

## **Executive Summary**

### **TPR- SR 81 from I-26 to SR 107- Unicoi and Washington Counties**

#### **Purpose of the TPR**

This report was initiated in response to a request to the Tennessee Department of Transportation (TDOT) from the First Tennessee Rural Planning Organization (RPO).

#### **Purpose and Need**

Safety- In all of Segment B and the narrow portion part of Segment A the actual crash rate exceeds the statewide average and critical crash rates.

System Linkage- Future improvements to SR 81 are part of a long-term desire to provide a better connection between I-26 and I-81 via SR 81 through the heart of Washington County.

Level of Service- SR 81 will operate at LOS D in the long term future, indicating marginal conditions.

Geometric Deficiencies- For all 2.25 miles of Segment A and 1.73 miles of Segment B SR 81 has two (2) ten (10) foot travel lanes and one (1) foot shoulders on both sides. The narrow lanes and lack of shoulders are contributing factors to the above average number reported crashes along SR 81 in this particular segment.

#### **Improvement Options Considered**

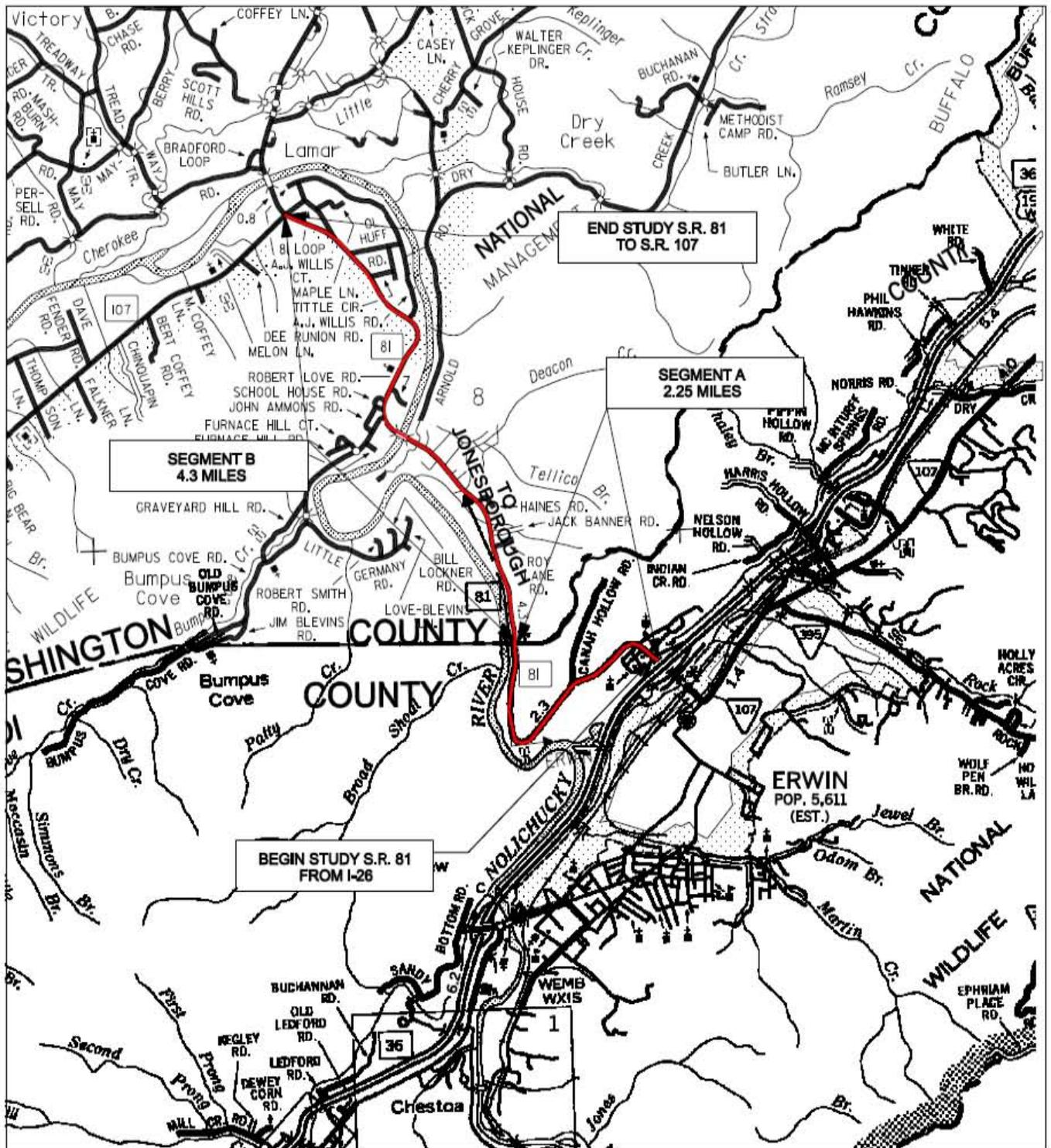
Option A: No-Build Option- Provides no improvement to safety or traffic operation along SR 81, and therefore does not satisfy the primary purpose and need of this study.

Option B: Widen Along Existing Alignment- The preferred option would include widening SR 81 from Log Mile 0.00 in Erwin at I-26 to Log Mile 2.25 at the Unicoi-Washington County line, and from Log Mile 0.00 at the Unicoi-Washington County line to approximately Log Mile 1.84 just before the Nolichucky River bridge. The recommended typical section is two (2) twelve (12) foot lanes and ten (10) foot shoulders. This recommendation would essentially match the existing SR 81 typical section in Washington County from Log Mile 1.84 to the end of the study at Log Mile 4.30. As a part of the build option, left turn lanes should be constructed on SR 81 in the already improved sections at Bumpus Cove Road and Ol' Huff Road. *Estimated Cost: \$44,100,000.*

Option C: Widen a Section of SR 81 Along Existing Alignment: Widen SR 81 to two (2) twelve (12) foot lanes and ten (10) foot shoulders from Log Mile 0.96 in Unicoi County to Log Mile 0.63 in Washington County. *Estimated Cost: \$24,817,000.*

Option D: Spot Improvements- Locations A-C are described below:

- Location A: Construct a southbound left turn lane on SR 81 at Ol' Huff Road and realign Ol' Hull Road so that it intersects SR 81 at a 90 degree angle. *Estimated Cost: \$837,000*
- Location B: Construct a northbound left turn lane on SR 81 at Bumpus Cove Road. *Estimated Cost: \$209,000*
- Location C: Construct a southbound left turn lane on SR 81 at the Cherokee National Forest entrance at Arnold Road. Striping taper for turn lanes will be carried onto the bridge over the Nolichucky River. However, the structure will be restriped to maintain shoulder widths. *Estimated cost: \$201,000*



**STUDY LOCATION MAP**  
**STATE ROUTE 81**  
**FROM INTERSTATE 26**  
**TO STATE ROUTE 107**  
**UNICOI AND WASHINGTON COUNTIES**



**FIGURE 2**

# TRANSPORTATION PLANNING REPORT

*State Route 81  
FROM INTERSTATE 26  
TO STATE ROUTE 107  
Unicoi and Washington Counties  
PIN. 112470.00*



*PREPARED BY  
WILBUR SMITH ASSOCIATES  
FOR THE  
FIRST TENNESSEE RURAL PLANNING ORGANIZATION  
AND  
THE TENNESSEE DEPARTMENT OF TRANSPORTATION  
PROJECT PLANNING DIVISION*

Approved by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING		6-21-10
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION		6-21-10
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION		6/21/10

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

## TABLE OF CONTENTS

1.0	PURPOSE OF THE TPR .....	1
2.0	HISTORY AND BACKGROUND .....	1
3.0	COMMUNITY PROFILE .....	2
4.0	PURPOSE AND NEED FOR IMPROVEMENT .....	4
4.1	Safety.....	4
4.2	System Linkage .....	5
4.3	Level of Service Analyses.....	5
4.4	Geometric Deficiencies.....	7
5.0	EXISTING CONDITIONS .....	7
5.1	Description of Study Area (Geometrics) .....	7
5.1.1	Segment A.....	7
5.1.2	Segment B.....	8
5.2	Average Annual Daily Traffic .....	8
5.3	Restrictions and Constraints.....	8
5.4	Major Structures .....	9
5.5	Multi-modal Facilities .....	9
5.5.1	Greenways .....	9
5.5.2	Railroad .....	10
5.5.3	Public Transportation.....	11
5.5.4	Air Transportation.....	11
5.5.5	Pedestrian /Bicycle Facilities.....	11
6.0	FIELD REVIEW INFORMATION.....	12
7.0	OPTIONS FOR IMPROVEMENT (SPOT AND CORRIDOR) .....	12
7.1	Corridor Improvements .....	12
7.1.1	Option A -No-Build Option.....	12
7.1.2	Option B- Widen Along Existing Alignment .....	13
7.1.3	Option C- Widen a Portion of SR 81 Along Existing Alignment.....	14
7.1.4	Option D- Spot Improvements.....	14
7.2	Projected Levels of Service .....	21
7.3	Spot Improvements.....	21
7.4	Bicycle and Pedestrians .....	21
7.5	Discussion of Structural Impacts (Bridges, Railroad Crossings, Rock Cuts)....	21
7.6	Context Sensitive Solutions .....	21
7.7	Disposition of Existing Route .....	21
8.0	EARLY ENVIRONMENTAL SCREENING .....	22
8.1	1,000 ft ESS Corridor.....	22
8.2	2,000 ft EES Corridor.....	22
8.3	4,000 ft EES Corridor.....	23
8.4	10,000 ft EES Corridor.....	23
8.5	Air Quality .....	23
9.0	ASSESSMENT OF CORRIDOR OPTIONS .....	24
9.1	TDOTs Seven Guiding Principles .....	24
9.2	Guiding Principle 1: Preserve and Manage the Transportation System .....	24
9.3	Guiding Principle 2: Move a Growing, Diverse, and Active Population .....	24
9.4	Guiding Principle 3: Support the State's Economy .....	24
9.5	Guiding Principle 4: Maximize Safety and Security .....	24
9.6	Guiding Principle 5: Build Partnerships for Livable Communities.....	25
9.7	Guiding Principle 6: Promote Stewardship of the Environment .....	25
9.8	Guiding Principle 7: Promote Financial Responsibility .....	25
10.0	COST ESTIMATE .....	25

10.1	Option A- No Build .....	25
10.2	Option B- Widen Existing Alignment .....	25
10.3	Option C- Widen Existing Alignment .....	26
10.4	Option D- Spot Improvements.....	26
11.0	SUMMARY .....	26

**LIST OF FIGURES**

Figure 1	Vicinity Map.....	iii
Figure 2	Location Map.....	iv
Figure 3	Area Topography.....	v
Figure 4a	Build Option C.....	15
Figure 4b	Build Option C.....	16
Figure 4c	Build Option C.....	17
Figure 5	Build Option D-Location A.....	18
Figure 6	Build Option D-Location B.....	19
Figure 7	Build Option D-Location C.....	20

**LIST OF TABLES**

Table 1	Top 10 Manufacturers (Unicoi County).....	3
Table 2	Crash Summary.....	4
Table 3	LOS Criteria for Two-lane Highways.....	6
Table 4	SR 81 Level of Service (LOS) Summary.....	7
Table 5	Cost Estimate for Option D- Spot Improvements.....	26

**CONTENTS OF APPENDIX VOLUME I**

- Purpose and Need Statement
- Field Review
- Crash Locations
- EES Scoring
- Data Tables (Segment A and Segment B)
- Preliminary Cost Estimates
- Design Criteria
- Concept Layout
- Typical Section
- Preliminary Cost Estimates for Spot Improvements
  - SR81 at Arnold Road (Location A)
  - SR81 at Bumpus Cove Road (Location B)
  - SR81 at Ol' Huff Road (Location C)
  - SR81 (Location D)
- Data Log

**CONTENTS OF APPENDIX VOLUME II**

- Traffic Schematics
- Crash Data
- Utility coordination
- Bridge Inspection reports
- Trims Data
- TDOT Bicycle Map
- Demographics

# VICINITY MAP

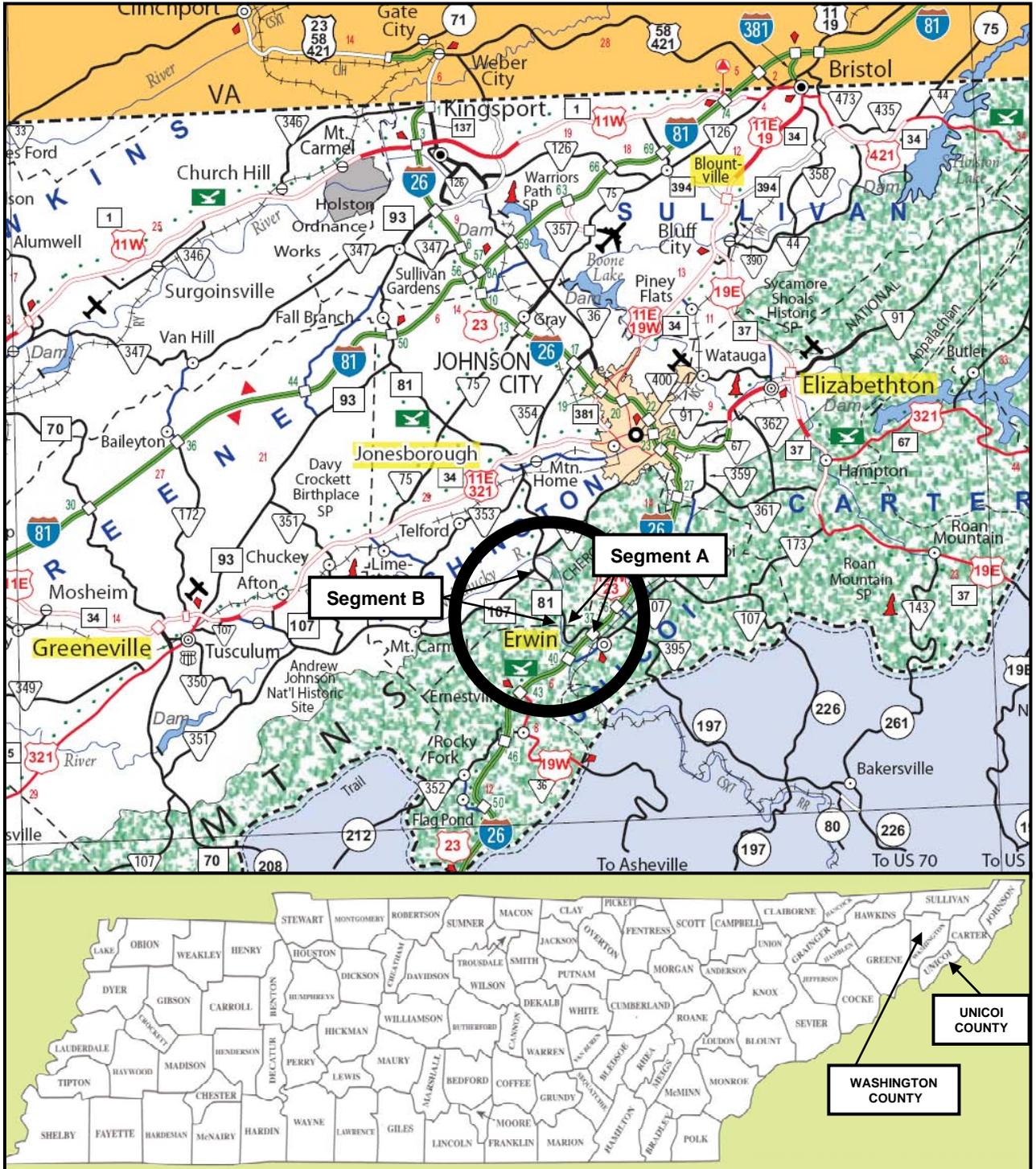
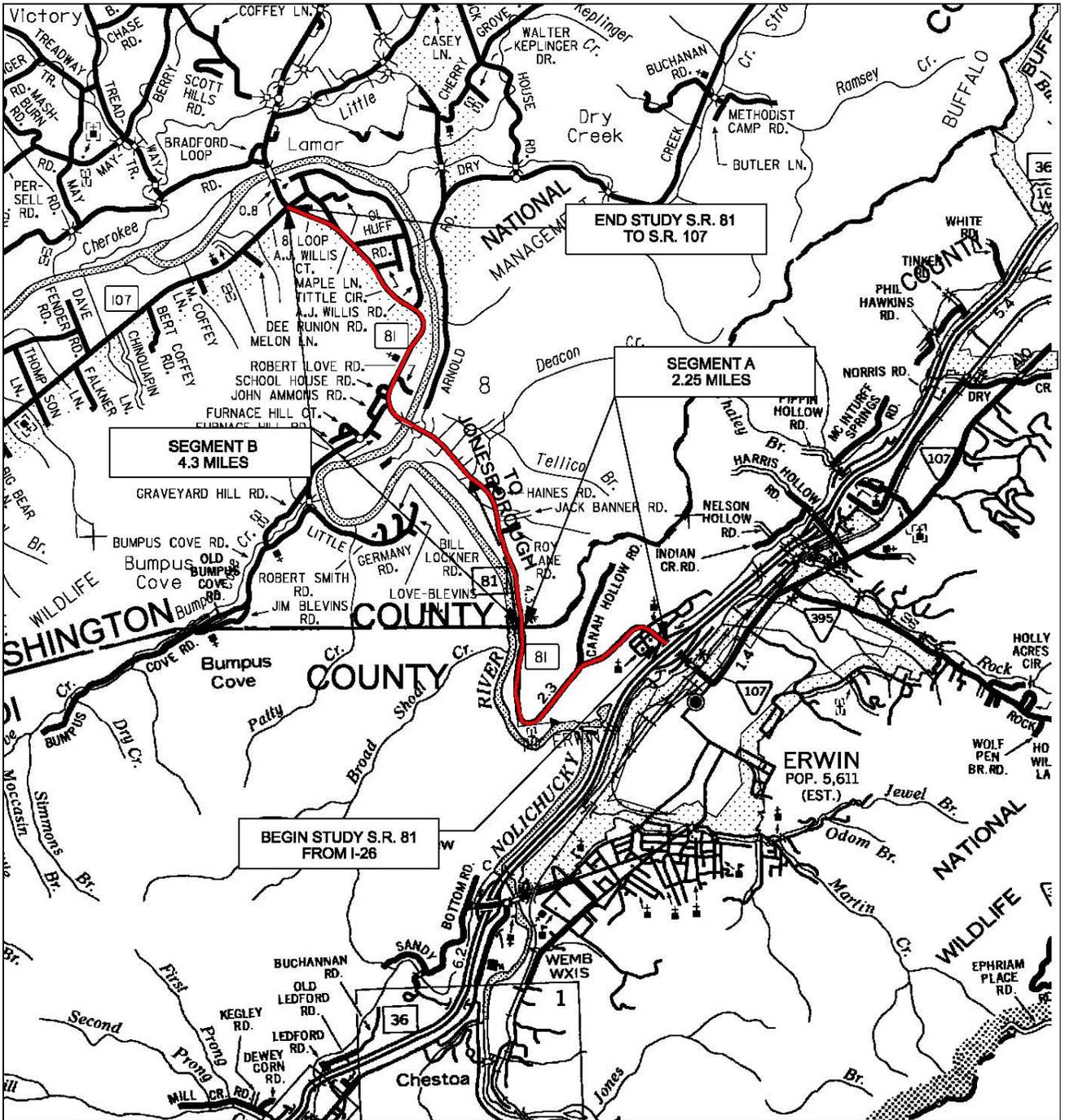


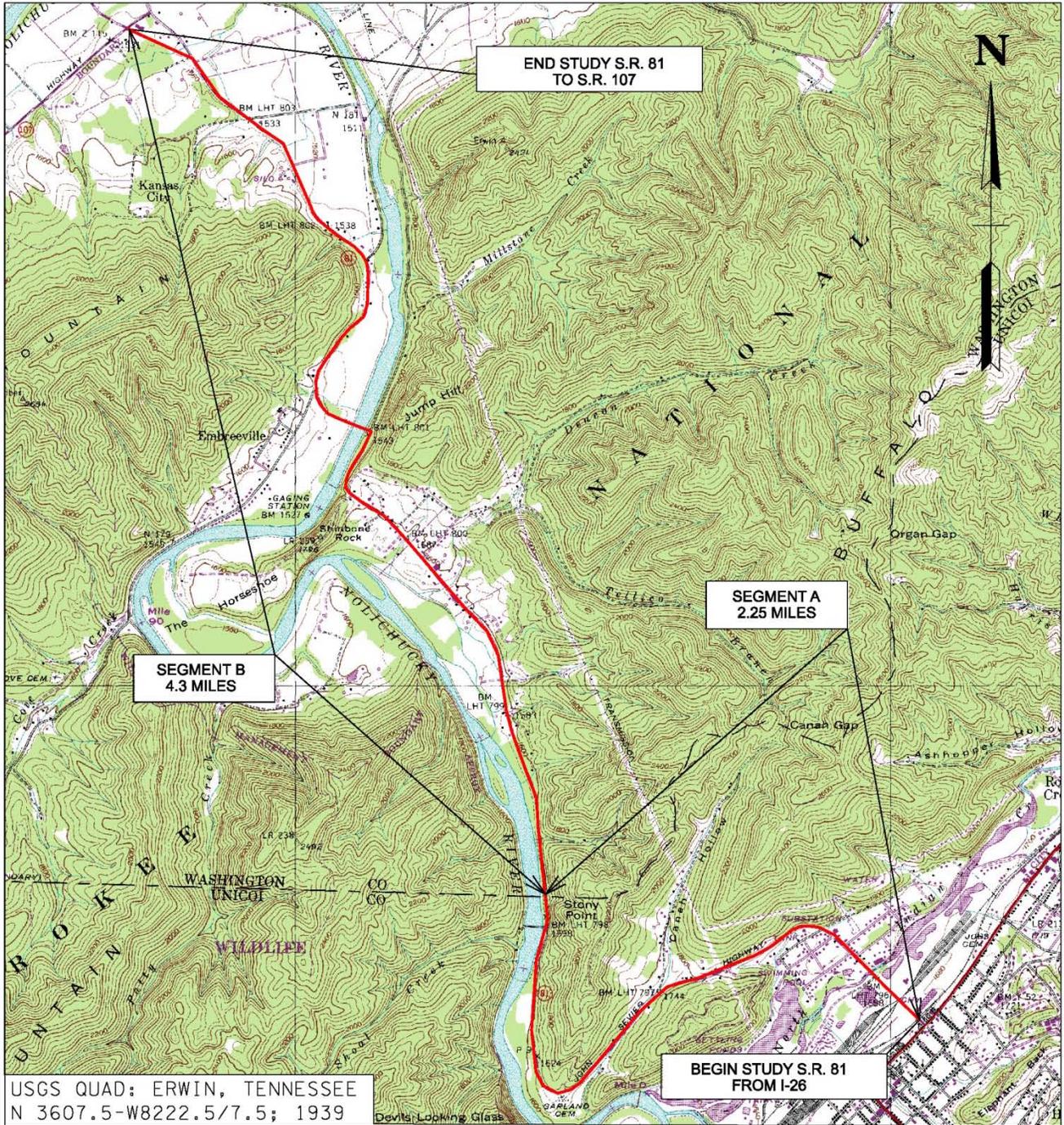
FIGURE 1



**STUDY LOCATION MAP  
STATE ROUTE 81  
FROM INTERSTATE 26  
TO STATE ROUTE 107  
UNICOI AND WASHINGTON COUNTIES**

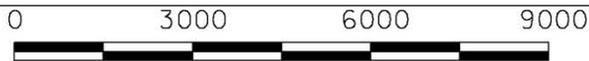


**FIGURE 2**



**STUDY AREA TOPOGRAPHY  
STATE ROUTE 81  
FROM INTERSTATE 26  
TO STATE ROUTE 107  
UNICOI AND WASHINGTON COUNTIES**

USGS Quad: Erwin, TN  
N3607.5-W8222.5/7.5;1939



**FIGURE 3**

## **1.0 PURPOSE OF THE TPR**

This Transportation Planning Report (TPR) was prepared to identify the purpose and evaluate the need for construction of roadway improvements to the SR 81 corridor from I-26 in Unicoi County to SR 107 in Washington County. Its primary purpose is to help establish the immediate and long term needs for improving SR 81, and to examine viable options for meeting those long term needs. This report was initiated in response to a request to the Tennessee Department of Transportation (TDOT) from the First Tennessee Rural Planning Organization (RPO).

This study briefly considered some new alignment for SR 81 but it was quickly discounted because of financial cost and environmental considerations. The more viable options include widening along the existing alignment for all segments that need improvements, widening the sections where crashes are the most prevalent, or making spot improvements.

No transportation studies for this section of SR 81 have been undertaken for the past several years. Consequently, SR 81 has not been evaluated for the increased level of truck traffic reported by local officials, particularly heavy trucks that frequent this route.

## **2.0 HISTORY AND BACKGROUND**

Figure 1 illustrates the regional setting. An Area Location Map is shown in Figure 2. A Location Map (USGS Map, Erwin, Tennessee Quadrangle) depicting the area topography is shown in Figure 3.

TDOT's Long Range Planning Division conducted a Needs Assessment Study for SR 81 from I-26 to SR 107 in Unicoi and Washington Counties. SR 81 provides connectivity from rural Washington County to I-26. In recent years, local officials in Jonesborough, Unicoi County, and Washington Counties have reported a significant increase in truck traffic on SR 81 since I-26 was completed to Asheville, North Carolina in 2003.

Before and after vehicle classification counts on SR 81 are not available. In fact, vehicle classification counts on SR 81 were available for only one (1) year apiece at only two (2) locations. At TDOT Count Station 237 on SR 81, a 2.7 percent truck value was reported in 2006. At TDOT Count Station 282 on SR 81 (Log Mile 6.93), a 3.2 percent truck value was measured in 2007. Both of these were recorded after I-26 was open in 2003. Based on these values and the current Average Annual Daily Traffic (AADT), it is expected that approximately 150 trucks per day utilize SR 81 in the study area.

Since SR 81 borders the Nolichucky River and the Cherokee National Forest, members of the First Tennessee Rural Planning Organization expressed a desire for preservation of the area's environmental resources (natural and cultural) which could be affected in the event of crashes involving heavy trucks with hazardous material. In fact, Nes Levotch, Washington County Emergency Management Authority (EMA), reported during the field review that his department has responded to several hazardous material

crashes on SR 81 near the Nolichucky River that required closing the road and cleaning up the material before it reached the river.

Overall, this study will evaluate how to improve the safety of all users of SR 81 and potentially maximize economic development opportunities in the area.

