FHWA-TN-EIS-05-01-SD
Tennessee Division

INTERSTATE 69
Segment of Independent Utility #8

From SR 385 in Millington, TN to I-155/US 51 in Dyersburg, TN
Shelby, Tipton, Lauderdale and Dyer Counties, Tennessee

Supplemental Draft Environmental Impact Statement

Submitted Pursuant to National Environmental Policy Act of 1969
42 USC 4332(2) and 49 USC 303

U.S. Department of Transportation
Federal Highway Administration
Tennessee Department of Transportation

Cooperating Agencies:
U.S. Army Corps of Engineers

This document identifies and assesses the environment impacts associated with a new crossover alternative of I-69 SIU #8. This Alternative begins at Node K, just north of the Hatchie River and ends at Node G. This crossover alternative is located entirely within Lauderdale County. This Alternative was not considered until after approval of the Draft Environmental Statement. The project is a segment of Corridor 18, a congressionally mandated High Priority transportation corridor, designated as Interstate 69. The total length of the proposed improvement is approximately 7.3 miles. This portion of the roadway is proposed for new location.

FHWA-TN-EIS-04-02-SD

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5/2/08
Date of Approval

For Tennessee Department of Transportation

5/2/08
Date of Approval

For Federal Highway Administration

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SUMMARY

The subject of this supplemental document involves the consideration of a new alternative that was not discussed in the original Draft Environmental Impact Statement (DEIS) for Interstate 69 (I-69), Segment of Independent Utility (SIU) #8. The length is approximately 7 miles long. The new alignment has been designated as "Alternative O4F." The Federal Highway Administration (FHWA) and the Tennessee Department of Transportation (TDOT) are the joint lead agencies for this project.

In the DEIS (approved August 31, 2005), TDOT analyzed and compared impacts to the environment, public comments received from Public Hearings (conducted in the four project counties, Shelby, Tipton, Lauderdale and Dyer) and the costs associated with proposed Build Alternatives. The objective was to determine the best suited alignment for the Project Purpose and Need while avoiding as many environmental impacts as possible. Included in the original alignments in the DEIS were two main Alternatives, R and G. Following is an Impacts Matrix chart that compares Alternatives R and G.

Table S.1: Impacts Matrix for Alternatives R and G from Millington to Dyersburg

Alternative	Residential Relocations	Business Relocations	Wetlands Impacts (Acres)	Flood Plains Impacts (Acres)	Adverse Impacts to Historical Sites
R	111	4	11.9	432.9	0
G	59	2	97.6	701.3	0

Alternative	Stream Impacts (in Miles)	Cost of Stream Mitigation	Impacts to Archaeological Sites	Hazardous Materials Sites Requiring Additional Work
R	33.9	$6,438,790.8	7	5
G	34.6	$6,577,459.2	11	0

TDOT announced on May 17, 2006, that Alternative R, the West Alternative, would be the Selected Alternative for all portions of SIU #8 except for a section within Lauderdale County. The sections of SIU #8 that were chosen as the Preferred Alternative are from Millington at Node A to Node K, which is just north of the Hatchie River (See Figure 1.3). Alternative R was selected for the southern section between Nodes A and K because it requires one crossing over the Hatchie River by incorporating an existing bridge from US 51 into the project. Alternative R will also provide better access to Brighton and Millington than Alternative G. Alternative G would have required two new bridges over the Hatchie.

The second announced portion begins at Alternative R at Node G and travels north to Node H in Dyersburg at Interstate 155. Alternative R avoids Lauderdale Wildlife Refuge, a resource which, if impacted, would require following the procedures mandated by Section 4(f) of the U.S. Department of Transportation Act of 1966. If historic properties,

parks, recreational areas and/or refuges are impacted Section 4(f) requires that a feasible and prudent alternative be analyzed and selected. Alternatives R and O4F, would both avoid this wildlife refuge, and are feasible and prudent options. Alternative R also avoids the construction of a massive interchange between SR 412 and Interstate 155. The configuration would have resulted in major traffic impacts and the construction costs were measurably higher for this elevated structure. This section of Alternative R provides better connection to Dyersburg than Alternative G

Alternative R was preferred in Shelby and Dyer Counties by the public. The total comments received in Dyer County differed by two (32 preferred Alternative R and 30 preferred Alternative G). Tipton and Lauderdale County comments resulted in a preference for Alternative G. The following table illustrates the preference within each of the four project counties for these two main alignments:

Table S.2 Comments Received Stating a Preference for Alternative R or G by County

County	Alternative R	Alternative G
Shelby	102	20
Tipton	34	60
Lauderdale	7	27
Dyer	32	30

This study will compare a segment of Alternative R with Alternative O4F. For comparison purposes both of these project segments begin at Node K, just north of the Hatchie River and end at Node G in Lauderdale County. Please refer to Figure 1.3 (page 6) and Figure 2.1 (page 13) illustrations of Alternatives R and O4F.

Throughout this phase of the project, the alternatives have been broken into smaller segments by the use of “nodes.” Nodes have allowed for various combinations of segments of the main alternatives, R and G, with crossover alternatives. Nodes also facilitate the ability to focus on smaller segments of the entire project when analyzing and comparing impacts. The area of nodes K to G of alternative R are common to the crossover area for Alternative O4F as the beginning and ending points, but the paths for the two alternatives between the nodes K and G differ. Alternative R utilizes Nodes KEG, and Alternative O4F uses Nodes KWG.

The new section of SIU #8 is being considered based on comments received at the November 2006 Public Hearings for the DEIS. The public inquired why TDOT had not considered a crossover in the northern section from Alternative G to R. Concerns were voiced that the Alternative R is located in west Lauderdale County and would bypass several communities including Ripley, Curve, Gates and Hall. Comments were also received that counties to the immediate east, Haywood and Crockett, would be closer to the new interstate if an alignment was located east of Ripley. In response, TDOT has studied a new corridor to determine the feasibility of, and to assess the environmental impacts of, the previously unconsidered alternative. This Supplemental Draft Environmental Impact Statement, SDEIS, documents impacts to the human and natural environments and the proposed mitigation measures of Alternative O4F. The SDEIS also compares impacts, costs and mitigation measures with Alternative R within Lauderdale County as defined in following sections of this document.

This document will compare the environmental impacts of both alignments between the K and G nodes. Alternative R, within this area, is defined by nodes K, E, and G.

Alternative O4F will use nodes K, W and G. The W node is a point along the previously considered Alternative G that was a transition point between Alternative R and G known as Alternative P2. Proposed Alternative O4F begins at Node K, a point just north of the Hatchie River. The new alternative travels in a northwestern direction until reaching Node W, then continues along a segment of the previously considered Alternative G to State Route 19. From State Route 19, Alternative O4F continues in a northerly direction until intersecting Alternative R near Curve Nankipoo Road. From this point, it continues by running concurrently with Alternative R until ending at Node G in Lauderdale County. Referring to the Build Alternatives map, Figure 2.1 on page 13, Alternative O4F is designated with a green color for the connecting section between Alternative R and Node W, as well as the section form the previously considered Alternative G between Node W and State Route 19; with a blue color for the new portion between State Route 19 and the northerly connection with Alternative R at Curve Nankipoo Road, and black for the areas that are common with Alternative R. Exhibit 2.1 also illustrates the locations of Alternatives O4A and O4B which were considered but eliminated. These previously considered alternatives are addressed in Chapter 2.

Upon approval of the SDEIS, the public will be invited to attend a Public Hearing to discuss and compare Alternative O4F and Alternative R within the area between Nodes K and G. All comments will be collected and reviewed. The results of the Public Hearing and the ensuing decision will be documented and included in the Final Environmental Impact Statement (FEIS).

S.1 Project Setting and Background

The total length of SIU #8 is approximately 65 miles between Millington and Dyersburg. To minimize confusion and to facilitate comparisons and discussion for this lengthy segment of the proposed new interstates, nodes were used to break up the entire length of the project into smaller compartments. These nodes are included on Figure 1.3 (page 6). The new seven-mile crossover option is situated between Node K and G.

S.2 Purpose and Need

The components of the purpose and need are consistent with those expressed and documented in the Draft Environmental Impact Statement (DEIS).

S.3 Alternatives of the New Crossover Option

The Department initiated the process of determining the location of a crossover option by presenting the public with a seven-mile long, five-mile wide corridor in June 2006 at a public meeting. An open house format was used to encourage the public to express concerns, identify any known areas of interest, and to locate their residences, businesses, and farms. Maps were available throughout the meeting room for the public to review and to provide their input on possible alignments.

The results of input from the June 2006 public meeting focused upon three potential alternatives – O4A, O4B, and O4F. These alternatives were presented to the public at a second meeting in November 2006. Based upon the comments received and on environmental field investigations, TDOT is recommending that Alternative O4F be considered as the Crossover Option for comparison with Alternative R for this segment of SIU #8 in Lauderdale County. Refer to Figure 1.1 (Page 2) and Figure 2.1 (Page 13) for maps showing the Crossover Option Area, Alternative Development Options and Alternative R.

Alternative O4F would begin at Node K north of the Hatchie River at Node K, traveling north and to the southeast of Ripley, TN, on SR 19 approximately 2,000 feet east of Eastland Avenue and 2,800 feet west of Gause Lane. Alternative O4F proceeds northerly through the Pecan Drive residential area and crosses Old Brownsville Road 1,000 feet southeast of Skyline Drive. Alternative O4F continues on a straight northerly course until it reaches US 51 crossing the following roads along the way, Country Club Road (1,500 feet east of Rolling Hills Country Club), George Brown Road (2,000 feet west of Parchman Road), Coffee Shop Road (3,200 feet southwest of Roy Crain Road), and the intersection of Chipman Road and Old US 51. Alternative O4F and US 51 interchange includes the area from 1,600 feet southwest of Chipman Road to 900 feet northeast of Chipman Road. Alternative O4F encompasses all of Chipman Road between Old US 51 and up to 1,000 feet south of Smithville Road where it begins to turn and proceeds northeasterly crossing Central Curve Road 1,400 feet east of Chipman Road. The project continues until it reaches Curve Nankipoo road 1,700 feet southeast of Bald Knob Road. At Curve Nankipoo Road, Alternative O4F connects into previously described West (Red) Alternative R and runs concurrent with Alternative R until it terminates at Node G. For comparison purposes and continuity, Alternative O4F will terminate at Node G, a common point with Alternative R in North Lauderdale County.

S.4 Design Features

Consistent with the features stated for I-69 SIU #8 in the DEIS, the crossover portion of the project would be designed according to the Tennessee Department of Transportation standards for interstate facilities with depressed medians. A copy of the typical sections, which provide a cross section view of how the new facility will appear, is included in Chapter 2 as Figure 2.2, Page 16.

S.5 Impacts

Impacts associated with Alternative R and Alternative O4F between Nodes K and G have been compared and are depicted in Tables S.3 and S.4 on the following page. Tables S.3 and S.4 provide comparisons of the costs and impacts associated with Alternative R and Alternative O4F. Alternative R has one less relocation of residences than Alternative O4F. Alternative O4F would require the relocation of a non-profit organization, a Veterans of Foreign War post. Alternative O4F has higher impacts to floodplains than Alternative R, but fewer culverts would be required. Alternative O4F would impact more than twice the wetland acreage as Alternative R. Alternative O4F would have less stream relocations, and fewer total feet of bridges crossing streams. Neither alternative would impose adverse impacts to historic sites, archaeological sites or impact threatened or endangered species. Both Alternatives would require additional work concerning a site with Hazardous Materials/Underground Tanks.

Table S.3: Estimated Costs

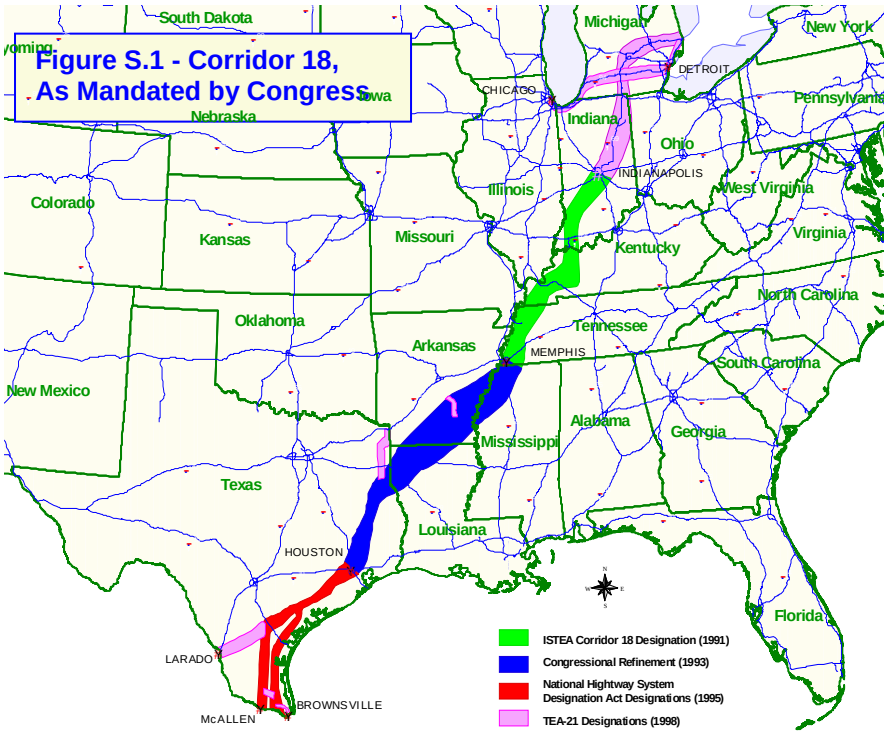
Alternative	Nodes	Length	Const. Costs*	Utility Costs	ROW Costs	Total*
R	KEG	23.84 miles	$279,346,402	$1,434,921	$3,370,000	**$284,151,323**
O4F	KWG	23.96 miles	$285,695,899	$2,242,056	$4,835,000	**$292,772,955**

- **Includes estimated costs for stream mitigation.**

Table S.4: Impacts Matrix of Alternatives O4A and R from Node K to Node G

Project Alternative	Residential Relocations	Business Relocations	Total Acres of Farmland /Prime & Unique	Non-profit Relocations	Floodplains Impacts (Acres)	Adverse Impacts to Historic Sites	Impacts to Archaeological Sites
R (Nodes KEG)	52	0	1,167/316	0	369	0	0
O4F (Nodes KWG)	53	0	1,125/489	1	386	0	0

Project Alternative	Culverts (feet)	Stream Crossing/ Bridge (feet)	Stream Relocation (feet)	Threatened and Endangered Species	Wetlands Impacts in Acres	Hazardous Materials Sites Requiring Additional Work
R (Nodes KEG)	1,809	883	4,457	None	16.2	1
O4F (Nodes KWG)	1,652	709	3,230	None	39.5	1



The I-69 SIU #8 project is part of the congressionally designated High Priority Corridor 18 which is comprised of finished portions of I-69 and proposed segments of independent utility. The DEIS documented and analyzed the original ten Build Alternatives in relation to the project's Purpose and Need. In addition environmental impacts for SIU #8 were analyzed and mitigation commitments conducted upon the ten Build Alternatives. The SDEIS provides the same level of documentation on the Alternative O4F. The SDEIS also compares the impacts of Alternatives R and O4F within the same project area within the defined area between Nodes K and G.

SAFETEA - LU Statute of Limitations

A Federal Agency may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published claims seeking judicial review of those Federal agency actions will be barred unless such claims are filed within 180 days after the date of publication of the notice, or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.

S.6 Environmental Mitigation Commitments

Following are measures that TDOT proposed to utilize to avoid, minimize and/or mitigate impacts to the human and natural environments associated with the construction and implementation of the proposed project.

- **Noise** – Standard noise controls will be implemented during the construction of the project.

- **Wetlands** – When possible, wetland replacement should be onsite and in kind with restoration of existing degraded wetlands taking preference over the creation of wetlands. If onsite compensatory mitigation is not practicable, another site will be chosen in as close proximity within the same watershed as possible. In order to ensure that thorough restoration occurs, the restored wetlands will be monitored for a number of years as designated through the coordinative efforts with the resource agencies. Permits will be required and are specified in the "Permits" section three paragraphs below.

- **Streams** – Stream crossings will be made perpendicular to the direction of stream flow. Culverts will be wide enough to pass high flows and placed so as not to restrict the movement of aquatic vertebrates in streams. Erosion control devices such as silt traps and filter rings will be used to minimize adverse effects. Maintaining the vegetated buffer zone between the roadway and streams will minimize impacts of non-point source pollution. Drainage ditches will direct runoff into appropriate areas to allow filtration of non-point source pollution. Re-vegetation with native floral species will diminish erosion impacts. Heavy equipment will not be allowed to be placed or operate within streams. Diversion channels will be constructed where possible to direct flow from the construction site into appropriate sedimentation control services. Construction should not take place immediately after a rain storm event.

- **Floodplains** – Alterations to the Cane Creek floodplain will require close coordination with the U.S. Army Corps of Engineers and the Tennessee Department of Environment and Conservation, Division of Water Pollution Control. Further analysis will be done during the hydraulic design phase.

- **Permits** – A Section 401 permit will be obtained from the Tennessee Department of Environment and Conservation during the design phase. A National Pollution Discharge Elimination System Storm Water Construction permit will be required by the Tennessee Department of Environment and Conservation. Impacted streams and wetlands within the Alternative O4F project corridor that are under the jurisdiction of the U.S. Army Corps of Engineers will require a permit under Section 404 Clean Water Act. An Aquatic Resource Alteration permit will be required from the Tennessee Department of Environment and Conservation.

- **Invasive Species** – Native herbaceous plants and grasses will be planted in the medians of Alternative O4F. Native woody vegetation will be planted on cut and fill slopes.

- **Archaeological Resources –** Sites If1 and If2 are located within the project right-of-way, but not the limits of construction. TDOT will avoid construction activities within the site areas.

  If archeological material is uncovered during construction, all construction will cease in that area and the Tennessee Division of Archaeology and the recognized Native American Tribes contacted so a representative can have the opportunity to examine and evaluate the material.

- **Hazardous Materials Impacts –** A Phase II investigation will be required for one site, the former Kirby Market/Gas Station, to determine the presence of Underground Storage Tanks on the property.

1.0 PURPOSE AND NEED

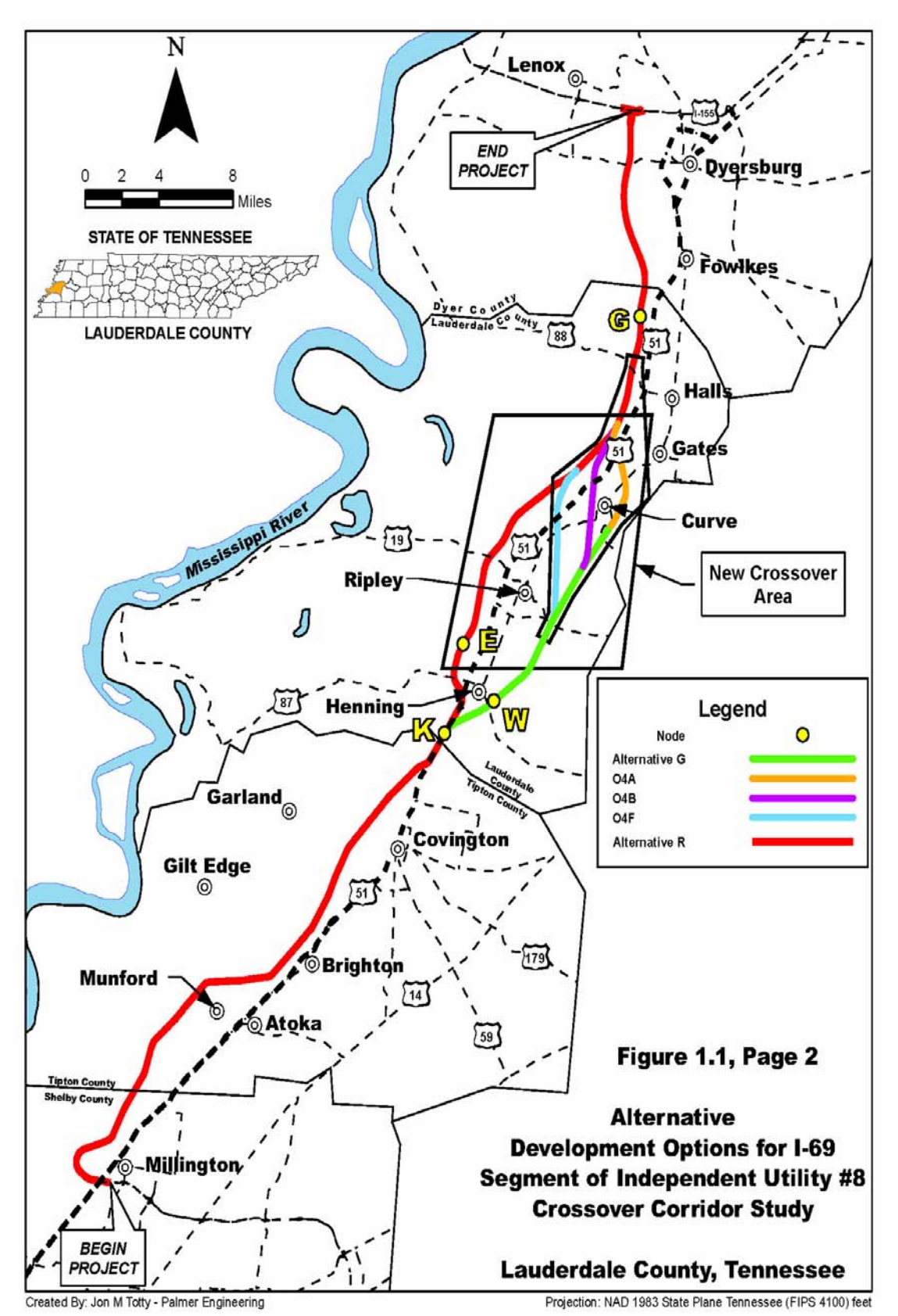
All components of the original Purpose and Need included in the Draft Environmental Impact Statement, (DEIS) remain unchanged. The DEIS was approved August 31, 2005.

