

## **EXECUTIVE SUMMARY**

---

This Transportation Planning Report examines a segment of U.S. Highway 72/State Route 2 (SR 2) in Marion County. The study area extends from Hillcrest Lane in Kimball eastward to Phillips Road in Jasper and from I-24 northward to the base of the Cumberland Plateau. The study area is included completely within the towns of Kimball and Jasper. The purpose of the study is to evaluate existing and future traffic conditions on SR 2 and identify possible options for improvement.

SR 2 is functionally classified as a rural major collector on the Surface Transportation Program system. For the majority of the project, SR 2 is a two lane roadway and extends in a west/east orientation across Marion County, providing access to SR 27 and I-24 on the west side and to U.S. Highway 41 and SR 28 on the east side. Short segments at each end of the project are three lane sections, with a center turn lane. Existing land uses in the study area are predominantly residential. The roadside contextual setting is rural.

This Transportation Planning Report was conducted in response to a request by the Mayor of Kimball, David Jackson. This project is also listed on the South East Regional Planning Organization requested studies list.

SR 2 is not currently funded nor is it in the Tennessee Department of Transportation Long Range Plan or the Statewide Transportation Improvement Program.

### **Purpose and Need**

The primary purpose and need for improvement to SR 2 is to provide increased vehicular capacity and to improve the overall safety of the roadway.

### **Options Analyzed**

- No Build – Make no physical changes to the existing roadway. (Total Construction Cost = N/A)
- Safety Option A – Construct a center two-way left turn lane on SR 2 from roughly Dixie Lee Center Road on the west side to Industrial Boulevard on the east side to provide a three lane cross section. Improvements would include paved shoulders, curb and gutter, and sidewalks. This option would connect the existing three lane cross sections on each end of the corridor. (Total Construction Cost = \$21,506,000)
- Capacity and Safety Option B – Construct a center two-way left turn lane on SR 2 for the entire length of the project and an additional through lane in each direction to provide a five lane cross section. Improvements would include paved shoulders, curb and gutter, and sidewalks. This option would likely require extending the limits of the project on each end in order to connect to larger existing cross sections just outside each project termini. (Total Construction Cost = \$29,015,000)

A Spot Improvement option was not included in this TPR. Individual safety improvement locations were too numerous and discriminatory in nature to warrant separation from the safety improvement of the entire segment.

Each option was evaluated for operational performance, potential safety enhancement, cost, environmental and cultural impacts, and ability to satisfy purpose and need. Following is a summary of the performance or issues associated with each option:

No Build:

*Advantages*

- Does not require additional right-of-way
- Creates no additional environmental impacts
- Does not create additional roadway maintenance for TDOT

*Disadvantages*

- Does not meet the purpose and need for improvement
- Does not correct existing facility deficiencies
- Results in deficient traffic operations for both design years

Safety Option A:

*Advantages*

- Improves capacity of facility
- Improves safety with implementation of clear zone standards
- Provides opportunity to mitigate existing unbarricaded drainage ditches
- Provides opportunity to construct pedestrian and bicycle facilities

*Disadvantages*

- Requires acquisition of additional right-of-way
- Has a higher potential for environmental impacts than No Build
- Adds additional roadway maintenance for TDOT
- Yields deficient levels of service for design year 2014 - 2033

Capacity and Safety Option B:

*Advantages*

- Provides more facility capacity than No Build or Safety Option A
- Improves safety with implementation of clear zone standards
- Provides opportunity to mitigate existing unbarricaded drainage ditches
- Yields acceptable traffic operations through 2033 (LOS B)
- Provides opportunity to construct pedestrian and bicycle facilities

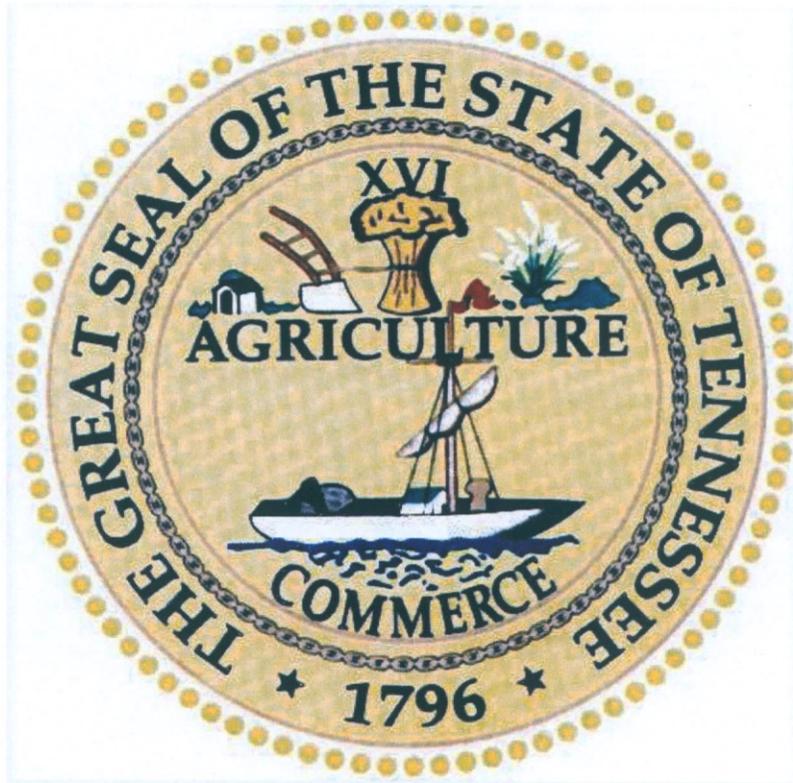
*Disadvantages*

- Requires acquisition of more right-of-way than No Build or Safety Option A
- Has a higher potential for environmental impacts than No Build or Safety Option A
- Adds additional roadway maintenance for TDOT
- Requires reconstruction of traffic signal at Dixie Lee Center Road

The Safety Option A and the Capacity and Safety Option B provide the most potential for operational and safety benefit to the study area. Both of the options, however, have a greater potential for environmental impacts than the No Build Option. Additional studies will be required to quantify the level of potential impact and possible mitigation measures after additional environmental studies.

# TRANSPORTATION PLANNING REPORT

*State Route 2 / U.S. 72  
FROM HILLCREST LANE TO PHILLIPS ROAD  
TOWNS OF KIMBALL AND JASPER  
MARION COUNTY  
PIN NO. 111453.00*



*PREPARED BY  
SAIN ASSOCIATES, INC.  
FOR THE  
TENNESSEE DEPARTMENT OF TRANSPORTATION  
PROJECT PLANNING DIVISION*

Approved by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING	<i>E. Blöle</i>	7/23/09
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION	<i>Steve Pl...</i>	7-20-09
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION	<i>Bill Hart</i>	7/15/09

*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

---

<u>Chapter</u>		<u>Page</u>
1.0	PURPOSE OF THE TRANSPORTATION PLANNING REPORT .....	1
2.0	HISTORY & BACKGROUND .....	2
3.0	EXISTING CONDITIONS .....	4
3.1	Description of the Study Area .....	4
3.2	Crash History .....	6
3.3	Geometrics .....	7
3.4	Level of Service Analyses.....	8
3.5	Land Uses / Traffic Generators.....	9
3.6	Major Structures .....	11
3.7	Topography.....	11
3.8	Multi-modal Facilities .....	11
4.0	FIELD REVIEW .....	12
5.0	PURPOSE & NEED FOR IMPROVEMENTS.....	13
5.1	Safety.....	13
5.2	System Linkage .....	13
5.3	Capacity.....	13
5.4	Transportation Demand .....	14
5.5	Legislation.....	14
5.6	Social Demands or Economic Development .....	14
5.7	Modal Interrelationships.....	14
5.8	Roadway Deficiencies .....	14
6.0	OPTIONS FOR IMPROVEMENT .....	15
6.1	Corridor Improvements .....	17
6.2	Environmental Impacts .....	22
6.3	Cultural Impacts.....	23
6.4	Structural Impacts.....	23
6.5	Cost Estimate .....	23
7.0	ASSESSMENT OF CORRIDOR OPTIONS .....	24
7.1	Preserve & Manage the Existing Transportation System .....	24
7.2	Move a Growing, Diverse and Active Population.....	24
7.3	Support the State's Economy .....	24
7.4	Maximize Safety and Security .....	24
7.5	Build Partnerships for Livable Communities .....	24
7.6	Promote Stewardship of the Environment .....	24
7.7	Emphasize Financial Responsibility .....	24
8.0	SUMMARY .....	25
	APPENDIX	

---

## LIST OF TABLES

---

<u>Table</u>		<u>Page</u>
1	Population Data by Geographic Area (Year 2000).....	4
2	Population Trends .....	6
3	Traffic Crash Rate for 2004-2008.....	7
4	Summary of Incapacitating Injury and Fatal Crashes.....	7
5	Existing (2009) Traffic Data.....	8
6	Level of Service (LOS) Description .....	9
7	Traffic Generators in the Study Area.....	11
8	2013 Traffic Data.....	14
9	2033 Traffic Data.....	14
10	Safety Option A 2013 Traffic Data.....	18
11	Safety Option A 2033 Traffic Data.....	18
12	Capacity and Safety Option B 2013 Traffic Data.....	19
13	Capacity and Safety Option B 2033 Traffic Data.....	19
14	Comparison of Construction Cost Estimates.....	23
15	Performance Measure Comparison .....	26

# LIST OF FIGURES

---

<u>Figure</u>		<u>Page</u>
1	Location Map.....	3
2	Study Area on Aerial Photography .....	5
3	Traffic Generators .....	10
4	Project Construction Corridor .....	16
5	Safety Option A on Aerial Photography.....	20
6	Capacity and Safety Option B on Aerial Photography.....	21
7-12	Topo ID on Aerial Photography .....	APPENDIX

## **1.0 PURPOSE OF THE TRANSPORTATION PLANNING REPORT**

This Transportation Planning Report (TPR) documents analyses undertaken to evaluate options for improving transportation on State Route 2 (SR 2) that would provide additional traffic capacity and also improve safety.

SR 2 is functionally classified as a rural major collector on the Surface Transportation Program system. For the majority of the project, SR 2 is a two lane roadway and extends in a west/east orientation across Marion County, providing access to SR 27 and I-24 on the west side and to US 41 and SR 28 on the east side. Short segments at each end of the project are three lane sections, with a center turn lane. Existing land uses in the study area are predominantly residential. The study area is characterized by undulating topography and a rural community setting.

This study is intended to identify existing and future deficiencies or needs along SR 2 within the study area. Located within the study area is a portion of the Town of Kimball (population 1,312, 2000 census) and the Town of Jasper (population 3,214, 2000 census). In addition to identifying the existing needs of SR 2, this study evaluates one no build option and two improvement options and identifies potential impacts to the adjacent community and environment.

A Spot Improvement option was not included in this TPR. Individual safety improvement locations were too numerous and discriminatory in nature to warrant separation from the safety improvement of the entire segment.

## **2.0 HISTORY & BACKGROUND**

The project was initiated at the request of Kimball Mayor David Jackson on October 1, 2003. At the time, the product of TDOT's planning process was referred to as an Advance Planning Report (APR). The APR was completed in late 2006. Since that time the environmental requirements and the process have changed. It is because of these changes that the TPR process began on this corridor.

SR 2 is not currently in the Tennessee Department of Transportation Long Range Plan or the Statewide Transportation Improvement Program. This project is however listed on the South East RPO requested studies list.



### 3.0 EXISTING CONDITIONS

#### 3.1 Description of the Study Area

This Transportation Planning Report (TPR) examines a portion of SR 2 located between Hillcrest Lane in the Town of Kimball on the west to Phillips Road in the Town of Jasper on the east. The study area includes portions of the towns of Kimball and Jasper. Figure 2 shows the study area for this evaluation. The study focuses on an approximately 3.1 mile section of SR 2 bound to the south by I-24 and to the north, generally, by the base of the Cumberland Plateau.

SR 2 is functionally classified as a rural major collector on the Surface Transportation Program system. For the majority of the project, SR 2 is a two lane roadway and extends in a west/east orientation across Marion County, providing access to SR 27 and I-24 on the west side and to U.S. Highway 41 and SR 28 on the east side. Short segments at each end of the project are three lane sections, with a center turn lane. Existing land uses in the study area are predominantly residential. The roadside contextual setting is small town rural.

Marion County was established in 1817. Jasper is the county seat, with Jasper and Kimball being two of the larger towns in the county. Marion County is situated twenty-five (25) miles west of Chattanooga and is served by Interstate 24. The county topography is varied according to its location in the Appalachian foothills. The towns of Kimball and Jasper, portions of which are located within the study area, are generally bound by I-24 to the south, U.S. Highway 41/SR 150 to the east, and the Cumberland Plateau to the north and west. SR 2 is aligned generally parallel to I-24 within the study area.

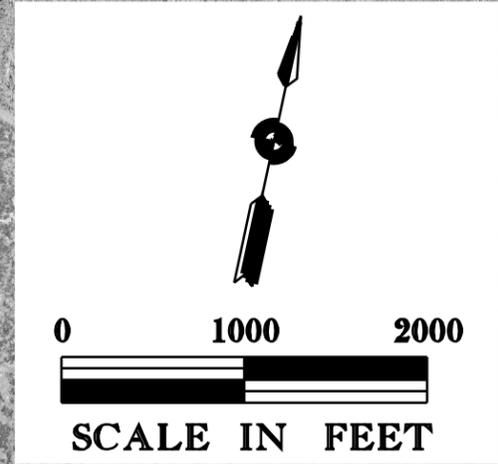
Table 1 summarizes general population data for Marion County, the towns of Kimball and Jasper, and the state of Tennessee. Population density and housing density in Marion County is less than the statewide average while Kimball and Jasper are greater than the statewide average. The percent of total population living below the poverty level ranges from 9%-15% in the study area, compared with 13% statewide. Census data indicates that the percentage of persons speaking a language other than English in the home within the study area is only 1%-4% compared to 5.5% statewide.