### **3.0 COMMUNITY PROFILE**

This proposed roadway improvement along SR 81 begins in Erwin, Tennessee and includes portions of Unicoi and Washington Counties. Erwin is the county seat for Unicoi County. Located at the foot of the Appalachian Mountains in Northeastern Tennessee, Erwin is approximately fifteen (15) miles south of Johnson City and one-hundred and twenty (120) miles east of Knoxville.

As of the 2000 Census, the Town of Erwin had a total of 5,601 residents. Also known as the “Valley Beautiful” the town was named in honor of David J.N. Ervin in 1879. However, a mistake by postal officials, which was never corrected, recorded the name as Erwin.

Unicoi County, named for the Cherokee Native American word “Unicoi” meaning “white,” “hazy,” “fog-like,” or “fog draped” covers approximately one-hundred and eight-six (186) square-miles of upper East Tennessee (50 percent is owned by the US Government, as the Cherokee National Forest). Presently, more than twenty-eight (28) miles of I-26 (formerly US Route 23) winds through the county. This scenic highway features two overlook/rest areas and two wildlife crossing structures to allow bears and other native wildlife to move safely across the corridor.

The Appalachian Trail (AT), America’s best known footpath, was constructed in the 1920s and 1930s. The path extends two-thousand one-hundred and seventy-five (2,175) miles from Katahdin, Maine to Springer Mountain, Georgia with a protected two-hundred and fifty thousand (250,000) acre greenway. Over fifty (50) miles of the Appalachian Trail passes through Unicoi County.

The mountain areas of Unicoi County provide ideal climate and growing conditions for many varieties of produce including apples from several family owned apple orchards. The annual Unicoi County Apple Festival (listed as one of the Southeast Tourism Society’s Top Twenty Events of the Southeast) gives tribute and celebration of the area’s important local crop. During the first weekend of October, the annual festival celebrates the unique heritage, foods, crafts and culture of the Southern Appalachian region.

Manufacturing and goods producing comprise ten (10) percent of the county’s employment, and twenty (20) percent of the county’s workforce is employed in the service industry. Another one-third of the county’s employment is in nonagricultural industry.

In 2008, the average unemployment rate for Unicoi County was 7.2 percent. Some jobs have been lost due to closure of local industries; however the number of available jobs has increased due to industry expansions and/or location of new industry.

Historically, Erwin’s strong economic base was due in part to the railroad industry. It was the location of the national headquarters for Clinchfield Railroad and Southern Potteries. The Clinchfield Railroad is now CSX Railroad.

Unicoi County has a strong industrial base. Presently, Riverview Industrial Park is the only industrial park in Unicoi County and contains most of the new industry. Located on the south end of Erwin, the industrial park is near capacity. The county is challenged with the lack of available land suitable for industrial development. Unicoi County continues to focus on the retention and expansion of current facilities. Their goal is to obtain funding for an additional rail spur into the Industrial Park and the widening of Fender Lane with hopes to provide new industry in the area. Most of the land uses along SR 81 are primarily agricultural (log yard), cattle farming and residential. Table 1 is a listing of major local industries.

**TABLE 1  
TOP 10 MANUFACTURERS (UNICOI COUNTY)**

<b>Manufacturer</b>	<b>Employment</b>
Nuclear Fuel Services, Inc.	315
Specialty Tires of America, Inc.	164
Nn Inc. Ball and Roller Division	150
Vesuvius USA Corporation	125
Impact Plastics Inc.	97
AB Plastics, Inc.	85
Duncan Mechanical Inc.	40
Polypipe Inc.	33
Farnor Enterprises Inc.	25
Tennessee Abrasives, Inc.	23

Source: Tennessee Department of Economic and Community Development (2009)-[www.unicoicountytn.gov](http://www.unicoicountytn.gov)

Unicoi County provides a variety of opportunities for recreation, exploration and adventure. Cherokee Adventures, Incorporated, has provided residents of and visitors to the area whitewater rafting adventures on the Nolichucky River since 1979. Recreationalists enjoy mountain biking through the Cherokee National Forest or hiking along the Appalachian Trail.

Unicoi County is part of the Johnson City Metropolitan Statistical Area (MSA), which is a component of the Johnson City–Kingsport–Bristol, TN-VA Combined Statistical Area – commonly known as the “Tri-Cities” region. As of the 2000 Census, the population of Unicoi County consisted of 17,667 residents. There are approximately 7,800 households in Unicoi County. The median household income is \$34,796.

Unicoi County is serviced by the First Tennessee Rural Development District (FTDD) which carries on general and comprehensive planning and development activities for local governments. Located in Johnson City, Tennessee, the FTDD office also serves seven other counties in Northeast Tennessee including Carter, Greene, Hancock, Hawkins, Johnson, Sullivan and Washington counties.

Northeast Tennessee is within a day's drive of half the US population. Unicoi and Washington Counties have interstate access via I-26 and I-81 and primary highway access via US 11E, 11W, 19, 19E, 19W, 23, 321, 421 and numerous State Routes including 36, 81, and 107.

## 4.0 PURPOSE AND NEED FOR IMPROVEMENT

### 4.1 Safety

Any improvements to SR 81 may provide safer conditions for truck traffic and residential traffic that are currently co-users of this route. Improvements made to this route may alleviate many of the safety concerns expressed by residents along SR 81.

Utilizing the Annual Average Daily Traffic (AADT) acquired from TDOTs Tennessee Roadway Information Management System (TRIMS) database for years 2006 through 2008, a crash rate (crashes per one-million (1,000,000) vehicle miles) was determined for the existing route. The Tennessee statewide average crash rate for two (2) lane rural roads similar to SR 81 is 1.65. As shown in Table 2, there were a total of seventy-four (74) crashes along the entire study corridor within the recorded three (3) year period, thirty-seven (37) in Segment A and thirty-seven (37) in Segment B. One (1) fatality was recorded along Segment B at Log Mile 1.84 that involved a head on collision. There were seven (7) incapacitating injuries (two (2) on Segment A and five (5) on Segment B) recorded within the study area during the three (3) year period analyzed. The twenty (20) foot wide portions of Segment A and B have the most crashes (56 in 3.98 miles) and a higher crash rate than the twenty-four (24) foot wide portions of SR 81.

**TABLE 2  
CRASH SUMMARY**

SECTION	BEGIN LOG MILE	END LOG MILE	LENGTH	WIDTH OF RD & SHOULDER (FT)	CRASHES 2006-2008	CRASH RATE		
						State Avg	Critical	Actual
Section A	0.00	2.25	2.25	20 & 1	56 (1)	1.652	2.323	2.628
Section B	0.00	1.73	1.73	20 & 1	56 (1)	1.652	2.323	2.628
Section B	1.73	4.30	2.57	24 & 7-10	18	1.652	2.519	1.381
TOTAL			6.55		74	1.652	2.177	2.153

(1) 56 crashes combined for Section A LM 0.00 to 2.25 and Section B LM 0.00 to 1.73. Thus, there were 56 reported crashes in the 20 foot wide sections

In the appendix of this report is an illustration showing the approximate location of all seventy-four (74) reported crashes (2006-2008) on SR 81 between I-26 and SR 107. The purpose of depicting the crash data in this fashion is to identify spots that may require more attention. Three (3) or more crashes were reported in the following locations:

- Segment A, 20 foot section; approximate LM 0.60- 3 crashes
- Segment A, 20 foot section, approximate LM 1.00- 6 crashes
- Segment A, 20 foot section, approximate LM 1.50- 4 crashes
- Segment A, 20 foot section, approximate LM 2.20- 5 crashes
- Segment B, 24 foot section, approximate LM 3.69- 4 crashes

- Segment B, 24 foot section, approximate LM 4.30- 4 crashes

The appendix also includes an illustration depicting the type of crash by location. The crash type distribution is as follows:

<u>TYPE</u>	<u>NUMBER</u>	<u>PERCENT</u>
Lane Departures/Striking Fixed Objects	32	43%
Crash with Deer or other Animal	10	14%
Head on	4	5%
Rear End	12	16%
Overtaken Vehicle	3	4%
Sideswipe	6	9%
Other	7	10%
TOTAL	74	100%

Rain, snow, or fog was recorded in only fifteen (15) percent of the reported crashes. Only eight (8) percent of the crashes occurred after 10:00 PM and only twelve (12) percent after 9:00 PM.

The analysis of the crash data suggest that most incidences probably occur due to horizontal curvature and SR 81 being narrow with minimal shoulders from I-26 at Erwin up to the Nolichucky River bridge.

#### **4.2 System Linkage**

SR 81 is a minor arterial route between I-26 and I-81. In addition to the other routes including SR 107 and US 11E/321 (SR 34), this section of SR 81 provides a major connection from rural Washington County and the Tusculum, Greeneville and Mosheim areas in Greene County. An increase in truck and vehicular traffic has been reported by local officials along SR 81 for access onto I-26. Future improvements to SR 81 are part of a long-term desire to provide a better connection between I-26 and I- 81 via SR 81 through the heart of Washington County.

#### **4.3 Level of Service Analyses**

The TDOT Long Range Planning Division prepared an initial needs assessment for the 6.55 mile corridor from I-26 in Unicoi County to SR 107 in Washington County). The study revealed that SR 81 will be at capacity within the next three (3) years. The First Tennessee RPOs ranking of project priorities has identified this project as a top priority as a result of its near term capacity deficiency within the twenty-five (25) year planning horizon. Subsequently, a TPR document was recommended for both Segment A and Segment B (according to the Preliminary Purpose and Need Statement).

The existing (2009), base year (2014), and design year (2034) “Level of Service” (LOS) for the SR 81 corridor was analyzed for this report. A “Level of Service” (LOS) index was used to gauge the operational performance of Segment A and B. For two (2) lane highways, the LOS is a qualitative measure that describes traffic conditions related to speeds, ability to pass slower vehicles, and being caught within a platoon of vehicles. There are six levels ranging from “A” to “F” with “F” being the worst. Each level represents a range of operating conditions. Table 3 shows the criteria related to each

LOS as described in the **2000 Highway Capacity Manual (HCM), Special Report 209 published by the Transportation Research Board (TRB).**

**TABLE 3  
LOS CRITERIA FOR TWO-LANE HIGHWAYS**

LOS	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonable free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is still high.
C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.
F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceed the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Source: 2000 Highway Capacity Manual, Special 209, Transportation Research Board (TRB)

A LOS analysis was performed on three (3) sections of SR 81 including:

- Segment A, from Log Mile 0.00 to Log Mile 2.25, which has 2 @10 foot travel lanes and a 1 foot shoulder in both directions;
- Segment B from Log Mile 0.00 to Log Mile 1.73, which has 2 @10 foot travel lanes and 1 foot shoulders in both directions; and,
- Segment B from LM 1.73 to LM 4.30, which has 2 @ 12 foot travel lanes and shoulder widths ranging from 7 to 10 feet in both directions.

Highway Capacity Software (HCS) was used to conduct the LOS analysis. Design Hour Volumes (DHV) were estimated by applying a twelve (12) percent K-factor to the AADT's. And then a 60/40 directional distribution was used. SR 81 is considered to be a Class I Highway as defined by the HCM because of its link to the federal interstate system and the critical role it plays in Washington and Unicoi Counties. The terrain on SR 81 is rolling and there are no passing zones available except in the general vicinity of Log Mile 1.00 to 1.50 in Unicoi County.

Table 4 presents the results of the LOS analysis. Presently, Segment A operates at a LOS D and LOS D will be maintained through 2034. Likewise, the twenty (20) foot section of Segment B is operating at LOS D now and will continue to operate at LOS D in the base year and design year. Road and shoulder widths make a difference relative to the LOS according to the HCM as is evident in Table 4. In the twenty-four (24) foot

portion of Segment B the LOS is C for base and future because of the wider travel lanes and shoulders.

**TABLE 4  
SR 81 LEVEL OF SERVICE (LOS) SUMMARY**

SECTION	BEGIN LOG MILE	END LOG MILE	LENGTH	WIDTH OF ROAD (FEET)	SHOULDER WIDTH (FEET)	LEVEL OF SERVICE		
						2009	2014	2034
Section A	0.00	2.25	2.25	20	1	D	D	D
Section B	0.00	1.73	1.73	20	1	D	D	D
Section B	1.73	4.30	2.57	24	7-10	C	C	C

**4.4 Geometric Deficiencies**

For all 2.25 miles of Segment A and 1.73 miles of Segment B, SR 81 has two (2) ten (10) foot travel lanes and one (1) foot shoulders on both sides. The narrow lanes and lack of shoulders are contributing factors to the above-average number reported crashes along SR 81 in this particular segment.

**5.0 EXISTING CONDITIONS**

**5.1 Description of Study Area (Geometrics)**

For study purposes, section breaks have been established at logical lengths on SR 81 for the proposed roadway. A description of these sections follows.

- Segment A-From I-26 to the Unicoi-Washington County Line is 2.25 miles.
- Segment B-From Unicoi-Washington County Line to SR 107 is 4.30 miles.

**5.1.1 Segment A**

Segment A begins from the eastbound exit ramp (Exit 37) from I-26, just outside the Erwin Urban Boundary. The study length for this segment is approximately 2.25 miles. This portion of SR 81 is more commonly known as Bogart Hill Road. Near the interstate, the typical section consists of two (2) sixteen (16) foot travel lanes (along rolling terrain) with a fourteen (14) foot painted striped median and curb and gutter. This section of SR 81 contains a combination of residential and commercial land uses. The right-of-way width varies between fifty (50) and eighty (80) feet and the posted speed limit is 30 MPH for the first 0.56 miles from the I-26 ramp to .21 miles east of Huskins Road. From Log Mile 0.56 to the end of Segment A, the posted speed limit is 45 MPH.

Beyond the city limits, SR 81 is known as Jonesborough Road. SR 81 is functionally classified as a Rural Minor Arterial roadway to the Unicoi-Washington County line. From South Buffalo Street, SR 81 begins to taper from a three (3) lane section to a two (2) lane roadway of approximately twenty (20) feet in width with one (1) foot shoulders on both sides along rolling terrain. This typical section extends to the county boundary. The land uses on this portion of SR 81 are primarily rural. The existing right-of-way is fifty (50) feet.

In Segment A , pavement markings indicate areas along the route where vehicle passing is allowed from approximately Log Mile 1.00 to approximately Log Mile 1.50. Other sections of Segment A contain a double yellow line indicating that passing is prohibited. Segment A has painted white edge lines in both directions.

### **5.1.2 Segment B**

Segment B begins at the Unicoi-Washington County line. The majority of this 4.30 mile segment is along rolling terrain. Approximately 1.5 miles of this section is rural and presently consists of two (2) ten (10) foot travel lanes with one (1) foot shoulders on both sides before entering into Embreeville. From the Nolichucky River Bridge crossing to the study terminus at SR 107, the roadway section widens to accommodate two (2) twelve (12) foot traffic lanes with wide shoulders on both sides of seven (7) to ten (10) feet. The posted speed limit is 45 MPH. The existing right-of-way varies between eighty (80) feet and one-hundred-fifty (150) feet. Pavement markings include white edge lines in both directions and a double yellow centerline for all of the Segment B length. Thus, passing is prohibited for the entire length of Segment B.

### **5.2 *Average Annual Daily Traffic***

The 2008 Average Annual Daily Traffic (AADT) on Segment A and Segment B between the Washington/Unicoi County line and Bumpus Cove Road is about 4,940 vehicles per day (vpd) at Count Station 037 near I-26. In this segment between I-26 and Bumpus Cove Road, the base year (2014) AADT is anticipated to increase to 5,090 vpd (a 3 percent increase). By the design year (2034), the AADT is expected to increase to 5,600 vpd (a 10 percent increase over the 2014 value).

Between Bumpus Cove Road and the end of the study at SR 107, the 2014 and 2034 AADT is projected to be 5,150 and 5,670 vehicles per day, respectively. The percentage of trucks of the total AADT is estimated at three percent by the design year. As with the I-26 to Bumpus Cove Road segment, the traffic growth from 5,150 to 5,670 is ten (10) percent over the twenty (20) years, or a half percent per year. A traffic schematic depicting this information is included in the appendix of this report.

### **5.3 *Restrictions and Constraints***

The majority of SR 81, particularly Segment A is not built to current design standards. Segment A consists of two (2) ten (10) foot travel lanes with one (1) foot shoulders on both sides. The narrow shoulders do not provide enough space for motorists to pull off the road if needed for emergencies or to provide drivers with maneuvering room to correct driving errors. Additionally, the shoulder widths of less than two (2) feet inhibits pedestrian and bicycle traffic. Approximately two-thirds of SR 81 is on the State's designated bike route, the Mountain Route.

There are numerous sharp curves and limited sight distances on both sections of the corridor. The topography of the area affects the horizontal alignment, but has an even more pronounced effect on the vertical alignment. Areas along the route with sharp turns and narrow shoulders near steep embankments have guardrail installed to protect motorists from hazards off the travel way, such as fixed objects (i.e., trees, utility poles) and the nearby Nolichucky River and its lakes.

## **5.4 Major Structures**

Segment A contains one structure that crosses over a branch (Bridge 86SR08100131) and Segment B contains a major structure that crosses over the Nolichucky River (Bridge 90SR0810001). Information pertaining to the location and condition of these bridges within the study area were obtained using the TDOT TRIMS database. Bridge repair recommendations are below:

### **1-Barrel Concrete Box over Spivey Branch 86SR0810013- (Unicoi County- Log Mile 1.13)**

This concrete box culvert was inspected on February 9, 2009. It has a sufficiency rating of 84.3 and is in fair condition. The bridge length is twenty-two (22) feet and has no guardrail or bridge railing. The maximum span width is twenty (20) feet. The approach width is 21'-11" and in good alignment. The wearing surface is good with minor cracks. Some reinforcement is exposed and the structure has moderate water abrasion. The wing walls are in poor condition with some deterioration, spalls, and voids underneath. The channel opening appears adequate.

### **Bridge (90SR0810001)- Nolichucky River (Washington County- Log Mile 1.86)**

This structure was inspected on January 29, 2008. The bridge received a sufficiency rating of 77.2 and is in fair condition. This structure consists of four (4) spans. The total bridge length is five-hundred and sixty-four (564) feet with a curb-to-curb bridge width of 43.58 feet and an out-to-out width of 45.91 feet. The maximum span length of this structure is one-hundred and fifty-eight (158) feet.

## **5.5 Multi-modal Facilities**

### **5.5.1 Greenways**

The Cherokee National Forest is located in Eastern Tennessee and stretches from Chattanooga to Bristol along the North Carolina border. According to the Southern Appalachian Greenways Alliance (SAGA), the Cherokee National Forest is identified as a major attractor and generator for Carter, Greene, Johnson, Sullivan and Unicoi counties. On a regional basis, the national park serves a broader population, including tourists for outdoor recreation.

The Appalachian Resource Conservation and Development (RC&D) Council in cooperation with the SAGA produced the Regional Greenways Alliance Plan (2006). The plan's objective is to link together the residents and natural characteristics of ten counties and communities of Northeast Tennessee and Southwest Virginia. SAGA's aim is to create a regional approach to connect these communities through a greenway master plan that will link projects beyond their individual boundaries into a larger system of inter-connecting roads, trails, and waterways throughout the region. Presently, over 600 miles of non-motorized trails traverse Cherokee National Forest including the Appalachian National Scenic Trail and four other nationally designated trails.

The Appalachian National Scenic Trail (AT) is a regional walking trail that spans the entire length of the Southern Appalachian region along the crest of the Appalachian Mountains. From Greene County, Tennessee, the AT passes through Unicoi, Carter and Johnson counties in Tennessee. This hiking trail was first envisioned in the 1930s and

today is operated as part of the National Park Service (NPS). Through Unicoi County, this historic public footpath follows more than two-thousand and one-hundred (2,100) miles of Appalachian ridgelines as part of a two-hundred and fifty thousand (250,000) acre greenway extending from Maine to Georgia. The Appalachian Trail has given Erwin the reputation as being a hiker-friendly destination. A handful of businesses cater to backpackers on the trail.

An illustration of the Appalachian Trail system is placed in the Appendix section of this report.

The 2008 Tennessee Greenways and Trails Plan encourages the planning, development and implementation of greenways and trails utilizing methods including public-private partnerships to provide an active outdoor lifestyle that will contribute to an increased quality of life for all residents.

SAGA identifies over seventy (70) miles of greenway and trails throughout Unicoi County and approximately forty-three (43) miles in Washington County. Locally, the area contains three trails totaling 4.25 trail miles. Twenty-two (22) additional miles of greenway are planned. The local greenway trails include the following amenities.

North Indian Creek Greenway- as part of the Erwin Linear Trail, the greenway runs parallel to I-26 along North Indian Creek and the Nolichucky River.

Fish Hatchery Trail-

Unicoi Elementary School Walking Trail-

### **5.5.2 Railroad**

Passenger train service is not available in the region. However, CSX Transportation offers railroad freight transportation in Unicoi County. The rail lines are not within the study area and are located south of I-26. An historic railroad follows the valley, as does the Nolichucky River and I-26, which crosses the Appalachian Mountains to Asheville, North Carolina. CSX averages over twenty (20) trips per day in the area.

### **5.5.3 Public Transportation**

Public Transportation is provided by the First Tennessee Human Resource Agency. *NET Trans* (Northeast Tennessee Rural Public Transportation) provides public transportation services to area residents as part of the community's Job Access Program. Job Access is especially designed for rural citizens to provide needed transportation to and from work including child care centers. In addition, Job Access can accommodate shift work, as well as weekend needs. Funding for the Job Access program is provided by The Federal Transit Administration (FTA), The Tennessee Department of Transportation, and The Tennessee Department of Human Services. Greyhound Bus Line offers intercity travel for the area with the closest station being located fifteen (15) miles from Erwin in Johnson City.

### **5.5.4 Air Transportation**

Tri-Cities Regional Airport (TRI) is the nearest full-service commercial airport serving Northeast Tennessee, Southwest Virginia, Western North Carolina and Eastern Kentucky. TRI is centrally located between the cities of Bristol, Kingsport and Johnson City, Tennessee and approximately thirty (30) miles from Unicoi County. The airport offers nonstop flights to seven hubs (Atlanta, Charlotte, Cincinnati, Detroit, Ft. Lauderdale, Orlando and Tampa Bay). The airport covers approximately one-thousand and two-hundred twenty-five (1,225) acres. The Tri-Cities Air Cargo Logistics Center contains US Customs Port No. 2027 and Foreign-Trade Zone No. 204. The airport is equipped with an industrial access road to handle tractor trailer traffic. A thirty-five (35) acre development area is available to accommodate approximately two-hundred and twenty thousand (220,000) square-feet of direct aircraft access facilities and/or warehousing and distribution operations. These operations and amenities serve as a major economic development tool for the area when discussing economic vitality and strategies regarding regional trade and logistics. Additionally, municipal airports strategically located in the Northeast Tennessee region offer charter service for the business community.

### **5.5.5 Pedestrian /Bicycle Facilities**

The Tennessee Department of Transportation (TDOT) has developed a bicycle and pedestrian program as part of its Long Range Transportation Plan (LRTP). This program serves as a guide in the development and maintenance of a statewide bicycle network with the intent to promote and facilitate the use of non-motorized modes of transportation. The bicycle and pedestrian policies are designed to routinely integrate bicycling and pedestrian facilities into the transportation system as a means to improve mobility and safety of non-motorized traffic.

The Mountain Route which is one of nine existing state bicycle routes is located on this corridor. The bike route provides several miles of bike trails within eastern Tennessee linking Gatlinburg to Jonesborough; Jonesborough to Warriors Path; and Jonesborough to Roane Mountain State Park. The Appalachian National Scenic Trail (AT) is designated as a popular destination for both bicyclists and pedestrians along this route.

## 6.0 FIELD REVIEW INFORMATION

A preliminary field investigation within the environs of the proposed project was performed on Thursday, August 6, 2009. The items discussed during the course of the field investigation are summarized in the Appendix (TPR Field Review- SR 81). Those representatives in attendance included:

NAME	AGENCY
Gena Gilliam	TDOT
Tyler King	TDOT
Bob Allen	TDOT
Ron Campbell	TDOT
Dawn Michelle Foster	Wilbur Smith Associates
Hollis Loveday	Wilbur Smith Associates
Chris Craig	First Tennessee Development District
Greg Lynch	Unicoi County Mayor
John Deakins	Washington County Highway Department
Steve Lockner	Erwin Utilities
Bob Browning	Town of Jonesborough Administrator
Randy Trivette	Erwin Town Recorder
Brandon Horne	Johnson City Power Board
Mike McCracken	Jonesborough Water Department
Ben Grizzle	Jonesborough Water Department
Glenn Berry	Johnson City MPO
Nes Levotch	Washington County EMA
Louna Koeut	TDOT-Design
Glenda Tyus	TDOT
Stacy Weaver	TDOT- Design
Mark Parrish	TDOT-Design
Philip Turner	Crossroads Country Store
Sue Carney	Cherokee Adventures

## 7.0 OPTIONS FOR IMPROVEMENT (SPOT AND CORRIDOR)

### 7.1 Corridor Improvements

This TPR document examines operational and safety improvement options along the SR 81 corridor. These options evaluate opportunities for meeting the traffic and economic development needs of the RPO. The options examined are summarized below:

#### 7.1.1 Option A -No-Build Option

As the name implies, would retain the existing facilities on SR 81 with no improvements and denotes that only minor improvements (safety improvements and normal maintenance) would be made to the existing road and/or intersection areas.

The No-Build option does not meet the purpose and need of the study, and it will not provide desired safety and operational improvements. In addition, the disadvantages of the No-Build Option include continued inadequate operating conditions and safety concerns inherent with increased traffic volumes, inadequate roadway geometrics, and deficient vertical and horizontal alignment.

However, advantages of the No-Build Option include less disruption of the existing land use patterns and no disruption of the area due to construction. Also, measures to mitigate environmental impacts would not be necessary.

### **7.1.2 Option B- Widen Along Existing Alignment**

This option would include widening SR 81 from Log Mile 0.00 in Erwin at I-26 to Log Mile 2.25 at the Unicoi-Washington County line, and from Log Mile 0.00 at the Unicoi-Washington County line to approximately Log Mile 1.84 just before the Nolichucky River Bridge. The recommended typical section is two (2) twelve (12) foot lanes and ten (10) foot shoulders. This recommendation would essentially match the existing SR 81 typical section in Washington County from Log Mile 1.84 to the end of the study at Log Mile 4.30. As a part of this option, left turn lanes should be constructed on SR 81 in the already improved sections at Bumpus Cove Road and Ol' Huff Road.