The overall purpose of the Interstate 69 (I-69) project is to improve transportation safety and mobility in West Tennessee as part of the High Priority Corridor 18 as identified in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The Corridor 18 project is being proposed to provide improved mobility, modal connections and to facilitate economic development for the unfinished portions of the congressionally designated I-69.

The specific purpose of I-69, SIU #8 is to complete an unfinished portion of Corridor 18/Interstate 69, to provide improved levels of service for the existing roadways in West Tennessee, improve system linkage, improve connectivity within the study area to modal connections, and to facilitate economic development in West Tennessee. These purposes are consistent with those stated in the DEIS.

This Supplemental Draft Environmental Impact Statement (SDEIS) identifies and assesses the environmental impacts associated with a new, four-lane divided interstate in Lauderdale County, Tennessee. This section of Interstate 69 (I-69), Segment of Independent Utility Number 8 (SIU #8), is being studied as an option that was not considered in the original Draft Environmental Impact Statement (approved 2005). The new alignment is approximately 7.3 miles in length and would connect at Node K just north of the Hatchie River. Alternative O4F would continue until its end at Node G in Northern Lauderdale County. This new alignment would be part of the total 65-mile SIU #8 action. The SDEIS addresses the environmental impacts associated with this new proposed portion of SIU #8 and compares the impacts to those of Alternative R within the same area. See Figure 1.1 on Page 2 for an overview of the project area, and Figure 2.1 on Page 12 for a specific map of the area that is being considered in the SDEIS.

The SDEIS summarizes information that has not changed since publication of the Draft Environmental Impact Statement (DEIS) and it discusses changes in the project setting, impacts, technical analyses, and mitigation measures that are associated with the new project alternative. In addition, the termini are logical and complementary to the overall goals and purposes of the entire SIU #8 project.


N
0 2 4 8
Miles
STATE OF TENNESSEE
LAUDERDALE COUNTY
Lenox
END PROJECT
Dyersburg
Fowlkes
Dyer County
Lauderdale County
G
88
51
Halls
Gates
Curve
New Crossover Area
Mississippi River
19
Ripley
E
87
Henning
K
W
Legend
Node
Alternative G
O4A
O4B
O4F
Alternative R
Lauderdale County
Tipton County
Garland
Covington
Gilt Edge
179
Brighton
Munford
14
Atoka
59
Tipton County
Shelby County
Millington
BEGIN PROJECT
Figure 1.1, Page 2
Alternative Development Options for I-69 Segment of Independent Utility #8 Crossover Corridor Study
Lauderdale County, Tennessee
Created By: Jon M Totty - Palmer Engineering
Projection: NAD 1983 State Plane Tennessee (FIPS 4100) feet

1.1 Project Setting and Background

1.1.1 Description of the Study Corridor

The original study corridor for I-69 SIU #8 is a 65-mile undertaking between Millington and Dyersburg. This corridor included ten Build Alternatives, which were described and analyzed in the DEIS. The SDEIS will describe and analyze the Alternative O4F option which was not considered in the DEIS, and compare it with Alternative R between Nodes K and G.

On May 17, 2006, the TDOT announced that Interstate 69, Segment of Independent Utility #8 from Paul Barrett (SR 385) in Millington to Interstate 155 in Dyersburg, would utilize Alternative R (also known as the Red or Western alignment) for most of the project length. Alternative R will be used from the southern terminus (endpoint) in Millington at Node A to a point just north of the Hatchie River and the Tipton/Lauderdale County line at Node K.

A northern section of Alternative R was also announced. This section begins at Node G in Lauderdale County and proceeds northward to Node H at Interstate 155 in Dyer County.

Comments received during the Public Hearing process in November 2005 included inquiries as to whether a “northern crossover” had been considered. The comments were focused upon a general area between Ripley and Dyersburg. Comments were received that area residents in Lauderdale County would continue to be isolated from opportunity for growth and from reliable and efficient roadways. TDOT discussed and considered these concerns, which resulted in the study of the new crossover.

Figures 1.2 (Page 4) and 1.3, (Page 6), represent the entire SIU #8 project corridor including the project nodes (sections) and Alternative O4F and Alternative R. Figure 2.1 includes Alternative R and the crossover options that were presented and discussed within the northern crossover area between Ripley and Dyersburg.

1.1.2 Project Background

The proposed I-69 project is a component of the High Priority Corridor 18, which was identified in the Intermodal Surface Transportation Efficiency Act of 1991. The United States Congress designated inclusion of the National Highway System of specific corridors of national significance to provide regions that currently are served by inadequate existing interstate highway systems with improved travel and safety conditions The National I-69 Corridor is shown on Page 4, Figure 1.2.

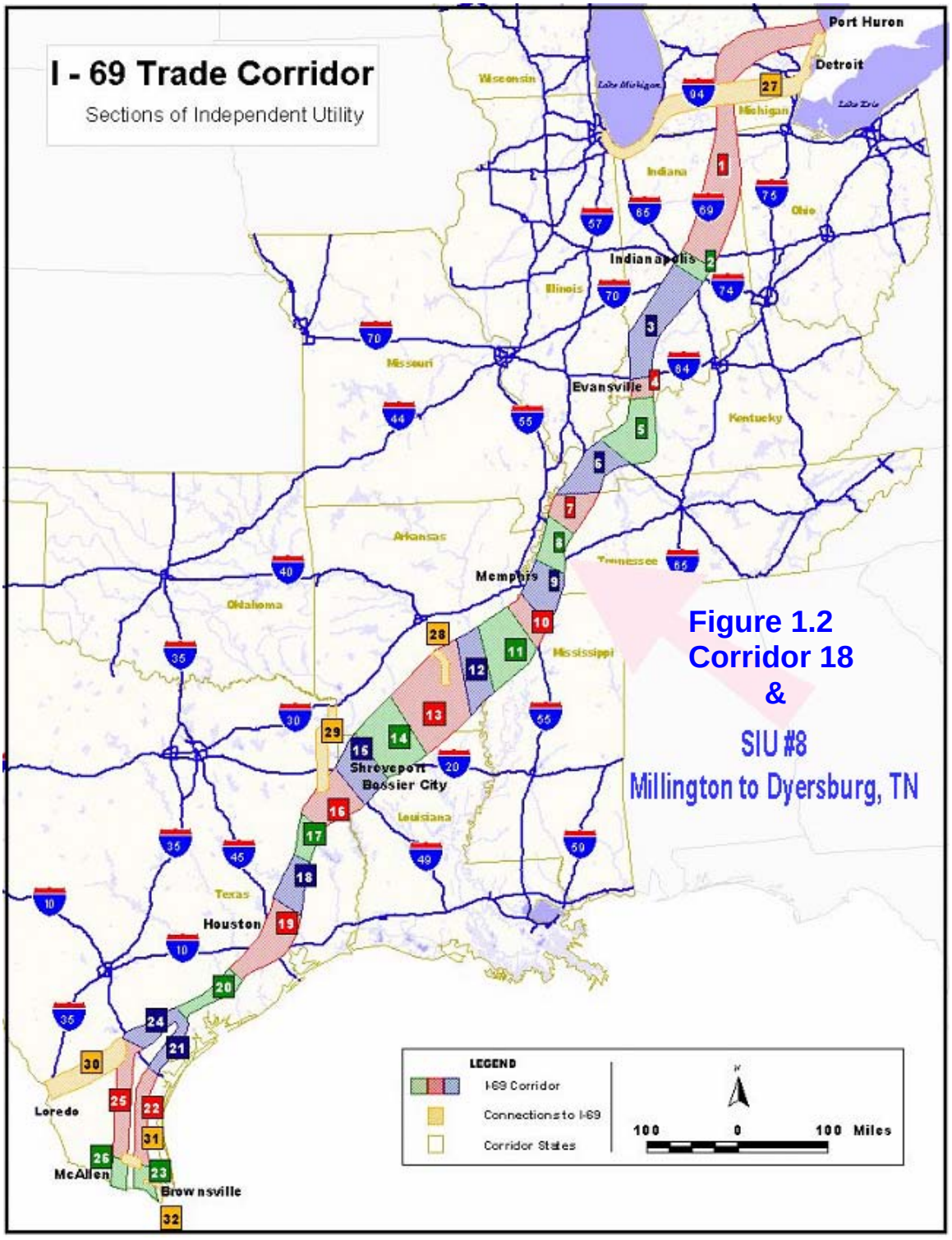


Figure 1.2
Corridor 18
&
SIU #8
Millington to Dyersburg, TN

1.2 Project Need

The project need is unchanged since the DEIS was approved. The project needs for all Build Alternatives considered, including the Alternative O4F option, are:

- The proposed action is an unfinished portion of the congressionally designated I-69.
- The Levels of Service along the existing US 51 roadway are substandard.
- Roadway system linkages in the study area are below standard and inadequate.
- Modal (other forms of transportation) Connections are below standard and inadequate.
- The project would facilitate Economic Development efforts locally and regionally.

1.2.1 Corridor 18/Interstate 69

The new crossover option, as with the original alternatives that were presented in the DEIS, is within the High Priority Corridor that was renamed Interstate 69 by the U.S. Congress. The overall purpose of the I-69 corridor is to improve interstate and international trade (trade between states and between countries). This purpose is in agreement with national and state goals, and is anticipated to assist in efforts to maintain and increase economic development and trade activities in accordance with state, regional and local policies, plans and surface transportation. See Figure 1.2 on the previous page for a visual representation of the entire I-69 corridor, and Figure 1.3 on the following page for a representation of SIU #8. Figure 1.3 also includes notes indicating the sections of I-69 SIU #8 that were announced by TDOT as portions of the project selected for construction.

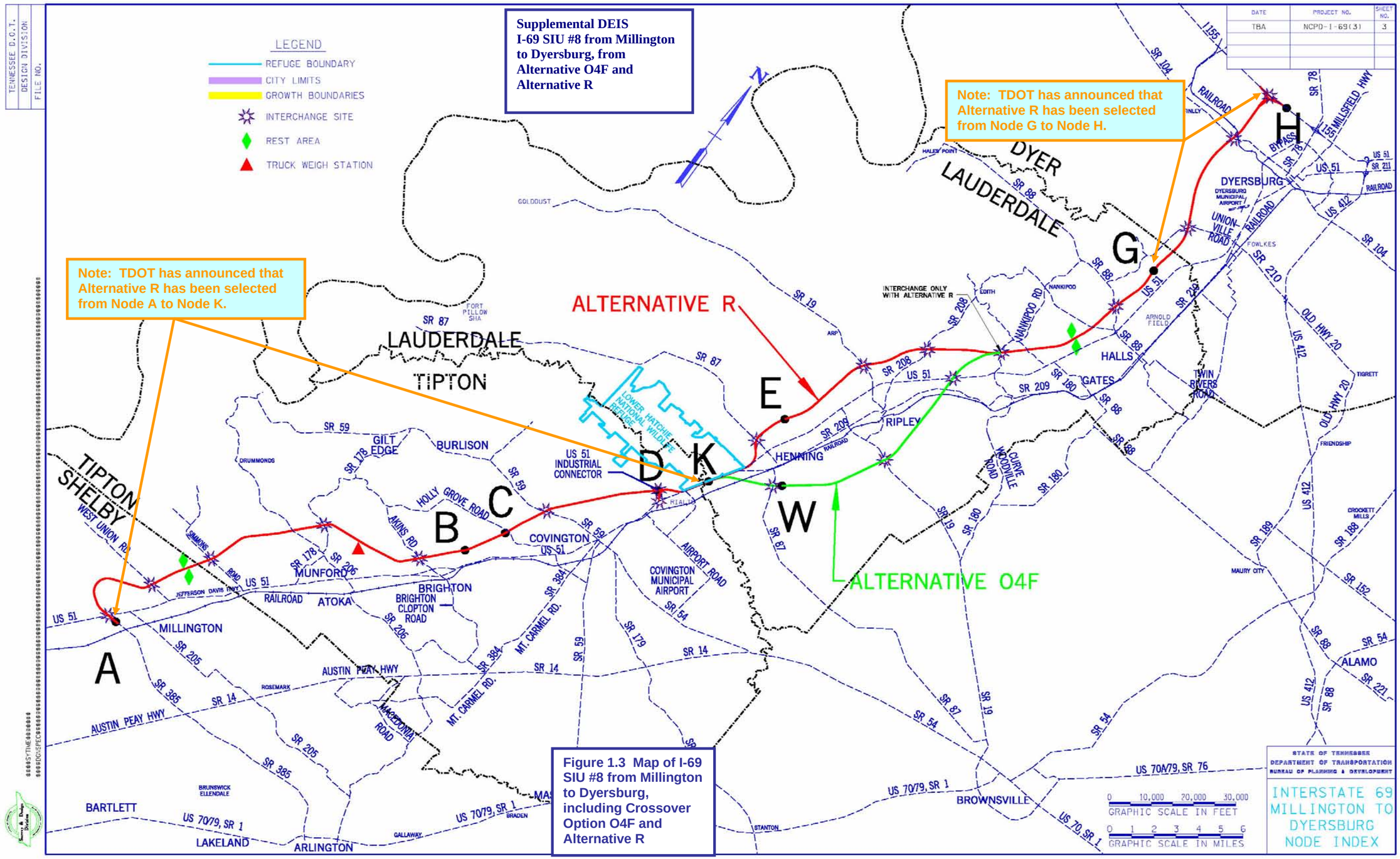


Figure 1.3 Map of I-69 SIU #8 from Millington to Dyersburg, including Crossover Option O4F and Alternative R

1.2.2 Level of Service

Level of Service (LOS) refers to an analysis that uses roadway design limitations and measurable highway factors to determine how to rate the quality of roadway travel conditions. The analysis considers factors such as amount of traffic, total number of lanes, passing and turning sight distances, and the terrain. The LOS ratings range from A for the best conditions possible to F for the worst conditions.

LOS levels are described below:

- **A – Describes free flow conditions. Vehicles are unimpeded in their ability to maneuver within the traffic stream.**
- **B – Represents reasonably free flow. The ability to maneuver in the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is high.**
- **C – Provides for flow at or near the posted speed limits. Maneuverability within the traffic stream is noticeably restricted, and changing lanes requires more attention on the part of the driver. Traffic will begin to backup (form queues) behind any blockage, such as a disabled vehicle.**
- **D – Level at which speeds begin to decline slightly with increasing flows and density begins to increase more quickly. Maneuverability is noticeably limited, and drivers experience reduced physical and psychological comfort levels. Minor incidents are expected to create queues, due to the limited space to absorb disruptions within the traffic stream.**
- **E – Describes operation at capacity. Vehicles are closely spaced, leaving little or no room to maneuver within the traffic stream at speeds that exceed 49 miles per hour.**
- **F – Represents breakdowns in vehicular flow. These conditions generally occur within queues forming behind the breakdown points. These breakdowns in flow occur for a number of reasons, including collisions where more traffic is arriving at the breakdown point than the number of vehicles that can move through it. Points of recurring congestion, such as merge or weaving segments, can also contribute to these conditions where the number of vehicles arriving at the point is greater than the number of vehicles discharged**

The Levels of Service, as included in the DEIS, remain unchanged and are featured on the next page in Table 1.1. Areas with the higher levels of traffic typically feature lower LOSs. These portions of the project are located in Shelby County and Dyer County. The area which includes the new Crossover Option area in Lauderdale County has been

shaded in yellow in Table 1.1 below. The values for this area remain the same for the proposed Crossover Option and the previously considered build alternatives.

Table 1.1 - Levels of Service Analysis for Existing US 51 and Build Alternatives

Roadway Segment		*Analysis Years*	
		Year 2010 (ADT)*	*Year 2030 (ADT*)*
Existing Condition			
From	*To*		
SR 385	SR 59	C (33148)	F (49784)
SR 59	SR 87	B (25470)	D (40750)
SR 87	SR 19	B (19440)	D (38880)
SR 19	SR 88	B (18050)	C (27075)
SR 88	SR 104	A (15080)	B (19120)
SR 104	SR 78	B (23200)	C (30160)
US 51 Bypass	I-155 via SR 78	D (38620)	F (61790)
SR 78	US 412 via I-155	A (19120)	C (36330)
No Build W/ I-69 Traffic			
From	*To*		
SR 385	SR 59	C (33148)	F (58584)
SR 59	SR 87	B (25470)	E (49550)
SR 87	SR 19	B (19440)	D (47680)
SR 19	SR 88	B (18050)	C (35875)
SR 88	SR 104	A (15080)	C (27920)
SR 104	SR 78	B (23200)	D (38960)
US 51/Bypass 3	I-155 via SR 78	D (38620)	F (70590)
SR 78	US 412 via I-155	A (19120)	C (45130)
Build Alternatives by Node			
From	*To*		
A (SR 385)	**B** (South of SR 59)	A (19288)	B (35150)
B (South of SR 59)	**D** (South of Hatchie River)	A (15280)	B (29730)
D (South of Hatchie River)	**K** (North of Hatchie River	A (25470)	B (49550)
E (SR 87)	**G** (Unionville Road)	A (10410)	A (21940)
K (North of Hatchie River)	**E** (SR 87)	A (15280)	B (29730)
K (North of Hatchie River)	**W** (SR 87)	A (16560)	B (32210)
G (Unionville Road)	**H** (I-155)	A (13920)	B (24975)
G (Unionville Road)	**Y** (SR 210)	A (11435)	B (22125)
J (SR 385)	**S** (Brighton-Clopton Road)	A (18963)	B (34388)
S (Brighton-Clopton Road)	**T** (SR 59)	A (19650)	C (36860)
S (Brighton-Clopton Road)	**C** (SR 59)	A (20110)	C (37530)
T (SR 59)	**U** (North of SR 54)	A (17600)	B (33580)
U (North of SR 54)	**V** (North of Hatchie River)	A (16560)	B (32210)
V (North of Hatchie River)	**W** (SR 87)	A (16560)	B (32210)
V (North of Hatchie River)	**E** (SR 87)	A (15920)	B (30970)
W (SR 87)	**Y** (SR 210)	A (11424)	B (23146)
Y (SR 210)	**Z** (I-155)	A (30137)	C (59957)

*ADT – Average Daily Traffic

1.2.3 System Linkage

I-69

At present, no facilities exist within the proposed I-69 corridor that provide a direct connection between the Mexican and Canadian borders. The development of the proposed I-69 would provide a continuous link between the two international borders with the United States, a route of approximately 1650 miles in length. I-69, as it currently exists, extends from the northeast corner of Indianapolis, Indiana to Port Huron/Sarnia, Ontario, Canada, a length of approximately 400 miles. The extension of I-69 from Indianapolis to the Mexican border would be approximately 1250 miles in length.

I-69 has a high demand for the movement of the North American Free Trade Act (NAFTA)-related goods. While short to medium length trips far out-number international trips in the corridor, local and regional trips could take advantage of a facility designed to interstate standards. Additionally, the diversion of traffic from local roads to the I-69 corridor would increase the efficiency and safety of the local and regional transportation systems.

I-69 would connect 16 existing interstate highways that cross the proposed corridor (ten east-west routes and six north-south routes). In its entirety, I-69 would also connect 9 urban areas with an average population of 570,000 that are situated within the corridor. The development of I-69 within urban areas could provide the opportunity to upgrade existing interstates of the area, connect major transportation corridors and radial freeways with a new facility, and connect modal and multi-modal terminals to the Interstate Highway Network.

All proposed build alternatives, including the Alternative O4F option would provide improved linkage for residents, commuters, businesses and shipping interests.

