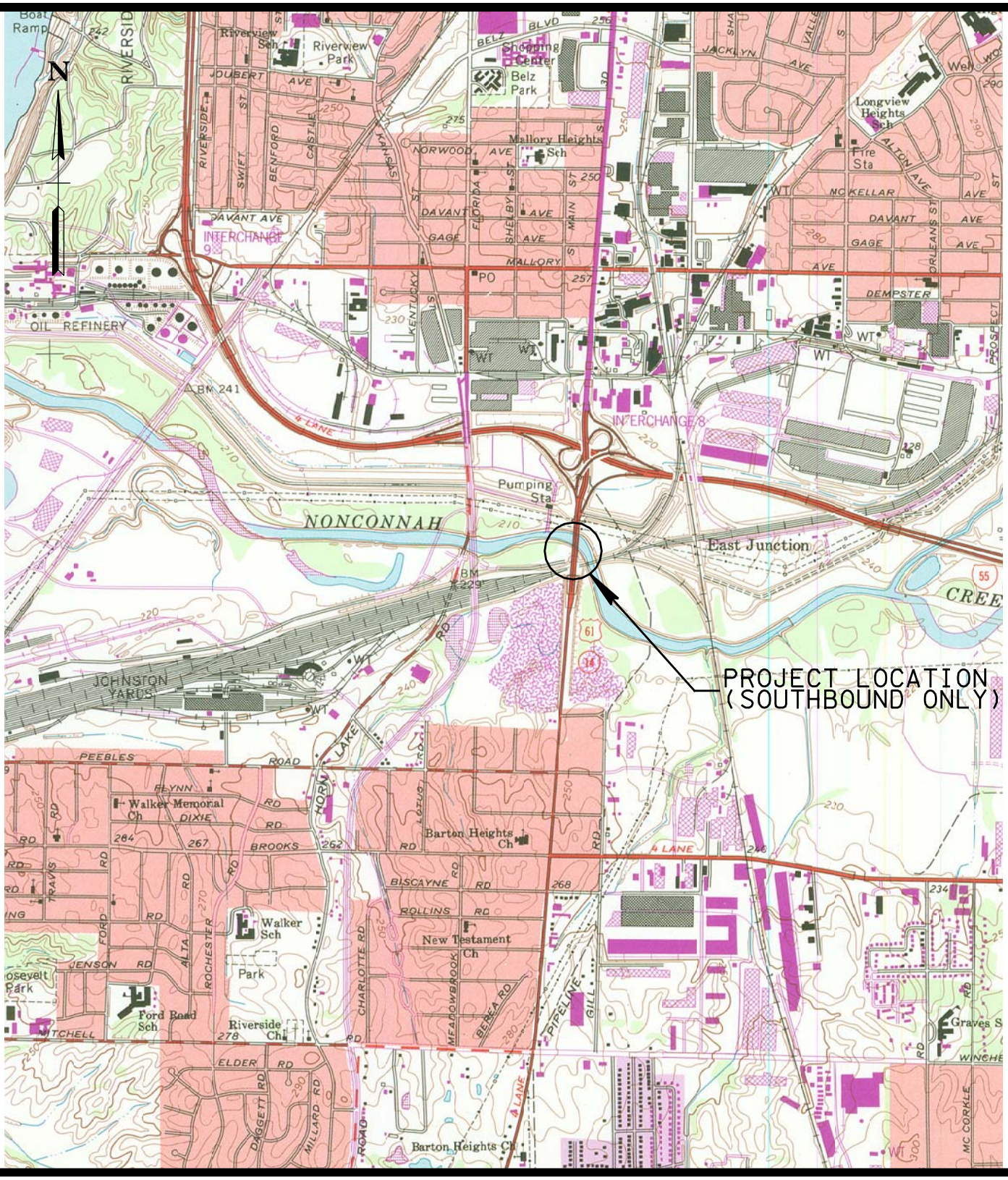
REVISION

Recommended by:	INITIALS	DATE	Recommended by:	INITIALS	DATE
TRANS. DIRECTOR PROJ. PLN. DIVISION	SA	10-15-07	TRANS. DIRECTOR PROJ. PLN. DIVISION		
TRANS. DIRECTOR ENV. DIVISION		10-17-07	TRANS. DIRECTOR ENV. DIVISION		
ENG. DIRECTOR DESIGN DIVISION		10-18-07	ENG. DIRECTOR DESIGN DIVISION		
ENG. DIRECTOR STRUCTURES DIVISION		10/18/07	ENG. DIRECTOR STRUCTURES DIVISION		
TRANS. DIRECTOR PROG. DEV. DIVISION		10/22/07	TRANS. DIRECTOR PROG. DEV. DIVISION		
ASSISTANT CHIEF ENGINEER			ASSISTANT CHIEF ENGINEER		
ASSISTANT CHIEF OF ENV. & PLN.		10/23/07	ASSISTANT CHIEF OF ENV. & PLN.		