The primary beneficial effects of this option include: 1) improving local and regional accessibility; 2) improving safety and operating conditions along the study corridor; 3) increasing traffic capacity; and, 4) enhancing future planned growth by local and/or regional land use planning agencies. The loss of land for right-of-way is minimal in this case because improvements are planned within the existing right-of-way.

The primary adverse effects of this option include: 1) temporary construction impacts (dust, siltation, equipment noise, etc.) during the construction period; 2) impacts to the environment to be determined in detail during the NEPA phase of the study.

Potential environmental impacts as well as other factors (i.e., topography and existing land use) will determine roadway geometrics prior to the right-of-way phase. Further public involvement will be initiated in the early phase of the environmental process.

A variation of Option B was considered that included a portion of new alignment to replace the severe horizontal curve at the north end of Segment A at Log Mile 0.96 to Log Mile 2.25. The new alignment would be very expensive and environmentally damaging due to large quantities of fill, large cuts, and significant structures; consequently it was dropped from further consideration.

Although recommendations for SR 81 normally require a standard typical section design (two (2) travel lanes at twelve (12) foot wide and ten (10) foot shoulders on both sides), there are some sections along SR 81 in which the standard design may not be applicable due to the topography and environmental constraints within the study corridor. For such instances, when it is appropriate, a request for a design exception may be necessary.

### **7.1.3 Option C- Widen a Portion of SR 81 Along Existing Alignment**

Option C would include widening SR 81 to twenty-four (24) feet with ten (10) foot shoulders from approximately Log Mile 0.96 in Unicoi County to approximately Log Mile 0.64 in Washington County, a distance of about 1.8 miles (Figures 4A, 4B, and 4C). This option would include widening a portion of SR 81 that experiences the highest number of crashes so it may improve safety by reducing the probability of lane departures, sideswipe, and head on crashes. The improvement would span the north end of Segment A and the south end of Segment B; consequently it falls in both Unicoi and Washington Counties.

### **7.1.4 Option D- Spot Improvements**

Potential spot improvements can be implemented independently or in combination as an overall improvement strategy along the SR 81 corridor. Consider adding turn lanes to improve safety. In terms of SR 81, this option seeks to primarily improve deficient sections of the road that may result in fewer crashes. If there are areas where the improvements will require land acquisition, further evaluation will be required.

The existing right-of-way is one-hundred (100) feet for portions of Segment A which lie within the Erwin urban boundary. Beyond the urban boundary, the existing right-of-way is fifty (50) feet to the Unicoi-Washington county line. Along Segment B, the existing right-of-way is eighty (80) feet from the Unicoi-Washington County line to the beginning of the Nolichucky Bridge. From the bridge end towards SR 107 the right-of-way is one-hundred (100) feet.

Based on the examination of the crash data, reviewing the road features of SR 81, and the field investigation, the following spot improvements are offered for consideration:

- Location A: Construct a southbound left turn lane on SR 81 at Ol' Huff Road and realign Ol' Hull Road so that it intersects SR 81 at a 90 degree angle (Figure 5).
- Location B: Construct a northbound left turn lane on SR 81 at Bumpus Cove Road (Figure 6).
- Location C: Construct a southbound left turn lane on SR 81 at the Cherokee National Forest entrance at Arnold Road. Striping taper for turn lanes will be carried onto the bridge over the Nolichucky River. However, the structure will be restriped to maintain shoulder widths. (Figure 7).

There were some crashes reported on SR 81 at Bumpus Cove Road and at the Cherokee National Forest, but they were not necessarily associated with traffic at the intersections. Nevertheless, these locations merit some consideration for turn lanes because of their significance to motorists. At SR 81 and Ol' Huff Road, four (4) crashes were reported in the three (3) year reporting period including two (2) rear end crashes and a vehicle striking a utility pole. Ol' Hull Road intersects SR 81 at a slight acute angle; consequently it could be realigned slightly.

TYPE	DATE	PROJECT NO.	SHEET NO.
TR	2010		



CHEROKEE NATIONAL FOREST

WIDEN STATE ROUTE 81 (SR 81) FROM 2-LANE SECTION TO A 2-LANE SECTION WITH 10 FT SHOULDERS. WIDEN TO THE NORTH SIDE OF SR 81 TO AVOID GARLAND CEMETERY AND DESTABILIZING EXISTING SLOPES. PROVIDE FULL 12 FT LANES AND 10 FT SHOULDERS WITH V-DITCH SECTION. (TOTAL LENGTH OF CONSTRUCTION ON THIS SHEET SR 81 = 3700 FT)

GARLAND CEMETERY  
CHEROKEE ADVENTURES

STATE ROUTE 81

50' EXIST. R.O.W.

BEGIN SR 81 WIDENING SPOT IMPROVEMENT

PROPOSED ROW / (PARK ESMT.)

WIDEN LANES TO 12 FT LANES. CONSTRUCT 10 FT SHOULDERS

SIGNIFICANT CUT INTO ROCK / FOREST

CHEROKEE NATIONAL FOREST

SIGNIFICANT CUT INTO ROCK / FOREST

50' EXIST. R.O.W.

STATE ROUTE 81

MATCHLINE SEE FIGURE 4B



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
BUREAU OF PLANNING & DEVELOPMENT

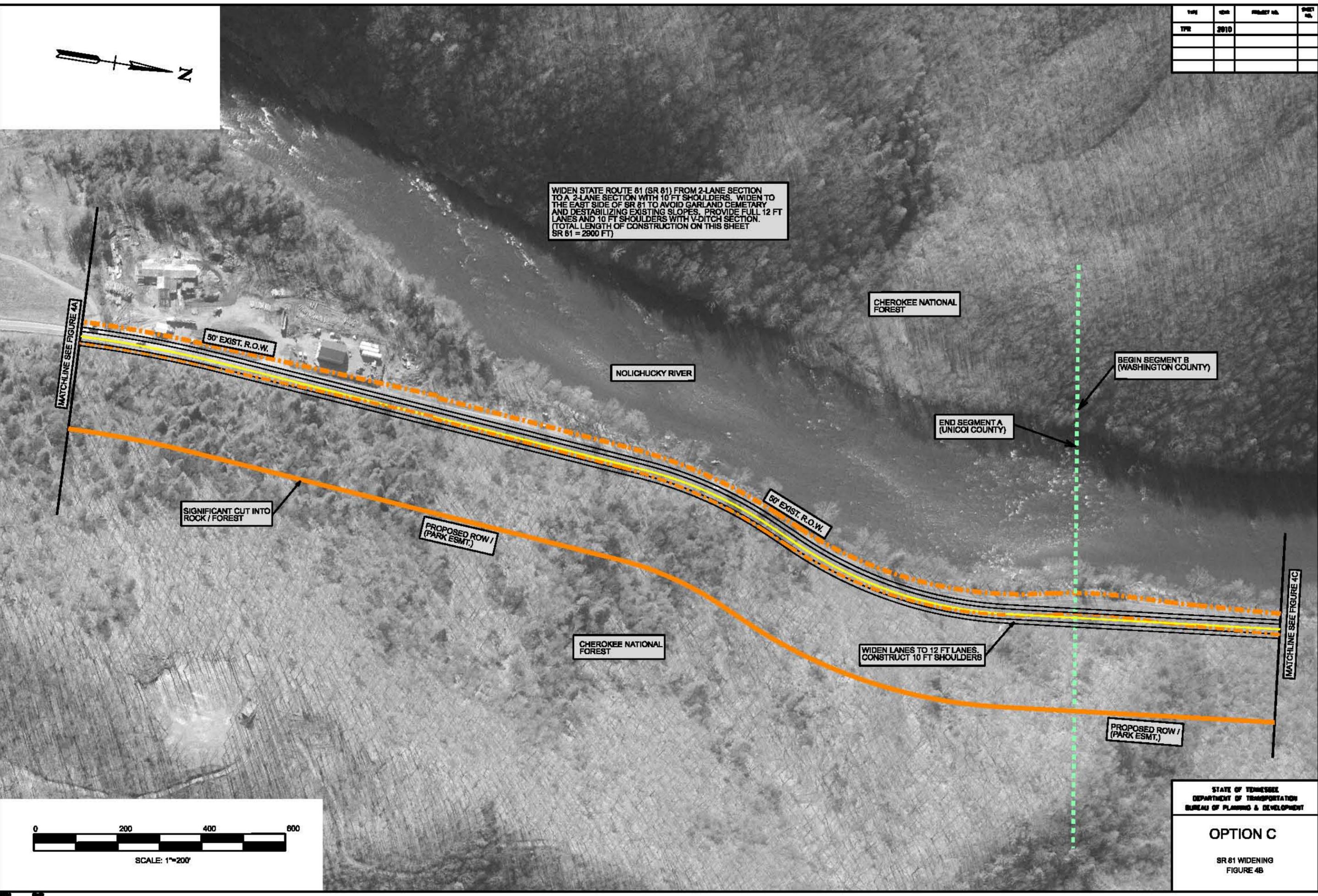
OPTION C

SR 81 WIDENING  
FIGURE 4A

TYPE	DATE	PROJECT NO.	SHEET NO.
TYPE	2010		



WIDEN STATE ROUTE 81 (SR 81) FROM 2-LANE SECTION TO A 2-LANE SECTION WITH 10' FT SHOULDERS. WIDEN TO THE EAST SIDE OF SR 81 TO AVOID GARLAND CEMETARY AND DESTABILIZING EXISTING SLOPES. PROVIDE FULL 12 FT LANES AND 10 FT SHOULDERS WITH V-DITCH SECTION. (TOTAL LENGTH OF CONSTRUCTION ON THIS SHEET SR 81 = 2900 FT)



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

**OPTION C**

SR 81 WIDENING  
 FIGURE 4B

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		



CHEROKEE NATIONAL FOREST

WIDEN STATE ROUTE 81 (SR 81) FROM 2-LANE SECTION TO A 2-LANE SECTION WITH 10 FT SHOULDERS. WIDEN TO THE EAST SIDE OF SR 81 TO AVOID GARLAND CEMETERY AND DESTABILIZING EXISTING SLOPES. PROVIDE FULL 12 FT LANES AND 10 FT SHOULDERS WITH V-DITCH SECTION. (TOTAL LENGTH OF CONSTRUCTION ON THIS SHEET SR 81 = 2800 FT)

NOLICHUCKY RIVER

END SR 81 WIDENING SPOT IMPROVEMENT

MATCHLINE SEE FIGURE 4B

STATE ROUTE 81

50' EXIST. R.O.W.

WIDEN LANES TO 12 FT LANES. CONSTRUCT 10 FT SHOULDERS

PROPOSED ROW / (PARK ESMT.)

SIGNIFICANT CUT INTO ROCK / FOREST

CHEROKEE NATIONAL FOREST



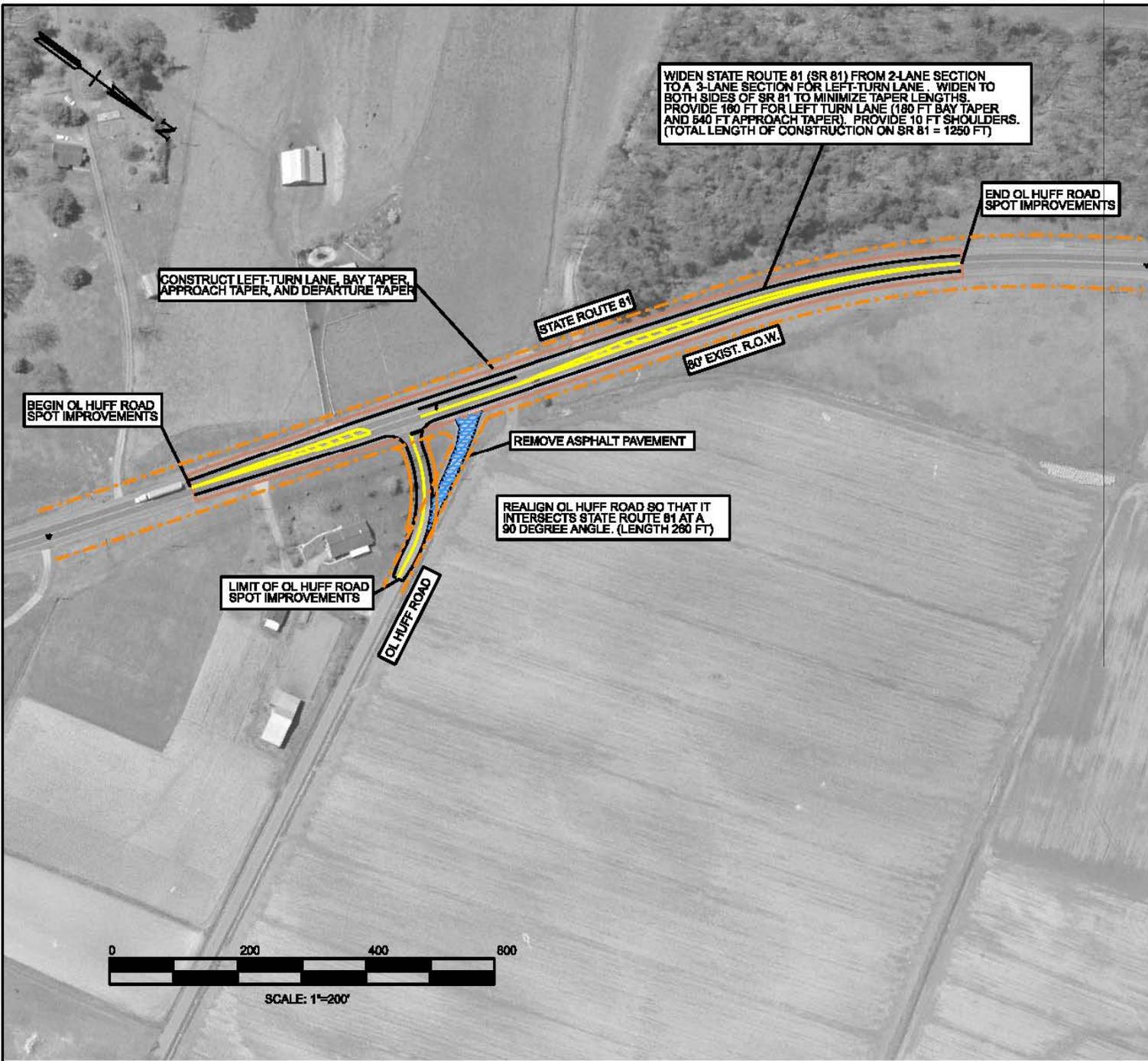
SCALE: 1"=200'

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
BUREAU OF PLANNING & DEVELOPMENT

**OPTION C**

SR 81 WIDENING  
FIGURE 4C

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010	SPOT IMPROVEMENT	

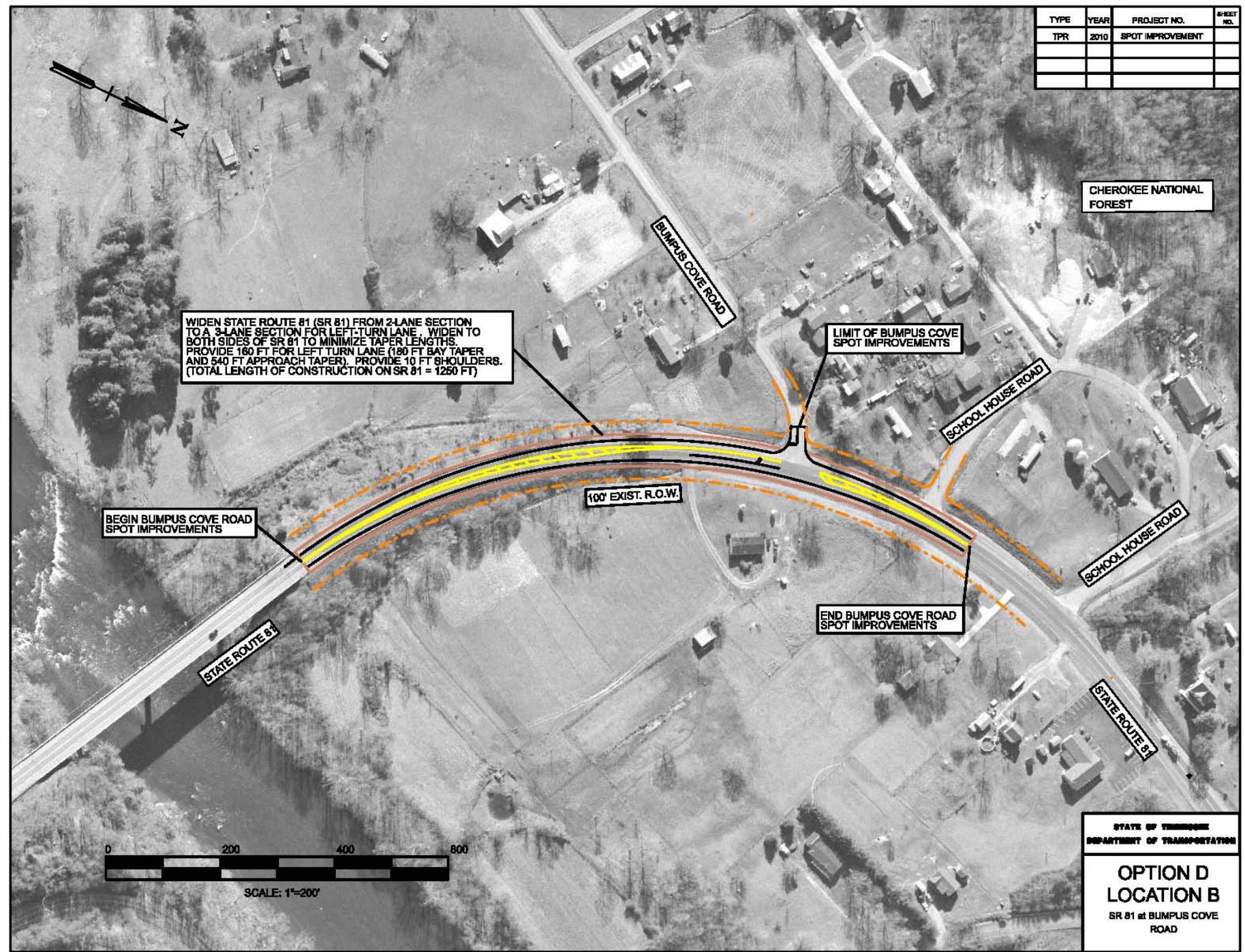


OFFICE OF TRANSPORTATION  
DEPARTMENT OF TRANSPORTATION

**OPTION D  
LOCATION A**

SR 81 at OL HUFF ROAD

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010	SPOT IMPROVEMENT	



CHEROKEE NATIONAL FOREST

WIDEN STATE ROUTE 81 (SR 81) FROM 2-LANE SECTION TO A 3-LANE SECTION FOR LEFT-TURN LANE. WIDEN TO BOTH SIDES OF SR 81 TO MINIMIZE TAPER LENGTHS. PROVIDE 160 FT FOR LEFT TURN LANE (180 FT BAY TAPER AND 540 FT APPROACH TAPER). PROVIDE 10 FT SHOULDERS. (TOTAL LENGTH OF CONSTRUCTION ON SR 81 = 1250 FT)

LIMIT OF BUMPUS COVE SPOT IMPROVEMENTS

BEGIN BUMPUS COVE ROAD SPOT IMPROVEMENTS

100' EXIST. R.O.W.

END BUMPUS COVE ROAD SPOT IMPROVEMENTS

STATE ROUTE 81

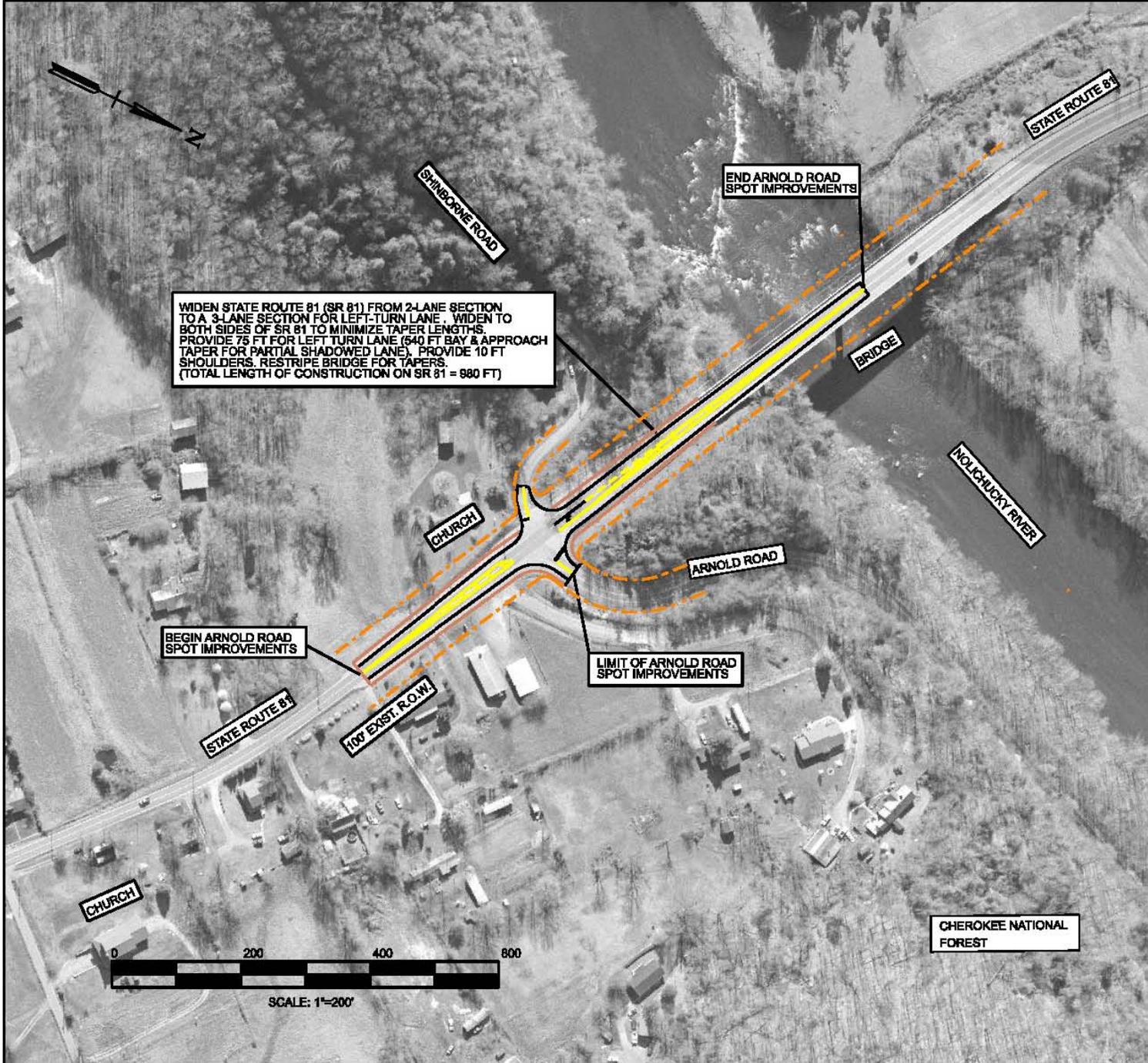
STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

OPTION D  
LOCATION B  
SR 81 at BUMPUS COVE ROAD



SCALE: 1"=200'

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010	SPOT IMPROVEMENT	



WIDEN STATE ROUTE 81 (SR 81) FROM 2-LANE SECTION TO A 3-LANE SECTION FOR LEFT-TURN LANE. WIDEN TO BOTH SIDES OF SR 81 TO MINIMIZE TAPER LENGTHS. PROVIDE 75 FT FOR LEFT TURN LANE (540 FT BAY & APPROACH TAPER FOR PARTIAL SHADOWED LANE). PROVIDE 10 FT SHOULDERS. RESTRIPE BRIDGE FOR TAPERS. (TOTAL LENGTH OF CONSTRUCTION ON SR 81 = 980 FT)

BEGIN ARNOLD ROAD SPOT IMPROVEMENTS

END ARNOLD ROAD SPOT IMPROVEMENTS

LIMIT OF ARNOLD ROAD SPOT IMPROVEMENTS



SCALE: 1"=200'

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

**OPTION D  
LOCATION C**

SR 81 @ ARNOLD ROAD

## **7.2 Projected Levels of Service**

There would be a slight improvement in Level of Service (from LOS D to LOS C in 2034) if Option B is implemented that includes widening the twenty (20) foot section of roadway with one (1) foot shoulders to a twenty-four (24) foot cross-section with ten (10) foot shoulders. The most significant benefit in constructing Option B is in safety improvements. A significant number of the crashes can be attributed to narrow lanes and shoulders. The turn lanes that are proposed would reduce rear end crashes and have a slight benefit on LOS that would need to be quantified with projected turning movement volumes.

## **7.3 Spot Improvements**

The benefit of the spot improvements would be primarily safety. The turn lanes suggested as part of the spot improvements would reduce the potential for rear end crashes.

## **7.4 Bicycle and Pedestrians**

A bike route is planned along SR 107/81 between Erwin and Jonesborough, Tennessee. This route, commonly known as the Erwin to Jonesborough Connector would lead cyclists along the scenic Nolichucky River. Approximately two-thirds ( $2/3^{\text{rd}}$ ) of the route is on the Mountain Route. Presently, the two (2) foot shoulder widths along this route are inadequate to accommodate operating space for bicyclists. Under these conditions, a five (5) foot operating space for cyclists is desired with Option B.

## **7.5 Discussion of Structural Impacts (Bridges, Railroad Crossings, Rock Cuts)**

It is preferred that the major structures on both Segment A and Segment B of SR 81 be replaced to meet structural requirements necessary to support the anticipated traffic growth by local and commercial traffic. This is included in the cost estimates.

## **7.6 Context Sensitive Solutions**

Both TDOT and First Tennessee Development District will take into account the community's aesthetic and environmental values while making recommended improvements along SR 81. All stages of development will be coordinated with the local agencies, including the public, to ensure that improvements to SR 81 fit into the community's goals and objectives. The outcome of the process should also ensure that improvements increase safety for both truck and residential traffic.

## **7.7 Disposition of Existing Route**

The recommended improvements on SR 81 will generally follow the existing alignment and should be primarily made within the existing right-of-way. No portion of the existing roadway is proposed to be closed or abandoned.

