

# TRANSPORTATION PLANNING REPORT

## Special Bridge Replacement Program

LOCAL ROUTE 0A068  
BRIDGE OVER HYDE CREEK AT L.M. 1.07  
LAUDERDALE COUNTY  
PIN: 117275.00



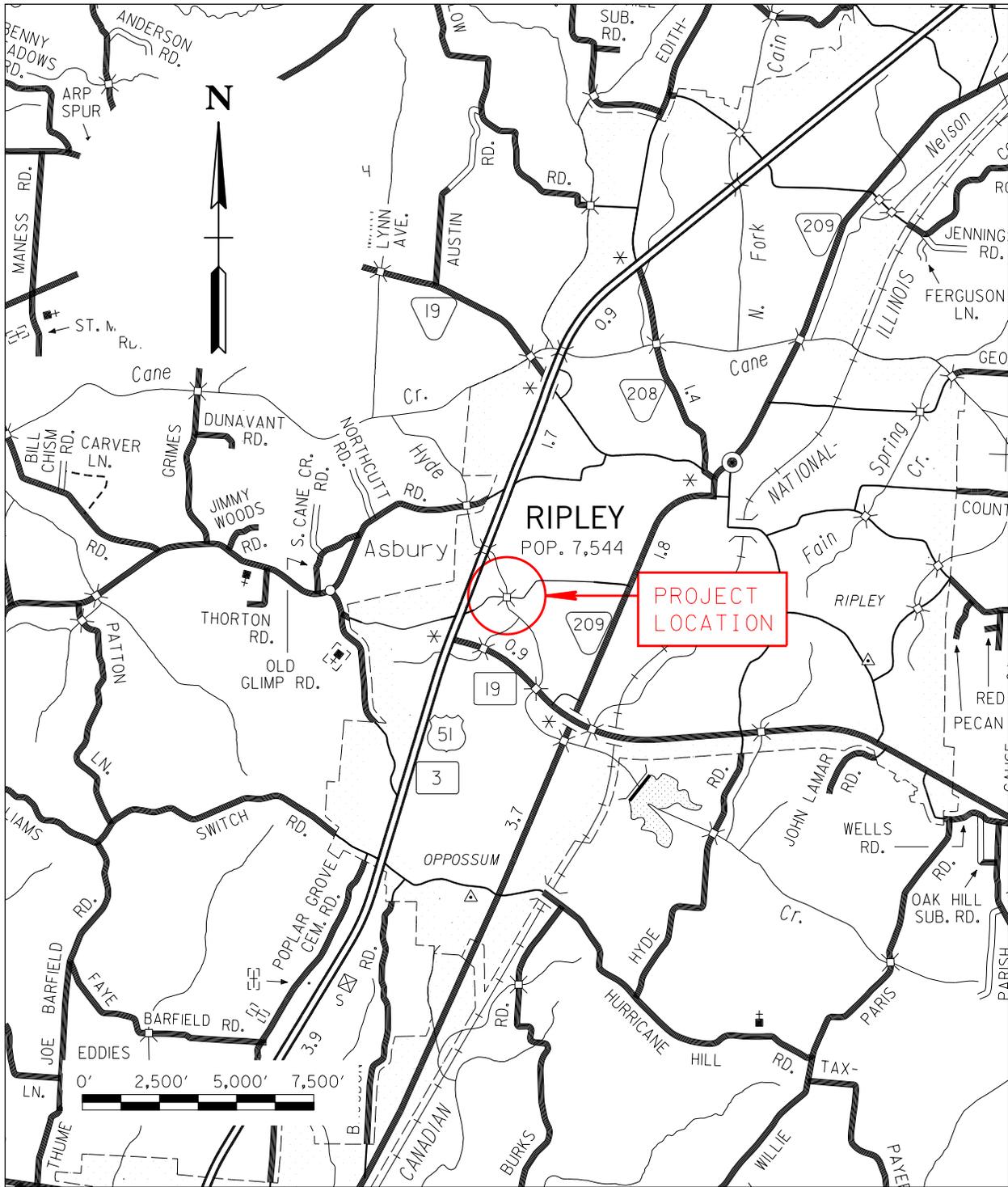
PREPARED BY  
TRANSYSTEMS CORPORATION  
FOR THE  
TENNESSEE DEPARTMENT OF TRANSPORTATION