LOCATION MAP

STATE ROUTE 14 (THIRD STREET) SOUTHBOUND SHELBY COUNTY
BRIDGE OVER NONCONNAH CREEK & IC RAILROAD @ L.M. 7.13
BRIDGE ID 79SR0140006



0 1000 2000 3000

SCALE: 1″ = 2000′

U.S.G.S. TOPOGRAPHIC MAP

STATE ROUTE 14 (THIRD STREET) SOUTHBOUND SHELBY COUNTY
BRIDGE OVER NONCONNAH CREEK & IC RAILROAD @ L.M. 7.13
BRIDGE ID 79SR0140006

0 500 1000 1500

SCALE: 1" = 1000'

LOCATION MAP

STATE ROUTE 14 (THIRD STREET) SOUTHBOUND SHELBY COUNTY
BRIDGE OVER NONCONNAH CREEK & IC RAILROAD @ L.M. 7.13
BRIDGE ID 79SR0140006

TRANSPORTATION PLANNING WORKSHEET
BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS

County: Shelby Route: State Route 14 (Third Street) Log Mile: 7.13

Feature Crossed: Nonconnah Creek & IC Railroad System: NHS

Functional Class: Urban Other Principle Arterial Bridge I.D.: 79SR0140006

EXISTING CONDITIONS

2012: ADT 52,320 App. Cross Section: 40'/42'/200' No. Lanes: 3

Approach Alignment: Tangent Year Built: 1929 Load Limit: 27 tons

Width (curb to curb): 40' Sidewalks: Right 5.9' Left 5.9' Length: 787'
No. Spans: Approach: 16 Main: 1

Substructure: Concrete Bents Vertical Clearance: 3.81 Sufficiency Rating: 46.4

Other: High Steel Struss (simple spans)

An underground petroleum pipeline exists under the bridge approximately 60' from the north end of the bridge.

PROPOSED IMPROVEMENTS – STANDARDS FROM RD01-TS-6 Type of Work: Replace

Design Year: 2032 Design ADT: 26,160 Terrain: Flat ADL (F): - (R): -

Length of Project: 1387' Structure Length: 787' Design Speed: 50 MPH

Posted Speed: 45 MPH Approach Width: 42' Bridge Width (C to C): 40' No. Lanes 3

Right-of-Way Required: No Additional (Out to Out): 52'/61'

Maintenance of Traffic

Temporary Detour: No (map & description) Temporary Runaround: Yes Stage Construct: No (schematic)

Alternate Route: Temporary runaround using existing northbound bridge (79-SR014-0713R). See schematic.

ESTIMATED COST (Rounded up to the nearest $5000.00**)**

Right-of-Way: - Approaches: $435,000 Structure: $5,325,000

Preliminary Engineering: $1,155,000 Utilities: $35,000 Total: $6,950,000

Remarks: Raise profile approximately 3' to maintain 23' vertical clearance over ICRR.

Field Investigation by: Hope, Jowers, King, Monroe, Pate, Petersen, Price

BRIDGE TPR COST ESTIMATE | County: **Shelby** | **Pg. 1 of 1**

State Route 14 @ LM 7.13 | Bridge No.: **79SR0140006**

Over ICRR and Nonconnah Creek | Date **10/10/2007**

Mineral Aggregate Base								
((Area x	depth)	/ 27 cf/cy) x 2.03 tons/cy x	$ unit price					
35,600	0.67		$ 15.00				$	26,800
Pavement @ 6" depth (3" Black base, 1.75" binder, 1.25" Surface)								
(Area	/ 9 sf/sy) x	$ unit price						
35,600		$ 30.00					$	118,700
Borrow Excavation for Mainline								
((Area x	depth)	/ 27 cf/cy) x	$ unit price					
14,000	4		$ 4.43				$	10,000
Guardrail at Bridge Ends		0	ft @	$ 30.00	L.F.		$	-
Type 2 Guardrail		1050	ft @	$ 13.00	L.F.		$	13,700
Guardrail Terminal Anchors		3	@	$ 1,000.00	each		$	3,000
Portable Barrier Rail		2020	ft @	$ 25.00	L.F.		$	50,500
Drum with Type "C" warning lights		124	@	$ 125.00	each		$	15,500
Signs (Construction)		448	sf @	$ 25.00	S.F.		$	11,200
Pavement Markings (6" Line)		2.5	mile @	$ 4,000.00	L.M.		$	10,000
Pavement Mrkngs (6" Dotted Line)		3000	ft @	$ 1.76	L.F.		$	5,300
Sidewalks		400	sf @	$ 5.00	L.F.		$	2,000
Curb & Gutter		20.4	cy @	$ 295.62	C.Y.		$	6,000
Seeding		9.2	unit @	$ 17.23	UNIT		$	200
Traffic Control (lump sum)							$	50,000
Pavement Removal								
(Area	/ 9 sf/sy) x	$ unit price						
25372		$ 5.00					$	14,100
Erosion Control (lump sum)							$	20,000
Mobilization at 5%							$	17,900
						Subtotal	$	374,900
Miscellaneous and Contingencies at 15% (rounded)								56,200
						Total Approaches (rounded)	**$**	**431,000**
Proposed bridge:	((length x	width x)	x $ unit price					
	790	56	$ 105.00				$	4,645,200
Removal of Ex. Br (Appr.)	645	52.3	$ 15.00				$	506,000
Removal of Ex. Br (Main)	142	61	$ 20.00				$	173,200
Detour Structure	N/A							
						Total Structures (rounded)	**$**	**5,324,400**
Right-of-Way Cost	0	Tracts	@	$ 2,500	avg. per tract		$	-
						Total R.O.W. (rounded)	**$**	**-**
Utilities	Light Stds.	5	@	$ 5,000	each	$ 25,000		
Encase UG Gas Line		200	ft @	$ 40	per ft	$ 8,000		
						Total Utilities (rounded)	**$**	**33,000**
						Preliminary Engineering at 20% (rounded)	**$**	**1,151,000**
Total							**$**	**6,939,400**