U.S. 51

U.S. Highway 51 is a north-south facility, originating just west of New Orleans and ending near Ironwood, Michigan. Regionally, US 51 connects the greater Memphis area with Dyersburg to the north. The portion of US 51 detailed in the SIU #8 project area is approximately 65 miles in length and features points of access serving industrial, commercial and residential areas. Communities include Millington, Kerrville, Atoka, Brighton, Covington, Munford, Henning, Ripley, Halls, Gates, Fowlkes, and Newbern. All Build Alternatives, including the new Alternative O4F, would link the existing highway system via a fully controlled interstate system, facilitating local economic development efforts, improve travel times and reduce traffic on U.S. 51.

1.2.4 Modal Connections

The crossover connection, as part of the total SIU #8 project, would be consistent with the concerns as stated in the Draft Environmental Impact Statement. I-69 would serve to connect the study area with other modes of transportation, such as rail, water, air and motor carrier/trucks, as outlined in the DEIS.

1.3 Economic Development

A large portion of the I-69 Corridor has historically experienced limited access to economic development opportunities, and has retained poverty rates well above and median income levels well below the national averages as described in the DEIS. With an improved competitive position, resulting from reduced transportation costs, enhanced reliability for the delivery of goods, and improved access to the employment base, I-69 is expected to assist communities in attracting economic production activity.

1.4 Consistency with Other Plans

The proposed project is consistent with plans and legislation for I-69 on national, state and local levels as included in the DEIS.

1.5 Logical Termini

Logical termini are the beginning and ending points for a project. The logical termini remain the same for I-69.

2.0 ALTERNATIVES

2.1 Alternatives Discussed in the Draft Environmental Impact Statement

The following alternatives were considered in the Draft Environmental Impact Statement for Segment of Independent Utility #8 (SIU #8):

- No-Build Alternative
- Transportation System Management Alternatives
- Highway Alternatives R and G.
- Highway Alternatives Previously Considered but Found to be Unreasonable (Alternatives P1, P2, P3, O1, O3, O1/P1, O3/P1 and O3/P2)

These alternatives will not be readdressed in this Supplemental Draft Environmental Impact Statement (SDEIS).

2.2 Alternatives

A Public Workshop was conducted June 20, 2006, at which time a corridor, seven miles long and five miles wide, was presented to the public to encourage comments concerning locations of potential alternatives for the new crossover section that would be advantageous to the communities in the area. Responses from the meeting were collected and reviewed by TDOT and three crossover alignments were developed. These crossovers O4A, O4B, and O4F, were presented to the public at a subsequent meeting on November 9, 2006. The project area begins at Node K just north or the Hatchie River and continues to the north passing southeast of Ripley crossing over to Node G in northern Lauderdale County. The crossover alternative is intended to provide another option in the selection of a Preferred Alternative in the Lauderdale County area. Alternatives O4A and O4B (summarized in Table 2.2, page 18) were dismissed because of their greater potential impacts and because they were the least supported at the public meeting in 2006. If selected, Alternative O4F would connect to Alternative R at Node K, north of the Hatchie River, divert eastward and travel northward until bearing back to the west reconnecting with Alternative R at Node G. Please refer to Figure 2.1, page 13, for a map of the proposed alternatives. Written and oral comments were collected and reviewed, and the results are detailed in Section 5.5, Public Involvement on Page 85. In addition, early field work was conducted throughout the corridor as early efforts to determine areas which might cause measurable impacts to the human and natural environments.

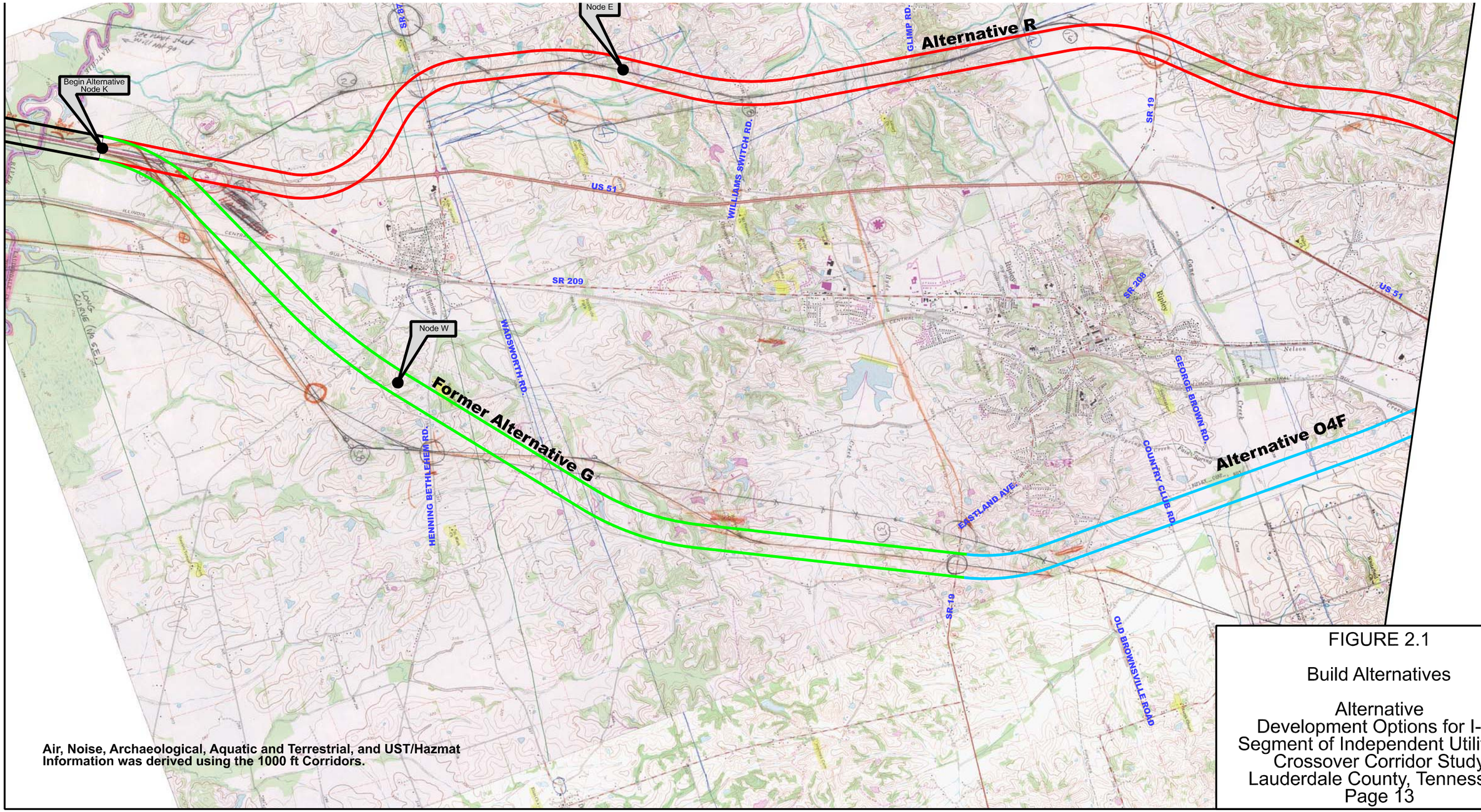
As a result of public comments and the lower number of potential environmental impacts in comparison to Alternatives O4A and O4B, Alternative O4F has been recommended as the Crossover Option. The SDEIS will address the environmental impacts and suggested mitigation measures associated with Alternative O4F and compare the results with Alternative R.

2.2.1 Description of Alternative O4F from Node K to Node G.

Alternative O4F begins at Node K and travels to northerly to the southeast of Ripley on SR 19 2,000 feet east of Eastland Avenue and 2,800 feet west of Gause Lane. Alternative O4F proceeds northerly through the Pecan Drive residential area and crosses Old Brownsville Road 1,000 feet southeast of Skyline Drive. It continues on a straight northerly course till it reaches US 51 crossing the following roads along the way, Country Club Road (1,500 feet east of Rolling Hills Country Club), George Brown Road (2,000 feet west of Parchman Road), Coffee Shop Road (3,200 feet southwest of Roy Crain Road), and the intersection of Chipman Road and Old US 51. Alternative O4F and US 51 interchange includes the area from 1,600 feet southwest of Chipman Road to 900 feet northeast of Chipman Road. Alternative O4F encompasses all of Chipman

Road between Old US 51 and up to 1,000 feet south of Smithville Road where it begins to turn and proceeds northeasterly crossing Central Curve Road 1,400 feet east of Chipman Road. The project continues until it reaches Curve Nankipoo road 1,700 feet southeast of Bald Knob Road. It is here at Curve Nankipoo road where Alternative O4F connects into previously described Alternative R and continues on to Node G. See Figure 2.1, Build Alternatives, on the following page to review Alternative O4F and formerly considered Alternatives O4A and O4B.

Table 2.1, on pages 14 and 15, provides information concerning the existing roadways that Alternative R and Alternative O4F will cross, whether the alternative is situated over or under the existing roadway, and if interchanges are featured.



Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

FIGURE 2.1

Build Alternatives

Alternative
Development Options for I-69
Segment of Independent Utility #8
Crossover Corridor Study
Lauderdale County, Tennessee
Page 13

Alternative R

Alternative O4F

Alternatives O4F and R Combined

End Alternative Node G

RYER CREEK
LAUDERDALE COUNTY

Scale: 1" = 4000'

US 51
ROY CRAIN ROAD
CURVE NANIKIPOO ROAD
SR 209
TRIMROD
DRY HILL ROAD
ARMOUR ROAD
JOHN WHITE ROAD
CURVE WOODVILLE ROAD
CONCORD ROAD
PENNINGTON ROAD
DUNAWAY RD.
SOUTH NANIKIPOO RD.
SR 88
SADIE HILLARD RD.
MILL CREEK RD.

FIGURE 2.1

Build Alternatives

Alternative
Development Options for I-69
Segment of Independent Utility #8
Crossover Corridor Study
Lauderdale County, Tennessee
Page 13

Table 2.1 – Alternative O4F Crossings and Interchanges

Station	Description	I-69 is	Interchanges
K	**K - E (Red)**		
3205+	Cooper Creek Road over I-69	under	
3284+	I-69 over SR 87	over	Interchange
3314+	Thumb Road over I-69	under	
3341+	Faye Barfield Road over I-69	under	
E	**E - G (Red)**		
3425+	William Switch Road over I-69	under	
3496+	Glimp Road over I-69	under	
3603+	I-69 over SR 19	over	Interchange
3656+	Barlow Road over I-69	under	
3703+	Chisolm Road over I-69	under	
3759+	SR 208 over I-69	under	Interchange
3813+	Arp Central Road over I-69	under	
3840+	Voss Road over I-69	under	
3938+	Curve Nankipoo Road over I-69	under	Interchange
3999+	Dry Hill Road over I-69	under	
4083+	Pennington Road over I-69	under	
4168+	I-69 over Edith Nankipoo Road	over	
4201+	Dunaway Road over I-69	under	
4242+	I-69 over SR 88	over	Interchange
4340+	Mill Creek Road over I-69	under	
G	**(Red)**		
K	**K – W (O4F)**		
3085+	I-69 over relocated US 51 w/interchange	over	Interchange
3108+	I-69 over Railroad	over	
3183+	SR 87 over I-69 w/interchange	under	Interchange
W	**W – G (O4F)**		
3219+	I-69 over Henning Road	over	
3276+	Wadsworth Rd. over I-69	under	
3362+	Hurricane Hill Rd. over I-69	under	
3461+	SR 19 over I-69 w/interchange	under	Interchange
3521+	Old Brownsville Road over I-69	under	
3556+	Country Club Road over I-69	under	
3595+	George Brown Road over I-69	under	
3661+	I-69 over Coffee Shop Road	over	
3674+	I-69 over Railroad	over	
3687+	I-69 over SR 209	over	
3722+	I-69 over US 51 w/interchange	over	Interchange

Station	Description	I-69 is	Interchanges
3798+	Central Curve Road over I-69	under	
3938+	Curve Nankipoo Road over I-69	under	
3999+	Dry Hill Road over I-69	under	
4083+	Pennington Road over I-69	under	
W	**W – G (O4F)**		
4168+	I-69 over Edith Nankipoo Road	over	
4201+	Dunaway Road over I-69	under	
4242+	I-69 over SR 88 w/interchange	over	Interchange
4340+	Mill Creek Road over I-69	under	
G	**(Red)**		

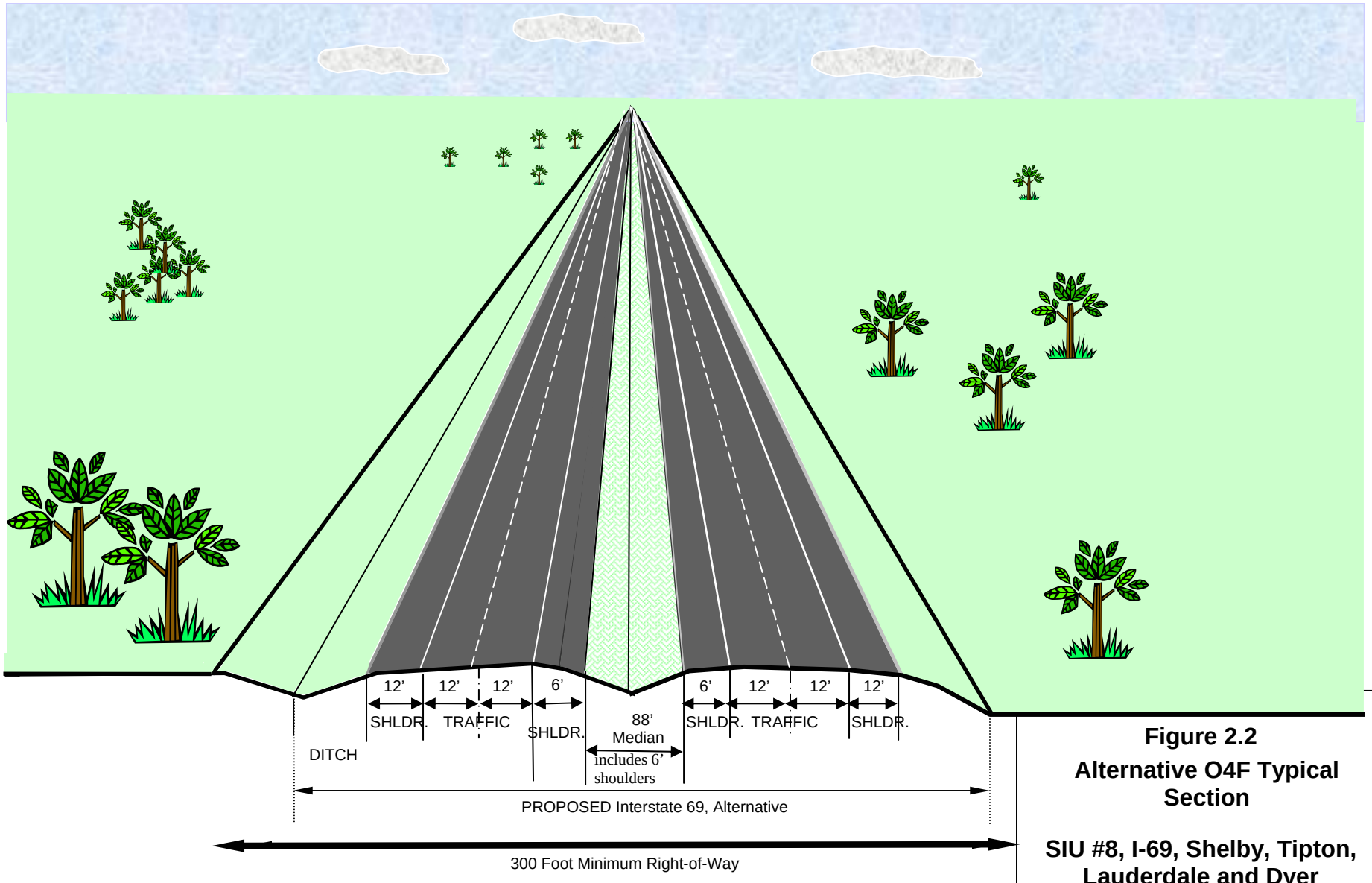
2.2.2 Design Features

The project would be designed according to the Tennessee Department of Transportation's standards for interstate facilities with depressed medians. The proposed design would involve sufficient right-of-way for the construction of a four-lane facility initially, with enough area to accommodate a six-lane facility, if needed in the future. Any future widening of this section would occur in the median. Figure 2.2 depicts the proposed Typical Section on page 16.

The project is proposed as an addition to the National System of Interstate and Defense Highways (Interstate System). Current policies on the design standards for the Interstate System require that the facility have full control of access. Therefore, pedestrian and bicycle usage would be prohibited on I-69. Bicycle and pedestrian transportation will be allowed on other roads crossing over and under the interstate. Access to the new roadway would be restricted to interchanges at various proposed locations. All state routes crossed by the proposed facility would have an interchange, with proper spacing. The proposed roadway would feature two 12 ft. driving lanes in each direction, 12 ft. outside shoulders, and a minimum median width of 88 ft. with 6.0 ft. inside shoulders and an outside slope ratio of 6:1. Additionally, the roadway right-of-way, as proposed, would have a minimum width of approximately 300 ft.

Additional design criteria includes:

Design Speed:	70 mph
Minimum stopping sight distance:	730 ft.
Maximum grade:	3%
Horizontal curvature:	3 degrees
Access control:	Full
Interchange design:	Diamond or other, as needed.



PROPOSED TYPICAL SECTION

Figure 2.2
Alternative O4F Typical Section

SIU #8, I-69, Shelby, Tipton, Lauderdale and Dyer Counties

2.3 Alternatives Previously Considered

This section discusses alternatives that have been considered in the SDEIS process, but are not being carried forward. The alternatives are included on Page 13, Figure 2.1 for comparison purposes to Alternative O4F. The environmental impacts were greater for Alternatives O4A and O4B. These alternatives are described below, and their potential impacts have been summarized in Table 2.2, page 18, following the dismissed alternative descriptions. Alternatives O4A and O4B also received the least support at the public meeting in 2006. Each of the new crossover options begins at Node K, just above the Hatchie River, and they each terminate at Node G.

Alternative O4A

Starting at Node K and continuing to the north, on SR 19 southeast of Ripley, TN, 2,800 feet east of Eastland Avenue and 2,800 feet west of Gause Lane, this alterative proceeds northeast crossing Old Brownsville Road 1,400 feet east of Oakview Drive. Continuing in a northeasterly direction this alternative crosses Country Club Road 900 feet west of Conner Whitefield Road and then crosses back over Conner Whitefield Road 1,800 feet north of Country Club Road. From Conner Whitefield Road the alternative crosses a large expanse of open land until it crossed a proposed interchange at Curve Woodville Road 4,000 feet west of Eylan Road. Continuing northeasterly, Alternative O4A crosses Concord Road 1,000 feet east of Curve Woodville Road. From here Alternative O4A begins a slight northerly curve towards John White Road which it crosses 2,400 feet northwest of Concord Road. After John White Road, Alternative O4A curves strongly north towards the intersection of SR 209 and Aunt Lillie Spur. It crosses SR-209 300 feet southwest of Aunt Lillie Spur and then crosses Aunt Lillie Spur 200 feet west of SR 209. From here it continues northerly towards its intersection with US 51 crossing Dr. Sparks Road 1,000 feet northeast of Armour Road. The Alternative O4A interchange with US 51 includes the area north of Dry Hill Road and south of SR 180/Gates Road. After the US 51 interchange, Alternative O4A curves northeast where it ties into the West (Red) Alternative R at Pennington Road 1,500 feet west of US 51. Alternative O4A ends at Node G in Northern Lauderdale County.

Alternative O4B

Starting at Node K and continuing to the north, southeast of Ripley on SR 19 900 feet west of Durhamville Road, Alternative O4B proceeds northerly through open land until it crosses Old Brownsville Road 1,900 feet east of Oakview Drive. After Old Brownsville Road, Alternative O4B turns northeasterly where it crosses Country Club Road 900 feet west of Conner Whitefield Road and then back over Conner Whitefield 1,800 feet north of Country Club Road. From here, Alternative O4B proceeds northeasterly through open country for about 4,000 feet than turns due north and crosses Conner Whitefield Road again 1,600 feet east of Coffee Shop Road and Bluebird Hill Road 1,500 feet west of Conner Whitefield Road. Alternative O4B continues to proceed north crossing SR 209 4,000 feet east of Bluebird Hill Road and Curve Nankipoo Road 500 feet east of Carmack Road. Next is the interchange with US 51 which includes the area starting 2,000 feet northeast of Curve Nankipoo Road and ending 1,400 feet southwest of Wilson Road. After the US 51 interchange, Alternative O4B begins to turn northeasterly at Bob Ellis Road 2,400 feet west of Wilson Road. After completing its turn in the open country between Bob Ellis Road and Dry Hill Road, Alternative O4B straightens proceeding northeasterly crossing Dry Hill Road 1,600 feet west of Wilson Road and then ties into the Alternative R alignment, at Pennington 1,500 feet west of US 51 and ends at Node G in Northern Lauderdale County.

