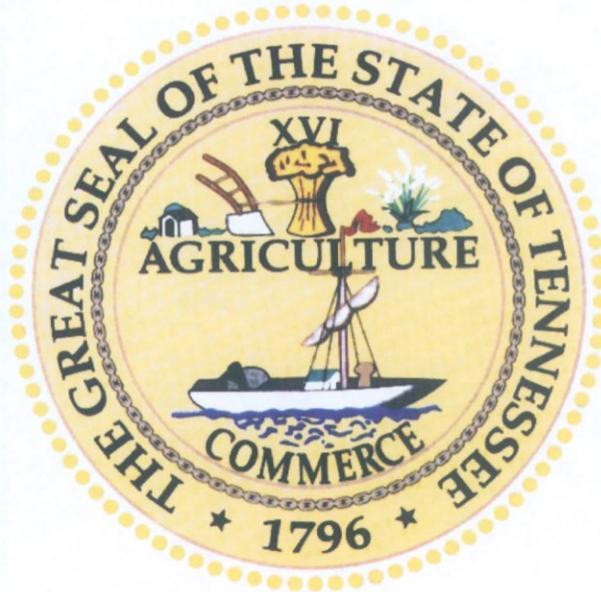


TRANSPORTATION PLANNING REPORT

State Route 50
From SR 48 / SR 100 to SR 247
Hickman and Maury Counties
PIN: 112468.00



Prepared by
LONG ENGINEERING, INC.
for the
SOUTH CENTRAL WEST RURAL PLANNING ORGANIZATION
And the
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

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

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1 HISTORY AND BACKGROUND

1.1 Report Purpose

As part of an annual review of planning priorities, the South Central Tennessee Development District (SCTDD) West Rural Planning Organization (RPO) requested that the Tennessee Department of Transportation (TDOT) conduct a study of State Route 50 from State Route 48 / State Route 100 to State Route 247 in Hickman and Maury Counties, Tennessee. The SCTDD West RPO considers the route to be a primary corridor between the cities of Centerville and Columbia, as well as their respective surrounding regions.

The purpose of this Transportation Planning Report (TPR) is to determine the short and long term needs of the study area and assess various options for meeting those needs in the future. This report represents part of the planning process for improvements to State Route 50 within the study area. As part of the process, this report will consider several options intended to meet the needs of the area.

1.2 Study Area History

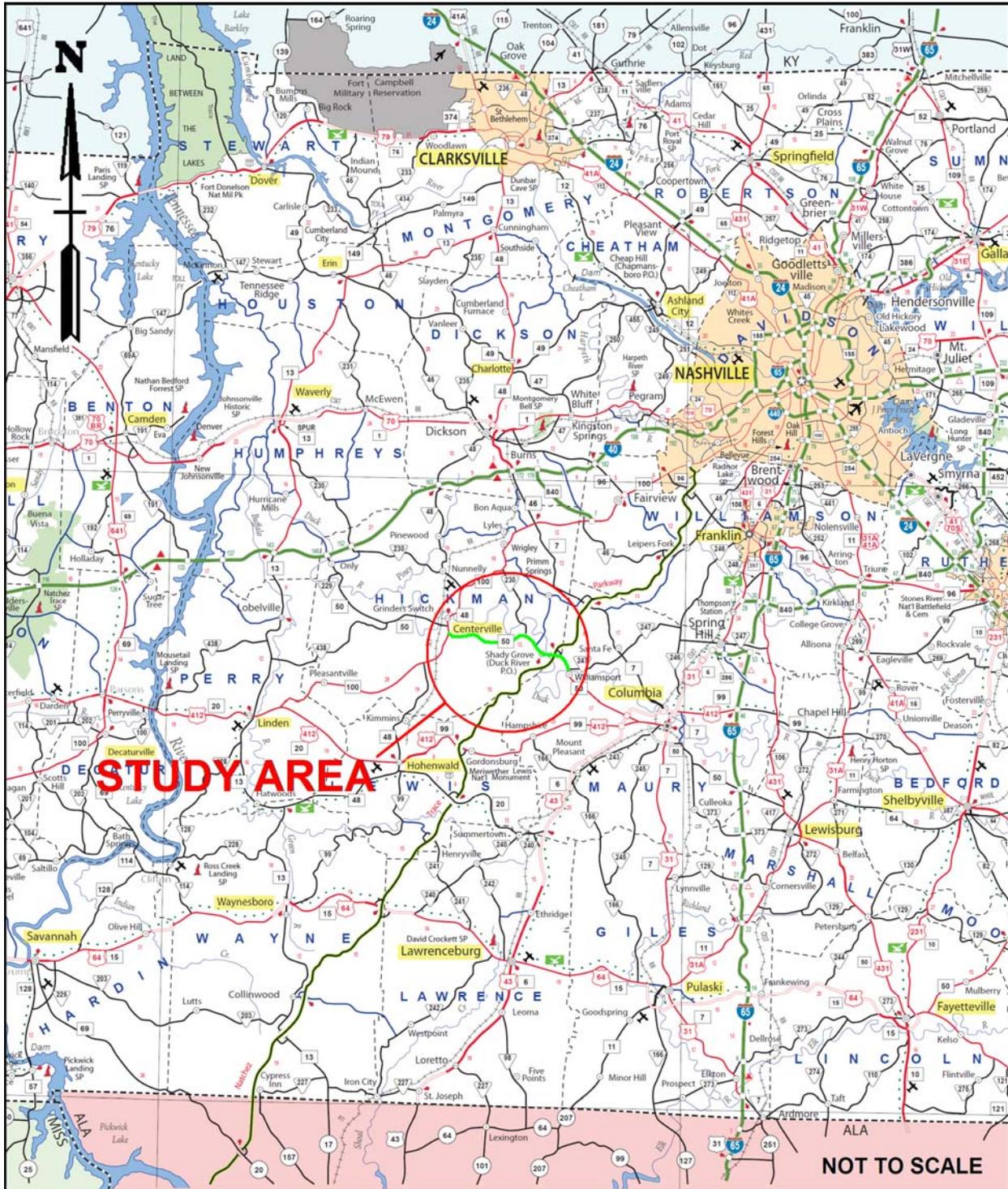
At the request of the RPO, the TDOT Long Range Planning Division conducted a Preliminary Purpose and Needs Statement of State Route 50 from State Route 48 / State Route 100 to State Route 6 (US Route 43) in Hickman and Maury Counties (found in **Volume II** of this report). A TPR for the section from State Route 247 to State Route 6 (US Route 43) was completed in January 2008. The segment of State Route 50 featured in this report represents the remainder of the area marked for study by the SCTDD West RPO.

No other planning studies have been completed for the study area as a whole; however, specific locations along State Route 50 have been the subject of past and ongoing projects. Improvements to the intersection of State Route 50 and State Route 48 / State Route 100 are under preliminary engineering design as of the time of publication of this report. Additionally, the J. W. Alderson Bridge over Swan Creek (LM 20.63) is slated for replacement by TDOT in December 2010.

1.3 Study Area Limits

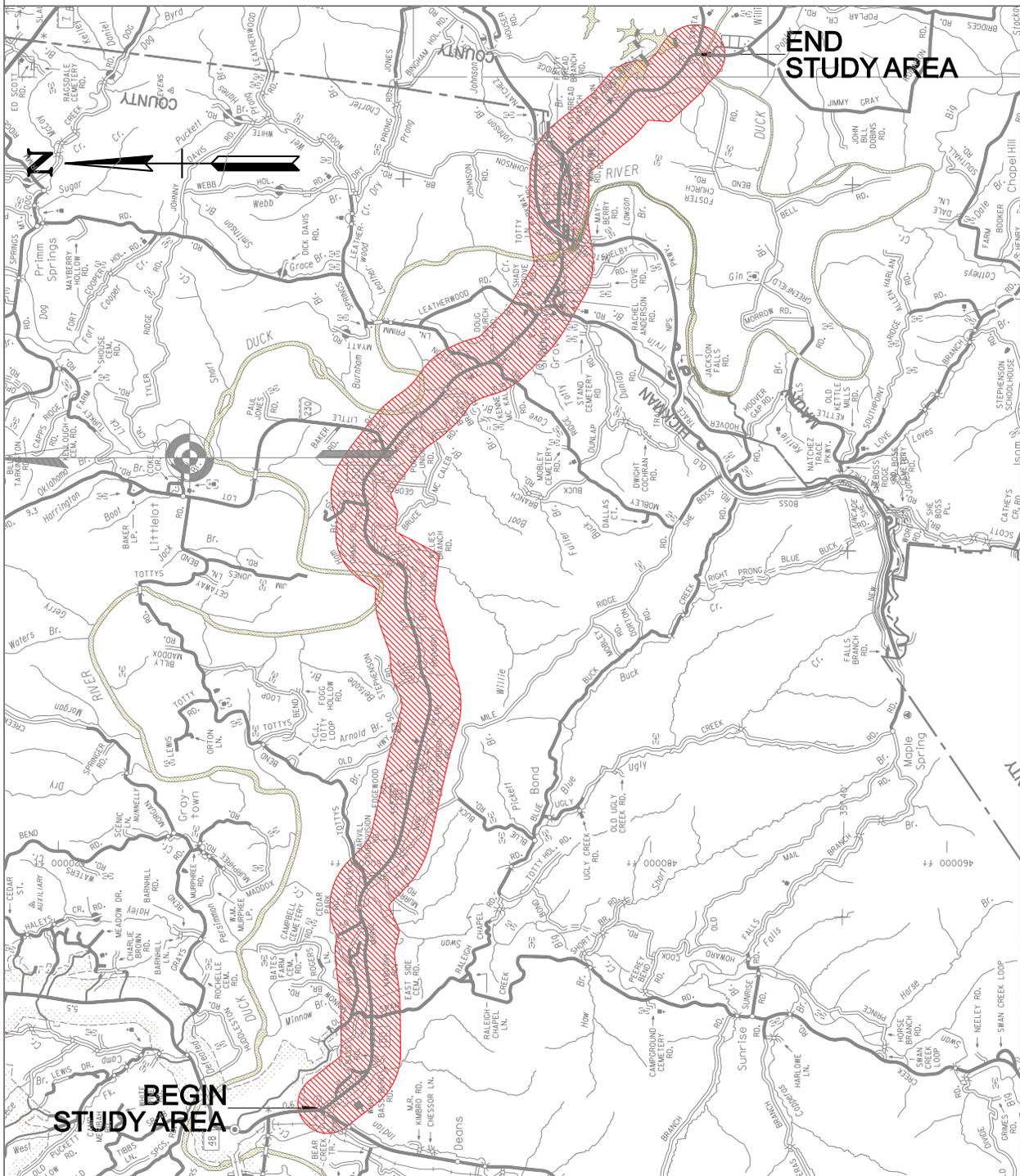
The limits of the study area extend from the intersection of State Route 50 and State Route 48 / State Route 100 (LM 17.68) in Centerville, Hickman County, Tennessee, to the intersection of State Route 50 and State Route 247 (LM 2.35) in Maury County, Tennessee, a distance of approximately 16.4 miles. **Figure 1.1** presents a map of the region, **Figure 1.2** shows the study area identified on the Hickman and Maury County highway maps, and **Figure 1.3** further details the study area on United States Geological Survey (USGS) maps.

