

## EXECUTIVE SUMMARY

The subject of this Transportation Planning Report (TPR) is the State Route (SR) 21 corridor located in Lake and Obion Counties. This TPR was initiated by the Northwest Tennessee Rural Planning Organization (RPO) to establish immediate and long-term needs for future improvement options for this corridor and to assess options for meeting these needs.

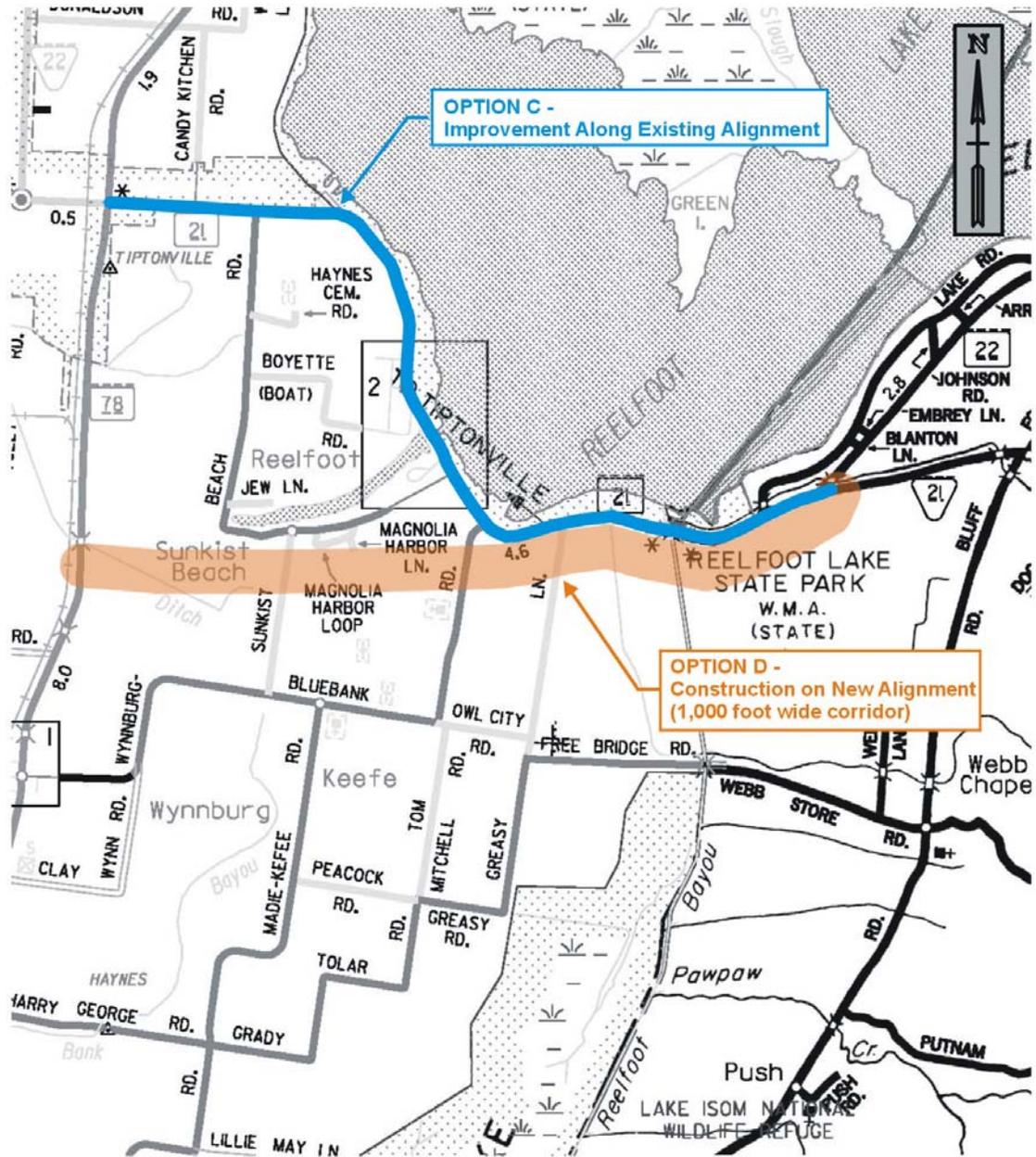
The purpose and need for improvement to the SR 21 corridor was developed based on the findings and analysis of the route's existing conditions, the traffic projections for future development in the area, and the input from local and regional stakeholders.

The primary transportation need for this location is a safe and efficient connection between SR 78 and SR 22 suitable for various user types including local traffic, tourists, non-motorized users, and increasing commercial truck traffic. The connection should provide ample capacity for growing traffic volumes brought by a regional port project. The connection should also enhance the tourism aspect brought by Reelfoot Lake. Any proposed improvements should also be sensitive to the environmental impacts caused by construction in proximity to Reelfoot Lake and its watershed.

To meet the need for an improved connection between SR 78 and SR 22, a distance of 5.59± miles, four options should be considered during the NEPA environmental analysis phase of this project.

- **Option A – No-Build:** Other than normal scheduled maintenance, there is no additional cost associated with Option A.
- **Option B – Spot Improvements**
  - Location 1: Turn lane construction on SR 21 at SR 78, estimated cost \$353,000.
  - Location 2: Turn lane construction at the intersection of SR 21 and Sunkist Beach Road, estimated cost \$259,000.
  - Location 3: Turn lane construction at the intersection of SR 21 and Boyette Road, estimated cost \$292,000.
  - Location 4: Turn lane construction at the intersection of SR 21 and Magnolia Road, estimated cost \$306,000.
  - Location 5: Turn lane construction at the intersection of SR 21 and Wynnburg Bluebank Road, estimated cost \$300,000.
  - Location 6: The reconfiguration of the intersection of SR 21 and SR 22, estimated cost \$297,000.
- **Option C – Two-Lane Improvement Along the Existing Route:** Construct full width twelve (12) foot travel lanes, eight (8) foot shoulders suitable for use by pedestrians and bicyclists, and spot improvements located at the intersections listed in Option B. The length of this new roadway would be 5.59 ± miles. Estimated cost \$13,933,000.
- **Option D – Two-Lane Construction on New Alignment:** New alignment south of and parallel to the existing SR 21 corridor. Construction of twelve (12) foot wide lanes and eight (8) foot wide shoulders and oriented to facilitate truck movements between the proposed Port of Cates Landing and the future I-69 alignment. The length of this new corridor alignment is 5.11 ± miles. Estimated cost \$12,247,000.

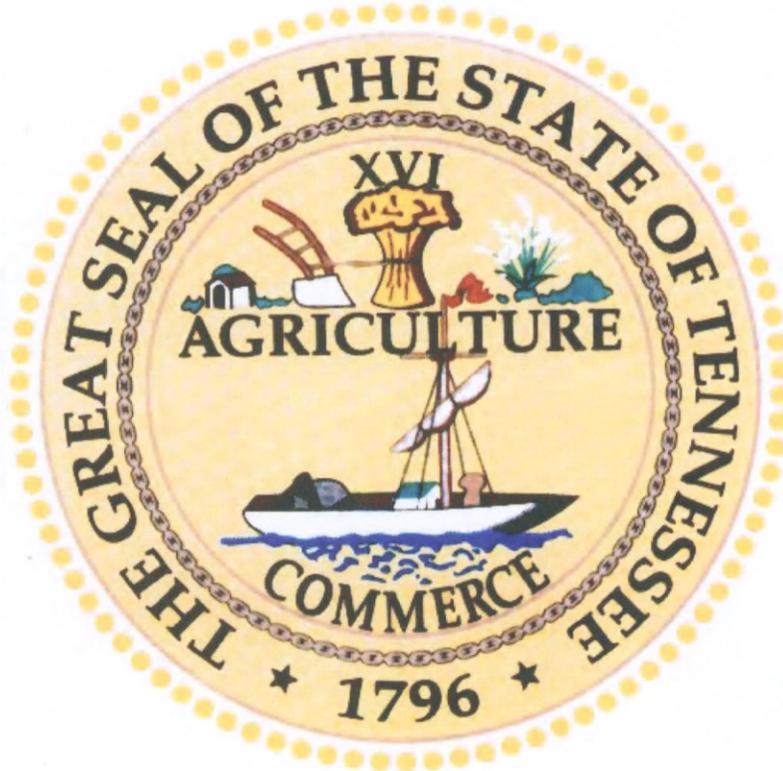
Transportation Planning Report  
State Route 21, From State Route 78 to State Route 22  
Lake and Obion Counties



 Project Location Map  
(Not to Scale)

# TRANSPORTATION PLANNING REPORT

**STATE ROUTE 21  
FROM STATE ROUTE 78 TO STATE ROUTE 22  
LAKE COUNTY AND OBION COUNTY  
PIN 112469.00**



**PREPARED BY  
RPM TRANSPORTATION CONSULTANTS, LLC  
For the  
NORTHWEST TENNESSEE RURAL PLANNING ORGANIZATION  
in cooperation with  
TENNESSEE DEPARTMENT OF TRANSPORTATION PROJECT PLANNING DIVISION**

Approved by:	Signature	DATE
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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.*

## TABLE OF CONTENTS

		<u>Page</u>
<b>1.0</b>	<b>PURPOSE OF STUDY</b>	1
<b>2.0</b>	<b>HISTORY AND BACKGROUND</b>	1
	2.1 Port of Cates Landing	2
	2.2 Interstate 69	3
<b>3.0</b>	<b>EXISTING CONDITIONS</b>	6
	3.1 Description of the Study Area	6
	3.2 Crash History	7
	3.3 Geometrics	7
	3.4 Level of Service Analyses	8
	3.5 Major Structures	11
	3.6 Multi-Modal Facilities	11
<b>4.0</b>	<b>FIELD REVIEW INFORMATION</b>	11
<b>5.0</b>	<b>PURPOSE AND NEED</b>	12
<b>6.0</b>	<b>OPTIONS FOR IMPROVEMENT</b>	12
	6.1 Option A – No-Build	12
	6.2 Option B – Spot Improvements	13
	6.3 Recommended Priority of Improvements	20
	6.4 Option C – Two Lane Improvement Along Existing Alignment	20
	6.5 Option D – Two Lane Construction on New Alignment	21
	6.6 Disposition of Existing Route	22
	6.7 Preliminary Environmental and Cultural Considerations	22
	6.8 Preliminary Structural Considerations	25
<b>7.0</b>	<b>ASSESSMENT OF CORRIDOR OPTIONS</b>	25
<b>8.0</b>	<b>SUMMARY</b>	27
	<b>APPENDIX</b>	

## TABLE OF CONTENTS (CON'T.)

	<u>Page</u>	
<b>FIGURES</b>		
Figure 1	Regional Projects Affecting the SR 21 Corridor	4
Figure 2	Project Location Map	5
Figure 3	Annual Average Daily Traffic (with Port of Cates Landing)	9
Figure 4	Spot Improvement Locations	13
Figure 5	Option B Location 1	14
Figure 6	Option B Location 2	15
Figure 7	Option B Location 3	16
Figure 8	Option B Location 4	17
Figure 9	Option B Location 5	18
Figure 10	Option B Location 6	19
<b>TABLES</b>		
Table 1	Leading Employment Industries, Lake and Obion Counties	6
Table 2	Study Crash Experience Summary, 2005 – 2007	7
Table 3	Geometrics Summary of State Route 21	8
Table 4	Level of Service Operational Criteria	10
Table 5	Current and Projected Segment Level of Service	10
Table 6	Current and Projected Non-Motorized Level of Service	11
Table 7	Current and Projected Non-Motorized Level of Service (with proposed improvements)	21
<b>APPENDIX</b>		
Cost Analysis		5
Traffic Projections		15
Level of Service Analysis Existing System		20
Base Year 2014		23
Future Year 2034		28
Environmental Documentation		33
Functional Drawings		57

## 1.0 PURPOSE OF STUDY

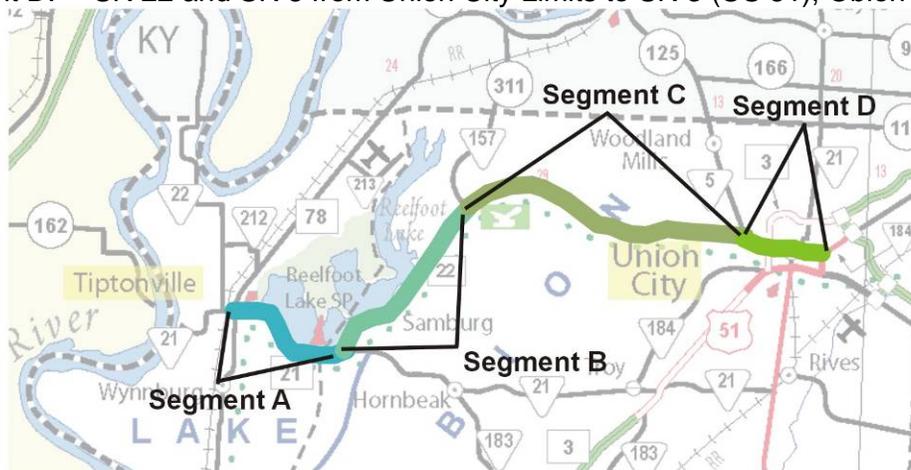
The subject of this Transportation Planning Report (TPR) is the State Route (SR) 21 corridor located in Lake and Obion Counties. The Northwest Tennessee Rural Planning Organization (RPO) prioritized approximately 28.09 miles of SR 21 to establish immediate and long-term needs for future improvement options for this corridor and to assess options for meeting these needs. The limits of the study are from SR 78 in Tiptonville in Lake County to SR 22 in Obion County. As its number one regional priority, this TPR was initiated by the Northwest Tennessee RPO.

This study will analyze existing traffic conditions, roadway geometrics, and crash data to determine current improvement needs. An analysis of other transportation, land use, and development changes will be made to determine future transportation needs for the corridor. Improvement options will then be developed to best provide for the future transportation needs of the corridor. Also, an early environmental screening (EES) will be made to determine the likely impacts to sensitive locations within the study area.

## 2.0 HISTORY AND BACKGROUND

The TDOT Long Range Planning Division has conducted a needs assessment for SR 21/SR 22/SR 5 from SR 78 in Tiptonville, Lake County to SR 3 (US 51) in Union City, Obion County, a distance of 28.09 miles. This study corridor was divided into four (4) sections, as shown in the map below, of independent utility based on logical termini as follows:

- Segment A: SR 21 from SR 78 to SR 22, Lake and Obion Counties
- Segment B: SR 22 from SR 21 to SR 157, Obion County
- Segment C: SR 22 from SR 157 to Union City Limits, Obion County
- Segment D: SR 22 and SR 5 from Union City Limits to SR 3 (US 51), Obion County



Subsequently, the TDOT Long Range Planning Division produced the Preliminary Purpose and Needs Statement for this corridor. The statement recommended the completion of a TPR for Segment A, the subject of this report, due to traffic volume, and the impacts of forthcoming regional projects.

In 2007, TDOT also completed a TPR for SR 22 from SR 21 to Cates Landing Road. This study recommended the improvement of SR 22 and a short segment of new construction to bring SR 22 to the SR 78 alignment. The realignment of SR 22 to the east is planned in order to connect to SR 78 at the intersection of existing SR 21 and SR 78 in Tiptonville. A segment of SR 78 in Tiptonville north of SR 21 was recommended to be widened to a three (3) lane cross-section.

A second project in the area is the construction of a new Reelfoot Lake spillway located on SR 21 within the study limits of this TPR. The Spillway is being reconstructed west of its existing location and the existing bridge will remain in place as an historic structure. This will limit the capacity of SR 21 to two (2) lanes of traffic at this location. The spillway relocation project is currently under construction.

One reason the SR 21/SR 22 corridor has been targeted for improvement at this time is because several regionally significant projects are being developed which will have a considerable effect on transportation in this area. These are defined in sections 2.1 and 2.2.

### 2.1 Port of Cates Landing

Under the oversight of the Northwest Tennessee Regional Port Authority, the Port of Cates Landing project will consist of a new slack water multi-modal port on the Mississippi River. The port will be located approximately 4.5 miles north of Tiptonville and the western terminus of the study segment. The port's business plan states that, "The Port of Cates Landing will provide an intermodal transportation service that is not available within nearly 100 miles. It will provide a mode of transportation that is significantly less than rail and truck freight and that can be utilized by a number of industries in the region, giving the port the potential to "hit the ground running" with immediate business. The ability to provide barge service will provide a "green" benefit to the freight demand on the area's environment."<sup>1</sup>

In addition to the port, project officials are promoting the availability of approximately 3,000 acres of adjacent land that can be available for industrial development that would take advantage of proximity to the port. These are expected to be industrial land uses that typically use water borne freight (steel production, agricultural processing, etc.).

With these land use changes, traffic impacts are expected in the area. Accounting for the combined impacts of the port and the related industrial development, TDOT generated traffic projections for the SR 22 TPR. It was projected that by 2014, 7,620 new daily trips would be generated by the port area and by 2034, 15,240 new trips per day would be generated. These trips will be distributed throughout the surrounding roadway system, with a portion of the new trips being added to the projected traffic volumes along SR 21. Trucks were projected to account for approximately nine (9) percent of the traffic on SR 22.

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<sup>1</sup> "Port of Cates Landing Business Plan." TVA Economic Development Technical Services, September, 2009. P.24.