Table 2.2 – Comparative Impact Totals of Alternative O4F with Previously Considered Alternatives O4A and O4B*

Project Alternative	Residential Relocations	Business Relocations	Non-profit Relocations	Floodplains Impacts (Acres)	Adverse Impacts to Historic Sites	Impacts to Archaeological Sites
O4A	24	0	0	NA	0	0
O4B	26	0	1	NA	0	0
O4F	20	0	1	96.07	0	0

Project Alternative	Culverts (ft)	Stream Crossing / Bridge (ft)	Stream Relocation (ft)	ROW for Streams (ft)	Threatened and Endangered Species	Wetlands Impacts (Total Acres/Impacted Acres)	Hazardous Materials Sites Requiring Additional Work
O4A	4,589	1,109	166	90	None	250.4/16.2	4
O4B	5,037	610	0	133	None	236.5/13.0	4
O4F	1,652	709	3,230	709	None	14.5/6.1	1

*** These impact totals compare only the new areas of alignment that were not previously investigated. These are the impacts within the new area of consideration for the three crossover alternatives, but they do not include the total impacts between Nodes K and G.**

Table 2.2, above, compares the impacts of the three build alternatives within an area that was not previously studied. These new areas do not include the total impacts between Nodes K and G. Alternative O4F (shaded in yellow) has fewer residential relocations and fewer total impacts to streams resulting in construction of culverts. In addition, Alternative O4F impacted fewer wetlands and hazardous materials sites. Alternatives O4A and O4B were dropped from further consideration for these reasons and for lack of public support.

3.0 AFFECTED ENVIRONMENT

This section discusses the project area as it exists today, and considers all aspects of the proposed action, including the build alternatives for the proposed northern crossover in Lauderdale County. Existing environmental conditions and potential impacts were investigated and analyzed within the 1000 foot project corridor for every area except the historic technical study. The historic technical study includes potential visual impacts to historic sites, which encompass a broader corridor to accommodate the viewshed. The Historic Area of Study is delineated by a heavy black line labeled "Study Corridor" in Figure 3.3 on Page 45.

3.1 Land Use

3.1.1 Existing Land Use

The crossover study area is located within Lauderdale County, Tennessee. Lauderdale County (population 27,101) is bordered by the Mississippi River to the west; Dyer County to the north; Crockett and Haywood Counties to the east; and Tipton County to the south. The City of Memphis, Shelby County, is located 50 miles south of Ripley (population 7,745), the county seat of Lauderdale County. Land use in Lauderdale County can be described as agricultural/rural with small pockets of residential and industrial development, particularly in and around Ripley. The study area occurs adjacent to Ripley and the communities of Flippen (population unknown), Curve (population unknown), and Gates (population 901).

The most common land use throughout the study area is agricultural. Agricultural production includes soybean, corn, cotton, and tomatoes. Limited structural development occurs outside the city limits. Residential density is low, except near major roadways and inside the city limits, such as, but not limited to, State Route 19, Old Brownsville Road, and Conner Whitefield Road. The residential structures are mainly single-family dwellings built during the 1980s and 1990s. Industrial development is contained in industrial parks located along US 51 and SR 19. Ripley features two (2) industrial parks within its city limits; the Ripley East/Walker Industrial Park (166 acres) and the North Industrial Park (109 acres) are located along US Highways 19 Bypass and 51, respectively. To the north, Halls has one (1) industrial park within its city limits; the Halls Industrial Park (up to approximately 1,400 acres) is located one mile east of US Highway 51. Commercial development occurs inside the city limits, particularly along US 51 and SR 209; these establishments are service-oriented.


Industrial Site in Lauderdale County

3.1.2 Land Use Plans and Regulatory Controls

Current zoning and land use for Lauderdale County includes forestry, agriculture, and residential, fringe residential, rural commercial, general commercial, light industrial, heavy industrial, and airport zoning. Current zoning ordinances for Halls, Gates, Ripley, and Henning include residential, commercial, hospital, and industrial land use regulations.

In April 2000, Lauderdale County agreed to a Growth Policy Plan under Tennessee Public Chapter 1101. PC1101 required local officials within each of the 92 non-metropolitan counties to work together to shape growth policy through the development of 20-year growth plans. The Act did not impose a single, statewide solution. However, Public Chapter 1101 included five statements of legislative intent: to eliminate annexation or incorporation out of fear; to establish incentives to annex or incorporate where appropriate; to more closely match the timing of development to the provision of public services; to stabilize each county's education funding base and establish an incentive for each county legislative body to be more interested in education matters; and to minimize urban sprawl. These stipulations require that Lauderdale County gain approval within their district before annexation occurs beyond current city limits. The proposed project could lead to opportunities for growth where annexation is feasible.

3.2 Community Services

3.2.1 Schools

The Lauderdale County School System is the only operating public school system in Lauderdale County. Nearly 5,000 students attend the eight schools of the Lauderdale County School System. Three schools are located in the community of Halls: Halls Elementary (K-6); Halls Junior High School (7-8); and Halls High School (9-12). Four schools are located in the city limits of or near Ripley: Ripley Primary School (K-2); Ripley Elementary School (3-5); Lauderdale Middle School (6-8); and Ripley High School (9-12). Additionally, the Lauderdale County School System operates the Lauderdale County Optional School for grades 9-12. The School System employs 350 teachers and numerous support staff.

Higher educational opportunities exist in the area at the Tennessee Technology Center at Ripley. This facility provides technical training designed to assist students in gaining qualifications for employment or advancement in their occupations. TTC-Ripley offers educational opportunities in practical nursing, industrial electronics, commercial truck driving, computer aided drafting, and a variety of technical studies. This type of learning environment supports the area’s industrial presence.

3.2.2 Fire and Police Protection

The City of Ripley Fire Department provides the only full capacity fire protection in Lauderdale County. Several volunteer fire departments exist throughout Lauderdale County, including the cities of Gates, Halls, and Henning. The County of Lauderdale Sheriff’s Department carries out law enforcement duties except within the city limits of Halls, Ripley, Gates, and Henning. These communities maintain individual police departments. The Sheriff’s office is located in Ripley.

3.2.3 Hospitals

Baptist Memorial Hospital of Lauderdale County is located at 326 Asbury Avenue in Ripley. This 86-bed facility, accessed from U.S. 51, provides residents with 24-hour emergency care, general surgery, outpatient services, physical therapy, senior care, occupational health care, and behavioral health care. The nearest hospitals are located in Dyersburg (Dyer County) and Covington (Tipton County). These provide similar services to the hospital in Lauderdale County. For more invasive treatments, patients travel to Memphis in Shelby County.

3.2.4 Utilities

TVA supplies electric service to Lauderdale County; Ripley Power and Light, Southwest Tennessee Electric Membership, and Forked Deer Electric Cooperative serve as local electric distributors. Williams Gas Pipeline and South Central Texas Gas Transmission supply natural gas to Lauderdale County; Ripley City Gas and Water Department, Halls Gas Department, and Henning Gas and Water Department serve as natural gas service providers in their respective localities. AT&T Telecommunications provides telephone service to Lauderdale County. Several carriers supply cable service.

3.3 Social and Economic Characteristics

3.3.1 Social Characteristics

Population Trends and Forecasts

The University of Tennessee Center for Business and Economic Research performs population projections for the State of Tennessee, including state, county, and city groups. Projections are based on the difference between births and deaths in addition to immigration versus emigration. The projected 2020 population densities for Lauderdale County, and the State of Tennessee are compared with their respective current population densities to identify any unsustainable projected growth patterns in population. As of February 2007, the most recent figures were estimations (2005). See Figure 3.1 on the Page 24 for a map detailing the Alternative O4F in relation to U.S. Census Tracts.

Current population figures and projections for Lauderdale County, the State of Tennessee, and the United States are shown in Table 3.1. Population growth for Lauderdale County is nearly half the growth estimated and projected for Tennessee and the nation from 2000 to 2005 and from 2005 to 2015, respectively. Tennessee and Lauderdale County are not expected to experience a similar level of growth from 2010 to 2020 as they did between 1990 and 2000.

Table 3.1 Population and Forecast Growth 1990 – 2020*

	Population			
Geographic Area	1990 Population	2000 Population	2010 Population	2020 Population
Tennessee	4,890,525	5,689,283	6,062,695	6,593,194
% Change		**16.3%**	**6.6%**	**8.8%**
Lauderdale County	23,498	27,101	25,830	27,287
% Change		**15.3%**	**-4.7%**	**5.6%**

*** UT Center for Business and Economic Research, February 2007.**

The Population growth rates are projected to decrease in Lauderdale County and Tennessee between 2010 and 2020. The growth rate over the 30-year period for the state is projected to be almost double the rate for Lauderdale County. A 34.8% projected increase for Tennessee between 1990 and 2020, and a 16.1% projected increase for Lauderdale County between 1990 and 2020 are predicted.

Demographics

2000 U.S. Census Tract data demonstrates the concentrations of minority groups shown in Table 3.2. In Lauderdale County, minority populations vary from 1.1 percent in Block

Group 2, Census Tract 504 to 80.2 percent in Block Group 2, Census Tract 502.02; neither represents the state or county minority averages of 20.6 percent and 36.6 percent, respectively. Lauderdale County's minority composition far exceeds that of its neighboring counties. As of 2000, Dyer County (adjacent to the north) has a minority population of 14.6 percent, while Tipton County (adjacent to the south) has a minority population of 22.1 percent.

Table 3.2 Population Characteristics by State, County and Census Tract, 2000

Geographic Area	Total Population	% Minority*	% Age 65 or Over	% Age Under 18
Tennessee	5,689,283	20.6%	12.4%	16.1%
Lauderdale Co.	27,101	36.6%	12.1%	21.2%
Tract 502				
Block Group 4	1,224	13.6%	10.0%	22.8%
Tract 503				
Block Group 2	824	6.6%	7.3%	28.2%
Block Group 3	935	21.5%	12.0%	27.0%
Tract 504				
Block Group 1	1,108	7.2%	9.0%	27.3%
Block Group 2	1,100	1.1%	14.1%	24.5%
Block Group 3	1,094	0.0%	10.9%	24.0%
Tract 505.01				
Block Group 1	1,021	8.4%	11.6%	25.1%
Block Group 2	890	21.0%	14.0%	23.7%
Tract 505.02				
Block Group 1	1,681	40.7%	11.4%	31.7%
Block Group 2	1,174	80.2%	15.7%	33.1%
Block Group 3	818	49.3%	10.4%	33.6%
Block Group 4	1,256	65.9%	13.1%	10.0%
Tract 506				
Block Group 1	772	50.3%	13.1%	30.1%
Block Group 2	1,631	65.1%	12.5%	29.7%

The project area has a collective younger minority population when compared to the state and county averages. However, Census Tract Block Group data for populations 65 years and older is approximate to Tennessee and Lauderdale County.

Housing

As of 2000, the value for owner-occupied units within the project area's Census Tract Block Groups ranged from $50,000 to $68,100. This range fell below Tennessee's median of $93,000 per owner-occupied unit, but agreed with Lauderdale County's average of $59,900 shown in Table 3.3 on page 25.

Most homes in the affected Census Tract Block Groups were built in the 1970s and 1980s. The vacant housing stock in the affected Census Tract Block Groups was comparable to the County and State figures; units were less than 15% vacant.

Although the median value for owner-occupied housing units was the least for Census Tract 505.02, Block Group 4, the median rent for the remaining units in this Block Group boundary is the greatest among all affect Block Groups. Median rent for the affect

Census Tract Block Groups ranged from $219 to $339 per month. The median Tennessee rent was $408 per month.

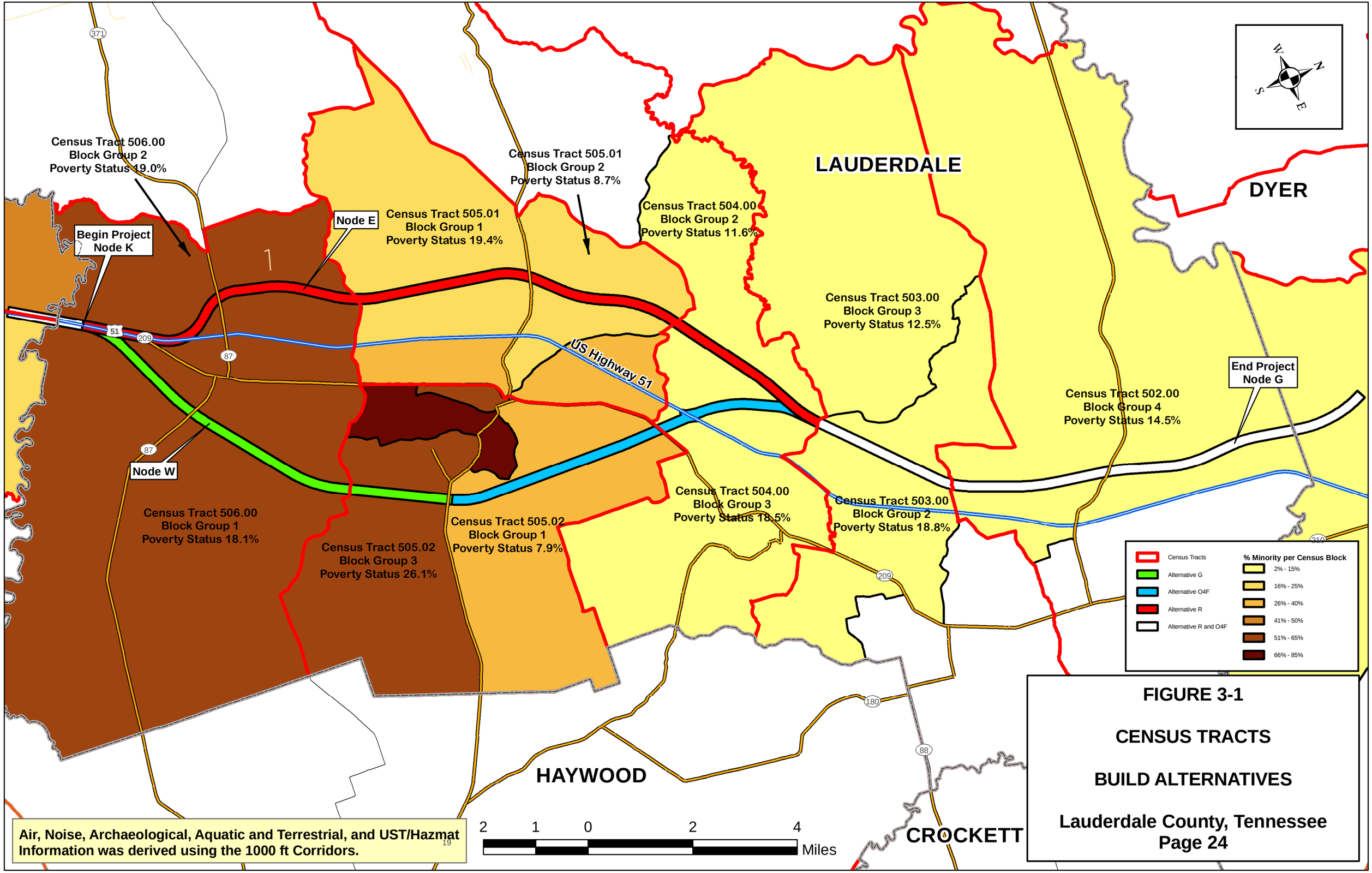


FIGURE 3-1

CENSUS TRACTS

BUILD ALTERNATIVES

Lauderdale County, Tennessee
Page 24

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

Table 3.3 – Housing Characteristics by State, County and Census Tract

Geographic Area	Total Housing Units	Occupied/ Vacant	Median Build Year	Median Value for Owner-Occupied Units	Median Rent
Tennessee	2,439,443	2,232,905/ 206,538	1975	$93,000	$408
Lauderdale Co.	10,563	9,567/996	1975	$59,900	$331
Tract 502					
Block Group 4	503	481/22	1976	$91,700	$339
Tract 503					
Block Group 2	347	334/13	1976	$68,100	$288
Block Group 3	439	346/93	1980	$55,000	$235
Tract 504					
Block Group 1	479	417/62	1980	$56,000	$322
Block Group 2	442	421/21	1973	$51,900	$247
Block Group 3	481	435/46	1976	$59,300	$354
Tract 505.01					
Block Group 1	383	352/31	1983	$49,000	$419
Block Group 2	343	343/0	1974	$59,100	$358
Tract 505.02					
Block Group 1	627	590/37	1980	$60,200	$307
Block Group 2	526	486/40	1972	$55,900	$219
Block Group 3	317	293/24	1975	$58,900	$324
Block Group 4	566	512/54	1974	$50,000	$339
Tract 506					
Block Group 1	342	297/45	1974	$53,900	$206
Block Group 2	653	608/45	1977	$50,800	$306

Income and Poverty

According to the 2000 U.S. Census, Lauderdale County had the lowest per capita income and median household income of four (4) counties bordering the Mississippi River: Dyer, Lauderdale, Tipton, and Shelby shown in Table 3.4.

Table 3.4 Income by State and County, 2000

Geographic Area	Per Capita Income	Median Household Income
Dyer County	$19,393	$36,360
Lauderdale County	$13,682	$29,751
Tipton County	$17,952	$41,856
Shelby County	$20,856	$39,593

Table 3.5 provides income and poverty information for Tennessee, Lauderdale County, and the affected Census Tract Block Groups. All Census Tract Block Groups had per capita incomes less than that of the state. Census Tract 505.02, Block Group 3 had the lowest per capita income of all affected Census Tract Block Groups, and ranked lower than the county and state for per capita income. However, this area did not have the lowest median household income; nearby Census Tract 505.02, Block Group 2 earned

more than $5,000 less than Block Group 3. Census Tract 504, Block Group 1 had a median household income greater than that of the state by nearly $5,000. This particular location had the lowest poverty level of all affected Census Tract Block Groups; the poverty rate ranged from 2.1-41.0 percent.

Table 3.5. Poverty Levels for Tennessee, Lauderdale County and Census Tracts and Block Groups, 2000

Geographic Area	Per Capita Income	Median Household Income	% Below Poverty
Tennessee	$19,393	$36,360	13.5%
Lauderdale Co.	$13,682	$29,751	19.2%
Tract 502			
Block Group 4	$16,042	$32,596	14.5%
Tract 503			
Block Group 2	$14,343	$32,188	18.8%
Block Group 3	$14,759	$28,750	12.5%
Tract 504			
Block Group 1	$16,469	$41,149	2.1%
Block Group 2	$13,569	$32,135	11.6%
Block Group 3	$13,849	$27,917	18.1%
Tract 505.01			
Block Group 1	$13,214	$39,323	19.4%
Block Group 2	$16,508	$37,885	8.7%
Tract 505.02			
Block Group 1	$14,916	$31,103	7.9%
Block Group 2	$10,666	$16,789	41.0%
Block Group 3	$9,782	$22,037	26.1%
Block Group 4	$11,823	$25,170	28.7%
Tract 506			
Block Group 1	$16,257	$26,250	18.1%
Block Group 2	$11,689	$26,071	19.0%

Educational Attainment

Lauderdale County's high school graduation rate, among residents 25 years and older, was more than 15 percent below the Tennessee average. The affected Census Tract Block Groups graduated students at a rate higher than that of the county average, but below the state's average of 75.9 percent.

In contrast, of the 25 year and older residents of the Census Tract Block Groups, only those living in Block Group 2, Census Tract 505.02 obtained a higher educational degree (Associate, Bachelor's, Master's, Professional School, or Doctorate) representing a rate (11.2%) higher than Lauderdale County's rate of higher education (10.3%) shown in Table 3.6. Overall, in the entire state of Tennessee, nearly a quarter of adults ages 25 and older held a higher educational degree.

Table 3.6. Educational Attainment for Tennessee, Lauderdale County and Census Tracts and Block Groups

Geographic Area	High School Graduate (includes equivalent)	Higher Educational Degree
Tennessee	75.9%	24.3%
Lauderdale Co.	58.2%	10.3%
Tract 502		
Block Group 4	64.2%	13.5%
Tract 503		
Block Group 2	58.4%	7.8%
Block Group 3	63.4%	3.4%
Tract 504,		
Block Group 1	62.8%	6.8%
Block Group 2	59.0%	7.5%
Block Group 3	59.9%	8.7%
Tract 505.01		
Block Group 1	62.0%	19.9%
Block Group 2	58.9%	12.6%
Tract 505.02		
Block Group 1	65.8%	9.7%
Block Group 2	60.3%	11.2%
Block Group 3	69.4%	7.6%
Block Group 4	58.6%	5.6%
Tract 506		
Block Group 1	68.5%	14.0%
Block Group 2	59.3%	5.3%

3.3.2 Economic Characteristics

Industry and Employment

Ripley has two (2) industrial parks within its city limits; the Ripley East/Walker Industrial Park (166 acres) and the North Industrial Park (109 acres) are located along US Highways 19 Bypass and 51, respectively. To the north, Halls has one (1) industrial park within its city limits; the Halls Industrial Park (up to approximately 1,400 acres) is located one mile east of US Highway 51.