Figure 1.1 — Regional Map



TRANSPORTATION PLANNING REPORT

SR 50 FROM SR 48 / SR 100 TO SR 247 HICKMAN AND MAURY COUNTIES

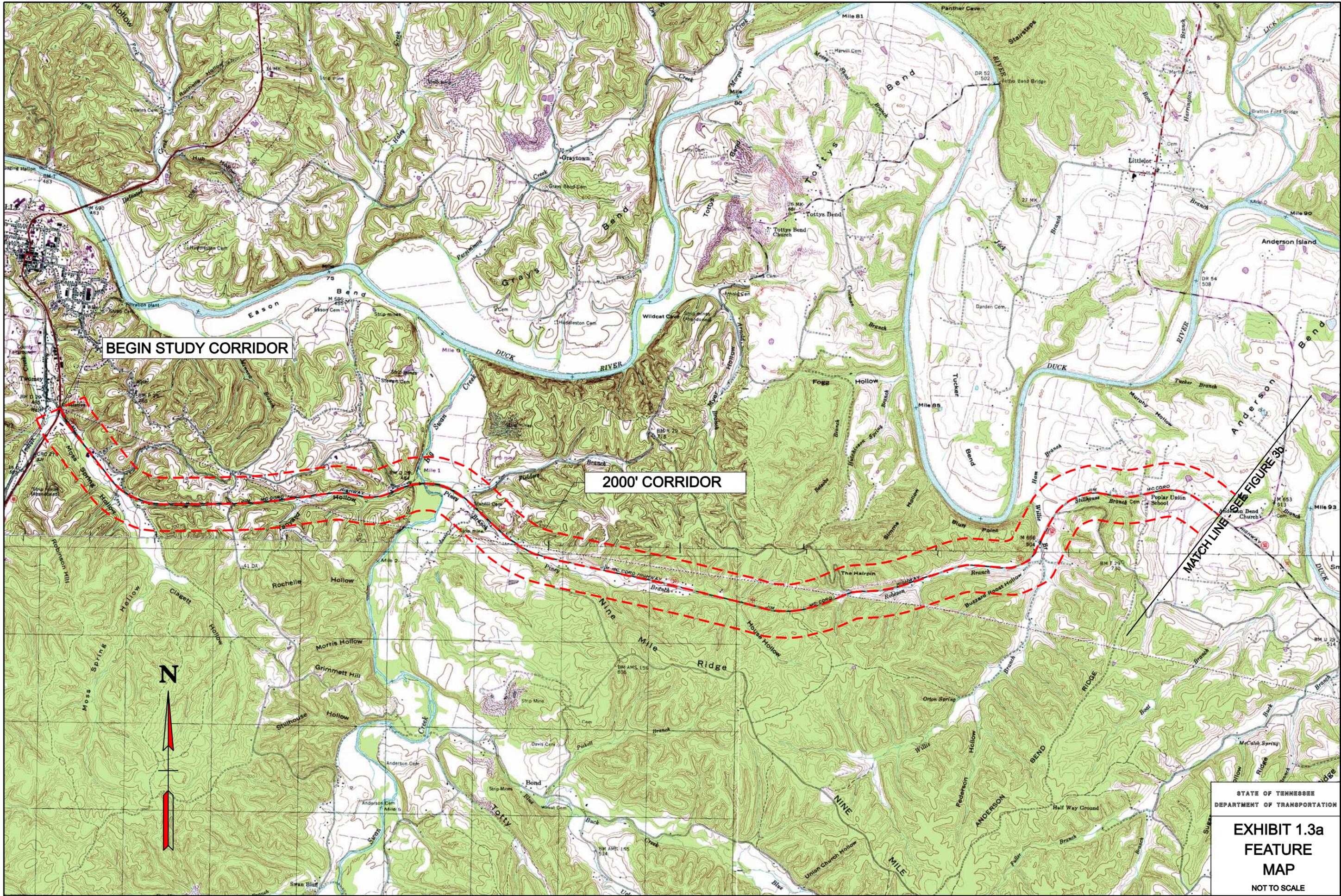


**BEGIN
STUDY AREA**

**END
STUDY AREA**



FIGURE 1.2
STUDY AREA MAP

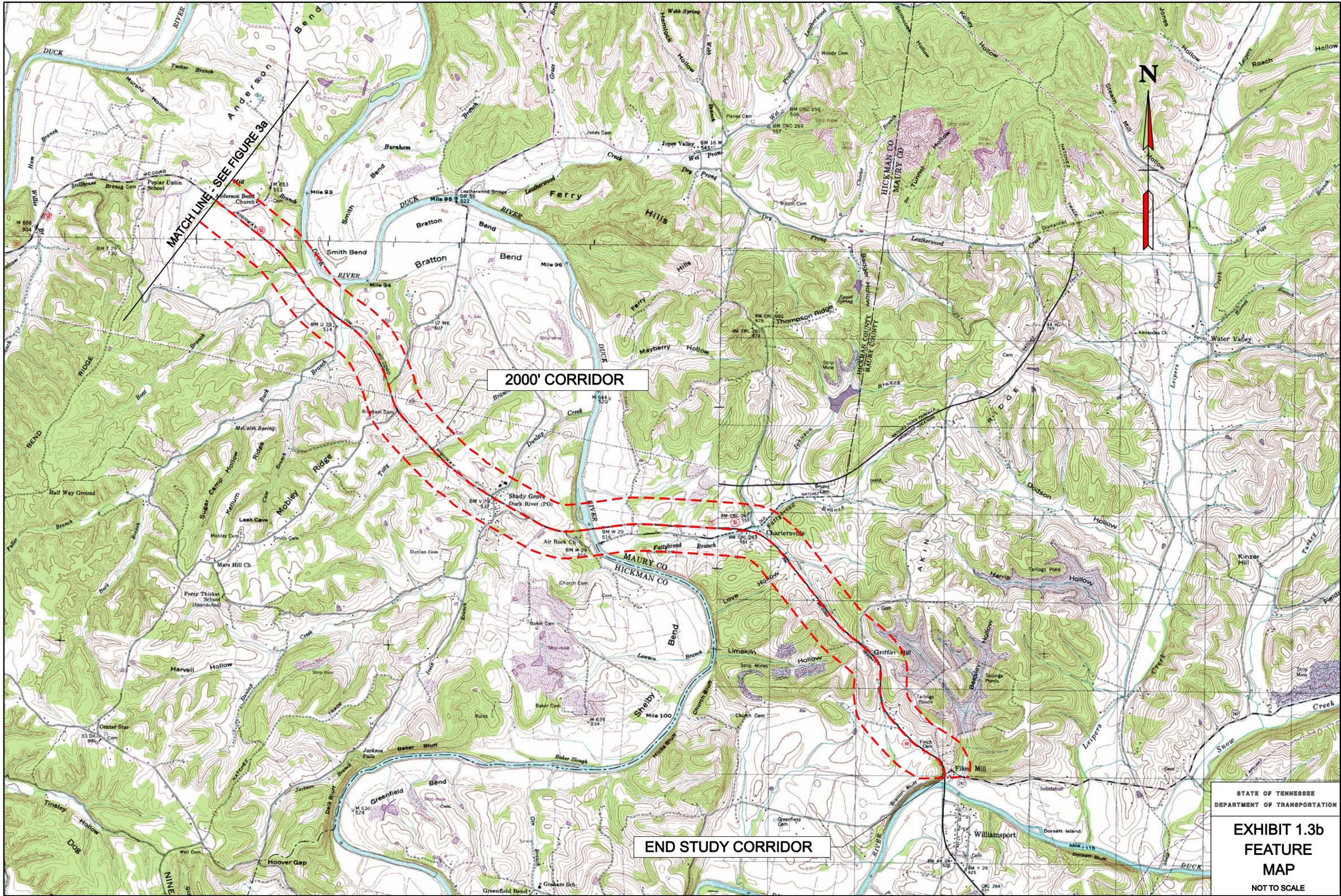


BEGIN STUDY CORRIDOR

2000' CORRIDOR

MATCH LINE SEE FIGURE 3b





MATCH LINE - SEE FIGURE 3a

2000' CORRIDOR

END STUDY CORRIDOR



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
EXHIBIT 1.3b
FEATURE
MAP
NOT TO SCALE

1.4 Community Description

The majority of the study area resides within Hickman County, with approximately 2.4 miles in Maury County. **Table 1.1** presents geographic data for the area. **Table 1.2** presents historic population data for the two counties, as well as statewide values for comparison.

Table 1.1 — Geographic Data¹

Category	Hickman County	Maury County
Land Area (excl. Water Covered) (<i>mi.</i> ²)	613.5	613.9
Persons per Square Mile	36	113
Housing Units per Square Mile	14	47

Table 1.2 — Population Data²

Jurisdiction	Category	Year		
		1990	2000	2008 ³
Hickman County	Population	16,754	22,295	23,841
	Percent Change	—	33.1%	6.9%
	Average Annual Growth Rate	—	2.9%	0.8%
Maury County	Population	54,812	69,498	81,938
	Percent Change	—	26.8%	17.9%
	Average Annual Growth Rate	—	2.4%	2.1%
State of Tennessee	Population	4,877,185	5,689,283	6,214,888
	Percent Change	—	16.7%	9.2%
	Average Annual Growth Rate	—	1.6%	1.1%

¹ Source: United States Census Bureau

² Source: United States Census Bureau

³ Population values for 2008 are United States Census Bureau estimates as of the time of publication of this report.

1.5 Description of Study Area

State Route 50 within the study area is a two (2) lane, minor arterial roadway on the Surface Transportation Program (STP) that serves as a link between Centerville and Columbia, Tennessee. Though there are no major traffic generators or large urban areas located directly on State Route 50 within the study area, the route serves as a link to employment opportunities, commercial locations, Maury Regional Hospital, Columbia State Community College, Interstate 65, and recreational destinations in Columbia and Maury County. According to the RPO, approximately ten (10) percent of the Hickman County workforce travels to Maury County for work. The RPO estimates as many as 1,000 Hickman County residents use State Route 50 to travel to Maury County each day.

The study area begins in Centerville, Hickman County, Tennessee, at the intersection of State Route 50 and State Route 48 / State Route 100. This Y-shaped intersection allows high-speed movements between the two routes without clearly delineating which movement has priority, leading to driver confusion and safety concerns. Improvements to this intersection are currently under preliminary engineering design which realign State Route 50 to create a T-shaped intersection while adding auxiliary lanes for turning movements. **Figure 1.4** presents a view of the intersection, looking south from State Route 48 / State Route 100.

Figure 1.4 — SR 50 at SR 48 / SR 100



Figure 1.5 — SR 50 in Centerville



State Route 50 remains within Centerville city limits for approximately 4,050 feet east of the intersection with State Route 48 / State Route 100. This section of the roadway, traversing Moss Spring Hollow, features an increased amount of side roads and access points, resulting in more frequent turning movements. Additionally, buildings along the route are closely spaced and nearer to the roadway than on much of the route. The roadway is also in proximity to an unnamed tributary of Indian Creek to the south. **Figure 1.5** presents a typical view of State Route 50 in this area, looking west from the intersection of State Route 50 and Moss Spring Hollow Road.

The intersection of State Route 50 and State Route 230 (known locally as Little Lot Road) is located approximately 8.6 miles east of the Centerville city limits in unincorporated Hickman County. This T-shaped intersection features a high degree of skew, resulting in excessive pavement and large turning radii. Anecdotal evidence and field observations show that turning movements within the intersection are completed at high speeds. Combined with inadequate sight distance on the western approach, the geometry of the intersection poses a safety hazard. **Figure 1.6** presents a view of the intersection of State Route 50 and State Route 230, looking west from the intersection.

Figure 1.6 — SR 50 at SR 230



Figure 1.7 — SR 50 in Duck River



Approximately 2.8 miles east of its intersection with State Route 230, State Route 50 enters the unincorporated community of Shady Grove (Duck River Post Office). This stretch of roadway, approximately 4,500 feet long, features an increased amount of side roads and unrestricted access points, resulting in more frequent and less predictable turning movements. There are several buildings in close proximity to the route. Additionally, State Route 50 crosses Dunlap Creek in this section. **Figure 1.7** presents a typical view of State Route 50 in this section, looking southeast from its intersection with Leatherwood Road.

State Route 50 crosses the Duck River and the Natchez Trace Parkway in succession approximately one (1) mile east of Shady Grove. The immediate area contains several areas of cultural significance, including not only the Parkway itself but also the John Gordon House and the Natchez Trace National Scenic Trail. State Route 50 in this section features ten (10) foot wide, paved shoulders, rumble strips along the centerline and edge lines, and auxiliary lanes for turning movements onto the Natchez Trace Parkway. **Figure 1.9** presents a view of State Route 50 and the Natchez Trace Parkway overpass, looking east from its intersection with Totty Lane.