## 2.2 Interstate 69

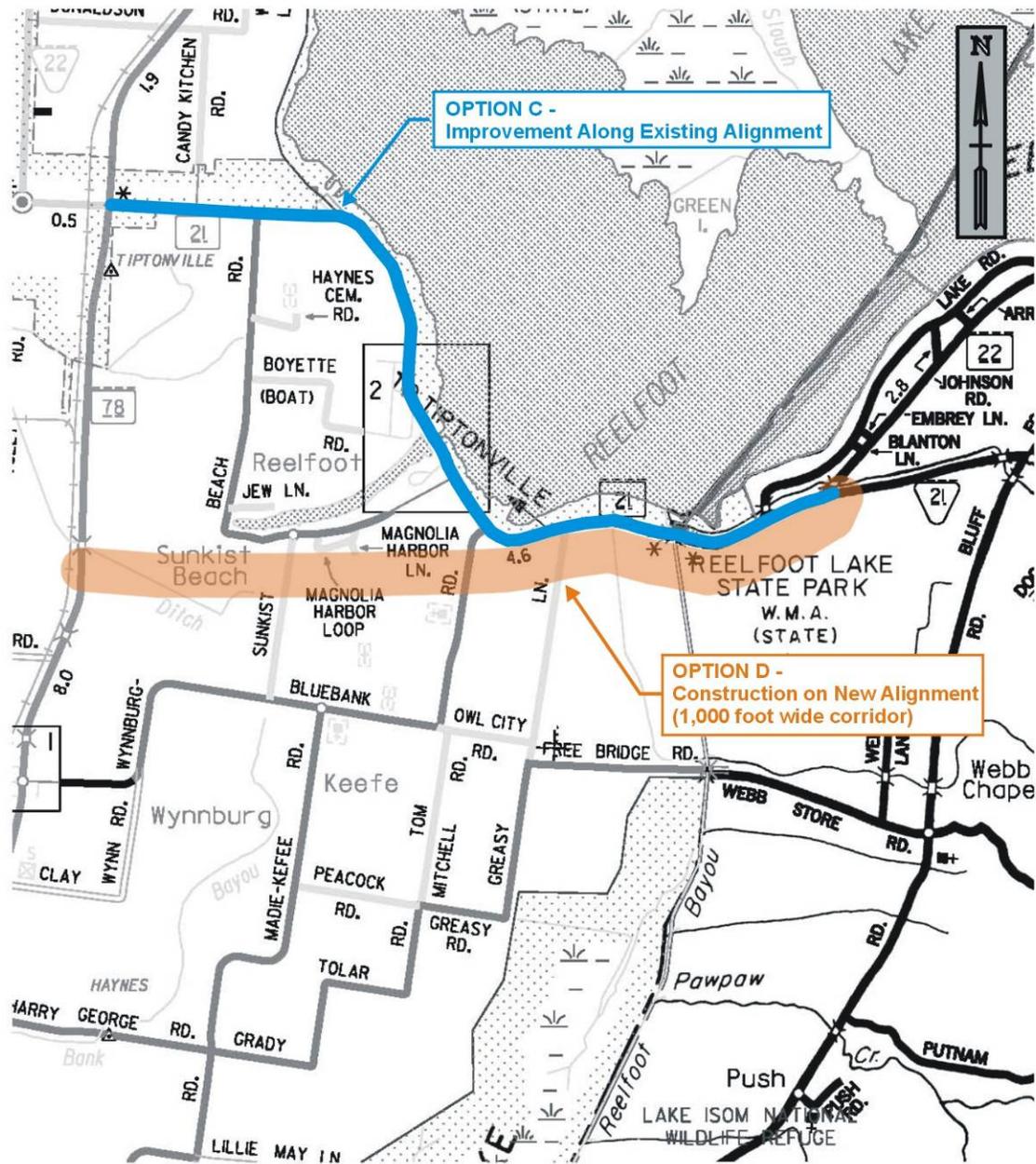
The planning for the new I-69 alignment in the study area has resulted in the selection of a preferred alignment through Tennessee from the Kentucky to Mississippi state lines. In Obion County, I-69 is proposed to be located along the western side of the City Limits of Union City. The new interstate will serve as a major regional transportation asset and will serve as a primary origin and destination for local trips in the area.

Considering these two major projects together, the connection between the port area and I-69 will be an important transportation link. The study segment of this TPR is a part of this link.

A regional map including the study area is given as Figure 1 and a location map of the study area is given as Figure 2.



Transportation Planning Report  
 State Route 21, From State Route 78 to State Route 22  
 Lake and Obion Counties



 Project Location Map  
 (Not to Scale)

Figure 2.

### 3.0 EXISTING CONDITIONS

#### 3.1 Description of the Study Area

This study begins in the community of Tiptonville and ends in an unincorporated area of Obion County. Several land uses exist along the 5.59 mile corridor including small scale commercial (retail and industrial), residential, private recreational, farmland, and parkland of Reelfoot Lake State Park.

This segment of SR 21 provides a portion of a connector between Tiptonville and Union City, the county seat of Obion County. This segment of SR 21 is the primary route serving Reelfoot Lake State Park, including the park visitor's center. This route is designated as a portion of both the Reelfoot State Bicycle Route and the Mississippi River Trail, a multi-state bicycle network.

The US Census estimated Tiptonville's 2008 population to be 4,008 residents. Respective unemployment rates for Lake and Obion Counties in July 2009 were 10.9% and 11.9% as compared to the statewide unemployment rate of 10.8%<sup>2</sup>. The State Department of Labor and Workforce Development reported the 2008 average annual wages for Lake and Obion Counties to be \$23,113 and \$35,681, respectively. Obion County has the 20<sup>th</sup> highest wages and Lake County the 93<sup>rd</sup> highest wages of Tennessee's 95 counties. The statewide average annual wage for 2008 was \$39,992<sup>3</sup>. The top industries (by percentage of all employment) for both counties are presented in Table 1.

**Table 1. Leading Employment Industries, Lake and Obion Counties**

Industry	Lake County	Obion County	Statewide Average
Local Government	32%	11%	10%
Manufacturing	0%	35%	13%
Retail Trade	11%	14%	12%
Education and Health Services	12%	9%	13%
Leisure and Hospitality	15%	7%	10%

*(Source: Quarterly Census of Employment and Wages. Tennessee Dept. of Labor and Workforce Development)*

Tiptonville's primary income comes from retail trade and services, agriculture, and tourism. Bordered by Reelfoot Lake, the town relies on tourism as a major revenue generator.

<sup>2</sup> Labor Force Estimates. Tennessee Dept. of Labor and Workforce Development, Employment Security Division.

<sup>3</sup> Quarterly Census of Employment and Wages. Tennessee Dept. of Labor and Workforce Development. Annual Average 2008.

### 3.2 Crash History

The crash experience for SR 21 was divided into three segments for analysis: SR 78 to the county line, the county line to SR 22, and the intersection of SR 21 and SR 22. The summarized results are given in Table 2.

**Table 2. Study Crash Experience Summary, 2005 - 2007**

Location	Length (mi)	Number of Crashes	Actual Crash Rate (number of crashes per million entering vehicles)	Statewide Average Crash Rate (number of crashes per million entering vehicles)
SR 78 to county line	4.63	11	0.76 cr/mvm	1.68 cr/mvm
County line to SR 22	0.96	2	0.88 cr/mvm	1.68 cr/mvm
Intersection of SR 21 and SR 22	N/A	7	2.55 cr/mev	0.2 cr/ mev

As shown in Table 2, most of the study route has a crash history that is less than the statewide average for rural two (2) lane highways. The intersection of SR 21 and SR 22, however, experienced a higher than average crash rate given the low volumes of traffic entering the intersection. Most of these crashes were rear end crashes on the stop controlled SR 22 approach.

### 3.3 Geometrics

The study segment of SR 21 is a typical rural road having eleven (11) foot travel lanes and minimal two (2) foot paved shoulders. Much of the route is constructed as a levee on earthen embankment. Very little vertical curvature exists, but several mid-and short-radius horizontal curves exist along the route. The major aspects of the SR 21 geometrics are presented in Table 3.

**Table 3. Geometrics Summary of State Route 21**

Geometric Data	Segment of SR 21	
	SR 78 to County Line	County Line to SR 22
Functional Classification	Rural Minor Arterial	Rural Minor Arterial
Length	4.63 miles from SR 78 (L.M. 3.0) to Co. line (L.M. 7.63)	0.96 miles from Co. line (L.M. 0.0) to SR 22 (L.M. 0.96)
Average Right-of-Way Width	50 feet	60 feet
Average No. Travel Lanes	2 (1 each direction)	2 (1 each direction)
Average Lane Width	11 feet	11 feet
Average Shoulder Width	2 feet (paved)	2 feet (paved)
Median Type	None	None
Average Median Width	N/A	N/A
Bicycle Facilities	Signage only	Signage only
Average Sidewalk Width	None	None
Topography	Level	Level
Major Intersections	All way stop control at SR 78	One way stop control for SR 22
Drainage	Open ditch	Open ditch

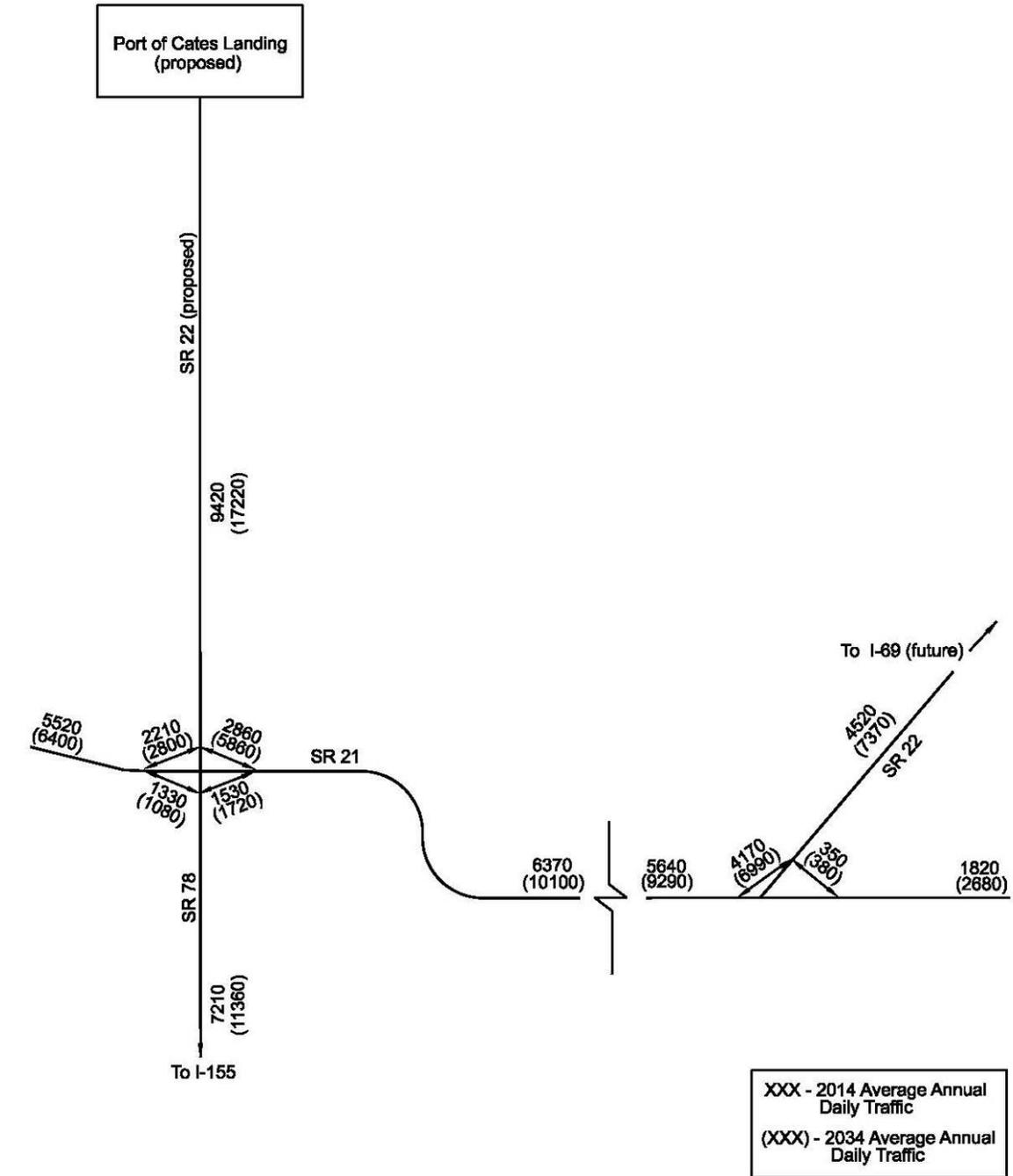
### 3.4 Level of Service Analyses

SR 21 currently carries approximately 2,200 vehicles per day (vpd). With inclusion of the distributed portion of the future traffic generated by the Port of Cates Landing, the projected base year (2014) annual average daily traffic (AADT) along the SR 21 is 6,370 vpd. The projected future year (2034) AADT is 10,100 vpd. The projected traffic volumes for the study area are given in Figure 3.

The base year and design year operating characteristics for the study segments were analyzed as part of the study. A “Level of Service” (LOS) index was used to gauge the operational performance at each 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 levels ranging from “A” to “F” with “F” being the worst. Each level represents a range of operating conditions. Table 4 shows the traffic flow conditions and approximate driver comfort level at each level of service.

Transportation Planning Report  
 State Route 21, From State Route 78 to State Route 22  
 Lake and Obion Counties



**Annual Average Daily Traffic (With Port of Cates Landing)**  
 (Not to Scale)

**Figure 3.**

**Table 4. Level of Service Operational Criteria**

Level of Service (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.

The base year and future year projected LOS is given in Table 5.

**Table 5. Current and Projected Segment Level of Service**

SR 21 Segment of Analysis	Analysis Type	Level Of Service		
		2009 Current Year Peak Hour	2014 Base Year Peak Hour	2034 Future Year Peak Hour
SR 78 to County Line	Two-Lane Segment	B	C	D
County Line to SR 22	Two-Lane Segment	B	C	D
Note: Analysis for years 2014 and 2034 include traffic generated by the proposed Port of Cates Landing. All analysis made using a two (2) lane cross-section.				

As shown in Table 5, the capacity of the study segment is expected to operate at a LOS D or better through the 2034 design year.

### 3.5 Major Structures

SR 21 borders the southern boundary of Reelfoot Lake and has several structures that would be affected if improvements to the existing alignment are made. A bridge over the lake's spillway exists just west of the county line. This bridge has historical significance and is being rehabilitated and left in place as part of the aforementioned spillway relocation project. A new bridge will be constructed as part of the relocation project as well. This will result in two bridges existing along the existing alignment of SR 21. Both of these bridges have sufficient width for only two (2) lanes of traffic.

### 3.6 Multi-Modal Facilities

As mentioned, this segment of SR 21 is part of the Reelfoot State Bicycle Route and the multi-state Mississippi River Trail bicycle route. However, no separate bicycle facilities or sidewalks currently exist, as the highway functions as a shared use route. Table 6 provides the route's pedestrian level of service (PLOS) and bicycle level of service (BLOS). The PLOS and BLOS are measures of the route's adequacy for pedestrian and bicycle travel. These values range from A (most adequate) to F (least adequate) and are based on the cross-sectional and operational characteristics of the roadway as defined in NCHRP 616<sup>4</sup>. Table 6 provides the current and projected non-motorized levels of service assuming no improvements are made.

**Table 6. Current and Projected Non-Motorized Level of Service**

SR 21 Segment of Analysis	Analysis Type	Non-Motorized Level Of Service		
		2009 Current Year Peak Hour	2014 Base Year Peak Hour	2034 Future Year Peak Hour
SR 78 to SR 22 (entire length)	Pedestrian LOS	D	F	F
	Bicycle LOS	B	D	E
Note: Analysis for years 2014 and 2034 include traffic generated by the proposed Port of Cates Landing. Analyses made using existing two (2) lane cross-section.				

No fixed route transit service exists or is planned in Lake or Obion Counties.

## **4.0 FIELD REVIEW INFORMATION**

A field review with TDOT, local, and regional stakeholders was held in Tiptonville on September 2, 2009 to discuss the purpose and need for this study. The general themes of the meeting were as follows:

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<sup>4</sup> "Multimodal Level of Service Analysis for Urban Streets". National Cooperative Highway Research Program (NCHRP) Report 616. Transportation Research Board.

- The operation of the Port of Cates Landing will bring increased volumes of new traffic into the area. A major component of this new traffic will be commercial trucks bringing freight to and from the port. These trucks will largely have origins from and destinations to Interstate highways (I-155 and future I-69).
- SR 21 needs improvement to better accommodate local and tourist needs (bicycles, pedestrians, tourism traffic).
- Making improvements to the existing SR 21 alignment is believed to have substantial environmental impacts, affecting the feasibility of the improvements.

The field review minutes are provided in the Appendix.

## **5.0 PURPOSE AND NEED**

The purpose and need for improvement to the SR 21 corridor was developed based on the findings and analysis of the route's existing conditions, the travel demand projections for future development in the area, and the input from local and regional stakeholders.

As a result of these analyses, the primary purpose and need for the proposed improvement options is to promote safety and a more efficient system linkage between SR 78 and SR 22 suitable for various user types including local traffic, tourists, non-motorized users, and increasing commercial truck traffic. The improved connection will provide ample capacity for growing traffic volumes brought by a regional port project. The connection also enhances the attractiveness of Reelfoot Lake State Park by providing improved access for tourism.

## **6.0 OPTIONS FOR IMPROVEMENT**

To meet the need for improved system linkage between SR 78, SR 22 and the future I-69, four (4) options should be considered during the NEPA environmental analysis phase of this project.

### **6.1 Option A – No-Build**

With no improvements to this segment of SR 21, the operational level of service will remain at an acceptable LOS C through the base year 2014. However, by the future year 2034 the operational level of service will be a LOS D and the functionality of the road will remain inconsistent with respect to its different types of users. The increasing volume of traffic generated by the proposed port will exacerbate this problem, particularly since a sizable share of this new traffic will be commercial trucks.

The limited shoulder width is currently a particular deficiency for cyclists using this route which carries bike route designation for two major bike routes. Aside from this, however, selection of the no-build option is not expected to result in additional safety or capacity problems along the existing SR 21 alignment.

**6.2 Option B – Spot Improvements**

This option involves the improvement of various locations to enhance safety and capacity at key intersections along SR 21. Spot improvements can be implemented independently or in combination with other locations to provide solutions that could be implemented over an extended time. There are six (6) locations along the study segment in need of spot improvements. These locations are shown below in Figure 4:

**Figure 4 – Spot Improvement Locations**

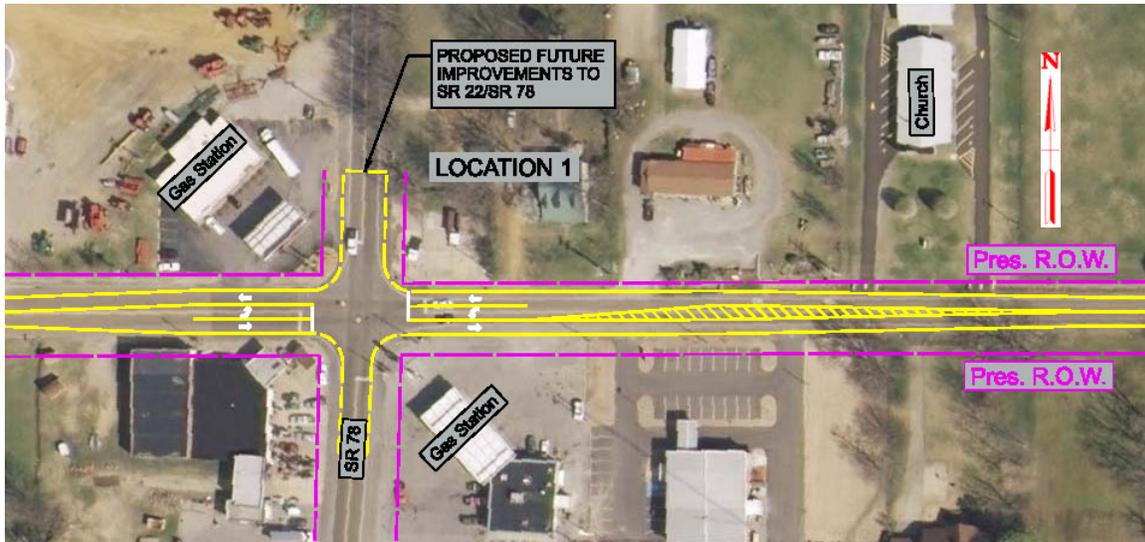


Not to Scale.

Location 1: The Intersection of SR 21 and SR 78

Construct left turn lanes with 100 feet of storage and 180 feet of taper for both east and westbound approaches on SR 21. All signing and striping at the intersection will be updated to meet current MUTCD standards. The cost estimate for this location is \$353,000 including, \$51,000 for utility relocation, \$266,000 for construction, and \$36,000 for preliminary engineering.