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: 99105-1298-94 ROUTE: S.R. 14
COUNTY: SHELBY CITY: MEMPHIS
PROJECT PIN NUMBER: 108883.00
PROJECT DESCRIPTION: BRIDGE OVER CNIN RAILROAD & NONCONNAH CREEK.
(SOUTH BOUND BRIDGE ONLY)

DIVISION REQUESTING:

MAINTENANCE	☐	PAVEMENT DESIGN	☐
PLANNING	☒	STRUCTURES	☐
PROG. DEVELOPMENT & ADM.	☐	SURVEY & DESIGN	☐
PUBLIC TRANS. & AERO.	☐	TRAFFIC SIGNAL DESIGN	☐
		OTHER	☐

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION:
PROJECTED LETTING DATE:

TRAFFIC ASSIGNMENT:

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
24,230	2012	26,160	2,093	8	2032	60-40	5	8		

REQUESTED BY: NAME TERRY GLADDEN DATE 8/24/07
DIVISION PLANNING
ADDRESS JAMES K. POLK BLDG., SUITE 900
NASHVILLE, TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 8-28-07
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: BILL HART Bill Hart DATE 8-28-07
TRANSPORTATION MANAGER 2
SUITE 900, JAMES K. POLK BUILDING

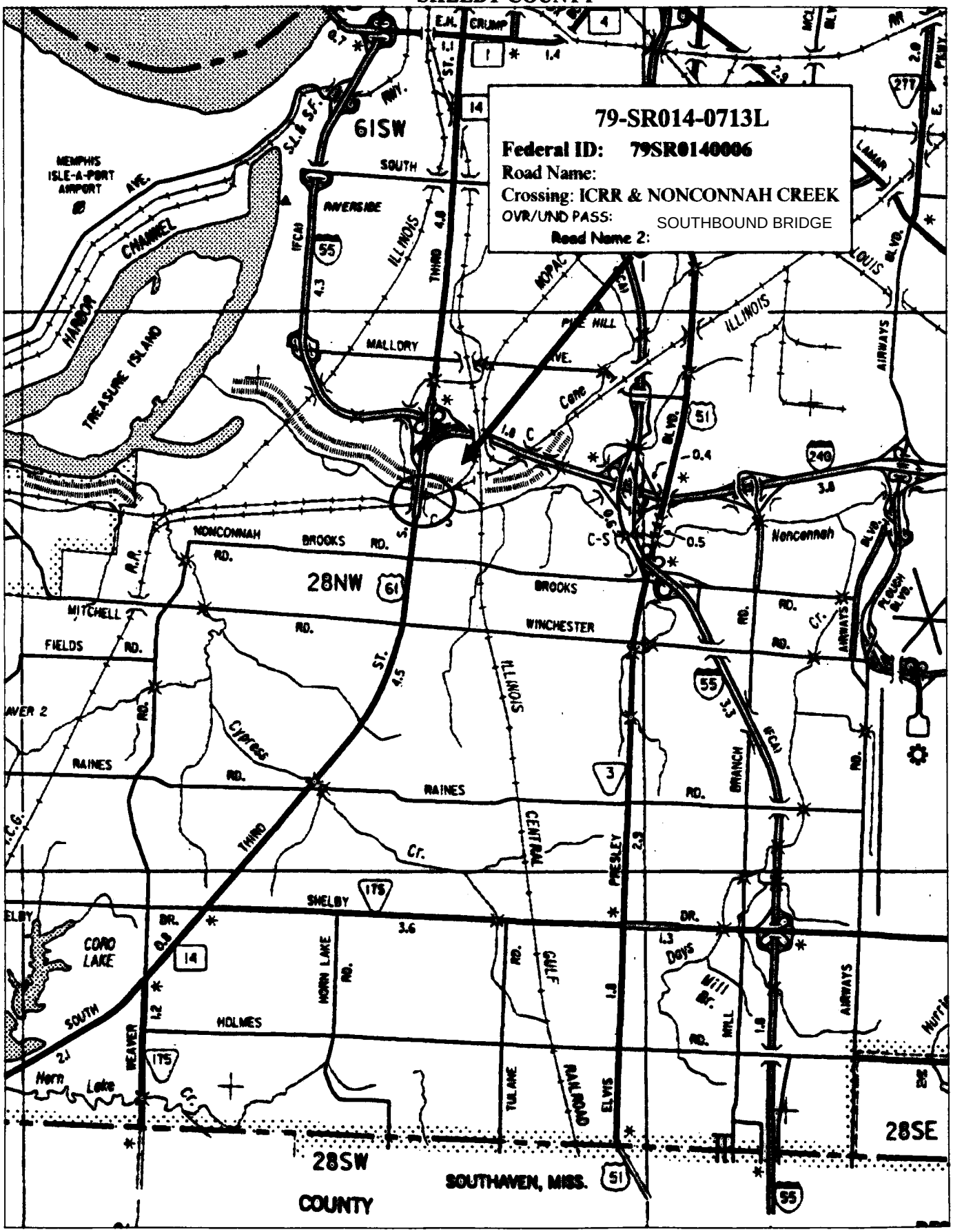
COMMENTS:

THIS TRAFFIC IS BASED ON 2006 CYCLE COUNTS. THE FUTURE TRAFFIC IS BASED ON GROWTH RATE FROM THE MEMPHIS COMPUTER ASSIGNMENT MODEL, AND IS FOR SOUTH BOUND BRIDGE ONLY. VOIDS PROJECT DATED 12/18/06.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR AADT's OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 11/6/06)

SHELBY COUNTY



Kimley-Horn
and Associates, Inc.

Memorandum

3175 Lenox Park Blvd.
Suite 200
Memphis, Tennessee
38115

To: Transportation Planning Office

From: Kenneth W. Monroe, P.E.

Date: May 18, 2007

Subject: TPR Field Review (Special Bridge Replacement Program)
State Route 14 (Third Street) over ICRR and Nonconnah Creek
@ L.M. 7.13
Bridge ID 79SR0140006
Shelby County
PIN 108883.00

A field review was held for the above-mentioned project on March 28, 2007. TDOT employees from the Planning, Design, and Survey departments attended the field review.

The existing structure is a 787 foot Concrete Pier/ Steel Truss bridge with 17 spans. The out-to-out width of the bridge is 52 feet. The sufficiency rating of the bridge is 46.4. The bridge carries southbound traffic only.

The proposed bridge will have the same alignment as the existing bridge. The Southbound SR 14 Bridge has a base year (2012) ADT of 24,230 with a design year (2032) ADT of 26,120. The proposed structure will have a total width of 56 feet, comprised of three 12 foot lanes, 2 foot outside curb and gutter, 6 foot sidewalk, and an 8 foot outside shoulder. The existing bridge plans from 1923 show a vertical clearance of 22'-3 3/8" between the low chord of the bridge and the top of rail along the ICRR. To maintain the required vertical clearance of 23' with the new span, the profile will be raised approximately 3 feet. The design speed will be 50 mph and the proposed structure will be designed to meet standard drawing RD01-TS-6.

During construction, the southbound traffic will utilize two lanes of the northbound bridge. Southbound traffic on SR 14 will taper to one lane prior to the bridge and the ramps from I-240 will be routed over to the northbound bridge. Northbound traffic will be tapered to one lane prior to the bridge. The replacement bridge will be constructed in the location of the previous bridge.