Figure 1.8 — SR 50 at Natchez Trace



Figure 1.9 — SR 50 at County Line



Approximately 4,500 feet after crossing the Natchez Trace Parkway, State Route 50 (known locally in Maury County as Williamsport Pike) reaches the Hickman/Maury county line. At this location both Marlowe Road and Fattybread Branch Road intersect the route during a horizontal curve and at a high degree of skew, hindering sight distance and complicating turning movements. State Route 50 also crosses Fattybread Branch at this location, and several buildings are present nearby, constraining the alignment of the road. **Figure 1.9** presents a view of State Route 50, looking west from its intersection with Fattybread Branch Road.

The study area terminates at the intersection of State Route 50 and State Route 247 (known locally as Snow Creek Road), approximately 2.4 miles east of the Hickman/Maury county line. This location features an offset intersection that includes Greenfield Bend Road on a steep grade south of State Route 50, with reduced sight distance and awkward turning movements. The adjacent TPR mentioned in **Section 1.2** recommended that excess vegetation be cleared and advanced warning signage be installed on State Route 50. **Figure 1.10** presents a view of the intersection of State Route 50 and State Route 247, looking north from the Joe Frank Porter Bridge over the Duck River.

Figure 1.10 — SR 50 at SR 247



1.6 Crash History

The Tennessee Roadway Information Management System (TRIMS) provides data for use in calculating crash rates for comparison to statewide averages and identify roadway segment features.

Over the most recent three (3) year period (2005-2007), seventy (70) documented crashes occurred on State Route 50 within the study area. Of these, twenty seven (27) crashes involved injuries and five (5) involved incapacitating injuries, resulting in a total of thirty six (36) injuries. No fatality crashes occurred within the study area during this period. Overall, the actual crash rate for State Route 50 within the study area was 2.169, which exceeds the statewide average for rural minor arterials of 1.652.

Table 1.3 presents a summary of crash types and conditions within the study area.

Table 1.3 — State Route 50 Crash Data Summary

Description	2005	2006	2007	Total	Pct.
Rear-End	2	2	1	5	7.1%
Angle	3	1	1	5	7.1%
Sideswipe (Opposite Direction)	1	0	0	1	1.5%
Overturn	2	2	1	5	7.1%
Jackknife	0	1	0	1	1.5%
Struck Bridge Rail/Guardrail	2	0	2	4	5.7%
Struck Other Object (Fixed)	9	7	3	19	27.1%
Struck Other Object (Not Fixed)	1	0	1	2	2.9%
Struck Animal in Road	5	5	4	14	20.0%
Left Roadway	2	6	4	12	17.1%
Unknown	1	1	0	2	2.9%
INVOLVEMENT					
All Vehicles	34	29	20	83	
ROAD SURFACE					
Dry (No Adverse Conditions)	26	22	15	63	90.0%
Wet (Rain)	2	2	2	6	8.6%
Fog	0	1	0	1	1.4%
SEVERITY					
Property Damage Only	12	14	12	38	54.3%
Injury Crashes (No Fatalities)	14	9	4	27	38.6%
Incap. Crashes (No Fatalities)	2	2	1	5	7.1%
Fatality Crashes	0	0	0	0	0.0%
Number of Injuries (All Crashes)	16	14	6	36	
Number of Fatalities (All Crashes)	0	0	0	0	
CRASH SUMMARY					
Total Crashes	28	25	17	70	100.0%
Percentage of Total	40.0%	35.7%	24.3%		
Actual Crash Rate (A)				2.169	
Critical Crash Rate (C)				2.194	
Ratio of A/C				0.99	
Severity Index (SI)				0.5286	

1.7 Geometrics

TRIMS provides geometric data for state routes, including information such as right-of-way (ROW) width, lane width, and shoulder width.

State Route 50 within the study area is 16.4 miles long, with 14.05 miles residing within Hickman County (LM 17.68 to 31.73) and 2.35 miles residing within Maury County (LM 0.00 to 2.35). The route is classified as a two (2) lane rural minor arterial road with rolling terrain for this entire length. Lane widths are eleven (11) feet throughout the study area. Except for the segment in the immediate vicinity of the Natchez Trace Parkway (where shoulders are ten [10] feet wide), the roadway also features two (2) to three (3) foot shoulders. Rumble stripes are incorporated into the edge and center lines from approximately LM 25.3 to the Hickman/Maury County line. There are no sidewalks or other facilities for pedestrians and bicycles within the study area.

1.8 Traffic

1.8.1 Volume Projection

The projected traffic volumes used for analysis were developed from several sources, including traffic count station data, TDOT volume projections (including those used in other reports), local traffic generators and land uses as determined by area governmental organizations, and the collection of turning movement counts at selected intersections along State Route 50. Using this data, traffic volumes were generated for the planning years of 2014 and 2034 as described in the Traffic Forecasting Findings Memorandum. The memorandum, a diagram of the developed traffic volumes, and associated data are found in **Volume II** of this report.

TDOT collects traffic data on a continuing basis at several count stations located on roads within the study area. Nine of these stations are located on State Route 50 or a major intersecting road. **Table 1.4** presents 2008 annual average daily traffic (AADT) counts for the count stations.

Table 1.4 — TDOT Traffic Count Stations

County	Station No.	Road (Location)	2008 AADT (veh./day)
Hickman	039	State Route 50 (West of Natchez Trace Parkway)	2,620
	043	State Route 50 (East of Nine Mile Ridge Road)	1,950
	044	Totty's Bend Road (North of State Route 50)	189
	047	State Route 50 (East of State Routes 48/100)	3,424
	048	State Routes 48/100 (North of State Route 50)	5,958
	049	State Routes 48/100 (South of State Route 50)	3,017
Maury	031	State Route 50 (West of State Route 247)	2,895
	033	State Route 247 (East of State Route 50)	337
	172	State Route 50 (East of State Route 247)	3,058

Previous traffic volume projections were also utilized for the development of the current projection, including volumes from an adjacent TPR regarding State Route 50 from State Route 247 to State Route 6 (US Route 43) in Maury County. The previous volumes were linearly projected to accommodate the planning years in this report.

Additionally, Long Engineering, Inc. conducted traffic counts at five (5) intersections along the route. This data was primarily used in determining turning movement percentages at the selected intersections. The count data can be found in **Volume II** of this report.

1.8.2 Level of Service (LOS)

A “Level of Service” (LOS) index was used to gauge the operational performance at each intersection/roadway segment. The LOS is a qualitative measure that describes traffic conditions related to speed and travel time, freedom to maneuver, traffic interruptions, etc. There are six (6) levels ranging from “A” to “F” with “F” being the worst. Each level represents a range of operating conditions. **Table 1.5** shows the traffic flow conditions and approximate driver comfort level at each level of service.

Table 1.5 — Level of Service (LOS) Description

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 exceeds 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.

Using the traffic volume data given in **Section 1.8.1**, mainline LOS were projected for State Route 50 for the planning years of 2014 and 2034. The calculation procedures are outlined in the 2000 edition of the *Highway Capacity Manual* (HCM) and performed using the McTrans *Highway Capacity Software* (HCS), version 5.3. **Table 1.6** displays the LOS data for State Route 50 under existing conditions. The analysis calculations can be found in **Volume II** of this report.

Table 1.6 — State Route 50 Mainline Levels of Service (LOS)

State Route 50 Segment	Level of Service (LOS)	
	2014	2034
From State Routes 48/100 to Moss Spring Hollow Road	C	C
From Moss Spring Hollow Road to Totty’s Bend Road	D	D
From Totty’s Bend Road to Natchez Trace Parkway	C	D
From Natchez Trace Parkway to State Route 247	D	D
East of State Route 247	D	D

Based on the mainline LOS calculations for State Route 50 within the study area, there are no capacity deficiencies expected for the existing route.

1.9 Multi-Modal Facilities

SCTDD Rural Public Transportation provides curb-to-curb public transportation to Hickman and Maury Counties. The service is provided in conjunction with TDOT and the Federal Transit Administration (FTA) and is available by reservation on weekdays (excluding holidays).

No dedicated facilities for pedestrians or bicycles currently exist along State Route 50. However, the segment of the route from the Natchez Trace Parkway to State Route 247 within the study area is listed as part of the “Heartland” Tennessee Bicycle Route. Additionally, the segment of State Route 50 from State Route 230 to the Natchez Trace Parkway is listed as a proposed bicycle route.

The South Central Tennessee Railroad Authority operates a short line railroad running parallel to and west of State Route 48 / State Route 100. The railroad does not intersect State Route 50 within the study area. No passenger facilities are provided.

1.10 Infrastructure

1.10.1 Utilities

The following presents the known utilities within the study area:

- **Water:** Water service within the study area is provided by the Town of Centerville, the Bon Aqua and Lyles Utility District, the Water Authority of Dickson County, and the Maury County Water Department.
- **Wastewater:** Sewer service within portions of the study area is provided by the Town of Centerville. Elsewhere, septic systems are used to treat wastewater. In some areas, particularly those in which buildings are close to the roadway, activity may impact septic systems. If they cannot be relocated to another area of the property, ROW costs may significantly increase.
- **Electricity:** The study area is served by the Meriwether Lewis Electric Cooperative, the Dickson Electric System, and Columbia Power and Water Systems, all of whom are supplied by the Tennessee Valley Authority (TVA). Electricity is provided via overhead

wires throughout the study area. There are an estimated 100 utility poles located along the route. Additionally, high-tension wires owned by TVA are present adjacent to the route.

- **Telephone:** Telephone service is provided by AT&T, Inc. via overhead wires throughout the study area. There are an estimated 100 utility poles located along the route.
- **Gas:** Gas service is supplied by the Town of Centerville and Atmos Energy Corporation in portions of the study corridor.

1.10.2 Structures

Information provided by TDOT, TRIMS, and the National Bridge Inventory (NBI) reveal fifteen (15) culverts and nine (9) bridges (including one [1] overpass) along the existing State Route 50. These structures will likely need modification or replacement if significant improvements are made to the roadway.

TDOT plans to replace the J. W. Alderson Bridge over Swan Creek (LM 20.64, Structure Number 41SR0500019); the project (TDOT No. 41008-1220-04) is scheduled to be let to contract in the fall of 2010. The bridge is currently rated in “Poor” condition with a sufficiency rating of 23.9%. The replacement will likely include a slight realignment of State Route 50. Additionally, TDOT has indicated that the bridge crossing Dunlap Creek (Structure Number 41SR0500029), currently rated in “Fair” condition with a sufficiency rating of 59.6%, will be replaced with any improvements made in its vicinity. The bridge crossing Fattybread Branch (Structure Number 60SR0500001), currently rated in “Fair” condition with a sufficiency rating of 80.0%, can be widened to accommodate improvements.

1.11 Early Environmental Screening (EES)

In preparation of Transportation Planning Reports (TPR), the Tennessee Department of Transportation (TDOT) has introduced an Early Environmental Screening (EES) process for the report study area. By screening the latest available Geographic Information Systems (GIS) environmental data during the early stages of planning, TDOT and the resource and permitting agencies 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:

- **Archaeological/Historic Architecture**, including historic properties and cemetery sites;
- **Community Impacts**, including sensitive community populations;
- **Ecology**, including Scenic Waterways, Natural Areas, large wetlands, and protected species (such as bat, aquatic, terrestrial, and plant species);
- **Hazardous Substances/Geology**, including hazardous substance sites, pyritic rock/geotechnical, and caves; and
- **Parks & Public Land**, including parks (federal/state/local), public land/buildings, railroads, and wildlife management areas.

As of the time of publication of this report, the GIS data within each layer is relevant and current for the study area. This data will be updated as part of the ongoing development process.

1.11.1 Archaeological/Historic Architecture

A preliminary review of the National Register of Historic Places (NRHP) revealed twelve (12) listed properties in Hickman County and sixty-five (65) in Maury County, including two (2) National Historic Landmarks (NHL) in the latter. Two (2) properties within the study area are the Old Natchez Trace (National Park Service [NPS] Reference Number 75002125) and the John Gordon House (NPS Reference Number 74000333), both of which are located at the intersection of State Route 50 and the current Natchez Trace Parkway near the Hickman/Maury county line.

Measures should be taken to avoid properties listed on the NHRP and minimize improvements in their immediate area in order to prevent adverse effects or potential Section 4(f) takes. If other properties are later identified as being eligible for the NRHP, they will need to be avoided or mitigated to prevent adverse effects or potential 4(f) takes.