**Figure 5 – Option B Location 1**



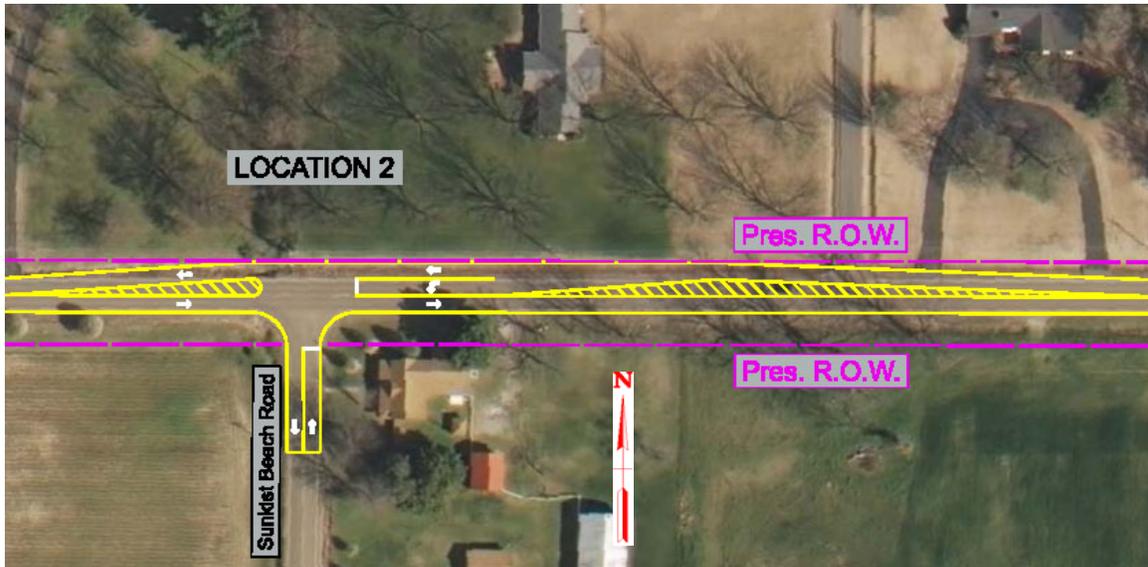
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Although no right-of-way acquisition is expected, construction and/or slope easements may be required outside of the existing right-of-way.

Location 2: The Intersection of SR 21 and Sunkist Beach Road

Construct a left turn lane with 100 feet of storage and 180 feet of taper for the westbound approach on SR 21. All signing and striping at the intersection will be updated to meet current MUTCD standards. The cost estimate for this location is \$259,000 including, \$37,000 for utility relocation, \$195,000 for construction, and \$27,000 for preliminary engineering.

**Figure 6 – Option B Location 2**



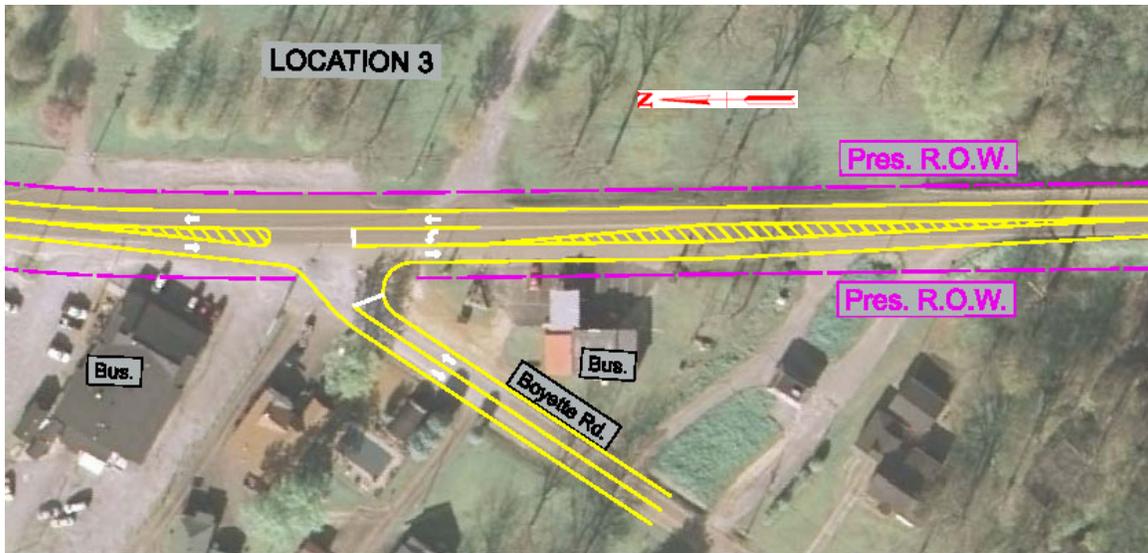
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Although no right-of-way acquisition is expected, construction and/or slope easements may be required outside of the existing right-of-way.

Location 3: The Intersection of SR 21 and Boyette Road

Construct a left turn lane with 100 feet of storage and 180 feet of taper for the northbound approach on SR 21. All signing and striping at the intersection will be updated to meet current MUTCD standards. The cost estimate for this location is \$292,000 including, \$47,000 for utility relocation, \$216,000 for construction, and \$29,000 for preliminary engineering.

**Figure 7 – Option B Location 3**



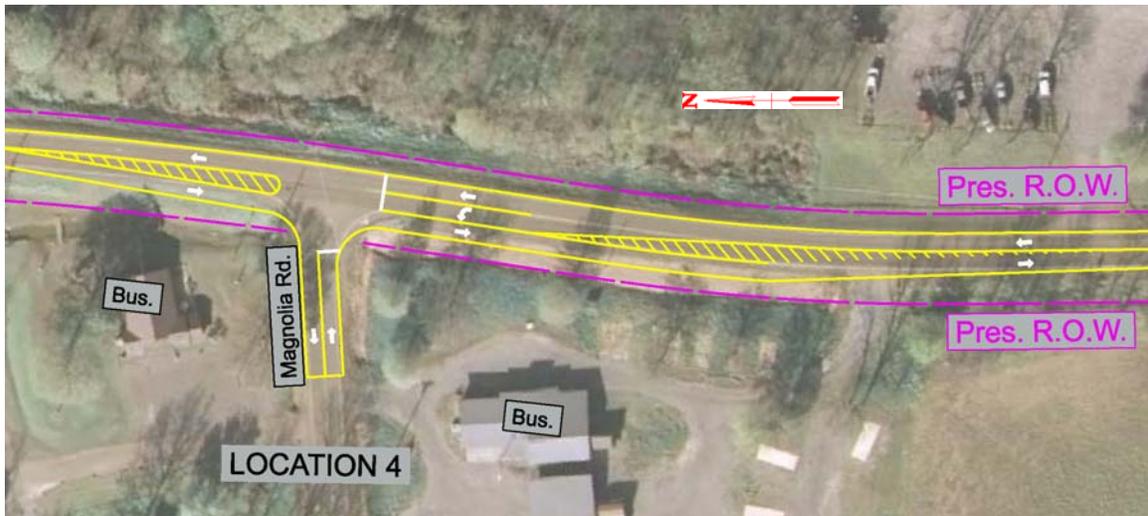
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Although no right-of-way acquisition is expected, construction and/or slope easements may be required outside of the existing right-of-way.

Location 4: The Intersection of SR 21 and Magnolia Road

Construct a left turn lane with 100 feet of storage and 180 feet of taper for the northbound approach on SR 21. All signing and striping at the intersection will be updated to meet current MUTCD standards. The cost estimate for this location is \$306,000 including, \$42,000 for utility relocation, \$232,000 for construction, and \$32,000 for preliminary engineering.

**Figure 8 – Option B Location 4**



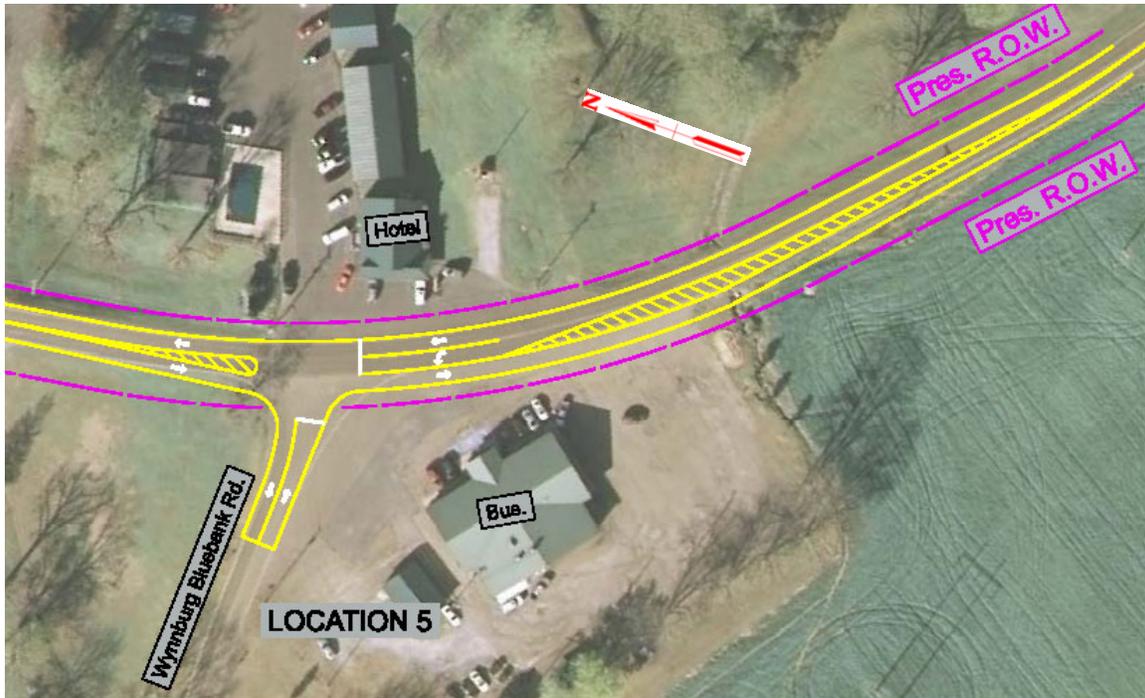
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Although no right-of-way acquisition is expected, construction and/or slope easements may be required outside of the existing right-of-way.

Location 5: The Intersection of SR 21 and Wynnburg Bluebank Road

Construct a left turn lane with 100 feet of storage and 180 feet of taper for the westbound approach on SR 21. All signing and striping at the intersection will be updated to meet current MUTCD standards. The cost estimate for this location is \$300,000 including, \$49,000 for utility relocation, \$221,000 for construction, and \$30,000 for preliminary engineering.

**Figure 9 – Option B Location 5**



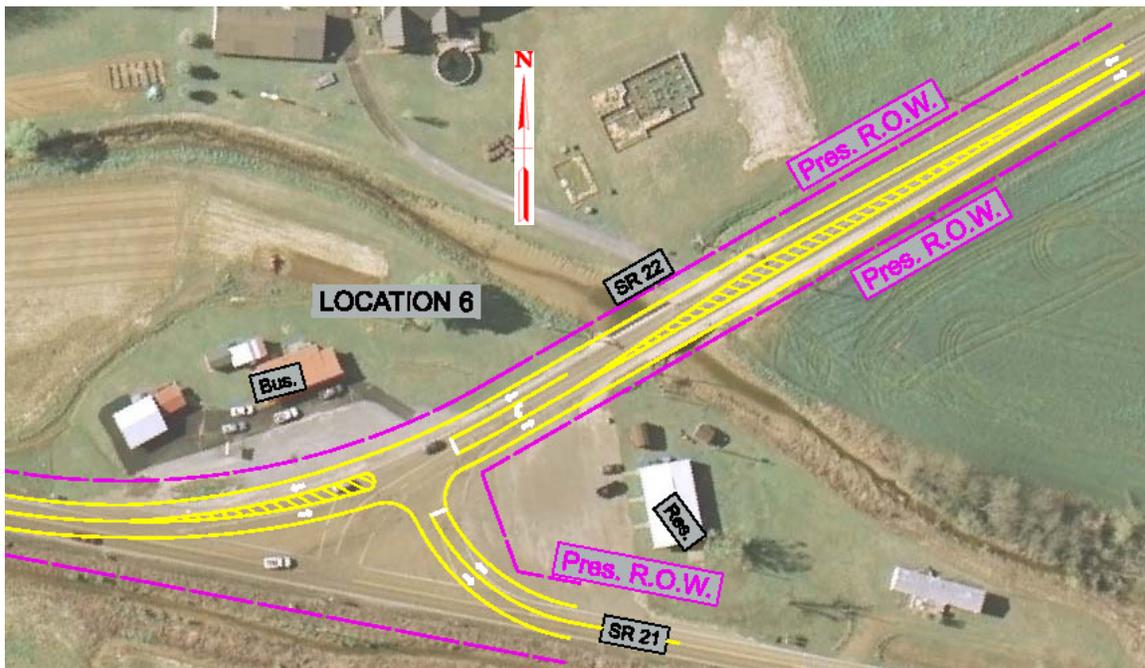
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Although no right-of-way acquisition is expected, construction and/or slope easements may be required outside of the existing right-of-way.

Location 6: The Intersection of SR 21 and SR 22

Reconfigure the intersection of SR 21 and SR 22 such that eastbound SR 21 has continuity with northbound SR 22, and southbound SR 22 has continuity with westbound SR 21. The eastern leg of SR 21 should tee into this continuous route. This configuration is more in keeping with the major desired travel patterns at this intersection. All signing and striping at the intersection will be updated to meet current MUTCD standards. The cost estimate for this location is \$297,000 including, \$53,000 for utility relocation, \$215,000 for construction, and \$29,000 for preliminary engineering.

**Figure 10 – Option B Location 6**



Not to Scale.

Although no right-of-way acquisition is expected, construction and/or slope easements may be required outside of the existing right-of-way.

### 6.3 Recommended Priority of Spot Improvements

These priorities are based on projected traffic demands and crash history within the corridor. The prioritization is subject to change in the future as traffic conditions and local objectives change within the corridor. The spot improvements are listed below in descending order with the first being the highest priority. It should be noted that implementation of Option B will not result in significant modifications to the non-motorized accommodations within the corridor.

**Priority 1:** Location 6 – The intersection of SR 21 and SR 22.

**Priority 2:** Location 1 – The intersection of SR 21 and SR 78

**Priority 3:** Location 3 – The intersection of SR 21 and Boyette Road.

**Priority 4:** Location 5 – The intersection of SR 21 and Wynnburg Bluebank Road.

**Priority 5:** Location 2 – The intersection of SR 21 and Sunkist Beach Road

**Priority 6:** Location 4 – The intersection of SR 21 and Magnolia Road

### 6.4 Option C – Two (2) Lane Improvement Along Existing Alignment

Option C meets the need for this transportation connection by making improvements to the cross-section of the existing SR 21 alignment. This would consist of constructing twelve (12) foot travel lanes, eight (8) foot shoulders suitable for use by bicyclists and pedestrians, and spot improvements on SR 21 at the locations previously mentioned in Option B, Spot Improvements:

- Intersection of SR 21 and SR 78
- Intersection of SR 21 and Sunkist Beach Road
- Intersection of SR 21 and Boyette Road
- Intersection of SR 21 and Magnolia Road
- Intersection of SR 21 and Wynnburg Bluebank Road
- Intersection of SR 21 and SR 21

These improvements will provide minor benefits to the vehicular capacity for this segment of SR 21. As shown in Table 5, the two (2) lane cross-section will operate at a LOS D through the 2034 design year. The non-motorized levels of service will improve as shown in Table 7.

**Table 7. Current and Projected Non-Motorized Level of Service (with proposed improvements)**

SR 21 Segment of Analysis	Analysis Type	Non-Motorized Level Of Service	
		2014 Base Year Peak Hour	2034 Future Year Peak Hour
SR 78 to SR 22 (entire length)	Pedestrian LOS	C	D
	Bicycle LOS	A	A

Note: Analysis for years 2014 and 2034 include traffic generated by the proposed Port of Cates Landing. Analysis made using proposed two (2) lane cross-section.

A new spillway is being constructed to replace the old spillway located in the study corridor. The new spillway is located approximately 1,200 feet west of the old spillway; however, the old spillway is deemed historic and will remain in its current location. Due to the cross-sections of both the old and new spillway bridges the improvements listed in Option C shall not be applied to the segment of SR 21 extending from 200 feet west of the new spillway bridge to 200 feet east of the old spillway bridge. The cross-section within this segment will remain as designed in the SR 21 bridge and spillway design plans.

The total estimated cost of Option C is \$13,933,000 including \$2,052,000 for right-of-way acquisition, \$2,342,000 for utility relocation, \$8,394,000 for construction, and \$1,145,000 for preliminary engineering. In order to meet corridor objectives it was assumed that a total right-of-way of 100 feet would be acquired as part of Option C.

**6.5 Option D – Two (2) Lane Construction on New Alignment**

Option D describes the concept of constructing a new roadway south of SR 21 on open farmland. Constructing on a new alignment is expected to lessen impacts along the south bank of Reelfoot Lake and prevent property impacts along the built-up areas. This new roadway would have two (2) twelve (12) foot wide lanes and eight (8) foot wide shoulders and would be oriented toward facilitating truck movements between the proposed Port of Cates Landing and the future I-69 alignment. The length of this new roadway would be 5.11 ± miles.

Because the intended use of this proposed new roadway is by commercial trucks having moderate to long haul distances, the new alignment should not introduce a significant added distance to the trip between the port and the I-69 alignment. Because of this, the NEPA study corridor for Option D should not be more than 1,000 feet south of the existing SR 21 alignment. A route located more than 1,000 feet south would introduce approximately ½ mile of added distance to this SR 78 to SR 22 connection, and would likely result in trucks continuing to use the shorter SR 21 (existing alignment) connection.

This new alignment will provide minor benefits on the vehicular capacity for the proposed segment of SR 21. As shown in Table 5, the two (2) lane cross-section will operate at a

LOS D through the 2034 design year. The non-motorized levels of service will improve by the design year 2034 to a pedestrian LOS of D and a bicycle LOS of A.

The total estimated cost of Option D is \$12,247,000 including \$1,611,000 for right-of-way acquisition, \$45,000 for utility relocation, \$9,320,000 for construction, and \$1,271,000 for preliminary engineering.

#### 6.6 Disposition of Existing Route

Options A, B, and C will not have an effect on the existing state route system. However, if Option D were implemented it could displace a portion of the existing SR 21 alignment to a new location and would have an effect on the existing state route system. No determination has been made with regard to the disposition of the state route system. Any modification to the designation of the state route system will be decided during the NEPA process.

#### 6.7 Preliminary Environmental and Cultural Considerations

The potential environmental impacts of this study have been investigated and the presence of common environmental items have been summarized in the “Preliminary Environmental Evaluation” form. A comprehensive analysis of the impacts will be completed in a later phase of the study in accordance with the National Environmental Policy Act (NEPA).

Both Options C and D will encounter several wetland areas along their respective alignments. These wetland impacts will require the confirmation from the appropriate coordinating agencies as well as TDOT’s coordination with them. These impacts will require either a general or an individual Aquatic Resource Alteration Permit (ARAP) from the State of Tennessee in addition to potential permitting coordination with the US Corps of Engineers, US Fish and Wildlife Service, and the Environmental Protection Agency. A map of identified wetland areas is provided in the Appendix.