**Table 1  
Population Data by Geographic Area (Year 2000)**

<b>Data</b>	<b>Marion County</b>	<b>Town of Kimball</b>	<b>Town of Jasper</b>	<b>Tennessee</b>
Land Area (square miles)	498.36	4.94	9.04	41,217.12
Population Density (persons per square mile)	55.7	265.6	355.7	138.0
Housing Density (units per square mile)	24.3	122.9	154.2	59.2
Percent of Population below poverty level	14.1%	9.0%	15.3%	13.1%
English not spoken at home (% of total population)	2.1%	1.4%	4.0%	5.5%

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

TYPE	YEAR	PROJECT NO.	SHT NO.
TPR	2009		



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
**STUDY AREA  
 ON AERIAL  
 PHOTOGRAPHY**  
 FIGURE 2

\$\$\$\$SYTIME\$\$\$\$  
 \$\$\$DCHSPEC\$\$\$

The population of Marion County in the last decennial census (year 2000) was 27,776 of which 1,312 lived in Kimball and 3,214 lived in Jasper. As shown in Table 2, population in Marion County, Kimball, and Jasper increased by 11.7%, 5.6%, and 15.6%, respectively, between 1990 and 2000. Those changes yield an average annual growth rate of 0.6-1.6%. Since 2000, population growth in the county has declined, in Kimball has increased slightly, and in Jasper has decreased. Comparatively, population growth in the state of Tennessee has continued at an average annual rate of approximately 1.2%.

**Table 2  
Population Trends**

Year	Marion County			Tennessee		
	Pop.	% Change	Avg. Annual Growth Rate	Pop.	% Change	Avg. Annual Growth Rate
1990	24,860			4.88 M		
2000	27,776	11.7%	1.2%	5.69 M	16.6%	1.7%
2007 Est.	28,138	1.3%	0.2%	6.16 M	8.2%	1.2%

Year	Kimball			Jasper		
	Pop.	% Change	Avg. Annual Growth Rate	Pop.	% Change	Avg. Annual Growth Rate
1990	1,243			2,780		
2000	1,312	5.6%	0.6%	3,214	15.6%	1.6%
2007 Est.	1,389	5.9%	0.8%	3,118	-3.0%	-0.4%

Marion County has approximately 30 manufacturing industries as well as more than 50,000 acres of farm land. The primary farming commodities in Marion County include livestock, poultry, corn, wheat, soybeans, and hay.

According to statistics for January 2009 compiled by the Tennessee Department of Labor and Workforce Development, the labor force in Marion County has an unemployment rate of 10.7% (non-seasonally adjusted). This unemployment rate is higher than the Tennessee statewide average of 9.3% (non-seasonally adjusted) for the same month.

### **3.2 Crash History**

The Safety Planning Section of TDOT's Project Planning Division conducted an analysis of traffic crashes on SR 2 from Hillcrest Lane to Phillips Road. TDOT provided corridor and statewide crash data from 2000 to 2004. Also provided was the most recent crash data for the corridor, specifically for the years 2004 to 2008. Table 3 summarizes the crash rate compared to the statewide average.

**Table 3  
Traffic Crash Rates**

Location	Statewide Average Crash Rate	Actual Crash Rate	Exposure Rate	Severity Index
SR 2 from Hillcrest Lane to Phillips Road	-	2.17	59.47	0.53
Statewide Average Crash Rate (05-07)	1.6519	-	-	-

Within the studied period (2004-2008), there were a total of 129 crashes on SR 2, of which 3 resulted in an incapacitating injury. There were no fatalities during that time period. Table 4 represents a summary of the crash locations for each incapacitating injury crash.

**Table 4  
Summary of Incapacitating Injury and Fatal Crashes**

Crash Date	Time	Log Mile	Location	Killed	Injured	Vehicles Involved	Crash Type
06/14/2005	12:54	14.055	Between Industrial Blvd and Browder Switch Rd	0	1	1	Roadway Departure
05/05/2008	12:50	14.240	Between Business Park Dr and Robinson Rd	0	1	1	Roadway Departure
05/27/2008	20:23	13.960	At Sequatchie Valley Memorial Gardens	0	1	2	Angle

A review of the crash data shows that over 60% of the crashes occurring in the 2004 – 2008 period were rear end collisions. On two lane roadways this is generally a result of vehicles slowing to make turn maneuvers. This is addressable by the construction of turn lanes.

### 3.3 Geometrics

SR 2 is a two-lane rural major collector administered by the Tennessee Department of Transportation under the Surface Transportation Program (STP) system. SR 2 provides east/west connectivity between Kimball and Jasper. Just outside of the study area, SR 2 provides access to SR 27 and I-24 on the west side and to U.S. Highway 41 and SR 28 on the east side.

Within the study area, from Hillcrest Lane to Kimball Lane, SR 2 has a cross section that consists of two 12' travel lanes with 5' paved shoulders, within a 60' right-of-way. From Kimball Lane to near Walnut Street, SR 2 has an existing cross section that consists of two 12' travel lanes with a 4' paved shoulder on the north side and a 10' paved shoulder on the south side, within a 60' right-of-way. From near Walnut Street to Industrial Boulevard, SR 2 has an existing cross section consisting of two 12' travel lanes with 5' paved shoulders, all within a 60' right-of-way. From Industrial Boulevard to Phillips Drive, SR 2 has an existing cross section consisting of two 11' travel lanes, an 11' two way left turn lane, and 3' paved shoulders all within a 60' right-of-way.

There are numerous access points (approximately 130) along SR 2 within the project limits including residential and commercial driveways and local street intersections. These driveways and intersections create a great number of conflict points within the project area and compound traffic delay as motorists wait for turning vehicles to enter and exit the highway. The study area of SR 2 also exhibits a general lack of clear zones, including utilities, vegetation, and structures within the clear zone. Also, there are several deep drainage ditches along the roadway within the study area. These drainage ditches are not protected by guardrail, and as a result present an existing safety issue.

**3.4 Level of Service Analyses**

For analysis purposes, SR 2 was considered an urban arterial as it operates more in line with that definition rather than a rural collector. SR 2 was divided into two segments based on existing cross section. The west segment is generally the two lane section from Hillcrest Lane to Industrial Boulevard. At the intersection of SR 2 and Dixie Lee Center Road, left turn lanes are provided but this intersection is the only part of the segment that is not a two lane cross section. The east segment is the three lane section from Industrial Boulevard to Phillips Road. Table 5 reflects the existing (2009) traffic volumes on SR 2.

**Table 5  
Existing (2009) Traffic Data**

Segment of SR 2	AADT	% Trucks	No. of Lanes	LOS*
West (Hillcrest Lane to Industrial Blvd)	11,370	5%	2	C (D)
East (Industrial Blvd to Phillips Road)	11,510	2%	3	B

TDOT LOS - X  
HCS LOS – (X)

The level of service column above denotes two ratings. The “TDOT LOS” is derived from a standard TDOT level of service table based on average daily traffic volumes for various roadway types and lane arrangements. The “HCS LOS” value is derived from the Highway Capacity Manual software. However, the software is unable to analyze a center two-way left turn lane. The east study segment along with all horizon year scenarios utilizing a center turn lane were assigned a LOS according to the TDOT table.

The 2009 traffic volumes were analyzed to evaluate the existing LOS. Level of Service is a term used to describe operational conditions within a stream of traffic based upon qualitative measures, such as speed, travel time, maneuverability, flow interruptions, driver comfort, and convenience. For two-lane highways, such as SR 2, service quality is based on the percent of time that a driver is likely to spend following another vehicle. Level of Service (LOS) measures are stated in a sequence of letter grades from A to F, with LOS A used to describe the highest quality of traffic flow and LOS F used to describe the worst conditions. Table 6 describes the qualities of each Level of Service category.

**Table 6  
Level of Service (LOS) Description**

LOS	Service Description
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The general level of physical and psychological comfort provided the driver is high.
B	Reasonably 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 high.
C	Flow with speeds at or near free flow. 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 because of additional vigilance required for safe operation.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At the lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.
F	Breakdowns in traffic flow. Then number of vehicles entering the highway section exceeds the capacity, or ability of the highway to accommodate that number of vehicles. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Source: Tennessee Department of Transportation

### **3.5 Land Uses / Traffic Generators**

Figure 3 shows a map of the study area with symbols to identify some of the key traffic generators. Some of the more prominent traffic generators are located outside of the study area, but are noted for clarity. The traffic generators are separated into three land use categories: 1) industrial or manufacturing, 2) retail, and 3) public facility. Table 7 lists the name of each identified site.



**Table 7**  
**Traffic Generators in the Study Area**

Map Symbol	Traffic Generators
▲ 1	<b>Industrial or Manufacturing Business</b> Orion Food
● 1	<b>Retail</b> Dixie Lee Center
■ 1 2 3	<b>Public Facility</b> Kimball Town Hall Park Jasper Post Office

### 3.6 Major Structures

There are no major roadway structures located within the study area. Major facilities other than roadway include the electrical substation just east of Mountain Meadows Lane.

### 3.7 Topography

The topography within the study area consists of gently rolling hills. Consistent with the terrain, SR 2 has multiple mild horizontal and vertical curves but no severe grade changes.

### 3.8 Multi-modal Facilities

Within the study area, alternative modes of transportation are nonexistent. There are no dedicated pedestrian, bicycle, or transit facilities within the study area.

In the vicinity of the project, but outside the study area, are rail, air, and water facilities. The Marion County Airport in Jasper provides general aviation, taxi, and rental car service. A rail line operated by CSX Transportation (CSXT) that connects Chattanooga to Nashville runs south of, and generally parallel to, I-24 along the section of SR 2 south of the study area. No rail passenger service is provided. The Tennessee River is a navigable waterway, and there is river access provided by the Port of Nickajack. The facility provides general freight transfer services.

In addition to these alternative transportation modes near the study area, Marion County has access to two larger airports via I-24. Nashville International Airport is located approximately 100 miles to the northwest and provides non-stop service to 14 major airline hubs. Chattanooga Metropolitan Airport is located approximately 40 miles to the east and provides non-stop service to 12 major airline hubs.

## 4.0 FIELD REVIEW

On February 19, 2009 a field review meeting of stakeholders was conducted in Kimball and along the study corridor to identify concerns and opportunities related to SR 2. A list of meeting attendees and minutes from the field review are included in the Appendix of this report. Key elements of the discussion included:

- location, costs, and financially responsible parties regarding utility relocations
- no known historical properties or locations
- four lane median divided cross section is not viable due to limited ROW
- access management is not an improvement option believed to be viable; TDOT would willingly assist individual property access management issues raised by property owners
- high collision intersections (Kimball Lane, Kimball Cove, Kingsberry Lane, Industrial Blvd, Harkins Lane, Turner Loop/Summertown Road, Phillips Drive) according to local observers
- potential residential growth on Kimball Cove with improved water service
- possible underground storage tank (UST) locations

An additional field review was performed by Sain Associates, Inc. staff on December 30, 2008. This review included a survey of the existing cross-section, speed limits, and a general overview of the traffic flow in the area.

## **5.0 PURPOSE AND NEED FOR IMPROVEMENTS**

The primary purpose and need for improvement to SR 2 is to provide increased vehicular capacity and to improve the overall safety of the roadway.

SR 2 is functionally classified as a rural major collector with two 12' travel lanes and shoulders of varying width. Numerous access points along the corridor limit its carrying capacity and create many conflict points. The route connects the towns of Kimball and Jasper and the roadside development includes single family residences, small commercial buildings, churches, municipal buildings, and cemeteries. There is a significant amount of undeveloped property along SR 2 within the project limits as well as outside the project limits.

### **5.1 Safety**

There are numerous access points including residential and commercial driveways and local street intersections with no turn lanes which affect the safety of the roadway. Additionally, there is a general lack of clear zones through the entirety of the project. Included within the clear zone are utilities, vegetation, buildings, and drainage structures. There are several deep drainage ditches along the roadway within the study area. These drainage ditches are adjacent to the travelway and are not protected by guardrail.

According to an analysis by the Safety Planning Section of TDOT's Project Planning Division, the traffic crash rate on SR 2 for the years 2004 through 2008 was 2.17. The crash rate was 2.327 for the years 2000 through 2004 as compared to a statewide average of 1.37. Within that four year period, there were a total of 129 crashes on SR 2, of which 3 resulted in an incapacitating injury. There were no fatalities in that time period.

### **5.2 System Linkage**

SR 2 is a two-lane rural major collector administered by the Tennessee Department of Transportation under the Surface Transportation Program (STP) system. In the study area, the highway provides east/west connectivity for communities that lie north of I-24 and south of the Cumberland Plateau, between Kimball and Jasper. This study examines options for improving existing SR 2 by widening the existing cross section. No new transportation system links are proposed.

### **5.3 Capacity**

Analysis of existing traffic volumes indicates that traffic operations on SR 2 under existing conditions are at acceptable values according to the TDOT level of service table. However, according to HCS, the west segment is deficient. Traffic forecasts for the horizon years 2013 and 2033 were prepared using a growth rate derived from historic traffic data and were compared to forecast volumes provided by TDOT. An annual growth rate of 1% was used for forecast purposes. Tables 8 and 9 reflect traffic data for the horizon years.