Several large industries and facilities have located in Ripley, Halls, and Henning. Some of the industries are American Greetings, Marvin Windows, and Komatsu American Corporation. The Lauderdale County Chamber lists the presence of 26 industries, varying in size, from two (2) to 670 employees shown in Table 3.7. A list of major industrial employers is listed in Table 3.7.

Table 3.7 – Nine industries of 50+ employees (Ripley, Halls, & Henning)

Industry*	Location	Product/Operation	Employment
American Greetings	Ripley	lithography of greeting cards	142
Coldiron Companies	Halls	storage of semi-trucks & tractors; minor repairs & services	100
Hutcherson Metal Inc.	Halls	scrap metal recyclers	75
Komatsu American Corp.	Ripley	Master Parts Distribution Center	300

Industry*	Location	Product/Operation	Employment
Marvin Windows of TN	Ripley	wood windows & doors	670
Reelfoot Lumber Company	Henning	logging & lumber	65
Siegal Robert Automotive	Ripley-N	plastic automotive parts	496
Siegal Robert Automotive	Ripley-S	custom electroplating	357
VF Imagewear	Henning	uniform distributor	75
**industries listed include 50 or more employees*			

Ripley is located 20 miles west of the nearest Interstate Highway, I-40, while Halls is located 10 miles south of I-155. Therefore, US Highways 51 and 19 bear the majority of truck traffic to and from these industrial locations. The lack of easy accessibility does not lend well to growth. With the appropriate transportation facilities and advanced labor pool, these established areas will be given the opportunity to accommodate a major distribution and manufacturing center in west central Tennessee.

Counties to the east could realize the benefits of improved accessibility to their own industrial facilities. As an economic development initiative, the Tennessee Valley Authority (TVA) has developed eight industrial locations in the TVA Region, two of which are located to the east, adjacent to Lauderdale County. The West Tennessee Auto Park in Bells, Crockett County is a 1,600 acre vacant facility located 11 miles west of Interstate 40 (an east-west route). Interstate 69 will provide truck traffic with a north-south route to remote markets.

In 2000, the United States unemployment rate averaged 4.0 percent. Although not the lowest in the nation, Tennessee's unemployment rate averaged 5.1 percent. Western Tennessee's average unemployment rate was not representative of the state's. Lauderdale County had one of the highest western Tennessee rates of unemployment (9.1%), and counties to the immediate east, Crockett and Haywood, shared similar higher than average rates show in Table 3.8.

Table 3.8 - State and County Employment

Geographic Area	Total Labor Force	Employed	Unemployed	Unemployment Rate
Tennessee	2,822,908	2,651,638	153,596	5.1%
Lauderdale County	9,640	8,760	870	9.1%
Crockett County	6,420	5,910	510	7.9%
Dyer County	17,260	16,180	1,080	6.3%
Haywood County	9,120	8,340	780	8.6%
Shelby County	432,400	404,670	27,720	6.4%
Tipton County	26,020	24,340	1,680	6.5%

Due to the relatively flat terrain of western Tennessee, historically, agriculture has served as an economic resource for Lauderdale County shown in Table 3.9. Known for growing tomatoes and cotton, among other major crops, such as corn, wheat, and soybeans, Lauderdale County's farming acreage and number of farms increased steadily; from 1992 to 2002 – a greater rate than that of the state. However, the amount of farm products sold between 1997 and 2002 decreased by 19.3.

Table 3.9 - Agriculture in Tennessee and Lauderdale County

	Tennessee	Lauderdale Co.
Number of Farms		
1992	75,076	472
1997	76,818	505
2002	87,595	624
Percent Change, 1997-2002	*14.1*	*23.6*
Total Land in Farms (acres)		
1992	11,169,086	182,754
1997	11,122,363	192,010
2002	11,681,533	215,072
Percent Change, 1997-2002	*5.0*	*12.0*
Average Size of Farm (acres)		
1992	149	387
1997	145	380
2002	133	345
Percent Change, 1997-2002	*-8.3*	*-9.2*
Farm Products Sold		
1992	$1,933,506,000	$37,123,000
1997	$2,178,389,000	$47,293,000
2002	$2,199,814,000	$38,142,000
Percent Change, 1997-2002	*0.9*	*-19.3*
Average Sold per Farm		
1992	$25,754	$78,650
1997	$28,358	$93,649
2002	$25,113	$61,125
Percent Change, 1997-2002	*-11.4*	*-35.7*

Source: USDA, National Agricultural Statistics Service 1992, 1997, 2002 Census of Agriculture

3.4 Physical Environment

Information contained in this section gives a general overview of the climate, physiography, topography, geology, soils, watershed make-up, land uses, and floral communities found in the project area.

3.4.1 Geology and Soils

Geology The project is within the Ripley North, Ripley South, and Gates, Tennessee Geologic Quadrangles. The following description is an excerpt taken from *The Geologic History of Tennessee* (Miller 1974).

The major unconformity between the Mesozoic and Cenozoic sediments in Tennessee is not recognizable in a large part of the outcrop belt because the Tertiary sediments are similar in character to those of the underlying Cretaceous. However, erosion at the beginning of the Tertiary removed the uppermost parts of Cretaceous sediments in some places. The Tertiary sea covered all of the Coastal Plain area of West Tennessee and may have extended over a part of the Highland Rim. However, no marine deposition occurred during this period in other regions of the state.

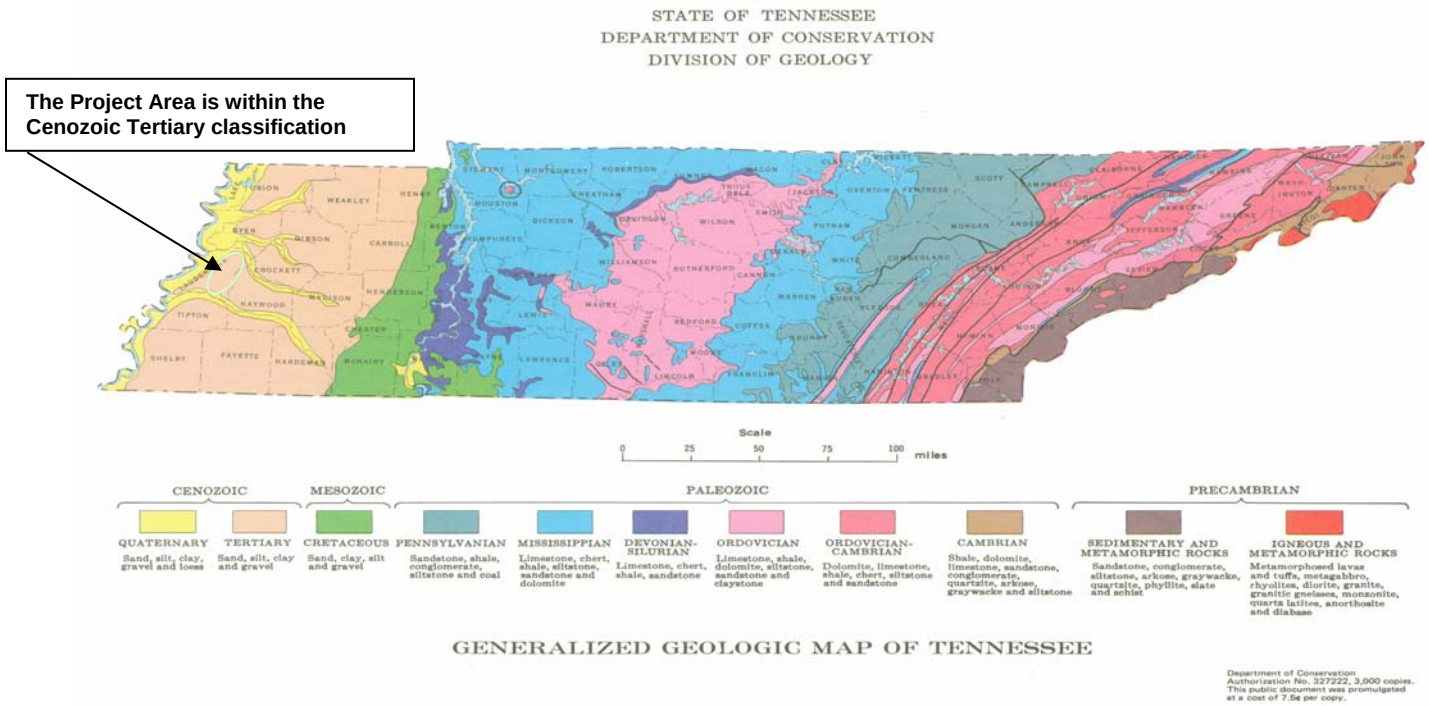
Until Pliocene time, Tertiary deposition in Tennessee was characterized by marine and non-marine sands, clays and silts, with sands being dominant. The clay, some present as lenses which may have formed in ponds or swamps, contains lignite and well-preserved leaf imprints, indicating nearby vegetated zones.

Any marine sediment that may have been deposited after Eocene time was removed by erosion. This gap in the sedimentary record includes the Oligocene and Miocene epochs of the Tertiary Period, and represents a span of about 24 million years. The deposits overlaying this unconformity consist of sand, silt, clay, and gravel that form a discontinuous cover over much of the Eocene sediments in West Tennessee. These sediments appear to be remnants of alluvial deposits of streams ancestral to the Mississippi, Ohio, Tennessee, and Cumberland Rivers and their tributaries. In many places these gravels merge with recently deposited alluvium, indicating continuous deposition by streams in the area.

As marine and non-marine sediments were being deposited in the Mississippi Embayment area, weathering and erosion were continuing uninterrupted in the middle and eastern regions of the state. During the Tertiary and Quaternary Periods the present Central Basin was formed after the resistant veneer of Fort Payne cherty rocks was breached by erosion. Once the underlying limestones were exposed, solutional removal of rock material became more rapid and erosion by streams continued to cut away the Fort Payne cap. Recent studies have shown that by chemical activity alone the Central Basin could have developed in less than 10 million years. If the abrasive action of stream erosion and gravity movements are added to this chemical activity, the basin could have been excavated in the last 6 million years.

The project area is not known to have any significant naturally formed geologic features such as caves or other structures. No sinkholes or other karst topographical features were identified. Refer to Figure 3.10 below for a generalized geologic map of Tennessee.

Table 3.10 - Geological Features of Tennessee



Soils According to the Lauderdale County Soil Survey (USDA 1990), the project is within the Memphis-Alder, Memphis-Loring, and Alder-Convent-Morganfield soils associations. The Memphis-Alder association has gently sloping to steep, well-drained, silty soils on the uplands, formed in loess; and nearly level, moderately well-drained, silty soils along narrow drainage ways formed in recent alluvium (USDA 1990). The Memphis-Loring association has gently sloping to steep, well-drained, silty soils and gently sloping to moderately steep, well-drained, silty soils that have a fragipans formed in loess (USDA 1990). The Alder-Convent-Morganfield association has well drained to somewhat poorly drained, silty soils formed in recent alluvium (USDA 1990).

The proposed project will potentially impact 17 soil complexes (Table 3.11).
According to the United States Department of Agriculture-National Resource Conservation Service Ripley field office, all 17 soil complexes are listed as highly erodible for Lauderdale County, Tennessee. In addition, eight (8) are listed as prime farm land. Five (5) of the soil complexes, Adler, Calloway, Convent, Dekoven, and Routon silt loams are identified on the national list of Tennessee's hydric soils by the USDA-NRCS.

Table 3.11: Soils Potentially Occurring within Crossover O4F Study Corridor

Mapping Unit	General Description	Prime Farmland	Hydric	Highly Erodible
Adler silt loam (Ad) 0 to 2 percent slopes Occasionally flooded	Deep, nearly level, and moderately well drained soils found on flood plains and drainage ways on loess uplands. Most areas are subject to occasional brief flooding in winter and early spring. Permeability is moderate.	Yes	Yes	Yes
Calloway silt loam (Ca)	Deep, nearly level and somewhat poorly drained soil on loess uplands and broad, loess-covered terraces adjacent to the floodplains of major streams. Permeability is moderate above the fragipan and slow in the fragipan.	Yes	Yes	Yes
Convent silt loam (Ct), 0 to 2 percent slopes Occasionally flooded	Deep, nearly level, and somewhat poorly drained soils found in low areas and depressions on the flood plains of streams that drain the loess. Most areas are subject to occasional brief flooding in winter and spring. Permeability is moderate	Yes	Yes	Yes
Dekoven silt loam (De), overwash, rarely flooded	Deep nearly level, and poorly drained soil. It has a very dark surface layer overlain by overwash material from steep uplands. They are found on benches adjacent to flood plains of major streams and are rarely flooded during periods of extremely heavy rainfall but are flooded by runoff from near by uplands.	Yes	Yes	Yes

Mapping Unit	General Description	Prime Farmland	Hydric	Highly Erodible
Grenada silt loam (GrB2), 2 to 5 percent slopes, eroded	Deep, gentle sloping and moderately well-drained on low, undulating loess uplands and broad, loess-covered terraces adjacent to flood plains of major streams. Permeability is moderate above the fragipans and slow in the fragipans.	Yes	No	Yes
Grenada silt loam (GrB3), 2 to 5 percent slopes, severely eroded	Deep, gentle sloping and moderately well-drained soils with a dense fragipans found on side slopes of low undulating, loess uplands and on broad, loess-covered benches adjacent to flood plains of major streams. Permeability is moderate above the fragipans and slow in the fragipans.	No	No	Yes
Grenada silt loam (GrC3), 5 to 8 percent slopes, severely eroded	Deep, moderately sloping and moderately well-drained soils on side slopes of low rolling uplands and broad, loess-covered benches. Permeability is moderate the fragipans and slow in the fragipans.	No	No	Yes
Loring silt loam (LoB3), 2 to 5 percent slopes, severely eroded	Deep, gentle sloping and moderately well-drained soils found on side slopes and lower ridgetops on undulating to rolling, loess uplands. They have a dense slowly permeable fragipan; permeability is moderate above the fragipan and slow in the fragipan.	No	No	Yes
Loring silt loam (LoC3), 5 to 8 percent slopes	Deep, moderately sloping, and moderately well-drained soils that are found on hillsides of rolling, loess uplands. They have a dense, slowly permeable fragipans at about 17 inches; permeability is moderate above the fragipan.	No	No	Yes

Mapping Unit	General Description	Prime Farmland	Hydric	Highly Erodible
Loring silt loam (LoD3), 8 to 12 percent slopes	Deep, strongly sloping, and moderately well-drained soils that are found on side slopes of hilly, loess uplands. They have a compact, slowly permeable fragipans at about 17 inches; permeability is moderate above the fragipan.	No	No	Yes
Memphis silt loam (MeB2), 2 to 5 percent slopes	Deep, gently sloping, and well drained soils found on long narrow ridgetops on steep, highly dissected uplands and broad, irregular ridgetops in less steep areas. They have a dense, compact fragipan in the lower part of the subsoil but a deep root zone that is moderately permeable to air and water movement.	Yes	No	Yes
Memphis silt loam (MeC2), 5 to 8 percent slopes	Deep, moderately sloping, and well drained on long narrow ridgetops on steep, highly dissected loess uplands and on broad, irregular ridgetops and some side slopes of rolling to hilly, loess uplands. They have a dense, compact fragipan in the lower part of the subsoil but a deep root zone that is moderately permeable to air and water movement.	No	No	Yes

Mapping Unit	General Description	Prime Farmland	Hydric	Highly Erodible
Memphis silt loam (MeD3), 8 to 12 percent slopes	Deep, strongly sloping, and well drained found on hillsides of dissected loess uplands. Rills and shallow gullies are in some places. They have a deep root zone that is moderately permeable to air and water movement.	No	No	Yes
Memphis silt loam (MeE3), 12 to 20 percent slopes	Deep, moderately steep, and well-drained soils found on the side slopes of long, branching ridges on highly dissected loess uplands. Rills and shallow gullies are common, and a few deep gullies are in some places. They have a deep root zone that is moderately permeable to air and water movement.	No	No	Yes
Memphis silt loam (MeF), 20 to 40 percent slopes	Deep, steep, well drained and found on side slopes of long, steep, branching ridges that have narrowed, gently sloping to moderately sloping tops. Woodland is the major use of these soils and if cleared the hazard of erosion will be severe. They have a deep root zone that is moderately permeable to air and water movement and available water capacity is high.	No	No	Yes, if vegetation cleared.
Morganfield silt loam (Mo), Occasionally flooded	Deep, nearly level, and well drained on the flood plains and in narrow drainage ways associated with loess uplands. Most areas are subject to brief flooding, mostly in the winter and early spring. Permeability is moderate and available water capacity is high.	Yes	No	Yes
Routon silt loam (Rt)	Deep, nearly level and poorly drained soil found on flats, divides, and around drainage heads on loess-covered uplands and on low flat terraces near major streams. Severe flooding can inundate lower areas adjacent to streams fro brief periods. Permeability is slow.	Yes	Yes	Yes

The above information is referenced from the USDA, Soil Conservation Service's *Soil Survey Book of Lauderdale County, Tennessee* (1990).

3.5 Natural Resources

3.5.1. Terrestrial Habitat

Seven floral habitats were identified within the I-69 proposed northern crossover project corridor. Following is a description of the identified habitats:

A. *Floodplain* (*Bottomland Hardwood*) *Forests*

Floodplain forests within the area were dominated by various ash, hickory, and oak, including willow oak and cherrybark oak. Cottonwood, cypress, sycamore, box elder, elm, sugarberry, sweetgum and maple are common also. Wetness and flooding in these areas limit the use of equipment in woodland management and timber harvest

B. *Agricultural Lands/Row Crops*

Agricultural crops within the proposed project corridor were cotton, soybeans, corn, tobacco, tomatoes and other vegetables. Croplands are frequently flooded until late spring, but typically dry out early enough for crops to be planted for a full harvest year. Many of the farmed areas have been drained and dammed to make them farmable.

C. *Residential/Developed Areas*

Residential/developed areas (areas developed for human use) within the project corridor held a variety of industrial plants and residential areas. Commercial and industrial sites held little or no vegetation, while lawns had a mixture of native and ornamental grasses, trees and shrubs.

D. *Emergent Vegetation Wetlands*

Emergent wetlands were identified within the project corridor area. Carex species, arrowheads, lizard's tail, bulrushes, spike rushes, and shrubs such as buttonbush and box elder often dominated these wetlands.

E. *Upland Woodlots*

Upland forested areas typically consist of mixed hardwoods. Various oaks, hickories, and yellow poplar were the dominant trees in wooded areas. Others included ash, maple, dogwood and elm.

F. *Pastures and Hay Fields*

Clovers, fescue and other grasses dominated the pastures and hay fields, with brambles and weedy plants taking hold in un-mowed areas.

G. *Riparian areas*

Riparian areas are the vegetated areas surrounding deep-water habitats contained within a stream channel. These areas consist mainly of named streams and rivers (Riverine) within the project corridor. Riverine systems typically have forest canopy and provide valuable wildlife habitat. Riparian areas serve various ecological functions, including protection of water quality and preservation of ecological balance to water bodies. Following is a description of riparian functions:

- Natural riparian vegetation features deep roots, which assist in preserving bank or shoreline structures as a barrier to the erosive capabilities of water by holding the soil together. Reducing erosion and sedimentation decreases the amount of sediment transferred to a body of water, which provides support in keeping fish spawning areas clear and facilitates water purification efforts. Riparian vegetation reduces the amount of sediment and nutrients that are transported in runoff by

physically trapping sediment in surface flow, and then using the nutrients in the subsurface flow.

- Riparian vegetation provides shade which regulates stream temperatures by controlling the amount of sunlight that reaches the stream. Fish typically prefer shaded streams for the cooler temperatures and the refuge provided by shade. In addition, fewer algae grow in shaded streams due to the limited amount of sunlight that regulates the photosynthetic process.
- Riparian vegetation is also a source of large, woody debris, which can provide shelter for fish and habitat for aquatic insects. The debris also traps sediment and helps create structures (pools, riffles and runs) in a stream, which are crucial in its ability to maintain aquatic life. Smaller debris is a source of food source for many aquatic organisms.
- Vegetation (i.e., plants, trees, grasses) within a riparian area can slow the above ground movement of water, and can cause sediment and attached nutrients to be deposited on the land before they can reach the stream channel. Riparian vegetation can also take up and remove some of the nutrients being transported through the water. Trees and deep-rooted shrubs and grasses use significant quantities of subsurface waters. These processes mean that riparian vegetation can influence underground water flows and the nutrients, salt or other contaminants that might enter streams by this route.
- Riparian vegetation is active in reducing stream velocity during high flooding, high rain and other situations that could cause accelerated erosion. Rapid erosion of the stream beds can lower the local groundwater table. Once the groundwater table is lowered, it is very difficult for plants that rely on large quantities of water to reestablish themselves.

As land conversion occurs within and near the project corridor, sensitivity to riparian areas and their functions should be demonstrated by local and regional planners.