Research of the Federal Emergency Management Agency’s published flood maps shows encroachment on the 100 year flood zone by both Options C and D, and to a limited degree, Option B. Construction in these areas should use design features that will minimize and mitigate the impacts to affected flood areas. The flood zone map for the area is provided in the Appendix.

To determine the presence of environmentally sensitive features along the proposed linear corridor improvement options, an Early Environmental Screening (EES) was performed by TDOT for Options C and D. The EES found that concentrations of minority and low-income populations exist along the Option C alignment and that Option D may affect low-income populations. The analysis also found substantial impacts to large wetland areas, and moderate impact to terrestrial species, aquatic species, TDEC Conservation Sites and Scenic Waterways, and Tennessee Natural Areas for both options.

Terrestrial species found within the study area are:

- Greene Lakecress (*Neobeckia aquatica*), special consideration – Option C

Transportation Planning Report  
State Route 21, From State Route 78 to State Route 22  
Lake and Obion Counties

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- American Featherfoil (*Hottonia inflata*), special consideration – Option C and D
- Common Barn Owl (*Tyto alba*), deemed important – Option C and D
- Bewick's Wren (*Thryomanes bewickii*), endangered – Option C and D
- Delta Arrowhead (*Sagittaria platyphylla*), special consideration – Option C and D
- Mississippi Green Water Snake (*Nerodia cyclopion*), deemed important – Option C and D
- Southeastern Shrew (*Sorex longirostris*), deemed important – Option D

The aquatic species found within the study area are:

- Alligator Gar (*Atractosteus spatula*), deemed important – Option C
- Golden Topminnow (*Fundulus chrysotus*), deemed important – Option C and D

The EES reports are provided in the Appendix.

## Preliminary Environmental Evaluation

If preliminary field reviews indicate the presence of any of the following facilities and/or Economic, Social, and Environmental categories (ESE), place an "X" in the blank opposite the item (or the Option designation). Where more than one option is to be considered, place its letter designation in the blank. A more comprehensive analysis of the impacts will be completed at a later date to comply with the National Environmental Policy Act (NEPA).

1.)	Hazardous Material Site or Underground Storage Tanks.....	<u>          C          </u>
2.)	Floodplains .....	<u>         B, C, D         </u>
3.)	Historical, archeological, cultural, or natural landmarks, or Cemeteries .....	<u>          C, D         </u>
4.)	Airport .....	<u>                          </u>
5.)	Residential Establishment .....	<u>          B, C         </u>
6.)	Urban area, city, town, or community.....	<u>          B, C         </u>
7.)	Commercial area, shopping center .....	<u>          B, C         </u>
8.)	Institutional Usages	
	a. School or other educational institution .....	<u>                          </u>
	b. Hospital or other medical facility .....	<u>                          </u>
	c. Church or other religious institution .....	<u>                          C          </u>
	d. Public Building, e.g., fire station.....	<u>                          </u>
	e. Defense installation.....	<u>                          C          </u>
9.)	Agricultural land usage.....	<u>          B, C, D         </u>
10.)	Forested land .....	<u>          C, D         </u>
11.)	Industrial Park, factory.....	<u>                          </u>
12.)	Recreational usages:	
	a. Park or recreational area, State Natural Area.....	<u>          B, C         </u>
	b. Wildlife refuge or wildlife management area.....	<u>          B, C         </u>
13.)	Waterway:	
	a. Lake .....	<u>          B, C         </u>
	b. Pond .....	<u>                          </u>
	c. River.....	<u>                          </u>
	d. Stream.....	<u>          C, D         </u>
	e. Spring.....	<u>                          </u>
14.)	Railroad Crossings.....	<u>                          </u>
15.)	Study coordinated with MPO/RPO and/or local officials.....	<u>          A, B, C, D         </u>
16.)	Other .....	<u>                          </u>

## 6.8 Preliminary Structural Considerations

Three (3) bridge structures exist along the study corridor. Option C will only affect one (1) of the three bridge structures. The first structure is currently being constructed as part of the spillway relocation project and will remain unchanged under Option C. The second structure is the historic spillway structure that is being left in place as part of the spillway relocation project, because the old spillway is considered to be historical the improvements listed in Option C will not affect the bridge. The third structure crosses the floodgate at Sunkist Beach and will be widened to incorporate the improvements listed in Option C.

Option D will require that at least one (1) bridge be constructed over the spillway. Several other drainage courses and potential wetlands exist south of SR 21 that may require spanning on structure.

## **7.0 ASSESSMENT OF CORRIDOR OPTIONS**

TDOT has developed a set of seven (7) guiding principles by which all transportation projects are to be evaluated. These principles evaluate how the SR 21 improvement study meets the established long-range statewide planning objectives. These guiding principles are discussed in the following paragraphs as they relate to the improvement of the SR 21 corridor in Lake and Obion Counties.

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

Options B, C, and D meet this objective by planning for the continuing efficiency of the existing SR 21 corridor. Options B and C does this by making improvements directly to the existing alignment. Option D requires new construction and therefore may not be seen as managing the existing system in a traditional sense. However, Option D does preserve the existing segment by constructing a parallel route on new alignment, thereby preserving low traffic volumes and speeds for local traffic on SR 21 and minimizing environmental impacts to the existing system. Option A would make no improvements and would result in partial degradation of service for all users along the existing SR 21 alignment.

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

With the introduction of the proposed port and the future I-69 corridor, industry-related growth is expected in this area. With this will likely be new residential growth as well. While it has been demonstrated that additional lane capacity is not needed, the improvements as recommended in the corridor will enhance the function of the corridor for a growing population. Also, the addition of standard-width lanes and shoulders should make commercial truck and non-motorized travel safer within the corridor.

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

A major tenet of this study, the improvement of the SR 21 corridor will support proposed development at and around the Port of Cates Landing development. The port has

respective lower and upper bound benefit/cost ratios of 2.89 and 6.21<sup>5</sup>. Additionally, improvement of this segment will provide improved access from Tiptonville and Lake County to the future I-69 corridor. This improved connection would likely result in increased visitation to Reelfoot Lake State Park and other scenic and recreational activities which drive a significant portion of the economy of Lake County and western Obion County.

*Guiding Principle 4: Maximize Safety and Security*

In the event that existing SR 21 becomes impassable, an alternative route is available via a series of county roads south of SR 21. Options B and C improve the safety of the existing road through standard width travel lanes and wider shoulders. Option D promotes safe operation by separating some truck traffic from local, tourist, and non-motorized traffic.

*Guiding Principle 5: Build Partnerships for Livable Communities*

Options B, C, and D have been developed with input from local stakeholders who are interested in an approach where the need for access to new industrial sites is balanced with the need for a safe local street network. These three options take different approaches to accommodating various types of users, both strive to make transportation in this corridor safe and efficient for all.

*Guiding Principle 6: Promote Stewardship of the Environment*

Because this study is proposed along the south bank of Reelfoot Lake, significant consideration of environmental issues must be made. Option D was developed partially to avoid impact to sensitive areas along the lake and adjacent public park land. This study is subject to all of the regulations of NEPA and these will be addressed in detail in the environmental phase of the study.

*Guiding Principle 7: Emphasize Financial Responsibility*

Planning level cost estimates were prepared for the improvement options for comparison purposes. TDOT's financial objectives include following a comprehensive transportation planning process, promoting coordination among public and private operators of transportation systems, and supporting efforts to provide stable funding for the public component of the transportation system. One or more of these strategies will be used in this study to promote financial efficiency and minimize taxpayer expenditures.

At the same time, this transportation improvement would support the operation of the proposed port which has been estimated to return significant value to the regional economy of northwest Tennessee. In the mid-to-long term horizon, annual financial projections include \$259M in annual business revenue, \$90.2M in value-added gross regional product, \$59.7M in added personal income, and \$5.4M in new state and local taxes<sup>6</sup>.

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<sup>5</sup> "Contributions of Proposed Investment in the Northwest Tennessee Regional Port at Cates Landing to the Regional Economy." Arik, Murat and David Penn. Business and Economic Research Center, Middle Tennessee State University. September 2009.

<sup>6</sup> Arik, et al.

## **8.0 SUMMARY**

The introduction of new regional transportation facilities in this area of northwest Tennessee has brought about a need for an improved connection between them. These facilities are the proposed Port of Cates Landing in Lake County and the future I-69 alignment in Obion County. The current alignment of SR 21 is currently the primary connection between these and also serves other local and regional traffic.

Traffic data have shown that the two (2) traffic lanes on SR 21 will adequately accommodate growing traffic volumes through the 2034 design year. However, due to the introduction of a new significant volume of traffic, including a high percentage of commercial trucks, benefits will be achieved from either individual spot improvements listed in Option B, or an improved cross-section including the previously mentioned spot improvements and standard lane widths and shoulders. Improving the existing alignment, including the spot improvements, to provide this connection is described as Option C and has an estimated cost of \$13,933,000.

Options B and C are expected to have some environmental impact due to the location of the existing corridor along the southern shore of Reelfoot Lake and the adjacent public park land. As an attempt to avoid some of these impacts and to further separate some truck traffic from local, tourist, and non-motorized traffic, Option D was developed. Option D describes a corridor having a new alignment parallel to and south of SR 21. Traversing primarily open farmland, this option would construct a new roadway making the connection from SR 78 in Tiptonville to SR 22. The cross-section of Option D would likewise be a two lane highway with paved shoulders. Option D has an estimated cost of \$12,247,000.

Options C and D meet the stated purpose and need for an improved connection for traffic generated by the proposed Port of Cates Landing. Option B partially meets the need for an improved connection through spot improvements.

# APPENDIX

**TENNESSEE DEPT. OF TRANSPORTATION, PLANNING DIVISION**  
**State Route 21 Transportation Planning Report**  
**Stakeholder Field Review**  
**Meeting Notes**

September 2, 2009  
10:00 AM – 12:00 PM

**Meeting Purpose:**

Discuss an overview of the process, study limits and purpose of a Transportation Planning Report. Present data and information on existing conditions within the study area. Gather information and opinions from the stakeholders in order to assist in the development of the Transportation Planning Report.

**Meeting Location:**

Main Street Center, 218 Church Street, Tiptonville, TN

**Attendees:**

See attached sign in sheet

**Meeting Summary:**

In general, materials presented and discussed included an overview of the Transportation Planning Report process, scope, and work progress to date. Further discussions involved environmental problems associated with Reelfoot Lake, proposals of alternative routes, and the traffic impact to the study area due to the Port at Cates landing.

The following are key discussion/comment items from the meeting:

- Port Authority does not support any project that impacts Reelfoot Lake. This was clarified to mean that significant negative environmental impact to the lake should be avoided.
- Local and possibly National environmental scrutiny will occur if affecting Reelfoot Lake.
- 60% – 65% of port traffic will be traveling south on SR 78 towards Memphis.
- Trucks traveling south or west will take Great River Road to I-155.
- MTSU Professor performed an Economic Study on the regional cities and the four counties surrounding the port. This study will be available after September 15.
- Between the SR 21/SR 22 intersection and Union City 80% - 85% will travel along SR 22.
- Port Authority agrees with the design for super two lane highway along SR 22 from SR 78 to Port of Cates Landing.
- Good feature of “super two” lane is wide shoulders. Twelve foot shoulders would help farm equipment, bicycles, or other slow moving traffic.
- Old spillway is to be considered historic and left in existing location. This design feature should be verified.
- In order to avoid all environmental issues a new connector would have to go south on SR 78 to Wynnburg.
- SR 78 is a designated four lane highway connecting to interstate (referring to county seat connector program).
- Mitigation land cannot seek eminent domain, there must be a willing seller.

- Crash rate is high due to the levees.
- There will be 30% - 40% levee work within the study area.
- There is a need to travel further south along SR 78 and build a new connector road from SR 78 to SR 22.
- Obion County has already approved a possible four lane cross county road from the SR 21/22 split to Union City. Belief that new construction here would be easier/have less impact than improving existing alignment.
- The Ethanol Plant in Union City will be shipping to port.
- The Port facility needs “slow growth” in the population of the surrounding area in order to sustain the projected employment with city and county services.
- Port has 350 acres and usually employs 3-4 employees per acre. Approximately 3,000 adjacent acres are being promoted for industrial development.
- 150 trucks expected in/out of port per day. (Note: this does not correspond well to TDOT’s projections which are for 15,240 new trips per day. Assuming just 5% trucks yields 381 trucks in/out per day. MTSU study may clarify this.)
- Do not mix truck traffic with tourist traffic.
- Opinion expressed that SR 21 needs improvement to better accommodate local and tourist needs (bicycles, farm equipment, tourism traffic). A truck connection to I-69 should be a separate proposal and a separate roadway. Mixing these needs on one common roadway is not desirable.
- Some companies have already agreed to build within the port industrial park area if the port is built.
- Industrial Park expected to bring raw materials in and send manufactured goods out.
- There is a need to have improvement on SR 21, without a change in its current role.
- An additional study should be done on the proposed new connector from SR 78 to SR 22. This connector would sustain westbound truck traffic, enabling SR 21 to maintain its role.

**TENNESSEE DEPT. OF TRANSPORTATION, PLANNING DIVISION  
 State Route 21 Transportation Planning Report  
 Stakeholder Field Review**

Main Street Center  
 218 Church Street, Tiptonville, TN

September 2, 2009  
 10:00 AM

Sign In Sheet

Please Sign In:

<u>Name</u>	<u>Organization</u>	<u>E-Mail</u>
Jimmy Williamson	East Auking	viewcospower.com
HOWARD G. BLANKENSHIP	TDOT	Glen.Blankenship@tn.gov
MIKE CORDER	T. DOT	
James Boyd	TDOT	
Maie Robertson	Lake Co.	Maie.Robertson@courthouse.com
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Tyler King	TDOT	Tyler.King@tn.gov
Jane Jones	TDOT	Jane.Jones@TN.GOV
JEFF HAMMOND	RPM	jeffhammond@rpmtraffic.net
BLAKE TURNER	RPM	blake.turner@rpmtraffic.net

# **COST ANALYSIS**

Route:	SR 21
Description:	Option A - No-Build
County:	Lake
Length:	5.59
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	0
CLEAR AND GRUBBING	\$	0
EARTHWORK	\$	0
PAVEMENT REMOVAL	\$	0
DRAINAGE	\$	0
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	0
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	0
TOPSOIL	\$	0
SEEDING	\$	0
SODDING	\$	0
SIGNING	\$	0
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (15%)	\$	0
MOBILIZATION	\$	0
CONSTRUCTION COST	\$	0
10% ENG. & CONT.	\$	0
TOTAL CONSTRUCTION COST	\$	0
15% PRELIMINARY ENGINEERING	\$	0
TOTAL COST *	\$	0

*\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.*

Route:	SR 21
Description:	Location 1 - Intersection of SR 21 and SR 78
	Transportation Planning Report
County:	Lake
Length:	Intersection
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	51,000
CLEAR AND GRUBBING	\$	0
EARTHWORK	\$	38,000
PAVEMENT REMOVAL	\$	8,000
DRAINAGE	\$	22,000
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	117,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	5,000
TOPSOIL	\$	2,000
SEEDING	\$	1,000
SODDING	\$	1,000
SIGNING	\$	6,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (15%)	\$	30,000
MOBILIZATION	\$	12,000
CONSTRUCTION COST	\$	242,000
10% ENG. & CONT.	\$	24,000
TOTAL CONSTRUCTION COST	\$	266,000
15% PRELIMINARY ENGINEERING	\$	36,000
TOTAL COST *	\$	353,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Location 2 - Intersection of SR 21 and Sunkist Beach Road
	Transportation Planning Report
County:	Lake
Length:	Intersection
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	37,000
CLEAR AND GRUBBING	\$	2,000
EARTHWORK	\$	29,000
PAVEMENT REMOVAL	\$	1,000
DRAINAGE	\$	17,000
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	89,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	2,000
TOPSOIL	\$	1,000
SEEDING	\$	1,000
SODDING	\$	1,000
SIGNING	\$	4,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (15%)	\$	22,000
MOBILIZATION	\$	8,000
CONSTRUCTION COST	\$	177,000
10% ENG. & CONT.	\$	18,000
TOTAL CONSTRUCTION COST	\$	195,000
15% PRELIMINARY ENGINEERING	\$	27,000
TOTAL COST *	\$	259,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Location 3 - Intersection of SR 21 and Boyette Road
	Transportation Planning Report
County:	Lake
Length:	Intersection
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	47,000
CLEAR AND GRUBBING	\$	2,000
EARTHWORK	\$	29,000
PAVEMENT REMOVAL	\$	10,000
DRAINAGE	\$	18,000
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	86,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	4,000
TOPSOIL	\$	1,000
SEEDING	\$	1,000
SODDING	\$	1,000
SIGNING	\$	11,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (15%)	\$	24,000
MOBILIZATION	\$	9,000
CONSTRUCTION COST	\$	196,000
10% ENG. & CONT.	\$	20,000
TOTAL CONSTRUCTION COST	\$	216,000
15% PRELIMINARY ENGINEERING	\$	29,000
TOTAL COST *	\$	292,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Location 4 - Intersection of SR 21 and Magnolia Road
	Transportation Planning Report
County:	Lake
Length:	Intersection
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	42,000
CLEAR AND GRUBBING	\$	2,000
EARTHWORK	\$	27,000
PAVEMENT REMOVAL	\$	8,000
DRAINAGE	\$	40,000
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	77,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	2,000
TOPSOIL	\$	1,000
SEEDING	\$	1,000
SODDING	\$	1,000
SIGNING	\$	4,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	9,000
RIP RAP OR SLOPE PROTECTION	\$	3,000
OTHER CONST. ITEMS (15%)	\$	26,000
MOBILIZATION	\$	10,000
CONSTRUCTION COST	\$	211,000
10% ENG. & CONT.	\$	21,000
TOTAL CONSTRUCTION COST	\$	232,000
15% PRELIMINARY ENGINEERING	\$	32,000
TOTAL COST *	\$	306,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Location 5 - Intersection of SR 21 and Wynnburg Bluebank Road Transportation Planning Report
County:	Lake
Length:	Intersection
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	49,000
CLEAR AND GRUBBING	\$	2,000
EARTHWORK	\$	31,000
PAVEMENT REMOVAL	\$	9,000
DRAINAGE	\$	18,000
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	122,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	2,000
TOPSOIL	\$	1,000
SEEDING	\$	1,000
SODDING	\$	1,000
SIGNING	\$	4,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (15%)	\$	0
MOBILIZATION	\$	10,000
CONSTRUCTION COST	\$	201,000
10% ENG. & CONT.	\$	20,000
TOTAL CONSTRUCTION COST	\$	221,000
15% PRELIMINARY ENGINEERING	\$	30,000
TOTAL COST *	\$	300,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Location 6 - Intersection of SR 12 and SR 22
	Transportation Planning Report
County:	Obion
Length:	Intersection
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	0
UTILITY RELOCATIONS	\$	53,000
CLEAR AND GRUBBING	\$	2,000
EARTHWORK	\$	32,000
PAVEMENT REMOVAL	\$	9,000
DRAINAGE	\$	19,000
STRUCTURES	\$	0
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	90,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	3,000
TOPSOIL	\$	1,000
SEEDING	\$	1,000
SODDING	\$	1,000
SIGNING	\$	4,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (15%)	\$	24,000
MOBILIZATION	\$	9,000
CONSTRUCTION COST	\$	195,000
10% ENG. & CONT.	\$	20,000
TOTAL CONSTRUCTION COST	\$	215,000
15% PRELIMINARY ENGINEERING	\$	29,000
TOTAL COST *	\$	297,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Option C - Improvement Along Existing Corridor
County:	Lake
Length:	5.59
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	2,052,000
UTILITY RELOCATIONS	\$	2,342,000
CLEAR AND GRUBBING	\$	7,000
EARTHWORK	\$	1,023,000
PAVEMENT REMOVAL	\$	6,000
DRAINAGE	\$	906,000
STRUCTURES	\$	1,430,000
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	2,862,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	10,000
TOPSOIL	\$	43,000
SEEDING	\$	37,000
SODDING	\$	26,000
SIGNING	\$	4,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	0
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	2,000
OTHER CONST. ITEMS (15%)	\$	953,000
MOBILIZATION	\$	322,000
CONSTRUCTION COST	\$	7,631,000
10% ENG. & CONT.	\$	763,000
TOTAL CONSTRUCTION COST	\$	8,394,000
15% PRELIMINARY ENGINEERING	\$	1,145,000
TOTAL COST *	\$	13,933,000