## 8.0 EARLY ENVIRONMENTAL SCREENING

In preparation of Transportation Planning Reports (TPR), the Tennessee Department of Transportation (TDOT) has introduced an environmental screening process for the study area. By screening the latest available Geographic Information Systems (GIS) environmental data during the early stages of study planning TDOT and the public will be better prepared to anticipate potential environmental issues and mitigation requirements. This screening process involves using GIS to assess environmental data as it spatially relates to the project's Area of Potential Effect (APE). In broad terms, the GIS environmental data reviewed in this TPR include the following layers:

### 8.1 1,000 ft ESS Corridor

- ◆ Cemetery Sites and Cemetery Properties:  
Garland Cemetery is located within one-thousand (1,000) feet of the study area. Low is anticipated as the cemetery abuts the study area or corridor. It is anticipated that a "normal" effort will be required to complete this environmental review as part of the NEPA process. Additional effort will be needed to locate and design the proposed transportation project in such a way that minimizes any direct impact or takings of the cemetery, including multiple alternatives, if proposed, in the study area or corridor.
- ◆ Institutions and Sensitive Community Populations-Churches  
The Embreeville Cove Missionary Baptist Church and the Embreeville United Methodist Church are located within the study area or corridor. There is the potential for probable impacts to these church properties. Additional effort will be needed to locate and design the proposed transportation project in such a way that avoids and/or minimizes the adverse effects of the churches and/or potential takes of these properties.
- ◆ Sensitive Community Populations- None recorded within the study area or corridor.
- ◆ Ecology- Rare and Protected Species: Bats  
A substantial impact on the study is probable as there is a known occurrence of Indiana or gray bats (*Myotis grisescens*) within four (4) miles of the proposed study area or corridor. It is anticipated that avoidance/minimization of potential impacts to species will be needed. Surveys for the species for the study may be required. Close and continued coordination with US Fish and Wildlife Service (USFWS) is necessary. Also a Section 7 biological assessment will be needed for the study. Additionally, seasonal construction limitations will likely be necessary.
- ◆ Railroads- No impact on the project is anticipated. There are no railroads located within the project study area or corridor.

### 8.2 2,000 ft EES Corridor

- ◆ National Register Sites- No impact is anticipated as there are no National Register listed properties abutting or within the study area or corridor.
- ◆ Superfund Sites-Hoover Precision  
A medium impact is anticipated as there are known contaminated land tracts within the study area or corridor. It is possible to avoid and minimize a taking of the contaminated tract(s) through more detailed design of the project.

- ◆ Pyritic Rock/Geotechnical-There are nine (9) classifications of pyritic rock listed within the study area. Four (4) classifications of Dolomite (Honaker, Shady and Knox Group,) are present. Five (5) formations of Hampton and Unicoi Foundations that may contain acid producing rock (symbolized as orange or pink in color) are anticipated in small quantities within the study corridor.

### **8.3 4,000 ft EES Corridor**

- ◆ Terrestrial Species-Medium impact on the project is likely as there is a known federally-protected terrestrial species or a state protected species with a status of threatened or endangered (*Trillium rugelli*, *Heracleum maximum*, *Diervilla sessilifolia* var. *rivularis*, and *Buckleya distichophylla*) located within the study area or corridor, and it is possible to avoid any impacts to the species with additional design. Additional alternatives will likely eliminate impacts to the species. Additional design alternatives and minimizations may be required if additional populations are found during required field surveys.
- ◆ TDEC Conservation Sites and TDEC Scenic Waterways- No impact is expected as there are no scenic waterways or TDEC Conservation Sites within study area or corridor.
- ◆ Large Wetland Impacts-A substantial impact to the project is probable as there is approximately 106.41 acres of wetlands within the study area or corridor. Compensatory mitigation will be required. Design effort will be needed to avoid and minimize impacts to wetlands to the maximum extent practicable. If a floodplain is crossed by the project, floodplain culverts may be necessary.
- ◆ Tennessee Natural Areas Program-The study area or corridor does not contain a Natural Area.
- ◆ Tennessee Wildlife Management Areas-Minimal impact on the project is anticipated as the North Cherokee National Forest and Wildlife Management Area is located within the study area. However, there is the potential to avoid any takings or impacts to the WMA through more detailed location and design of the proposed transportation project. With additional effort to locate and design the project, there will be no impact to the WMA.

### **8.4 10,000 ft EES Corridor**

- ◆ Aquatic Species-There is no known occurrence of a rare, state, or federally-protected aquatic species within the study area or corridor.
- ◆ Caves-No impact is anticipated as there are no caves in the study area or corridor.

As of the publication of this document, the GIS data within each layer was current relevant to the date of its publication. The TDOT EES Scoring Sheets are listed in Tables 5A-5D. This data will be updated as part of the ongoing project development process.

### **8.5 Air Quality**

Currently, TDECs Air Pollution Control Division recommended to the Environmental Protection Agency (EPA) that both Unicoi and Washington Counties be classified as attainment for Ozone. Both counties do not have monitoring stations. However, the nearest violating monitor is in Sullivan County, which is located downwind (east,

southeast-Unicoi County and south, southeast –Washington County) from that monitor in a rural and farming environment.

## **9.0 ASSESSMENT OF CORRIDOR OPTIONS**

### **9.1 *TDOTs Seven Guiding Principles***

The Tennessee Department of Transportation has adopted seven guiding principles against which all transportation projects are to be evaluated. These guiding principles address concerns for system management, mobility, economic growth, safety, community, environmental stewardship, and fiscal responsibility. These guiding principles are discussed in the following paragraphs as they relate to the option for improving the corridors within the study area.

### **9.2 *Guiding Principle 1: Preserve and Manage the Transportation System***

Option B would provide continuity of width and improvements to the deficient horizontal and vertical alignments that exist on SR 81. Improvements to the corridor will preserve a necessary link between I- 26 and I-81 that meets current highway design and safety standards.

### **9.3 *Guiding Principle 2: Move a Growing, Diverse, and Active Population***

Option B will provide better connectivity and accessibility throughout Unicoi and Washington counties. Local traffic and truck traffic will benefit from the improvements on the route, which could also enhance the quality of life for area residents.

### **9.4 *Guiding Principle 3: Support the State's Economy***

The industries and commercial businesses within the project area require an adequate transportation facility to operate to their potential. SR 81 is a vital transportation link with SR 107 and US 11E/321. Together these routes form a major transportation network throughout the Northeast Tennessee area. Improvements to the SR 81 corridor are necessary for the movement of people and goods and for future expansion in the area's industry, as well as to accommodate visitors to the Cherokee National Forest.

### **9.5 *Guiding Principle 4: Maximize Safety and Security***

The safety of SR 81 may be improved by increasing the lane widths to the standard of twelve (12) feet to meet current design standards. Additionally, full shoulders will provide a safer area for disabled vehicles and provide adequate space for maneuvering when necessary. The additional shoulder width will be needed for bicyclists utilizing the state designated bike route (Mountain Route) located on this corridor. The proposed improvements will provide improved safety for all users. Wider lanes also provide a safer evacuation route for locals in the event of an emergency.

### **9.6 Guiding Principle 5: Build Partnerships for Livable Communities**

This study was initiated in response to a request made by the First Tennessee Development District (FTDD) to address the need to improve accessibility for SR 81. Residents in the area have expressed safety concerns, particularly with the increase in truck traffic that they have reported. At the TPR stage, local, state and federal representatives along with area stakeholders participated in a field review to provide input and suggestion during the early planning stages for this project. As the study moves beyond the TPR, public meetings and hearings will be scheduled to involve the community as part of the National Environmental Policy Act (NEPA) process and during the design phase of the project.

### **9.7 Guiding Principle 6: Promote Stewardship of the Environment**

An appropriate environmental document will be prepared in order to fully address the impact of any proposed build option. An EES has been conducted and the results shown in Section 8.0 of this report. To determine a project's potential benefit or harm to the environment, the National Environmental Policy Act of 1969 (NEPA) requires an assessment of environmental impacts prior to making decisions on projects that have federal involvement (i.e., funding or permitting). This assessment will require the consideration of environmental values in the decision making processes by taking into account the environmental impacts of proposed actions and reasonable alternatives to mitigate the impacts. The environmental information will be made available to public officials as well as local citizens to be included in the decision-making processes. Any potential environmental effects will be mitigated to the fullest extent possible under federal law.

### **9.8 Guiding Principle 7: Promote Financial Responsibility**

Cost estimates based on various roadway improvement options were calculated for this report. The cost estimates in this report are offered for comparison purposes and will fluctuate with inflation and economic conditions. It is TDOT's goal to follow a comprehensive transportation planning process, promote coordination among public and private operators of transportation systems, and support efforts to provide stable funding for the public component of the transportation system. The preparation of this TPR, and the cost estimates contained herein, initiate the promotion of financial responsibility in the scheduling and development of roadway projects and minimizing costs to taxpayers.

## **10.0 COST ESTIMATE**

### **10.1 Option A- No Build**

No cost is associated with this option.

### **10.2 Option B- Widen Existing Alignment**

The cost estimate for Option B (along the existing route) was developed to construct two (2) twelve (12) foot lanes and ten (10) foot shoulders using a proposed right-of-way width of one-hundred (100) feet. Since several environmental features exist along the

corridor, the ROW was determined by avoiding impacts to the Nolichucky River and the Cherokee National Forest.

The construction costs are based on the existing topography, road alignment, and proposed typical sections. Construction costs include mobilization, pavement removal, earthwork drainage, paving, utility relocation, guardrail, and other related construction items. The cost for Option B is \$44,100,000, which includes ROW, utility relocation, and engineering.

**10.3 Option C- Widen Existing Alignment**

The cost estimate for Option C, widen SR 81 from Log Mile 0.96 in Unicoi County to Log Mile 0.64 in Washington County to two (2) twelve (12) foot lanes and ten (10) foot shoulders is \$24,817,000.

**10.4 Option D- Spot Improvements**

The cost estimate for the spot improvements provides for the reconstruction and mitigation of four (4) existing intersections on SR 81. Construction costs include mobilization, pavement removal, earthwork, drainage, paving, utility relocation, traffic maintenance and other related construction items. A comparison of the estimated construction costs to construct the preferred spot improvements are provided in the following table.

**TABLE 5  
COST ESTIMATE FOR OPTION D- SPOT IMPROVEMENTS**

LOCATION	TYPE OF IMPROVEMENT	CONSTRUCTION COSTS*
SR 81 at Ol' Huff Road LOCATION A	Construct southbound turn lane	\$322,000
SR 81 at Ol' Huff Road LOCATION A	Realign intersection at 90 degree angle	\$515,000
SR 81 at Bumpus Cove Road LOCATION B	Construct northbound left turn lane	\$209,000
SR 81 at Arnold Road LOCATION C	Construct southbound left turn lane	\$201,000

\*For estimating future project costs, a compounded inflation rate of 10% will be applied.

**11.0 SUMMARY**

This Transportation Planning Report (TPR) was prepared to identify the purpose and evaluate the need to improve SR 81 from I-26 in Unicoi County to SR 107 in Washington County. Its primary purpose is to help establish the immediate and long term needs for improving SR 81, and to examine viable options for meeting those long term needs.

Segment A of SR 81 extends from I-26 to the Unicoi/Washington County line and is 2.25 miles. This section of SR 81 is twenty (20) feet wide with minimal shoulders. Segment B is 4.3 miles long and extends from Segment A to SR 104. A portion of Segment B contains twelve (12) foot lanes and wide shoulders, so significant improvements are not necessary. The other portion of Section B from the county line to the Nolichucky River Bridge also has twenty (20) foot lanes and minimal shoulders. The most costly

improvements identified in this report are concentrated within the 3.98 mile section of SR 81 with the twenty (20) foot lanes and minimal shoulders.

The purpose and need for improving SR 81 is summarized as follows:

- Safety- In all of Segment B and the narrow portion part of Segment A the actual crash rate exceeds the statewide average and critical crash rates.
- System Linkage- Future improvements to SR 81 are part of a long-term desire to provide a better connection between I-26 and I-81 via SR 81 through the heart of Washington County.
- Level of Service- SR 81 will operate at LOS D in the long term future, indicating marginal conditions.
- Geometric Deficiencies- For all 2.25 miles of Segment A and 1.73 miles of Segment B SR 81 has two (2) ten (10) foot travel lanes and one (1) foot shoulders on both sides. The narrow lanes and lack of shoulders are contributing factors to the above average number reported crashes along SR 81 in this particular segment.

Including the No-Build, four options were considered and ranged from spot improvements to widening along existing alignment from I-26 to the Nolichucky River bridge. These improvements and the estimated cost to construct each are summarized below.

Option A: No-Build Option- Provides no improvement to safety or traffic operation along SR 81, and therefore does not satisfy the primary purpose and need of this study.

Option B: Widen Along Existing Alignment- The preferred option would include widening SR 81 from Log Mile 0.00 in Erwin at I-26 to Log Mile 2.25 at the Unicoi-Washington County line, and from Log Mile 0.00 at the Unicoi-Washington County line to approximately Log Mile 1.84 just before the Nolichucky River bridge. The recommended typical section is two (2) twelve (12) foot lanes and ten (10) foot shoulders. This recommendation would essentially match the existing SR 81 typical section in Washington County from Log Mile 1.84 to the end of the study at Log Mile 4.30. As a part of the build option, left turn lanes should be constructed on SR 81 in the already improved sections at Bumpus Cove Road and Ol' Huff Road. *Estimated Cost: \$44,100,000.*

Option C: Widen a Section of SR 81 Along Existing Alignment: Widen SR 81 to two (2) twelve (12) foot lanes and ten (10) foot shoulders from Log Mile 0.96 in Unicoi County to Log Mile 0.63 in Washington County. *Estimated Cost: \$24,817,000.*

Option D: Spot Improvements- Locations A-C are described below:

- Location A: Construct a southbound left turn lane on SR 81 at Ol' Huff Road and realign Ol' Hull Road so that it intersects SR 81 at a 90 degree angle. *Estimated Cost: \$837,000*
- Location B: Construct a northbound left turn lane on SR 81 at Bumpus Cove Road. *Estimated Cost: \$209,000*
- Location C: Construct a southbound left turn lane on SR 81 at the Cherokee National Forest entrance at Arnold Road. Striping taper for turn lanes will be carried onto the bridge over the Nolichucky River. However, the structure will be restriped to maintain shoulder widths. *Estimated cost: \$201,000*

**STATE ROUTE 81 (UNICOI COUNTY)  
TRANSPORTATION PLANNING REPORT**

**APPENDIX – VOLUME I**

## **PURPOSE AND NEED STATEMENT**

Wilbur Smith  
Hart

Unicoi / Washington  
0.0 to 2.25 / 0.0 to 4.3



2008

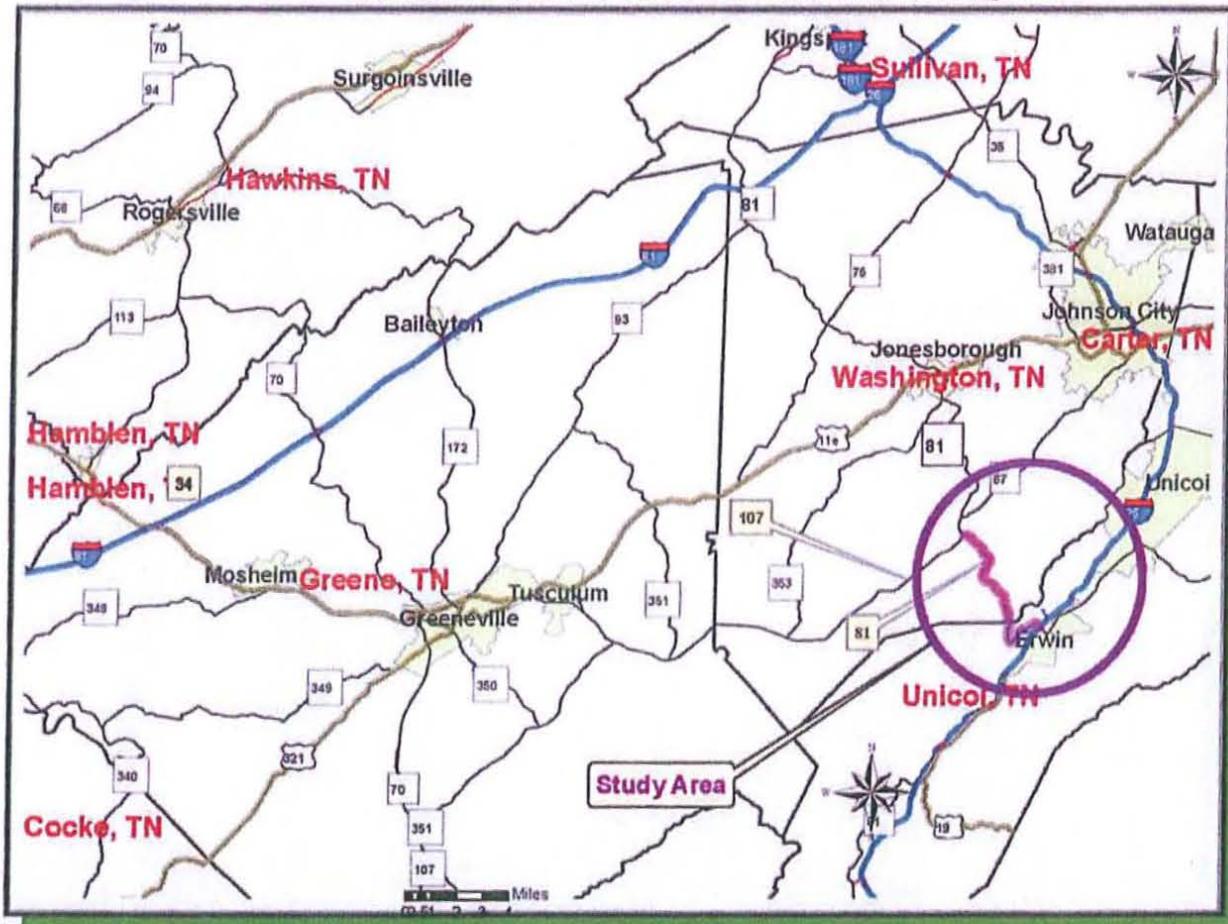
PIN 112470.00

## PRELIMINARY PURPOSE AND NEEDS STATEMENT FIRST TENNESSEE RPO SR-81, Unicoi County to SR-107, Washington County

### Location of Proposed Project

The First Tennessee RPO recommended improvement to SR-81, an arterial that extends 6.55 miles from I-26, Unicoi County to SR-107 in Washington County, as part of a longer route connecting I-26 to I-81 through the Greeneville area.

SR-81; From I-26, Erwin, Unicoi Co. to SR-107, Washington Co.



### History/Previous Studies

The Long Range Planning Division conducted a Needs Assessment (Study #6012005) for SR-81 from I-26, Unicoi Co. to SR-107, Washington Co. a distance of 6.55 miles. No transportation studies for this section of SR-81 have been undertaken for the past several years.

2/2008

use environment, while Segment B consists of two 10-foot to 12-foot lanes, 1-foot to 10 foot shoulders, as well as 50-feet to 100-feet of Right-Of-Way within a rural land use environment. The narrow shoulders do not provide enough space for vehicles to pull off the road in emergencies or provide drivers with maneuvering room to correct driving errors.

A statewide average crash rate is based on the number of crashes statewide for a specific highway type. The Tennessee statewide average crash rate for 2-lane rural roads in Tennessee like SR-81 is 1.76. A critical crash rate factor is a ratio based on a crash rate calculated from the number of crashes, the length, traffic volumes, and the number of years in the analysis for the section of roadway being evaluated, divided by a statewide crash rate based on data for a section of roadway with similar characteristics. Segments A and B have not demonstrated a crash rate greater than the statewide average or an indication of a critical crash rate. TDOT is in the process of implementing revised crash incidence and rate thresholds for prioritizing safety issues analysis on road segments.

Segment	Shoulder width deficiency	Lane width deficiency	Excessive Curves & Grades	Crash Rate > Statewide Average**
A	X	X	X	--
B	--	--	X	--

\*\*All Crash Data is derived from TRIMS.

### Access (System Linkage/ Corridor Connection/ Social / Economic Development/ Infrastructure Demand)

(The infrastructure facilities and amenities listed below have been provided by the local RPO Coordinator)

- SR-81 is a major connector to Interstate 26 for traffic traveling on SR-107 through Greene County.
- This route has increased freight and residential traffic in recent years due to improved access along Interstate 26 to Ashville, North Carolina.

### RPO's Purpose or Vision for the Project

Any improvements to SR-81 will provide safer conditions for truck traffic and residential traffic that are currently co-users on this route. Improvements made to this route will also alleviate many of the safety concerns expressed by residents along SR-81. The overall objective of this study is to improve the safety of people using SR-81 and potentially maximize economic development opportunities in this heavily rural area of Unicoi and Washington Counties.

### Recommendation

The Long Range Planning Division recommends that Segments A and B, running along SR-81 from I-26 in Unicoi County to SR-107 in Washington County be selected for a Transportation Planning Report.

### Problem or Need for the Project

The First Tennessee RPO desires to address the need for improved accessibility for SR-81 from I-26 at Erwin to SR-107. Along with SR-107 and US 11E/321 (SR-34), this section of SR-81 forms a major connection between I-26 and I-81 through the Tusculum, Greeneville and Mosheim area in Greene County. In recent years, there has been a significant increase in truck traffic on SR-81 from the Greeneville area since I-26 was completed to Asheville, North Carolina. It is estimated that traffic will continue to increase over the next several years. Segment A of SR-81 is a narrow, two lane road, with multiple curves and elevation changes. Residents in the area have expressed safety concerns due to the increase in truck traffic and the potential for an environmental disaster. SR-81 borders the Nolichucky River, and with the increase in traffic over the last several years there is an enhanced potential for an impact to the environment as a result of possible crashes. The roadway was not optimized for the amount of tractor trailers currently using this route. Therefore, First Tennessee RPO is requesting that a Transportation Planning Report (TPR) be conducted to determine if improvements to SR-81 will alleviate these problems and concerns.

### Logical Termini

The study corridor was divided into Sections of Independent Utility (SIU) based upon logical termini or significant breaks in traffic conditions. This assessment resulted in the identification of 2 SIUs for the 6.55 mile study corridor. The Needs Assessment evaluated each of the two SIUs based upon Congestion (Level of Service), Safety (Crash and Geometrics), and Access (System Linkage/Corridor Connection /Social/Economic Development/Infrastructure Demands).

The following table provides a description of each of the 2 SIUs:

<u>Segment</u>	<u>County</u>	<u>Route</u>	<u>Termini</u>
A	Unicoi	SR-81	I-26 to Washington Co. line
B	Washington	SR-81	Unicoi Co. line to SR-107

**Recommendation: TPR for Segments A and B from I-26 in Unicoi County to SR-107 in Washington County, a distance of 6.55 miles.**

### Congestion and Level of Service (LOS)

Typically, roadway projects are designed for conditions 20 to 30 years in the future. The future date is known as the horizon year, and is used to represent the project service life or full build-out of all project components. In order to determine how well traffic operates, a Level of Service (LOS) analysis was conducted. LOS is a measure of expected travel conflicts, delay, driver discomfort and congestion.

Tennessee Department of Transportation (TDOT) policy specifies that capacity deficiency (i.e., congestion)

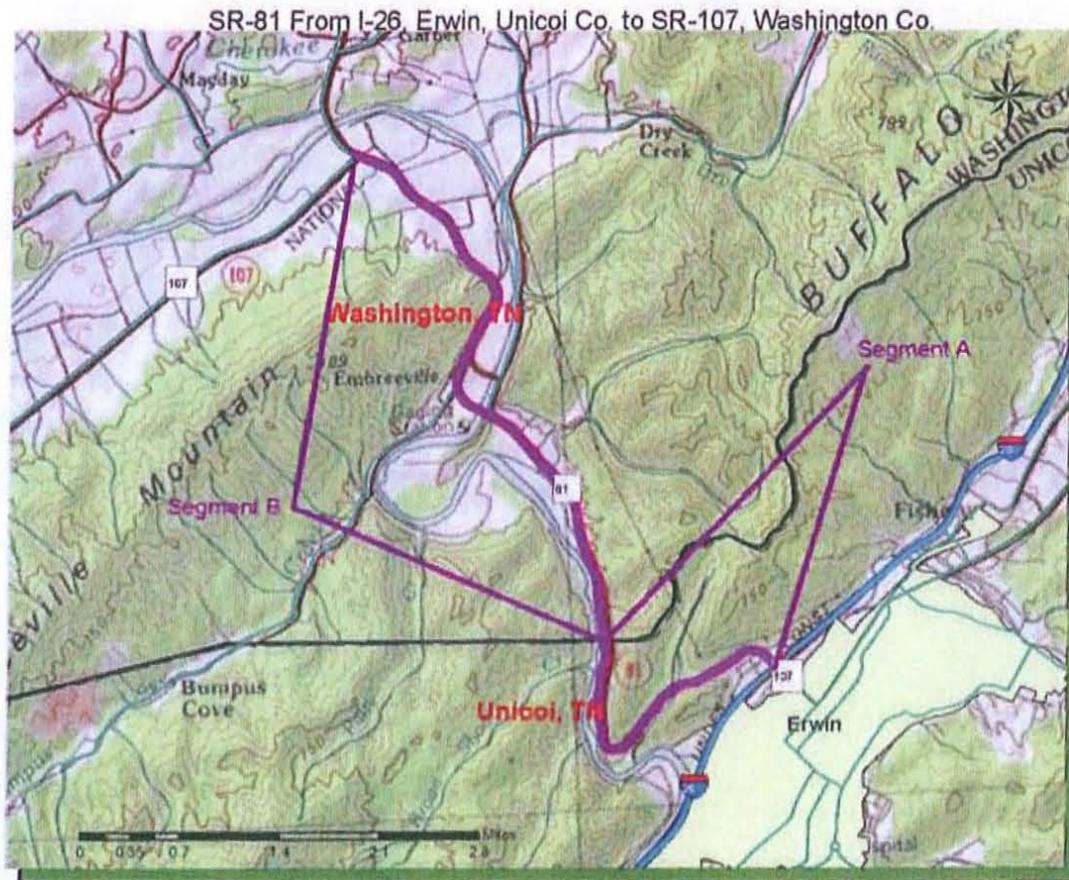
12/2008

occurs at LOS D in rural areas, and at LOS E in urban areas. A capacity analysis of the 6.55 mile corridor indicated that both Segment A and B within the primary study corridor demonstrated near term capacity deficiency within the 25 year planning horizon.

The LOS and traffic information for Segments A and B is shown below:

Segment*	Mileage	Current ADT	Current LOS	Forecast ADT	Capacity Deficiency
A	2.25	5,330	D	7,620	2007-2012
B	4.3	5,130	D	9,077	2007-2012

\*Roadway segment is illustrated in the attached maps and needs assessment table.