Approved by [Signature] Date 2/28/13  
Chief of Environment and Planning

Approved by [Signature] Date 3/20/13  
Deputy Commissioner and Chief Engineer

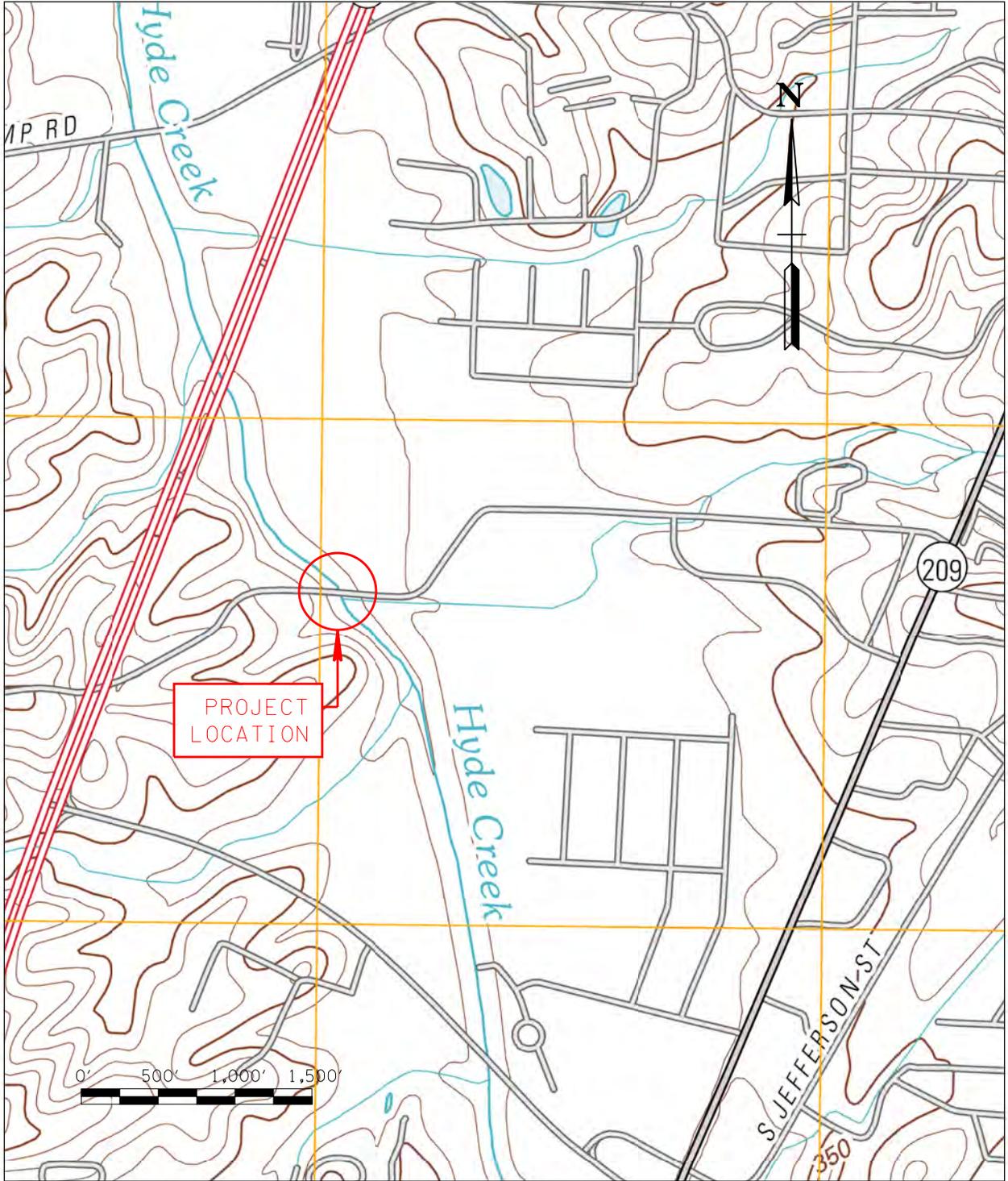
Approved by:	Signature:	Date:
Transportation Director Project Planning Division	<u>[Signature]</u>	1-25-13
Engineering Director Design Division	<u>[Signature]</u>	1-28-13
Engineering Director Structures Division	<u>[Signature]</u>	1-30-13

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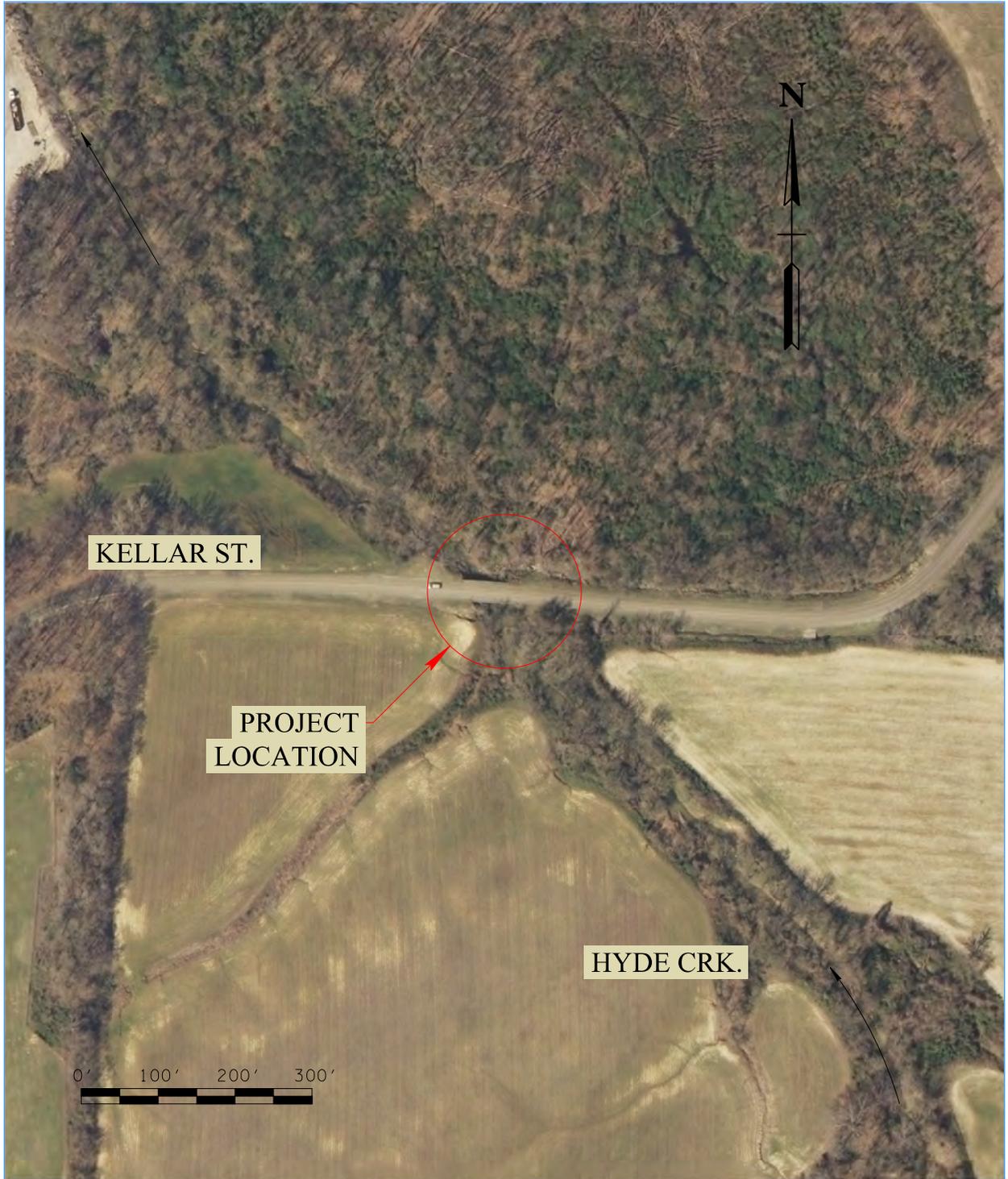
## LOCATION MAP

