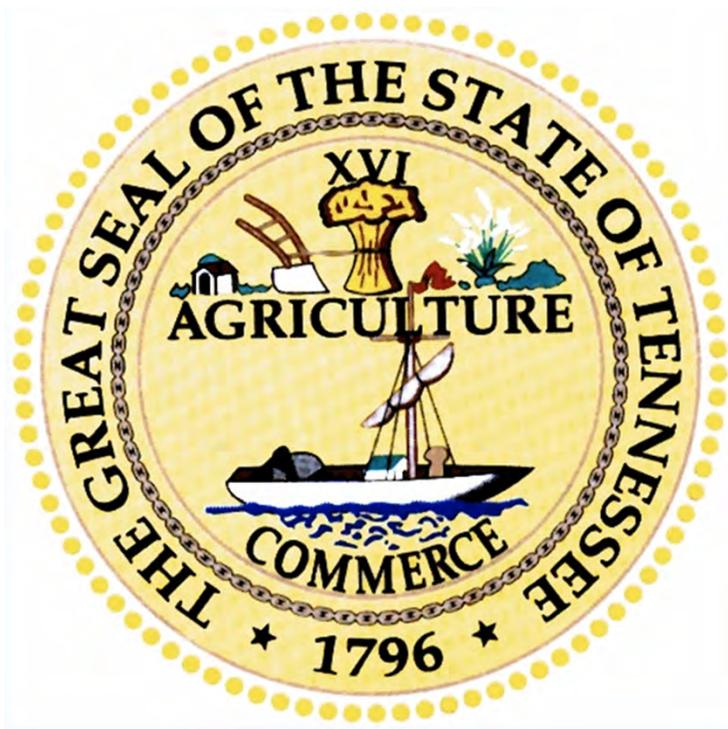


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TENNESSEE

DEPARTMENT OF TRANSPORTATION



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ORIGINAL SUBMITTAL
DATE: 07-31-14
REVISION DATES:

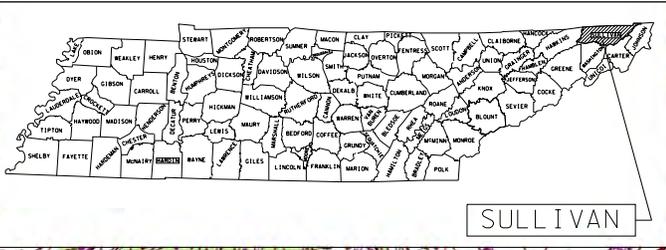
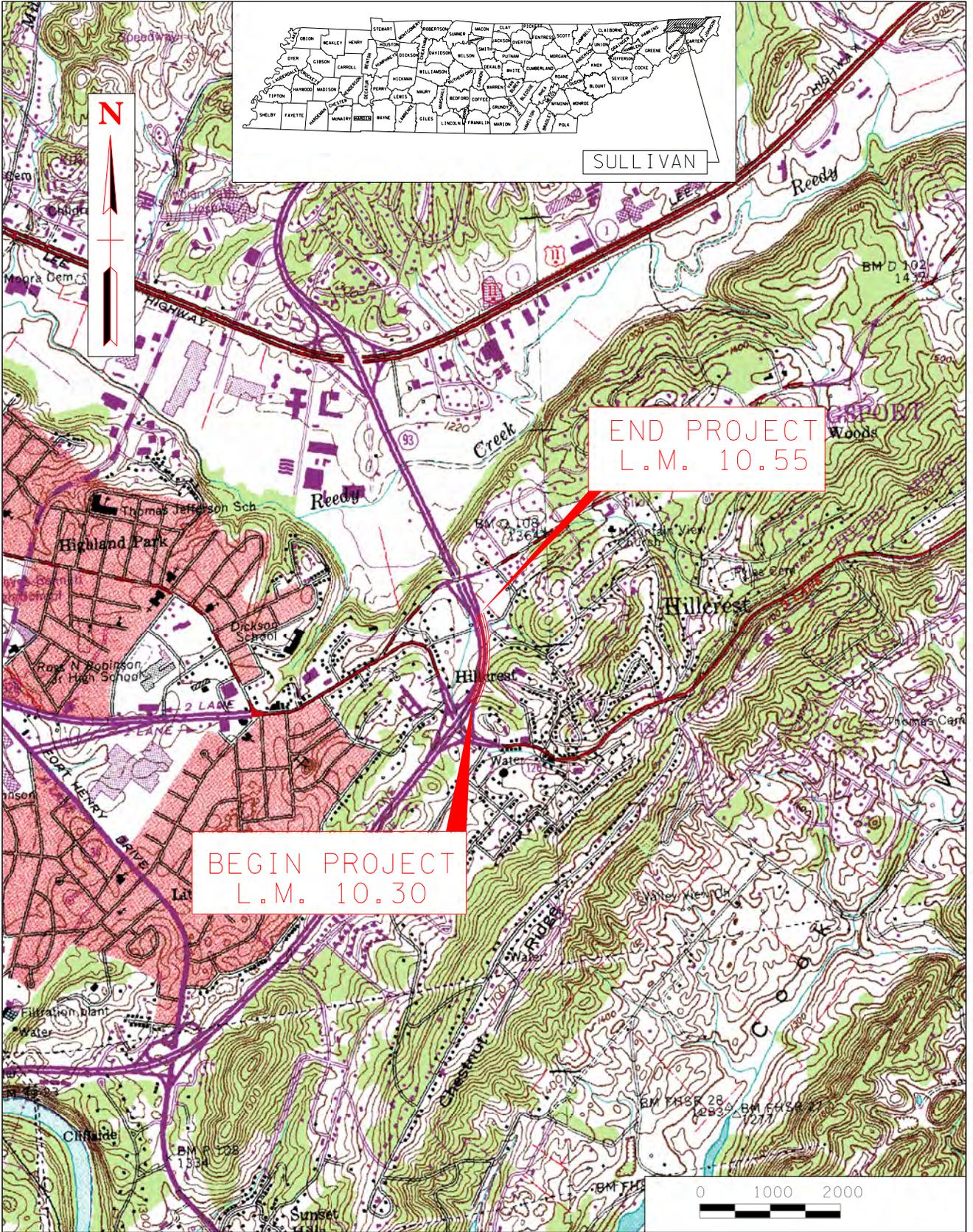
ROAD SAFETY AUDIT REPORT

***S.R. 93 (Valley Home Rd.)
From Ramp from S.R. 126 to Ramp to Orebank Rd.
(Log Mile 10.30 to Log Mile 10.55),
Sullivan County
PIN# 120060.00***

***PREPARED BY GRESHAM, SMITH AND PARTNERS
for the
Strategic Transportation Investments Division***

Recommended by:	Signature	DATE
TRANSPORTATION DIRECTOR STRATEGIC TRANSPORTATION INVESTMENTS DIVISION		