**Table 8  
2013 Traffic Data**

Segment of SR 2	AADT	% Trucks	No. of Lanes	LOS (No Build)*
West (Hillcrest Lane to Industrial Blvd)	11,830	5%	2	D
East (Industrial Blvd to Phillips Road)	11,980	2%	3	C

\* From TDOT LOS table

**Table 9  
2033 Traffic Data**

Segment of SR 2	AADT	% Trucks	No. of Lanes	LOS (No Build)*
West (Hillcrest Lane to Industrial Blvd)	14,440	5%	2	E
East (Industrial Blvd to Phillips Road)	14,620	2%	3	D

\* From TDOT LOS table

Traffic projections for 2013 indicate a deficient level of service on the west segment of SR 2 for the No Build scenario. Traffic projections for 2033 indicate a deficient level of service on both segments of SR 2 for the No Build scenario. A LOS C or better is desired on all segments of SR 2, according to TDOT standards for rural roads.

#### **5.4 Transportation Demand**

There are no plans for improvement of SR 2 in the State Transportation Improvement Plan (STIP) or Long-Range Transportation Plan. Traffic forecasts were developed for this study using a historical growth rate for SR 2.

#### **5.5 Legislation**

While there is no federal, state, or local government mandate for improvement of SR 2, the local government did request a Transportation Planning Report be conducted by TDOT. The South East RPO listed this project on its requested studies list.

#### **5.6 Social Demands or Economic Development**

Marion County has an option on the old racetrack property, approximately 150 acres, to build a secondary education facility. Also, a vacant building on Derby Trail is being considered for use as a training center related to employees of automotive manufacturers/suppliers within the area. These developments may result in an increase in demand on SR 2.

#### **5.7 Modal inter-relationships**

Since other modes of transportation are basically non-existent within the study area, improvement of SR 2 could only be a non-factor or slightly assist in the creation of modal inter-relationships.

#### **5.8 Roadway Deficiencies**

The options considered in this study would provide correction of or mitigation of existing deficiencies by widening the existing facility. Both widening options would improve safety issues along the corridor, including clear zone issues and drainage ditches. Under all improvement options discussed in this report, SR 2 would remain in the State Highway System.

## 6.0 OPTIONS FOR IMPROVEMENT

Several options were considered and evaluated as a means of addressing the transportation needs within the study area. The options include the following:

- No Build – Make no physical changes to the existing roadway.
- Safety Option A – Construct a center two-way left turn lane on SR 2 for the entire length of the study area. The three lane curb and gutter section, with paved shoulders and sidewalks, would need to tie in on the west end to match the existing three lane section at Dixie Lee Center Road. The east end of the project, beginning near Industrial Boulevard and continuing to the end of the project, currently contains a center two-way left turn lane and would need no additional widening.
- Capacity and Safety Option B – Construct a center two-way left turn lane and construct an additional through lane with curb and gutter in each direction, with paved shoulders and sidewalks, for the length of the project. The west end would join the existing five lane cross section located just outside the study area. The east end would need to transition down to match the existing four lane section just outside the study area.

A Spot Improvement option was not included in this TPR. Individual safety improvement locations were too numerous and discriminatory in nature to warrant separation from the safety improvement of the entire segment.

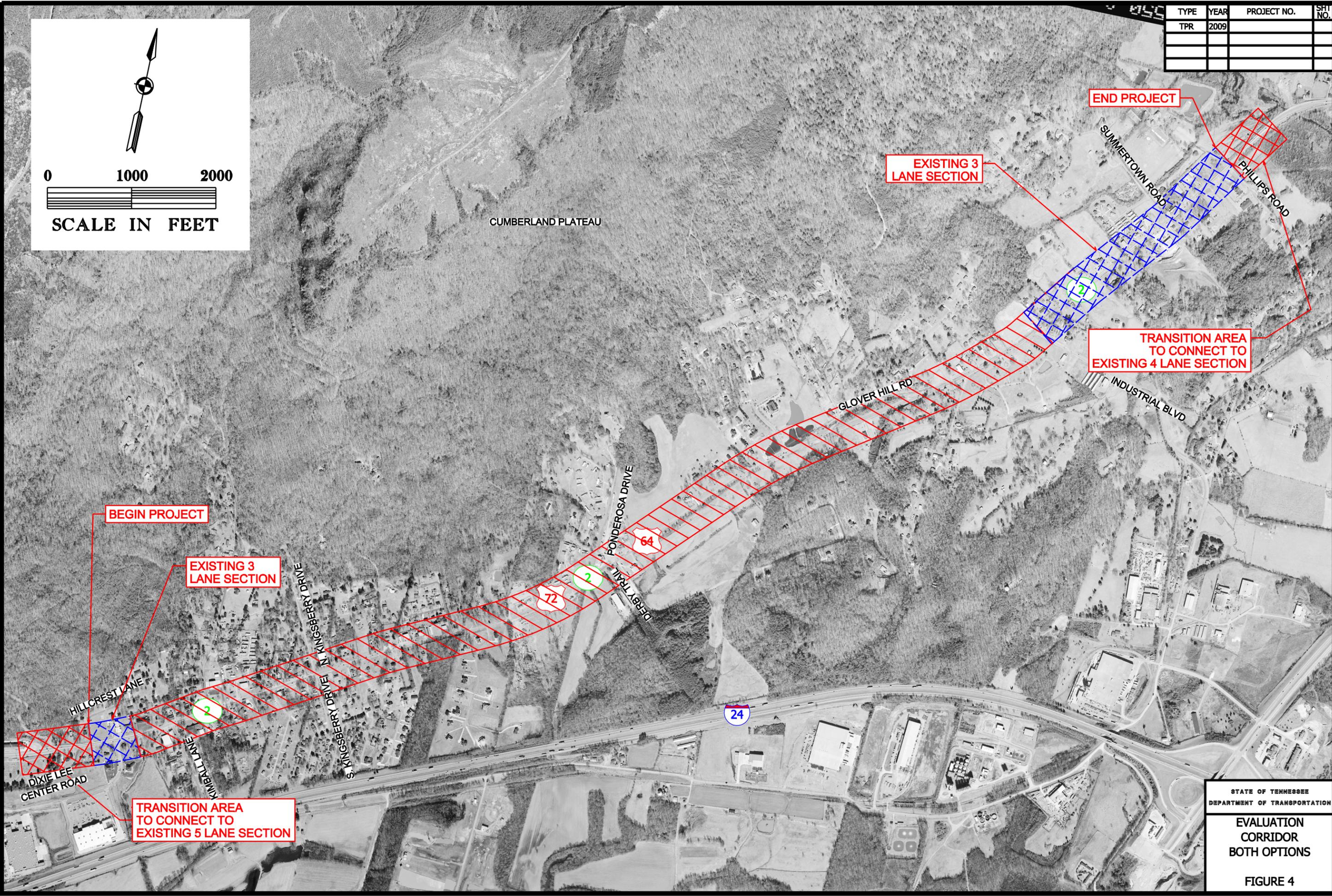
Both build scenarios would be constructed within the same general corridor with only the width of construction activities and termini points varying. To be conservative, an evaluation corridor width of 500 feet was assumed. Figure 4 reflects this evaluation corridor.

The following sections of this report summarize the concept, typical section, identified environmental and cultural resource concerns, structural impacts, and preliminary cost (based upon a per mile estimate) of each considered option. For each option, an operational performance assessment was conducted to provide an objective measure of the benefits and/or shortcomings of each option. The operational performance assessment is based upon future peak hour volumes estimated by multiplying the annual average daily traffic (AADT) projections by a design hour factor. Traffic projections for SR 2 were developed for two horizon years (2013 and 2033 to match the projections provided by TDOT) by applying a historical growth rate to existing traffic counts.

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

TYPE	YEAR	PROJECT NO.	SHT NO.
TPR	2009		

SCALE IN FEET



STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION

EVALUATION  
 CORRIDOR  
 BOTH OPTIONS

FIGURE 4

\$\$\$\$\$YTIME\$\$\$\$\$  
 \$\$\$DCNSPEC\$\$\$\$\$

## 6.1 Corridor Improvements

### No Build Option

*Concept:*

Make no physical changes to the existing roadway network.

*Typical Section:*

All roadway sections would remain as they are currently configured.

*Operational Performance:*

SR 2 volumes are projected to reach approximately 14,500 vehicles per day by the year 2033, causing traffic operations on the roadway to decline to an unacceptable level of service E. In the near horizon year (2013), the volume of traffic on SR 2 is anticipated to reach approximately 11,900 vehicles per day, a volume that can be causing roadway operations at a deficient level of service D.

Given the existing geometric conditions including a lack of turn lanes and clear zone deficiencies, additional traffic volumes would likely increase the facility crash rate.

### Safety Option A

*3 Lane Concept:*

Construct a new center two-way left turn lane and maintain a single through lane in each direction for a finished three lane cross section. Outside each travel lane, the new roadway would include a paved shoulder, curb and gutter, and a sidewalk within an approximately 80' right-of-way. To the west, the center turn lane could terminate at the existing three lane section near Dixie Lee Center Road. On the east end of the project, the center turn lane would connect with the existing three lane section which begins near Industrial Boulevard. Figure 5 illustrates the project corridor over aerial photography.

*Typical Section (proposed):*

- Safety Option A
  - Two travel lanes with a center two-way left turn lane
  - paved shoulders
  - Curb and gutter
  - sidewalks
  - approximately 80' right-of-way (temporary slope easements may also be required)
- All other roadways would maintain existing typical section.

*Operational Performance:*

Tables 10 and 11 represent traffic volumes, truck percentages, and LOS values for 2013 and 2033 under Safety Option A conditions.

**Table 10  
Safety Option A 2013 Traffic Data**

Segment of SR 2	AADT	% Trucks	No. of Lanes	LOS
West (Hillcrest Lane to Industrial Blvd)	11,830	5%	3	C
East (Industrial Blvd to Phillips Road)	11,980	2%	3	C

\* From TDOT LOS table

**Table 11  
Safety Option A 2033 Traffic Data**

Segment of SR 2	AADT	% Trucks	No. of Lanes	LOS
West (Hillcrest Lane to Industrial Blvd)	14,440	5%	3	D
East (Industrial Blvd to Phillips Road)	14,620	2%	3	D

\* From TDOT LOS table

As shown in the above tables, the Safety Option A does produce acceptable levels of service for 2013 traffic projections but not the 2033 design year. LOS D is considered deficient by TDOT standards for rural roads.

*Disposition of Existing Route*

No portion of existing SR 2 will be disposed or removed from the State Highway System. Possible relocation of SR 2 was not considered as a part of this project. The existing and projected capacity and safety deficiencies can be mitigated via improving the existing facility. A new alignment would also fall short of several of the seven guiding principles used by TDOT for corridor assessment.

Capacity and Safety Option B

*5 Lane Concept:*

Construct a new center two-way left turn lane and construct an additional through lane in each direction for a finished five lane cross section. The new roadway would include paved shoulders, curb and gutter, and a sidewalk within an approximately 100' right-of-way. The proposed five lane cross section would need to extend past the west study area endpoint to connect with the existing five lane cross section. On the east side of the project, the five lane cross section would need to connect with the existing four lane median divided cross section located east of Phillips Road. Figure 6 illustrates the project corridor over aerial photography.

*Typical Section (proposed):*

- Capacity and Safety Option B
  - Two travel lanes in each direction and a center two-way left turn lane
  - Paved shoulders
  - Curb and gutter
  - Sidewalks
  - Approximately 100' right-of-way (temporary slope easements may also be required)
- All other roadways would maintain existing typical section.

*Operational Performance:*

Tables 12 and 13 represent traffic volumes, truck percentages, and LOS values for 2013 and 2033 under Capacity and Safety Option B conditions.

**Table 12  
Capacity and Safety Option 2013 Traffic Data**

<b>Segment of SR 2</b>	<b>AADT</b>	<b>% Trucks</b>	<b>No. of Lanes</b>	<b>LOS</b>
West (Hillcrest Lane to Industrial Blvd)	11,830	5%	5	A
East (Industrial Blvd to Phillips Road)	11,980	2%	5	A

\* From TDOT LOS table

**Table 13  
Capacity and Safety Option 2033 Traffic Data**

<b>Segment of SR 2</b>	<b>AADT</b>	<b>% Trucks</b>	<b>No. of Lanes</b>	<b>LOS</b>
West (Hillcrest Lane to Industrial Blvd)	14,440	5%	5	B
East (Industrial Blvd to Phillips Road)	14,620	2%	5	B

\* From TDOT LOS table

As shown in the above tables, the Capacity and Safety Option B does produce acceptable levels of service for design year traffic projections.