LOCAL ROUTE OA068 (KELLAR STREET)  
 BRIDGE #490A0680003 OVER HYDE CREEK (L.M. 1.07)  
 RIPLEY, LAUDERDALE COUNTY



## LOCATION MAP

LOCAL ROUTE OA068 (KELLAR STREET)  
BRIDGE #490A0680003 OVER HYDE CREEK (L.M. 1.07)  
RIPLEY, LAUDERDALE COUNTY



## AERIAL MAP

LOCAL ROUTE 0A068 (KELLAR STREET)  
BRIDGE #490A0680003 OVER HYDE CREEK (L.M. 1.07)  
RIPLEY, LAUDERDALE COUNTY

**TRANSPORTATION PLANNING WORKSHEET  
BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS**

County: Lauderdale Route: Local Route 0A068 (Kellar Street) Log Mile: 1.07  
 Feature Crossed: Hyde Creek System: Local  
 Functional Class: Urban Local Bridge ID: 490A0680003

**EXISTING CONDITIONS**

2016 AADT: 970 App. Cross Section: 20' / 28' / 60' No. Lanes: 2  
 Approach Alignment: Tangent Year Built: 1976 Load Limit: 12 tons  
 Width (out to out): 26.5 ft. Sidewalks: Right N/A Left N/A Length: 58 ft.  
 No. Spans: Approach: 1 Main: 1  
 Substructure: Steel I-beam / Timber Vertical Clearance: 14.5 ft Sufficiency Rating: 30.2  
 Other: \_\_\_\_\_

**PROPOSED IMPROVEMENTS**

STANDARDS FROM RD01-TS- 1 (Table 1) Type of Work: Replace  
 Design Year: 2036 Design AADT: 1,160 Terrain Rolling ADL (F): — (R): —  
 Project Length: 400 ft Bridge Length: 67 ft Approach Length: 340 ft  
 Design Speed (MPH): 40 Posted Speed (MPH): — Bike/Ped: —  
 Min. Clear Bridge Width: 20' / 36' / As Req. Bridge Width (C to C): 38 ft No. Lanes: 2  
 Right-of-Way Required: 0 Ac. Tract(s) 0 Structure Type: Conc. I-beam