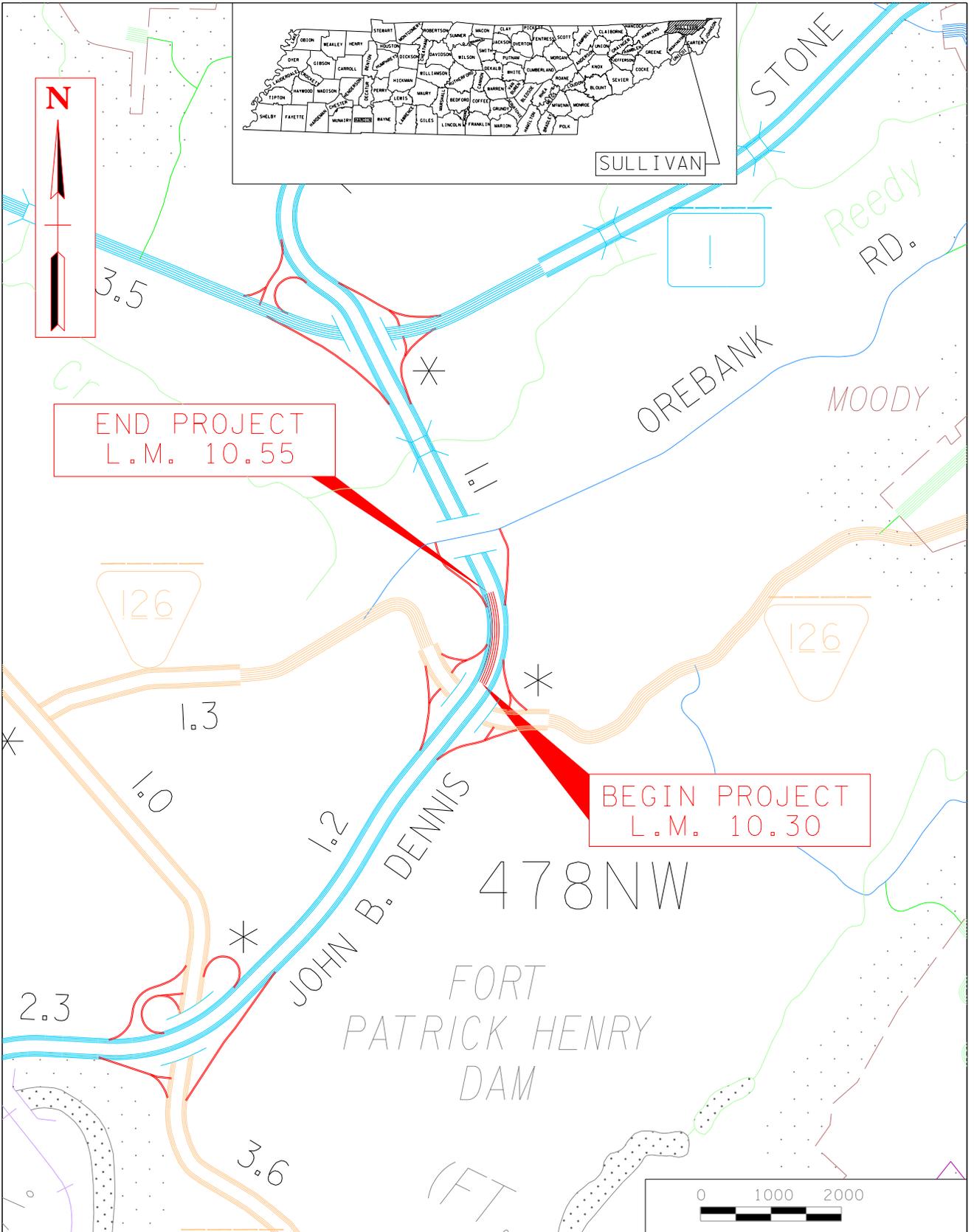
This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.