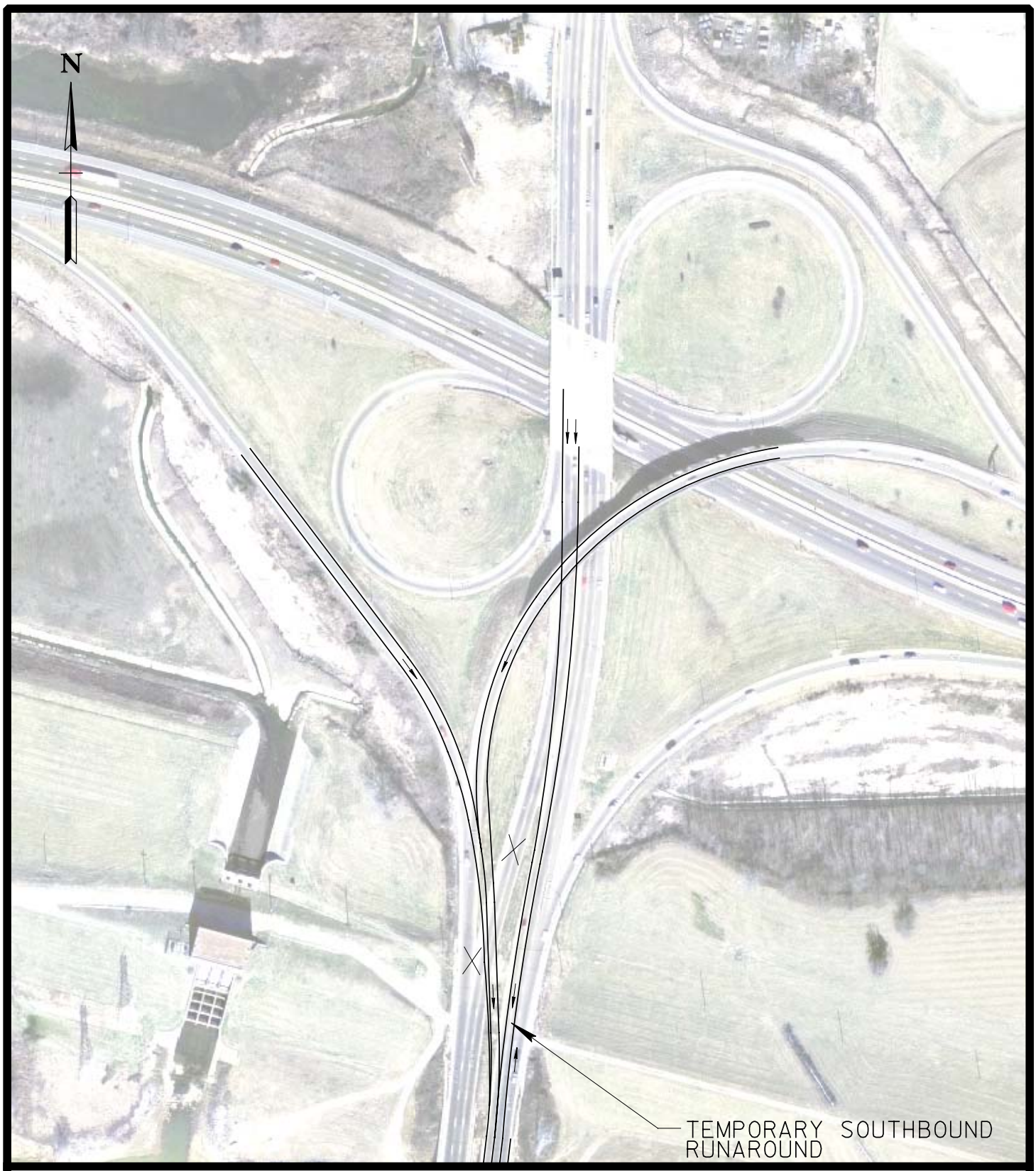
The cost of approach work, estimated replacement cost and preliminary engineering for this bridge replacement is $6,950,000.

TEL 901 374 9109
FAX 901 374 9111

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 usage	
2.	Airport (existing or proposed)	
3.	Commercial area, shopping center	
4.	Floodplains	X
5.	Forested land	
6.	Historical, cultural, or natural landmark	
7.	Industrial park, factory	
8.	Institutional usages	
	a. School or other educational institution	
	b. Church or other religious institution (Cemetery)	
	c. Hospital or other medical facility	
	d. Public building, e.g., fire station	
	e. Defense installation	
9.	Recreation usages	
	a. Park or recreational area	
	b. Game preserve or wildlife area	
10.	Residential establishment	
11.	Urban area, town, city, or community	X
	(Memphis , Population 650,000)	
12.	Waterway, lake, pond, river, stream, spring	X
	(Permit required: Coast Guard	
	Section 404	X
	TVA Section 26a review	
	NPDES	X
	Aquatic Resource Alteration	X
13.	Other	
14.	Location coordinated with local officials	
15.	Railroad crossings	X
16.	Hazardous materials site	