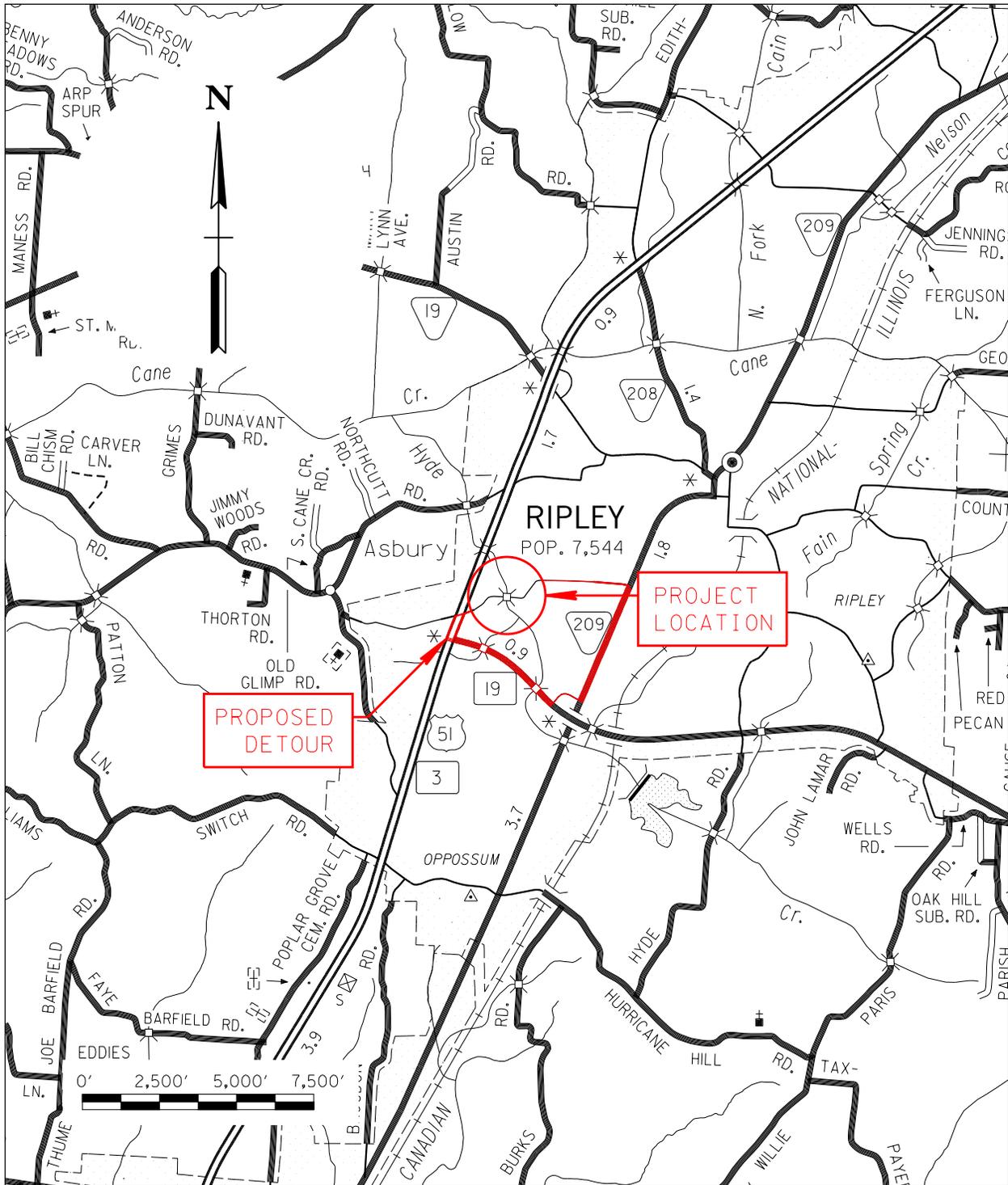
**MAINTENANCE OF TRAFFIC**

Temporary Detour:  Temporary Runaround:  Stage Construct:   
 Alternate Route: 3.1 miles total. From west of bridge: left on SR 3 (US Route 51), left on SR 19,  
left on SR 209. From east of bridge: right on SR 209, right on SR 19, right on SR 3 (US Route 51).  
 Remarks: Close roadway and detour traffic. See Detour Map for detour route. Road closure letter required.

**ESTIMATED COST**

Right-of-Way: \$10,000 Approaches: \$151,900 Structure: \$425,100  
 Preliminary Engineering: \$79,100 Utilities: \$0 Misc./Cont.: \$170,000  
 Mobilization: \$34,300 Total: \$870,400  
 Remarks: Replace existing bridge with single-span, 67-foot structure.

**Field investigation by:** Glen Blankenship (TDOT Region 4 Survey), Mike Gilbert (TDOT Project Planning), Gena Gilliam (TDOT Project Planning), Jane Jones (TDOT Region 4 Design), Jason Moody (TDOT Region 4 Traffic), Patrick Murray (TranSystems Corporation), Lisa Reaney (TDOT Project Planning), Luke Sullivan (TranSystems Corporation), Andy Vaughan (Lauderdale County Highway Department), Fred Vinson (TDOT Region 4 ROW)



## DETOUR MAP

LOCAL ROUTE OA068 (KELLAR STREET)  
 BRIDGE #490A0680003 OVER HYDE CREEK (L.M. 1.07)  
 RIPLEY, LAUDERDALE COUNTY

Route:	Local Route 0A068 (Kellar Street)
Description:	Bridge #490A0680003 over Hyde Creek (LM 1.07)
County:	Lauderdale
Length:	0.08 Miles
Date:	August 31, 2012

<u>DESCRIPTION</u>	<u>LOCAL</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>TOTAL</u>
Right-of-Way	\$ 2,000		\$ 8,000	\$ 10,000
Clearing and Grubbing	\$ 3,000		\$ 12,000	\$ 15,000
Earthwork	\$ 3,000		\$ 12,000	\$ 15,000
Railroad Crossing or Separation	\$ -		\$ -	\$ -
Drainage	\$ -		\$ -	\$ -
Utilities	\$ -		\$ -	\$ -
Structures	\$ 85,020		\$ 340,080	\$ 425,100
Pavement Removal	\$ 2,740		\$ 10,960	\$ 13,700
Paving	\$ 13,660		\$ 54,640	\$ 68,300
Roadway and Pavement Appurtenances	\$ -		\$ -	\$ -
Retaining Walls	\$ -		\$ -	\$ -
Topsoil	\$ -		\$ -	\$ -
Seeding	\$ 60		\$ 240	\$ 300
Sodding	\$ -		\$ -	\$ -
Rip-Rap or Slope Protection	\$ 4,500		\$ 18,000	\$ 22,500
Fencing	\$ -		\$ -	\$ -
Signing	\$ 200		\$ 800	\$ 1,000
Pavement Markings	\$ 60		\$ 240	\$ 300
Lighting	\$ -		\$ -	\$ -
Signalization	\$ -		\$ -	\$ -
Guardrail	\$ 3,160		\$ 12,640	\$ 15,800
Pay Item Quantity Adjustment (15%) <sup>1</sup>	\$ 17,610		\$ 70,400	\$ 88,100
Maintenance of Traffic	\$ -		\$ 10,000	\$ 10,000
Mobilization (5%)	\$ 6,800		\$ 27,500	\$ 34,300
<b>CONSTRUCTION COST (rounded)</b>	<b>\$ 141,800</b>		<b>\$ 577,500</b>	<b>\$ 719,400</b>
Engineering and Contingency (10%)	\$ 14,200		\$ 57,800	\$ 71,900
<b>TOTAL CONSTRUCTION COST (rounded)</b>	<b>\$ 156,000</b>		<b>\$ 635,300</b>	<b>\$ 791,300</b>
Preliminary Engineering (10%)	\$ 15,600		\$ 63,500	\$ 79,100
<b>PROJECT COST (ROUNDED)<sup>2</sup></b>	<b>\$ 171,600</b>		<b>\$ 698,800</b>	<b>\$ 870,400</b>

<sup>1</sup> For estimating purposes pay items are adjusted for fluctuation of cost based on quantity.