Though several cemeteries are located near or within the study area, it is possible to avoid most if not all potential impacts through improvements to the existing roadway. An environmental impact may still result and necessitate an archaeological review as part of the National Environmental Policy Act (NEPA). A moderate level of environmental documentation and time will be required to proceed with development of the project, including steps to result in no adverse effect and/or minimum impact to cemetery property.

1.11.2 Community Impacts

No impact is anticipated for any sensitive community populations within the study area.

1.11.3 Ecology

No impact is expected on any Scenic Waterways or Natural Areas as designated by the Tennessee Department of Environment and Conservation (TDEC). Approximately thirty seven (37) miles of the Duck River is defined as a Class II (Pastoral River Area) Scenic River in eastern Maury County; however, this designation falls outside of the study area. Additionally, the John Noel Natural Area at Bon Aqua in Hickman County, defined as a Class I (Scenic/Recreational) Natural Area, lies outside the study area.

According to the United States Fish and Wildlife Service (USFWS), there are thirteen (13) endangered (four [4] historically), two (2) candidate (one [1] historically), and one (1) threatened species residing in Hickman and Maury Counties. As the planning process advances, additional consideration for proposed improvements should include additional environmental studies to determine if any protected species are in the area of potential impact. Many of the protected species present in Hickman and Maury Counties are associated with watercourses (e.g., the Duck River and its tributaries). Additional consideration must be given when proposing improvements in areas where watercourses may be impacted.

1.11.4 Hazardous Substances/Geology

There are underground storage tanks (UST) present in the western portion of the study area, within Centerville city limits. These may need permitting if they are impacted by improvements to the existing route.

Pyritic rock is not known to occur within the study area, though limestone and dolomite are present. There are no known cave formations within the study area.

1.11.5 Parks and Public Land

The National Park Service (NPS) maintains the Natchez Trace Parkway, which crosses State Route 50 near the Hickman/Maury county line. Additionally, the southern trailhead of the Natchez Trace National Scenic Trail (Leipers Fork District) is located off State Route 50 on Totty Lane. No impacts are anticipated to the parkway from improvement options to the route.

The South Central Tennessee Railroad Authority operates a short line railroad running parallel to and west of State Route 48 / State Route 100. However, no impact is anticipated as the railroad does not intersect State Route 50 within the study area and has no passenger facilities.

The Williamsport Wildlife Management Area (WMA), maintained by the Tennessee Wildlife Resources Agency (TWRA), lies adjacent to and within the study area near its terminus at State Route 247 in Maury County. Improvements made to the existing roadway should not affect the WMA.

2 PURPOSE AND NEED FOR IMPROVEMENTS

The purpose of planned improvements to State Route 50 within the study area is to provide a transportation facility that improves safety, enhances mobility within the region, and corrects deficiencies in the existing route.

The SCTDD West RPO lists State Route 50 in Hickman and Maury Counties as a prime study corridor in the region. The route not only serves as a direct link between the respective county seats of Centerville and Columbia, but also provides access to major manufacturing facilities (including the General Motors manufacturing plant), Maury Regional Hospital, Columbia State Community College, Interstate 65, and recreational venues (such as the Natchez Trace Parkway, Natchez Trace National Scenic Trail, and Williamsport WMA). Within the study area, State Route 50 is the primary route for citizens of Hickman County to access services, employment, and commercial opportunities currently unavailable in their county. Additionally, the route serves as a connection between eastern Hickman County and the county seat of Centerville.

A Preliminary Purpose and Need Statement completed by TDOT identified several deficiencies in the study area that warrant evaluation. Much of State Route 50 within the study area is identified as having deficient shoulder width, excessive curves and grades, and a crash rate exceeding the statewide average. Though the route is not projected to become deficient in capacity within the planning horizon, improvements to the route can increase efficiency while improving the listed deficiencies and increasing safety.

Based on the needs of the study area as outlined by the SCTDD West RPO and TDOT, the objectives of an improved State Route 50 within the study area include:

- **Correcting geometric deficiencies and excessive curves and grades** to improve safety and bring the route to meet accepted design standards;
- **Improving traffic flow and efficiency along the route** by improving unnecessary delay for mainline traffic and ensuring adequate capacity for demands;
- **Supporting economic development within the region** by providing adequate access to employment and commercial opportunities in Columbia and Centerville; and
- **Meeting present and future demand for mobility** in the area.

3 OPTIONS FOR IMPROVEMENT

This section identifies and evaluates the various options for improving State Route 50 within the study area. The options considered include:

- a **no-build option** that assumes no improvements are made to the study area;
- a **widening option** that provides improvement to the existing alignment throughout the study area;
- a **relocation option** that provides a new corridor for alternative alignments within the study area; and
- an option for **localized improvements** that provide enhancement to several locations within the study area.

3.1 Option 1 (No-Build)

This option assumes no modifications are made to the study area throughout the planning horizon (though routine maintenance activities, such as resurfacing, resigning, and isolated safety improvements, would occur as normal). This option provides no major improvements in capacity, efficiency, and safety; it can be used as a benchmark for comparison of all other improvement options.

3.2 Option 2 (Widening)

This option considers the improvement and widening of shoulders along State Route 50 throughout the study area. As noted in **Section 1.7**, shoulders along the existing route vary in width, with some segments featuring rumble strips. This option considers constructing ten (10) foot wide shoulders throughout the study area for improving overall efficiency and safety.

3.2.1 Location

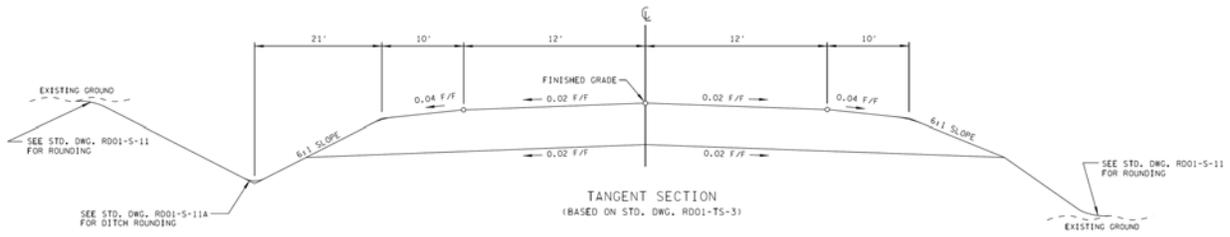
As a corridor-wide improvement, this option covers all of State Route 50 within the study area. The only segment of the route that already features sufficient shoulder width is the intersection of State Route 50 and the Natchez Trace Parkway (LM 30.55–31.23). This area serves as a good representation of improvements proposed under this option. A view of State Route 50 near its intersection with the Natchez Trace Parkway can be seen in **Figure 1.8**.

3.2.2 Cross-Section

Option 2 utilizes the TDOT standard cross-section for two (2) lane arterial highways. The section features two (2) twelve (12) foot travel lanes (one [1] eastbound and one [1] westbound) with ten (10) foot shoulders. Rumble stripes may also be incorporated into the center and edge lines; currently only the section of the route from LM 25.30 to the Hickman/Maury County line features rumble stripes.

Figure 3.1 presents a typical cross-section for State Route 50 improved under Option 2. The typical cross-section can also be found in the attached Corridor Plans.

Figure 3.1 — Typical Cross-Section (Option 2)



The proposed cross-section for Option 2 does not have provisions for dedicated bicycle lanes or sidewalks. However, the improved shoulders in conjunction with twelve (12) foot travel lanes are adequate for bicycle use. Sidewalks are considered unnecessary for Option 2 due to low building density and the lack of pedestrian destinations along the route.

3.2.3 Level of Service (LOS) Analysis

LOS for Option 2 were analyzed using the procedures outlined in **Section 1.8.2**. The mainline LOS results for State Route 50 improved under Option 2 are shown in **Table 3.1**.

Table 3.1 — SR 50 Mainline LOS Analysis (Option 2)

State Route 50 Segment	Level of Service (LOS)	
	2014	2034
From State Routes 48/100 to Moss Spring Hollow Road	C	C
From Moss Spring Hollow Road to Totty's Bend Road	C	D
From Totty's Bend Road to Natchez Trace Parkway	C	C
From Natchez Trace Parkway to State Route 247	C	D
East of State Route 247	—	—

A comparison of the mainline LOS results for State Route 50 improved under Option 2 with the LOS for the existing route (presented in **Table 1.6**) show minor improvements in capacity. As with the existing route, there are no projected capacity deficiencies throughout the planning horizon for State Route 50 improved under Option 2.

3.2.4 Cost Estimates

Improvements to State Route 50 as proposed by Option 2 are estimated to cost approximately **\$16,800,000 to \$22,800,000**. **Section 3.5** presents additional information on cost estimates for Option 2.

3.3 Option 3 (New Location)

This option considers the construction of an improved State Route 50 on new location within the study area. Typically the new route would feature a four (4) lane, divided cross-section with a depressed, grassed median. The section of the existing State Route 50 replaced by the new facility would remain in place, with jurisdiction transferred to Hickman and/or Maury County.

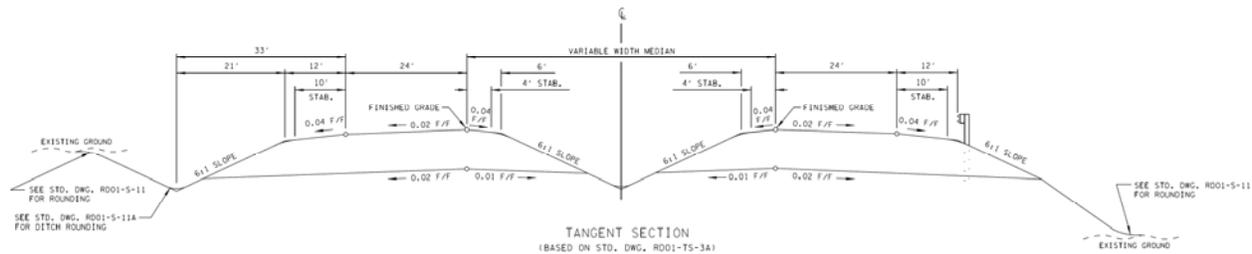
Work performed under this option would include the construction of a new facility within the study area, including ROW acquisition, grading, paving, and associated tasks, as well as the conversion of the existing State Route 50 to a local road, including the removal of signage and other tasks.

This option was not evaluated further because of incompatibilities with the current needs and objectives of State Route 50 within the study area. There are few deficiencies in the existing alignment that require relocation of the route, rather than improvement of the existing route. Additionally, capacity for the route, as noted in **Section 1.8.2**, is adequate for projected traffic volumes throughout the planning horizon. Construction of a new facility would be costly and could severely impact the surrounding area.

3.3.1 Cross-Section

Option 3 utilizes the TDOT standard cross-section for divided four (4) lane highways. The section features two (2) two (2) lane roadways with twelve (12) foot outside shoulders and six (6) foot inside shoulders. The minimum median width for the proposed cross-section is forty eight (48) feet. **Figure 3.2** presents a typical cross-section for State Route 50 improved under Option 3.

Figure 3.2 — Typical Cross-Section (Option 3)



The proposed cross-section for Option 3 does not have provisions for dedicated bicycle lanes or sidewalks. However, the improved shoulders in conjunction with twelve (12) foot travel lanes are adequate for bicycle use. Sidewalks are considered unnecessary for Option 3 due to low building density and the lack of pedestrian destinations along the route.

3.3.2 Cost Estimates

Improvements to State Route 50 as proposed by Option 3 are estimated to cost approximately **\$145,000,000 to \$196,000,000**. **Section 3.5** presents additional information on cost estimates for Option 2.

3.4 Option 4 (Localized Improvements)

This option considers independent, localized improvements at nine (9) locations (labeled alphabetically in order from west to east) throughout the study area. While most of the route adequately meets capacity demand and safety standards, this option allows for enhancements to segments of State Route 50 within the study area to increase its capacity, efficiency, and safety for less cost than a corridor improvement. Additionally, the improvements can be implemented separately or in combination over time with respect to short and long term funding limitations.

Work performed under this option includes the addition of passing lanes, climbing lanes, and center two (2) way left turn lanes (TWLTL) to different segments of the roadway, as well as secondary improvements that further improve the route, such as minor realignment of side roads.