Scale: 1" = 4000'

Begin Alternative
Node K

Node E

Alternative R

Node W

Former Alternative G

Alternative O4F

= Forested Land Use

= Urban Land Use

= Agricultural Land Use

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

FIGURE 3.2

LAND USE AND FORESTED AREAS

ALTERNATIVE 04F

Lauderdale County, Tennessee

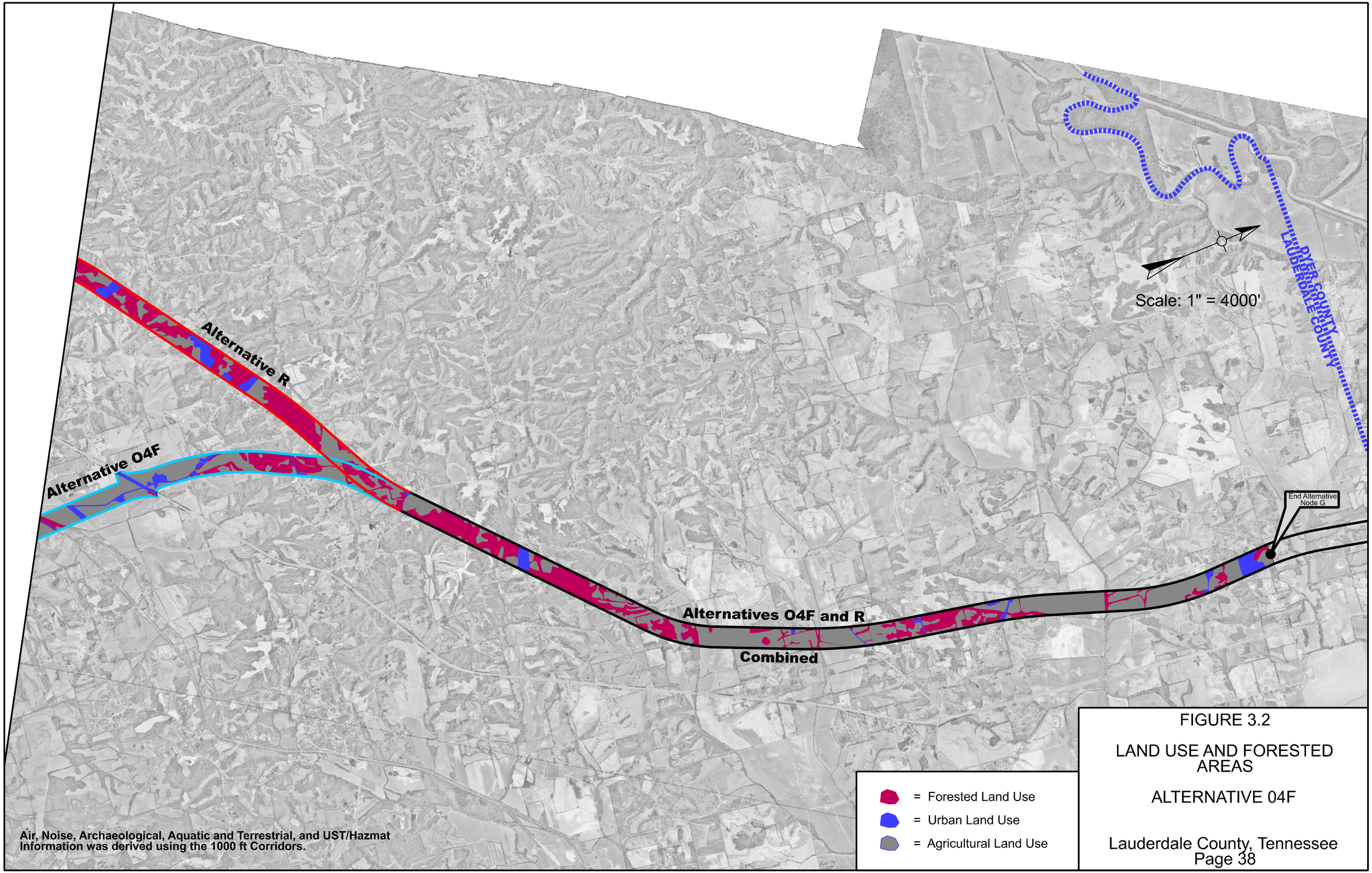


FIGURE 3.2

LAND USE AND FORESTED AREAS

ALTERNATIVE 04F

Lauderdale County, Tennessee

3.5.2 Aquatic Resources Impacts
Surface Waters (Stream) Impacts

During the field investigation 40 streams in the corridor were assessed for physical characteristics and quality, and were sampled for macroinvertebrates, fish and mussels. Following are descriptions of aquatic resources that coincide with the Alternative O4F corridor:

A. Groundwater

Many rural residents access aquifers through private wells and springs as their water supplies, although there is good coverage from municipal water supplies. Municipal supplies often rely on groundwater as well. Wellhead Protection Areas occur within the project corridor.

Wellhead protection areas are those surface and subsurface areas, which contribute water to a community public water supply system production well or well field and through which contaminants are likely to move and reach the well within a specified period (US EPA, 1987).

Wellhead protection areas in Lauderdale County are in the towns of Gates, Halls, Ripley, Henning, Central, and in the areas of Ripley North. In Gates, there is a wellhead protection area at about 35° 50'30" N and 89° 24' W, just west of SR 209/210. A wellhead protection area is located in the town of Halls at 35° 53' to 35° 52' N and 89° 23' 30" W off SR 210. Just north of Ripley, there is a wellhead protection area at 35° 45' to 35° 44' 30'' N and 89° 32' W off SR 209, near the Canadian National/Illinois Central Railroad. Another is located in the Ripley North region east of SR 208 off either Sutton or Voss Rd. at 35° 49' N, 89° 31'30" W. At or near the town of Henning off SR 87 is a wellhead protection area at 35° 41' 30" N and 89° 34' 30" W off SR 87, near the Canadian National/Illinois Central RR. Another is east of the town of Central at 35° 48" N and 89° 31' 30" W.

B. Jurisdictional Wetlands

The U.S. Army Corps of Engineers (USACOE) defines wetlands as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated conditions. For the USACOE to classify an area as a jurisdictional wetland under Section 404 of the Clean Water Act, the following conditions must be present: 1) Area must contain a dominance of vegetation adapted to growth in low-oxygen soils (i.e., hydrophytic vegetation); 2) have soils that have developed over time in a low oxygen environment (i.e. hydric soils); and 3) have hydrology that saturates or inundates the soil for a required percentage of the vegetative growing season. The proposed project is located within the jurisdiction of the Memphis District of the U.S. Army Corps of Engineers.

Hydrophytic vegetation consists of plants typically adapted to life in areas permanently or periodically inundated or saturated by surface or ground water. Vegetation found in a wetland may consist of more than one plant community. Although many factors influence the presence and character of hydrophytic vegetation, hydrologic factors exert an overriding influence on the plant species that occur in wetlands.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper portion. A hydric soil may be drained or non-drained, and a drained hydric soil may not continue to support hydrophytic vegetation. Therefore, not all areas having hydric soils will qualify as wetlands. Hydric soil is referred to as a "wetland soil" in areas where it supports hydrophytic vegetation and has additional wetland indicators.

Wetland hydrology includes all hydrologic conditions that cause an area to be periodically inundated or saturated to the degree that other wetland characteristics develop.

Wetlands dominated the ecological studies for the proposed project. Large bottomland hardwood wetland complexes associated with the Hatchie and Forked Deer Rivers and related tributaries were identified and delineated in accordance with the 1987 Army Corps of Engineers Wetland Delineation Manual. Smaller isolated wetlands and emergent wetlands associated with farm ponds were not as common as the large complexes, but did occur. All potential wetland sites were delineated in accordance with the "1987 Army Corps of Engineers Wetland Delineation Manual." Routine Wetland Determination Data Forms were completed in the field for each potential jurisdictional wetland except those areas that contained obvious lacustrine or riverine systems, or palustrine unconsolidated bottom. These areas included sites such as farm ponds, creeks and rivers.

Palustrine Forested Wetlands are commonly known as swamps and are covered by persistent trees greater than 20 feet tall. Forested swamps within the area consist of bottomland hardwoods. These wetlands consist of broad-leaved deciduous trees such as hickories, ash, sycamore, and cottonwood. Bald cypress also commonly occurs. Most of the bottomland hardwood forest within the project area is considered palustrine-forested wetland.

Emergent wetlands are dominated by erect, herbaceous vegetation and often appear as stands of rush and sedge growth. These areas occur typically between open waters and uplands. They may occur at edges of ponds, streams and lakes.

Riverine/Lacustrine Wetlands
Riverine/lacustrine and unconsolidated bottom wetlands are those areas of open waters in the project area. These include lakes, ponds and streams.

3.5.3 Federally-listed and Proposed Threatened and Endangered Species
Early coordination with U.S. Fish and Wildlife Service, TDEC, TWRA and the Chickasaw National Wildlife Refuge indicated that no federally endangered species are known to occur within the project impact area. A table which includes federal and state listed species is included below.

3.5.4 State-listed Rare Species
TDEC, TWRA and the Chickasaw National Wildlife Refuge were contacted for information concerning potential impacts to federal and state threatened and/or endangered species within the project area. No state-listed or rare species are known to occur within the project area.

Following is a list of rare species which are known to occur in this area of Tennessee. Biologists conducted a field survey of the corridor and did not find suitable habitat or species within or near the 1000-foot corridor.

Table 3.12 - Federal and State Listed Species with the potential to occur or known to occur within the I-69, Segment of Independent Utility #8, Crossover Corridor Study, Lauderdale County, Tennessee.

Species/Habitat	Agency Reporting	Status
Hatchie River	USEPA, TDEC	State- Natural River Area- swamp river
Bald Eagle *Haleaeetus leucocephalus*	USFWS, TDEC	Federal – Delisted 07/09/2007 as reported in Federal Register, Vol 72, No. 130. State – Deemed in need of management. The bald eagle will also continue to be protected by the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act.
Interior Least Tern *Sterna antillarum athalassos*	USFWS, TDEC	Federal and State listed Endangered
Red Starvine *Schisandra glabra*	TDEC	State – Threatened
Blue Sucker *Cycleptus elongatus*	TDEC, TWRA	State- Threatened
Southern Hickorynut *Obovaria jacksoniana*	TDEC	State – No status
Striped Whitelip (=t. Webbhelix *Triodopsis multilineata*	TDEC	State – No status
Southern Rainbow *Villosa vibex*	TDEC	State – No status
Lake Cress *Neobeckia aquatica*	TDEC	State – Special Concern
Cedar Elm *Ulmus crassifolia*	TDEC	State – Special Concern
Creeping Spot-flower *Acmella oppositifolia*	TDEC	State – Special Concern
Heavy Sedge *Carex gravida*	TDEC	State – Special Concern
Tissue Sedge *Carex hyaline*	TDEC	State – Special Concern
Featherfoil *Hottonia inflate*	TDEC	State – Special Concern
Louisiana Broomrape *Orobanche ludoviciana*	TDEC	State – Special Concern
Ovate-leaved Arrowhead *Sagittaria platyphylla*	TDEC	State – Special Concern
Plains Minnow *Hybognathus placitus*	TDEC	State – Deemed in need of management
Alligator Gar *Lepisosteus spatula*	TDEC	State – Deemed in need of management
Cerulean Warbler *Dendroica cerulean*	TDEC	State – Deemed in need of management
Great Egret *Ardea alba*	TDEC	State – Deemed in need of management

Species/Habitat	Agency Reporting	Status
Little Blue Heron *Egretta caerulea*	TDEC	State – Deemed in need of management
Anhinga *Anhinga anhinga*	TDEC	State – Deemed in need of management
Mississippi Kite *Ictinia mississippiensis*	TDEC	State – Deemed in need of management
Swainson's Warbler *Limnothlypis swainsonii*	TDEC	State – Deemed in need of management

3.5.5 Invasive Species

Next to habitat loss, invasive species are a considerable threat to native ecosystems. Exotic invasive plants are those that have evolved within one ecosystem and were introduced, either intentionally or accidentally, to another ecosystem. Because they evolved elsewhere, they encounter few or no natural control mechanisms in their new location, allowing them to spread easily and quickly. As they spread, invasive plants disrupt available nutrients, occupy space, and out-compete native plants. Some exotic species introduce pathogens or insects that can devastate the native ecosystem, although the exotic is relatively immune to its effects. Other exotic plants, such as leafy spurge (*Euphorbia esula*), may be poisonous to wildlife or livestock. Typically, exotic invasive plants offer native wildlife only inferior nutrition, and inadequate nesting habitat or shelter, placing them at risk for extinction or extirpation. All of these changes alter the ecosystem, oftentimes dramatically and negatively. A severely altered ecosystem is incapable of functioning adequately and can no longer supply the necessary goods and services upon which humans depend.

Invasive plants identified in the project area include the following; Japanese honeysuckle (*Lonicera japonica),* Japanese grass (*Microstegium vimineum),* mimosa/silk tree *(Albizia julibrissin),* kudzu *(Pueraria montana1),* chinese privet *(Ligustrum sinense) and* common privet *(Ligustrum vulgare),* multiflora rose *(Rosa multiflora),* princess tree *(Paulownia tomentosa),* tree-of-heaven *(Ailanthus altissima),* poison hemlock (*Cicuta maculata),* Queen Anne's lace (*Daucus carota),* lady's-thumb (*Ploygonum persicaria),* paper mulberry (*Broussonetia papyrifera),* ground-ivy (*Glechoma hederacea),* Cocklebur (*Xanthium strumarium),* bull-thistle (*Cirsium vulgare),* Canada thistle (*Cirsium arvense),* ox-eye daisy (*Chrysanthemum leucanthemum),* meadow fescue and tall fescue *(Festuca arundinacea).*

Field surveys noted the presence of several exotic terrestrial species. Included in these observations were Asian clams (*Corbicula fluminea)* and starlings (*Sturnus vulgaris*), an exotic bird species. Other exotic organisms, including fish species, are likely to be present in the project area. However, field surveys did not reveal their presence.

3.6 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by the Council and referred to as "Protection of Historic Properties" (36 CFR Part 800).

Surveys of potential historic/archaeological sites were performed pursuant to the Section 106 guidelines outlined in 36 CFR 800. The purpose of these studies was to determine the presence of resources listed, or eligible for listing, in the National Register of Historic Places (NRHP) within the Area of Potential Effect (APE). The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

The NRHP criteria of eligibility outlined in 36 CFR 63 were applied to all surveyed resources. Those criteria are as follows:

- Criterion A – Sites that are associated with events that have made an important contribution to the broad patterns of our history; or
- Criterion B - Sites associated with the lives of persons of considerable importance in our past; or
- Criterion C – Sites that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a noteworthy and distinguishable entity whose components may lack individual distinction; or
- Criterion D – Sites that have yielded, or may be likely to yield, information important in history or prehistory.

Provided below are summaries of the findings of this analysis. Please refer to Chapter 5 for a summary of Section 106 coordination.

3.6.1 Architectural/Historic Resources

Pursuant to 36 CFR 800.4 which requires the agency to identify historic resources near its proposed projects, the Department completed an architectural and historical survey of the Interstate 69 project area in 2002. The SDEIS addresses the areas associated with Alternative O4F that were not covered in the 2002 survey including the communities of Curve and Flippin, which are within the new study corridor area. The Area of Potential Effects (APE) for the Architectural/Historic Resources is substantially larger than the 1,000 foot corridor used to assess the other environmental areas of concern for this project. The viewshed of historic properties often extends well beyond their boundaries and is often an important contributing element to their historic significance. Therefore, projects which alter the landscape drastically, including highway construction, must take into account the surrounding viewshed when determining the APE. A field inspection of the project area was conducted to help to establish the APE, which include the geographic areas within which the project could directly or indirectly cause changes in the character or use of historic properties. The APE for this project includes the 1,000 foot corridor that encompasses the driving lanes, median, shoulders and associated property. The APE also includes areas within the nearby viewshed of the project, and areas with potential noise and atmospheric impacts that extend to a maximum of 675 feet from the centerline of Alternative O4F. See Page 45, Figure 3.3.

Within the crossover alignment project area, a total of 28 properties were surveyed. An additional 60 properties were noted but not surveyed. These 60 properties were not impacted directly or visually. Four previously surveyed and seventeen previously noted properties were revisited and reviewed for any changes or alterations occurring since the 2002 survey. One of the previously surveyed properties was the James A. Langley House (LA-27) which was determined to meet National Register criteria in 2002. The appearance of this property has not been changed in the past five years and continues to meet National Register criteria. This property is located to the west of Curve and is

approximately 0.4 miles from the preliminary route of the proposed crossover alignment O4F. Due to the distance and intervening topography, it was concluded that the preliminary route of the proposed crossover alignment would have no adverse effects to the James A. Langley House. With the exception of the James A. Langley House, it is the opinion of the Department, that none of the other properties surveyed or resurveyed for this project meet the criteria of the National Register. The communities of Curve and Flippin were both reviewed and assessed for their potential to meet National Register criteria as a historic district. Due to the presence of post-1957 buildings and changes and alterations to the late 19th and early 20th century properties, it is the opinion of the Department, that neither community possesses sufficient integrity or continuity to meet historic district criteria. The SHPO concurred with the no adverse effects finding to the Langley House and the conclusions of the report on April 1, 2008. The SPHO letter is included in Appendix A.

STUDY AREA

O4F

Langley House Site

N
E
S
W

Alternative G Corridor
Alternative G R/W
Alternative O4F Corridor
Alternative O4F R/W
Alternative R Corridor
Alternative R R/W
StudyCorridor

FIGURE 3-3, Page 45

3.6.2 Archaeological Resources

Investigations were conducted in June 2007 to provide information on the distribution of important archaeological properties within the project area. This information was used to make informed management decisions relating to the design and construction of the Northern Crossover for I-69, SIU 8 in Lauderdale County, Tennessee. Approximately 3.7 miles of the project area features high-probability areas, meaning that the potential for archaeological resources greater.

A literature and records search for the areas surrounding the proposed crossover Alternative O4F was conducted. This part of the investigation addressed three objectives; (1) to identify all previously recorded archaeological and historical properties within the study area; (2) to develop an environmental, cultural and historical context for the study area, and; (3) to develop a model to predict site locations within the various topographic regions included within the study area.

In addition to the records search a systematic pedestrian survey of the high-probability areas was conducted for archaeological resources within the Crossover O4F alignment area. Goals and methods employed during the pedestrian survey were based upon criteria outlined in the *Scope of Work for TDOT Phase 1 Archaeological Assessments* (Kline 1999). The objective of the survey was to identify and record all cultural resources within, or adjacent to, the proposed highway corridors that are listed, eligible for listing, or potentially eligible for listing on the NRHP pursuant to criteria set forth in 36 CFR 60.4.

The results of the surveys included a total of 2 new sites being identified within, or adjacent to the proposed alternatives, and 19 previously recorded sites were re-visited during the study. Please refer to Chapter 4 for a detailed description of sites impacted by the various proposed Build Alternatives.

Additional archaeological investigations, referred to as Phase II, might be necessary for two isolated finds if alignments are shifted. Every effort should be made to continue to avoid the sites. These sites have been included in the technical study, but will not be disclosed in this document. These investigations will make recommendations for each recorded site's eligibility for inclusion in the NRHP.

3.7 Recreational Resources

Field trips and conversations with local officials were conducted to determine if any recreational parks or other facilities were located within or near the project. No recreational facilities will be acquired, separated or otherwise impacted if Alternative O4F is selected as the build alternative for this portion of I-69.

3.8 Visual Resources

The northern crossover project area is located within Lauderdale County in western Tennessee and roughly parallels the Mississippi River. The length of the project requires several different landscape units, or geographic areas, to fully detail the existing landscape's visual character. The north part of the project, above the Hatchie River, has gently rolling hills. The South Fork of the Forked Deer River runs through the north part of the project and drains into the Mississippi River. Wetlands and marshes are very common in this area with seasonal flooding occurring in the winter months as part of the floodplain system linked to the Mississippi River. The vegetation in this area is a mix of

deciduous trees and agricultural land use of cotton fields and pasture. Residential areas are sparsely mixed with agricultural farm use. The residential areas, along with limited shopping and commercial areas are located adjacent to towns on U.S. 51.

The south part of the project, below the Hatchie River, is flatter with minimal rolling terrain. This area is also not as prone to flooding as the northern part of the project. However, wetlands are still a part of this terrain. Vegetation is predominantly agricultural crops and pastureland. Residential areas are larger and more densely located through the southern half of the project. Additionally, commercial and industrial areas are more common.

The visual quality of the existing landscape is generally appealing. The viewshed along U.S. 51 is of a typical highway that passes through areas of residential and commercial development along with areas of agricultural land use. The visual landscape away from U.S. 51 is more rural with fields of cotton and other agricultural crops.