<sup>2</sup> For estimating future project costs, a compounded inflation rate of 10% should be applied from the date of this estimate.

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
—	Right-of-Way	LS	1	\$ 10,000.00	\$ 10,000
<b>RIGHT-OF-WAY TOTAL (ROUNDED)</b>					<b>\$ 10,000</b>
201-01	Clearing and Grubbing	LS	1	\$ 15,000.00	\$ 15,000
<b>CLEAR AND GRUBBING TOTAL (ROUNDED)</b>					<b>\$ 15,000</b>
203-03	Borrow Excavation (Unclassified)	CY	1,000	\$ 15.00	\$ 15,000
<b>EARTHWORK TOTAL (ROUNDED)</b>					<b>\$ 15,000</b>
202-03 01	Removal of Asphalt Pavement	SY	912	\$ 15.00	\$ 13,680
<b>PAVEMENT REMOVAL TOTAL (ROUNDED)</b>					<b>\$ 13,700</b>
<b>DRAINAGE TOTAL (ROUNDED)</b>					<b>\$ -</b>
<b>UTILITIES TOTAL (ROUNDED)</b>					<b>\$ -</b>
—	Removal of Existing Structure	SF	1,537	\$ 15.00	\$ 23,055
—	Structure	SF	2,680	\$ 150.00	\$ 402,000
<b>STRUCTURES TOTAL (ROUNDED)</b>					<b>\$ 425,100</b>
<b>RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)</b>					<b>\$ -</b>
303-01	Mineral Aggregate, Type A Base, Grading D	TON	750	\$ 20.00	\$ 15,000
307-01 01	ACS Mix (PG64-22) (BPMB-HM) Grading A	TON	89	\$ 100.00	\$ 8,900
307-01 08	ACS Mix (PG64-22) (BPMB-HM) Grading B-M2	TON	50	\$ 90.00	\$ 4,500
402-01	Bituminous Material for Prime Coat (PC)	TON	0.3	\$ 610.00	\$ 183
402-02	Aggregate for Cover Material (PC)	TON	1.2	\$ 25.00	\$ 30
403-01	Bituminous Material with Tack Coat (TC)	TON	0.2	\$ 635.00	\$ 127
411-01 07	ACS Mix (PG64-22) Grading E Shoulder	TON	34	\$ 85.00	\$ 2,890
411-01.10	ACS Mix (PG64-22) Grading D Roadway	TON	45	\$ 120.00	\$ 5,400
604-03 04	Pavement at Bridge Ends	SY	160	\$ 195.00	\$ 31,200
<b>PAVING TOTAL (ROUNDED)</b>					<b>\$ 68,300</b>
<b>ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)</b>					<b>\$ -</b>
<b>RETAINING WALLS TOTAL (ROUNDED)</b>					<b>\$ -</b>
712-01	Traffic Control	LS	1	\$ 10,000.00	\$ 10,000
<b>MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)</b>					<b>\$ 10,000</b>
203-07	Furnishing and Spreading Topsoil	CY	185	\$ 15.00	\$ 2,775
<b>TOPSOIL TOTAL (ROUNDED)</b>					<b>\$ -</b>
801-01	Seeding (With Mulch)	UNIT	10	\$ 28.00	\$ 280
801-03	Water (Seeding and Sodding)	MG	1	\$ 5.00	\$ 5
<b>SEEDING TOTAL (ROUNDED)</b>					<b>\$ 300</b>
<b>SODDING TOTAL (ROUNDED)</b>					<b>\$ -</b>
—	Signs	LS	1	\$ 1,000	\$ 1,000
<b>SIGNING TOTAL (ROUNDED)</b>					<b>\$ 1,000</b>
716-05 01	Painted Pavement Marking (4" Line)	LM	0 311	\$ 850.00	\$ 264
<b>PAVEMENT MARKINGS TOTAL (ROUNDED)</b>					<b>\$ 300</b>
<b>LIGHTING TOTAL (ROUNDED)</b>					<b>\$ -</b>
<b>SIGNALIZATION TOTAL (ROUNDED)</b>					<b>\$ -</b>
<b>FENCE TOTAL (ROUNDED)</b>					<b>\$ -</b>
705-01 01	Guardrail at Bridge Ends	LF	110	\$ 65.00	\$ 7,150
705-02 02	Single Guardrail (Type 2)	LF	50	\$ 20.00	\$ 1,000
705-04 04	Guardrail Terminal (Type 21)	EA	4	\$ 1,900.00	\$ 7,600
<b>GUARDRAIL TOTAL (ROUNDED)</b>					<b>\$ 15,800</b>
709-05 06	Machined Rip-Rap (Class A-1)	TON	750	\$ 30.00	\$ 22,500
<b>RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)</b>					<b>\$ 22,500</b>
<b>PAY ITEM TOTAL (ROUNDED)</b>					<b>\$ 597,000</b>