\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR 21
Description:	Option D - Construction of New Corridor
County:	Lake
Length:	5.11
Date:	9/27/2010

RIGHT-OF-WAY ACQUISITION	\$	1,611,000
UTILITY RELOCATIONS	\$	45,000
CLEAR AND GRUBBING	\$	28,000
EARTHWORK	\$	933,000
PAVEMENT REMOVAL	\$	3,000
DRAINAGE	\$	1,250,000
STRUCTURES	\$	1,750,000
RAILROAD CROSSING OR SEPARATION	\$	0
PAVING	\$	2,625,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	3,000
TOPSOIL	\$	42,000
SEEDING	\$	34,000
SODDING	\$	14,000
SIGNING	\$	20,000
LIGHTING	\$	0
SIGNALIZATION	\$	0
FENCE	\$	109,000
GUARDRAIL	\$	156,000
RIP RAP OR SLOPE PROTECTION	\$	92,000
OTHER CONST. ITEMS (15%)	\$	1,059,000
MOBILIZATION	\$	355,000
CONSTRUCTION COST	\$	8,473,000
10% ENG. & CONT.	\$	847,000
TOTAL CONSTRUCTION COST	\$	9,320,000
15% PRELIMINARY ENGINEERING	\$	1,271,000
TOTAL COST *	\$	12,247,000

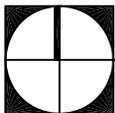
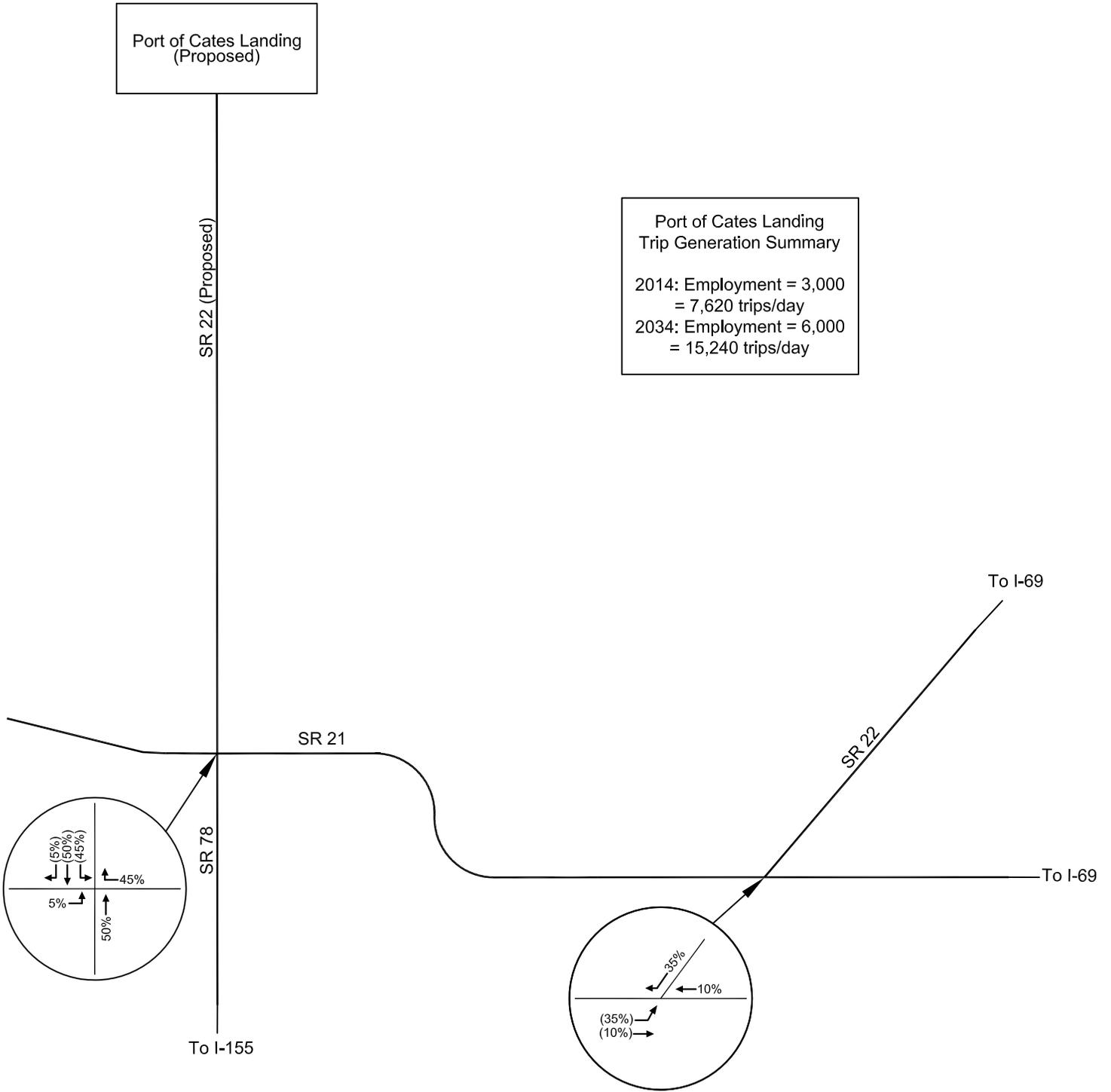
\* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

# TRAFFIC PROJECTIONS

Port of Cates Landing  
(Proposed)

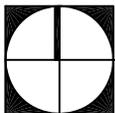
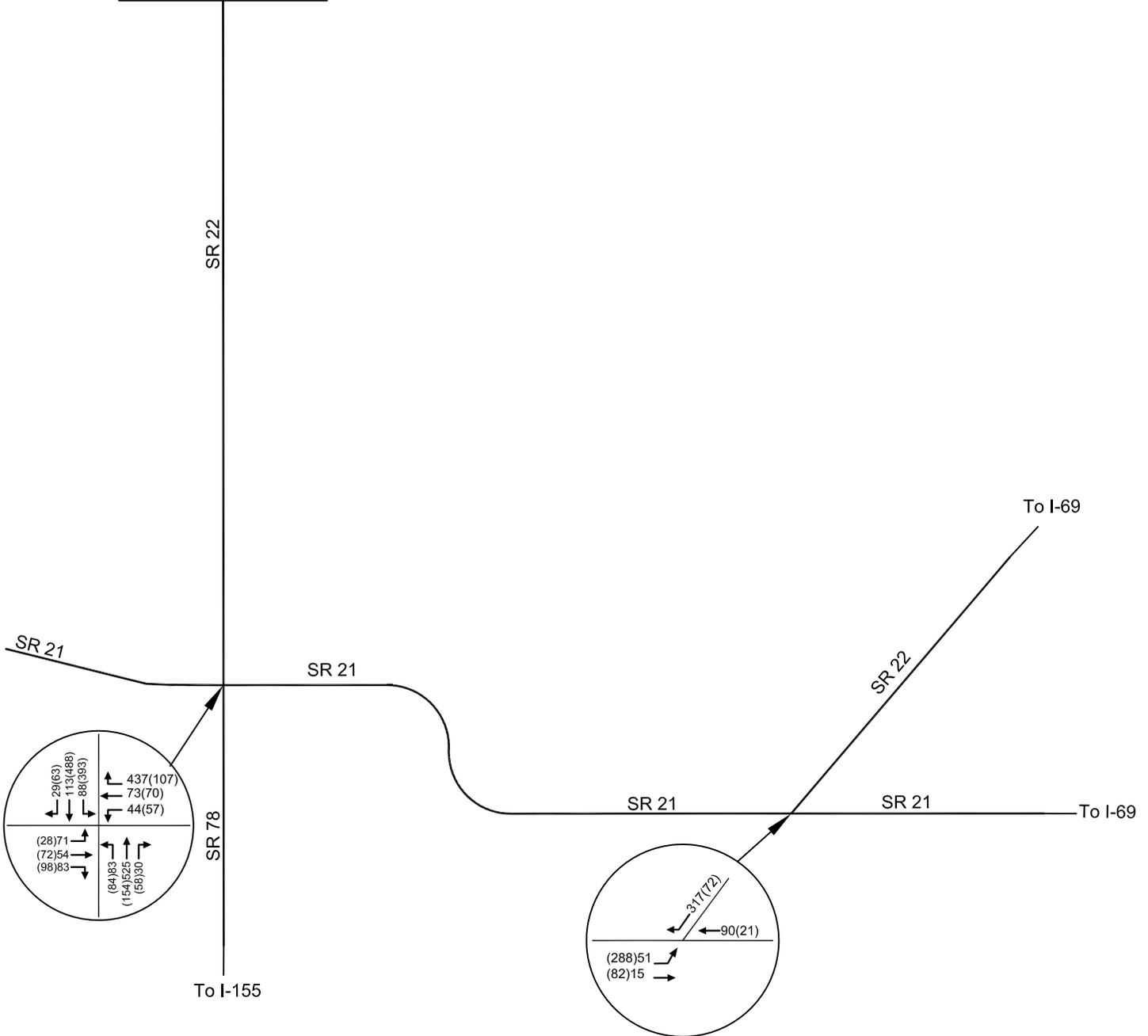
Port of Cates Landing  
Trip Generation Summary

2014: Employment = 3,000  
= 7,620 trips/day  
2034: Employment = 6,000  
= 15,240 trips/day



**Port of Cates Landing Traffic Distribution**  
**(Not to Scale)**

Port of Cates Landing



**2014 Traffic Assignments (With Cates Landing)**  
**(Not to Scale)**

Port of Cates Landing

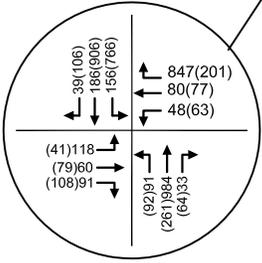
SR 22

To I-69

SR 21

SR 21

SR 22

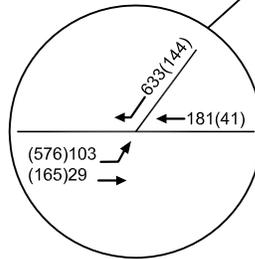


To I-155

SR 21

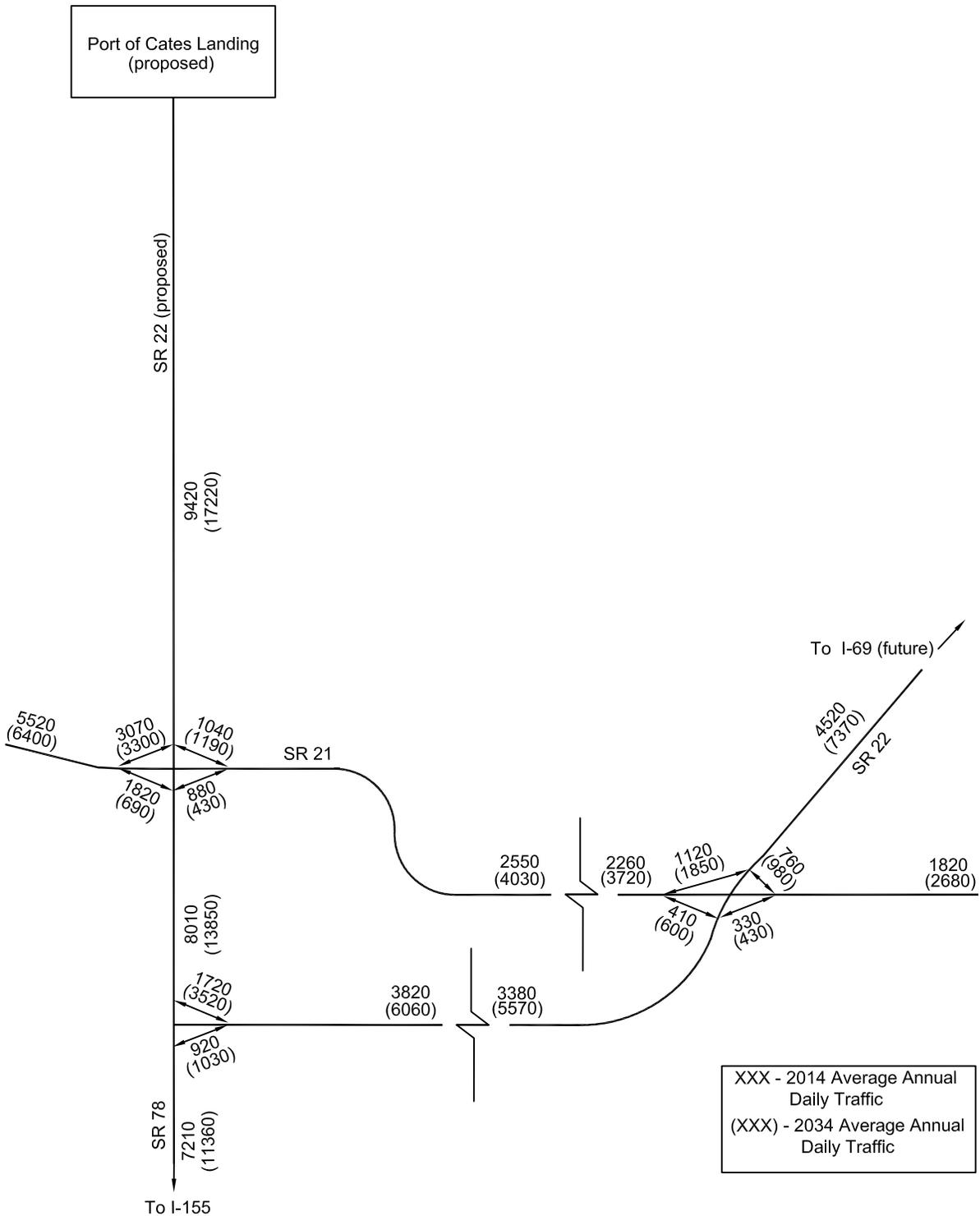
SR 21

To I-69

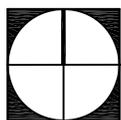


2034 Traffic Assignments (With Cates Landing)

(Not to Scale)



XXX - 2014 Average Annual Daily Traffic  
 (XXX) - 2034 Average Annual Daily Traffic



**Average Daily Traffic (With Port of Cates Landing) - Option B**  
 (Not to Scale)

# **LEVEL OF SERVICE ANALYSIS EXISTING SYSTEM**

Phone: Fax:  
 E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst JH  
 Agency/Co. RPM  
 Date Performed 9/28/2009  
 Analysis Time Period PEAK HOUR  
 Highway SR 21  
 From/To CO LINE TO SR 22  
 Jurisdiction LAKE CO  
 Analysis Year 2009  
 Description

-----Input Data-----

Highway class	Class 2				
Shoulder width	2.0	ft	Peak-hour factor, PHF	0.90	
Lane width	11.0	ft	% Trucks and buses	10	%
Segment length	4.0	mi	% Recreational vehicles	4	%
Terrain type	Level		% No-passing zones	100	%
Grade: Length		mi	Access points/mi	12	/mi
Up/down		%			
Two-way hourly volume, V	220	veh/h			
Directional split	55 / 45	%			

-----Average Travel Speed-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.7	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.935	
Two-way flow rate, (note-1) vp	262	pc/h
Highest directional split proportion (note-2)	144	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	45.0	mi/h
Adj. for lane and shoulder width, fLS	3.0	mi/h
Adj. for access points, fA	3.0	mi/h
Free-flow speed, FFS	39.0	mi/h
Adjustment for no-passing zones, fnp	3.8	mi/h

-----Percent Time-Spent-Following-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	0.990	
Two-way flow rate,(note-1) vp	247	pc/h
Base percent time-spent-following, BPTSF	19.5	%
Adj.for directional distribution and no-passing zones, fd/np	22.9	
Percent time-spent-following, PTSF	42.4	%

-----Level of Service and Other Performance Measures-----

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.08	
Peak-hour vehicle-miles of travel, VMT60	880	veh-mi
Peak 15-min total travel time, TT15	7.4	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.

# **BASE YEAR 2014**

Phone: Fax:  
E-Mail:

-----Two-Way Two-Lane Highway Segment Analysis-----

Analyst JH  
Agency/Co. RPM  
Date Performed 9/28/2009  
Analysis Time Period PEAK HOUR  
Highway SR 21  
From/To SR 78 TO CO LINE  
Jurisdiction LAKE CO  
Analysis Year 2014  
Description

-----Input Data-----

Highway class	Class 2				
Shoulder width	2.0	ft	Peak-hour factor, PHF	0.90	
Lane width	11.0	ft	% Trucks and buses	10	%
Segment length	4.0	mi	% Recreational vehicles	4	%
Terrain type	Level		% No-passing zones	100	%
Grade: Length		mi	Access points/mi	12	/mi
Up/down		%			
Two-way hourly volume, V	637	veh/h			
Directional split	55 / 45	%			

-----Average Travel Speed-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.2	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.980	
Two-way flow rate, (note-1) vp	722	pc/h
Highest directional split proportion (note-2)	397	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	45.0	mi/h
Adj. for lane and shoulder width, fLS	3.0	mi/h
Adj. for access points, fA	3.0	mi/h
Free-flow speed, FFS	39.0	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h

-----Percent Time-Spent-Following-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	0.990	
Two-way flow rate,(note-1) vp	715	pc/h
Base percent time-spent-following, BPTSF	46.7	%
Adj.for directional distribution and no-passing zones, fd/np	17.3	
Percent time-spent-following, PTSF	64.0	%

-----Level of Service and Other Performance Measures-----

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak-hour vehicle-miles of travel, VMT60	2548	veh-mi
Peak 15-min total travel time, TT15	23.6	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 JH  
Agency/Co. RPM  
Date Performed 9/28/2009  
Analysis Time Period PEAK HOUR  
Highway SR 21  
From/To CO LINE TO SR 22  
Jurisdiction LAKE CO  
Analysis Year 2014  
Description

-----Input Data-----

Highway class	Class 2				
Shoulder width	2.0	ft	Peak-hour factor, PHF	0.90	
Lane width	11.0	ft	% Trucks and buses	10	%
Segment length	4.0	mi	% Recreational vehicles	4	%
Terrain type	Level		% No-passing zones	100	%
Grade: Length		mi	Access points/mi	12	/mi
Up/down		%			
Two-way hourly volume, V	564	veh/h			
Directional split	55 / 45	%			

-----Average Travel Speed-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.2	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.980	
Two-way flow rate, (note-1) vp	639	pc/h
Highest directional split proportion (note-2)	351	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	45.0	mi/h
Adj. for lane and shoulder width, fLS	3.0	mi/h
Adj. for access points, fA	3.0	mi/h
Free-flow speed, FFS	39.0	mi/h
Adjustment for no-passing zones, fnp	3.7	mi/h

-----Percent Time-Spent-Following-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	0.990	
Two-way flow rate,(note-1) vp	633	pc/h
Base percent time-spent-following, BPTSF	42.7	%
Adj.for directional distribution and no-passing zones, fd/np	19.7	
Percent time-spent-following, PTSF	62.3	%

-----Level of Service and Other Performance Measures-----

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.20	
Peak-hour vehicle-miles of travel, VMT60	2256	veh-mi
Peak 15-min total travel time, TT15	20.7	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.