VICINITY MAP

S.R. 93
L.M. 10.30 TO L.M. 10.55
SULLIVAN COUNTY

DRAWN BY: CT	CHECKED BY: SS
S.R. 93 PIN 120060.00	
SCALE: 1" = 2000'	DATE: 06-09-14



END PROJECT
L.M. 10.55

BEGIN PROJECT
L.M. 10.30



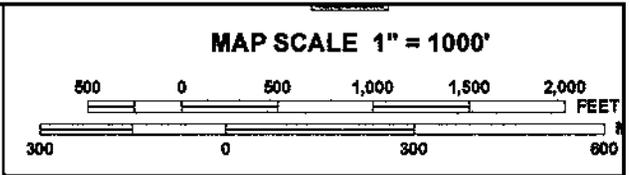
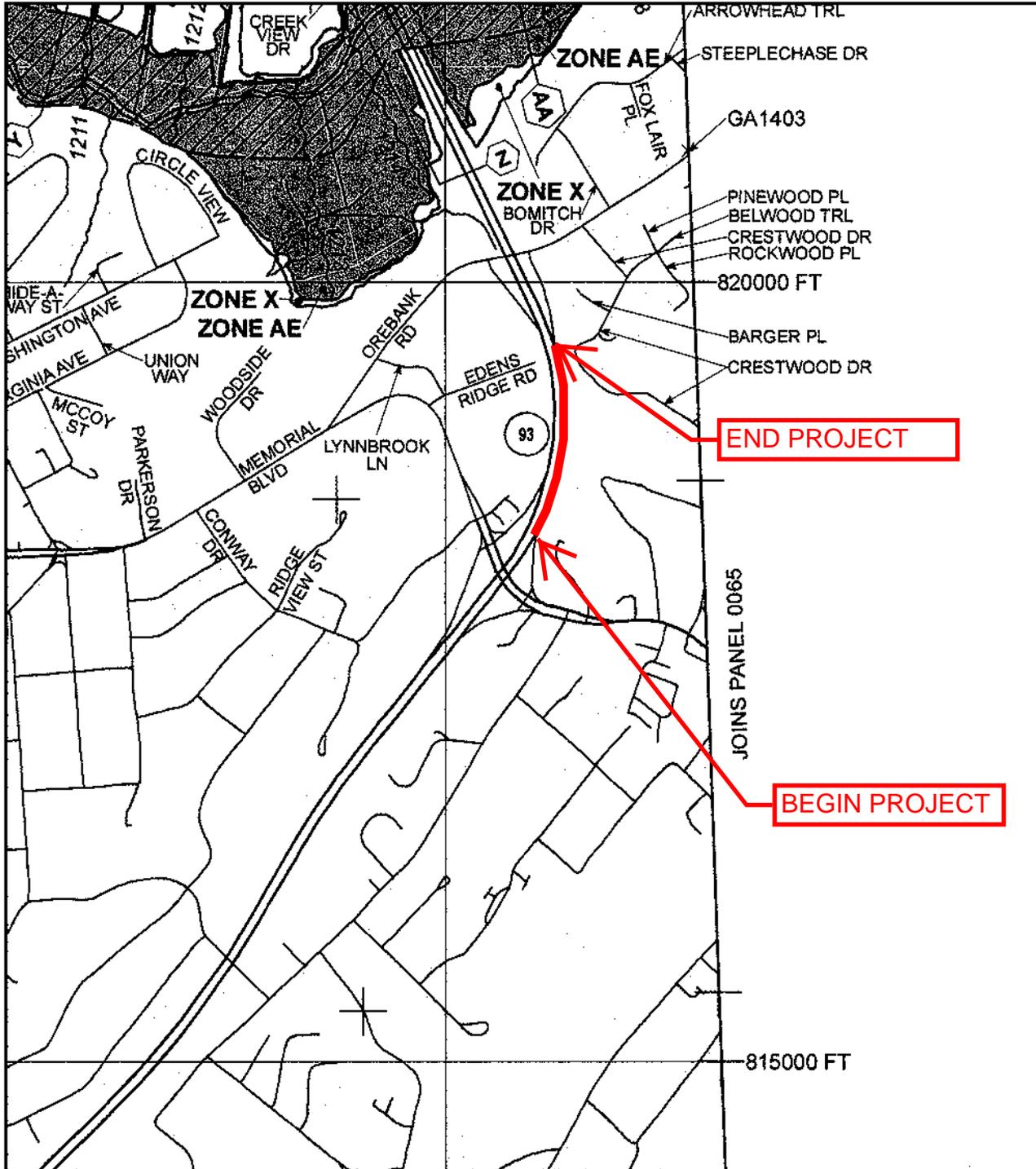
LOCATION MAP

S.R. 93
 L.M. 10.30 TO L.M. 10.55
 SULLIVAN COUNTY



DRAWN BY: CT	CHECKED BY: SS
S.R. 93 PIN 120060.00	
SCALE: 1" = 2000'	DATE: 06-09-14

DRAFT



PANEL 0045D

FIRM
FLOOD INSURANCE RATE MAP
SULLIVAN COUNTY,
TENNESSEE
AND INCORPORATED AREAS

PANEL 45 OF 375
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KINGSPORT, CITY OF	470184	0045	D
SULLIVAN COUNTY	470181	0045	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
47163C0045D
EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Sullivan County
S.R. 93
L.M. 10.30-L.M. 10.55
PIN: 120060.00