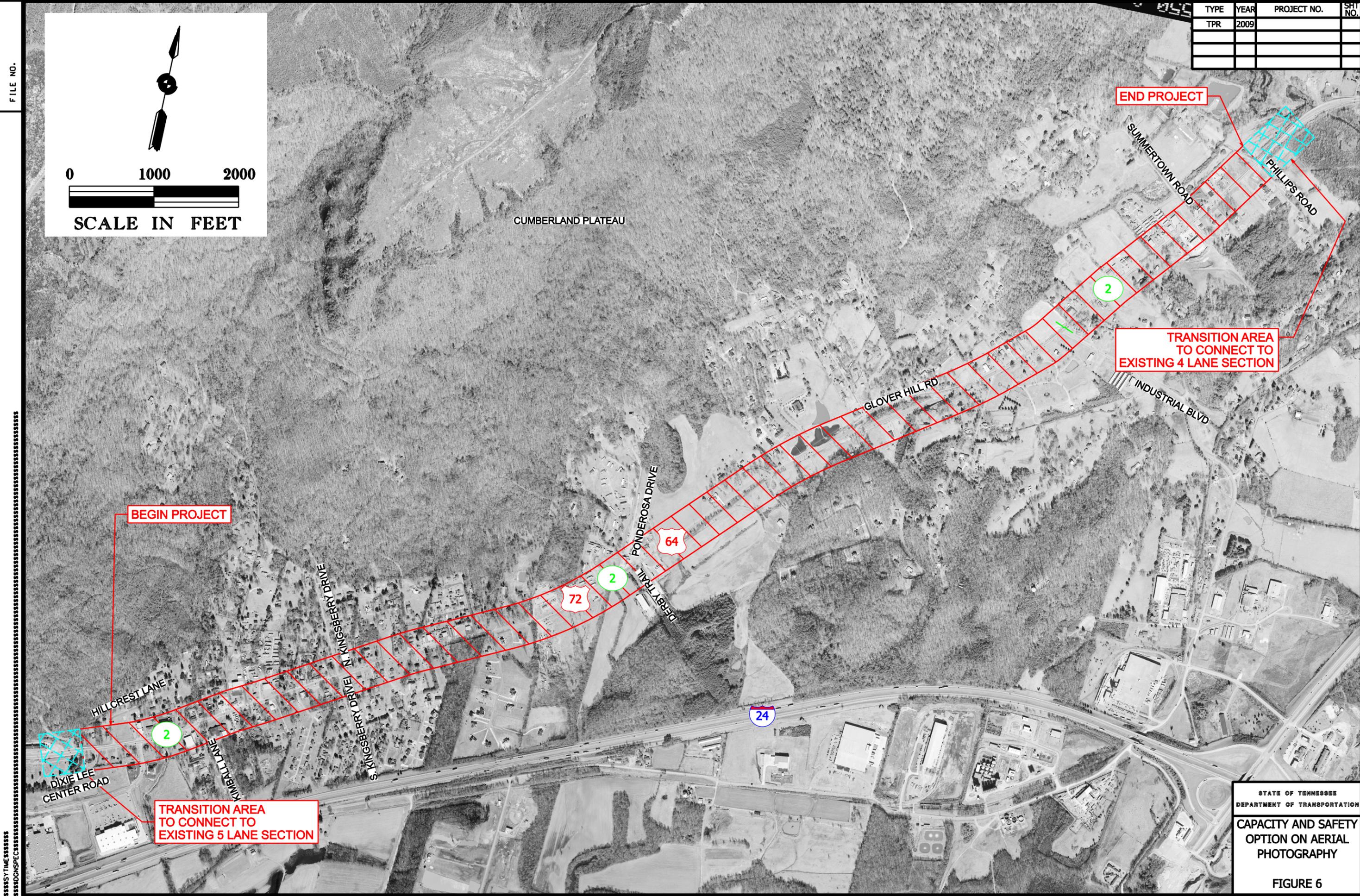
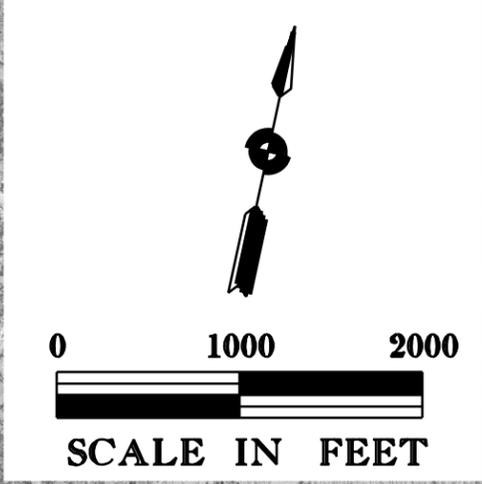
*Disposition of Existing Route*

No portion of existing SR 2 will be disposed or removed from the State Highway System. Possible relocation of SR 2 was not considered as a part of this project. The existing and projected capacity and safety deficiencies can be mitigated via improving the existing facility. A new alignment would also fall short of several of the seven guiding principles used by TDOT for corridor assessment.



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

TYPE	YEAR	PROJECT NO.	SHT NO.
TPR	2009		



\$\$\$\$SYTIME\$\$\$\$  
\$\$\$\$DGSPEC\$\$\$\$

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
CAPACITY AND SAFETY  
OPTION ON AERIAL  
PHOTOGRAPHY

FIGURE 6

## 6.2 Environmental Impacts

There are no known threatened or endangered species within the study area. There is, however, an endangered bat located just outside the east end of the study area. Care should be taken with any improvement option that the bat habitat is not encroached upon.

A preliminary environmental review, provided by TDOT, shows that an area below the poverty level exists from Glover Hill Road east to the end of the project. This population may qualify for consideration under Title 6. In the 2000 Census, approximately 14.5% of Marion County's population was identified as below poverty level. Approximately 15.3% of the residents of Jasper are below the poverty level. A detailed analysis will be needed to identify any environmental justice considerations.

There is forested land within the corridors defined for both the Safety Option A and the Capacity and Safety Option B.

Other environmental concerns specific to each considered option are as follows:

### No Build

No specific environmental concerns are identified at this time for the No Build option.

### Safety Option A

The evaluation corridor for the Safety Option A encompasses five blue line streams. Also, portions of the Safety Option A are in the 100 year flood zone of the blue line streams. The Safety Option A crosses areas of possible wetlands associated with the blue line streams. This option has the potential to impact underground storage tanks (UST) at the following locations:

- Vacant area east of Kimball Cove Road
- Car lot west of North Kingsberry Drive
- Vacant property across from the Bakery Thrift Store, east of Ponderosa Drive
- Vacant property west of Ponderosa Drive on south side of SR 2

A detailed environmental study and concept plan for improvements would be needed to assess the UST impacts of construction.

### Capacity and Safety Option B

The evaluation corridor for the Capacity and Safety Option B encompasses five blue line streams. Also, portions of the Capacity and Safety Option B are in the 100 year flood zone of the blue line streams. The Capacity and Safety Option B crosses areas of possible wetlands associated with the blue line streams. This option has the potential to impact underground storage tanks (UST) at the following locations:

- Vacant area east of Kimball Cove Road
- Car lot west of North Kingsberry Drive
- Vacant property across from the Bakery Thrift Store, east of Ponderosa Drive
- Vacant property west of Ponderosa Drive on south side of SR 2

A detailed environmental study and concept plan for improvements would be needed to assess the UST impacts of construction.

### 6.3 Cultural Impacts

There are no National Historic Register sites located within the study area.

There are no known archaeologically significant sites within the study area. We have been unable to determine if or when any archaeological investigations have been performed within the study area. An archaeological investigation may be needed to assess the potential presence of archaeological resources in the evaluation corridor.

Other potential cultural impacts specific to each considered option are as follows:

#### No Build

No specific cultural concerns are identified at this time for the No Build option.

#### Safety Option A

The evaluation corridor for the Safety Option A includes Kimball Baptist Church, Kimball Church of Christ, and Sequatchie Valley Memorial Gardens Cemetery. Cumberland View Cemetery is located just outside the west end of the study area. If the Safety Option A is chosen, due care should be exercised near these sites.

#### Capacity and Safety Option B

The evaluation corridor for the Capacity and Safety Option B includes Kimball Baptist Church, Kimball Church of Christ, and Sequatchie Valley Memorial Gardens Cemetery. Cumberland View Cemetery is located just outside the west end of the study area. If the Capacity and Safety Option B is chosen, due care should be exercised near these sites.

### 6.4 Structural Impacts

No structural impacts are anticipated with either option.

### 6.5 Cost Estimate

Preliminary cost estimates were prepared for each build option based upon per mile costs. Costs for both the Safety Option A and the Capacity and Safety Option B were estimated for widening to a new three lane or five lane highway in rolling terrain. The cost estimate for these corridor options includes purchasing sufficient right-of-way for the typical section and relocating utilities for the length of the project. Table 14 summarizes the estimated cost for each improvement option based on 2008 average prices, excluding inflation allowances.

**Table 14  
Comparison of Construction Cost Estimates**

<b>Option</b>	<b>Number of New Lanes</b>	<b>Construction Cost</b>	<b>Length (miles)</b>	<b>Cost Per Lane Mile</b>
No Build	0	N/A	0	N/A
Safety Option A	3	\$21,506,000	2.2	\$9,606,000
Capacity and Safety Option B	5	\$29,015,000	3.1	\$9,318,000

## **7.0 ASSESSMENT OF CORRIDOR OPTIONS**

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 options discussed in this report.

### **7.1 Preserve and Manage the Existing Transportation System**

Both improvement options involve improvement to the existing transportation system. Neither option involves construction of a roadway on new alignment, rather a widening of the existing roadway. None of the options will add any distance to the State Highway System.

### **7.2 Move a Growing, Diverse, and Active Population**

Both improvement options would serve to assist in creating additional facility capacity, thereby increasing vehicular mobility for residents and visitors alike.

### **7.3 Support the State's Economy**

Both improvement options would, as mentioned previously, increase the capacity of the facility. This would allow for further residential, commercial, and industrial growth in the area well into the future. The roadway capacity under the No Build option would not support additional growth in the area. The Capacity and Safety Option B provides the highest potential of economic support.

### **7.4 Maximize Safety and Security**

Both improvement options would allow the opportunity to correct existing clear zone issues along the corridor which would increase facility safety. Construction of a center turn lane would allow left turning vehicles to exit the through lanes, thereby reducing left turn conflicts and delay. The No Build option would not meet this principle.

### **7.5 Build Partnerships for Livable Communities**

Both improvement options provide the opportunity for the construction of sidewalks and paved shoulders for the length of the project with the goal of improving mobility and the quality of life for residents. The No Build option would not meet this principle.

### **7.6 Promote Stewardship of the Environment**

A detailed environmental study is needed to fully address the impacts of each considered option. Preliminary environmental data based upon information of record is included in the Appendix. Reasonable efforts should be made to minimize impacts to natural and cultural resources.

### **7.7 Promote Financial Responsibility**

This Transportation Planning Report (TPR) is prepared in accordance with the Goals and Objectives set forth in Tennessee's Long Range Transportation Plan (LRTP).

Preliminary construction cost estimates were prepared for each considered option based upon typical per mile costs. Table 14 summarizes the construction cost estimates for all options.

## 8.0 SUMMARY

### **Purpose and Need**

The primary purpose and need for improvement to SR 2 is to provide increased vehicular capacity and to improve the overall safety of the roadway.

The following options and potential benefits are considered:

#### No Build Option

- Make no physical changes to the existing transportation infrastructure

#### Safety Option A:

- Construct a center two-way left turn lane, paved shoulders, curb and gutter, and sidewalks from the existing three lane section at Dixie Lee Center Road toward the west end of the study area to approximately Industrial Boulevard toward the east side of the study area
- Improve safety for left turning vehicles into the numerous driveways and roadways located along the facility
- Improve clear zone characteristics of the facility
- Improve open drainage ditches which are currently have no barriers to stop errant vehicles
- Provide accommodations for pedestrians and bicycles

#### Capacity and Safety Option B:

- Construct a center two-way left turn lane, an additional through lane in each direction, paved shoulders, curb and gutter, and sidewalks from the existing five lane section just west of Hillcrest Lane (outside the project study area) to the existing four lane median divided section east of Phillips Road (outside the project study area)
- Increase overall vehicular carrying capacity on the roadway network throughout the study area
- Improve safety for left turning vehicles into the numerous driveways and roadways located along the facility
- Improve clear zone characteristics of the facility
- Improve open drainage ditches which are currently have no barriers to stop errant vehicles
- Provide accommodations for pedestrians and bicycles

## Summary Tables

### Comparison of Projected Operational Performance and Costs

The operational performance of each option was evaluated using a standard TDOT level of service table based on average daily traffic volumes for various roadway types and lane arrangements. Table 15 summarizes the level of service (LOS) and percentage of truck traffic computed for each option and horizon year. A level of service D is considered deficient by TDOT standards for rural roads. Both build options perform at acceptable levels of service in the 2013 horizon year, however, the No Build option is deficient. Results for horizon year 2033 indicate that the Capacity and Safety Option B yields acceptable levels of service, while the No Build Option and the Safety Option A operate at deficient levels of service. Preliminary cost estimates are also included in the summary on Table 15. Current construction costs were based on 2008 average prices. Future construction costs account for a 6% yearly inflation increase.