# **FUTURE YEAR 2034**

Phone: Fax:  
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst JH  
Agency/Co. RPM  
Date Performed 9/28/2009  
Analysis Time Period PEAK HOUR  
Highway SR 21  
From/To SR 78 TO CO LINE  
Jurisdiction LAKE CO  
Analysis Year 2034  
Description

Input Data

Highway class	Class 2				
Shoulder width	2.0	ft	Peak-hour factor, PHF	0.90	
Lane width	11.0	ft	% Trucks and buses	10	%
Segment length	4.0	mi	% Recreational vehicles	4	%
Terrain type	Level		% No-passing zones	100	%
Grade: Length		mi	Access points/mi	12	/mi
Up/down		%			
Two-way hourly volume, V	1010	veh/h			
Directional split	55 / 45	%			

Average Travel Speed

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.2	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.980	
Two-way flow rate, (note-1) vp	1145	pc/h
Highest directional split proportion (note-2)	630	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	45.0	mi/h
Adj. for lane and shoulder width, fLS	3.0	mi/h
Adj. for access points, fA	3.0	mi/h
Free-flow speed, FFS	39.0	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h

-----Percent Time-Spent-Following-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	0.990	
Two-way flow rate,(note-1) vp	1133	pc/h
Base percent time-spent-following, BPTSF	63.1	%
Adj.for directional distribution and no-passing zones, fd/np	11.1	
Percent time-spent-following, PTSF	74.1	%

-----Level of Service and Other Performance Measures-----

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.36	
Peak-hour vehicle-miles of travel, VMT60	4040	veh-mi
Peak 15-min total travel time, TT15	40.2	veh-h

Notes:

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

Phone: Fax:  
E-Mail:

Two-Way Two-Lane Highway Segment Analysis

Analyst JH  
Agency/Co. RPM  
Date Performed 9/28/2009  
Analysis Time Period PEAK HOUR  
Highway SR 21  
From/To CO LINE TO SR 22  
Jurisdiction LAKE CO  
Analysis Year 2034  
Description

Input Data

Highway class	Class 2				
Shoulder width	2.0	ft	Peak-hour factor, PHF	0.90	
Lane width	11.0	ft	% Trucks and buses	10	%
Segment length	4.0	mi	% Recreational vehicles	4	%
Terrain type	Level		% No-passing zones	100	%
Grade: Length		mi	Access points/mi	12	/mi
Up/down		%			
Two-way hourly volume, V	929	veh/h			
Directional split	55 / 45	%			

Average Travel Speed

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.2	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor,	0.980	
Two-way flow rate, (note-1) vp	1053	pc/h
Highest directional split proportion (note-2)	579	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	45.0	mi/h
Adj. for lane and shoulder width, fLS	3.0	mi/h
Adj. for access points, fA	3.0	mi/h
Free-flow speed, FFS	39.0	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h

-----Percent Time-Spent-Following-----

Grade adjustment factor, fG	1.00	
PCE for trucks, ET	1.1	
PCE for RVs, ER	1.0	
Heavy-vehicle adjustment factor, fHV	0.990	
Two-way flow rate,(note-1) vp	1043	pc/h
Base percent time-spent-following, BPTSF	60.0	%
Adj.for directional distribution and no-passing zones, fd/np	12.1	
Percent time-spent-following, PTSF	72.1	%

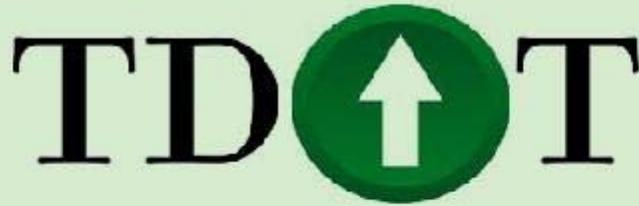
-----Level of Service and Other Performance Measures-----

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak-hour vehicle-miles of travel, VMT60	3716	veh-mi
Peak 15-min total travel time, TT15	36.4	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.

# **ENVIRONMENTAL DOCUMENTATION**



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

**Project Score Factors**

	Total Impacts Evaluated	Total Impacts to Evaluate	EES Evaluation
<b>Project Impact Areas:</b>	<b>15</b>	<b>15</b>	<b>Complete</b>
<b>Date of Evaluation:</b>	October 12, 2009		
<b>Evaluation done by:</b>	Gregory L. Horton		
	Planner 3		
<b>County:</b>	Lake		
<b>Route:</b>	SR 21		
<b>PIN:</b>	112469.0		
<b>Termini:</b>	SR 78 to SR 22		

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

<b>Features with No Impact</b>	<b>8</b>
Cemetery Sites & Cemetery Properties	
National Register Sites	
Bat	
Superfund Sites	
Caves	
Pyritic Rock	
Railroads	
TWRA Lakes & Other Public Lands	
<b>Features with Low Impact</b>	<b>1</b>
Wildlife Management Areas	
<b>Features with Moderate Impact</b>	<b>4</b>
Terrestrial Species	
Aquatic Species	

**Features with Substantial Impact** **1**

Large Wetland Impacts

**Community Impacts Present:**

**Institutions:**

**Populations:**

No population present

Minority populations 24%

Populations below poverty - State average- 13%

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

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

**CEMETERY SITES & CEMETERY PROPERTIES**

**Impact**

<b>Project Impact (Environmental, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> - No impact on the project as there are no known cemetery sites within or abutting the project study area or corridor. It is anticipated that a 'normal' effort to complete this environmental review as part of NEPA.
--	--

**INSTITUTIONS & SENSITIVE COMMUNITY POPULATIONS**

**Sensitive Populations Project Impact:** **Present** **Not Present**

<b>Institutions:</b>	<b>Present</b>	<b>Not Present</b>
Hospital	<input type="checkbox"/>	<input checked="" type="checkbox"/>
School	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Church	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Public Building	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Populations:</b>		
No population present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
65 and older populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disability populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Households without a vehicle	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minority populations 24%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Linguistically isolated populations	<input type="checkbox"/>	<input checked="" 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

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – 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

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

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

## NATIONAL REGISTER SITES

### Impact

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

## SUPERFUND SITES

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – 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

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – 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)**

- Moderate** – Medium impact on the project is likely as there is a known federally-protected terrestrial species or a state protected species with a status of threatened or endangered located within the project study area or corridor, and it is possible to avoid any impacts to the species with additional design. Additional alternatives will likely eliminate impacts to the species. Additional design alternatives and minimizations may be required if additional populations are found during required field surveys.

### TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

#### Impact

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

- Moderate** – Medium impact on the project is anticipated as a scenic waterway or TDEC Conservation Site is within the project study area or corridor. Impacts to the scenic waterway or TDEC Conservation Site cannot be avoided but will likely be minor. Examples include replacing a bridge structure in its existing location. Project impact will include analysis, coordination, and negotiation to resolve Section 4(f) issue(s) associated with the crossing of a scenic waterway.

### LARGE WETLAND IMPACTS

#### Impact

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

- Substantial** – Region 4: A substantial impact to the project is probable as there is greater than 5 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)**

- Moderate** – Medium environmental impact is anticipated as the project study area or corridor is less than 0.5 miles from a Natural Area. It may be necessary to coordinate with the Tennessee Department of Environment and Conservation on the project and to design avoidance/ minimization measures for the Natural Area (i.e., aesthetics, bridging, etc). Additional design may be required to locate and design the project to avoid indirect effects (i.e., aesthetics and audible) upon the Natural Area (i.e., bridging as opposed to culvert, etc).

# WILDLIFE MANAGEMENT AREAS

## Impact

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

# Impacts Evaluated Within 10,000 Ft of Study Area

## AQUATIC SPECIES

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Moderate</b> – Medium impact on the project is expected as there is a known occurrence of federally-protected aquatic species or a state protected species with a status of threatened or endangered located within the project study area or corridor. Additional alternatives could likely reduce species impacts. Consultation with the US Fish and Wildlife Service and/or the Tennessee Wildlife Resources Agency will be required possibly resulting in a survey for the species. Special construction considerations may be required.
--	---

## CAVES

### Impact

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

## EES Report

PIN 112469.00

Study Line ID: 112469\_4801V01

1,000 Foot Corridor

Version Date: June 16, 2009

Created by: J. ROGERS

---

### **Cemetery Sites & Cemetery Properties**

Cemeteries None were found

Cemetery Property None were found

### **Institutions & Sensitive Community Populations**

Institutions None were found

#### **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% Present

Linguistically isolated populations None were found

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 112469.00  
2,000 Foot Corridor

Study Line ID: 112469\_4801V01  
Version Date: June 16, 2009  
Created by: J. ROGERS

---

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
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 112469.00  
4,000 Foot Corridor

Study Line ID: 112469\_4801V01  
Version Date: June 16, 2009  
Created by: J. ROGERS

Terrestrial Species	<u>Total</u> = 12	USESA	SPROT
Neobeckia aquatica			S
Hottonia inflata			S
Tyto alba			D
Thryomanes bewickii			E
Sagittaria platyphylla			S
Hottonia inflata			S
Nerodia cyclopion			D
Nerodia cyclopion			D
Sagittaria platyphylla			S
Sagittaria platyphylla			S
Nerodia cyclopion			D
Nerodia cyclopion			D

## TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites Total= 1  
REELFOOT LAKE DESIGNATED STATE NATURAL AREA

TDEC Scenic Waterways None were found

## Large Wetland Impacts Total Acreage= 6,493.55

L1OWH	969.95	acres
L1OWH	2,868.59	acres
L2OWH	1,290.67	acres
L2OWH	78.40	acres
PEM1F	0.51	acres
PEM1Fx	0.77	acres
PFO1A	12.68	acres
PFO1A	18.97	acres
PFO1A	3.62	acres
PFO1A	15.74	acres
PFO1A	3.85	acres
PFO1A	8.07	acres
PFO1A	21.22	acres
PFO1A	1,120.36	acres
PFO1A	19.38	acres
PFO1A	10.83	acres
PFO1A	20.29	acres
PFO1C	3.09	acres

PIN 112469.00  
4,000 Foot Corridor

Study Line ID: 112469\_4801V01  
Version Date: June 16, 2009  
Created by: J. ROGERS

---

PFO1C	3.51	acres
PFO1C	2.15	acres
PFO1F	1.11	acres
PFO1F	0.98	acres
PFO6C	5.64	acres
PFO6F	0.62	acres
PFO6F	4.25	acres
PFO6F	4.04	acres
POWF	4.29	acres

Tennessee Natural Areas Program  
REELFOOT LAKE (NNL)

Total= 1

Wildlife Management Areas  
Reelfoot WMA  
Blackjack Hunting Club

Total= 2

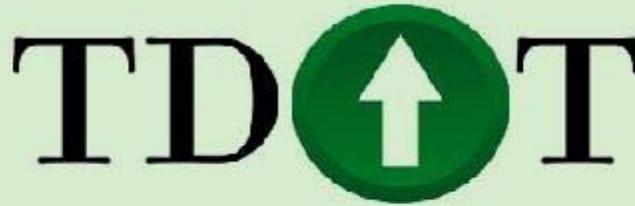
# EES Report

PIN 112469.00  
10,000 Foot Corridor

Study Line ID: 112469\_4801V01  
Version Date: June 16, 2009  
Created by: J. ROGERS

---

<i>Aquatic Species</i>	<u>Total</u> = 6	USESA	SPROT
Fundulus chrysotus			D
Atractosteus spatula			D
Fundulus chrysotus			D
<i>Caves</i>	None were found		



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

**Project Score Factors**

	Total Impacts Evaluated	Total Impacts to Evaluate	EES Evaluation
<b>Project Impact Areas:</b>	<b>15</b>	<b>15</b>	<b>Complete</b>
<b>Date of Evaluation:</b>	October 12, 2009		
<b>Evaluation done by:</b>	Gregory L. Horton		
	Planner 3		
<b>County:</b>	Lake		
<b>Route:</b>	SR 21		
<b>PIN:</b>	112469.0		
<b>Termini:</b>	SR 78 to SR 22 option 2		

<b>Impact Ranking of Features Evaluated:</b>	<b>Total by Rank</b>
--	----------------------

<b>Features with No Impact</b>	<b>7</b>
--------------------------------	----------

- Cemetery Sites & Cemetery Properties
- National Register Sites
- Bat
- Superfund Sites
- Caves
- Pyritic Rock
- TWRA Lakes & Other Public Lands

<b>Features with Low Impact</b>	<b>2</b>
---------------------------------	----------

- Railroads
- Wildlife Management Areas

<b>Features with Moderate Impact</b>	<b>4</b>
--------------------------------------	----------

- Terrestrial Species
- Aquatic Species

State Route 21

**Features with Substantial Impact** **1**

Large Wetland Impacts

**Community Impacts Present:**

**Institutions:**

**Populations:**

No population present

Populations below poverty - State average- 13%

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

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

**CEMETERY SITES & CEMETERY PROPERTIES**

**Impact**

<b>Project Impact (Environmental, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> - No impact on the project as there are no known cemetery sites within or abutting the project study area or corridor. It is anticipated that a 'normal' effort to complete this environmental review as part of NEPA.
--	--

**INSTITUTIONS & SENSITIVE COMMUNITY POPULATIONS**

**Sensitive Populations Project Impact:** **Present** **Not Present**

<b>Institutions:</b>	<b>Present</b>	<b>Not Present</b>
Hospital	<input type="checkbox"/>	<input checked="" type="checkbox"/>
School	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Church	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Public Building	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Populations:</b>		
No population present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
65 and older populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disability populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Households without a vehicle	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minority populations 24%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Linguistically isolated populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Populations below poverty - State average - 13%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Populations below poverty - State average - 27%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# BAT

## Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – 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

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Low</b> – Minimal impact on the project is anticipated as there are railroads within or abutting the project study area or corridor. Impacts to the railroad can be avoided, and the proposed project will be greater than 200 feet from the railroad. There is the remote possibility of minor involvement on railroad property to accommodate drainage, but there will be no grade crossing.
--	---

# Impacts Evaluated Within 2,000 Ft of Study Area

# NATIONAL REGISTER SITES

## Impact

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

# SUPERFUND SITES

## Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – 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

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>None</b> – 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

<b>Project Impact</b>	<input checked="" type="checkbox"/> <b>None</b> – No impact on the project is anticipated as there area no parks located within or
-----------------------	--

(Environment, Time, Cost, Design, and Maintenance)

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)**

- Moderate** – Medium impact on the project is likely as there is a known federally-protected terrestrial species or a state protected species with a status of threatened or endangered located within the project study area or corridor, and it is possible to avoid any impacts to the species with additional design. Additional alternatives will likely eliminate impacts to the species. Additional design alternatives and minimizations may be required if additional populations are found during required field surveys.

### TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

#### Impact

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

- Moderate** – Medium impact on the project is anticipated as a scenic waterway or TDEC Conservation Site is within the project study area or corridor. Impacts to the scenic waterway or TDEC Conservation Site cannot be avoided but will likely be minor. Examples include replacing a bridge structure in its existing location. Project impact will include analysis, coordination, and negotiation to resolve Section 4(f) issue(s) associated with the crossing of a scenic waterway.

### LARGE WETLAND IMPACTS

#### Impact

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

- Substantial** – Region 4: A substantial impact to the project is probable as there is greater than 5 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)**

- Moderate** – Medium environmental impact is anticipated as the project study area or corridor is less than 0.5 miles from a Natural Area. It may be necessary to coordinate with the Tennessee Department of Environment and Conservation on the project and to design avoidance/ minimization measures for the Natural Area (i.e., aesthetics, bridging, etc). Additional design may be required to locate and design the project to avoid indirect effects (i.e., aesthetics and audible) upon the Natural Area (i.e., bridging as opposed to culvert, etc).