### Safety (Crash and Geometrics)

The Tennessee Roadway Information Management System (TRIMS) provides data for locations of crashes, for geometric deficiencies such as narrow lane (less than 11 feet) and shoulder width (e.g., less than 6 feet for arterials), and for excessive curves and grades, as defined by generally accepted design standards.

Typically, Segment A of the existing roadway within the project corridor consists of two 10-foot paved lanes and 1-foot shoulders over most of its length, as well as 50-feet of Right-Of-Way within a rural land

## PRELIMINARY PURPOSE AND NEEDS STATEMENT FIRST TENNESSEE RPO TERMINOLOGY

### Logical Termini

FHWA regulations outline three criteria for selecting the end points of a transportation project: the end points should connect logical termini (rational end points) that encompass a corridor of sufficient length to ensure that environmental effects are addressed on a broad scope; the project limits should represent a project that has independent utility (thereby meaning that the project must be usable and result in a reasonable expenditure even if no other transportation improvements are made in the area); and the project limits must not restrict consideration of alternatives for other reasonably foreseeable transportation projects.

### Congestion and Level of Service (LOS)

The horizon year is used in planning and environmental studies and engineering evaluations to represent the project service life or full build-out of all project components. Level of Service measurements rate how well traffic operates for a transportation facility. The rating scale uses the letters A through F, where A is the best grade and F is the worst. Typically, an LOS D or worse is considered deficient in rural areas, while LOS E is considered deficient in urban areas.

### Safety (Crash and Geometrics)

The Tennessee Roadway Information Management System (TRIMS) provides data for locations of crashes, for geometric deficiencies such as narrow lane (less than 11 feet) and shoulder width (e.g., less than 6 feet for arterials), and for excessive curves and grades, as defined by generally accepted design standards.

TDOT is implementing new crash criteria in order to assist with the prioritization process of roadway segments deficiency analysis. TDOT identifies locations that qualify for a Road Safety Audit Review on state highways, and any local concerns with verifiable data will be reviewed.

Tennessee Department of Transportation  
Systems Planning and Policy Office

2008 Needs Assessment Report  
First Tennessee RPO  
Long Range Planning Report  
Data

Study Number	Route	Segment	Termini	Miles	Capacity					>25 Years	Current Year (2007) ADT	Forecast Year (2032) ADT	Safety		Strategic Corridor	County Seat Connector
					2007-2012	2013-2017	2018-2022	2023-2027	2028-2033				Geometrics	Crash Rate		
6012001	SR-67		SR-167, Johnson Co. to SR-34 (US421), Mountain City	11.68							3,880-6,190	6,228-9,442	X			X
6012004	SR-107		SR-34 (US11E/321), Tusculum, Greene Co. to SR-61, Washington Co.	18.65												
		A	SR-34 (US11E/321), Tusculum, to Florence St., Greene Co.	1.17							7,190-10,290	11,259-16,365	X			
		B	Florence St. to SR-351, Greene Co.	3.61							4,520-10,290	6,486-16,365	X			
		C	SR-351, Greene Co. to Washington Co. Line	2.33							4,520	6,486	X			
		D	Greene Co. Line to SR-353, Washington Co.	2.92							4,260-4,520	7,255-7,597	X			
		E	SR-353 to SR-61, Washington Co.	8.42							3,370-4,110	4,948-6,149	X			
6012005	SR-61		I-26, Unicoi Co. to SR-107, Washington Co.	6.55												
		A	I-26, Unicoi Co. to Washington Co. Line	2.25							5,330	7,620	X			
		B	Unicoi Co. Line to SR-107, Washington Co.	4.3							5,130	9,977	X			
6012007	SR-34		Triplett Rd., south of Mountain City, Johnson Co., to North Carolina State line	7.22							5,660-6,300	9,632-11,126	X			
			Economic Development Study Recommended													
6012008	SR-167		SR-67, Johnson Co. to SR-34, Mountain City	13.94							1,170-4,490	1,927-7,102	X			
6012009	SR-70		N. of Nolichucky River, Greene Co. to US 321 (SR-35), Greeneville, Greene Co.	6.43												
		A	N. of Nolichucky River, Greene Co. to Greeneville city limits (Marshall Ln.)	5.03							7,430	10,952	X	X		
		B	Greeneville city limits (Marshall Ln) to US321 (SR-35), Greeneville, Greene Co.	1.4							12,650	16,952	X	X		
6012010	SR-172		US321 (SR-35) Main St. to I-61, Greene Co.	11.69												
		A	US321 (SR-35) Main St. to Greeneville Urban Boundary (Roaring Fork Rd), Greene Co.	3.08							7,780	11,852		X		
		B	Greeneville Urban Boundary (Roaring Fork Rd) to I-61, Greene Co.	8.61							3,470-5,020	4,586-7,516				
6012011	SR-357 Ext.		Extension from US19E/US11E (SR-34) to Tri-Cities Regional Airport, Sullivan Co.	8								4,944				
6012012	SIA Rock Ln.		US11E to Tri-County Industrial Park, Sullivan Co.	2												

Long Range Planning Needs Assessments did not identify any planning deficiencies in 25 year planning horizon.  
 Long Range Planning Needs Assessments identified planning deficiencies within 25 year planning horizon.



## PRELIMINARY PURPOSE AND NEEDS STATEMENT FIRST TENNESSEE RPO STAKEHOLDERS

Currently, within each of the individual Rural Planning Organizations, the interests of stakeholders are addressed by and through a governing Executive Board, composed of elected local municipal and county government representatives, supported by a Technical Committee of local administrators and a RPO coordinator. Members of both the Executive Board and Technical Committee are regional stakeholders promoting their entire RPO Region.

There will be more public involvement from additional stakeholders as the Project Planning Report proceeds. Eventually, if the proposed project moves forward with funding, the Purpose and Need Statement will identify likely stakeholders for the Transportation Planning Report process.

The following RPO members have been identified as being specifically concerned with this project:

Greg Lynch	Unicoi County Mayor P.O. Box 169 Erwin TN 37650
Don Lewis	Mayor of Erwin 211 North Main Street P.O. Box 59 Erwin TN 37650
Terry Haynes	Unicoi County Highway Superintendent P.O. Box 258 Erwin TN 37650
George Jaynes	Washington County Mayor P.O. Box 219 Jonesborough TN 37659
Johnny Deakins	Washington County Highway Superintendent 608 Depot Street Jonesborough TN 37659
Chris Craig	First Tennessee RPO Coordinator First Tennessee Development District 207 North Boone Street, Suite 800 Johnson City TN 37604

## **FIELD REVIEW**

State Route 81  
Transportation Planning Report  
Field Review Meeting Minutes  
Thursday, August 6, 2009  
(TDOT Pin Number 112470.00)

Project Termini: From Interstate 26 (in Erwin, Unicoi County) to State Route 107  
(Washington County)

Segment A- State Route 81 from Interstate 26 to Unicoi/Washington  
County Line (2.25 miles)

Segment B- State Route 81 from Unicoi/Washington County Line to  
State Route 107 (4.30 Miles)

Total Project Length= 6.55 Miles

As an element of the TPR process, a field review for the above referenced project was conducted on Thursday, August 06, 2009 at 10:00 AM (EST). The list of attendees is attached.

## **I. PRE-FIELD REVIEW AND DISCUSSION**

Before the field review, handout of project description and mapping were distributed to attendees. Attendees gather to offer suggestions and give comments in regards to issues and concerns with the proposed improvements. An aerial map was available for viewing and also to record additional information.

The following is a list of comments and suggestions:

Local officials Bob Browning (Town of Jonesborough) and Randy Trivette (Erwin City Manager) the local officials had concerns regarding the existing grades and horizontal and vertical alignment along the corridor. There are some concerns in relation to hazardous materials being transported by trucks through the route. Three percent of traffic along this route consists of truck traffic. These types of crashes create hazardous materials concerns that could possibly impact the river. Although safety is a major concern, local representatives suggested looking into moving the section on new alignment, if possible. It was recommended that the improvements would probably be made along the existing centerline. A 2,000 ft study corridor will be used for the planning document.

State Route 81 provides a secondary route from Greeneville and I-26 in Erwin. Residents as well as truck traffic utilize this route to connect Greeneville, Mosheim, Jonesborough, Johnson City and Erwin. The dangers of this road have been expressed by many users.

Mr. Browning (Town of Jonesborough) and Mr. Trivette (Erwin City Manager) mentioned that there has been earlier discussion plans to reroute the corridor toward Harris Hollow. Chris Craig (FTDD-RPO) mentioned that Representative Ford (Washington County) initiated a meeting with local residents to address safety concerns along this corridor.

Local officials stated that they believed that representatives from TDOT Region One may have attended the meeting. TDOT-Region One will be contacted to see if there is documentation of this meeting.

Local officials also mentioned that trucks utilized this corridor as a faster connector between Interstate 26 in Erwin to Greeneville, Tennessee. The increase in truck traffic is a concern with road improvements on this route. Currently, the truck percentage on this route is 3 percent.

Due to excessive costs and environmental constraints including the Nolichucky River and the Cherokee National Forest, both of which lie adjacent to the corridor, new alignment will not be considered of the TPR. However two build options and one no build option will be explored:

- No Build
- Safety/Spot Improvements
- Shoulder Widening/Improvement option

A suggestion to review the road profile of the entire segment of State 81 from its beginning terminus (I-26) to the Nolichucky Bridge could help to determine locations where improvements could be made to address safety concerns.

The corridor is also designated as a state bicycle route (Mountain Route) and has bike route signing. The bike route follows State Route 81 and turns at Arnold Road to the National Park. Local representatives responded that this route is a very active venue for bicyclists going to the national park. The route is challenging and sometimes used for training and exercise purposes. However, at its lowest part, the grade is pretty flat. More experienced bike riders are seen on the route. Families and novice bicyclist(s) are not encouraged to use this route even though it is a very scenic rural route undisturbed by development.

Given the nature of the route, there is very little line of sight for motorists coming up on bicyclists. The winding two-lane narrow roadway is challenging and causes some safety concerns with the combination of bicyclists and motorists. Suggestions included providing "Share the Road" signage along the corridor.

A suggestion would be for some type of bike/pedestrian enhancement along the corridor to improve accessibility and safety for users. Jessica Wilson, TDOT's Bicycle/Pedestrian Coordinator, will be consulted for input.

Also, the utility poles line the edge of the roadways causing little clearance between bikers and the roadway. A buffer area should be provided for bicyclists.

Currently, bicyclists travel between the Nolichucky Bridge and the Buffalo Road area, commuting between South Johnson City and Johnson City (proper). This area was once a farm/rural area but has become a new area for residential development. Dan Reese (FTDD Bike Coordinator) would like to see this particularly route prioritize as a major bike/pedestrian project to connect to the system of bikeways being built in the area connecting ETSU, Johnson City, and Buffalo Mountain Park. This would also expand on the non-motorized travel option in the area.

## II. FIELD REVIEW

After a brief on-site meeting to discuss the proposed roadway improvements, the field review continued with a windshield survey along the corridor and stopping at several locations along the route to gather additional comments and suggestions. The following are the comments and suggestions recorded at the locations:

### ◆ Project Beginning to Canah Hollow Road

The guardrail through the route is in poor condition. In some locations, the guardrail needs to be extended along the drop off areas. Guardrail is located along the roadway and follows the river. Guardrail is also placed in front of utility poles that line the roadway.

Water tower is located on the northwest side of the road, north of Walnut Street. Proposed improvements should include avoiding this structure, if possible.

### ◆ Canah Hollow Road to Embreeville Church

Lack of signage (curves, chevrons) to warn motorists approaching curves. It was suggested to proposed improvements to straighten out curves in this area. Other options included additional signage or break-away utility poles. Signage for trucks entering the highway is visible in the vicinity of the logging company.

Some pull-off areas and also some areas with rock outcrops near edge of roadway. Most of this segment contained two-lane highway with ditches. Attendees discussed filling in ditches and providing drainage to eliminate some of the shoulder drop-offs along the corridor in this section.

### ◆ Embreeville Church to Nolichucky Bridge

Nolichucky Bridge- Bridge inspection reports reveal the bridge is in fair condition.

There is another small structure (culvert) on the project in fair condition. Inspection is scheduled for March 2010.

Currently, from the bridge to State Route 107 is considered a super 2-lane roadway.

### ◆ Nolichucky Bridge to State Route 107 (Project end)

Speed Limit 45MPH.

Good visibility.

This area is considered super 2-lane highway.

Trucks from Greeneville exit I-81 take State Route 107 and travel through to get to I-26.

The Embreeville Volunteer Fire Department is located north of Bumpus Cove Road. There is a very short curb and gutter section located on the southbound side on SR-81 near School House Road. Another section of curb and gutter is located north off Ol Huff Road.

"No parking signs" are also located near the state junction.

It was mentioned that these "No parking" signs should be removed. The Region One traffic engineer will be consulted regarding the "No Parking" signage in concurrence with junction signs located at the same site.

Mr. Deakins (Washington County Highway Superintendent) stated these "No Parking" signs were placed in efforts to keep trucks from parking in shoulders (in the vicinity of the store). Trucks parking in shoulders near the SR 107/SR 81 junction limited sight distance. No parking signs are also located on both sides of roadway near Log Mile 3.

Recommendation: resurfacing, striping and signage from the bridge to the state junction.

◆ State Route 107/State Route 81 intersection

The northbound and southbound approaches of State Route 81 have an exclusive left-turn lane. The eastbound approach of State Route 107 has a left-turn lane. The westbound approach (SR-81 Loop Road) is paved as a two-lane highway with no turn lanes designated.

Currently an ARRA project (Resurfacing) is being performed on State Route 107. The paving project begins at the SR 81/107 junction and extends west along State Route 107 for 12 miles.

### III. UTILITIES

Several residences/businesses along roadway have some underground utilities at their locations.

Water tower is located on the northwest side of the road, north of Walnut Street. Proposed improvements should include avoiding this structure, if possible.

- ◆ Erwin Utilities – Provided information regarding location of power lines.
- ◆ Johnson City Power Board- Provided information about utility poles within project vicinity. At the beginning of project power lines are on both sides of roadway. There are sections along the roadway where the power lines cross over to one side. Certain locations, the power lines are placed behind guardrail.
- ◆ Jonesborough Water Department- 6" water main line on left side beginning at Mile Post 1 (Washington County) to State Route 107. All side roads have a 6" lateral line connecting to mainline.
  
- ◆ Phone- Not present
  
- ◆ Cable- Not present
  
- ◆ Natural Gas- Underground utility lines were present in the project area.

\*\* All utility companies that have utilities located within the project area will be asked to provide a preliminary cost estimate for relocation of utilities. The utility companies will be asked to provide an average per mile cost.

#### IV. ADDITIONAL SUGGESTIONS

- ◆ The corridor primarily consists of ditches on both sides of the roadway.  
Suggestion: Fill in some ditches with pipe for drainage to widen the roadway.
- ◆ Several locations along the corridor have areas rock bluffs or outcrops of rock which cause danger for trucks and automobiles on the narrow roadway. This has been an issue with several vehicles hitting the rock wall.  
Suggestion: Evaluate the areas with the rock along the roadway edge to see if it can be removed to allow safer passage of trucks and automobiles.
- ◆ Rock Bluff at County Line- cut out and make turn out for trucks.
- ◆ The area is designated as a scenic highway. The pull-off areas should be maintained.

#### V. CRASH DATA

Crash data obtained from TDOT was mapped and used in field review discussion. The project team stopped to evaluate areas with high crash volumes. A copy of the illustration with a brief summary will be provided. Along Section A, 38 crashes were recorded. These crashes occurred at various locations along the corridor within a three year period (2006-2008). Six crashes occurred on Segment A near Log Mile 1.00. Other crashes along Segment A occurred in the vicinity of Log Mile 1.55 (in a curve) near Garland Cemetery and Cherokee Adventures. Four crashes at Log Mile 2; five crashes between Log Mile 2.15-2.25 near the county line.

Along Segment B, 38 crashes occurred over three year period (2006-2008). A majority of crashes occurred along the corridor. Four crashes occurred at the intersection of Ol Huff Road and State Route 81. Four crashes occurred at the intersection of State Route 107 and State Route 81. There were one fatal and five incapacitating injury crashes along the entire corridor, for a total of six severe crashes.

This crash information will continued to be evaluated with recommendations addressed in the TPR document.

#### VI. OTHER: BUSINESS OWNERS

- ◆ Cherokee Adventures  
Sue Carney (for Dennis Nedelman) participated in the field review to give input and provide suggestions. Cherokee Adventures is a water rafting and mountain biking facility that transports tourist to several water adventure and biking areas. The facility is located next to the Garland Cemetery and Rivers Edge Restaurant. The facility is also in a horizontal curve. Ms. Carney claimed that the access road has adequate sight distance but it is hard to predict the speed of oncoming traffic.

- ◆ Crossroads Country Store  
Philip Turner participated in the field review. The Crossroads Country Store is located northeast of the SR 107/SR 81 intersection.

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

**Bold = field review/meeting attendee**

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	<b>Gena Gilliam</b>	<b>TDOT-HQ Project Manager</b>	<b>Gena.gilliam@tn.gov 615-253-7692</b>
	Liz Smith	TDOT-HQ Conceptual Planning	Elizabeth.a.smith@tn.gov 615-532-3200
	Suzanne Herron	TDOT-HQ Environmental Planning	Suzanne.herron@tn.gov 615-741-2612
	Jon Zirkle	TDOT-Nashville Hydraulics Office	Jon.zirkle@tn.gov 615-741-4253
	Mike Tugwell	TDOT-HQ Traffic	Mike.tugwell@tn.gov 615-741-2466
	Paul Lane	TDOT	paul.lane@tn.gov 615-253-2432
	Paul Beebe	TDOT Region One (Design)	Paul.beebe@tn.gov 865-594-2442
	<b>Tyler King</b>	<b>TDOT</b>	<b>tyler.king@tn.gov 615-253-2781</b>
	Ronnie Walker	TDOT Region One (Survey)	Ronnie.walker@tn.gov 865-594-2356
	Amanda Snowden	TDOT Region One (Traffic)	Amanda.snowden@tn.gov 865-594-2456
	Bill Hart	TDOT-HQ	Bill.hart@tn.gov 615-741-3688
	Steve Allen	TDOT-HQ	Steve.allen@tn.gov 615-741-2208
	David H. Thompson	TDOT	david.H.Thompson@tn.gov
	<b>Bob Allen</b>	<b>TDOT</b>	<b>Bob.allen@tn.gov 615-253-2468</b>

**Bold = field review/meeting attendee**

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	Mwafaq Mohammed	TDOT	<a href="mailto:Mwafaq.mohammed@tn.gov">Mwafaq.mohammed@tn.gov</a> 615-253-2454
	<b>Ron Campbell</b>	<b>TDOT</b>	<b><a href="mailto:ron.campbell@tn.gov">ron.campbell@tn.gov</a></b> <b>865-594-2416</b>
	Dexter Justis	TDOT	<a href="mailto:dexter.justis@tn.gov">dexter.justis@tn.gov</a> 865-594-4539
	Keven Brown	TDOT	<a href="mailto:keven.brown@tn.gov">keven.brown@tn.gov</a> 865-594-2437
	Jeff Horton	TDEC	<a href="mailto:jeff.horton@tn.gov">jeff.horton@tn.gov</a> 423-854-5400
	Tom Foley	TDOT-Utility	<a href="mailto:tom.foley@tn.gov">tom.foley@tn.gov</a>
	Oliver Farris	TDOT-ROW	<a href="mailto:oliver.farris@tn.gov">oliver.farris@tn.gov</a>
	LeighAnn Tribble	FHWA	<a href="mailto:Leighann.tribble@dot.gov">Leighann.tribble@dot.gov</a> 615-781-5760
	<b>Dawn Michelle Foster</b>	<b>Wilbur Smith Associates</b>	<b><a href="mailto:dfoster@wilbursmith.com">dfoster@wilbursmith.com</a></b> <b>865-963-4300</b>
	Chris Kirby	Wilbur Smith Associates	<a href="mailto:ckirby@wilbursmith.com">ckirby@wilbursmith.com</a> 865-963-4300
	<b>Hollis Loveday</b>	<b>Wilbur Smith Associates</b>	<b><a href="mailto:hloveday@wilbursmith.com">hloveday@wilbursmith.com</a></b> <b>865-963-4300</b>
	Chris Craig	FTDD RPO	<a href="mailto:ccraig@ftdd.org">ccraig@ftdd.org</a> 423-722-5091
	Don Lewis	City of Erwin Mayor	<a href="mailto:cityoferwin@comcast.net">cityoferwin@comcast.net</a> 423-743-6231
	<b>Greg Lynch</b>	<b>Unicoi County Mayor</b>	<b><a href="mailto:mayorgreglynch@yahoo.com">mayorgreglynch@yahoo.com</a></b>

**Bold = field review/meeting attendee**

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	George Jaynes	Washington County Mayer	washco@naxs.net
	<b>John Deakins</b>	<b>Washington County Highway Department</b>	<b>washingtoncohighway@embarqmail.com 423-753-1714</b>
	Glenn Rosenoff	TDOT Local Planning Assistance Office	Glenn.rosenoff@tn.gov 423-434-6476
	Charles Anderson	TDOT Local Planning Assistance Office	Charles.anderson@tn.gov
	Dan Gibbs	TWRA	dan.gibbs@tn.gov 423-587-7037
	Lee Brown	Erwin Utilities	lhbrown@erwinutilities.com 423-743-1823
	<b>Steve Lockner</b>	<b>Erwin Utilities</b>	<b>423-743-1823</b>
	Doris Hensley	Unicoi County EDB	ddh6090@embarqmail.com
	Terry Haynes	Unicoi County Highway Superintendent	423-743-6171
	<b>Bob Browning</b>	<b>Jonesborough Town Administrator</b>	<b>bob@jonesboroughtn.org 423-753-1031</b>
	Homer G'Fellers	Johnson City Power Board	423-952-5040

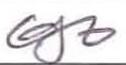
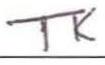
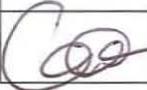
**Bold = field review/meeting attendee**

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	Steve Ferrell	First Tennessee HRA	<a href="mailto:sferrell@fthra.org">sferrell@fthra.org</a> 423-928-4572
	Tim Whitson	Unicoi County Gas Utility District	<a href="mailto:twhitson@ucgud.com">twhitson@ucgud.com</a> 423-743-6793
	Amanda Bennett	Union County Chamber of Commerce	<a href="mailto:amanda@unicoicounty.org">amanda@unicoicounty.org</a>
	Tim Lingerfelt	Union County Chamber of Commerce	<a href="mailto:timlingerfelt@yahoo.com">timlingerfelt@yahoo.com</a>
	Randy Trivette	Erwin Town Recorder	<a href="mailto:rrivette@comcast.net">rrivette@comcast.net</a> 423-743-6231
	Brandon Horne	Johnson City Power Board	<a href="mailto:Brandon_horne@jcpb.com">Brandon_horne@jcpb.com</a> 423-952-5000
	Mark Eades	Johnson City Power Board	<a href="mailto:meades@jcpb.com">meades@jcpb.com</a> 423-952-5000
	Mike McCracken	Jonesborough Water Dept	mike m @ jonesboroughtn.org 423-753-1003
	Ben Grizzle	Jonesborough Water Dept	<a href="mailto:bengrizzle@embarqmail.com">bengrizzle@embarqmail.com</a>
	Glenn Berry	Johnson City MPO	<a href="mailto:glennberry@icmpo.org">glennberry@icmpo.org</a>
	Nes Levotch	Washington Co EMA	<a href="mailto:nesema@earthlink.net">nesema@earthlink.net</a>
	Louna Koeut	TDOT Design	<a href="mailto:Louna.koeut@tn.gov">Louna.koeut@tn.gov</a>
	Glenda Tyus	TDOT Project Planning	<a href="mailto:Glenda.tyus@tn.gov">Glenda.tyus@tn.gov</a>
	Stacy Weaver	TDOT Region One Design Office	<a href="mailto:Stacy.weaver@tn.gov">Stacy.weaver@tn.gov</a>



STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	Gena Gilliam	TDOT-HQ Project Manager	Gena.gilliam@tn.gov 615-253-7692
	Liz Smith	TDOT -HQ Conceptual Planning	Elizabeth.a.smith@tn.gov 615-532-3200
	Suzanne Herron	TDOT -HQ Environmental Planning	Suzanne.herron@tn.gov 615-741-2612
	Jon Zirkle	TDOT-Nashville Hydraulics Office	Jon.zirkle@tn.gov 615-741-4253
	Mike Tugwell	TDOT-HQ Traffic	Mike.tugwell@tn.gov 615-741-2466
	Paul Lane	TDOT	paul.lane@tn.gov 615-253-2432
	Paul Beebe	TDOT Region One (Design)	Paul.beebe@tn.gov 865-594-2442
	Tyler King	TDOT	tyler.king@tn.gov 615-253-2781
	Ronnie Walker	TDOT Region One (Survey)	Ronnie.walker@tn.gov 865-594-2356
	Amanda Snowden	TDOT Region One (Traffic)	Amanda.snowden@tn.gov 865-594-2456
	Bill Hart	TDOT-HQ	Bill.hart@tn.gov 615-741-3688
	Steve Allen	TDOT-HQ	Steve.allen@tn.gov 615-741-2208
	David H. Thompson	TDOT	david.H.Thompson@tn.gov
	Bob Allen	TDOT	Bob.allen@tn.gov 615-253-2468

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	Mwafaq Mohammed	TDOT	Mwafaq.mohammed@tn.gov 615-253-2454
<i>RC</i>	Ron Campbell	TDOT	ron.campbell@tn.gov 865-594-2416
	Dexter Justis	TDOT	dexter.justis@tn.gov 865-594-4539
	Keven Brown	TDOT	keven.brown@tn.gov 865-594-2437
	Jeff Horton <i>Thomas ISAACS</i>	TDEC	<i>tom. isaacs</i> jeff.horton@tn.gov 423-854-5400
	Tom Foley	TDOT-Utility	tom.foley@tn.gov
	Oliver Farris	TDOT-ROW	oliver.farris@tn.gov
	LeighAnn Tribble	FHWA	Leighann.tribble@dot.gov 615-781-5760
<i>DMF</i>	Dawn Michelle Foster	Wilbur Smith Associates	dfoster@wilbursmith.com 865-963-4300
	<del>Chris Kirby</del>	Wilbur Smith Associates	<del>ckirby@wilbursmith.com</del> 865-963-4300
<i>hb</i>	Hollis Loveday	Wilbur Smith Associates	hloveday@wilbursmith.com 865-963-4300
<i>CC</i>	Chris Craig	FTDD RPO	ccraig@ftdd.org 423-722-5091
	Don Lewis	City of Erwin Mayor	cityoferwin@comcast.net 423-743-6231
<i>EG</i>	Greg Lynch	Unicoi County Mayor	mayorgreglynch@yahoo.com

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	George Jaynes	Washington County Mayor	washco@naxs.net
<i>JAD</i>	John Deakins	Washington County Highway Department	washingtoncohighway@embarqmail.com 423-753-1714
	Glenn Rosenoff	TDOT Local Planning Assistance Office	Glenn.rosenoff@tn.gov 423-434-6476
	Charles Anderson	TDOT Local Planning Assistance Office	Charles.anderson@tn.gov
	Dan Gibbs	TWRA	dan.gibbs@tn.gov 423-587-7037
	Lee Brown	Erwin Utilities	lhbrown@erwinutilities.com 423-743-1823
<i>SL</i>	Steve Lockner	Erwin Utilities	423-743-1823
	Doris Hensley	Unicoi County EDB	ddh6090@embarqmail.com
	Terry Haynes	Unicoi County Highway Superintendent	423-743-6171
<i>BB</i>	Bob Browning	Jonesborough Town Administrator	bob@jonesboroughtn.org 423-753-1031
	Homer G'Fellers	Johnson City Power Board	423-952-5040

STATE ROUTE 81 TPR  
MEETING/FIELD REVIEW  
THURSDAY, AUGUST 6, 2009  
10:00 AM (EST)  
SIGN-IN SHEET

771-

INITIALS	NAME	ORGANIZATION	CONTACT INFORMATION EMAIL/PHONE
	Steve Ferrell	First Tennessee HRA	sferrell@fthra.org 423-928-4572
	Tim Whitson	Unicoi County Gas Utility District	twhitson@ucgud.com 423-743-6793
	Amanda Bennett	Union County Chamber of Commerce	amanda@unicoicounty.org
	Tim Lingerfelt	Union County Chamber of Commerce	timlingerfelt@yahoo.com
RT	Randy Trivette	Erwin Town Recorder	rtrivette@comcast.net 423-743-6231
Bit	Brandon Horne	Johnson City Power Board	Brandon_horne@jcpb.com 423-952-5000
	Mark Eades	Johnson City Power Board	meades@jcpb.com 423-952-5000
	Mike McCracken	Jonesborough Water Dept.	423-753-1003 Mike M@Jonesborough Tr. Org
	Ben Grizzle	Jonesborough Water Dept	bengrizzle@embermail.com
	Glenn Berry	Johnson City MPO	glennberry@JcMPO.org
	Nes Levetch	Washington Co. EMA	nesema@earthlink.net
	LAVNA KOEHL	TDOT DESIGN P	LAVNA.KOEH@TN.GOV
	Glenda Tyus	TDOT - Project Planning	Glenda.Tyus@tn.gov
	Stacy Weaver	TDOT Design Reg. 1	Stacy.weaver@tn.gov



State Route 81, Unicoi County  
Transportation Planning Report

**Project Description**

Project Termini: From Interstate 26 to State Route 107 (Washington County)  
Segment A- State Route 81 from I-26 to Washington County Line (2.55 Miles)  
Segment B-State Route 81 from Unicoi County Line to SR-107 (4.30 Miles)  
Total Project Length: Approximately 6.55 miles

The First Tennessee RPO recommended improvements to SR-81, an arterial that extends from I-26 (Unicoi County) to State Route 107 (Washington County)  
-- See attached maps.