PROJECT DESCRIPTION AND BACKGROUND

A study of State Route (S.R.) 93 was requested by First Tennessee Regional Planning Organization as a candidate safety project. After a complete review of this location, it was determined that the candidate project did not qualify for Hazard Elimination Safety Program (HESP) funding, because it did not meet the fatal and incapacitating crash criteria. Therefore, this location is under consideration for other safety funding.

The section of S.R. 93 from log mile (L.M.) 10.30 to L.M. 10.55 is a four (4) lane divided expressway, with twelve (12) foot travel lanes, thirty (30) foot grass median, and eight (8) foot paved shoulders. S.R. 93 has a severe crash rate of 0.117, which exceeds the statewide average severe crash rate of 0.026 for a urban four lane divided freeway/expressway.

There were a total of ten (10) crashes that occurred along S.R. 93 between 2009 to 2011, with three (3) property damage crashes, six (6) non-incapacitating injury crashes, one (1) incapacitating injury crash involving one (1) incapacitating injury, and zero (0) fatal crashes.

ROAD SAFETY AUDIT (RSA) TEAM MEMBERS

NAME	ORG.	PHONE #	EMAIL
Jeremy Bowlan	TDOT - STI	615-532-7123	jeremy.bowlan@tn.gov
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Nathan Vatter	TDOT – Reg. 1	865-594-2456	nathan.vatter@tn.gov
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Troy Ebbert	Kingsport MPO	423-224-2670	troyebbert@kingsporttn.gov
Bill Albright	Kingsport MPO	423-224-2677	billalbright@KingsportTN.gov
Chris Craig	First TN RPO	423-722-5091	ccraig@ftdd.org
Patrick Fiveash	GS&P	865-521-6777	patrick_fiveash@qspnet.com
Shap Stiles	GS&P	865-521-6777	shap_stiles@qspnet.com

INFORMATION USED IN REVIEW

- Crash Reports
- Field Review Comments
- TRIMS Crash Data (2009-2011)
- TRIMS Geometric Report
- Aerial Photographs
- Crash Summary
- County Highway Maps
- TRIMS Route Feature Report
- TRIMS Road Segment Report

Sullivan County
S.R. 93
L.M. 10.30-L.M. 10.55
PIN: 120060.00

PRE-BRIEF MEETING SUMMARY

A Pre-brief meeting was held at TDOT Headquarters at 1:00 P.M. on June 16, 2014. A summary of the topics and information discussed at the meeting is provided below:

1. Discussed Crash history and types of crashes.
 - Majority are rear-ends (60%).
 - Crashes were clustered around the interchange ramps.
2. AADT is 31,124 vehicles per day
3. The interchange at Orebank Road is not a full access interchange and it was noted people will use the exit at S.R. 126 as a turnaround.
4. On-ramp from S.R. 126 to S.R. 93 has an acceleration lane of 250 feet.
5. Discussed construction of an auxiliary lane between the on-ramp at S.R. 126 to the off-ramp at Orebank Road.
6. The section of S.R. 93 was investigated by TDOT and found to be a good candidate for cable barrier rail within the project corridor.

OBSERVATIONS

An onsite field review was held at 2:00 P.M. on June 19, 2014. The following discussions/observations were noted:

- Roadway pavement was in good condition.
- Pavement markings and snowplowable pavement markers were in good condition.
- A field review of the horizontal alignment along the corridor was performed. A traditional ball-bank indicator was used to analyze each curve. All curves within the limits of the project met the posted speed limit.
- The section of the project is along a horizontal curve and project team agreed installation of cable barrier along the median is a good candidate. Limits should cover the gap in the guardrail between the interchange at S.R. 126 (L.M. 10.30) and Orebank Road (L.M. 10.64).

The RSAR recommended safety improvements are depicted on the aerial layout sheets included with this report.