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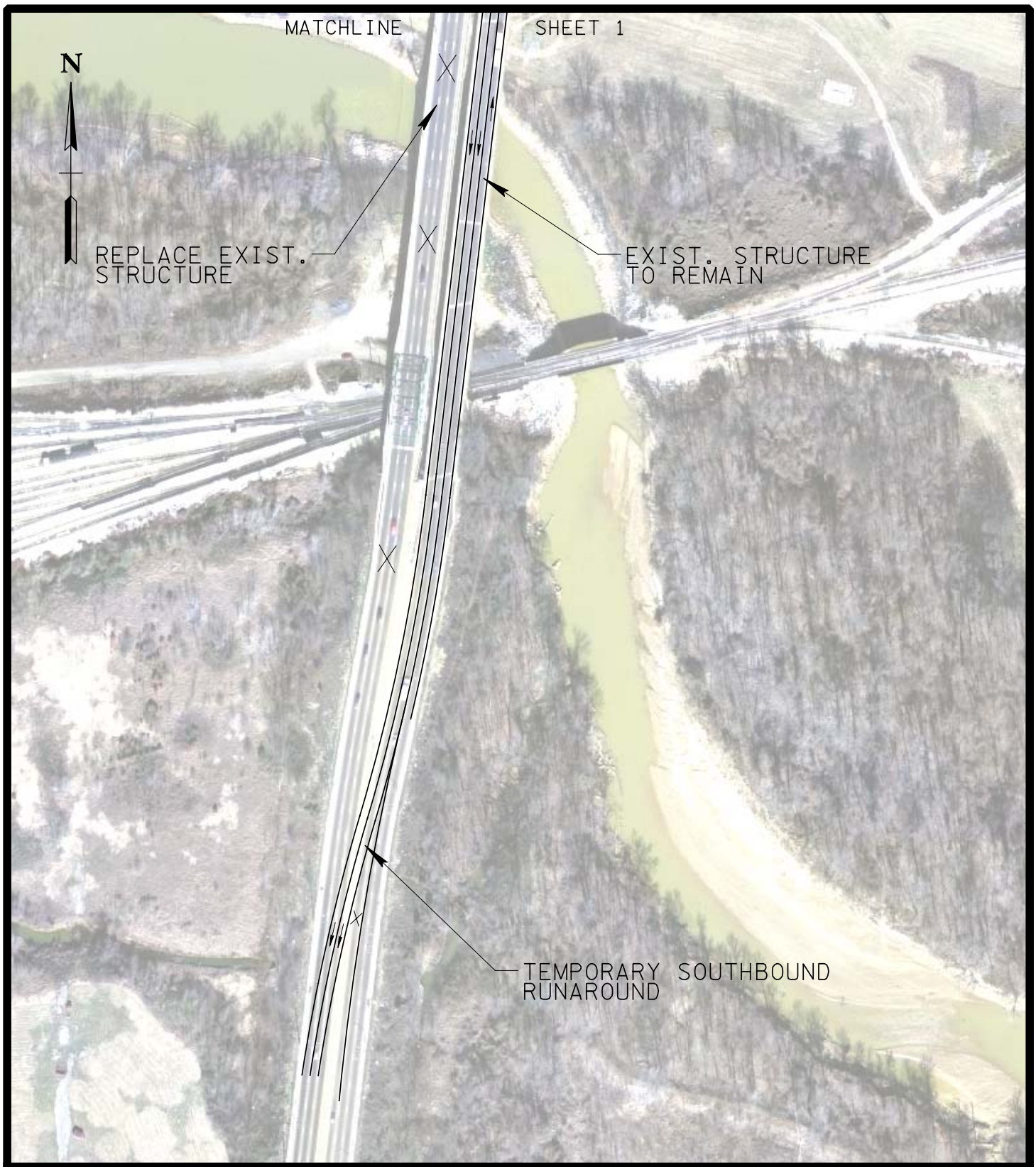
SCALE: 1″ = 200′

MATCHLINE SHEET 2

SHEET 1 OF 2

STATE ROUTE 14 (THIRD STREET) SOUTHBOUND SHELBY COUNTY
BRIDGE OVER NONCONNAH CREEK & IC RAILROAD @ L.M. 7.13
BRIDGE ID 79SR0140006
CONSTRUCT NEW BRIDGE IN EXISTING LOCATION, USE RIGHT BRIDGE FOR NORTH AND SOUTHBOUND TRAFFIC DURING CONSTRUCTION



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SCALE: 1″ = 200′

SHEET 2 OF 2

STATE ROUTE 14 (THIRD STREET) SOUTHBOUND SHELBY COUNTY
BRIDGE OVER NONCONNAH CREEK & IC RAILROAD @ L.M. 7.13
BRIDGE ID 79SR0140006
CONSTRUCT NEW BRIDGE IN EXISTING LOCATION, USE RIGHT BRIDGE FOR NORTH AND SOUTHBOUND TRAFFIC DURING CONSTRUCTION

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BRIDGE INSPECTION AND REPAIR OFFICE
SUITE 1200, JAMES K. POLK BUILDING
NASHVILLE, TENNESSEE 37243-0338

GERALD F. NICELY
COMMISSIONER

PHIL BREDESEN
GOVERNOR

MEMORANDUM

DATE: January 12, 2007

TO: Agatha McCollum, Transportation Specialist 2

FROM: Terry D. Leatherwood, Civil Engineering Manager 1

RE: Ownership of Bridge ID# 79SR0140006 (RR# 297767K) in Shelby County, Tennessee

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In response to your request for information regarding the ownership of the above bridge, my office has checked our records. This check has revealed the following facts:

- The original plans for this bridge indicate that it was designed and built by the Tennessee Department of Highways and Public Works which was the processor to the current Tennessee Department of Transportation (TDOT). The plans are dated 1929 and show a Federal Aid Project Number of 218-D.

- TDOT has let at least two (2) projects to repair and maintain this bridge. Our records show that in 1982, TDOT let a contract to paint the steel truss span and make minor steel repairs under Project 79024-4235-04. Then in 1988, TDOT let another repair contract to upgrade the safety features of this bridge and install new expansion joints. This was done under Project 79022-3215-44.

Given that this bridge was designed, built and is being maintained by TDOT, our conclusion is that the bridge is owned by the State of Tennessee. We have no information in our files indicating ownership by any other party.

If you have any questions or need further information, please advise.