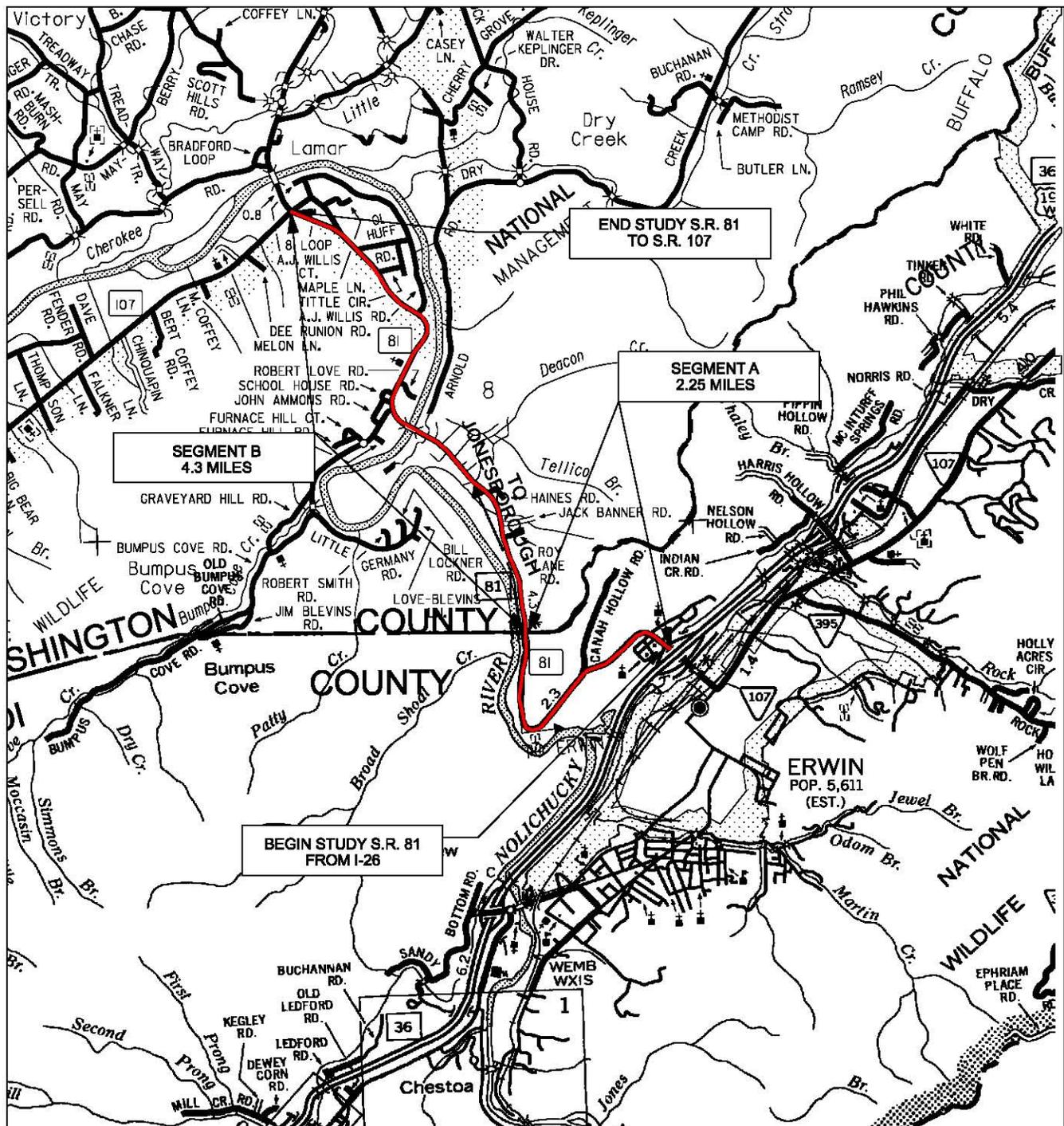
This section of State Route 81 is a major connector to Interstate 26 for traffic traveling on SR-107 through Greene County. In recent years, there has been an increase in truck traffic, particularly on Interstate 81 within the Greeneville area since Interstate 26 was completed to North Carolina. It is anticipated that the truck traffic will continue to increase on this route. The potential increase in truck traffic causes concerns with area residents. The entire route consists of a narrow two-lane roadway with excessive curves and grade changes.

The study corridor is divided into sections based on logical termini or significant breaks in traffic conditions. Therefore, the TPR document will define the corridor in two segments:

- Segment A- (approximately 2.25 miles)- consists of two 10-foot paved lanes and 1-foot shoulders over most of its length, as well as 50 feet of right-of-way.
- Segment B- (approximately 4.30 miles)- consists of two 10-foot to 12-foot lanes, 1-foot to 10 foot shoulders, as well as 50-feet to 100 feet of right-of-way.

A capacity analysis of the project corridor indicated that both Segment A and Segment B within the primary study corridor demonstrated near term capacity deficiency (i.e., congestion) within the 25 year planning horizon.

The overall objective of this study is to improve the safety for motorists utilizing State 81 and potentially maximize economic development opportunities in this heavily rural area of Unicoi and Washington Counties.



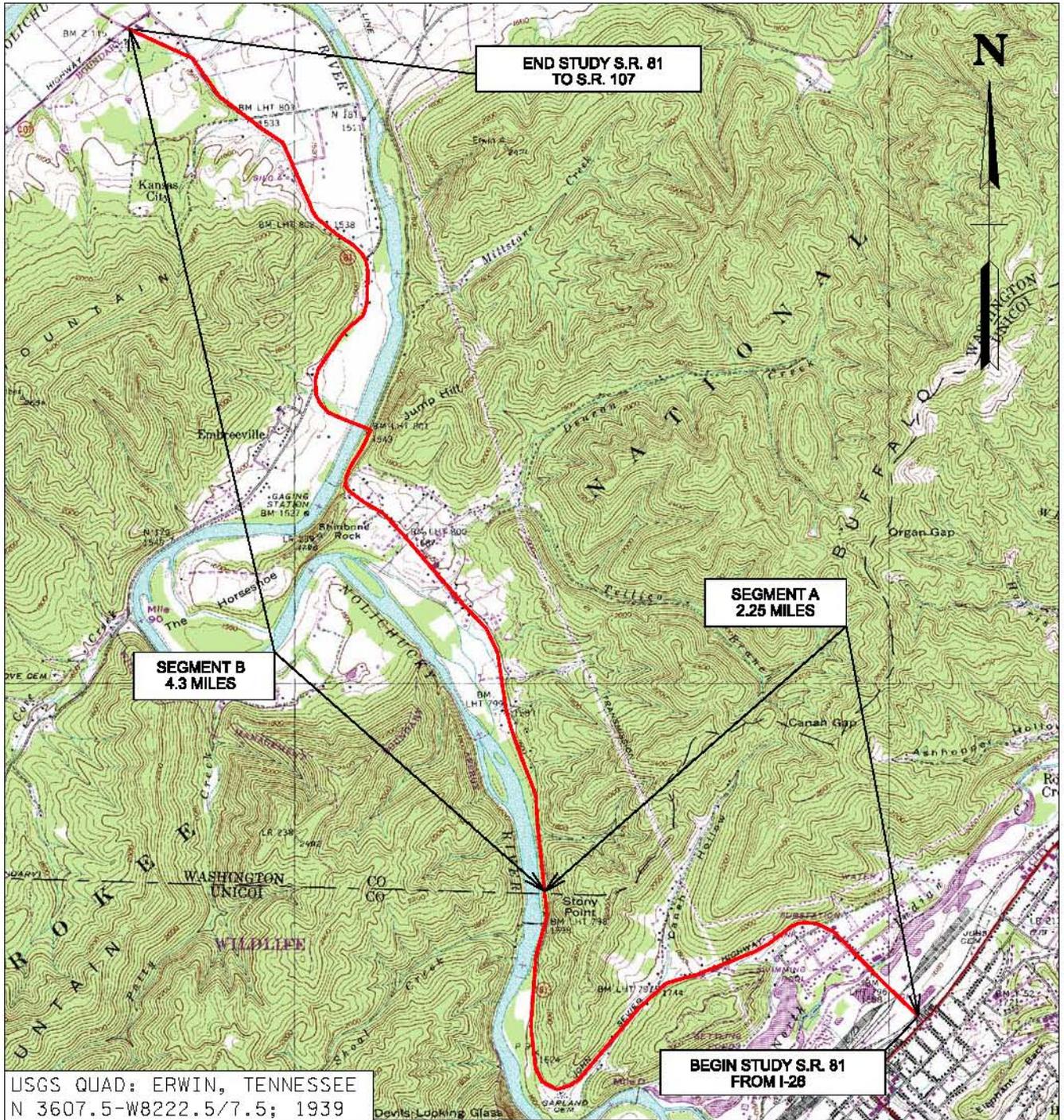
**STUDY LOCATION MAP  
STATE ROUTE 81  
FROM INTERSTATE 26  
TO STATE ROUTE 107  
UNICOI AND WASHINGTON COUNTIES**



0 6000 12000 18000



**FIGURE 2**



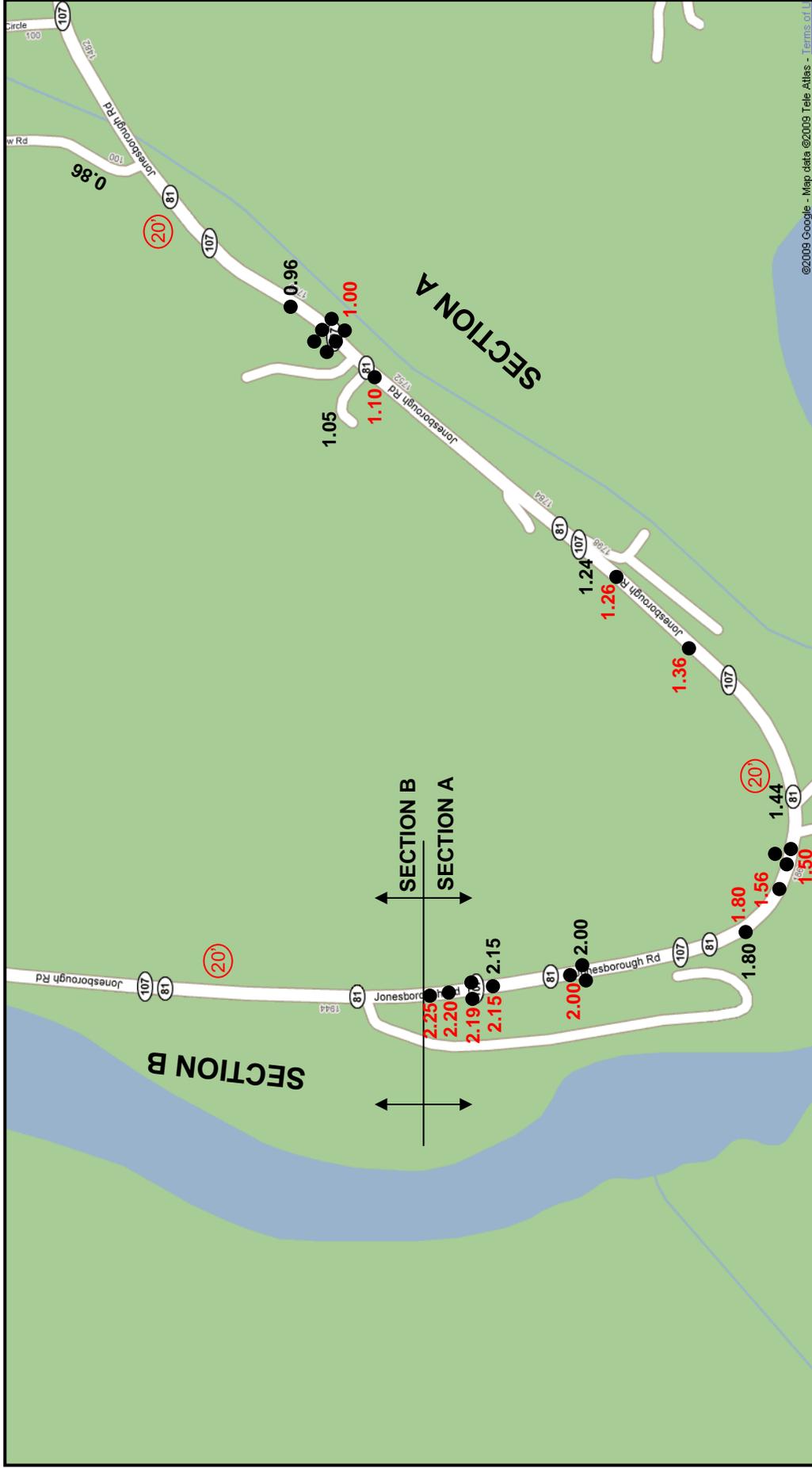
**STUDY AREA TOPOGRAPHY  
STATE ROUTE 81  
FROM INTERSTATE 26  
TO STATE ROUTE 107  
UNICOI AND WASHINGTON COUNTIES**



**FIGURE 3**



# STATE ROUTE 81 TPR CRASH LOCATIONS



## LEGEND

- (20) ROAD WIDTH
- 0.77 LOG MILE OF INTERSECTING STREET OR ROAD SEGMENT
- CRASH LOCATION
- 0.20 LOG MILE OF CRASH



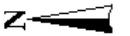
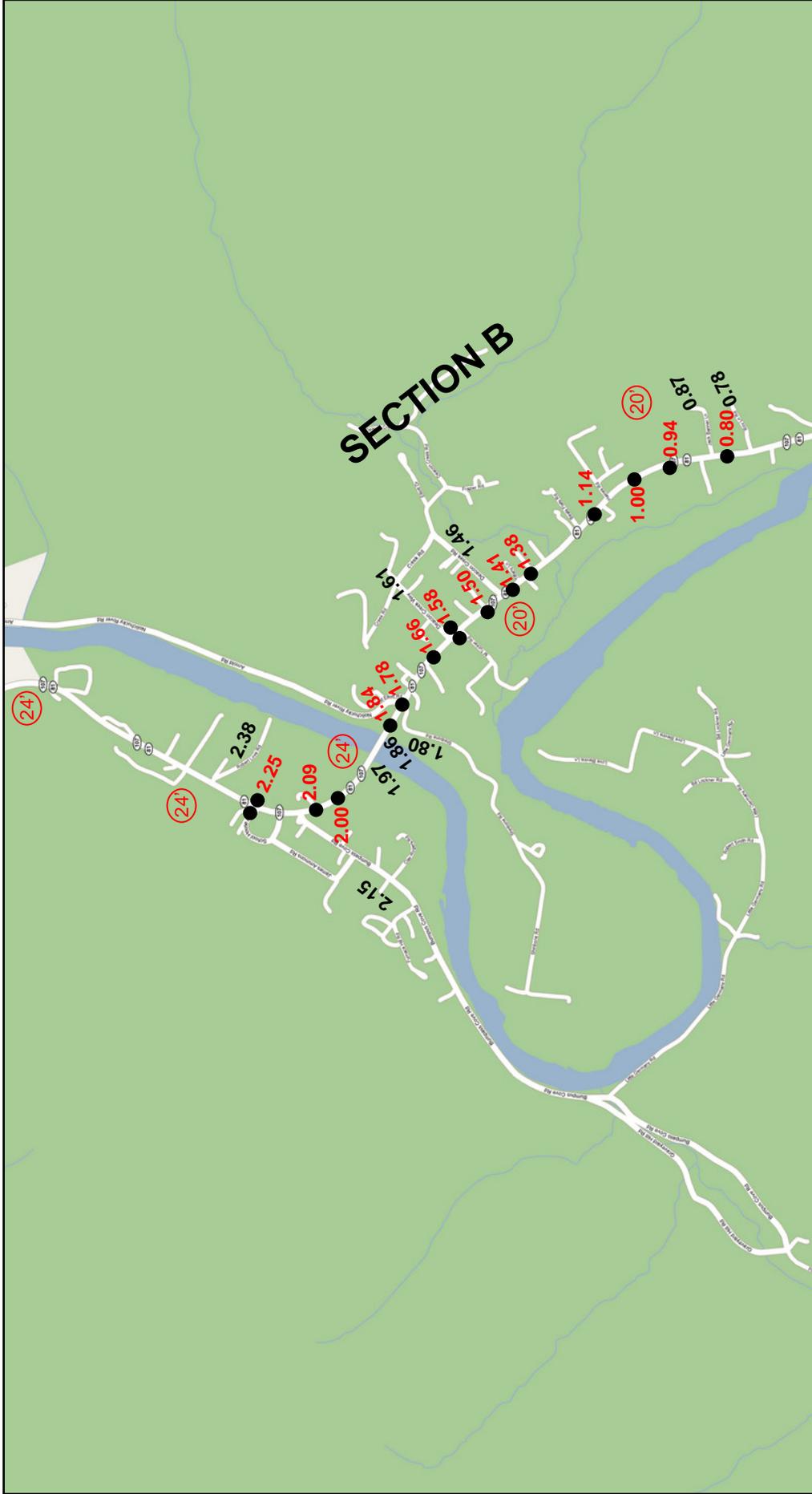
# STATE ROUTE 81 TPR CRASH LOCATIONS



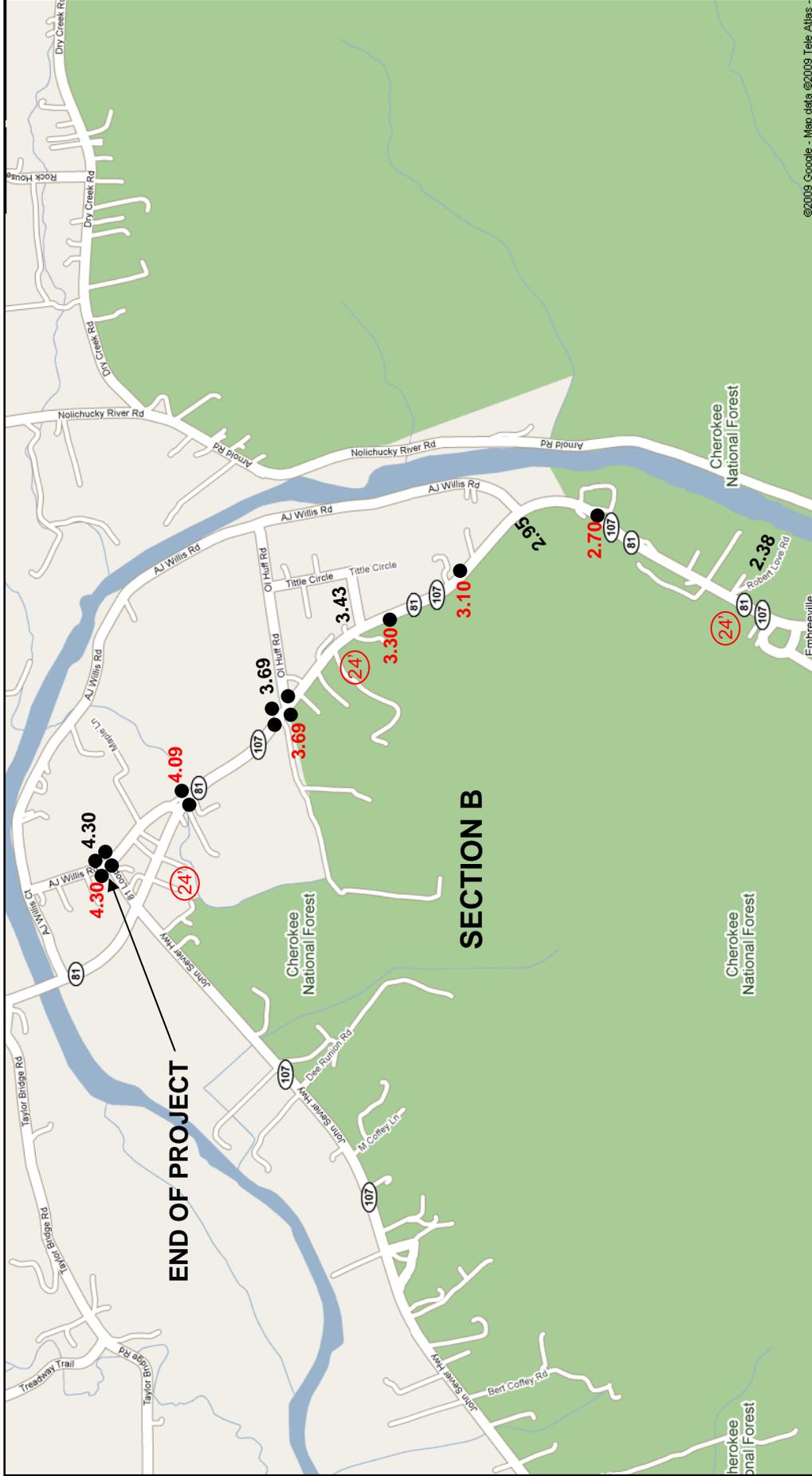
## LEGEND

- 20 ROAD WIDTH
- 0.77 LOG MILE OF INTERSECTING STREET OR ROAD SEGMENT
- CRASH LOCATION
- 0.20 LOG MILE OF CRASH

# STATE ROUTE 81 TPR CRASH LOCATIONS



# STATE ROUTE 81 TPR CRASH LOCATIONS



## LEGEND

- 20 ROAD WIDTH
- 0.77 LOG MILE OF INTERSECTING STREET OR ROAD SEGMENT
- CRASH LOCATION
- 0.20 LOG MILE OF CRASH





**Tennessee Department of Transportation**  
**EARLY ENVIRONMENTAL SCREENING PROCESS (EES)**  
**PROJECT SCORING**

**Project Score Factors**

	Total Impacts Evaluated	Total Impacts to Evaluate	EES Evaluation
<b>Project Impact Areas:</b>	<b>15</b>	<b>15</b>	<b>Complete</b>
<b>Date of Evaluation:</b>	June 18, 2009		
<b>Evaluation done by:</b>	Gena Gilliam		
	Transportation Planner 3		
<b>County:</b>	Unicoi, Washington		
<b>Route:</b>	State Route 81		
<b>PIN:</b>	112470.00		
<b>Termini:</b>	from Interstate 26 to State Route 107		

Impact Ranking of Features Evaluated:	Total by Rank
<b>Features with No Impact</b>	<b>6</b>
National Register Sites	
Aquatic Species	
TDEC Conservation Sites & TDEC Scenic Waterways	
Caves	
Railroads	
Tennessee Natural Areas Program	
<b>Features with Low Impact</b>	<b>2</b>
Cemetery Sites & Cemetery Properties	
Wildlife Management Areas	
<b>Features with Moderate Impact</b>	<b>4</b>
Terrestrial Species	
Superfund Sites	

Pyritic Rock

TWRA Lakes & Other Public Lands

**Features with Substantial Impact**

**2**

Bat

Large Wetland Impacts

**Community Impacts Present:**

**Institutions:**

Church

**Populations:**

No population present

**EES Project Impact:**

**Complete**

## Impacts Evaluated Within 1,000 Ft of Study Area

### CEMETERY SITES & CEMETERY PROPERTIES

**Impact**

<b>Project Impact (Environmental, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Low</b> - Low impact on the project is anticipated as there is a cemetery abutting the project study area or corridor. It is anticipated that a 'normal' effort will be required to complete this environmental review as part of NEPA.
--	--