There are numerous highway viewers throughout the project area. There are a high number of viewers with a view from the road, including local and commuter traffic. These groups are generally on the road daily and view the landscape while driving their vehicles. The number of viewers of the road, such as residents and commercial and industrial facilities vary from low to high throughout the project area depending on if they are located in a town or agricultural area. The groups with a view of the road in town will have a view with heavier traffic. The view of the road in an agricultural area will have less traffic with higher speeds.

3.9 Air Quality

An air quality analysis was performed to determine if this section of the proposed Interstate 69 Northern Crossover in Lauderdale County could contribute to decreased air quality within the project area by exceeding the National Ambient Air Quality Standards (NAAQS). The U.S. Environmental Protection Agency (EPA) has identified seven air pollutants of national concern including carbon monoxide (CO), nitrogen oxides (NOx), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur oxides (SOx), and lead (Pb). The FHWA requires modeling of CO to determine concentrations and compare with the NAAQS. Please refer to Table 3.13 on page 48 for the above-described NAAQS criteria.

Mobile Source Air Toxics Impact (MSAT). Mobile Source Air Toxics impacts, as defined by the FHWA Interim Guidance on Air Toxics Analysis (February 3, 2006) are now required in NEPA documents. MSAT impacts have been analyzed for Alternatives R and O4F between Nodes K and G, and are included in Appendix B.

Table 3.13 National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Period	National Standards	
		Primary	Secondary
Ozone	1 Hour[1]	0.12 ppm (235 ug/m^3)	Same as Primary
	8 Hour[2]	0.08 ppm (157 ug/m^3)	Same as Primary
Carbon Monoxide	1 Hour[3]	35 ppm (40 mg/m^3)	Same as Primary
	8 Hour[3]	9 ppm (10 mg/m^3)	Same as Primary
Nitrogen oxide	Annual Average	0.053 ppm (100 ug/m^3)	Same as Primary
Sulfur Dioxide	Annual Average	80 ug/m3 (0.03 ppm)	None
	24 Hour[3]	0.14 ppm (365 ug/m^3)	None
Suspended Particulate Matter (PM_{10})	24 Hour[4]	150 ug/m^3	Same as Primary
	Annual Arithmetic Mean	50 ug/m^3	Same as Primary
Suspended Fine Particulate Matter ($PM_{2.5}$)	24 Hour[4]	65 ug/m^3	Same as Primary
	Annual Arithmetic Mean	15 ug/m^3	Same as Primary
Lead	Quarterly Mean	1.5 ug/m^3	Same as Primary

Sources: U.S. EPA, "National Primary and Secondary Ambient Air Quality Standards" (49 CFR 50) Monitoring Report. Abbreviations: ppm – parts per million, ug/m^3 – micrograms per cubic meter, mg/m^3 – milligrams per cubic meter.

[1]Applicable to current Non-attainment areas until such areas meet the standard for three consecutive years.

[2]New Standards effective September 16, 1997.

[3]Not to be exceeded more than once a year per site.

[4]Relaxed National Standard. The number of days with hourly levels greater than the standard are not to be exceeded more than once per year.

Section 107 of the 1977 Clean Air Act Amendment requires the EPA to publish a list of geographic areas in compliance with the NAAQS. Lauderdale County is with the Western Tennessee Interstate Air Quality Control Region, which is in attainment for all criteria pollutants.

3.10 Existing Noise Levels

A noise impact analysis was conducted for the proposed project in accordance with the methodology outlined in 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise,* as well as guidelines developed by TDOT. This study identified noise sensitive sites adjacent to all Build Alternatives.

The FHWA Noise Abatement Criteria (NAC), provided in 23CFR 772, are outlined in this document in Table 3.14 on the following page. The purposes of the NAC for highway projects are to minimize any potential adverse effects resulting from noise related to the operation of the facility and, where appropriate, to provide reasonable and feasible noise control. More specifically, the NAC are thresholds for considering abatement measures.

Table 3.14 FHWA Noise Abatement Criteria Hourly A-Weighted Sound Levels

Land Use Category	L_{eq}	Description
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in categories A and B above.
D	---	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source :FHWA, 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, FHWA, USDOT, April 1992

Field measurements were taken at representative sites throughout the project area, located at or near existing areas of human use. These measurements were made at varying times with the majority of the readings occurring between 6:30 and 9:30 am or between 3:30 and 6:30 pm. Local industry and commercial work times dictated peak traffic hours. However, the predominately agricultural land use throughout the project area created traffic on local roads throughout the day traveling between farms during typically off-peak traffic times. Field measurements for all sites were conducted during clear and dry weather conditions. The existing (ambient) noise levels were documented to establish baseline conditions for comparative reasons, as well as to calibrate the prediction model.

A total of 5 sensitive receptors were measured for Alternative O4F and included in the model, with all receptors in Land Use Category B and were either occupied residential properties or churches (See Figure 3.4 on the following page for a map of the noise receptor locations). Category B, which includes picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, schools, churches, libraries and hospitals, has a Noise Abatement Criteria level of 67 dBA L_{eq}. Existing noise levels ranged from 43 to 65 dbA L_{eq} for all sites. No sites were found to have existing conditions above their respective NAC threshold levels. Please refer to Table 3.15, below, for a summary of receptors.

Table 3.15 Noise Receptors

Site	Build Alternative	2007 Field Measured Existing**	Design Year Noise Levels 2003 No-Build	Design Year Noise Levels 2030 Build	Number and Type of Sensitive Receptors Represented†
1	O4F Crossover	51	53	56	1
2	O4F Crossover	51	51	60	1
3	O4F Crossover	52	52**	58	1
4	O4F Crossover	53*	53**	60	3
5	O4F Crossover	55*	55**	62	3

*Field Measured Existing Levels at these receptors were primarily the result of ambient noise.
**The Field Measured Existing level is used when it is greater than modeled No-Build or Build levels.
†Sensitive receptors are residences unless otherwise indicated.

Scale: 1" = 4000'

Begin Alternative Node K

Node E

Node W

R-15

R-16

R-13

Alternative R

R-12

R-11

R-63

R-64

Former Alternative G

NR 1

NR 2

Alternative O4F

US 51

SR 19

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

FIGURE 3.4

Noise Receptor Locations

Alternative
Development Options for I-69
Segment of Independent Utility #8
Crossover Corridor Study
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R-8

R-9

Alternative R

NR 3

NR 5

Alternative O4F

NR 4

R-7

Alternatives O4F and R

Combined

R-5

R-4

End Alternative Node G

Scale: 1" = 4000'

RYER COUNTY LAUDERDALE COUNTY

US 51

SR 209

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

FIGURE 3.4

Noise Receptor Locations

Alternative
Development Options for I-69
Segment of Independent Utility #8
Crossover Corridor Study
Lauderdale County, Tennessee
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3.11 Hazardous Materials/Underground Storage Tanks

A Phase I Environmental Site Assessment (ESA) report was conducted in accordance with the scope and limiting conditions set forth in the American Society for Testing and Materials (ASTM) practice 1527-05. Recognized environmental conditions (RECs) were identified for properties located in the approximate corridor of the proposed Interstate 69, Segment of Independent Utility #8, Crossover Corridor Study, Lauderdale County, Tennessee from SR 19 to Double Branches Creek.

Within this refined alignment, Alternative O4F was examined for the environmental phase: O4F originates at Node K, just north of the Hatchie River and proceeds north to merge with the previously described Alternative R at Node G in northern Lauderdale County. See Figures 4.2 and 4.3 on pages 76 and 77 for the location of potential hazardous materials within the proposed crossover alternative O4F.

The findings, conclusions, and environmental professional opinions in the Phase I ESA report result from a review of environmental regulatory records; historical research; interviews with land owners and interested parties in July and August 2006; and ESA observations conducted in June, July, and August 2006; and February and July 2007.

The goal of the Phase I study was to determine the potential presence of aboveground storage tanks (ASTs) and underground storage tanks (USTs); hazardous wastes or hazardous materials; solid and special wastes; areas that could pose a threat to human health and/or the environment; and areas that might potentially impact the project. The findings and conclusions were utilized to determine the possible need for Phase II ESAs based upon which alternative, if any, is selected.

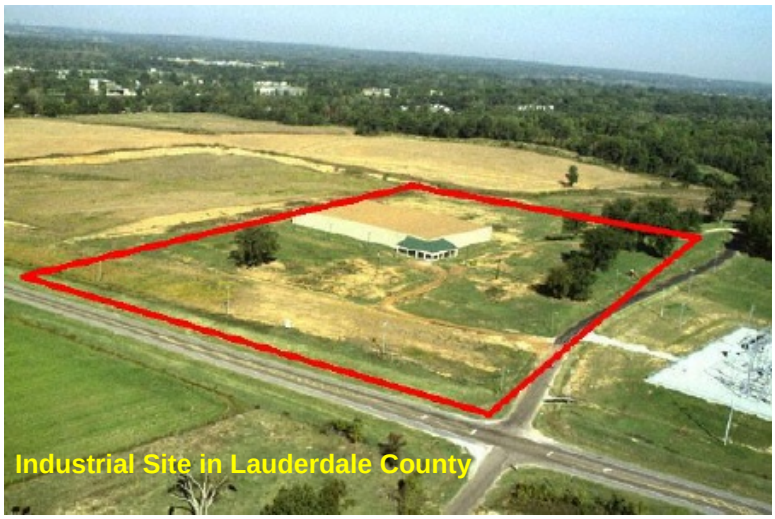
The state and federal database search, conducted by FirstSearch Technology Corporation in June 2006, identified 214 properties and businesses with environmental records within the zip code of the project area. Of these, six (6) are located within or near the corridor. After a thorough review of the files and an exhaustive onsite field reconnaissance and literature search, it was determined that one (1) site identified in the database and eight (8) not identified in the database were of potential environmental concern. Of the nine (9) sites, three (3) sites were identified as having *recognized environmental conditions* in connection with the subject alternatives. Three (3) sites were identified as having a high potential for environmental impacts, two (2) sites have a medium potential for environmental impacts, and four (4) sites have a low potential for environmental impact to the project. Only one site was located within the Alternative O4F corridor, Described in Section 4.12, page 74, the results of this investigation indicate the potential for environmental impact to the project as high for one site.

4.0 ENVIRONMENTAL CONSEQUENCES

The areas of new study and impacts will be discussed in detail in Chapters 3 and 4. Comparisons of impacts will include everything between Nodes K and G (K-E-G for Alternative R and K-W-G for Alternative O4F). As mentioned in Chapter 3, the areas of study for all concerns were the 1000-foot corridor except for Cultural Historic impacts, which are shown on Figure 3.3 on page 44.

4.1 Land Use Impacts

The construction of the project will result in the conversion of primarily agricultural and forested land into highway right of way. Scattered residential areas in the area will also be converted into highway right of way. The proposed interchanges are likely to result in a conversion of existing land uses into commercial highway developments including gasoline stations, convenience stores, fast food restaurants and motels. These interchanges within the Alternative O4F study area are:


Industrial Site in Lauderdale County

- US 51 south of Henning.
- SR 87 east of Henning.
- SR 19 east of Ripley.
- US 51 north of Ripley.
- SR 88 west of Halls.

The interchange with State Route 87 will provide access to Henning. The interchange with State Route 19 and the two with U.S. 51 will allow easier access to commercial and industrial areas in Ripley and improve access to Ripley and Henning. The interchange at State Route 88 will provide access to Halls and northern Ripley.

4.2 Community Service Impacts

4.2.1 Schools

The proposed interstate will allow through access for unimpeded travel along major intersecting roads, particularly bus routes; however, interchanges will not be built at all crossroad locations. Accessibility to and from schools should improve with implementation of I-69 as well as safety conditions due to less traffic on the heavier traveled corridors. US 51 and SR 19 carry most truck traffic to and from industrial locations; Lauderdale County High School, Lauderdale County Middle School, Lauderdale County Vocational School, and Ripley Elementary are located along or adjacent to US 51, SR 19, and SR 209. Interstate 69 may divert truck traffic and

commuting travelers away from several Lauderdale County Schools and away from bus routes.

4.2.2 Fire and Police

The proposed project will not have direct impacts on police and emergency services since none of the facilities are located in or adjacent to any of the proposed alternatives. The proposed I-69 will provide through access for those traveling the major intersecting roads; however, interchanges will not be built at all intersecting roads. No existing routes used by emergency vehicles will be eliminated by the facility.

As a direct impact, reduced emergency response times for police and emergency service vehicles will result. The proposed facility will allow these vehicles to travel unimpeded at high speeds and through less congested areas, increasing safe travel for both emergency service vehicles and the general public.

In addition, the new interstate will assist emergency personnel if natural disasters and/or large scale emergency situations should occur. The benefits would be realized if evacuations are necessary by allowing area residents to travel at higher speeds to safe locations.

4.2.3 Hospitals

The project will assist congestion relief on US 51 and provide a direct route to other hospitals, particularly in Shelby County, for more intensive treatments. Baptist Memorial Hospital of Lauderdale County is located adjacent to US 51 (to the west of the crossover alternative study area). None of the services provided by Baptist Memorial Hospital will be impacted or impaired by the proposed alternative.

4.2.4 Utilities

No long-term utility impacts are anticipated. However, temporary service disruptions may result during project construction. Alternative O4F crosses an electric transmission line near Country Club Road. Utility relocation will require coordination with local service providers.

4.3 Social and Economic Impacts

4.3.1 Relocations and Displacements

Residential Relocations

Alternative O4F would result in residential relocations. The relocations are scattered throughout the entire study area, but are mostly along roads. An estimate was conducted in April 2007, and reported that the new section of Alternative O4F will require 20 family relocations, and when combined with the relocations between Nodes K and G, a total of 53 relocations would be required. No cemeteries, schools, or churches will be affected by either alignment.

The potential relocatees consist of individuals, families with children, and married senior adults. The majority of residential structures are owner-occupied, frame, brick, or pre-manufactured homes on foundations; a few mobile homes may require relocation. A balance exists between homes within a range 10 to 40 years of age and new homes that appear to have been built since the 2000 Decennial Census. Additional new homes are planned for construction, which is ongoing.

Based on available information and field reconnaissance, some minority and low-income residences are likely to be relocated. Long term negative impacts are not expected to result from the relocations. The proposed interstate will help offset any lost property tax revenue by bringing new commerce and growth to the area.

Most of the families will be able to relocate to a different location on the same property or to a nearby property. The displaced residents' needs can be addressed without any undue hardship.

The types of homes to be acquired will include frame, brick, and mobile home dwellings, ranging in price from $10,000 to $250,000. All of the homes appear to be two (2) to three (3) bedroom units.

As previously mentioned, an even number of older dwellings in fair to good condition and newer dwellings in good to excellent condition exist within and near the project corridor. The ages of the homes range from one (1) to 40 years. The following further describes the types of potential dwellings to be displaced.

- Number of residential displacements: 53 between Node K and G.
- Ratio of owners to renters: 75% owners/25% renters.
- Income ranges of residential displacements: $10,000 to $75,000.
- Tenure of households to be displaced: 90 days to 40 years.
- Percentage of minority residences being displaced: 30%-50%.
- Percentage of elderly residences being displaced: 20%-40%.
- Percentage of residences with five (5) or more family members: 30%-50%.
- Number of disabled residential occupants for whom special relocation services may be necessary: none.

Residents who will be relocated are expected to remain near their existing residences or communities along the project, or in Ripley. No adverse environmental effects to areas where the displaced residents may move to are anticipated if adequate time (12 months) is allowed for the market to absorb the displacements. The following further describes the properties available for the displaced residences.

- Estimate of the distance from the project to crossroad clusters with the nearest available replacement housing: less than ¼ mile.
- Makeup of neighborhoods/crossroads into which displacees will likely relocate: Most will be able to relocate within the same community. Race and ethnic composition will remain the same, even if relocatees choose to move to another neighborhood within Ripley. No residences are expected to lose accessibility to a community facility.
- Conversations with governmental officials, potentially affected residents, other citizens in the area, business owners, and a local realtor were all positive. There do not appear to be any general and/or specific long-term, adverse impacts due to the relocation of residences.

- Additional projects that could compete with the I-69 SIU #8 project for housing are not known to be planned for this area; therefore, no significant relocation problems are anticipated during months leading up to the project.
- No specific financial or incentive programs are available for displacees other than those provided under the Uniform Relocation Assistance and Real Property Acquisition Act of 1970.

Business Displacements

No businesses were identified within the project corridor that will require relocation. A Veterans of Foreign Wars (VFW) hall is still active; however, there is land available in the immediate area for relocation of this non-profit organization.

Availability of Replacement Property

The real estate market in the crossover area indicates that ample replacement sites and dwellings exist within the financial means of the potential displacees. Very few of the residences that may be displaced are mobile homes; some are brick or frame, while others are prefabricated.

Relocation Assistance

TDOT assures that those impacted by relocation would be offered decent, safe, and sanitary housing within their financial means. Within a reasonable period of time prior to displacement, a comparable replacement dwelling would be available or provided for displaced individuals and families who are initial occupants, or an adequate replacement dwelling would be available or provided for subsequent occupants. TDOT's Relocation Program is adequate to provide orderly, timely, and efficient relocation of persons displaced by this project. The following statistics provide information on real estate market conditions within the project area:

- There appears to be sufficient, safe, decent, and sanitary replacement housing available to residents who would be displaced, and they will not experience financial hardships in the relocation process; this was confirmed through visits to the project area, reviews of home buying guides, and census data research. During a June 2007 field survey, several homes were identified that appeared to have been built between the 1960s and the present. These homes were valued within the same price range as the displaced residences. Additional available land was for sale. Housing costs and land, including mobile homes, typically start in the $10,000 range.
- There are 53 owner-occupied and renter-occupied units with the potential to be acquired. It is expected that all 53 units are in the two (2) to three (3) bedroom range and range price between $10,000 and $300,000. The following table provides a more detailed breakout of homes within value ranges.

Table 4.1 – Values and Totals of Available Homes

Value Ranges of Homes	Total Number of Homes
Less than $25,000	4
25,000 to 49,999	4
50,000 to 74,999	10
75,000 to 99,999	7
100,000 to 199.999	22
200,000 to $500,000 (or higher)	6

- According to www.realtor.com (September 2007), 171 residences were for sale in Ripley. A total of 33 were listed between $10,000 and $50,000; 80 were listed between $50,001 and $100,000; 31 were listed between $100,001 and $150,000; 15 were listed between $150,001 and $200,000; and 12 were listed above $200,001. Although additional homes are listed through other outlets, these numbers of homes per price range are representative for Lauderdale County.
- Conversations with a local realtor indicated that the real estate market has been stable for the last 5 years; on average, homes have been selling for their listing prices. The realtor expects the future market to maintain this level of activity for the next 5 years. According to the realtor, on average, 350 homes are listed each year, and approximately the same amount of homes is sold each year. In addition, the realtor said that vacant land is not as plentiful in the market as are single-family residences. Three-bedroom, two-bath homes are the most common type of single-family structure sold. If these market conditions remain constant, the potential for finding suitable replacement housing should meet the needs of the displaced residents

Last Resort Housing measures will be used as needed to affect any relocation if it is determined that the relocation will cause undue hardship on the residence utilizing the typical relocation methods. Special relocation advisory services do not appear to be necessary.

To minimize unavoidable effects of right-of-way acquisition and displacement of people and businesses, all displaced persons will be treated without discrimination on any basis an in a manner that complies with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 as amended; Public Law 91-646, Title IV of the Surface Transportation Uniform Relocation Act of 1987; CFR, Part 24, Uniform Relocation Assistance and Real Property Regulations for Federal and Federally Assisted Programs; Final Rule and Notice, as administered by the Tennessee Department of Transportation. Relocation resources are available to all residential and business relocatees without discrimination in accordance with the Civil Rights Act of 1964, Title VI.

The Relocation Agent is prepared to assist relocatees in finding adequate replacement housing, in contacting lending agencies and approved moving firms, and in processing claims for payment and appeals. The Relocation Agent will assist the relocatees in any way, within the law and his/her capability, to relocate into adequate replacement housing with a minimum of disruption.

TDOT will provide advance notification of impending right-of-way acquisition and before acquiring right-of-way, have all properties appraised on the basis of comparable sales and land values in the area. Owners of property to be acquired will be offered and paid fair market value for their property.

If any unforeseen problem should arise, Last Resort Housing can be implemented on a case-by-case basis. Last Resort Housing is used when there is no comparable housing available for sale or rent within TDOT's current limitations. Last Resort Housing procedures can be implemented through the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 and may include construction of a new dwelling, loan or rental subsidy, relocation of a dwelling, or the purchase of land.

4.3.2 Community Cohesion

The project area vicinity includes several small towns and communities: Henning, Ripley, Flippin, Curve, and Gates. These small communities are interdependent in nature with many residents living in the immediate areas for years, and depend upon each other for transportation, use of telephones and other necessities that might not be affordable or accessible.