# WILDLIFE MANAGEMENT AREAS

## Impact

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

# Impacts Evaluated Within 10,000 Ft of Study Area

## AQUATIC SPECIES

### Impact

<b>Project Impact (Environment, Time, Cost, Design, and Maintenance)</b>	<input checked="" type="checkbox"/> <b>Moderate</b> – Medium impact on the project is expected as there is a known occurrence of federally-protected aquatic species or a state protected species with a status of threatened or endangered located within the project study area or corridor. Additional alternatives could likely reduce species impacts. Consultation with the US Fish and Wildlife Service and/or the Tennessee Wildlife Resources Agency will be required possibly resulting in a survey for the species. Special construction considerations may be required.
--	---

## CAVES

### Impact

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

# EES Report

PIN 112469.00

Study Line ID: 112469\_4802V01

1,000 Foot Corridor

Version Date: December 30, 1899

Created by:

---

## **Cemetery Sites & Cemetery Properties**

Cemeteries None were found

Cemetery Property None were found

## **Institutions & Sensitive Community Populations**

Institutions None were found

### **Populations:**

No population present Present

65 & older populations None were found

Disability populations None were found

Households without a vehicle None were found

Minority populations 24% None were found

Linguistically isolated populations None were found

Populations below poverty-State average-13% Present

Populations below poverty-State average-27% None were found

**Bat** None were found

**Railroads** Present

## EES Report

PIN 112469.00  
2,000 Foot Corridor

Study Line ID: 112469\_6602V01  
Version Date: October 07, 2009  
Created by: chuck g

---

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
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 112469.00  
4,000 Foot Corridor

Study Line ID: 112469\_4802V01  
Version Date: October 7, 2009  
Created by: Chuck G

Terrestrial Species	<u>Total</u> = 9	USESA	SPROT
Hottonia inflata			S
Tyto alba			D
Thryomanes bewickii			E
Sagittaria platyphylla			S
Sorex longirostris			D
Nerodia cyclopion			D
Nerodia cyclopion			D
Sagittaria platyphylla			S
Nerodia cyclopion			D

## TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites Total= 1  
REELFOOT LAKE DESIGNATED STATE NATURAL AREA

TDEC Scenic Waterways None were found

## Large Wetland Impacts Total AVERAGE= 4,552.05

L1OWH	2,868.59	acres
L2OWH	78.40	acres
L2OWH	1,290.67	acres
PEM1Fx	0.77	acres
PFO1A	19.38	acres
PFO1A	3.62	acres
PFO1A	15.74	acres
PFO1A	2.11	acres
PFO1A	8.07	acres
PFO1A	18.97	acres
PFO1A	12.68	acres
PFO1A	10.83	acres
PFO1A	3.83	acres
PFO1A	36.77	acres
PFO1A	118.77	acres
PFO1A	3.85	acres
PFO1C	2.15	acres
PFO1C	3.09	acres
PFO1C	3.51	acres
PFO1C	31.84	acres
PFO1C	7.13	acres

PIN 112469.00  
4,000 Foot Corridor

Study Line ID: 112469\_4802V01  
Version Date: October 7, 2009  
Created by: Chuck G

---

PFO1F	0.98	acres
PFO1F	1.11	acres
PFO6C	4.30	acres
PFO6F	0.62	acres
POWF	4.29	acres

Tennessee Natural Areas Program  
REELFOOT LAKE (NNL)

Total= 1

Wildlife Management Areas  
Reelfoot WMA

Total= 1

# EES Report

PIN 112469.00  
10,000 Foot Corridor

Study Line ID: 112469\_4802V01  
Version Date: October 07, 2009  
Created by: Chuck G

---

<i>Aquatic Species</i>	<u>Total</u> = 5	USESA	SPROT
Fundulus chrysotus			D
<i>Caves</i>	None were found		



Location of new spillway bridge  
 Location of old spillway bridge (historic)

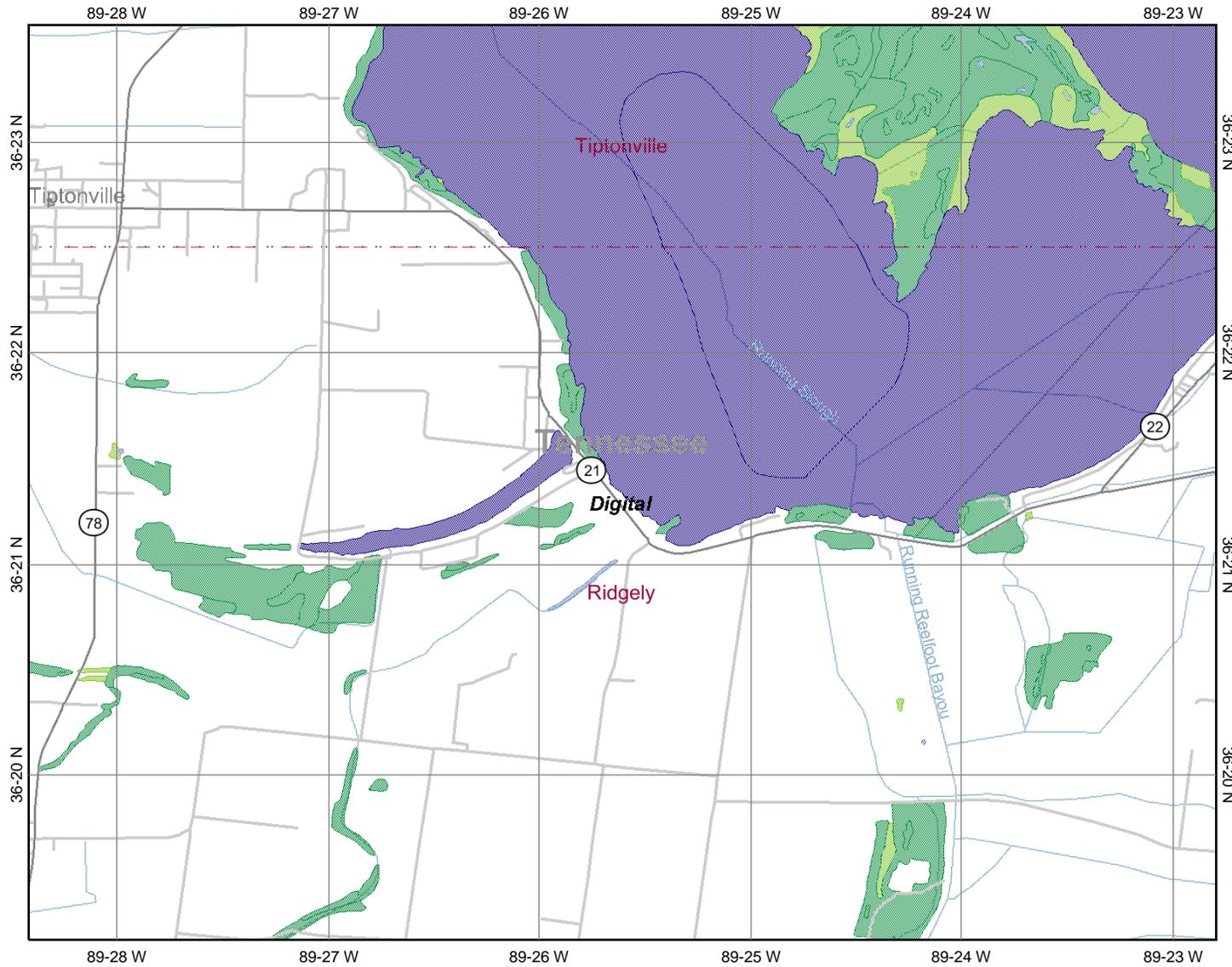
**LEGEND**

-  Hazardous Waste Site (per EPA)
-  Reelfoot Lake State Parkland
-  Wetland Area
-  Cemetery
-  Improvement Option A
-  Improvement Option B Corridor

**Locations of Environmental and Cultural Significance**

0      1/2      1 mi

# US Fish & Wildlife Identified Wetlands



## Legend

- Interstate
- Major Roads
- Other Road
- Interstate
- State highway
- US highway
- Roads
- Cities
- USGS Quad Index 24K
- Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine
- Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan
- NHD Streams
- Counties 100K
- States 100K
- South America
- North America

Map center: 36° 21' 23" N, 89° 25' 36" W



Scale: 1:56,112

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.



APPROXIMATE SCALE  
 2000 0 2000 FE

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
**FLOOD INSURANCE RATE MAP**

**LAKE COUNTY,  
 TENNESSEE**  
 (UNINCORPORATED AREAS)

PANEL 100 OF 150

**COMMUNITY-PANEL NUMBER**  
 470334 0100 B

**EFFECTIVE DATE:**  
 MARCH 16, 1981



federal emergency management agency  
 federal insurance administration

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

# FUNCTIONAL DRAWINGS

# STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION PROJECT PLANNING DIVISION

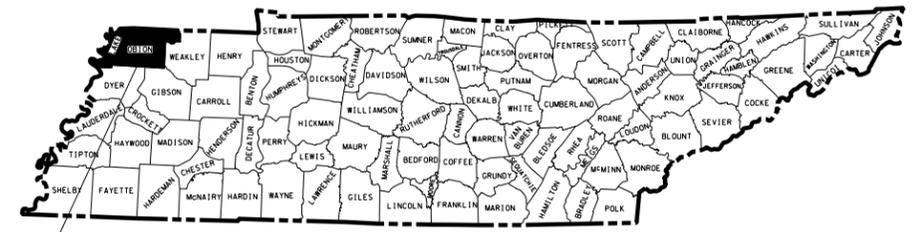
TENN.	YEAR	SHEET NO.
	2009	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS
3-15	PROPOSED LAYOUTS (OPTION A)
16-18	PROPOSED LAYOUTS (OPTION B)

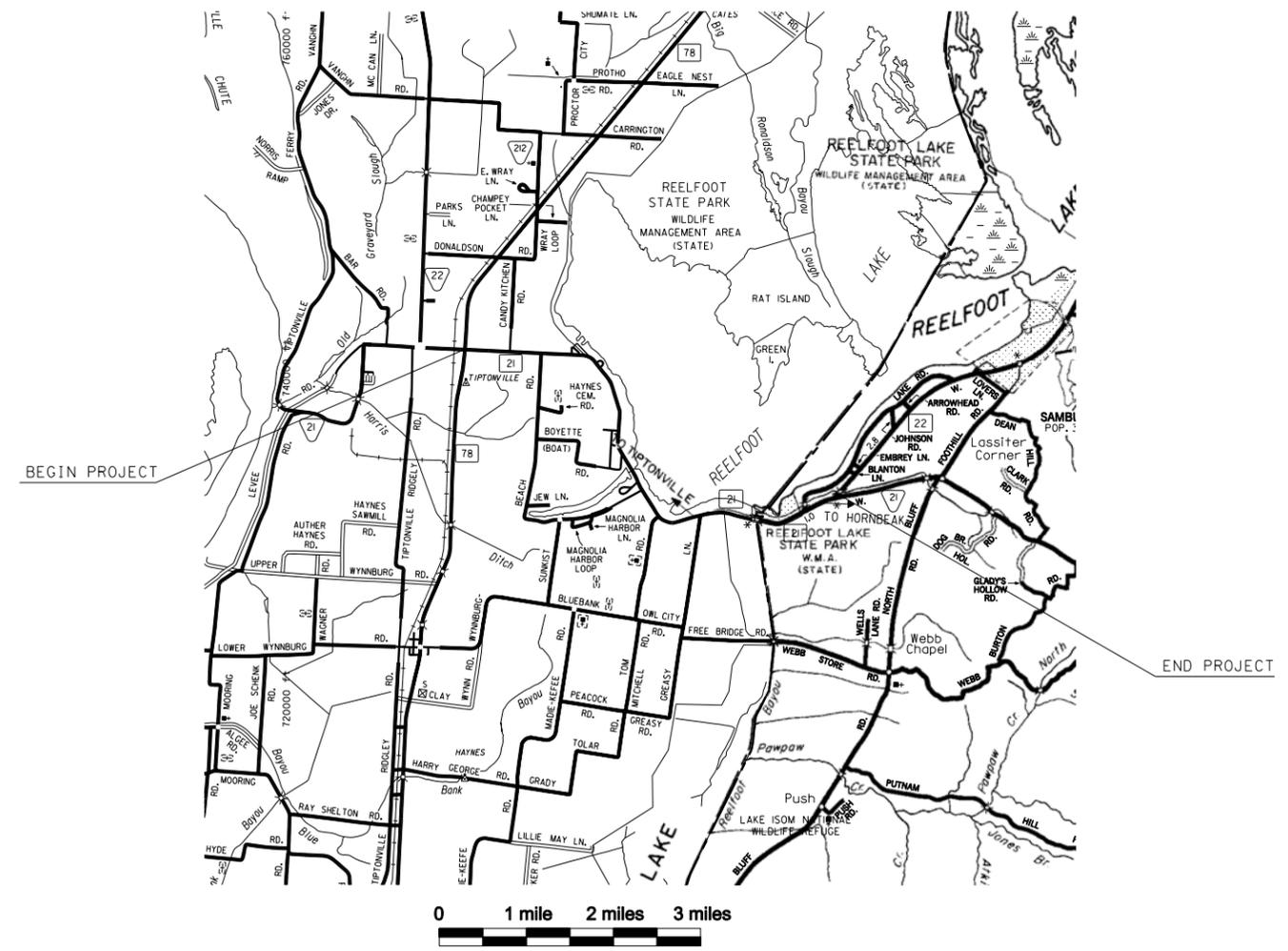
## LAKE & OBION COUNTIES TRANSPORTATION PLANNING REPORT

### STATE ROUTE 21 FROM STATE ROUTE 78 TO STATE ROUTE 22

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



PROJECT LOCATION  
LAKE AND OBION COUNTIES



#### SPECIAL NOTES

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

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

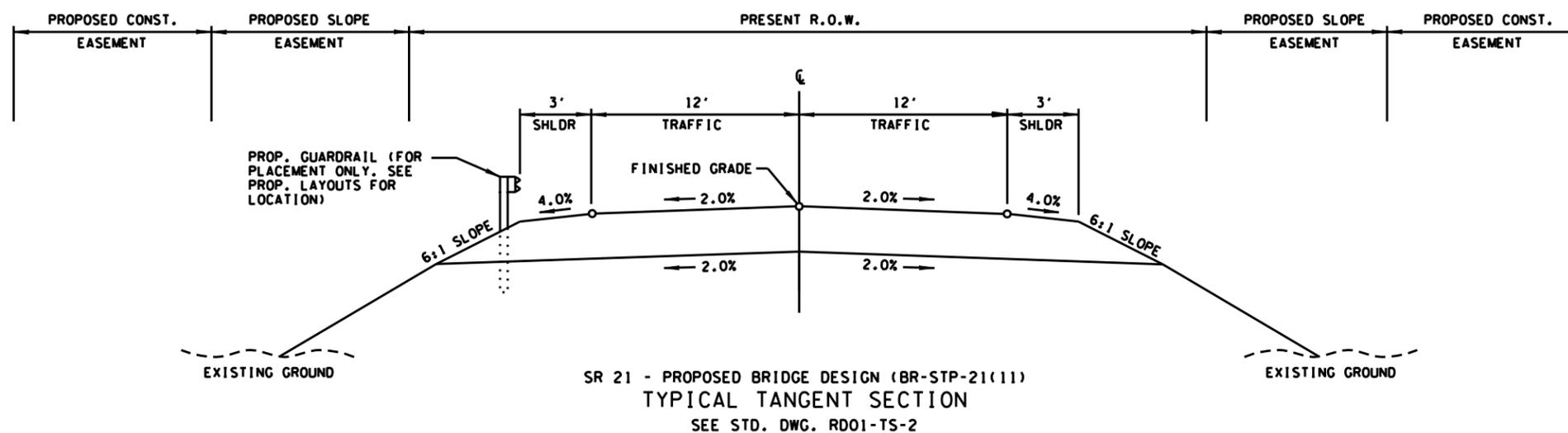
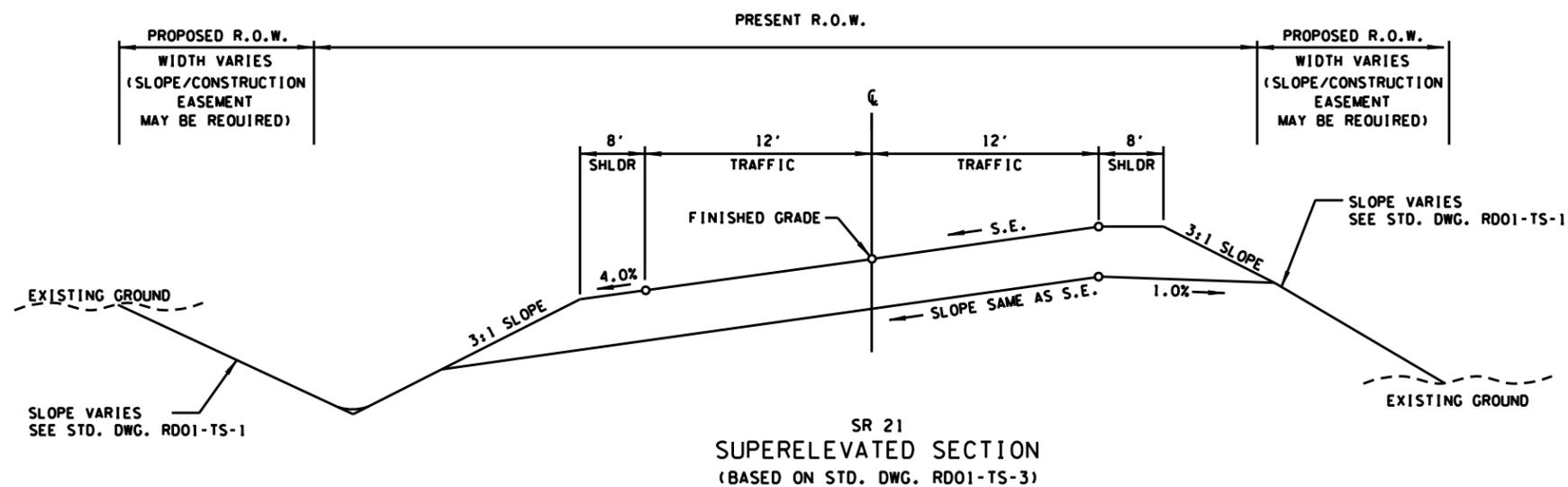
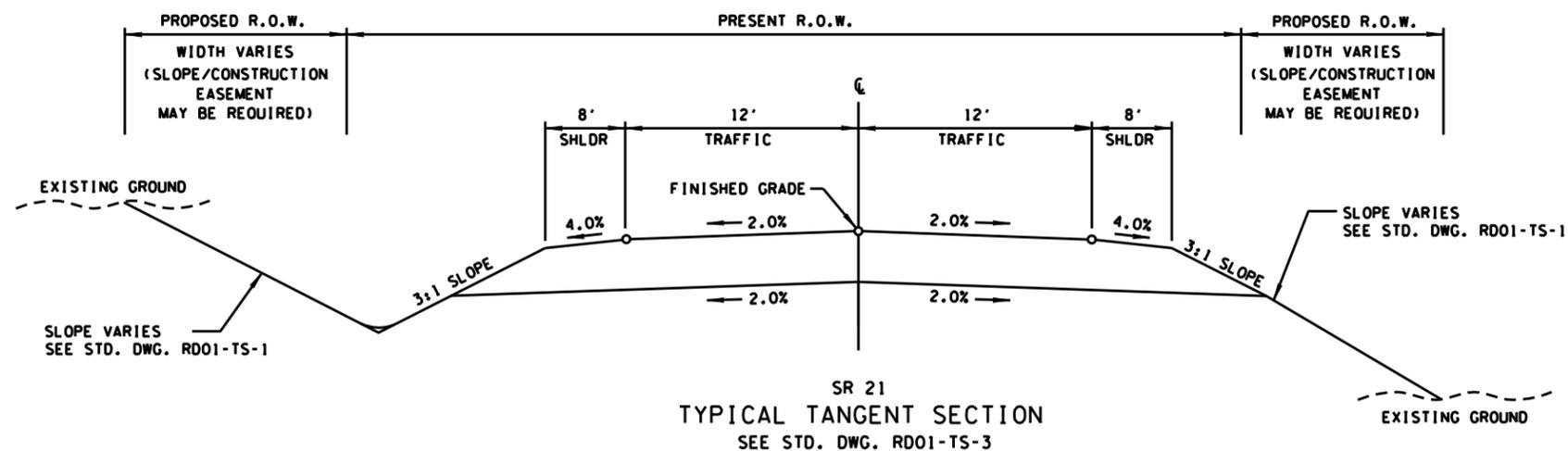
TDOT C.E. MANAGER 1 \_\_\_\_\_  
 DESIGNED BY RPM Transportation Consultants, LLC  
 DESIGNER \_\_\_\_\_ CHECKED BY \_\_\_\_\_  
 P.E. NO. \_\_\_\_\_  
 PIN NO. \_\_\_\_\_