### INSTITUTIONS & SENSITIVE COMMUNITY POPULATIONS

**Sensitive Populations Project Impact:**

**Present**

**Not Present**

<b>Institutions:</b>		
Hospital	<input type="checkbox"/>	<input checked="" type="checkbox"/>
School	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Church	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Public Building	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Populations:</b>		
No population present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
65 and older populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disability populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Households without a vehicle	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minority populations 24%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Linguistically isolated populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Populations below poverty - State average - 13%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Populations below poverty - State average - 27%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## BAT

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Substantial</b> - A substantial impact on the project is probable as there is a known occurrence of Indiana or gray bats within 4 miles of the proposed transportation study area or corridor. It is anticipated that: a) avoidance/minimization of potential impacts to species will be needed, b) surveys for the species for the project may be required, c) coordination with USFWS and establish Section 7 biological conclusions for the project will be needed, and d) seasonal construction limitations will likely be necessary.
--	--

## RAILROADS

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – No impact on the project is anticipated. There are no railroads located within the project study area or corridor.
--	--

## Impacts Evaluated Within 2,000 Ft of Study Area

## NATIONAL REGISTER SITES

### Impact

<b>Project Impact (Environmental, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – No project impact is anticipated as there are no National Register listed properties abutting or within the project study area or corridor.
--	---

## SUPERFUND SITES

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Moderate</b> – Medium impact on the project as there is a known contaminated land tracts within the project study area or corridor. It is possible to avoid and minimize a taking of the contaminated tract(s) through more detailed design of the project.
--	--

## PYRITIC ROCK

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Moderate</b> – Medium project impact is anticipated in the project study area or corridor. Formations that may contain acid producing rock (symbolized as orange or pink in color) are anticipated in small quantities. A greater than normal design is anticipated to perform geotechnical studies and analysis and design (i.e., containment measures and minimize disturbance/ movement of pyritic rock during construction). More effort is likely needed to: identify additional right of way to 'waste' material, secure permits, and design project blending of pyritic materials. Minimal long term efforts are anticipated to ensure performance of containment measures.
--	---

## TWRA LAKES & OTHER PUBLIC LANDS

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Moderate</b> – Medium impact on the project is anticipated as a park lies with the project study area or corridor. It is possible to locate the proposed transportation project in such a way that it avoids any impacts or taking of the park property. A moderate level of effort and time will be required to resolve the project’s environmental impact on the park and to move forward with project development. Additional design may be needed to locate the proposed transportation project in such a way that it avoids any impact or takings of the park property. Indirect impacts (audible and visual) to the park may occur and need to be studied. If there is indirect impact, additional design would be needed to design the appropriate mitigation measures.
--	---

## Impacts Evaluated Within 4,000 Ft of Study Area

### TERRESTRIAL SPECIES

#### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Moderate</b> – Medium impact on the project is likely as there is a known federally-protected terrestrial species or a state protected species with a status of threatened or endangered located within the project study area or corridor, and it is possible to avoid any impacts to the species with additional design. Additional alternatives will likely eliminate impacts to the species. Additional design alternatives and minimizations may be required if additional populations are found during required field surveys.
--	---

### TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

#### Impact

<b>Project Impact (Environment, Time, Cost, Design, Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – No project impact is expected as there are no scenic waterways or TDEC Conservation Sites within project study area or corridor.
--	--

### LARGE WETLAND IMPACTS

#### Impact

<b>Project Impact (Environment, Time, Cost, Design, Maintenance)</b>	<input checked="" type="checkbox"/> <b>Substantial</b> – Regions 1, 2, and 3: A substantial impact to the project is probable as there is greater than 2 acres of wetlands within the project study area or corridor. Compensatory mitigation will be required. Design effort will be needed to avoid and minimize impacts to wetlands to the maximum extent practicable. If a floodplain is crossed by the project, floodplain culverts may be necessary.
--	--

### TENNESSEE NATURAL AREAS PROGRAM

#### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – No impact on the project is anticipated as the project study area or corridor does not include a Natural Area.
--	--

## WILDLIFE MANAGEMENT AREAS

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Low</b> – Minimal impact on the project is anticipated as a WMA is located within the project study area or corridor. However, there is the potential to avoid any takings or impacts to the WMA through more detailed location and design of the proposed transportation project. With additional effort to locate and design the project, there will be no impacts to the WMA.
--	---

## Impacts Evaluated Within 10,000 Ft of Study Area

## AQUATIC SPECIES

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> - No impact to the project is anticipated. There is no known occurrence of a rare, state, or federally-protected aquatic species within the project study area or corridor.
--	---

## CAVES

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – No project impact is anticipated as there are no caves in the project study area or corridor.
--	---

## EES Report

PIN 112470.00

1,000 Foot Corridor

Study Line ID: 112470\_9001V01

Version Date: June 11, 2009

Created by: Gilliam

---

### Cemetery Sites & Cemetery Properties

Cemetery Sites	<u>Total=</u> 1
Garland Cemetery	
Cemetery Property	None were found

### Institutions & Sensitive Community Populations

Institutions:	<u>Total=</u> 2
Church	Embreeville Cove Baptist Churc
Church	Embreeville United Methodist C

#### Populations:

No population present	Present
65 & older populations	None were found
Disability populations	None were found
Households without a vehicle	None were found
Minority populations 24%	None were found
Linguistically isolated populations	None were found
Populations below poverty-State average-13%	None were found
Populations below poverty-State average-27%	None were found

Bat	<u>Total=</u> 1	USES	SPROT
Myotis grisescens		LE	E

Railroads	None were found
-----------	-----------------

## EES Report

PIN 112470.00  
2,000 Foot Corridor

Study Line ID: 112470\_9001V01  
Version Date: June 11, 2009  
Created by: Gilliam

---

National Register Sites None were found

Superfund Sites Total= 1  
HOOVER PRECISION

Pyritic Rock Classification Total= 9

**Dolomite**

Honaker Dolomite

Shady Dolomite

Knox Group

Shady Dolomite

**May Contain Potentially Acid Producing Rock**

Hampton Formation

Unicoi Formation

Unicoi Formation

Unicoi Formation

Hampton Formation

**TWRA Lakes & Other Public Lands**

TWRA Lakes None were found

Other Public Lands Total= 1

North Cherokee NF

## EES Report

PIN 112470.00  
4,000 Foot Corridor

Study Line ID: 112470\_9001V01  
Version Date: June 11, 2009  
Created by: Gilliam

---

Terrestrial Species	<u>Total=</u> 5	USES A	SPROT
Trillium rugelii			E
Trillium rugelii			E
Heracleum maximum			S
Diervilla sessilifolia var. rivularis			T
Buckleya distichophylla			T

### TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites	None were found
TDEC Scenic Waterways	None were found

### Large Wetland Impacts

Total Acreage= 106.41

R3UBH	106.41	acres
-------	--------	-------

Tennessee Natural Areas Program	None were found
---------------------------------	-----------------

Wildlife Management Areas	<u>Total=</u> 1
North Cherokee NF & WMA	

## EES Report

PIN 112470.00  
10,000 Foot Corridor

Study Line ID: 112470\_9001V01  
Version Date: June 11, 2009  
Created by: Gilliam

---

*Aquatic Species*

None were found

*Caves*

None were found

**DATA TABLES**  
**(SEGMENT A and SEGMENT B)**

DATA TABLE-SR 81 (Segment A)

From: I-26  
 To: Unicoi/Washington Co. Line

<u>Item</u>	<u>Existing</u>	<u>Proposed</u>
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles	2.25	2.25
Cross Section Feet	18'/50'	48'/100'
Present ADT(2008)		4,900
Projected Future ADT(2033)		5,600
Percent Trucks		2
Estimated Right-of-Way Acquisition (Acres)		46.6 Acres
Estimated Right-of-Way Tracts Affected		22
Estimated Family Displacements		10
Estimated Business Displacements		3
Estimated Right-of-Way Cost	\$	2,432,000.00
Estimated Utility Cost Reimbursable	\$	0
Estimated Utility Cost Non-Reimbursable	\$	672,000.00
Estimated Construction Cost	\$	29,547,000.00
Estimated Preliminary Engineering Cost	\$	2,686,000.00
Total Estimated Section Cost	\$	35,337,000.00

DATA TABLE-S.R. 81 (Segment B)

From: Unicoi/Washington Co. Line  
 To: S.R 107

<u>Item</u>	<u>Existing</u>	<u>Proposed</u>
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles	1.84	1.84
Cross Section Feet	20'/50'	48'/100'
Present ADT(2008)		4,900
Projected Future ADT(2033)		5,600
Percent Trucks		2
Estimated Right-of-Way Acquisition (Acres)		26.4 Acres
Estimated Right-of-Way Tracts Affected		27
Estimated Family Displacements		6
Estimated Business Displacements		1
Estimated Right-of-Way Cost	\$	1,351,000.00
Estimated Utility Cost Reimbursable	\$	0
Estimated Utility Cost Non-Reimbursable	\$	1,050,000.00
Estimated Construction Cost	\$	11,445,000.00
Estimated Preliminary Engineering Cost	\$	1,040,500.00
Total Estimated Section Cost	\$	14,886,500.00

**PRELIMINARY COST ESTIMATES**



**PRELIMINARY COST ESTIMATES  
(SEGMENT A and SEGMENT B)**



**PROJECT COST SHEET**  
**S. R. 81 (Segment B)**

Section: Segment B (From Unicoi/Washington County Line to State Route 107)  
Length: 1.84 Miles (section of recommended improvements); 4.30 miles total length

Right-of-Way

Land, (26.4acres)Res=25.4 Bus=1.0-----	\$ 1,151,000
Improvements-----	\$
Damages-----	\$
Incidentals-----	\$
Relocation Payments ( 6 residences)-----	\$ 150,000
( 1 business & farm)-----	\$ 50,000
( 0 non-profits)-----	\$ 0
 Total Right-of-Way Cost-----	 <b>\$ 1,351,000.00</b>

Utility Relocation

Reimbursable-----	\$ 0
Non-reimbursable-----	\$ <u>1,050,000</u>
 Total Adjustment Cost-----	 <b>\$ 1,050,000.00</b>

Construction

Clear and Grubbing-----	\$ 95,000
Earthwork-----	\$ 6,220,000
Pavement Removal-----	\$ 40,000
Drainage (Includes Erosion Control)-----	\$ 181,550
Structures(Box Culverts)-----	\$ 80,000
Structures (Bridge Over Deacon Creek)-----	\$ 525,000
Paving-----	\$ 1,143,100
Retaining Walls-----	\$ 120,000
Maintenance of Traffic-----	\$ 92,000
Topsoil-----	\$ 27,400
Seeding-----	\$ 19,000
Sodding-----	\$ 12,900
Signing-----	\$ 9,200
Lighting-----	\$ 0
Signalization-----	\$ 0
Fence-----	\$ 40,000
Guardrail-----	\$ 85,800
Rip Rap or Slope Protection-----	\$ 40,000
Other Construction Items(8.5%)-----	\$ 805,500
Mobilization-----	\$ 282,500
Construction Cost-----	\$ 9,806,000
10% Eng. And Cont.-----	\$ 981,000
Total Construction Cost-----	<b>\$ 10,787,000</b>
Preliminary Engineering (10%)-----	<b>\$ 1,080,000</b>

\*Total Cost-----**\$ 11,867,000**

**\*For estimating future project costs, a compounded inflation rate of 10% will be applied.**

## **DESIGN CRITERIA**

**TENNESSEE DEPARTMENT OF TRANSPORTATION**  
**DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE**

<b>ROUTE:</b>	STATE ROUTE 81	<b>ALTERNATE:</b>	
<b>SECTION:</b>	1	<b>REGION:</b>	
<b>COUNTY:</b>	UNICOI/WASHINGTON	<b>PROJECT #:</b>	

**LOCATION**

From:	I-26
To:	NOLICHUCKY RIVER

PARAMETER	CRITERIA
2009 ADT	4,900
2033 ADT	5,600
PERCENT TRUCKS(DHV)	2
DHV(10% ADT 2033)	560
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL
MINIMUM DESIGN SPEED	40 mph
ACCESS CONTROL	N/A
MAXIMUM CURVE	600'
MAXIMUM GRADE	8%
MINIMUM STOPPING DISTANCE	275'/325'
SURFACE WIDTH	48'
NUMBER OF LANES	2@12'
USABLE SHOULDER WIDTH	2@12' (10' stabilized)
MEDIAN WIDTH	N/A
MINIMUM RIGHT-OF-WAY	100'
SIGNALIZATION	N/A

REMARKS: Slope and/or construction easements may be required outside of the minimum Right-of-way.

**TENNESSEE DEPARTMENT OF TRANSPORTATION**  
**DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE**

<b>ROUTE:</b>	S. R.81	<b>ALTERNATE:</b>	
<b>SECTION:</b>		<b>REGION:</b>	
<b>COUNTY:</b>	UNICOI/WASHINGTON	<b>PROJECT #:</b>	

**LOCATION**

From:	S. R. 81
To:	ARNOLD ROAD

PARAMETER	CRITERIA
2008 ADT	4,900
2034 ADT	5,600
PERCENT TRUCKS(DHV)	2
DHV(10% ADT 2034)	560
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL
MINIMUM DESIGN SPEED	40 MPH
ACCESS CONTROL	N/A
MAXIMUM CURVE	600'
MAXIMUM GRADE	8%
MINIMUM STOPPING DISTANCE	275'/325'
SURFACE WIDTH	48"
NUMBER OF LANES	2 @ 12'
USABLE SHOULDER WIDTH	2 @ 12'
MEDIAN WIDTH	12' (FLUSH)
MINIMUM RIGHT-OF-WAY	100'
SIGNALIZATION	

**REMARKS: Slope and/or construction easements may be required outside of the minimum Right-of-way.**

## **CONCEPTUAL LAYOUT**

TENNESSEE D.O.T.  
DESIGN DIVISION  
FILE NO.

Index Of Sheets  
TYPICAL SECTION SHEET  
PLAN SHEETS

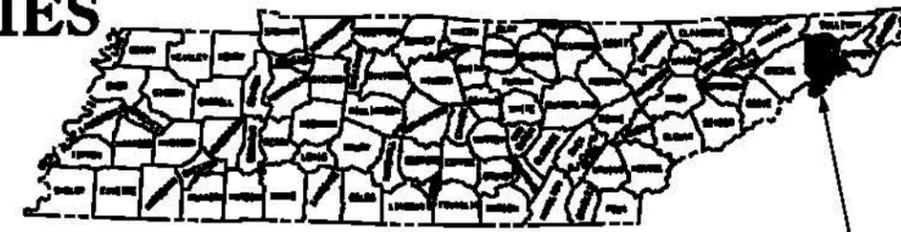
STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING

TENN.	YEAR	SHEET NO.
	2010	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

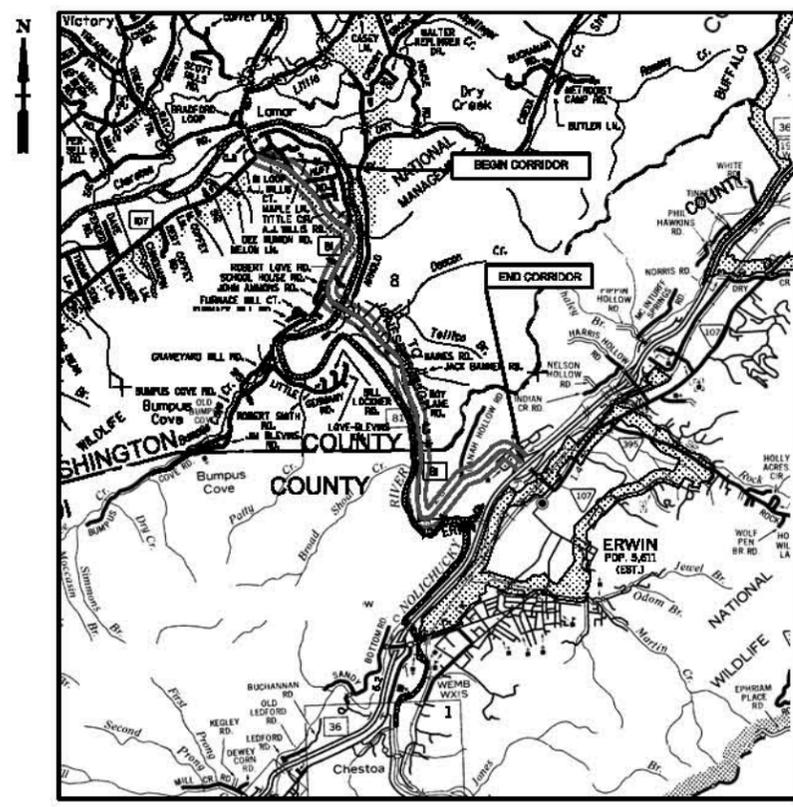
**UNICOI - WASHINGTON COUNTIES**

STATE ROUTE 81  
FROM INTERSTATE 26 TO  
STATE ROUTE 107  
CORRIDOR PLANS

STATE HIGHWAY NO. F.A.H.S. NO.



PROJECT LOCATION



**SPECIAL NOTES**

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 2006 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT.

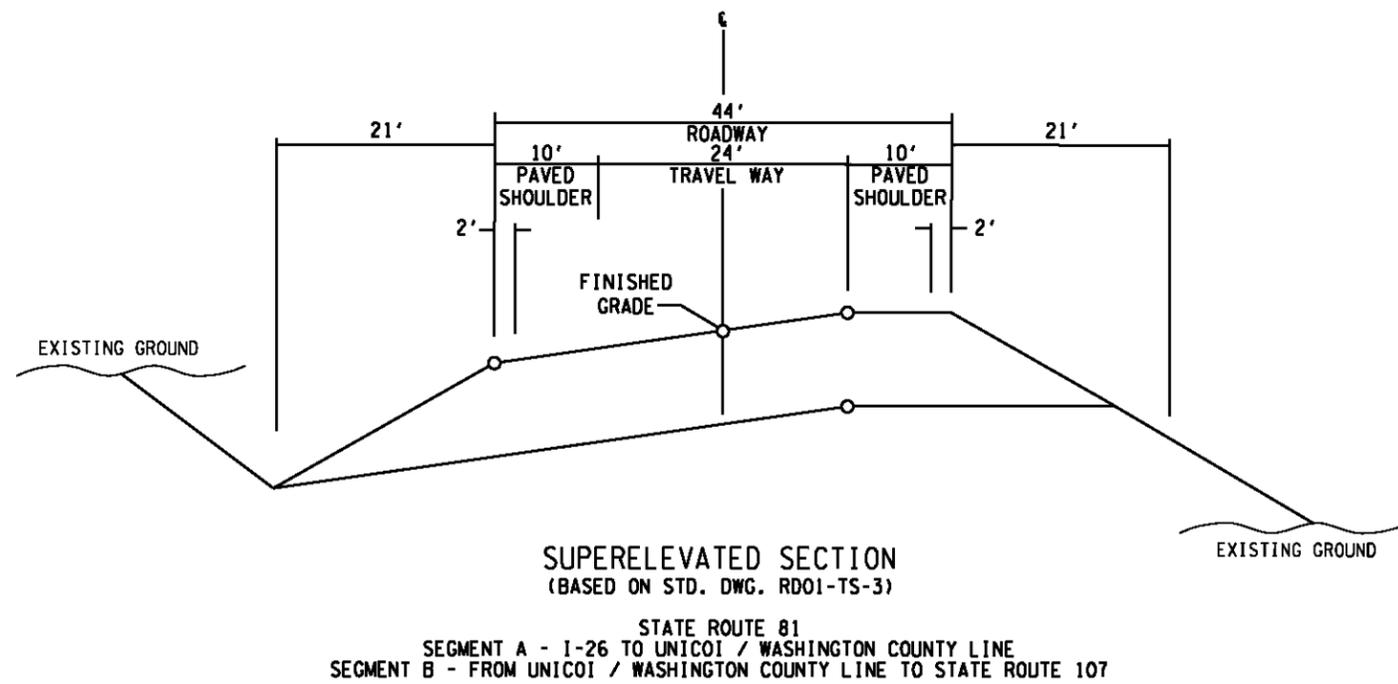
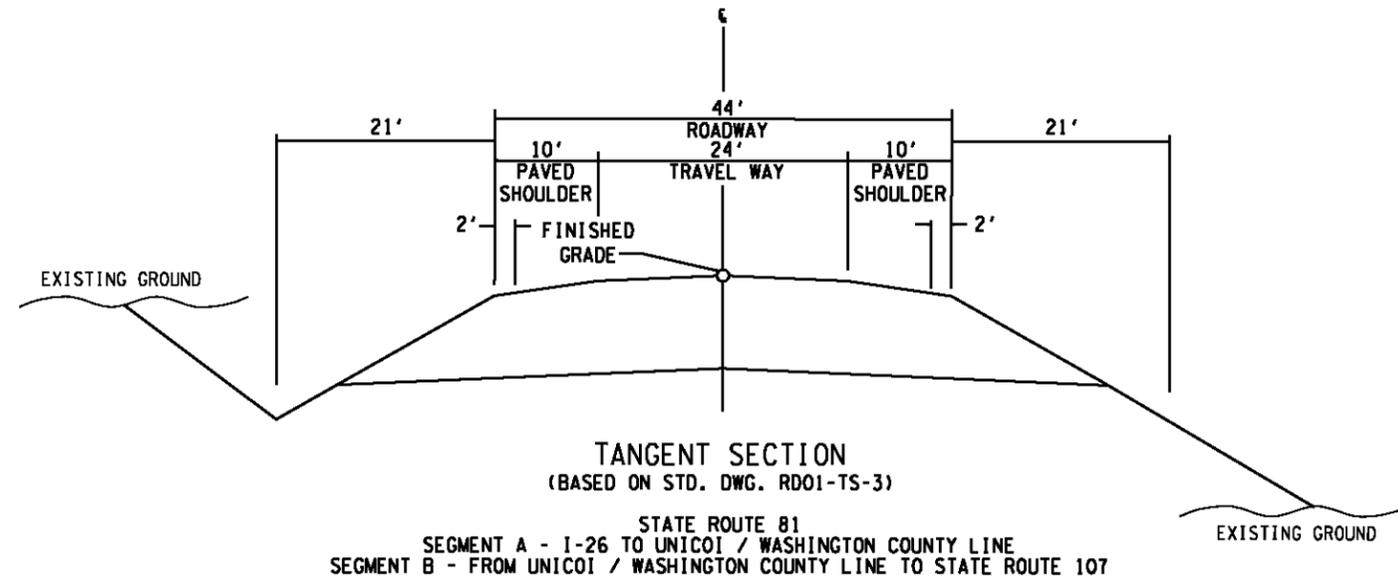
TDOT C.E. MANAGER 1 OR  
TDOT DESIGN MANAGER 1  
TDOT ROAD SP. SV. 2  
DESIGNED BY \_\_\_\_\_ CHECKED BY \_\_\_\_\_  
P.E. NO. \_\_\_\_\_  
PIN NO. \_\_\_\_\_

APPROVED: \_\_\_\_\_  
CHIEF ENGINEER  
DATE: \_\_\_\_\_  
APPROVED: \_\_\_\_\_  
COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
APPROVED: \_\_\_\_\_  
DIVISION ADMINISTRATOR DATE

DESIGNED BY: \_\_\_\_\_

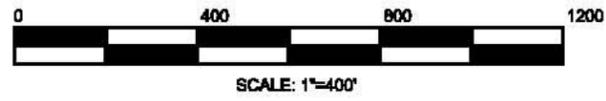
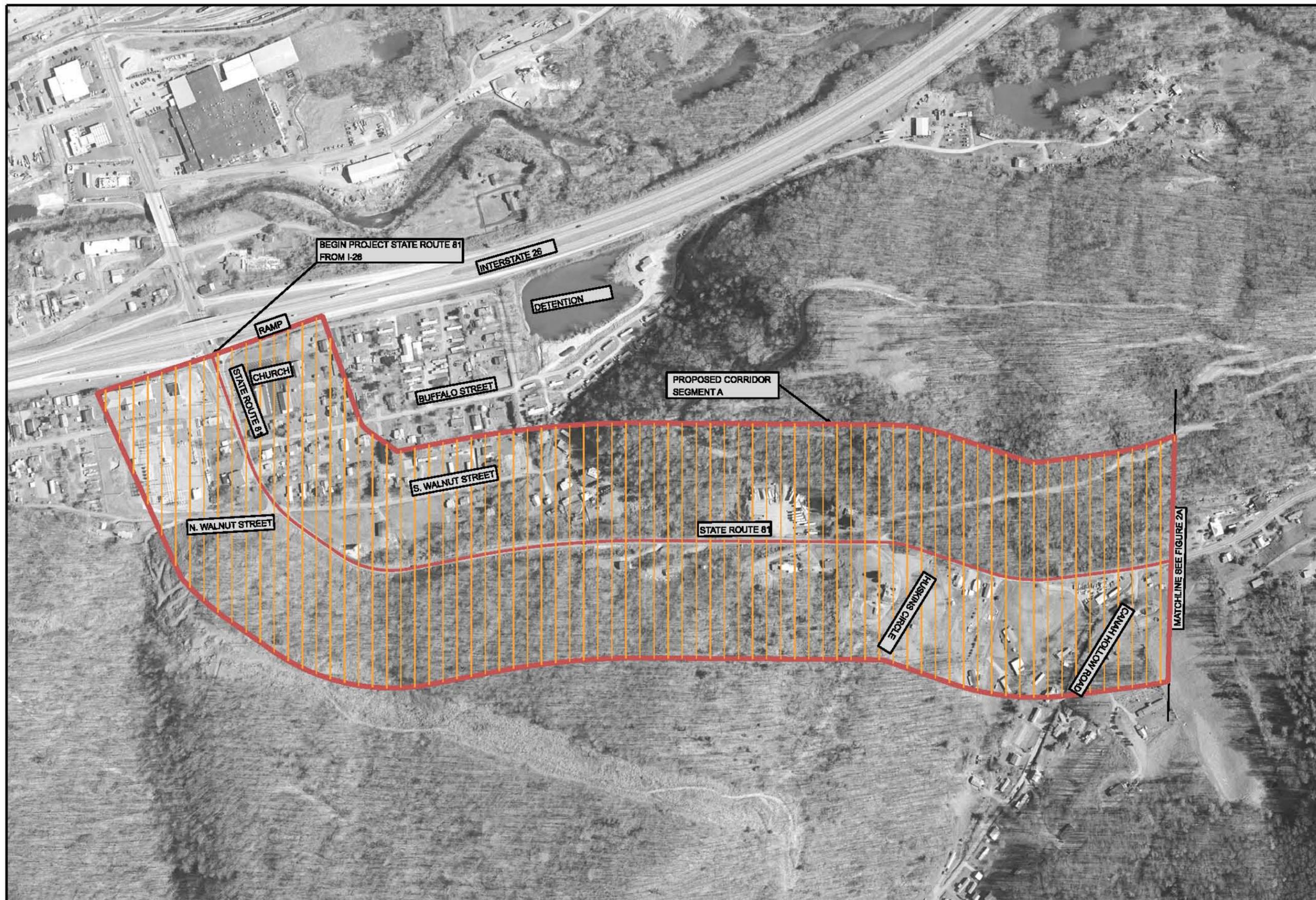
TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