TranSystems

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Suite 250  
Brentwood, TN 37027-3273  
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## **MEMORANDUM**

**To:** TDOT Project Planning Office

**From:** TranSystems Corporation

**Date:** August 31, 2012

**Subject:** **Project No. 99109-1453-04, PIN 117275.00**  
Transportation Planning Report (TPR) Bridge Replacement  
Local Route 0A068 (Kellar Street)  
Bridge #490A0680003 over Hyde Creek (L.M. 1.07)  
Ripley, Lauderdale County

A field review for the Kellar Street bridge replacement TPR was held on July 12, 2012. The following table lists attendees present:

<b>Name</b>	<b>Organization</b>	<b>Phone</b>	<b>E-mail</b>
Glen Blankenship	TDOT Region 4 Survey	(731) 935-0137	glen.blankenship@tn.gov
Mike Gilbert	TDOT Project Planning	(615) 741-0772	michael.gilbert@tn.gov
Gena Gilliam	TDOT Project Planning	(615) 253-7692	gena.gilliam@tn.gov
Jane Jones	TDOT Region 4 Design	(731) 935-0140	jane.jones@tn.gov
Jason Moody	TDOT Region 4 Traffic	(731) 935-0183	jason.d.moody@tn.gov
Patrick Murray	TranSystems Corporation	(615) 829-7737	rpmurray@transystems.com
Lisa Reaney	TDOT Project Planning	(615) 741-0967	lisa.reaney@tn.gov
Luke Sullivan	TranSystems Corporation	(615) 829-7734	lrsullivan@transystems.com
Fred Vinson	TDOT Region 4 ROW	(731) 935-0115	fred.vinson@tn.gov

The existing bridge, built in 1976, is a three-span, timber and steel I-beam structure with a length of approximately 58 feet and an out-to-out deck width of approximately 26.5 feet. The bridge features a timber deck, piles, and abutments. The most recent sufficiency rating for this bridge, determined during a June 5, 2012 inspection, is 30.2. Based on regression equations supplied by TDOT and the United States Geological Survey (USGS), the estimated 10-year depth of flow for the Hyde Creek drainage basin is approximately 9.5feet and the 100-year depth of flow is approximately 11.9 feet.

Based on the conditions of the existing bridge, it is recommended that the structure be replaced. The design year for the new structure is 2036; the projected average annual daily traffic (AADT) for Kellar Street at the design year is approximately 1,160 vehicles per day. The roadway is classified as an urban local road and will feature two 10-foot travel lanes at a design speed of 40 miles per hour, per TDOT standard drawing RD01-TS-1. The bridge is located



## TranSystems

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within walking distance of Ripley City Park; in order to accommodate future bike lanes and/or sidewalks, the roadway will also feature 8-foot shoulders.

The proposed structure is a single-span, prestressed concrete I-beam bridge approximately 60 feet in length and with a deck width of approximately 40 feet. No permanent ROW acquisition or utility relocation is necessary. The proposed bridge will be constructed in the same location and have the same vertical and horizontal alignment as the existing structure. The low chord of the proposed bridge provides approximately 1.2 feet of clearance above the 100-year high water elevation. Kellar Street is recommended to be closed at the construction limits during construction of the proposed bridge; a road closure agreement letter is necessary.

The estimated replacement cost for this bridge is approximately \$848,500, including costs for right-of-way, approaches, structure, preliminary engineering, utilities, mobilization, and miscellaneous items.

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

**TENNESSEE DEPARTMENT OF TRANSPORTATION  
PROJECT PLANNING DIVISION**

PROJECT NO.: 99109-1453-04 ROUTE: Kellar Street  
 COUNTY: Lauderdale CITY: Ripley  
 PROJECT PIN NUMBER: \_\_\_\_\_  
 PROJECT DESCRIPTION: Bridge over Hyde Creek on Kellar Street  
L.M. 1.07

**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
970	2016	1,160	190	16	2036	65-35	2	3		

REQUESTED BY: NAME Glenda Tyus DATE 5/10/12  
 DIVISION Project Planning  
 ADDRESS 10th Floor, JKP Bldg  
Nashville, TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 5-14-12  
 TRANSPORTATION MANAGER 1  
 SUITE 1000, JAMES K. POLK BUILDING