The total estimated cost of the improvements listed in the report is \$31,200.00. No right-of-way acquisition is required. A maintenance agreement is not required. A local match is not required. These improvements will be let to contract.

Sullivan County
S.R. 93
L.M. 10.30-L.M. 10.55
PIN: 120060.00

SITE PHOTOS – 06/19/2014



(L.M. 10.30) S.R. 93 looking north at beginning of project.



(L.M. 10.41) S.R. 93 looking north along horizontal curve.

Sullivan County
S.R. 93
L.M. 10.30-L.M. 10.55
PIN: 120060.00



(L.M. 10.55) S.R. 93 looking north at off-ramp at end of project.



(L.M. 10.55) S.R. 93 looking south at on-ramp at end of project.

Sullivan County
S.R. 93
L.M. 10.30-L.M. 10.55
PIN: 120060.00



(L.M. 10.41) S.R. 93 looking south along horizontal curve.



(L.M. 10.30) S.R. 93 looking south at off-ramp at beginning of project.

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RSAR NO PLANS COST ESTIMATE	
Route:	State Route 93
Description:	Ramp from S.R. 126 Memorial Blvd. (L.M. 10.30)
	to Ramp to Orebank Road (4792)(L.M. 10.55)
County:	Sullivan
Length:	0.25 Mile
Date:	July 31, 2014

<u>DESCRIPTION</u>	<u>LOCAL</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>TOTAL</u>
Right-of-Way	\$ -	\$ -	\$ -	\$ -
Clearing and Grubbing	\$ -	\$ -	\$ -	\$ -
Earthwork	\$ -	\$ -	\$ -	\$ -
Railroad Crossing or Separation	\$ -	\$ -	\$ -	\$ -
Drainage	\$ -	\$ -	\$ -	\$ -
Utilities	\$ -	\$ -	\$ -	\$ -
Structures	\$ -	\$ -	\$ -	\$ -
Pavement Removal	\$ -	\$ -	\$ -	\$ -
Paving	\$ -	\$ -	\$ -	\$ -
Roadway and Pavement Appurtenances	\$ -	\$ -	\$ -	\$ -
Retaining Walls	\$ -	\$ -	\$ -	\$ -
Topsoil	\$ -	\$ -	\$ -	\$ -
Seeding	\$ -	\$ -	\$ -	\$ -
Sodding	\$ -	\$ -	\$ -	\$ -
Rip-Rap or Slope Protection	\$ -	\$ -	\$ -	\$ -
Fencing	\$ -	\$ -	\$ -	\$ -
Signing ¹			\$ -	\$ -
Pavement Markings ¹			\$ -	\$ -
Lighting ¹			\$ -	\$ -
Signalization ¹			\$ -	\$ -
Guardrail ¹			\$ 24,700	\$ 24,700
Pay Item Quantity Adjustment (15%) ²	\$ -		\$ -	\$ -
Maintenance of Traffic		\$ -	\$ 5,000	\$ 5,000
Mobilization (5%)		\$ -	\$ 1,500	\$ 1,500
CONSTRUCTION COST (rounded)		\$ -	\$ 31,200	\$ 31,200
Engineering and Contingency (10%)			\$ -	\$ -
TOTAL CONSTRUCTION COST (rounded)		\$ -	\$ 31,200	\$ 31,200
Preliminary Engineering (5%)		\$ -	\$ -	\$ -
PROJECT COST ³(rounded)	\$ -	\$ -	\$ 31,200	\$ 31,200

¹ This safety item is 100% eligible and does not require a 10% funding match by the local agency.

² For estimating purposes pay items are adjusted for fluxuation of cost based on quantity.

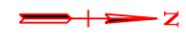
³ For estimating future project costs, a compounded inflation rate of 7% should be applied from the date of this estimate.

TYPE	YEAR	COUNTY	FIGURE NO.
RSAR	2014	SULLIVAN	1

TENNESSEE D.O.T.
STRATEGIC TRANSPORTATION
INVESTMENTS DIVISION
FILE NO.