**Table 15  
Performance Measure Comparison  
2013 & 2033**

SR 2 Segment	Performance Measure	No Build		Safety Option A		Capacity and Safety Option B	
		2013	2033	2013	2033	2013	2033
Hillcrest Ln to Phillips Road	AADT	11,830	14,440	11,830	14,440	11,830	14,440
	LOS	D	E	C	D	A	B
	Truck %	5%		5%		5%	
	Construction Cost 2008 (2013)	\$0		\$21,506,000 (\$28,780,000)		\$29,015,000 (\$38,829,000)	
	Approximate Length	-		2.2		3.1	

### **Advantages/Disadvantages of Each Option**

Following are items that summarize the performance or issues associated with each option:

#### No Build:

##### *Advantages*

- Does not require additional right-of-way
- Creates no additional environmental impacts
- Does not create additional roadway maintenance for TDOT

##### *Disadvantages*

- Does not meet the purpose and need for improvement
- Does not correct existing facility deficiencies
- Results in deficient traffic operations for both design years

### Safety Option A:

#### *Advantages*

- Improves capacity of facility
- Improves safety with implementation of clear zone standards
- Provides opportunity to mitigate existing unbarricaded drainage ditches
- Provides opportunity to construct pedestrian and bicycle facilities

#### *Disadvantages*

- Requires acquisition of additional right-of-way
- Has a higher potential for environmental impacts than No Build
- Adds additional roadway maintenance for TDOT
- Yields deficient levels of service for design year 2014 - 2033

### Capacity and Safety Option B:

#### *Advantages*

- Provides more facility capacity than No Build or Safety Option A
- Improves safety with implementation of clear zone standards
- Provides opportunity to mitigate existing unbarricaded drainage ditches
- Yields acceptable traffic operations through 2033 (LOS B)
- Provides opportunity to construct pedestrian and bicycle facilities

#### *Disadvantages*

- Requires acquisition of more right-of-way than No Build or Safety Option A
- Has a higher potential for environmental impacts than No Build or Safety Option A
- Adds additional roadway maintenance for TDOT
- Requires reconstruction of traffic signal at Dixie Lee Center Road

### **Summary Based on Purpose and Need**

SR 2 is functionally classified as a rural major collector on the Surface Transportation Program system. For the majority of the project, SR 2 is a two lane roadway and extends in a west/east orientation across Marion County, providing access to SR 27 and I-24 on the west side and to US 41 and SR 28 on the east side. Short segments at each end of the project are three lane sections, with a center turn lane.

A traffic crash rate was calculated for SR 2 from crash data for the years 2004 through 2008. Within the studied period, there were a total of 129 crashes on SR 2, of which 3 resulted in an incapacitating injury and there were no fatalities. The overall crash rate for this section of SR 2 is above the statewide average.

The primary purpose and need for improvement to SR 2 is to provide increased vehicular capacity and to improve the overall safety of the roadway

The Safety Option A and the Capacity and Safety Option B provide the most potential for operational and safety benefit to the study area. Both of the options, however, have a greater potential for environmental impacts than the No Build Option. Additional studies are needed to quantify the level of potential impact and possible mitigation measures.

## **APPENDIX**

Field Review Attendance List and Minutes

Cost Estimates

Crash Rate Calculations

Aerial Photography

EES Maps

EES Scoring Sheet

Crystal Reports

HCS Printouts

## FIELD REVIEW ATTENDANCE LIST AND MINUTES



# sain associates

244 West Valley Avenue, Suite 200 Birmingham, Alabama 35209

## MEETING MINUTES

PROJECT: SR-2 – MARION COUNTY TPR		PROJECT #: 08-0384	
TITLE: TDOT REVIEW MEETING		REVISION #:	REVISION DATE:
LOCATION: SR-2 – Marion County	PREPARER: Diane Callahan		
PROJECT MANAGER: Diane Callahan	DATE: 02-20-09	PAGE: 1 OF 3	

MEETING DESCRIPTION: TDOT Field Review Meeting		MEETING DATE: 02-19-09		
MEETING LOCATION: SR-2		MEETING TIME: 10:00 AM CST		
ATTENDEES:				
<u>NAME:</u>	<u>COMPANY:</u>	<u>PHONE:</u>	<u>FAX:</u>	<u>EMAIL:</u>
Diane Callahan	Sain Associates, Inc.	205-940-6420		<a href="mailto:dcallahan@sain.com">dcallahan@sain.com</a>
Tyler King	TDOT Planning	615-253-2781		<a href="mailto:Tyler.King@state.tn.us">Tyler.King@state.tn.us</a>
Gena Gilliam	TDOT Planning	615-253-7692		<a href="mailto:Gena.gilliam@state.tn.us">Gena.gilliam@state.tn.us</a>
Mayor David Jackson	Town of Kimball	423-837-7040		<a href="mailto:djackson@townofkimball.com">djackson@townofkimball.com</a>
Chuck Hammonds	RPO-SETDD	423-424-4264		<a href="mailto:chammonds@sedev.org">chammonds@sedev.org</a>
Jackie Wolfe	TDOT-ROW	423-510-1100		<a href="mailto:Jackie.Wolfe@state.tn.us">Jackie.Wolfe@state.tn.us</a>
Don Blansett	So. Pittsburg	423-837-7169		<a href="mailto:mngdon@bellsouth.net">mngdon@bellsouth.net</a>
Tom Landers	So. Pittsburg	423-837-5012		<a href="mailto:TJLanders@att.net">TJLanders@att.net</a>
Jody Rollins	So. Pittsburg	423-837-6505		<a href="mailto:MNGas@bellsouth.net">MNGas@bellsouth.net</a>
John Graham	Marion County Highway Dept	423-942-2581		<a href="mailto:marionhwy@aol.com">marionhwy@aol.com</a>
Alan Wolfe	TDOT-Region 2 Traffic	423-510-1139		<a href="mailto:Alan.Wolfe@state.tn.us">Alan.Wolfe@state.tn.us</a>
Landon Castleberry	TDOT-Region 2 Traffic	423-510-1180		<a href="mailto:Landon.T.Castleberry@state.tn.us">Landon.T.Castleberry@state.tn.us</a>
Mayor Billy Simpson	Town of Jasper	423-942-3180		<a href="mailto:JSimp10242@aol.com">JSimp10242@aol.com</a>
Erin Curry	Sain Associates, Inc.	931-424-0300		<a href="mailto:ecurry@sain.com">ecurry@sain.com</a>
Barry McClendon	TDOT-Region 2 Survey	423-510-1240		<a href="mailto:Robert.Mcclendon@state.tn.us">Robert.Mcclendon@state.tn.us</a>
Gary Chapman	TDOT-Region 2 Survey	423-510-1144		<a href="mailto:Gary.hapman@state.tn.us">Gary.hapman@state.tn.us</a>

### DISCUSSION

The discussion at the Kimball Town Hall included the following:

- The utility relocation costs are expected to be high (approximately \$2 million in Kimball and \$350 - \$450 thousand in Jasper) It would be expected by the locals that TDOT would be responsible for the costs.
- It was discussed that the utility relocation costs would be Chapter 86 reimbursement eligible because it is on a State Route, but the cap is \$1.75 million.
- The utilities may need to bounce back and forth across the roadway as concluded in the January 2006 APR.

- The January 2006 APR had the cost at approximately \$27.5 million.
- The City of Kimball requires a 40 foot setback to the front of the building.
- The property that was formerly a racetrack is approximately 150 acres and the County has an option on it to build a secondary education facility.
- A five lane section would require approximately 120 foot ROW with curb and gutter. Larger if utilize a shoulder and ditch section.
- If use five lane option should consider extending the limits of the project to the existing five lane section at Timber Ridge and the odd cross section of four lane median divided section east of Phillips Road.
- No known historical properties. The Holland House was remodeled with Vinyl siding.
- 4 lane median divided option is not viable because of limited ROW.
- The sun is an issue in the morning and afternoon commuter hours.
- Park located next to the Kimball Town Hall is considered a 4F property.
- Access Management is not an improvement option that is believed to be viable by the group. If the landowners would like to channelize their access points TDOT would be glad to assist.
- The following are intersections have the highest crash rates through the corridor as identified by TDOT Region 2 Traffic personnel:
  - Kimball Lane – possible problem because of large volume of industry traffic
  - Kimball Cove – mainly left turn issue
  - Kingsberry – large subdivisions
  - Industrial Boulevard – because young part time workers leaving industry jobs
  - Harkins Lane – will become important because the new Baptist Church is being constructed across the street.
  - Turner Loop/Summertown Road –
  - Phillips Drive – Hard to make a left turn
- There have been several near misses with school busses, therefore the busses have a police escort through town. Especially troublesome between Kimball Cove and Cooley Lane
- There is potential for an increased number of residences up Kimball Cove if water service was extended.
- Church traffic is an issue through town on Sundays.
- Traffic signal needs would be assessed at specific intersections at a later stage in the project as it approached design plans.
- The vacant building supply on Derby Trail is being looked at for a potential training center.
- Several locations were identified for possible UST's
  - Vacant area east of Kimball Cove
  - Car lot west of N. Kingsberry Drive
  - Vacant property across from the Bakery Thrift Store east of Ponderosa Drive
  - Vacant property west of Ponderosa Drive on the south side of SR 2

The discussion on the field review portion of the meeting included:

- Kimball Lane
  - Crosses the interstate and makes a sharp right to Industrial Blvd.
  - City of Kimball is building a park on the south side of the interstate which will increase traffic at that location.
  - The Church of Christ can relocate parking to the back side of the building if necessary.
  - Mayor Jackson will discuss controlled access points with the Church of Christ
  - Sight Distance is adequate
- Kimball Cove
  - Vehicles cut the corner headed west into the bank and cannot see vehicles coming down Kimball Cove
  - Possible UST on E side of office supply in area noted as vacant, not sure if they have been removed.
  - Sight Distance is adequate
- Kingsberry Drive
  - Large subdivision located on the south side of SR2
  - Sight Distance is adequate
- Harkins Lane
  - New Church construction
  - Driveways are offset properly
  - City granted variance because two driveways don't meet their minimum spacing requirements.
  - Sight Distance is adequate
- Industrial Blvd



- TDOT will put up end road treatment with the double arrow on the north side of SR2
- Summertown Road
  - Is difficult to see from mainline SR2
  - TDOT to consider putting up intersection ahead sign

**ACTION ITEMS**

- Get new crash data – Diane to request
- Get APR – Diane to request
- Get additional information regarding the following utilities:
  - Sewer
  - Phone
  - Cable
  - Power
  - Fiber

Diane & Erin



## **COST ESTIMATE SAFETY OPTION A**

	Unit	Quantity	Unit Cost	Total
<b>Right of Way</b>				
Total Land Acquisition (separate spreadsheet)				\$3,580,500.00
<b>Total</b>				<b>\$3,580,500.00</b>
<b>Construction Cost</b>				
New 3 Lane, Urban	LM	2.24	\$1,448,513.58	\$3,242,933.85
Earthwork	CY	53419	\$8.81	\$470,621.04
Rock Cut	CY	5935	\$80.00	\$474,835.21
Widen Bridge	SF			
Storm Sewer Pipe 24"	LF	7110	\$44.53	\$316,608.30
Storm Sewer Pipe 30"	LF	7110	\$55.69	\$395,955.90
Cross Drain Pipe 24"	LF	500.00	\$44.53	\$22,265.00
Cross Drain Pipe 30"	LF	500.00	\$55.69	\$27,845.00
Cross Drain Pipe 60"	LF	500.00	\$280.49	\$140,245.00
Inlets	EACH	60.00	\$4,000.00	\$240,000.00
Signalization	LS	0.00	\$150,000.00	\$0.00
<b>Total</b>				<b>\$5,331,309.30</b>
<b>Utilities</b>				
Reimbursable Utilities	LS	1.00	\$8,285,832.49	\$8,285,832.49
<b>Total</b>				<b>\$8,285,832.49</b>
Mobilization				\$450,000.00
Erosion Control	(3.5% of Construction Cost)			\$186,595.83
Contingency	(15% of (Construction Cost + Utility Cost))			\$2,042,571.27
<b>Total Construction Cost</b>				<b>\$16,296,308.88</b>
<b>Preliminary Engineering (10% of Total Construction Cost)</b>				<b>\$1,629,630.89</b>
Total (without inflation)				\$21,506,000.00
Inflation (6%/yr over 5 years)				+
<b>TOTAL COSTS with Inflation (6% per year over 5 years)</b>				<b>\$28,780,000.00</b>

**COST PER MILE ITEMS**

Item #	TDOT Description	Unit	Unit Cost	Quantity	Total
201-01	Removal of Asphalt Pavement	ACRE	\$ 6,300.00	5.43	\$34,192.60
202-03.01	wearing surface	SY	\$ 2.56	5,000.00	\$12,800.00
411-02.10	upper binder	TON	\$ 74.17	3,042.23	\$225,642.37
307-02.08	lower binder	TON	\$ 67.91	5,343.03	\$362,845.39
307-02.01	base (3.25%)	TON	\$ 57.40	8,156.40	\$468,177.38
307-02.02	base (96.75%)	TON	\$ 661.52	207.46	\$137,236.47
307-02.03	Aggregate Base	TON	\$ 34.18	6,175.81	\$211,089.31
303-01	wearing surface	TON	\$ 16.69	21,330.10	\$355,999.42
411-01.07	Base	TON	\$ 74.17	1,216.89	\$90,256.95
303-01	Concrete Combined Curb & Gutter	TON	\$ 16.69	13,997.88	\$233,624.62
702-03		CY	\$ 169.68	1,697.71	\$288,068.00
		LS	\$ 100,000.00	1.00	\$100,000.00
203-07	Furnishing and Spreading Topsoil	CY	\$ 18.17	3,925.66	\$71,329.20
801-01	Seeding (with Mulch)	ACRE	\$ 1,250.00	4.87	\$6,083.15
803-01	Sodding (New Sod)	SY	\$ 5.00	13,134.30	\$65,671.50
713-01.10	Signing	LS	\$ 1,000.00	20.00	\$20,000.00
705-02.02	Single Guardrail (Type 2)	LF	\$ 17.88	5,000.00	\$89,400.00
705-04	Guardrail Terminal	EACH	\$ 2,509.00	12.00	\$30,108.00
709-05	Concrete Sidewalk (4")	ton	\$ 29.20	1,000.00	\$29,200.00
701-01.01	spry thermo pavement marking	SF	\$ 3.29	118,208.70	\$388,906.62
716-11.01	plastic pavement marking (24" barrier line)	LM	\$ 1,660.33	13.43	\$22,302.89
716-02.07		LF	\$ 10.33	420.00	\$ 4,338.60