A key feature of these improvements is the addition of climbing lanes to allow traffic to pass slower moving vehicles. Trucks currently account for approximately eight (8) to eleven (11) percent of traffic throughout the study corridor, and several steep grades encountered along the route can result in traffic delays. The addition of passing and climbing lanes to the route should provide opportunity for traffic to pass slower moving traffic, increasing safety and efficiency.

3.4.1 Option 4 Location A (East of Hills Rd. to Bass Rd.)

Figure 3.3 — SR 50 at Moss Spring Hollow Rd.



As noted in **Section 1.5**, the segment of State Route 50 within Centerville city limits features numerous side roads and access points. The increased number and unpredictable nature of turning movements, as well as the presence of slowing or stopped vehicles in the travel lanes, creates capacity and safety concerns within this segment. **Figure 3.3** presents a view of State Route 50 in this location, looking east.

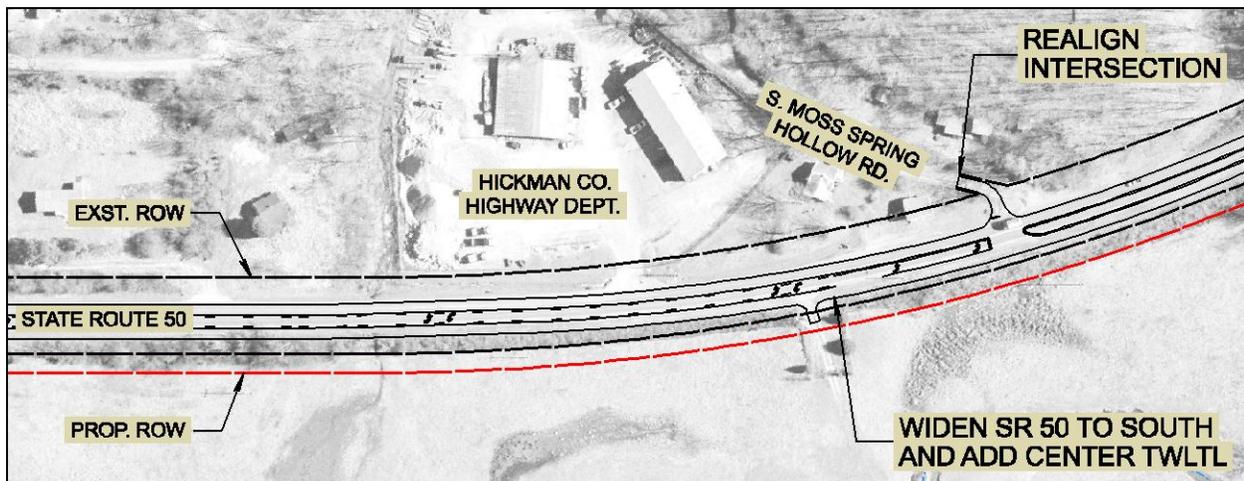
Improvement options in this location include the addition of a center TWLTL on State Route 50 from east of Hills Road (LM 17.87) to Bass Road (LM 18.59), a distance of approximately 3,800 feet. State Route 50 would be widened to the south in this location to minimize impacts to buildings along the route. This location roughly corresponds to the Centerville city limits and also adjoins the preliminary design plans for the improvement of the intersection of State Route 50 and State Route 48 / State Route 100. The addition of the three (3) lane section would allow turning vehicles to decelerate and queue outside of the travel lanes, improving safety and traffic flow in this segment.

Additionally, the intersection of State Route 50 and South Moss Spring Hollow Road (LM 18.48) would be relocated approximately eighty (80) feet to the west to eliminate skew and improve sight distance at the intersection.

Figure 3.4 presents a concept for improvements at one area of this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$1,600,000** and **\$2,200,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.4 — Improvement Concept (Option 4 Location A)



3.4.2 Option 4 Location B (Edgewood Church to West of Old Hwy. 50)

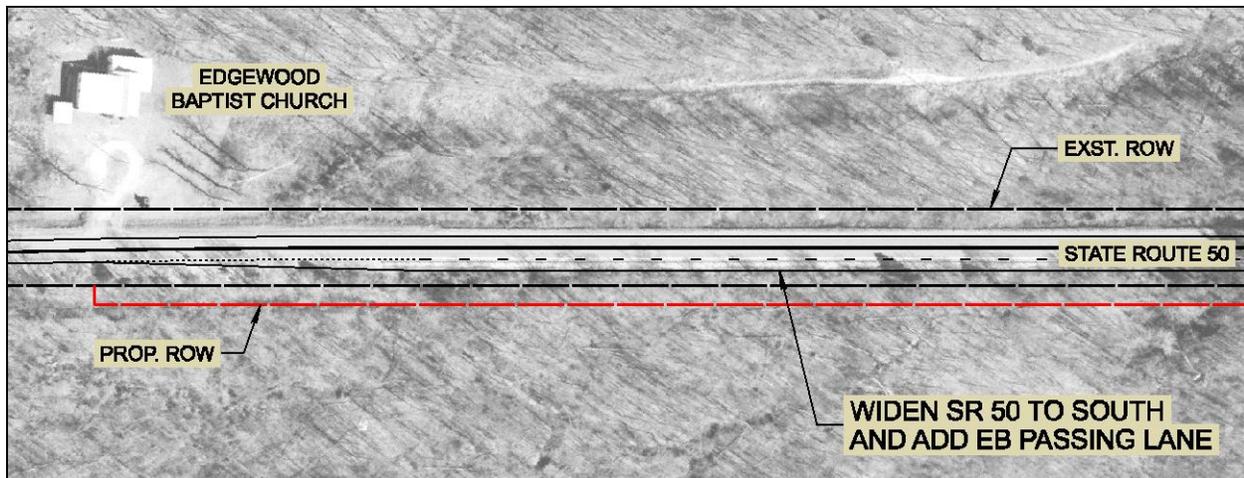
This segment of State Route 50 features a grade of approximately 5.4% lasting for about 3,060 feet, corresponding to a decrease in speed of over 30 miles per hour for a typical truck climbing a grade of this length in the eastbound direction⁴.

Improvement options in this location include the addition of an eastbound climbing lane on State Route 50 from Edgewood Baptist Church (LM 22.94) to west of Old Highway 50 (LM 23.80), a distance of approximately 4,550 feet. State Route 50 would be widened to the south in this location to accommodate adjacent improvements at Location C (detailed in **Section 3.4.3**). The addition of a climbing lane will reduce traffic delays caused by trucks climbing the grade and also allow traffic to pass other slow moving vehicles.

Figure 3.5 presents a concept for improvements at the beginning of this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$1,400,000** and **\$1,900,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.5 — Improvement Concept (Option 4 Location B)



⁴ Source: *A Policy on Geometric Design of Highways and Streets*, 5th edition.

3.4.3 Option 4 Location C (East of Edgewood Baptist Church to West of Collins Ln.)

Figure 3.6 — SR 50 at Old Highway 50



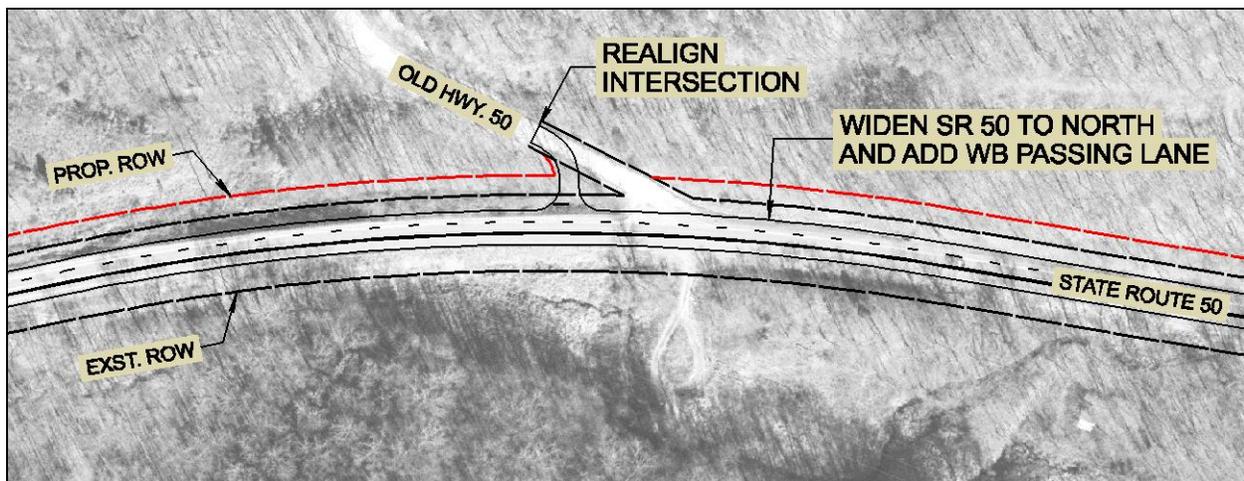
This segment of State Route 50 features a grade of approximately 5.4% lasting for about 3,000 feet, followed by a grade of about 2% lasting for approximately 3,500 feet. This corresponds to a decrease in speed of over 30 miles per hour for a typical truck climbing a grade of this length in the westbound direction, in turn blocking traffic flow and presenting safety issues. **Figure 3.6** presents a view of State Route 50 in this section, looking west from its intersection with Old Highway 50.

Improvement options in this location include the addition of a westbound climbing lane on State Route 50 from east of Edgewood Baptist Church (LM 23.19) to west of Collins Lane (LM 25.12), a distance of approximately 10,170 feet. State Route 50 would be widened to the north in this location to accommodate adjacent improvements at Location B (detailed in **Section 3.4.2**) and avoid relocation of a water main to the south of the roadway. The addition of a climbing lane will reduce traffic delays caused by trucks climbing the grade and also allow traffic to pass other slow moving vehicles. Additionally, the intersection of State Route 50 and Old Highway 50 (LM 23.98) would be relocated approximately 100 feet to the west to eliminate skew and improve sight distance within the intersection.

Figure 3.7 presents a concept for improvements in one area of this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$2,500,000** and **\$3,300,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.7 — Improvement Concept (Option 4 Location C)



3.4.4 Option 4 Location D (Intersection at SR 230)

As noted in **Section 1.5**, the intersection of State Route 50 and State Route 230 (LM 27.08) features excessive pavement, a high degree of skew, and poor sight distance due to the vertical alignment on State Route 50. Anecdotal evidence and field observations indicate that turning movements in the intersection are completed at a high rate of speed, adding to safety issues at the location. **Figure 3.8** presents a view of the intersection, looking southeast.

Figure 3.8 — SR 50 at SR 230

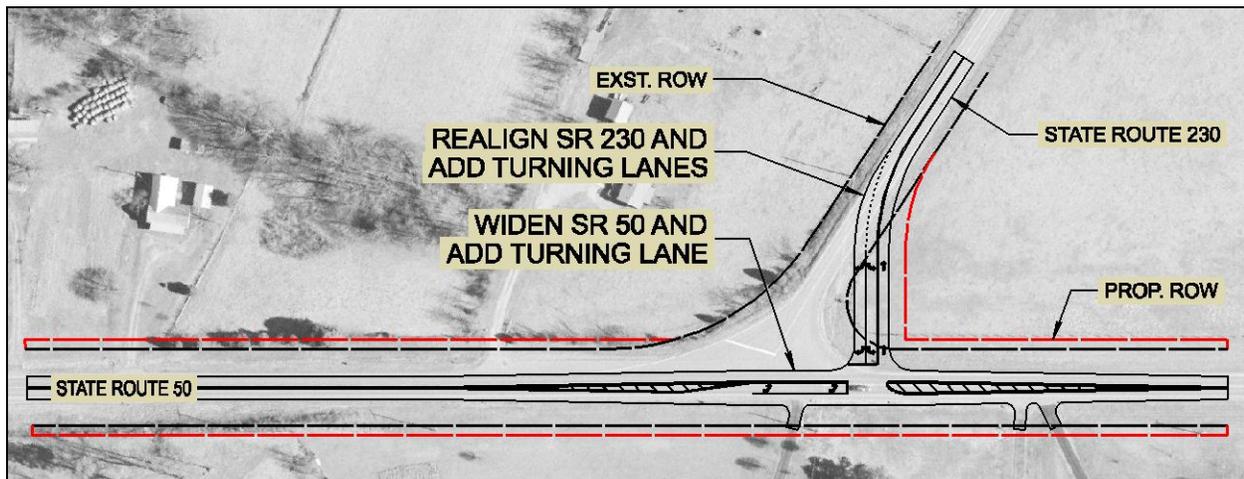


Improvement options at this location include the removal of pavement and realignment of State Route 230 to eliminate skew and prevent high-speed movements between the two roads, as well as the addition of turning lanes on State Route 50 and State Route 230 to provide space for queued turning vehicles. Additionally, the vertical alignment of State Route 50 west of the intersection would be modified to flatten the vertical curve and provide more sight distance for vehicles within the intersection.