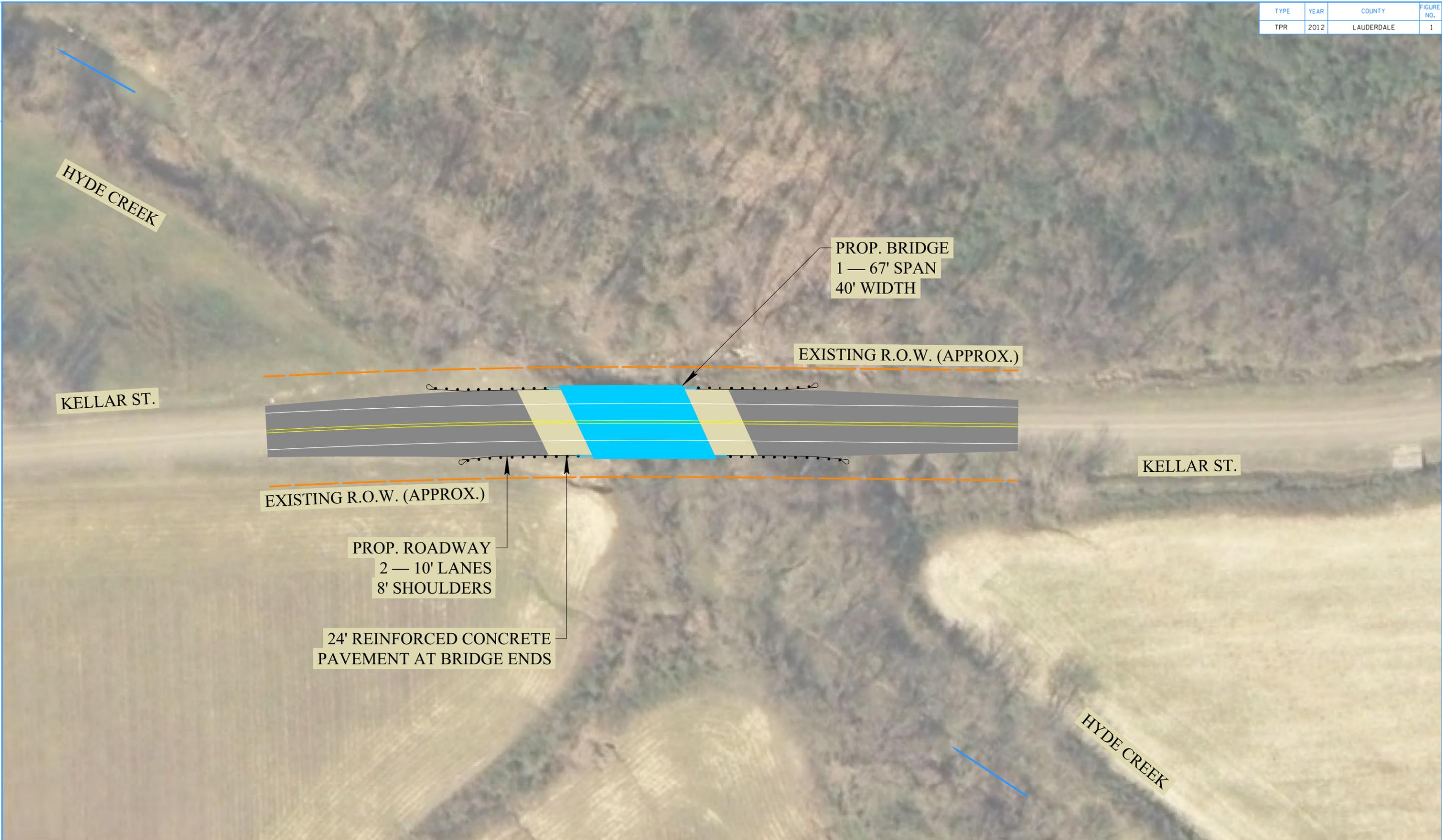
APPROVED BY: DUDLEY DANIEL Dudley Daniel DATE 15 May 12  
 TRANSPORTATION MANAGER 2  
 SUITE 1000, JAMES K. POLK BUILDING

**COMMENTS:**

This Traffic is based on 2005 Bridge Count from ADAM. The Future Traffic Count is based on the Growth Rate from the ADAM Computer Program.

**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.



TRANSPORTATION PLANNING REPORT

LOCAL ROUTE OA068 (KELLAR STREET)  
 BRIDGE #490A0680003 OVER HYDE CREEK (L.M. 1.07)  
 RIPLEY, LAUDERDALE COUNTY



**Bridge TPR Flow Calculations  
for Hydrologic Area 4  
Area > 486 Acres**

County:	Lauderdale	By:	TranSystems Corp.
Bridge ID:	490A0680003	Date:	August 31, 2012
Route:	Local Route 0A068 (Kellar Street)	PIN:	117275.00
Feature Crossed:	Hyde Creek		
Log Mile:	1.07		

**DRAINAGE BASIN**

Measurement from USGS quad =	5,625	ac.
Contributing drainage area (CDA) =	8.79	mi. <sup>2</sup>

**USGS REGRESSION EQUATIONS FOR FLOW**

2-Year Flood Flow Rate = $Q_2 = 436 \times (CDA)^{0.527} =$	1,371	ft. <sup>3</sup> /sec.
5-Year Flood Flow Rate = $Q_5 = 618 \times (CDA)^{0.545} =$	2,020	ft. <sup>3</sup> /sec.
10-Year Flood Flow Rate = $Q_{10} = 735 \times (CDA)^{0.554} =$	2,450	ft. <sup>3</sup> /sec.
25-Year Flood Flow Rate = $Q_{25} = 878 \times (CDA)^{0.564} =$	2,991	ft. <sup>3</sup> /sec.
50-Year Flood Flow Rate = $Q_{50} = 981 \times (CDA)^{0.570} =$	3,386	ft. <sup>3</sup> /sec.
100-Year Flood Flow Rate = $Q_{100} = 1080 \times (CDA)^{0.575} =$	3,769	ft. <sup>3</sup> /sec.

**FLOOD DEPTH OF FLOW EQUATIONS**

10-Year Flood Depth of Flow ( $D_{10}$ ) = $6.98 \times (CDA)^{0.142} =$	9.5	ft.
100-Year Flood Depth of Flow ( $D_{100}$ ) = $9.24 \times (CDA)^{0.116} =$	11.9	ft.