TDL

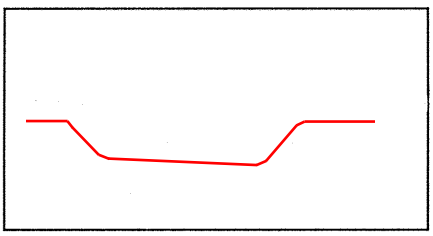
TPR ON SITE INSPECTION REPORT

FOR STREAM CROSSINGS

INSPECTION MADE BY: KWM , AP BRIDGE ID: 79-SR014-0713L COUNTY: Shelby
Date: 3/28/07 Route Name: S.R. 14 , U.S. 61 (Third Street) Stream Name: Nonconnah Creek

CHANNEL

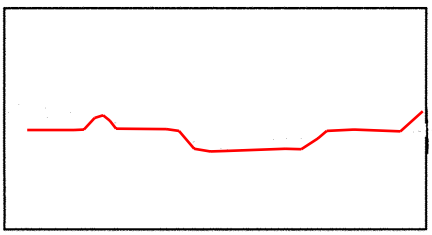
Approx depth and width of channel: Hor.: 258' Vert: 21'
Depth of normal flow: 16' In Reservoir: ☐ Yes ☒ No
Depth of Ordinary H.W.: 209' (16')
Type of material in stream bed: Rip rap
Type of vegetation on banks: Brush/Trees
"N" factor of the channel: 0.040
Are channel banks stable: Stabilized with rip rap
If the streambed is gravel: D_{30} = D_{85} =
Skew of the channel with the roadway: 85 Degrees



Channel Shape Sketch

FLOODPLAIN

Is the skew same as the channel? No
Is it symmetrical about the channel? No
Type of vegetation in the floodplain and "N" factors
Left U.S.: Trees - 0.070 Right U.S.: Trees - 0.070
Left D.S.: Grass - 0.025 Right D.S.: Trees - 0.070
Are roadway approaches lower than the structure? Yes
Are there any buildings in the floodplain? Yes (Pumping Sta./Flood Control)
Approx. floor elevations: N/A
Flood information from local residents:
(elevations & dates) –



Floodplain Sketch

EXISTING STRUCTURE

Concrete girder (appr.)
Length: 787' No. of spans: 17 Structure type: Steel truss (main) No. of lanes: 3 Skew: 90 degrees
Width (out to out): 61' (52') Width (curb to curb): 40' Approach: ☒ paved ☐ graveled
Sidewalks (left,right): 5.9', 5.9' Bridgerail type: Concrete (appr.) Steel (main) Bridgerail height = 4.125'
Superstructure depth: Finished Grade to low girder = 4.08' Girder depth = 3.41'
Are any substructures in the channel? Yes Area of opening = 21,920 ft^2
Indications of overtopping: No
High water marks: Yes
Local scour: None visible
Any signs of stream ☐ aggradation or ☐ degradation? None visible
Any drift or drift potential? Little
Any obstructions (pipes,stock fences,etc.)? No

PROPOSED STRUCTURE

☒ Replacement ☐ Rehabilitate ☐ Widening ☐ 1@142', 8@70'
Bridge length: 790' Bridge type: Multi-span, Steel girder Span arrangement: 1@56', 1@50' Skew: 90 degrees
Bridge width: 56' Sidewalks: 6' Lt. only Design Speed (MPH): 50 ADT (2032) = 52,320
Proposed grade: Raise profile to provide 23' clear over ICRR Proposed alignment: Maintain existing
Method of maintaining traffic: ☐ Stage construction ☒ On site detour ☐ Close road ☐ Shift Centerline

Cost of proposed Structure:	$105	per ft^2 X	790/56	length (ft) / width (ft)	Cost =	$4,645,200
Cost of proposed Structure:		per ft^2 X		length (ft) / width (ft)	Cost =	
Cost of proposed Structure:		per ft^2 X		length (ft) / width (ft)	Cost =	
Cost of bridge removal:	$15	per ft^2 X	645/52.3	length (ft) / width (ft)	Cost =	$506,000
Cost of bridge removal:	$20	per ft^2 X	142/61	length (ft) / width (ft)	Cost =	$173,200
Cost of bridge removal:		per ft^2 X		length (ft) / width (ft)	Cost =	
Detour structure: Type and size =	N/A				Cost =	

Total Structure Cost = $5,324,400

Bridge TPR Flow Calculations
For Hydraulic Area 4
Area > 186 Acres

County:	Shelby	By:	KHA
Bridge ID:	79SR0140006	Date:	7/2/2007
Route:	State Route 14 (Third Street)	PIN:	108883.00
Feature Crossed:	ICRR & Nonconnah Creek		
Log Mile:	7.13		

DRAINAGE AREA

Total drainage area at SR 14/US 61	112,192	acres
	175.3	sq. mi.
Downstream gaged D.A. (FEMA Flood Insurance Study)	180.3	sq. mi.
Channel condition (p)	1	

USGS REGRESSION EQUATIONS FOR FLOW*

$Q_{10} = 32{,}963 - 918\ (\Delta CDA)^{0.79}\ (p)^{1.08}$	29,689	cfs
$Q_{50} = 42{,}892 - 1{,}350\ (\Delta CDA)^{0.77}\ (p)^{1.05}$	38,230	cfs
$Q_{100} = 47{,}214 - 1{,}550\ (\Delta CDA)^{0.76}\ (p)^{1.04}$	41,947	cfs