Figure 3.9 presents a concept for improvements at this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$400,000** and **\$600,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.9 — Improvement Concept (Option 4 Location D)



3.4.5 Option 4 Location E (East of Buck Branch to West of Doug Church Rd.)

Figure 3.10 — SR 50 at Bratton Lane



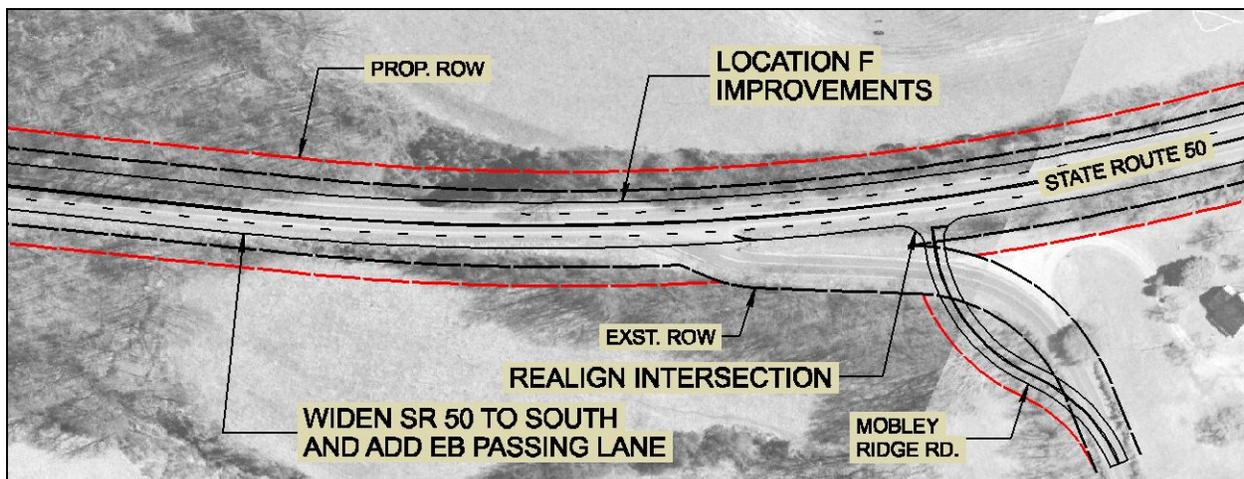
This segment of State Route 50 features a grade of approximately 3.6% lasting for about 2,380 feet, corresponding to a decrease in speed of over 15 miles per hour for a typical truck climbing a grade of this length in the eastbound direction. This speed reduction blocks traffic flow and presents safety issues. **Figure 3.10** presents a view of State Route 50 in this location, looking northwest from its intersection with Bratton Lane.

Improvement options in this location include the addition of an eastbound climbing lane on State Route 50 from east of Buck Branch (LM 28.26) to west of Doug Church Road (LM 29.24), a distance of approximately 5,160 feet. State Route 50 would be widened to the south in this location. The addition of a truck climbing lane will reduce traffic delays caused by trucks climbing the grade and also allow traffic to pass other slow moving vehicles. Additionally, the intersection of State Route 50 and Mobley Ridge Road (LM 28.91) would be relocated approximately 240 feet to the east to eliminate skew and improve sight distance within the intersection.

Figure 3.11 presents a partial concept for improvements at the Mobley Ridge Road area. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$1,700,000** and **\$2,300,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.11 — Improvement Concept (Option 4 Location E)



3.4.6 Option 4 Location F (West of Bratton Ln. to East of Doug Church Rd.)

This segment of State Route 50 features a grade of approximately 5.9% lasting for about 1,650 feet, corresponding to a decrease in speed of over 15 miles per hour for a typical truck climbing a grade of this length in the westbound direction. This speed reduction blocks traffic flow and presents safety issues. **Figure 3.12** presents a view of State Route 50 in this location, looking northwest from its intersection with Mobley Ridge Road.

Figure 3.12 — SR 50 at Mobley Ridge Rd.

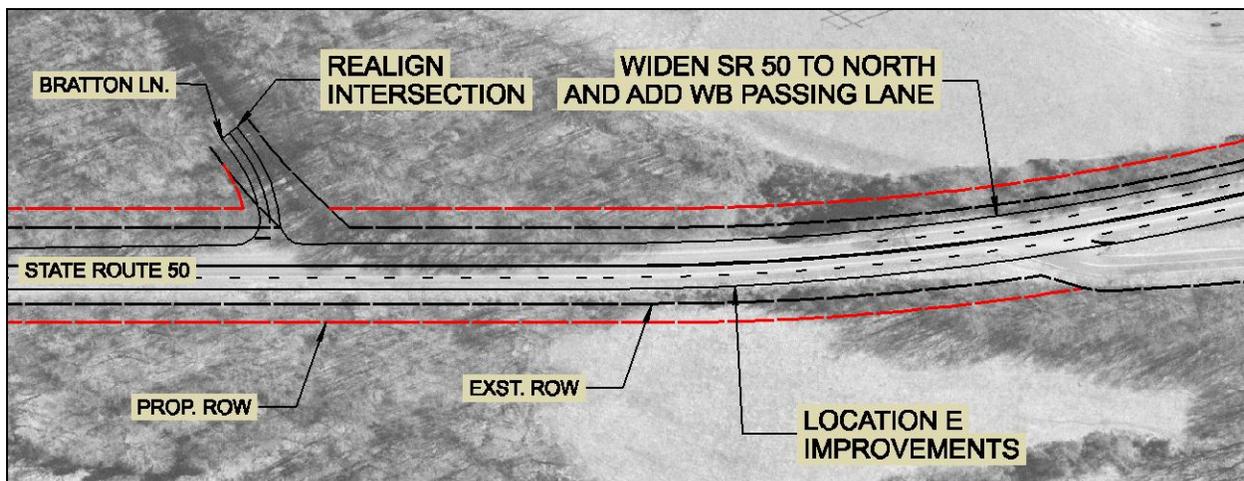


Improvement options in this location include the addition of a westbound climbing lane on State Route 50 from east of Buck Branch (LM 28.67) to west of Doug Church Road (LM 29.40), a distance of approximately 3,870 feet. State Route 50 would be widened to the north in this location. The addition of a climbing lane will reduce traffic delays caused by trucks climbing the grade and also allow traffic to pass other slow moving vehicles. Additionally, the intersection of State Route 50 and Bratton Lane (LM 28.77) would be relocated approximately sixty (60) feet to the west to eliminate skew and improve sight distance within the intersection.

Figure 3.13 presents a concept for improvements in one area of this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$1,500,000** and **\$1,900,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.13 — Improvement Concept (Option 4 Location F)



3.4.7 Option 4 Location G (East of Doug Church Rd. to West of Mayberry Rd.)

Figure 3.14 — SR 50 at Hoovers Rd.



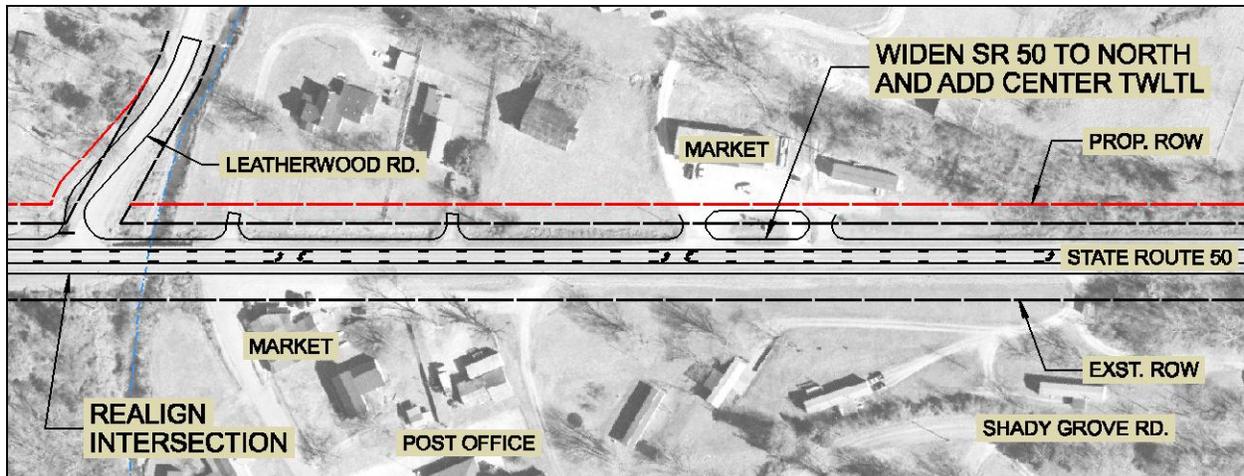
As noted in **Section 1.5**, the segment of State Route 50 located within the community of Shady Grove (Duck River Post Office) features an increased number of side roads and access points, resulting in more frequent and less predictable turning movements. **Figure 3.14** presents a view of State Route 50 in this location, looking east from its intersection with Hoovers Road.

The primary localized improvement option at Location I is the modification of the cross-section of State Route 50 to include a center TWLTL and two (2) travel lanes (one [1] eastbound and one [1] westbound) from east of Doug Church Road (LM 29.44) to west of Mayberry Road (LM 30.41), a distance of approximately 5,130 feet. State Route 50 would be widened to the north in this location to minimize impacts to nearby buildings. The addition of a TWLTL will increase capacity and safety for this segment of State Route 50 by removing queued left-turning vehicles from the travel lanes. Additionally, the intersection of State Route 50 and Leatherwood Road will be modified to reduce skew, improve sight distance, and provide additional space for replacement of the bridge crossing Dunlap Creek.

Figure 3.15 presents a partial concept for improvements within the Shady Grove community. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$2,800,000** and **\$3,800,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.15 — Improvement Concept (Option 4 Location G)



3.4.8 Option 4 Location H (County Line to East of Akin Ridge Rd.)

This segment of State Route 50 features a grade of approximately 5% lasting for about 5,330 feet, corresponding to a decrease in speed of over 30 miles per hour for a typical truck climbing a grade of this length in the eastbound direction. This speed reduction blocks traffic flow and presents safety issues. **Figure 3.16** presents a view of State Route 50 in this location, looking southeast from its intersection with Fattybread Branch Road at the Hickman/Maury County line.

Figure 3.16 — SR 50 at Fattybread Branch Rd.