Clearing and Grubbing  
 Pavement Removal  
 Paving  
 Shoulder  
 Curb & Gutter  
 Maintenance of Traffic  
 Topsoil  
 Seeding  
 Sodding  
 Signing  
 Guardrail  
 Rip Rap  
 Sidewalk  
 Striping

Total  
 Length \$3,242,933.85  
 11,821 Cost per mile  
 2.24 \$1,448,513.58

0.07181 CY/LF

## **COST ESTIMATE CAPACITY AND SAFETY OPTION B**

SR-2

## Cost Estimate - Capacity and Safety Option

	Unit	Quantity	Unit Cost	Total
Right of Way				\$5,045,250.00

Total				\$5,045,250.00
-------	--	--	--	----------------

## Construction Cost

New 5 Lane, Urban	LM	3.11	\$1,951,609.02	\$6,076,970.42
Earthwork	CY	101932	\$8.81	\$898,024.61
Rock Cut	CY	11326	\$80.00	\$906,065.94
Storm Sewer Pipe 24"	LF	9820	\$44.53	\$437,284.60
Storm Sewer Pipe 30"	LF	9820	\$55.69	\$546,875.80
Cross Drain Pipe 24"	LF	500.00	\$44.53	\$22,265.00
Cross Drain Pipe 30"	LF	500.00	\$55.69	\$27,845.00
Cross Drain Pipe 60"	LF	500.00	\$280.49	\$140,245.00
Inlets	EACH	80.00	\$4,000.00	\$320,000.00
Signalization	LS	1.00	\$150,000.00	\$150,000.00
Total				\$9,525,576.37

## Utilities

Reimbursable Utilities	LS	1.00	\$8,741,972.98	\$8,741,972.98
Total				\$8,741,972.98

Mobilization				\$450,000.00
Erosion Control	(3.5% of Construction Cost)			\$333,395.17
Contingency	(15% of (Construction Cost + Utility Cost))			\$2,740,132.40

Total Construction Cost				\$21,791,076.92
-------------------------	--	--	--	-----------------

Preliminary Engineering (10% of Total Construction Cost)				\$2,179,107.69
--	--	--	--	----------------

Total (without inflation)				\$29,015,000.00
---------------------------	--	--	--	-----------------

Inflation (6%/yr over 5 years)				+
--------------------------------	--	--	--	---

TOTAL COSTS with Inflation (6% per year over 5 years)				\$38,829,000.00
---	--	--	--	-----------------

COST PER MILE ITEMS							TDOT Description		
	Item #	Unit	Unit Cost	Quantity	Total				
Clearing and Grubbing	201-01	ACRE	\$ 6,300.00	15.10	\$95,113.22				
Pavement Removal	202-03.01	SY	\$ 2.56	5,000.00	\$12,800.00				
Paving	411-02.10	TON	\$ 74.17	7,052.12	\$523,055.99				
	307-02.08	TON	\$ 67.91	12,385.55	\$841,102.93				
	307-02.01	TON	\$ 57.40	18,907.15	\$1,085,270.41				
	307-02.02	TON	\$ 661.52	480.90	\$318,124.47				
	307-02.03	TON	\$ 34.18	14,316.00	\$489,320.91				
	303-01	TON	\$ 16.69	49,444.79	\$825,233.46				
Shoulder	411-01.07	TON	\$ 74.17	1,692.51	\$125,533.44				
	303-01	TON	\$ 16.69	19,468.88	\$324,935.68				
Curb & Gutter	702-03	CY	\$ 169.68	2,361.26	\$400,657.99	0.07181 CY/LF			
Maintenance of Traffic		LS	\$ 100,000.00	1.00	\$100,000.00				
Topsoil	203-07	CY	\$ 18.17	5,266.15	\$95,685.91				
Seeding	801-01	ACRE	\$ 1,250.00	6.53	\$8,160.35				
Sodding	803-01	SY	\$ 5.00	18,267.78	\$91,338.89				
Signing	713-01.10	LS	\$ 1,000.00	20.00	\$20,000.00				
Guardrail	705-02.02	LF	\$ 17.88	5,000.00	\$89,400.00				
	705-04	EACH	\$ 2,509.00	12.00	\$30,108.00				
Rip Rap	709-05	ton	\$ 29.20	1,000.00	\$29,200.00				
Sidewalk	701-01.01	SF	\$ 3.29	164,410.00	\$540,908.90				
Striping	716-11.01	LM	\$ 1,660.33	18.68	\$31,019.87				
	716-02.07	LF	\$ 10.33	420.00	\$ 4,338.60				
prime coat	307-02.03	TON	\$ 36.72	7,052.12	\$258,953.97				

Total  
Length \$6,076,970.42  
16,441 Cost per mile  
3.11 \$1,951,609.02

## CRASH RATE CALCULATIONS

SR-2 Marion County, TN  
 Hillcrest St [Kimball] (SW Termini) to Phillips Rd [Jasper] (NE Termini)

Crash Data 01/01/2004 - 12/31/2008  
 Mileposts 11.505 - 14.676

### Crash Summary Report

Date: 09/26/2008

County: MARION

Route: SR002

Spcl Cse: 0-NONE

Cnty Seq: 1

Begin LogMile: 11.49

End LogMile: 14.67

Begin Date: 01/01/2004

End Date: 12/31/2006

Statistics		Weather Conditions			
Fatal Crashes:	0	No Adverse Conditions:	70	Sleet and Fog:	0
Total Killed:	0	Rain:	15	Smog, Smoke:	0
Incap Injury Crashes:	1	Sleet and Hail:	0	Severe Crosswind:	0
Total Incap Injuries:	1	Snow:	0	Other:	0
Other Injury Crashes:	20	Foggy:	0	Unknown:	0
Total Other Injuries:	46	Rain and Fog:	1	Blowing Sand, Soil, Dirt, or Snow:	0
Prop Damage Crashes:	66				
Total Crashes:	87				

Crashes Involving		Manner of Collision		Road Conditions	
Pedestrians:	0	Rear End:	52	Ice:	0
Hazardous Cargo:	0	Head On:	6	Snow or Slush:	0
Construction Zones:	4	Rear-to-Rear:	0	Sand, Mud, Dirt or Oil:	0
Fixed Objects:	11	Angle:	11	Wet:	0
Heavy Trucks:	0	Sideswipe Same Dir:	1	Dry:	0
Bicycles:	0	Sideswipe Opp. Dir:	2	Other:	0
		Unknown:	1	Unknown:	0

Crash Location		First Harmful Event		Lighting Conditions	
Along Roadway:	32	Pedestrian:	0	Dawn:	1
At Intersection:	55	Pedalcycle:	0	Daylight:	72
Railroad Crossing:	0	Railway Train:	0	Dusk:	3
Bridge:	0	Deer (Animal):	3	Dark/Lighted:	6
Underpass:	0	Other Animal:	0	Dark/Not Lighted:	5
Ramp:	0	Motor Vehicle in Transport:	70	Not Indicated:	0
Private Property:	0	Motor Vehicle in Transport in Other Rdway:	1		
Other:	0	Parked Motor Vehicle:	0		
		Other Type Non-Motorist:	0		
		Fixed Object:	11		
		Other Object (not fixed):	2		
		Non Collision:	0		

**PRODUCED PURSUANT TO PUBLIC RECORD REQUEST**  
 This document is covered by 23 USC §40 and its production pursuant to a public document records request does not waive the provision of §409.

**Variables**

V	Year 2008 AADT	**	12730 vpd	Fatal Crashes	0
A	Number of Crashes		129	Incap. Injury Crashes	3
T	Time of Study		4 years	Injury Crashes	63
L	Length of Segment		1460 days		
Ra	Statewide Average Crash Rate		3.2 miles		
			2.152		

\*\* From APR

**Calculations**

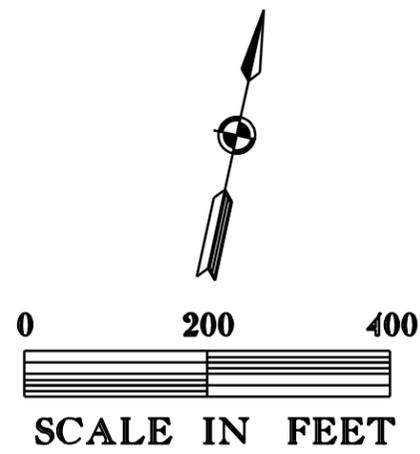
E	Exposure Rate	59.47
R	Actual Crash Rate	2.17
Rc	Critical Crash Rate	2.60
SI	Severity Index	0.53
R/Rc	Actual Crash Rate to Critical Crash Rate	0.83