* Gauged flow downstream - Peak discharge for difference in drainage area

DEPTH OF FLOW

10-Year Depth**	25	ft
100-Year Depth**	33	ft

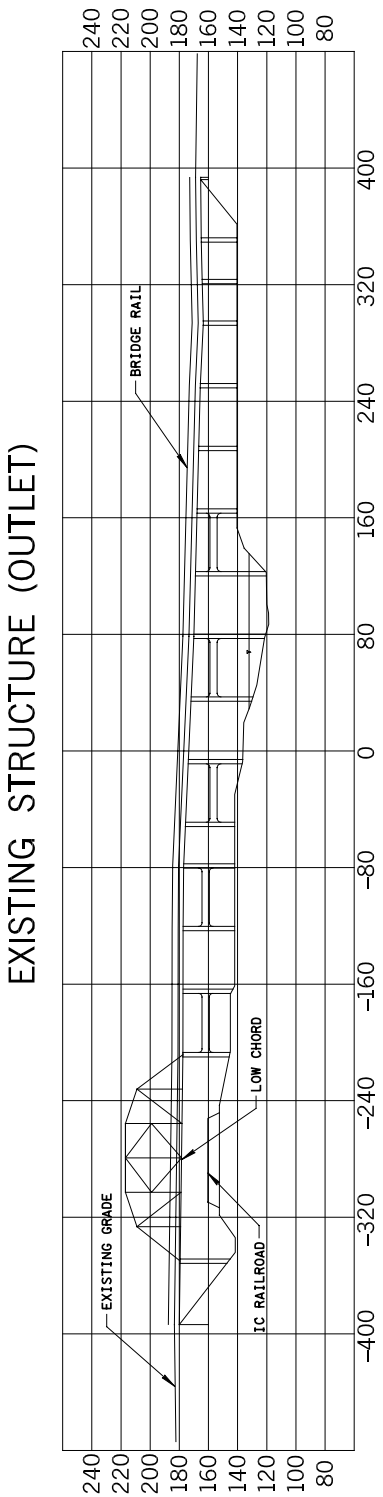
** Depth from flood profiles - FEMA Flood Insurance Study, Dec. 2, 1994

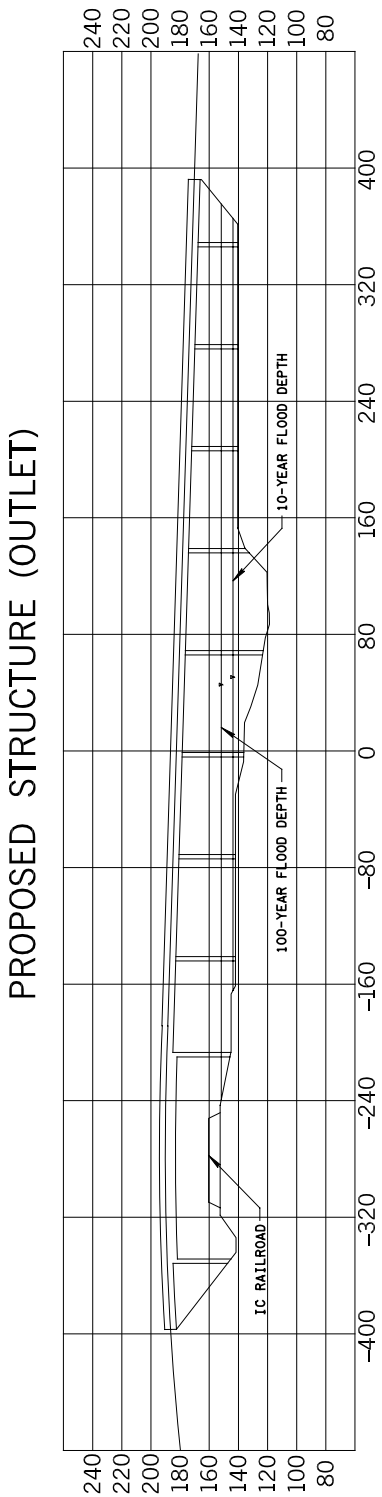
AREAS

Existing Area Below Low Chord =	21,620	ft^2
Proposed Area Below Low Chord =	26,350	ft^2
Proposed 10-Year Flood Area, A_{10} =	3,300	ft^2
Proposed 100-Year Flood Area, A_{100} =	7,850	ft^2

VELOCITIES

Proposed 10-Year Flood Velocity, $V_{10} = Q_{10}/A_{10}$ =	9.0	fps
Proposed 100-Year Flood Velocity, $V_{100} = Q_{100}/A_{100}$ =	5.3	fps





0 60 120 180

SCALE: 1″ = 120′

BRIDGE SECTIONS

STATE ROUTE 14 (THIRD STREET) SOUTHBOUND SHELBY COUNTY
BRIDGE OVER NONCONNAH CREEK & IC RAILROAD @ L.M. 7.13
BRIDGE ID 79SR0140006

Structure from inlet view

Structure from outlet view

Feature crossed – upstream

Feature crossed – downstream

Floodplain upstream left

Floodplain upstream right

Floodplain downstream left

Floodplain downstream right

Southbound approach

Northbound approach