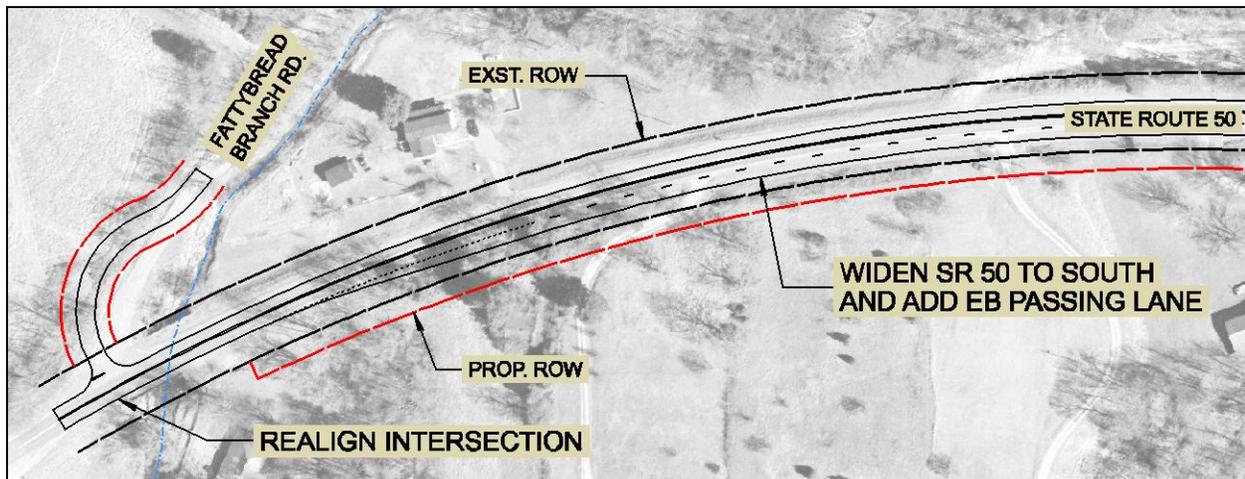


Improvement options in this location include the addition of an eastbound climbing lane on State Route 50 from the Hickman/Maury County line (LM 0.00) to east of Akin Ridge Road (LM 1.40), a distance of approximately 7,410 feet. The addition of a climbing lane will reduce traffic delays caused by trucks climbing the grade and also allow traffic to pass other slow moving vehicles. Additionally, the intersection of State Route 50 and Fattybread Branch Road (LM 0.00) would be slightly realigned to improve the approach to the intersection.

Figure 3.17 presents a concept for improvements at the beginning of this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$2,500,000** and **\$3,400,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.17 — Improvement Concept (Option 4 Location H)



3.4.9 Option 4 Location I (East of Arrow Rock Church of Christ to West of Greenfield Bend Rd.)

Figure 3.18 — SR 50 at WMA Entrance



This segment of State Route 50 features a grade of approximately 4.5% lasting for about 3,000 feet, corresponding to a decrease in speed of over 25 miles per hour for a typical truck climbing a grade of this length in the westbound direction. This speed reduction blocks traffic flow and presents safety issues. **Figure 3.18** presents a view of State Route 50 in this location, looking southwest from the entrance to Williamsport Wildlife Management Area.

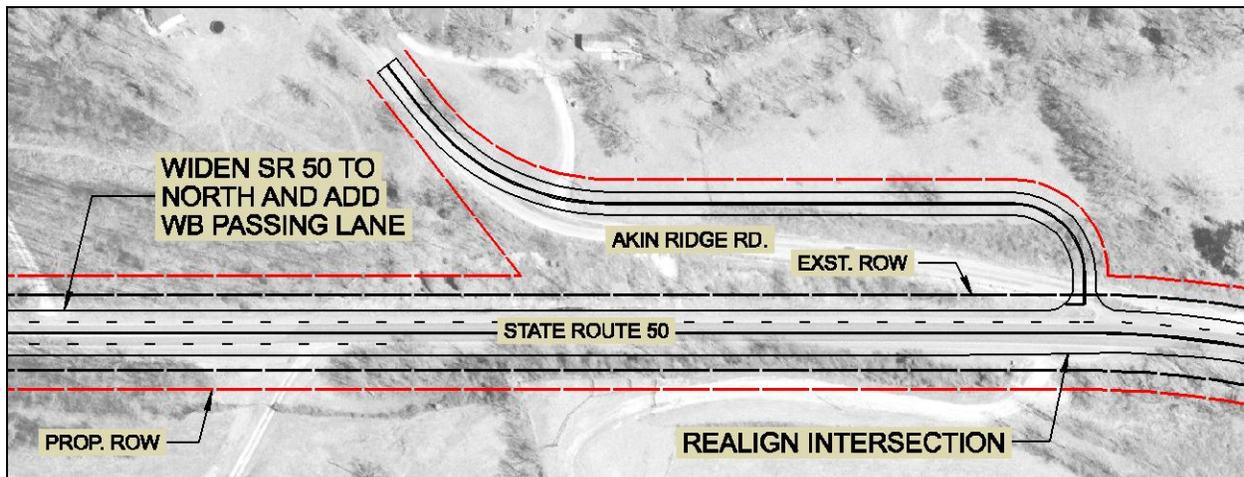
Improvement options in this location include the addition of a westbound climbing lane on State Route 50. The addition of a climbing lane would reduce traffic delays caused by trucks ascending

the grade and also would allow traffic to pass other slow moving vehicles, improving safety and increasing operational efficiency.

Figure 3.19 presents a concept for improvements in one area of this location. The westbound climbing lane would extend from east of Arrow Rock Church of Christ (LM 0.82) to west of Greenfield Bend Road (LM 1.81), a distance of approximately 5,250 feet. To accommodate the climbing lane at this location, State Route 50 would be widened to the north to avoid lane shifts and integrate with overlapping improvements at Location H (detailed in **Section 3.4.8**). The intersection of State Route 50 and Akin Ridge Road would also be realigned to eliminate skew and improve sight distance. Due to steep grades along the approaches to the intersection, retaining walls would likely be necessary at this location. Additional details are available in the attached **Appendix F**.

These improvements are estimated to cost between **\$3,400,000** and **\$4,600,000**. A summary of the cost estimate for this location can be found in **Section 3.5**.

Figure 3.19 — Improvement Concept (Option 4 Location I)



3.4.10 Other Locations Considered

Several other locations within the study area were considered for localized improvements but ultimately rejected for various reasons. The locations considered include:

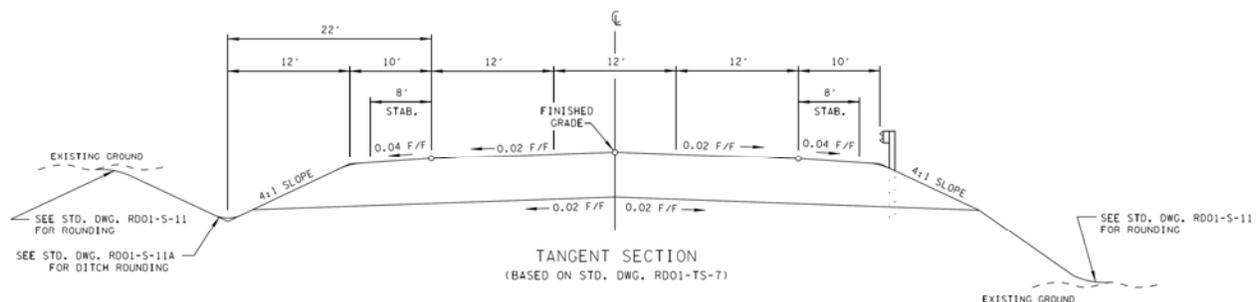
- **South Moss Spring Hollow Road (LM 18.48) to East of Swan Creek Rd. (LM 19.54):** Improvements considered at this location included the addition of an eastbound climbing lane to State Route 50 and intersection improvements at the intersection of Bass Bend Road and State Route 50. However, improvement options were constrained by the presence of several residences and a stream to the south of the route, as well as East Side Cemetery to the north.
- **East of Bass Bend Rd. (LM 18.92) to West of Cedar Park Rd. (LM 20.33):** Improvements considered at this location included the addition of a westbound climbing lane to State Route 50 and intersection improvements at the intersection of Columbia Avenue and State Route 50. However, improvement options were constrained by the Hickman County Water Department and the East Side Cemetery to the north of the route.
- **Willie’s Branch Rd. (LM 25.45) to East of Haley Rd. / Poplar Union Rd. (LM 26.60):** Improvements considered at this location included the addition of an eastbound climbing lane to State Route 50. However, improvement options were constrained by the Anderson Bend and Poplar Union Cemeteries at the intersection of State Route 50 with Haley Road and Poplar Union Road.
- **West of Haley Rd. / Poplar Union Rd. (LM 26.10) to East of George Rd. (LM 26.80):** Improvements considered at this location included the addition of a westbound climbing lane to State Route 50. However, improvement options were constrained by the Anderson Bend and Poplar Union Cemeteries at the intersection of State Route 50 with Haley Road and Poplar Union Road.

3.4.11 Cross-Sections

Capacity analysis indicates that a two (2) lane cross-section is adequate for forecasted volumes throughout the planning horizon. However, the addition of passing lanes and TWLTL as recommended in the localized improvement options will improve efficiency, flow, and safety.

Figure 3.20 presents a typical cross-section for State Route 50 improved under Option 4. Localized improvement options utilizing passing lanes and TWLTL would effectively use the same three (3) lane cross-section. This typical cross-section can also be found in the attached **Appendix F**.

Figure 3.20 — Typical Cross-Section (Option 4)



The proposed cross-section for Option 4 does not have provisions for dedicated bicycle lanes or sidewalks. However, paved shoulders in conjunction with twelve (12) foot travel lanes are adequate for bicycle use. Sidewalks are considered unnecessary for State Route 50 within the study area due to low building density and the lack of pedestrian destinations along the route.

3.4.12 Level of Service (LOS) Analyses

LOS for the localized improvement options were analyzed jointly using the procedures discussed in **Section 1.8.2**. **Table 3.2** displays the mainline LOS results for State Route 50 as improved using Option 4.

Table 3.2 — State Route 50 Mainline LOS Analysis (Option 4)

State Route 50 Segment	Level of Service (LOS)	
	2014	2034
From State Routes 48/100 to Moss Spring Hollow Road	C	C
From Moss Spring Hollow Road to Totty’s Bend Road	C	D
From Totty’s Bend Road to Natchez Trace Parkway	C	D
From Natchez Trace Parkway to State Route 247	C	D
East of State Route 247	—	—

A comparison of the calculated LOS for State Route 50 improved under Option 4 to the LOS results for the existing route (presented in **Table 1.6**) show minor capacity improvements for several segments within the study area. Additionally, it should be noted that the HCM does not fully evaluate the operational effectiveness of TWLTL, as proposed at Locations A and G. These improvements can be expected to reduce delay for vehicles traveling along the route and improve safety.

As with the existing route, there are no projected capacity deficiencies throughout the planning horizon for State Route 50 improved using Option 4.

3.5 Cost Estimates

Table 3.3 presents a summary of cost estimates for the localized improvement options of Option 4. Detailed cost estimates can be found attached at the end of this study. Estimate calculations and backup data are found in **Volume II** of this report.

Table 3.3 — State Route 50 Cost Estimate Summary

Option	ROW	Utility	Const.	Total	Low	High
Option 2 (Widening)	\$1,543,000	\$690,000	\$17,523,000	\$19,760,000	\$16,800,000	\$22,800,000
Option 3 (Relocation)	\$16,835,000	\$640,000	\$152,343,000	\$170,000,000	\$145,000,000	\$196,000,000
Option 4 Location A	\$130,000	\$224,000	\$1,519,000	\$1,880,000	\$1,600,000	\$2,200,000
Option 4 Location B	\$40,000	\$278,000	\$1,267,000	\$1,590,000	\$1,400,000	\$1,900,000
Option 4 Location C	\$89,000	\$0	\$2,746,000	\$2,840,000	\$2,500,000	\$3,300,000
Option 4 Location D	\$32,000	\$72,000	\$359,000	\$470,000	\$400,000	\$600,000
Option 4 Location E	\$65,000	\$224,000	\$1,626,000	\$1,920,000	\$1,700,000	\$2,300,000
Option 4 Location F	\$35,000	\$147,000	\$1,466,000	\$1,650,000	\$1,500,000	\$1,900,000
Option 4 Location G	\$146,000	\$288,000	\$2,806,000	\$3,240,000	\$2,800,000	\$3,800,000
Option 4 Location H	\$162,000	\$450,000	\$2,327,000	\$2,940,000	\$2,500,000	\$3,400,000
Option 4 Location I	\$114,000	\$60,000	\$3,759,000	\$3,940,000	\$3,400,000	\$4,600,000
Option 4 TOTAL	\$813,000	\$1,743,000	\$17,875,000	\$20,470,000	\$17,800,000	\$24,000,000

3.6 Recommended Priority of Localized Improvements

Based on local input during the planning process and site visit and engineering analysis, this section prioritizes localized improvements on their efficiency, costs, and benefits as detailed throughout **Section 3.3.2**. The recommended order of improvements, ranked from the highest priority to the lowest, is as follows:

**HIGH
PRIORITY**

Location D (Intersection at SR 230): This option provides several safety and operational benefits to the intersection of State Route 50 and State Route 230 at less cost compared to the other localized improvement options. Improvements at this location are estimated to cost between **\$400,000** and **\$600,000**.