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

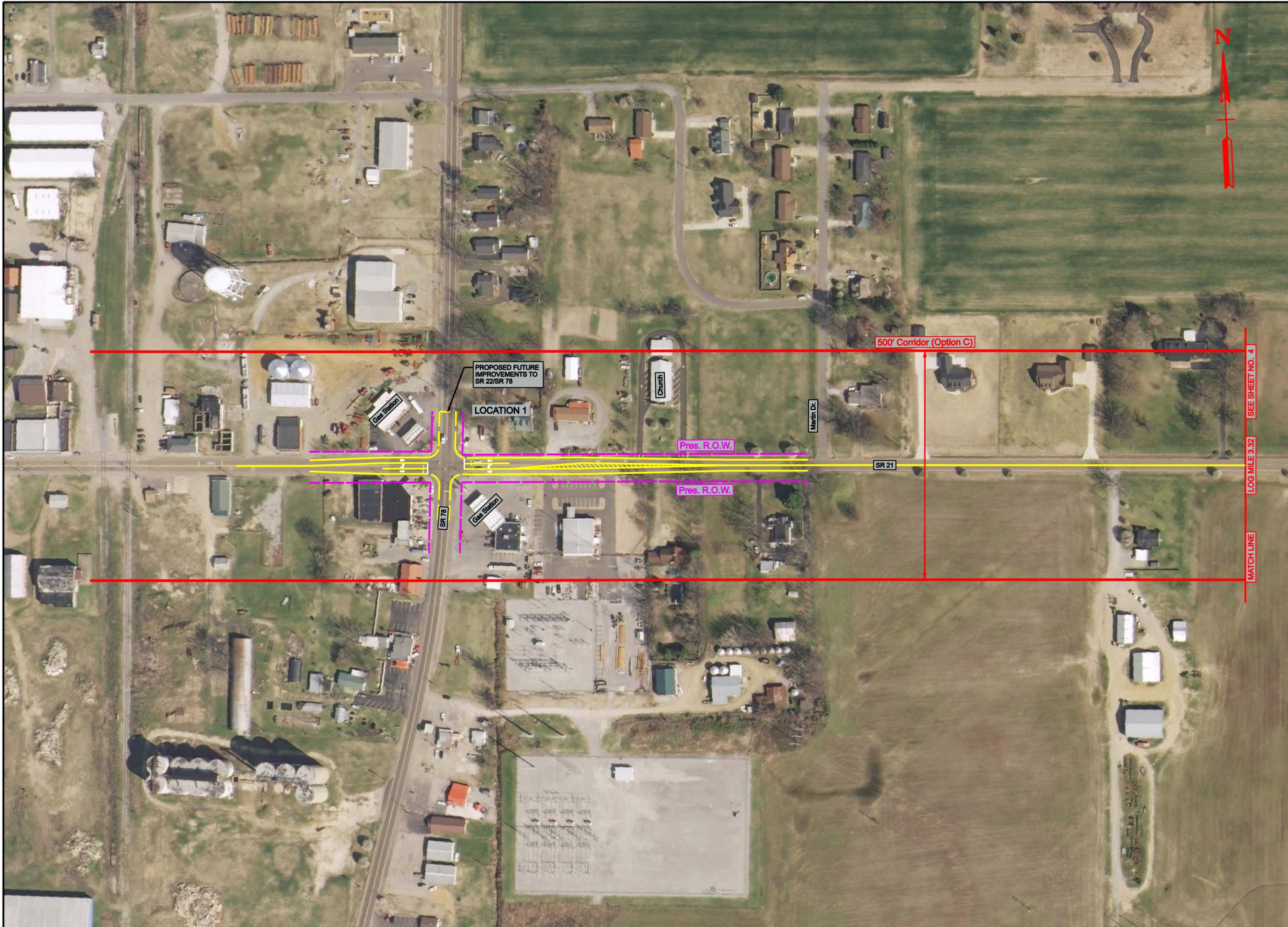
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: \_\_\_\_\_  
 DIVISION ADMINISTRATOR      DATE

TYPE	YEAR	COUNTY	SHEET NO.
FUNCT.	2009	LAKE AND OBION	2



TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		3

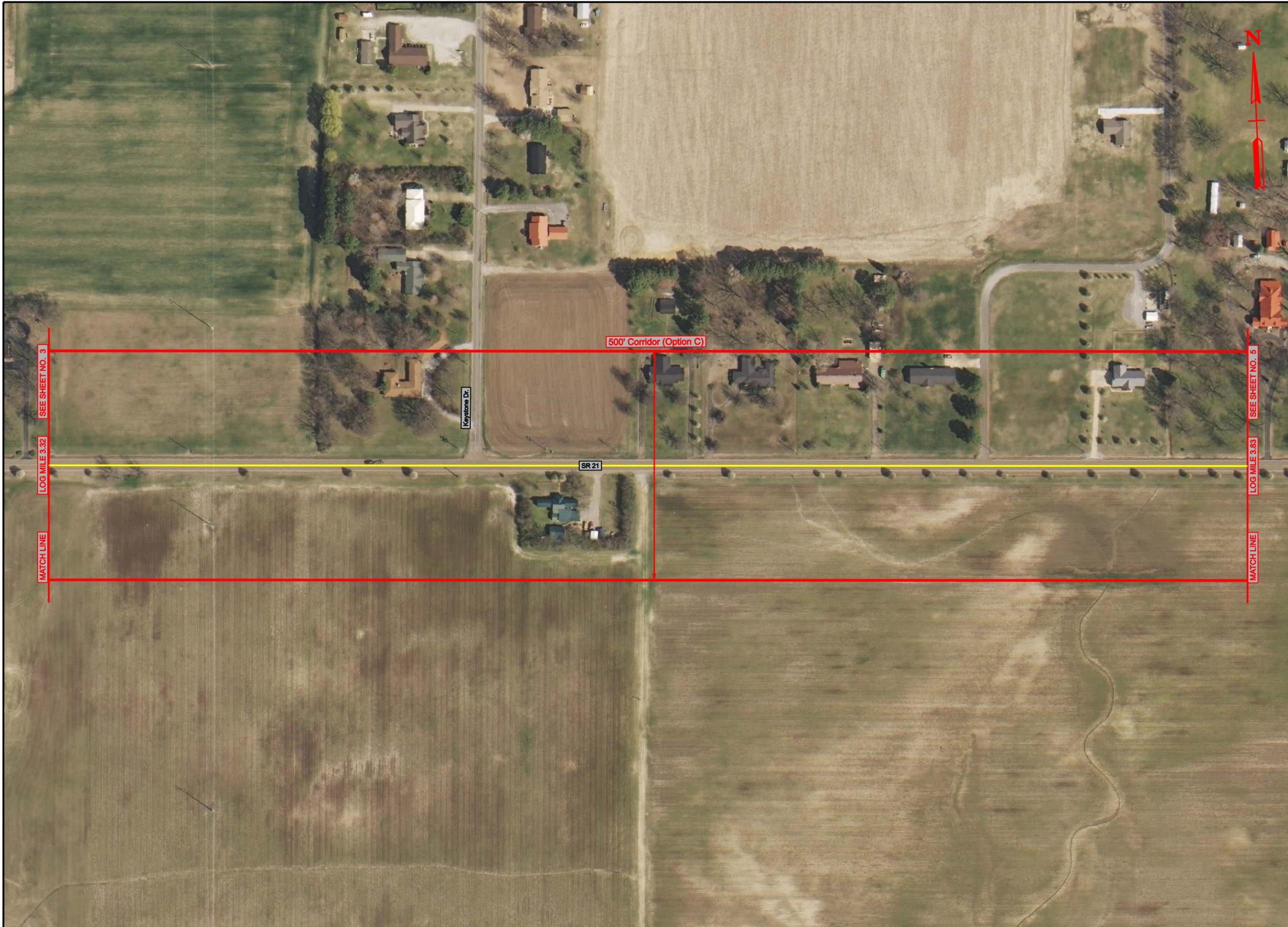


SEE SHEET NO. 4  
LOG MILE 3.32  
MATCH LINE



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
  
STATE ROUTE 21  
CORRIDOR  
  
OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		4

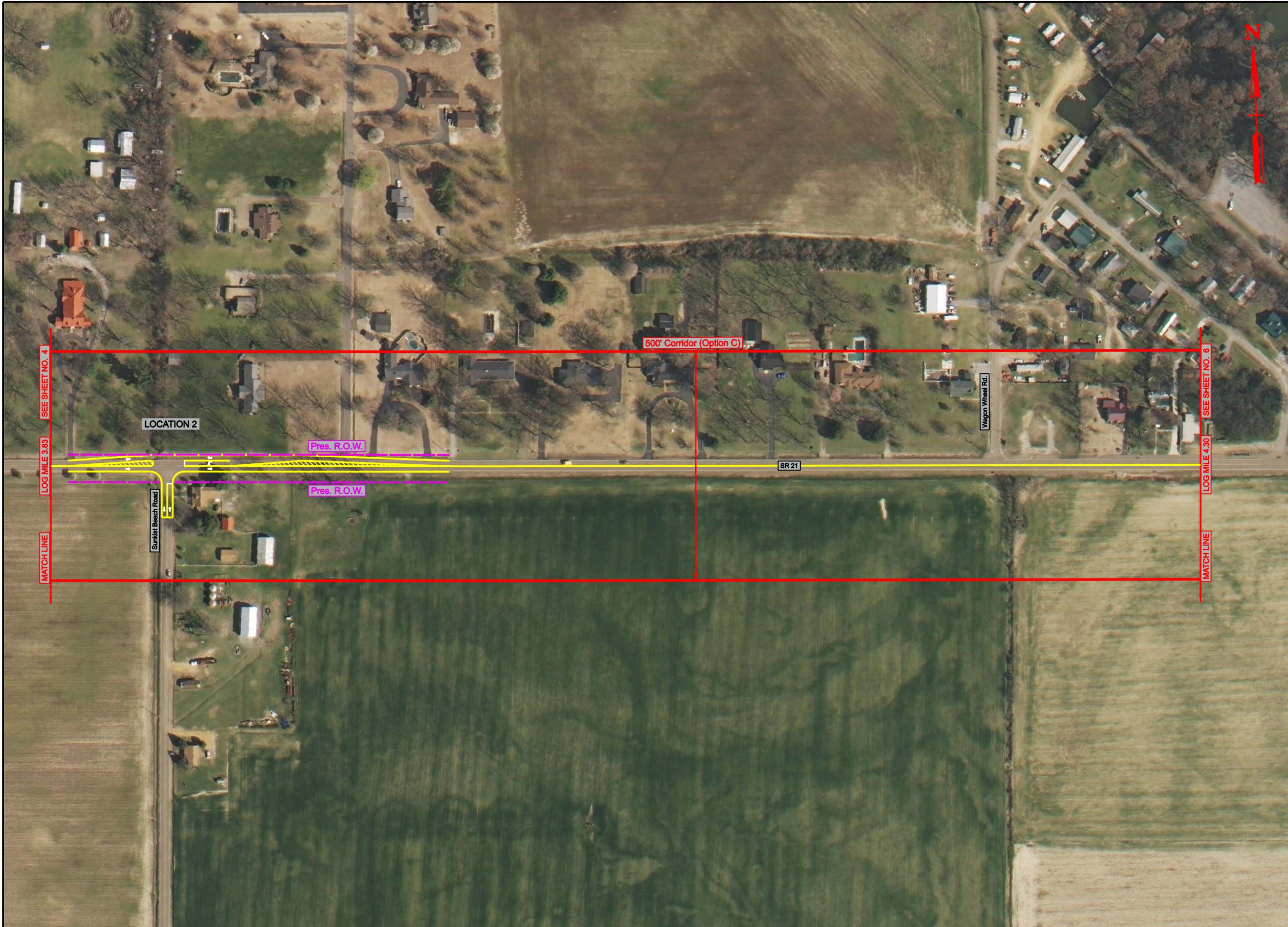


STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		5



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		6



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		7



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		8

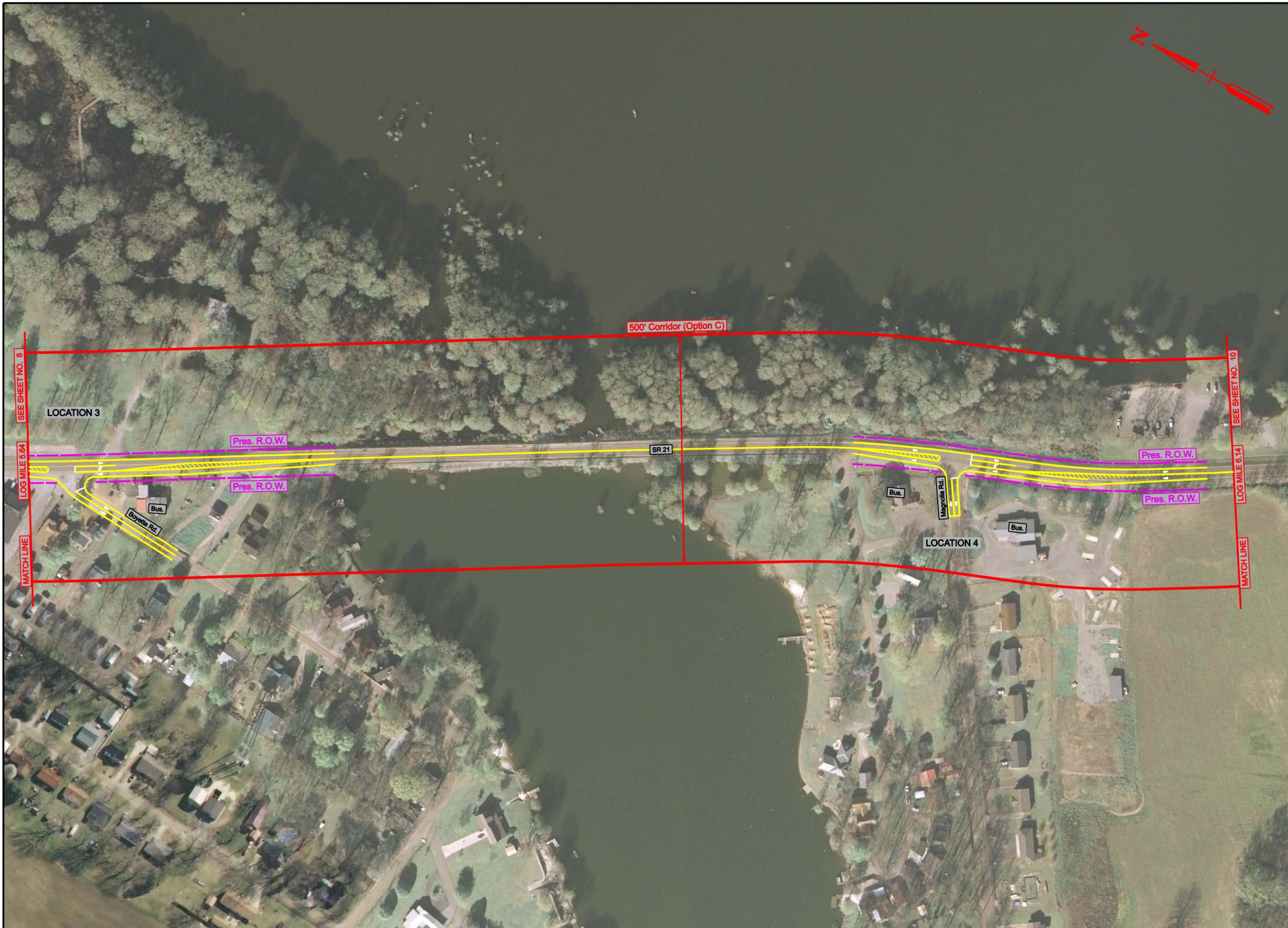


STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		9



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		10



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		11



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		12



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		13



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		14



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		15



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "B & C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		16

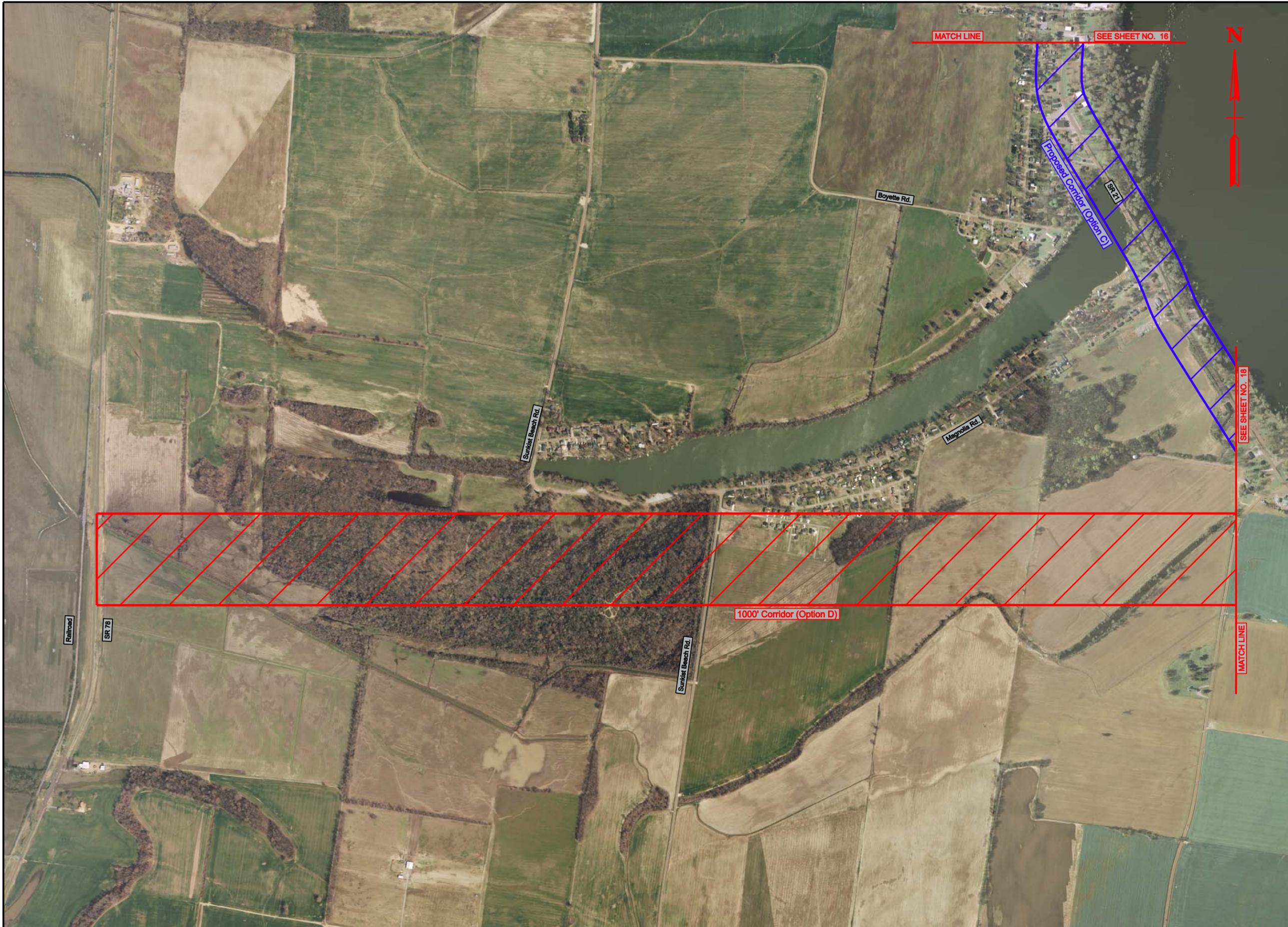


STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "C"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		17



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "C" AND "D"

TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2009		18



STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 21  
CORRIDOR

OPTION "C" AND "D"