GUIDANCE

1. Install 1770 feet of longitudinal cable barrier with two (2) longitudinal cable barrier end terminals on the west side of S.R. 93 from approximately L.M. 10.30 to L.M. 10.64.



ROAD SAFETY AUDIT REVIEW

S.R. 93
L.M. 10.30 TO L.M. 10.55
SULLIVAN COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION
INVESTMENTS DIVISION

FIGURE 1
S.R. 93
L.M. 10.30 TO
L.M. 10.55

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APPENDIX

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RSAR - SR-93 FROM L.M. 10.30 TO L.M. 10.55

2009-2011

ALL CRASHES

PIN: 120060.00

SULLIVAN

	LOG MILE	TYPE OF CRASH				CRASH DESCRIPTION	TIME	WEATHER
		FATAL	INCAP. INJ.	NON-INCAP. INJ.	PROP. DAMAGE			
1	10.300			X		REAR-END; NB ON S.R.93 AT RAMP; FOLLOWING IMPROPERLY; 2 VEH	DAY	CLEAR
2	10.300				X	REAR-END; NB ON S.R.93 AT RAMP; FOLLOWING IMPROPERLY; 2 VEH	DAY	CLEAR
3	10.300				X	REAR-END; NB ON S.R.93; FOLLOWING IMPROPERLY; 2 VEH	DAWN	CLEAR
4	*10.300		X			REAR-END; NB ON S.R.93; FOLLOWING IMPROPERLY; 3 VEH	DAY	CLEAR
5	10.300			X		REAR-END; NB ON S.R.93; FOLLOWING IMPROPERLY; 2 VEH	DAY	RAIN
6	10.321			X		SB ON S.R. 93; LANE DEPARTURE GUARDRAIL; 1 VEH	DAY	CLEAR
7	10.321			X		OTHER (GUARDRAIL 1 VEH)	NIGHT	CLEAR
8	10.359			X		REAR-END; NB ON S.R. 93; NO CONTRIBUTING ACTIONS; 3 VEH	DAY	CLEAR
9	10.550				X	SAME DIR. SIDESWIPE; NB ON S.R. 93; 2 VEH	DAY	CLEAR
10	10.550			X		ANGLE; NB ON S.R. 93; NO CONTRIBUTING ACTIONS; 2 VEH	DAY	CLEAR
		0	1	6	3			

* CRASH REPORT AVAILABLE

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RSAR – S.R. 93 – SULLIVAN COUNTY CRASH REPORT SUMMARY FATAL AND INCAPACITATING INJURY CRASHES

L.M. 10.300 (Incapacitating Injury): A vehicle traveling northbound on S.R. 93 slowed for a merging vehicle when it was rear-ended by a vehicle and forced into another lane hitting another vehicle. The crash occurred at 3:37 p.m. during daylight with no adverse weather conditions.

DRAFT

COUNTY = SULLIVAN Date: 7/23/2014
 Route = SR 93 (John B. Dennis Highway)
 Location = FROM RAMP FROM SR 126 MEMORIAL BLVD.
 TO RAMP TO OREBANK ROAD(4792)
 Highway Type = STATE URBAN HIGHWAY
 FUNCTIONAL CLASS= 4 Lane Divided Urban Freeway or Expressway
 DATA YEARS = 2009 - 2011
 ADT YEARS USED= Adam Stations 288 (2009-2011 AVERAGE)
 COMMENTS = 50 MPH SPEED LIMIT
 ANALYZED BY = GS&P

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
10.300	10.550	0.25	31,124	7,781
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0

0.25 31,124 7,781

INTERSECTION

Log Mile = 0

Leg	Traffic AADT
North	0
East	0
South	0
West	0

Entering AADT = 0

Adam Stations 288 (2009-2011 Average)

State Urban Highway
2009 - 2011

	Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	10	0	1	1	6
No. of Years	3				
SW avg. rate	0.981	0.005	0.021	0.026	0.239
08-10 S/W Rates					
Exposure (E)	8.5202				
Crash Rate (A)	1.174	0.000	0.117	0.117	0.704
Critical Rate (C)	1.829				
Severity Index (SI)	0.8000				
Actual Rate/SW Average	1.20	0.00	5.59	4.51	2.95
Ratio of A/C	0.64				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

TYPE	YEAR	COUNTY	FIGURE NO.
RSAR	2014	SULLIVAN	1

TENNESSEE D.O.T.
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION
FILE NO.