**FIGURE 7-12  
TOPO ID ON AERIAL PHOTOGRAPHY**



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

TYPE	YEAR	PROJECT NO.	SHT NO.
TPR	2009		



\$\$\$\$SYTIME\$\$\$\$  
\$\$\$\$DGN\$PEC\$\$\$\$

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
  
TOPO ID  
OVER AERIAL  
  
FIGURE 8





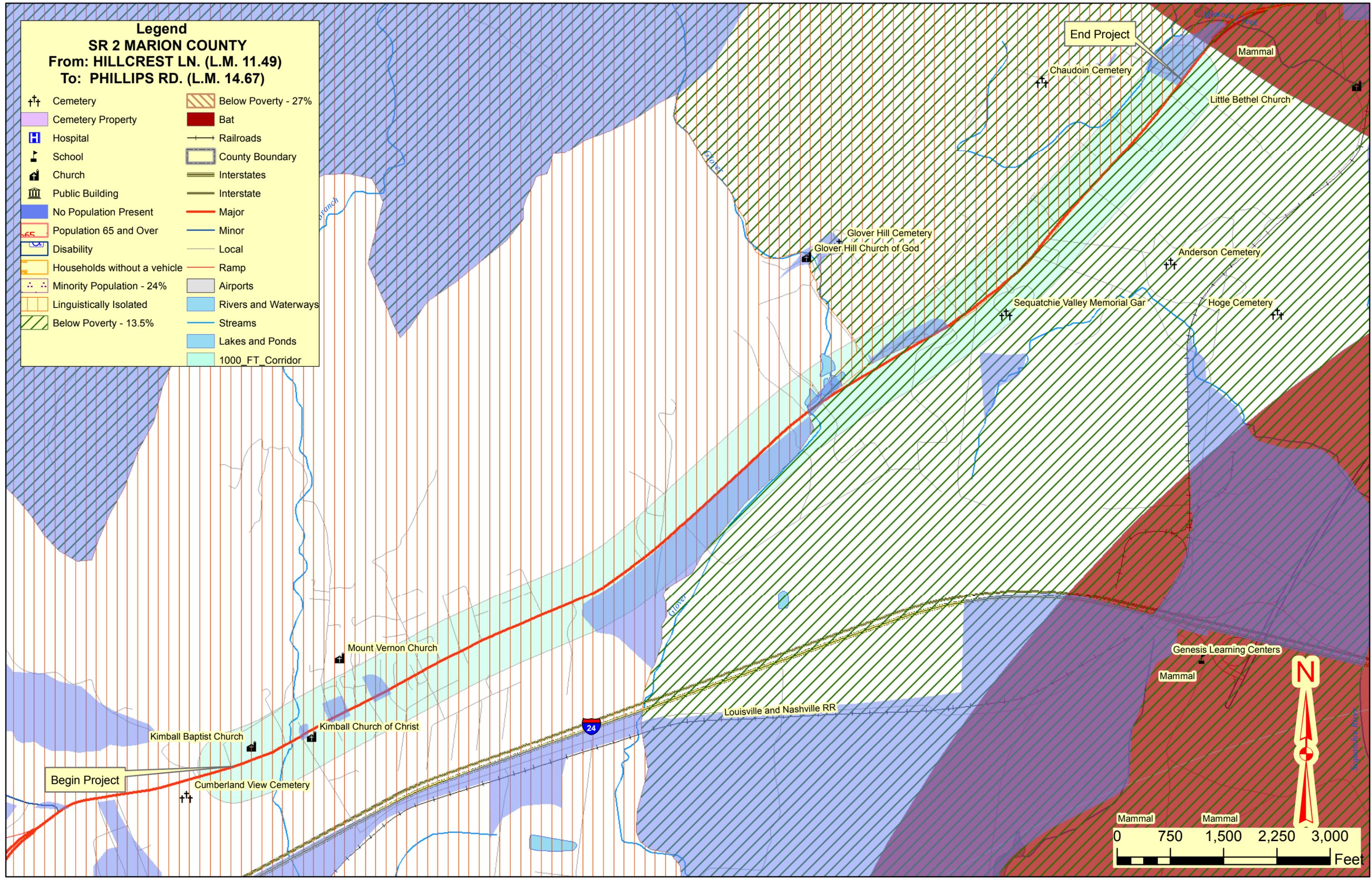




**FIGURE 13-16**  
**EES MAPS**

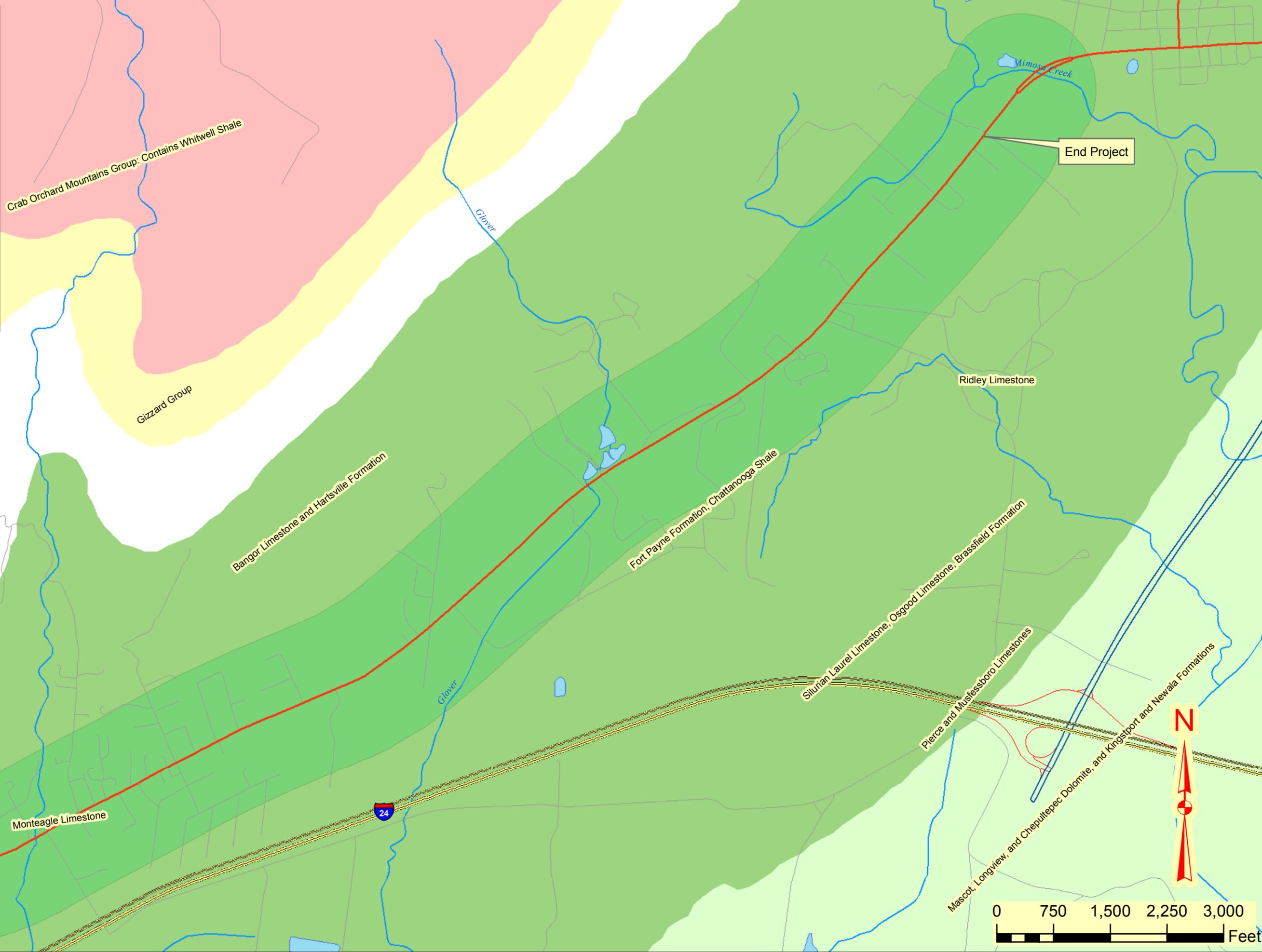
**Legend**  
**SR 2 MARION COUNTY**  
**From: HILLCREST LN. (L.M. 11.49)**  
**To: PHILLIPS RD. (L.M. 14.67)**

- |                              |                      |
|------------------------------|----------------------|
| †† Cemetery                  | Below Poverty - 27%  |
| Cemetery Property            | Bat                  |
| Hospital                     | Railroads            |
| School                       | County Boundary      |
| Church                       | Interstates          |
| Public Building              | Interstate           |
| No Population Present        | Major                |
| Population 65 and Over       | Minor                |
| Disability                   | Local                |
| Households without a vehicle | Ramp                 |
| Minority Population - 24%    | Airports             |
| Linguistically Isolated      | Rivers and Waterways |
| Below Poverty - 13.5%        | Streams              |
|                              | Lakes and Ponds      |
|                              | 1000_FT_Corridor     |



**Legend**  
**SR 2 MARION COUNTY**  
**From: HILLCREST LN. (L.M. 11.49)**  
**To: PHILLIPS RD. (L.M. 14.67)**

- 2000\_FT\_Corridor
- County Boundary
- Interstates
- Interstate
- Major
- Minor
- Local
- Ramp
- Airports
- Rivers and Waterways
- Streams
- Lakes and Ponds
- National Register Sites
- Superfund Sites
- Formation that contains acid producing rock
- Includes formations that contain acid producing rock
- Formation that may contain potentially acid producing rock
- Includes formations that may contain acid producing rock
- Limestone
- Dolomite
- TWRA Lakes
- Recreation
- Nature
- Federal
- State



Begin Project

End Project

Crab Orchard Mountains Group: Contains Whitwell Shale

Gizzard Group

Bangor Limestone and Hartsville Formation

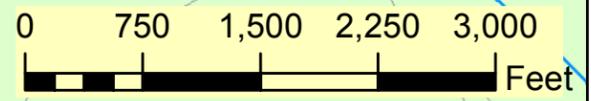
Fort Payne Formation, Chattanooga Shale

Ridley Limestone

Silurian Laurel Limestone, Osgood Limestone, Brassfield Formation

Monteagle Limestone

Mascol, Longview, and Chepultepec Dolomite, and Kingsport and Newala Formations



**Legend**  
**SR 2 MARION COUNTY**  
**From: HILLCREST LN. (L.M. 11.49)**  
**To: PHILLIPS RD. (L.M. 14.67)**

- 4000\_FT\_Corridor
- Terrestrial Species
- TDEC Conservation Sites
- TDEC Scenic Waterways
- Large Wetland Impacts
- Tennessee Natural Areas Program
- Wildlife Management Areas
- County Boundary
- Interstates
- Interstate
- Major
- Minor
- Local
- Ramp
- Airports
- Rivers and Waterways
- Streams
- Lakes and Ponds

**Marion**  
**Value**

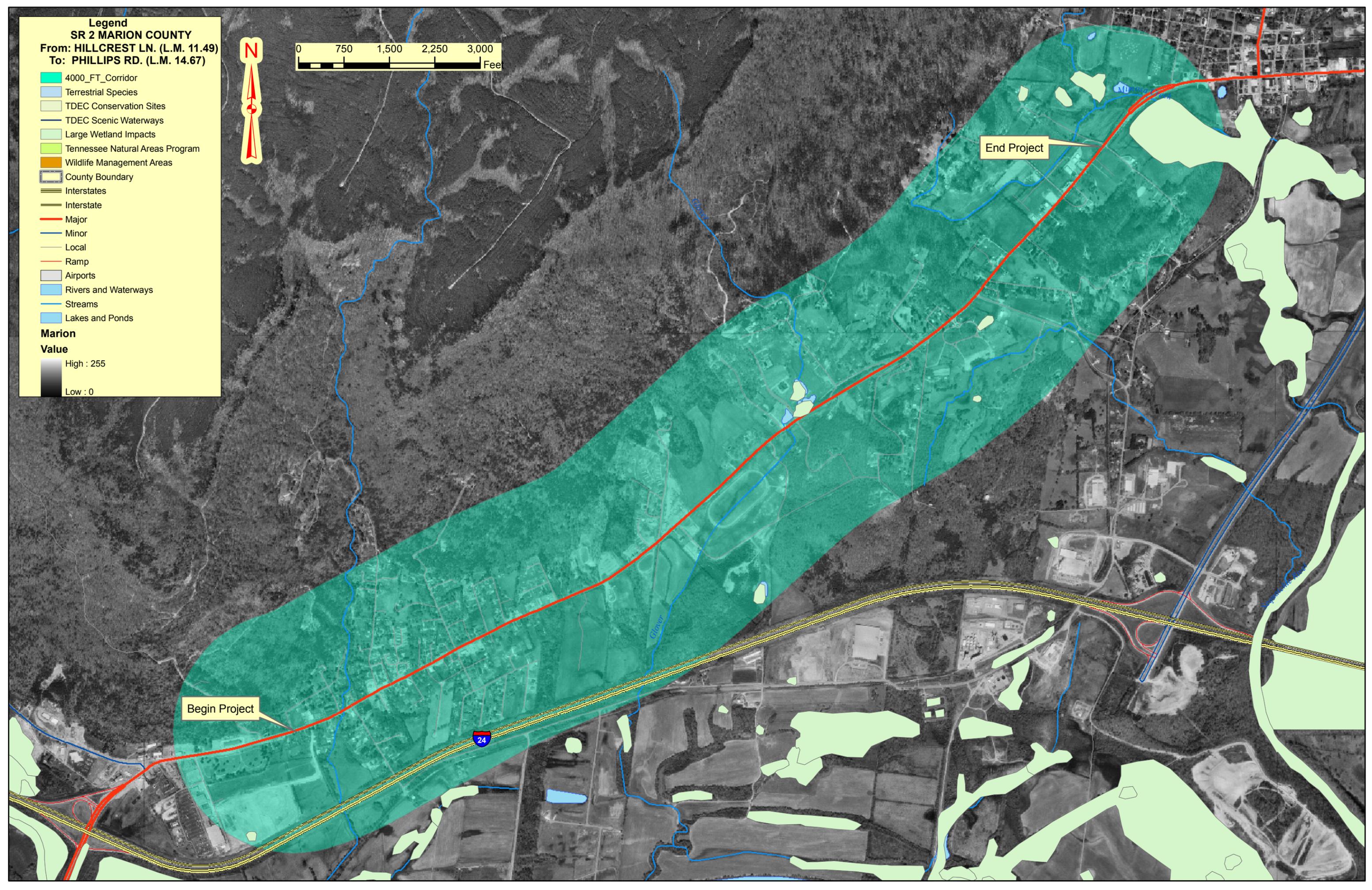
High : 255

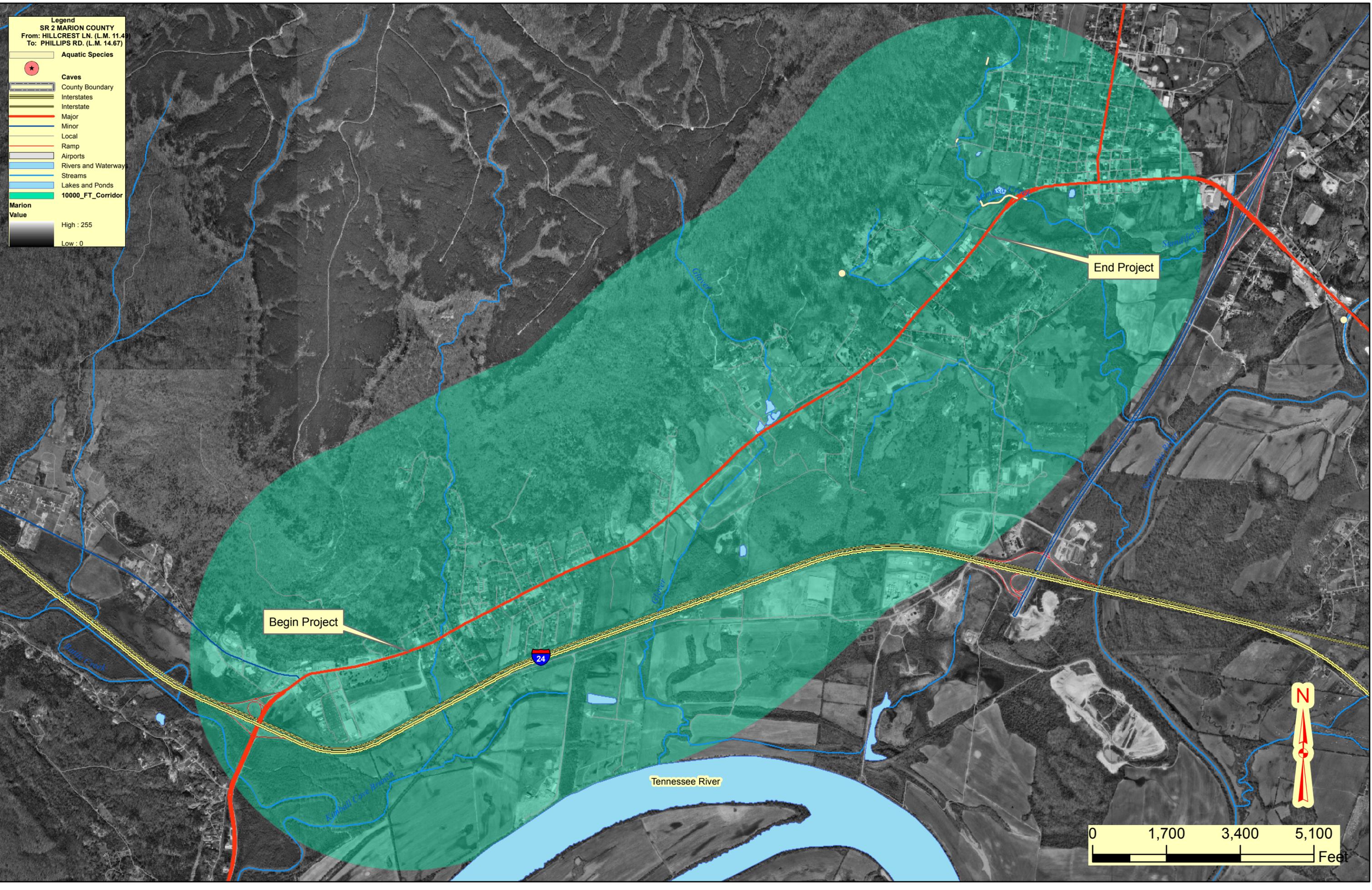
Low : 0



Begin Project

End Project





**Legend**  
**SR 2 MARION COUNTY**  
 From: HILLCREST LN. (L.M. 11.49)  
 To: PHILLIPS RD. (L.M. 14.67)

- Aquatic Species
- Caves
- County Boundary
- Interstates
- Interstate
- Major
- Minor
- Local
- Ramp
- Airports
- Rivers and Waterways
- Streams
- Lakes and Ponds
- 10000\_FT\_Corridor