Location A (East of Hill's Road to Bass Road): Of the two options proposing the addition of center TWLTL, this location features the higher traffic volume and more access points. These improvements are estimated to cost between **\$1,600,000** and **\$2,200,000**.

Location G (East of Doug Church Road to West of Mayberry Road): The addition of a TWLTL to this location would improve safety and efficiency in the Shady Grove community. These improvements are estimated to cost between **\$2,800,000** and **\$3,800,000**.

Location C (East of Edgewood Baptist Church to West of Collins Lane): Trucks attempting to climb the grade in this location experience a higher loss of speed compared to other locations. Improvements at this location, consisting of a westbound climbing lane and an intersection relocation, are estimated to cost between **\$2,500,000** and **\$3,300,000**.

Location H (Hickman/Maury County Line to East of Akin Ridge Road): This option considers the construction of an eastbound climbing lane and the realignment of Fattybread Branch Road. These improvements are estimated to cost between **\$2,500,000** and **\$3,400,000**.

Location B (Edgewood Baptist Church to West of Old Highway 50): This option considers the construction of an eastbound climbing lane. These improvements are estimated to cost between **\$1,400,000** and **\$1,900,000**.

Location I (East of Arrow Rock Church of Christ to West of Greenfield Bend Road): Westbound trucks attempting to climb the grade in this location experience a speed reduction of over 25 miles per hour. These improvements, consisting of a westbound climbing lane and an intersection relocation, are estimated to cost between **\$3,400,000** and **\$4,600,000**.

Location F (West of Bratton Lane to East of Doug Church Road): Improvements at this location, consisting of a westbound climbing lane and intersection improvements, are estimated to cost between **\$1,500,000** and **\$1,900,000**.

Location E (East of Buck Branch to West of Doug Church Road): This option, considering the construction of an eastbound climbing lane, improves the grade with the least speed reduction of the selected locations (approximately 15 miles per hour) and also involves a more intensive intersection relocation than other options. These improvements are estimated to cost between **\$1,700,000** and **\$2,300,000**.

**LOW
PRIORITY**

The total cost for all improvements is estimated to be between **\$17,800,000** and **\$24,000,000**.

4 ASSESSMENT OF CORRIDOR OPTIONS

4.1 TDOT Seven Guiding Principles

TDOT has developed a set of seven guiding principles by which all transportation projects are to be evaluated. The principles address concerns for system management, mobility, economic growth, safety, community, environmental stewardship, and financial responsibility. This section outlines the seven guiding principles and includes discussion of each as it pertains to the options evaluated in this report.

4.1.1 Guiding Principle 1: Preserve and Manage the Existing Transportation System

Plan, implement, maintain, and manage an integrated transportation system for the movement of people and products, with emphasis on quality, safety, efficiency, and the environment.

Many aspects of the existing State Route 50 within the study area are less than ideal. There are few opportunities for vehicles to pass slower traffic and trucks, particularly on grades, resulting in reductions in capacity and efficiency. The roadway lacks adequate shoulders and in many locations has deficient sight distance, especially where side roads intersect State Route 50 at a steep grade and high degree of skew.

Addressing the safety and operational needs of State Route 50 within the study area will improve the transportation system in the region by providing the infrastructure to adequately address the movement of people and products. The improved route will create a safer, more efficient link between Hickman and Maury Counties and improve mobility in the region.

4.1.2 Guiding Principle 2: Move a Growing, Diverse, and Active Population

Reduce congestion, optimize service and operation efficiency, develop inter-modal connections, and support transportation technology advances.

The improvement options discussed in this report will reduce congestion, improve service and operational efficiency, and benefit mobility between Hickman and Maury Counties. An improved State Route 50 will benefit freight movements, rural transportation services, emergency vehicles, and passenger cars.

The existing State Route 50 does not easily accommodate pedestrian and bicycle movements within the study area. However, the proposed improvement options provide additional safety concessions for alternative modes of transportation, such as wider shoulders and increased sight distance.

4.1.3 Guiding Principle 3: Support the State's Economy

Target transportation investment to support business, employment growth, and enhance the economy of Tennessee.

State Route 50 is the principal route for citizens of Hickman County to access employment opportunities and commercial services in Columbia and Maury County, as well as Interstate 65. Additionally, the route is the primary means for citizens of eastern Hickman County to reach the county seat of Centerville and its services. The existing roadway does not facilitate these

movements as efficiently and safely as possible. Improvements to State Route 50 within the study corridor will allow for improved access to these employment and commercial centers and benefit the regional and state economies.

4.1.4 Guiding Principle 4: Maximize Safety and Security

Provide a transportation system that offers a high degree of mobility in a reliable and safe fashion.

From 2005 to 2007, seventy (70) documented crashes occurred on State Route 50 within the study area, including twenty-seven (27) injury crashes and five (5) incapacitating injury crashes. Approximately 27.1% of the crashes stemmed from vehicles striking fixed objects along the roadway, with an additional 17.1% caused by vehicles leaving the roadway. Overall, the actual crash rate for State Route 50 within the study area was 2.169, which exceeds the statewide average for rural minor arterials of 1.652. These crash types are typically attributed to poor sight distance, insufficient shoulders, and/or reduced clear zones.

The proposed improvement options to State Route 50 should improve safety within the study area by adding usable shoulder width, providing improved sight distance, upgrading several intersections and providing several opportunities for passing.

4.1.5 Guiding Principle 5: Build Partnerships for Livable Communities

Establish strategies for the goal of creating and maintaining livable communities.

The TDOT Long Range Transportation Plan promotes and encourages projects that have public and community support. This study, initiated by the South Central Tennessee Development District RPO, is identified as a primary need for the region and is supported by local officials. As this project advances, the public involvement process will continue as mandated by the provisions of the National Environmental Policy Act (NEPA).

4.1.6 Guiding Principle 6: Promote Stewardship of the Environment

Ensure a compatible interface of the transportation system with environmental, social, and energy goals.

In preparation of Transportation Planning Reports (TPR), the Tennessee Department of Transportation (TDOT) has introduced an Early Environmental Screening (EES) process for the report study area. By screening the latest available Geographic Information Systems (GIS) environmental data during the early stages of planning, TDOT and the resource and permitting agencies 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).

Further environmental studies will be required if state and/or federal funds are planned for the proposed improvement options. If federal funds are involved, a document consistent with NEPA will be required. If state funds are involved, and no federal monies are used, a Tennessee Environmental Evaluation Report (TEER) will be required.

4.1.7 Guiding Principle 7: Emphasize Financial Responsibility

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.

A goal of TDOT is 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. This entails exercising financial responsibility in the development and implementation of roadway projects and minimizing costs to the taxpayers.

Many of the costs associated with the proposed improvement options are offset by the savings associated with potential reductions in crashes, reduced travel time delays, and increased economic development.

4.2 Summary of Guiding Principles

A summary of the improvement options as discussed in this report in relationship to the seven guiding principles adopted by TDOT can be found in **Table 4.1**. The options are described as “good”, “fair”, or “poor” in relation to each individual principle, as defined below:

- **Good:** The option is compatible with and promotes the vision of the guiding principle.
- **Fair:** The option is acceptable but not an ideal fit with the guiding principle.
- **Poor:** The option is not compatible with the guiding principle.

Table 4.1 — Improvement Options in Relationship to Guiding Principles

Improvement Option	Preserve and Manage the Existing Transportation Sys.	Move a Growing, Diverse, and Active Population	Support the State's Economy	Maximize Safety and Security	Build Partnerships for Livable Communities	Promote Stewardship of the Environment	Emphasize Financial Responsibility
Option 1 (No-Build)	Poor	Poor	Poor	Poor	Poor	Good	Good
Option 2 (Widening)	Fair	Fair	Fair	Fair	Fair	Fair	Poor
Option 3 (New Location)	Poor	Good	Fair	Good	Fair	Poor	Poor
Option 4 Location A	Good	Fair	Good	Good	Good	Good	Good
Option 4 Location B	Fair	Good	Fair	Good	Good	Fair	Good
Option 4 Location C	Good	Good	Fair	Fair	Good	Fair	Good
Option 4 Location D	Good	Fair	Fair	Good	Good	Good	Good
Option 4 Location E	Fair	Good	Fair	Good	Good	Fair	Good
Option 4 Location F	Fair	Good	Fair	Fair	Good	Fair	Good
Option 4 Location G	Good	Fair	Good	Good	Good	Good	Good
Option 4 Location H	Good	Good	Fair	Fair	Good	Fair	Good
Option 4 Location I	Fair	Good	Fair	Fair	Good	Fair	Good

5 SUMMARY

Improvements to the existing State Route 50 are necessary to address the local and regional needs of the area by improving safety, enhancing mobility within the region, and correcting deficiencies in the existing route.

The following options are proposed in order to address the aforementioned issues within the study area while adhering to the purpose of the improvements:

- **Option 2**, detailed in **Section 3.2**, considers shoulder widening and improvement along State Route 50 throughout the study area. This option would create continuity along the route and provide safer shoulder areas and clear zones. Though this option may be impractical in light of short-term funding limitations, it serves as a cost-effective method of improving safety without superfluous capacity upgrades. Additionally, this option can be integrated with localized improvements detailed in Option 4 for even greater safety benefits.
- **Option 4**, detailed in **Section 3.3.2**, considers a combination of small-scale, independent improvements that improve safety and efficiency in specific locations along State Route 50 for less cost than corridor-wide improvements. Although it may not presently be practical to construct all of the recommended improvements, phased construction would reduce financial and operational impacts. This option can also be combined with corridor-wide improvements (such as those detailed in Option 2) as funding dictates for additional benefit. The recommended order of improvements is:
 1. **Option 4 Location D**: Improvements to the intersection of State Route 50 and State Route 230.
 2. **Option 4 Location A**: Construction of a TWLTL and intersection improvements within Centerville city limits.
 3. **Option 4 Location G**: Construction of a TWLTL within the community of Shady Grove.
 4. **Option 4 Location C**: Addition of a westbound climbing lane and intersection improvements from Edgewood Baptist Church to west of Collins Lane.
 5. **Option 4 Location H**: Construction of an eastbound climbing lane and intersection improvements from the Hickman/Maury County line to east of Akin Ridge Road.
 6. **Option 4 Location B**: Construction of an eastbound climbing lane between Edgewood Baptist Church and Old Highway 50.
 7. **Option 4 Location I**: Construction of a westbound climbing lane and intersection improvements from Arrow Rock Church of Christ to Greenfield Bend Road.
 8. **Option 4 Location F**: Construction of a westbound climbing lane and intersection improvements from Bratton Lane to Doug Church Road.
 9. **Option 4 Location E**: Construction of an eastbound climbing lane and intersection improvements from Buck Branch to Doug Church Road.

The following options were considered but are not recommended at this time:

- **Option 1**, detailed in **Section 3.1**, specifies no improvements to the route within the planning horizon. While the existing capacity is adequate for projected traffic demands through this period, this option overlooks deficiencies in the existing State Route 50 that affect safety and traffic flow.
- **Option 3**, detailed in **Section 3.3**, considers relocation of segments of State Route 50 to a new location. This option provides for maximum benefits to safety, capacity, and efficiency; however, it is fiscally prohibitive and creates more severe impacts to the study area. As such, it is not considered further.

Table 5.1 presents the adequacy of each potential option to meet the purpose, needs, and goals of a corridor improvement program.

Table 5.1 — Improvement Options in Relationship to Purpose, Needs, and Goals

Goals	Option 1 (No-Build)	Option 2 (Widening)	Option 4 (Localized)
Improve Geometric and Clear Zone Deficiencies	These goals are not addressed by this option.	This option meets this goal.	Considered collectively, this option may notably meet these goals, as it allows for more passing opportunities and better traffic flow.
Improve Traffic Flow and Efficiency		This option does not allow for more passing opportunities.	
Support Economic Development within the Region		This option does not meet these goals.	
Meet Present and Future Demand for Mobility		This option may meet these goals.	