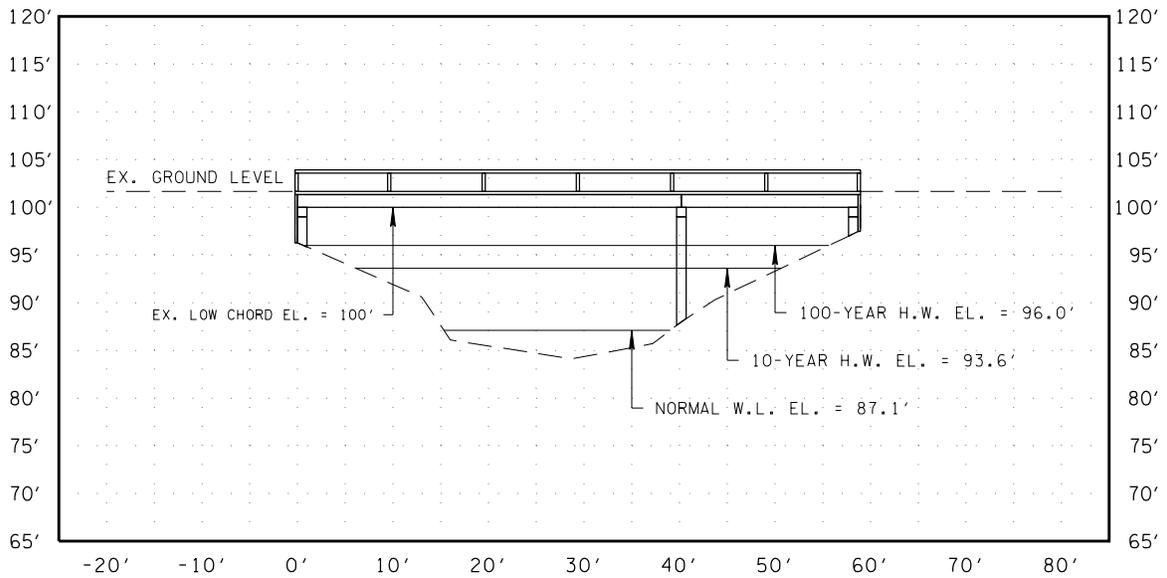
**FLOOD AREAS**

Existing Area Below Low Chord =	587	ft. <sup>2</sup>
Proposed Area Below Low Chord =	511	ft. <sup>2</sup>
Proposed 10-Year Flood Area ( $A_{10}$ ) =	301	ft. <sup>2</sup>
Proposed 100-Year Flood Area ( $A^{100}$ ) =	437	ft. <sup>2</sup>

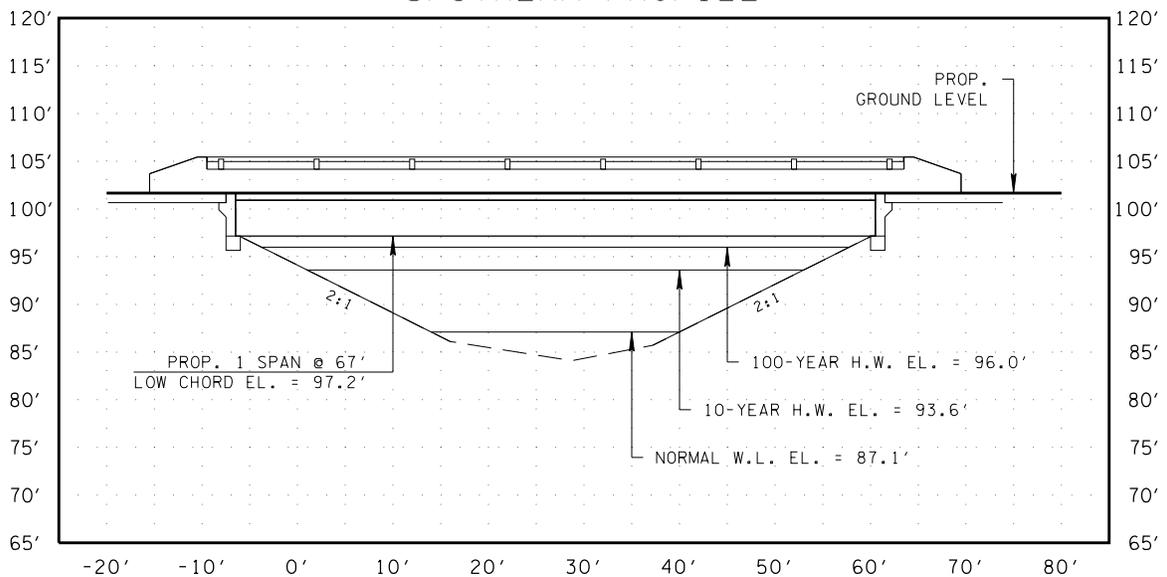
**FLOOD VELOCITIES**

Proposed 10-Year Flood Velocity ( $V_{10}$ ) = $Q_{10} / A_{10} =$	8.2	ft./sec.
Proposed 100-Year Flood Velocity ( $V_{100}$ ) = $Q_{100} / A_{100} =$	8.6	ft./sec.

## EXISTING BRIDGE UPSTREAM PROFILE



## PROPOSED BRIDGE UPSTREAM PROFILE



## BRIDGE PROFILE

LOCAL ROUTE 0A068 (KELLAR STREET)  
BRIDGE #490A0680003 OVER HYDE CREEK (L.M. 1.07)  
RIPLEY, LAUDERDALE COUNTY



View upstream from bridge.



Right view of upstream floodplain.



View downstream from bridge.



Right view of downstream floodplain.



Left view of downstream floodplain.



View forwards on route from bridge.



View backwards on route from bridge.



View of bridge inlet.



View of bridge outlet.



View of bridge outlet.