CRASH LEGEND

- VEHICLE PATH (DIRECTION OF TRAVEL)
- BACKING VEHICLE
- REAR END
- HEAD ON
- SIDE SWIPE (SAME DIRECTION)
- SIDE SWIPE (OPPOSITE DIRECTION)
- RIGHT ANGLE
- LEFT TURN
- OVERTURN
- OUT OF CONTROL
- PEDESTRIAN/BICYCLE/PEDACYCLE/MOTORCYCLE (SPECIFY ROAD USER)
- HEAVY TRUCK/BUS
- NON-INVOLVED VEHICLE
- FATAL CRASH
- INCAPACITATING INJURY
- NON-INCAPACITATING INJURY
- PROPERTY DAMAGE
- PARKED VEHICLE
- OBJECT (SPECIFY)

TIME: A=AM P=PM

CONDITION CODES LEGEND

X - X - X - # ← NUMBER OF VEHICLES

WEATHER	ROAD SURFACE	LIGHTING
C = CLEAR	D = DRY	D = DAYLIGHT
R = RAIN	W = WET	DKN = DARK NOT LIGHTED
CLD = CLOUDY	I = ICY	DKL = DARK LIGHTED
F = FOG	O = OTHER	DN = DAWN
S = SNOW	U = UNKNOWN	DS = DUSK
U = UNKNOWN		U = UNKNOWN



ROAD SAFETY AUDIT REVIEW

S.R. 93
L.M. 10.30 TO L.M. 10.55
SULLIVAN COUNTY

LEGEND

- FATALITY
- INCAPACITATING INJURY
- NON-INCAPACITATING INJURY
- PROPERTY DAMAGE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

FIGURE 1
S.R. 93
L.M. 10.30 TO
L.M. 10.55

6/11/2014 2:08:36 PM K:\29251534\Crash Figure_SR93_01.dgn

DRAFT

Sullivan County

SR 93
Ramp to S.R. 126 Memorial Blvd.
to Ramp to Orebank Rd. (4792)

Pay Item Breakdown

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
RIGHT-OF-WAY TOTAL (ROUNDED)					\$ -
CLEAR AND GRUBBING TOTAL (ROUNDED)					\$ -
EARTHWORK TOTAL (ROUNDED)					\$ -
PAVEMENT REMOVAL TOTAL (ROUNDED)					\$ -
DRAINAGE TOTAL (ROUNDED)					\$ -
UTILITIES TOTAL (ROUNDED)					\$ -
STRUCTURES TOTAL (ROUNDED)					\$ -
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)					\$ -
PAVING TOTAL (ROUNDED)					\$ -
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)					\$ -
RETAINING WALLS TOTAL (ROUNDED)					\$ -
712-01	Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)					\$ 5,000
TOPSOIL TOTAL (ROUNDED)					\$ -
SEEDING TOTAL (ROUNDED)					\$ -
SODDING TOTAL (ROUNDED)					\$ -
SIGNING TOTAL (ROUNDED)					\$ -
PAVEMENT MARKINGS TOTAL (ROUNDED)					\$ -
LIGHTING TOTAL (ROUNDED)					\$ -
SIGNALIZATION TOTAL (ROUNDED)					\$ -
FENCE TOTAL (ROUNDED)					\$ -
705-04.10	Longitudinal Cable Barrier	LF	1,770	\$ 10.33	\$ 18,284
705-04.11	Cable Barrier Terminal	EA	2	\$ 3,160.00	\$ 6,320
GUARDRAIL TOTAL (ROUNDED)					\$ 24,700
RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)					\$ -