**Marion Value**

High : 255

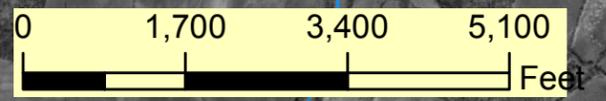
Low : 0

Begin Project

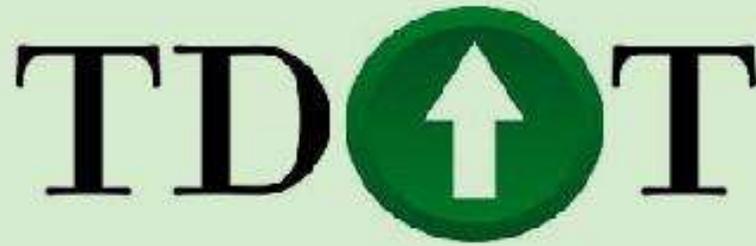
End Project

24

Tennessee River



# EES SCORING SHEET



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

**Project Score Factors**

	<b>Total Impacts Evaluated</b>	<b>Total Impacts to Evaluate</b>	<b>EES Evaluation</b>
<b>Project Impact Areas:</b>	<b>15</b>	<b>15</b>	<b>Complete</b>
<b>Date of Evaluation:</b>	<input type="text" value="June 24, 2009"/>		
<b>Evaluation done by:</b>	<input type="text" value="Gena Gilliam"/>		
	<input type="text" value="Transportation Planner 3"/>		
<b>County:</b>	<input type="text" value="Marion"/>		
<b>Route:</b>	<input type="text" value="State Route 2"/>		
<b>PIN:</b>	<input type="text" value="111453.00"/>		
<b>Termini:</b>	<input type="text" value="from Hillcrest Lane in Kimball to Phillips Road in Jasper"/>		

**Impact Ranking of Features Evaluated: Total by Rank**

**Features with No Impact 11**

National Register Sites

Bat

Terrestrial Species

TDEC Conservation Sites & TDEC Scenic Waterways

Superfund Sites

Caves

Pyritic Rock

Railroads

Tennessee Natural Areas Program

Wildlife Management Areas

TWRA Lakes & Other Public Lands

---

**Features with Low Impact** **1**

---

Cemetery Sites & Cemetery Properties

---

**Features with Moderate Impact** **0**

---

---

**Features with Substantial Impact** **2**

---

Aquatic Species

Large Wetland Impacts

---

**Community Impacts Present:**

---

**Institutions:**

---

Church

**Populations:**

---

No population present

Linguistically isolated populations

Populations below poverty - State average- 13%

---

**EES Project Impact:** **Complete**

---

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

# CEMETERY SITES & CEMETERY PROPERTIES

## Impact

### Project Impact (Environmental, Time, Cost, Design, and Maintenance)

- Low** - 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

### Institutions:

	Present	Not Present
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"/>

### Populations:

	Present	Not Present
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 checked="" type="checkbox"/>	<input type="checkbox"/>
Populations below poverty - State average - 13%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Populations below poverty - State average - 27%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# BAT

## Impact

### Project Impact (Environment, Time, Cost, Design, and Maintenance)

- None** – No project impact is anticipated. There is no occurrence of Indiana or gray bats within 4 miles of the proposed project study area or corridor.

# RAILROADS

## Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

**None** – 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

**Project Impact  
(Environmental, Time,  
Cost, Design, and  
Maintenance)**

**None** – 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

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

**None** – No project impact is anticipated as there are no known contaminated land tracts abutting or within the project study area or corridor.

## PYRITIC ROCK

### Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

**None** – No project impact is anticipated. Pyritic rock is not known to occur in the study area/corridor or project does not involve excavation. Limestone (symbolized as dark green) and dolomite (symbolized as light green) are present.

# TWRA LAKES & OTHER PUBLIC LANDS

## Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

- None** – No impact on the project is anticipated as there are no parks located within or abutting the project study area or corridor.

# Impacts Evaluated Within 4,000 Ft of Study Area

## TERRESTRIAL SPECIES

### Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

- None** - No impact to the project is anticipated. There is no known occurrence of a rare, state, or federally-protected terrestrial species within the proposed transportation study area or corridor.

## TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

### Impact

**Project Impact  
(Environment, Time,  
Cost, Design,  
Maintenance)**

- None** – 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

**Project Impact  
(Environment, Time,  
Cost, Design,  
Maintenance)**

- Substantial** – 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

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

- None** – No impact on the project is anticipated as the project study area or corridor does not include a Natural Area.

# WILDLIFE MANAGEMENT AREAS

## Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

- None** – No project impact is anticipated as a WMA does not abut nor is located within the project study area or corridor.

# Impacts Evaluated Within 10,000 Ft of Study Area

# AQUATIC SPECIES

## Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

- Substantial** – A substantial impact to the project is likely as there is a federally-protected aquatic species located within the project study area or corridor. The potential of locating a population of the species during field surveys in the project study area or corridor exists. Impacts to the species will be difficult to avoid even with additional alternatives. Extensive consultation with the US Fish and Wildlife Service and the Tennessee Department of Environment and Conservation will be necessary. Additional design that minimizes or eliminates impacts to streams will likely be required based on field surveys and consultation with the US Fish and Wildlife Service and the Tennessee Department of Environment and Conservation. Special construction considerations may be required.

# CAVES

## Impact

**Project Impact  
(Environment, Time,  
Cost, Design, and  
Maintenance)**

- None** – No project impact is anticipated as there are no caves in the project study area or corridor.

# CRYSTAL REPORTS SCORING SHEET

## EES Report

PIN 111453.00

Study Line ID: 11145358V01

1,000 Foot Corridor

Version Date: June 23, 2009

Created by: CHARLES GILLIHAN

---

### Cemetery Sites & Cemetery Properties

Cemetery Sites	<u>Total=</u> 1
Sequatchie Valley Memorial Gar	
Cemetery Property	None were found

### Institutions & Sensitive Community Populations

Institutions:	<u>Total=</u> 2
Church	Kimball Church of Christ
Church	Kimball Baptist Church
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	Present
Populations below poverty-State average-13%	Present
Populations below poverty-State average-27%	None were found
Bat	None were found
Railroads	None were found

## EES Report

PIN 111453.00  
2,000 Foot Corridor

Study Line ID: 11145358V01  
Version Date: June 23, 2009  
Created by: CHARLES GILLIHAN

---

National Register Sites	None were found
Superfund Sites	None were found
Pyritic Rock	None were found
TWRA Lakes & Other Public Lands	
TWRA Lakes	None were found
Other Public Lands	None were found

## EES Report

PIN 111453.00  
4,000 Foot Corridor

Study Line ID: 11145358V01  
Version Date: June 23, 2009  
Created by: CHARLES GILLIHAN

---

Terrestrial Species None were found

### TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites None were found

TDEC Scenic Waterways None were found

Large Wetland Impacts **Total Acentage= 54.81**

PEM1C	1.31	acres
PEM1F	2.67	acres
PFO1A	40.75	acres
PFO1C	3.89	acres
POWHh	1.17	acres
POWHh	1.26	acres
POWHh	0.69	acres
POWHh	1.41	acres
POWHh	0.87	acres
POWHx	0.50	acres
POWHx	0.29	acres

Tennessee Natural Areas Program None were found

Wildlife Management Areas None were found

## EES Report

PIN 111453.00  
10,000 Foot Corridor

Study Line ID: 11145358V01  
Version Date: June 23, 2009  
Created by: CHARLES GILLIHAN

---

<i>Aquatic Species</i>	<u>Total</u> = 4	USESA	SPROT
Marstonia ogmorhapse		LE	E
Marstonia ogmorhapse		LE	E
Marstonia ogmorhapse		LE	E
Cambarus hamulatus			

*Caves*

None were found

## HCS PRINTOUTS

Phone: Fax:  
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst JDG  
Agency/Co. Sain Associates, Inc.  
Date Performed 1/22/2009  
Analysis Time Period PM  
Highway SR 2  
From/To West Seg(Beginning - Ind Blvd)  
Jurisdiction TDOT  
Analysis Year 2013  
Description No Build

Input Data

Highway class	Class 2				
Shoulder width	6.0	ft	Peak-hour factor, PHF	0.91	
Lane width	12.0	ft	% Trucks and buses	4	%
Segment length	2.4	mi	% Recreational vehicles	1	%
Terrain type	Rolling		% No-passing zones	50	%
Grade: Length		mi	Access points/mi	10	/mi
Up/down		%			
Two-way hourly volume, V	1055	veh/h			
Directional split	57 / 43	%			

Average Travel Speed

Grade adjustment factor, fG	0.99	
PCE for trucks, ET	1.5	
PCE for RVs, ER	1.1	
Heavy-vehicle adjustment factor,	0.979	
Two-way flow rate, (note-1) vp	1196	pc/h
Highest directional split proportion (note-2)	682	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	mi/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	55.0	mi/h
Adj. for lane and shoulder width, fLS	0.0	mi/h
Adj. for access points, fA	2.5	mi/h
Free-flow speed, FFS	52.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATS	41.8	mi/h

---

Percent Time-Spent-Following

---

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.0	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	
Two-way flow rate, (note-1) vp	1159	pc/h
Highest directional split proportion (note-2)	661	
Base percent time-spent-following, BPTSF	63.9	%
Adj. for directional distribution and no-passing zones, fd/np	8.6	
Percent time-spent-following, PTSF	72.5	%

---

Level of Service and Other Performance Measures

---

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	696	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2532	veh-mi
Peak 15-min total travel time, TT15	16.6	veh-h

---

Notes:

1. If  $vp \geq 3200$  pc/h, terminate analysis-the LOS is F.
2. If highest directional split  $vp \geq 1700$  pc/h, terminate analysis-the LOS is F.

Phone: Fax:  
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst JDG  
Agency/Co. Sain Associates, Inc.  
Date Performed 1/22/2009  
Analysis Time Period PM  
Highway SR 2  
From/To West Seg(Beginning - Ind Blvd)  
Jurisdiction TDOT  
Analysis Year 2009  
Description Existing

Input Data

Highway class	Class 2				
Shoulder width	6.0	ft	Peak-hour factor, PHF	0.91	
Lane width	12.0	ft	% Trucks and buses	4	%
Segment length	2.4	mi	% Recreational vehicles	1	%
Terrain type	Rolling		% No-passing zones	50	%
Grade: Length		mi	Access points/mi	10	/mi
Up/down		%			
Two-way hourly volume, V	1014	veh/h			
Directional split	57 / 43	%			

Average Travel Speed

Grade adjustment factor, fG	0.99	
PCE for trucks, ET	1.5	
PCE for RVs, ER	1.1	
Heavy-vehicle adjustment factor,	0.979	
Two-way flow rate, (note-1) vp	1149	pc/h
Highest directional split proportion (note-2)	655	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	mi/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	55.0	mi/h
Adj. for lane and shoulder width, fLS	0.0	mi/h
Adj. for access points, fA	2.5	mi/h
Free-flow speed, FFS	52.5	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATS	42.1	mi/h

Phone:  
E-Mail:

Fax:

Two-Way Two-Lane Highway Segment Analysis

Analyst JDG  
Agency/Co. Sain Associates, Inc.  
Date Performed 1/22/2009  
Analysis Time Period PM  
Highway SR 2  
From/To West Seg(Beginning - Ind Blvd)  
Jurisdiction TDOT  
Analysis Year 2033  
Description No Build

Input Data

Highway class	Class 2				
Shoulder width	6.0	ft	Peak-hour factor, PHF	0.91	
Lane width	12.0	ft	% Trucks and buses	4	%
Segment length	2.4	mi	% Recreational vehicles	1	%
Terrain type	Rolling		% No-passing zones	50	%
Grade: Length		mi	Access points/mi	10	/mi
Up/down		%			
Two-way hourly volume, V	1288	veh/h			
Directional split	57 / 43	%			

Average Travel Speed

Grade adjustment factor, fG	0.99	
PCE for trucks, ET	1.5	
PCE for RVs, ER	1.1	
Heavy-vehicle adjustment factor,	0.979	
Two-way flow rate, (note-1) vp	1460	pc/h
Highest directional split proportion (note-2)	832	pc/h
Free-Flow Speed from Field Measurement:		
Field measured speed, SFM	-	mi/h
Observed volume, Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, BFFS	55.0	mi/h
Adj. for lane and shoulder width, fLS	0.0	mi/h
Adj. for access points, fA	2.5	mi/h
Free-flow speed, FFS	52.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATS	40.2	mi/h

---

Percent Time-Spent-Following

---

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.0	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	1.000	
Two-way flow rate, (note-1) vp	1415	pc/h
Highest directional split proportion (note-2)	807	
Base percent time-spent-following, BPTSF	71.2	%
Adj. for directional distribution and no-passing zones, fd/np	6.1	
Percent time-spent-following, PTSF	77.3	%

---

Level of Service and Other Performance Measures

---

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	849	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3091	veh-mi
Peak 15-min total travel time, TT15	21.1	veh-h

---

Notes:

1. If  $vp \geq 3200$  pc/h, terminate analysis-the LOS is F.
2. If highest directional split  $vp \geq 1700$  pc/h, terminate analysis-the LOS is F.