**TYPICAL  
 SECTIONS**

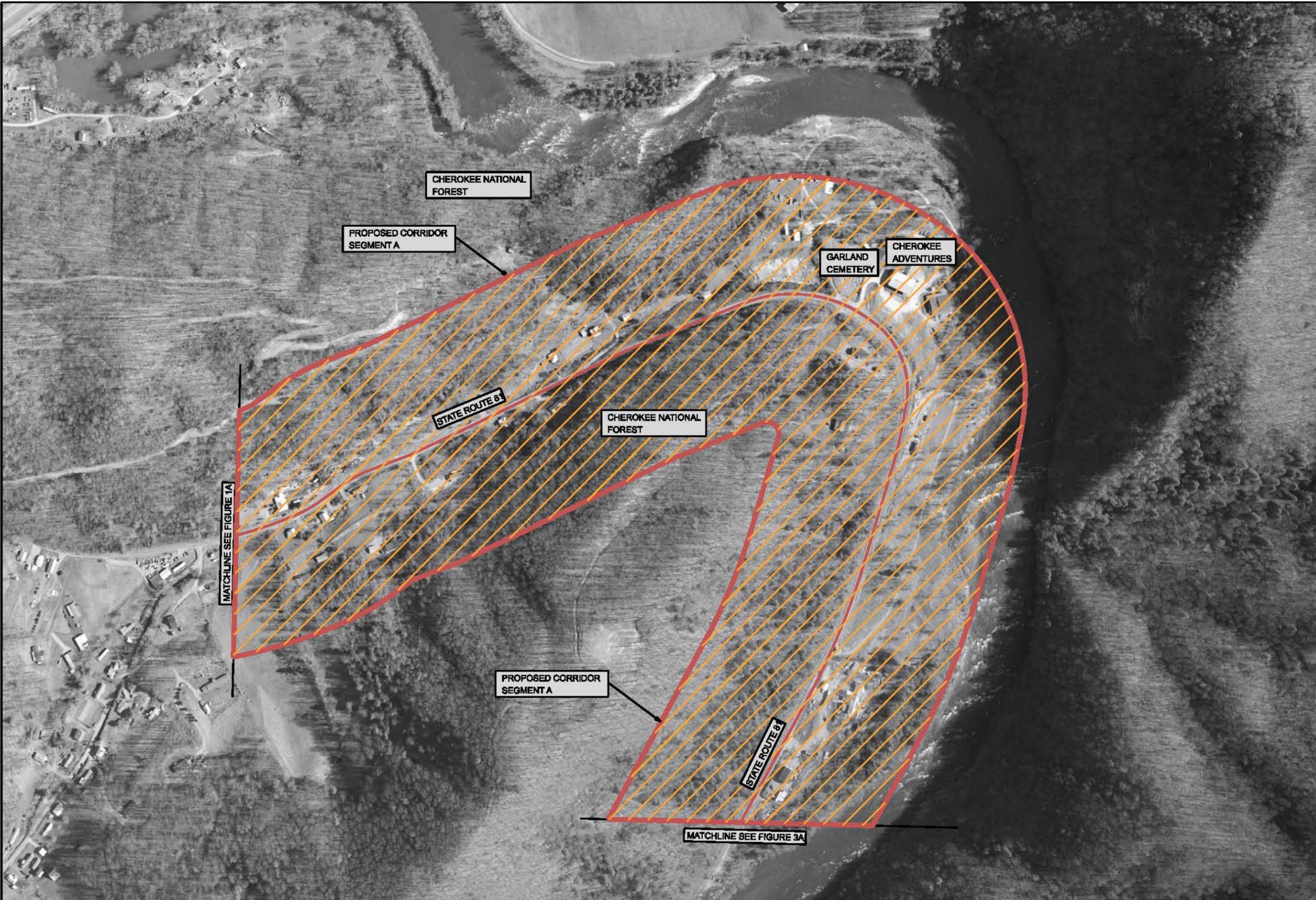
DATE	YEAR	PROJECT NO.	SHEET NO.
WPR	2010		1A



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
FIGURE 1A

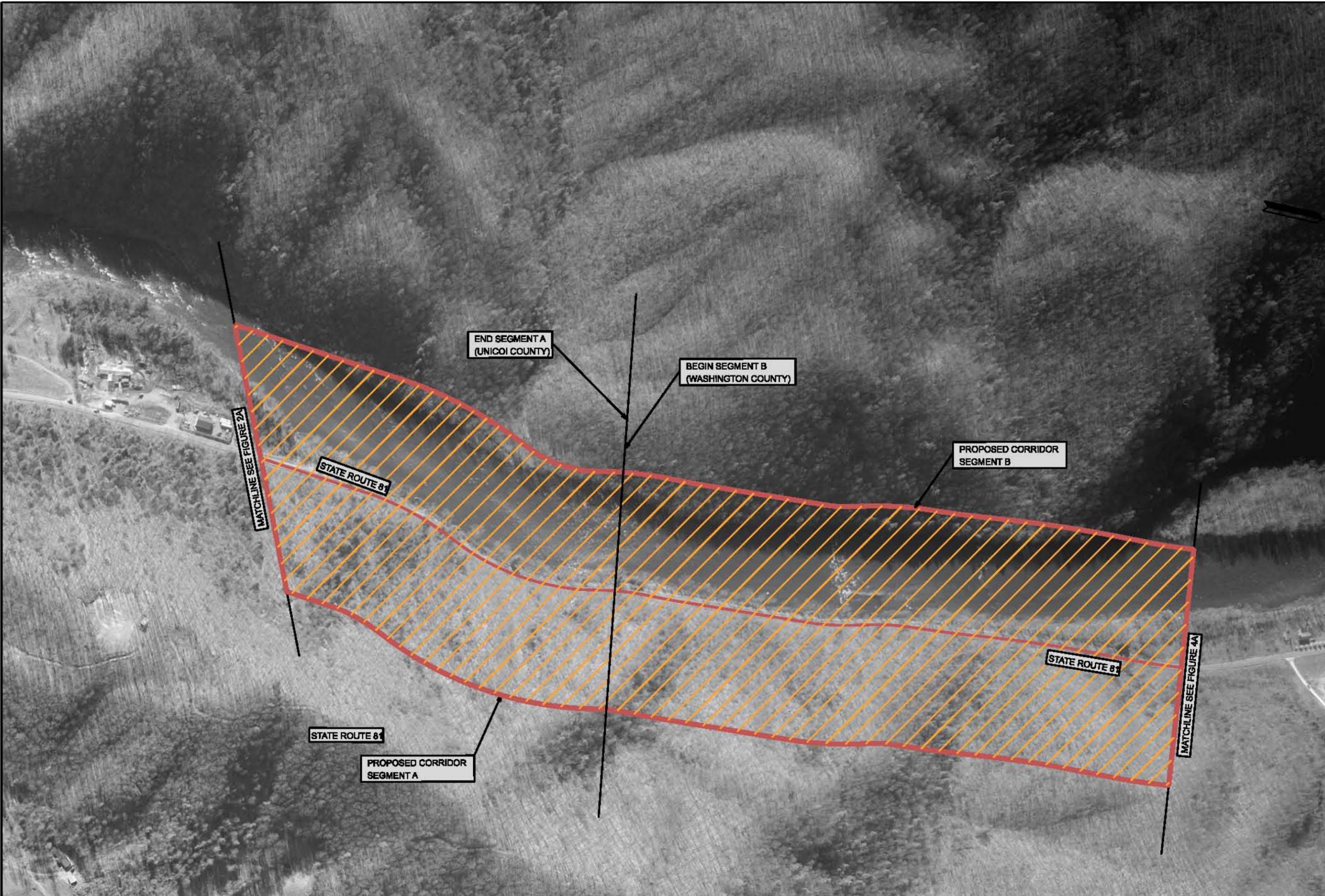
FILE	YEAR	PROJECT NO.	SHEET NO.
TFR	2010		2



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
 FIGURE 2A

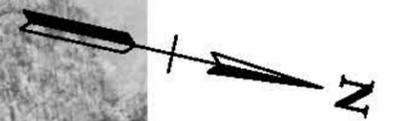
DATE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		3



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
 FIGURE 3A

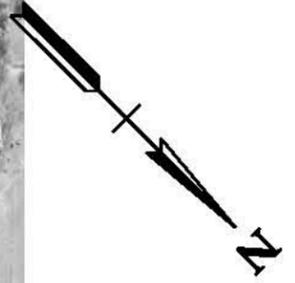
TYPE	YEAR	PROJECT NO.	SHEET NO.
SPR	2010		4



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
 FIGURE 4A

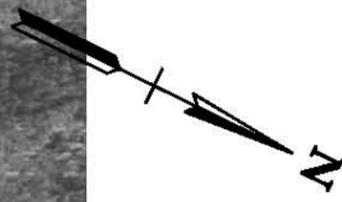
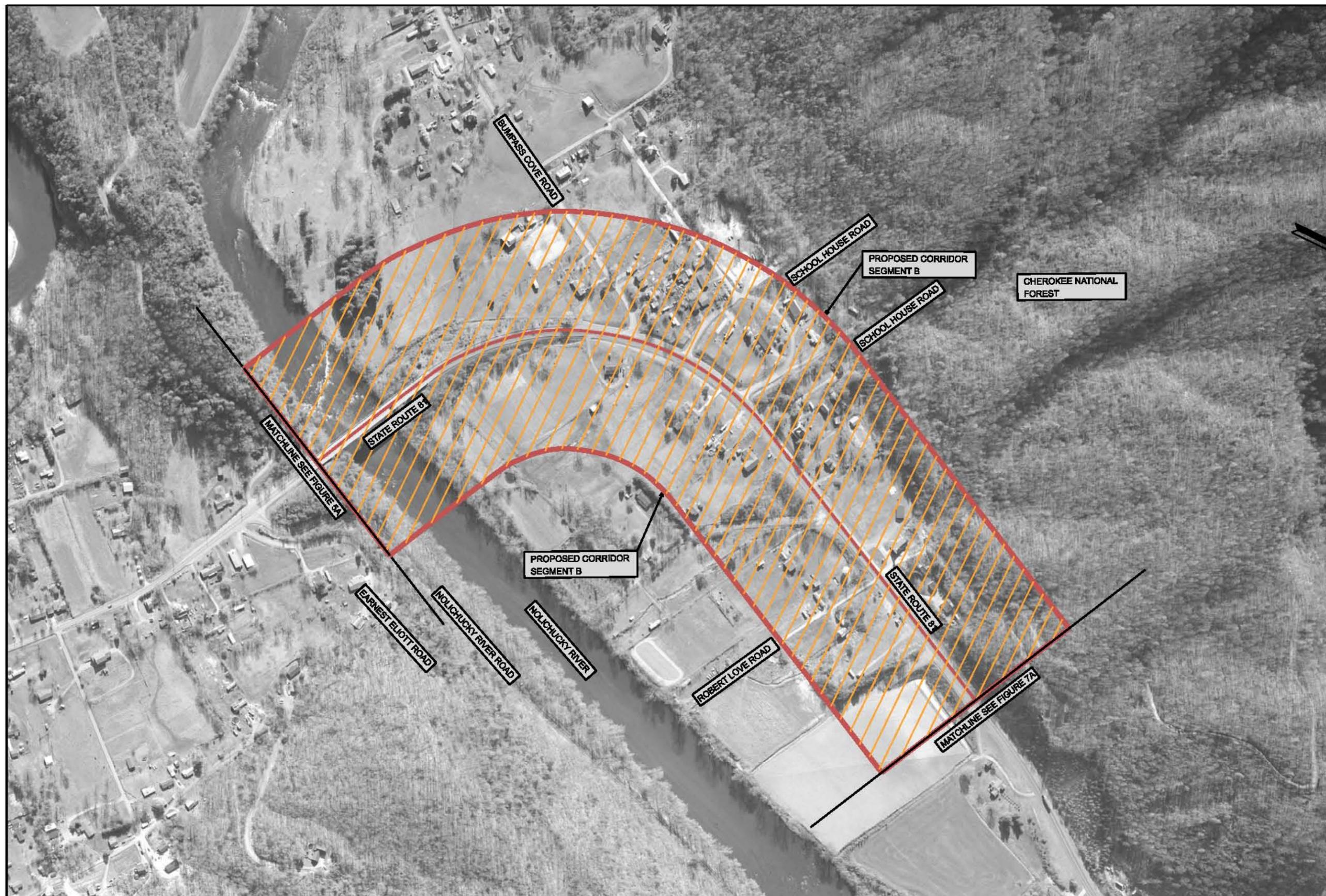
DATE	YEAR	PROJECT NO.	SHEET NO.
TPP	2010		5



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
 FIGURE 5A

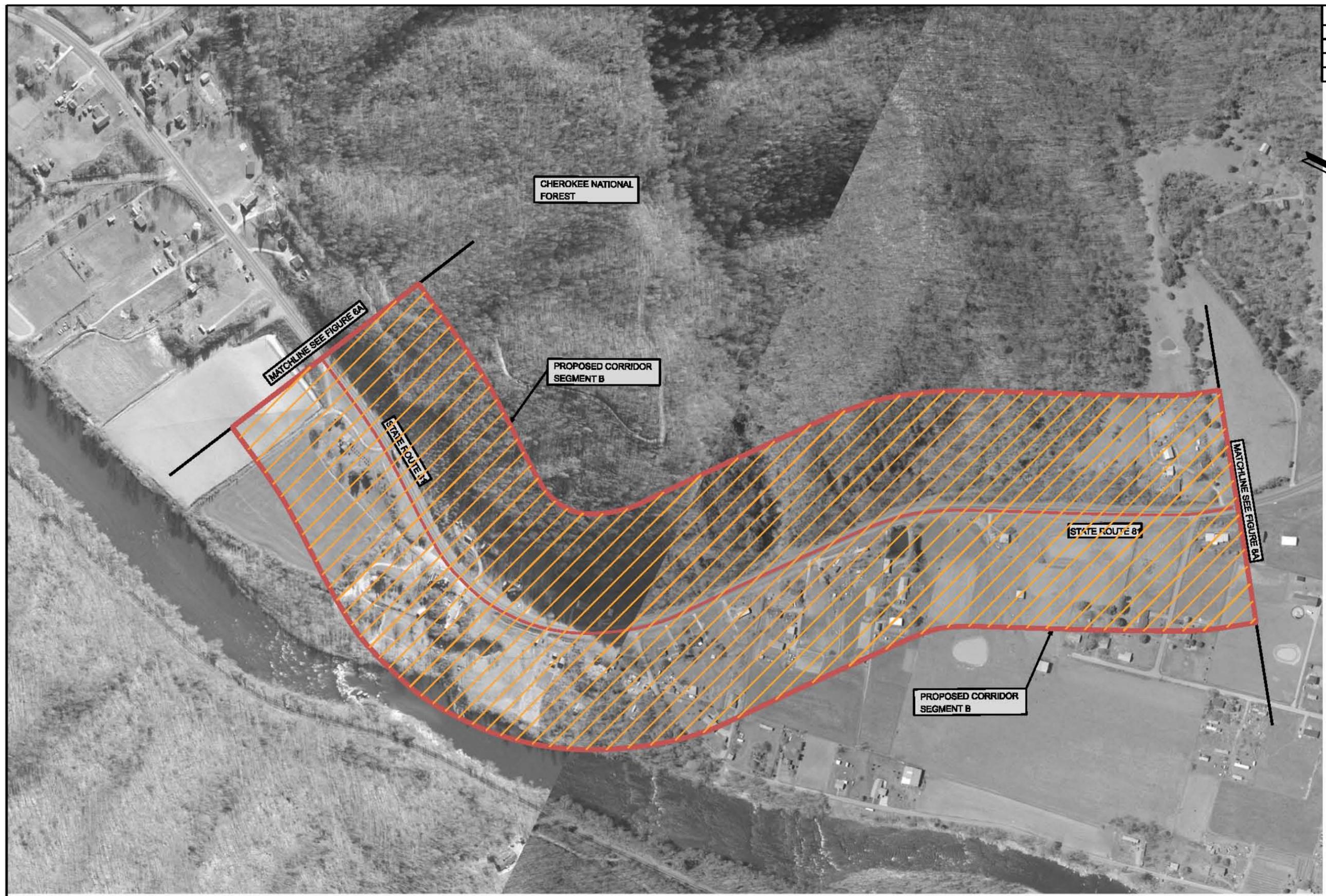
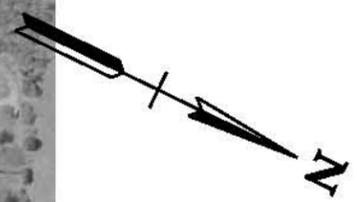
DATE	YEAR	PROJECT NO.	SHEET NO.
TPD	2010		6



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
FIGURE 6A

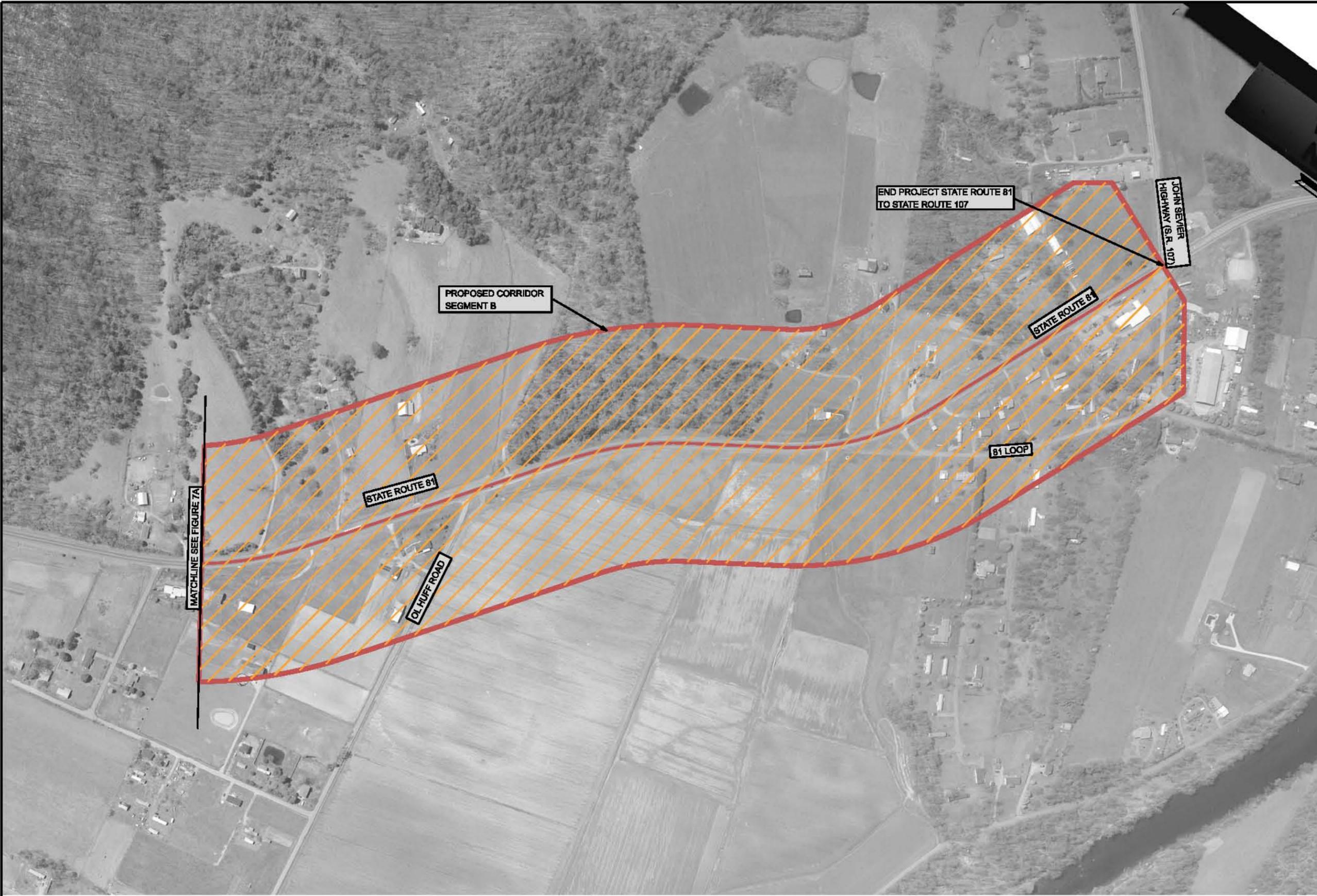
DATE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		7



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
FIGURE 7A

TYPE	YEAR	PROJECT NO.	SHEET NO.
EPR	2010		6



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF PLANNING & DEVELOPMENT

OPTION B  
 FIGURE 8A

## **SPOT IMPROVEMENTS**

**STATE ROUTE 81 @ ARNOLD ROAD**



**STATE ROUTE 81 @ BUMPUS COVE ROAD**



**STATE ROUTE 81 @ OL HUFF ROAD  
(ALTERNATE A)**

**PROJECT COST SHEET**  
**S. R. 81 @ OI Huff Rd.(Alt. A)**

Section:  
 Length:

Right-of-Way

Land, (0.5acres)Res=0.5 -----	\$ 48,000
Improvements-----	\$
Damages -----	\$
Incidentals -----	\$
Relocation Payments ( residences)-----	\$ 0
( business & farm)	
(non-profits)	

Total Right-of-Way Cost----- **\$ 48,000.00**

Utility Relocation

Reimbursable -----	\$
Non-reimbursable -----	\$ <u>10,000</u>

Total Adjustment Cost----- **\$ 10,000.00**

Construction

Clear and Grubbing-----	\$ 5,000
Earthwork -----	\$ 30,000
Pavement Removal-----	\$ 6,800
Drainage (Includes Erosion Control) -----	\$ 25,000
Structures -----	\$ 0
Railroad Crossing or Separation -----	\$ 0
Paving -----	\$ 109,500
Retaining Walls -----	\$ 0
Maintenance of Traffic -----	\$ 15,000
Topsoil -----	\$ 2,600
Seeding-----	\$ 1,800
Sodding-----	\$ 0
Signing -----	\$ 1,000
Lighting -----	\$ 0
Signalization-----	\$ 0
Fence -----	\$ 1,600
Guardrail -----	\$ 0
Rip Rap or Slope Protection-----	\$ 0
Other Construction Items(8.5%)-----	\$ 17,000
Mobilization-----	\$ 4,300
Construction Cost -----	\$ 220,000
10% Eng. And Cont. -----	\$ 22,000

Total Construction Cost----- **\$ 242,000.00**

Preliminary Engineering (10%)----- **\$ 22,000.00**

\*Total Cost----- **\$ 322,000.00**

**\* For estimating future project costs, a compounded inflation rate of 10% will be applied**

**STATE ROUTE 81 @ OL HUFF ROAD  
(ALTERNATE B)**

**PROJECT COST SHEET**  
**S. R. 81@OI Huff (Alt B)**

Section:  
 Length:

Right-of-Way

Land, (1.12acres)Res=1.12acres -----	\$ 98,000
Improvements-----	\$
Damages -----	\$
Incidentals -----	\$
Relocation Payments ( residences)-----	\$ 0
( business & farm)	
(non-profits)	
Total Right-of-Way Cost-----	<b>\$ 98,000</b>

Utility Relocation

Reimbursable -----	\$
Non-reimbursable -----	\$ <u>10,000</u>

Total Adjustment Cost----- **\$ 10,000**

Construction

Clear and Grubbing-----	\$ 5,000
Earthwork -----	\$ 6,000
Borrow -----	\$ 63,000
Pavement Removal-----	\$ 9,600
Drainage (Includes Erosion Control) -----	\$ 38,450
Structures -----	\$ 0
Railroad Crossing or Separation -----	\$ 0
Paving -----	\$ 147,000
Retaining Walls -----	\$ 0
Maintenance of Traffic -----	\$ 15,000
Topsoil -----	\$ 4,000
Seeding-----	\$ 2,800
Sodding-----	\$ 8,400
Signing -----	\$ 1,200
Lighting -----	\$ 0
Signalization-----	\$ 0
Fence -----	\$ 5,600
Guardrail -----	\$ 0
Rip Rap or Slope Protection-----	\$ 0
Other Construction Items(8.5%)-----	\$ 21,000
Mobilization -----	\$ 6,650
Construction Cost -----	\$ 338,700
10% Eng. And Cont. -----	\$ 34,000
Total Construction Cost-----	<b>\$ 373,000.00</b>
Preliminary Engineering (10%)-----	<b>\$ 34,000.00</b>

\*Total Cost----- **\$ 515,000.00**

**\* For estimating future project costs, a compounded inflation rate of 10% will be applied.**

**DATA LOG**  
**State Route 81 Transportation Planning Report**  
**Segment A-From Interstate 26 to Unicoi/Washington County Line**  
**Segment B- from Unicoi/Washington County Line to State Route 107**

<b>Log Number</b>	<b>Description</b>	<b>Date Produced</b>	<b>Source</b>	<b>Type</b>	<b>Location</b>
0001	EES Information/Narrative	6/11/2009	TDOT	PDF/WORD (Narrative)	Short Range Planning Office
0002	Traffic Data	6/26/2009	VOLKERT	PDF	VOLKERT (Chatt) office
0003	Georeferenced DGN Mapping Files	7/9/2009	TDOT/FTP SITE	DGN	Short Range Planning Office
0004	Hand-out of Field Review Materials	8/6/2009	WSA	PDF/WORD	WSA (Knox) office
0005	Field Review (List of Attendees)	8/6/2009	WSA	PDF	WSA (Knox) office
0006	Field Review Meeting Minutes	8/17/2009	WSA	WORD/PDF	WSA (Knox) office
0007	Crash Data	9/1/2009	TDOT	PDF	Short Range Planning Office
0009	TRIMS-Structures	9/1/2009	TDOT	PDF	Short Range Planning Office