Alternative O4F will displace 53 residences that are scattered throughout the entire project between Nodes K and G. Cohesion between the relocatees is not tied to one community or neighborhood. There was one neighborhood on the west end of Alternative O4F (located on Chipman Road) that appears to have some level of cohesion. Most of the residences throughout the corridor are scattered. An investigation was conducted in March, 2007, to determine if any family or socially interdependent clusters might be negatively impacted by the project. Interviews were conducted with the residents to see if family clusters existed.

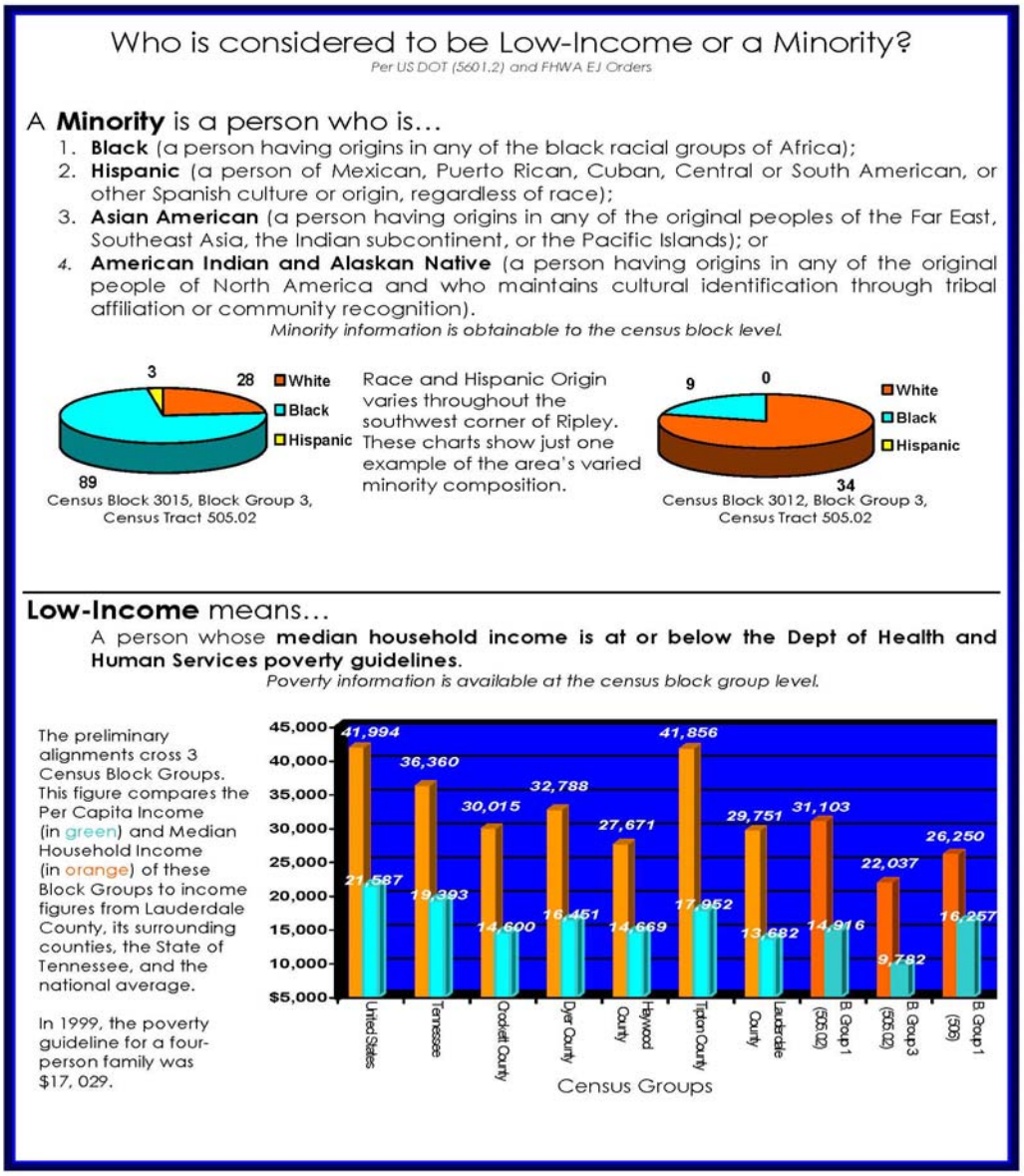
After the interviews, it was determined that there was some common bond between neighbors. Several residents were related; however, none were dependent on one another for transportation or care. All of those interviewed expressed support for the project and indicated that there would be no hardship if they were relocated. There would be no negative impact from the project.

4.3.3 Environmental Justice

The purpose of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, is to address disproportionately high and adverse human health and environmental impacts on low income and minority populations.

Based on research, discussions with local community leaders, and conversations with local residents, no disproportionately high and adverse human health or environmental effects on minority and low-income populations are anticipated to result from the proposed project. Adverse impacts associated with the project would not be realized primarily by a minority and/or low income population. The adverse impacts suffered by a minority and/or low income population would not be more severe or greater in magnitude than the effects that would be associated with non-minority and/or non-low income populations. Consequently, the project would not have a disproportionately high and/or adverse effect on those populations. All people living in the project area will share equally in the benefits of the proposed project. Table 4.2 on the following page illustrates income levels and compares them with basic definitions for low- income and minority status.

Table 4.2 Minority and Low-Income Information



Minority and/or low-income populations have been identified in areas near the project corridor. Efforts were made to avoid direct and indirect impacts to these communities of minority or low-income residences and to social/family clusters where community cohesion has been established. Area roadways which intersect with I-69 would be provided with underpasses or overpasses, as appropriate, to ensure safe and uninterrupted passage for area residents to houses of worship, community services, government assistance offices, and hospitals, and to ensure that social interactions with other communities remains unhindered. The impacts of the project concerning social isolation, segmentation or disruption to these communities are not anticipated to warrant selection of the No Build Alternative or realignment of the proposed Build Alternative.

Census data and field trips indicated that a predominately minority community lived in the area where Alternative G would cross SR 19 east of Ripley. The 2006 census data, field surveys, and interviews indicated that a predominately minority community lived in this area of Ripley. In response to this information, TDOT relocated the alignment of Alternative G in an attempt to avoid or minimize divisive or disruptive effects to the community. At the SIU #8 Public Hearing for the DEIS, conducted on November 15, 2005 in Lauderdale County, citizens stated that they would prefer the original location of Alternative G and not the avoidance section. In response to those concerns, TDOT conducted a community meeting on August 17, 2007, and the area residents were invited to attend and voice their opinions, concerns, and comments about the location of the SR 19 interchange east of Ripley. A total of 11 comments were collected. Of the 11 comments received, 8 meeting participants preferred the original Alternative G which is located closer to Ripley, while 3 participants preferred the avoidance alternative. Based upon the comments of the August 2007 meeting, TDOT has relocated this portion of Alternative G to its original location in response to public preferences.

Sensitivity to relocations has been incorporated into the decision making process and consideration of location of the alternatives with respect to *Executive Order 12898* to ensure that social or familial clusters are not impacted by the project. Social and family clusters are the simplest form of a community. These interdependencies are typified by low-income clusters of residents who reside in proximity to one another, sometimes on a common parcel, and rely upon one another for basic services that would otherwise not be afforded them in daily life. These services include shared use of an automobile, telephone/utilities, and/or dependency upon another for transportation to government services, medical services, worship services, and essential needs shopping (i.e. groceries, pharmacies, home supplies). Although no special needs have been identified through previous efforts via field trips, conversations with local officials, or from the past public meetings, TDOT acknowledges that these needs may be identified at any time during the project.

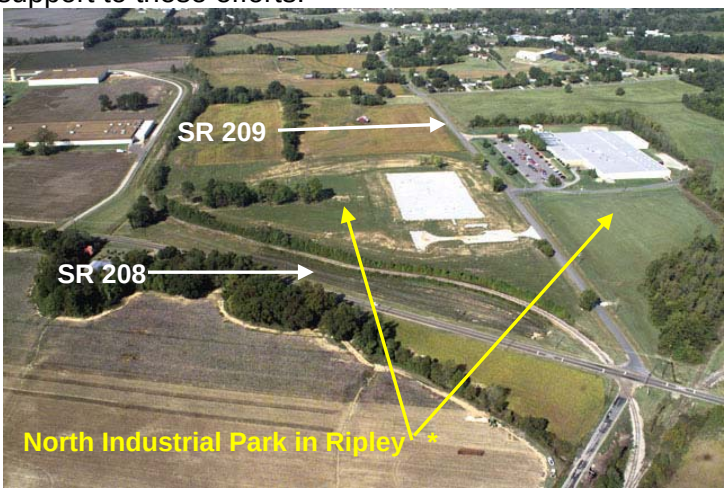
The Department has employed efforts to avoid impacts to communities throughout the process. These efforts have included avoidance of minority and low-income communities, and construction of overpasses and underpasses at areas where I-69 would intersect with roadways that provide uninterrupted passage between the communities and regional economic centers, government services, job sites, and schools.

4.3.4 Economic Impacts

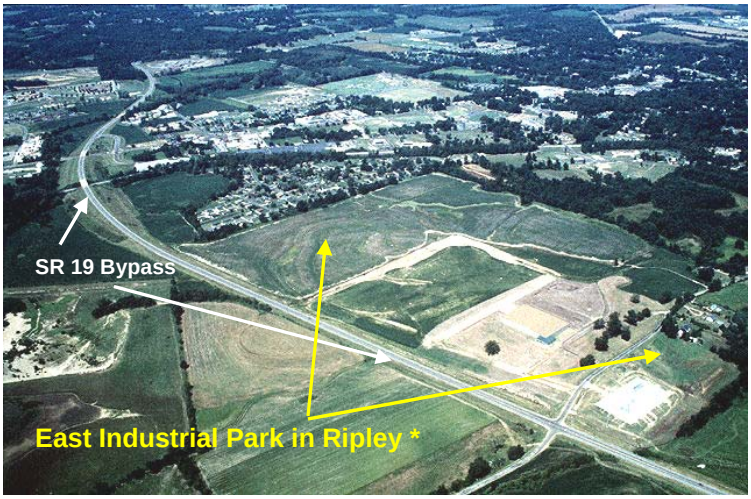
Industry

The Lauderdale County Economic and Community Development Board and West Tennessee Industrial Association provide information about industrial relocation and/or expansion possibilities in Lauderdale County to prospective companies. In a conversation with the Lauderdale County Economic and Community Development officials, they have indicated that Lauderdale County is equipped for and in need of industrial growth. Ripley local officials anticipate that I-69 will bring industry to the area and/or expand established industries. This result could assist local officials in their efforts to increase employment opportunities for the diverse labor market and in neighboring counties. Economic growth will be dependent upon the local and regional

efforts to market, attract and retain business in the area. The interstate, along with other infrastructural components such as water, gas, and electricity will provide complementary support to these efforts.



Industrial impacts would be realized on a regional scale as well as locally. Commuting potential would increase with the construction of I-69. Therefore, the ability of those living in neighboring counties such as Dyer and Crockett to reach new industry in the North Industrial Park or the East Industrial Park could complement the general economic vitality in the area including service, health care, and educational facilities. These services could benefit due to increased needs.



***** The photographs of the Industrial Park sites were used with permission from the West Tennessee Industrial Association.

Revenue Impacts

The proposed project will result in a direct conversion of existing land uses to transportation right-of-way. Lauderdale County will initially experience revenue losses due to the removal of the land from the tax rolls. The amount of the initial loss is dependent upon the value of the land. The new facility would assist in accommodating present and future residential, industrial, and commercial development that will generate new tax revenue. Property assessments in Tennessee are 100% of fair cash value. The local property tax rates are dependent upon city-county households and school

districts. Revenue impacts will likely increase due to the additional business and residential activity in the area. This will help offset the short-term loss in revenue.

4.4 Farmland Impacts

In accordance with 7 CFR, Part 658 of the National Farmland Protection Policy Act, land evaluation criteria were applied to determine effects to farmland within the project area. The land evaluation criterion is a relative value (from 0 to 100) for agriculture production of the farmland to be converted based on information within the local government's jurisdiction. A Farmland Conversion Impact Rating (FCIR) form has been completed and is included in Appendix A. The FCIR criteria are designed to assess important factors in addition to the agricultural value of the land and classify the surrounding land uses as urban, non-urban, or in transition. Each factor within the site assessment criteria is assigned a score relative to its importance. Sites that receive a total site assessment score of 160 or less are given a minimal level of consideration for protection. Sites with a total site assessment score of 160 points or more require the consideration of alternative project alignments that would serve the proposed purpose but convert fewer acres of farmland or farmland that has a relative lower value.

Coordination with the Natural Resource Conservation Service (NRCS) Jackson Division Office provided the information in Table 4.3. The table below lists total acres to be converted for right-of-way, total acres of prime and unique farmland to be converted and total farmland impact rating score for Selected Alternative O4F:

Table 4.3 Farmland Conversion Totals

Alternative	Total Acres of Land to be Converted	Total Acres Prime & Unique Farmland to be Converted	Total Farmland Impact Rating Score
O4F	1,125.0	489	139

Alternative O4F will require the conversion of 489 acres of "Prime and Unique" farmland. According to the NRCS in March, 2007, there will unlikely be any long-term adverse impacts to the county from farming activities. Although the project will reduce the amount of available farmland, farming operations will likely benefit from the new interstate. These positive impacts could open the markets for locals that rely on heavy truck traffic.

Due to the predominantly rural nature of the project area, many property owners rely on farmland as an economic resource. Disruption of viable agricultural uses could have detrimental impacts on a community which relies on the disposable income from farm operations for a wide host of service industries. Despite minimization efforts, the proposed crossover could bisect (separate) farms and/or impact structures (barns, sheds, etc.) relating to farming activities. See Figure 3.2, Page 38 for a map which shows land uses including agricultural land uses.

4.5 Natural Resources

4.5.1 Terrestrial Habitat Impacts

The construction of I-69, SIU #8 could lead to fragmentation of wildlife habitat living within and near the project area. The impacts are associated with interruptions to wildlife travel corridors and increased road kill incidents of animals living along the new facility.

Migratory birds are susceptible to loss of forested and treed habitat and will not nest in fragmented areas. Forested habitat appears to be minimal in the project area. Most of the land has been converted to agricultural and residential/commercial use over the past century. Efforts to minimize right of way were used to minimize these impacts.

4.5.2 Aquatic Impacts

Reductions in aquatic productivity can result from sedimentation associated with the new facility. Sedimentation impacts are associated with water runoff from the roadway. These impacts are unavoidable, long-term effects. Short-term impacts will be associated with construction activities. The Department will implement a stringent sedimentation and erosion control program in efforts to reduce and minimize adverse ecological impacts to these area resources.

Stream Impacts

Table 4.4 includes the total number of impacts for Alternative O4F. A second table, 4.5, is a subset of the area for Alternative O4F. This table illustrates the impacts within the new section of SIU #8 that were not addressed in the DEIS.

Table 4.4 - Stream Impacts in Linear Feet between Nodes K and G, Alternative O4F

	Alternative O4F (KWG)	
Streams Impacted	**Linear Ft**	**Miles**
	60,943.259,365.2	11.511.2

Impacts to a stream during road construction activities are primarily destruction of habitat and sedimentation. Habitat destruction will directly impact portions of the stream located within the project's right of way limits. Sedimentation, also referred to as siltation and erosion, is associated with construction activities. Sedimentation impacts are temporary and can impact a stream for hundreds of feet downstream. These impacts include reduced levels of oxygen in the stream, and interference with the ability of fish, aquatic insects, mussels and other aquatic organisms to remove oxygen from the water. Temperature patterns and water flow patterns can be altered. Siltation increases turbidity (cloudiness from dust and other disturbed particles) which can slow photosynthesis, clog gills in fish and other aquatic life, and covers macroinvertebrates and fish egg-laying substrates (streambed layers). This can result in long term negative impacts to streams. Siltation can redistribute itself to increase flooding events, loss of storage capacity in reservoirs, and potential economic impacts associated with increased water treatment costs. Organic chemicals and metals can be reintroduced into the water columns that were previously contaminated.

Nonpoint source pollution in the project area is related primarily to agricultural practices. In addition industrial discharges, urban runoff, sewage and construction activities contribute to nonpoint source pollution. These pollutants include deicing compounds,

weed, rodent, and insect control products, surface runoff of pollutants coming from vehicular operations (oil, grease, asbestos and rubber), toxic chemical spills by trucks into a water supply system, and contamination of surface and groundwater supplies by polluted fill materials. Deicing and herbicide/pesticide uses are seasonal, and typically result in short term concentration increases in area waters. Surface runoffs associated with vehicles are unavoidable, but the quantities of these pollutants are typically small which would result in negligible impacts. Accidental spills are not predictable, but emergency procedures should be developed that report, contain, and clean up hazardous materials. Use of borrow material from accepted supply sources will be used to minimize pollution associated with fill materials.

Alternative O4F Stream Impacts

This section of Alternative O4F had not been previously analyzed. This section is represented in blue and is located between "Former Alternative G," represented in green and the area where Alternatives O4A and R are combined (represented in black).

A total of 14 streams were investigated along Alternative O4F, five (5) were perennial and nine (9) were intermittent, of these 14 streams, one (1) was "not impaired", nine (9) were "moderately impaired" and four (4) were "severely impaired" (See Figure 4.1, Stream Impacts on Page 65). The total amount of stream channel impacted will be determined after final project plans become available (i.e., alternative selected). Bridge design is focused on spanning the entire stream channel with structural supports located well away from the stream banks whereby limits stream impacts to loss of riparian zone the width of the structure. The construction of culverts impacts only that section of the stream channel by removing in-stream habitat. The last alternative is relocation of the stream channel and this usually results in creating a straight channel with little in-stream habitat. In Alternative O4F a total of 1,652 feet of culverts will be constructed, 3,230 feet stream will be relocated, 709 feet will be spanned by bridges, and are located within the project's proposed Right-of-Way. If future alignment changes move left or right, additional stream channel may have to be relocated. Table 4.5 illustrates stream impacts anticipated in association with Alternative O4F. TDOT considered shifting the alignment to avoid these resources, but this would not have been prudent. The shifts would have resulted in additional relocations of residences, archaeological resources and greater impacts to floodplains.

Table 4.5 - Linear feet of stream impact by impact type of the I-69, Segment of Independent Utility #8, Crossover Corridor Study, Lauderdale County, Tennessee for Alternative O4F

Item	Culverts (ft)	Crossing / Bridge (ft)	Relocation (ft)	Unimpacted Streams within Project Corridor (ft)
Alternative O4F	1,652	709	3,230	980

Mitigation Measures for Impacted Streams Figure 4.1, Page 65, shows impacted streams for Alternative O4F.

To protect water quality and aquatic species it is necessary that stream crossings should be designed perpendicular to the direction of flow, and culverts should be wide enough to pass high flows and should be placed so as not to restrict the movement of aquatic vertebrates within the stream.

Mitigation is required for all stream impacts which do not meet requirements for general TDEC- Division of Water Aquatic Resources Alterations permits (ARAP) and for certain Nationwide Section 404 permits (U.S. Army Corps of Engineers; TDOT 2004).

Coordination with TDEC Division of Water for a potential Water Quality Certification (401) prior to disturbance of streams is required. A 401 Water Certification states that a discharge into surface waters complies with the aquatic protection requirements of the State. The *Status of Water Quality in Tennessee Year 2000 305 (b) Report* states "As a general rule, the Division prefers bridging of streams or even relocation of streams as an alternative to culverting." Furthermore, large projects where culverting is unavoidable may require compensatory mitigation. Aquatic life cannot be maintained in a culverted body of water. Altered stream flow consists of layers of water that do not mix. Hence, there is limited mixing of nutrients and dissolved oxygen. Additionally, the smooth bottom of the culvert eliminates refuge, feeding and egg-laying sites for aquatic organisms associated with natural stream substrates.

A Section 404 Dredge and Fill Permit will be required from the USACE prior to any construction work on the proposed project. Permittees must meet all conditions, restrictions, and notification procedures required prior to work under any said permit.

Cost estimates for mitigation measures for Alternative O4F were prepared using the U.S. Army Corps of Engineers ratio of 1.5:1 linear feet, which means that for every foot of impacted stream, 1.5 feet of mitigation will be required. The cost is between $100 and $125 per linear foot with a 20% surcharge. The total amount of impacted streamline on Alternative O4F is 19,800 feet. With the 1.5:1-foot factor, the total amount of mitigated streamline will total 29,700 feet, and the estimated cost would be $594,000.

Scale: 1" = 4000'

Begin Alternative Node K

Node E

Node W

Alternative R

Former Alternative G

Alternative O4F

PND

WTL

STR 33
WTL 7
WTL 8
WTL13
STR 36
STR 37
STR 35
STR 38
STR 40
STR 1
WTL 12
WTL 10
WTL 9
STR 39
WTL 11

US 51

SR 19

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

STR = Stream
PND = Pond
FLD = Flood Plain
WTL = Wetland

FIGURE 4.1

STREAM, POND, WETLAND, AND FLOODPLAIN IMPACTS

ALTERNATIVE 04F

Lauderdale County, Tennessee

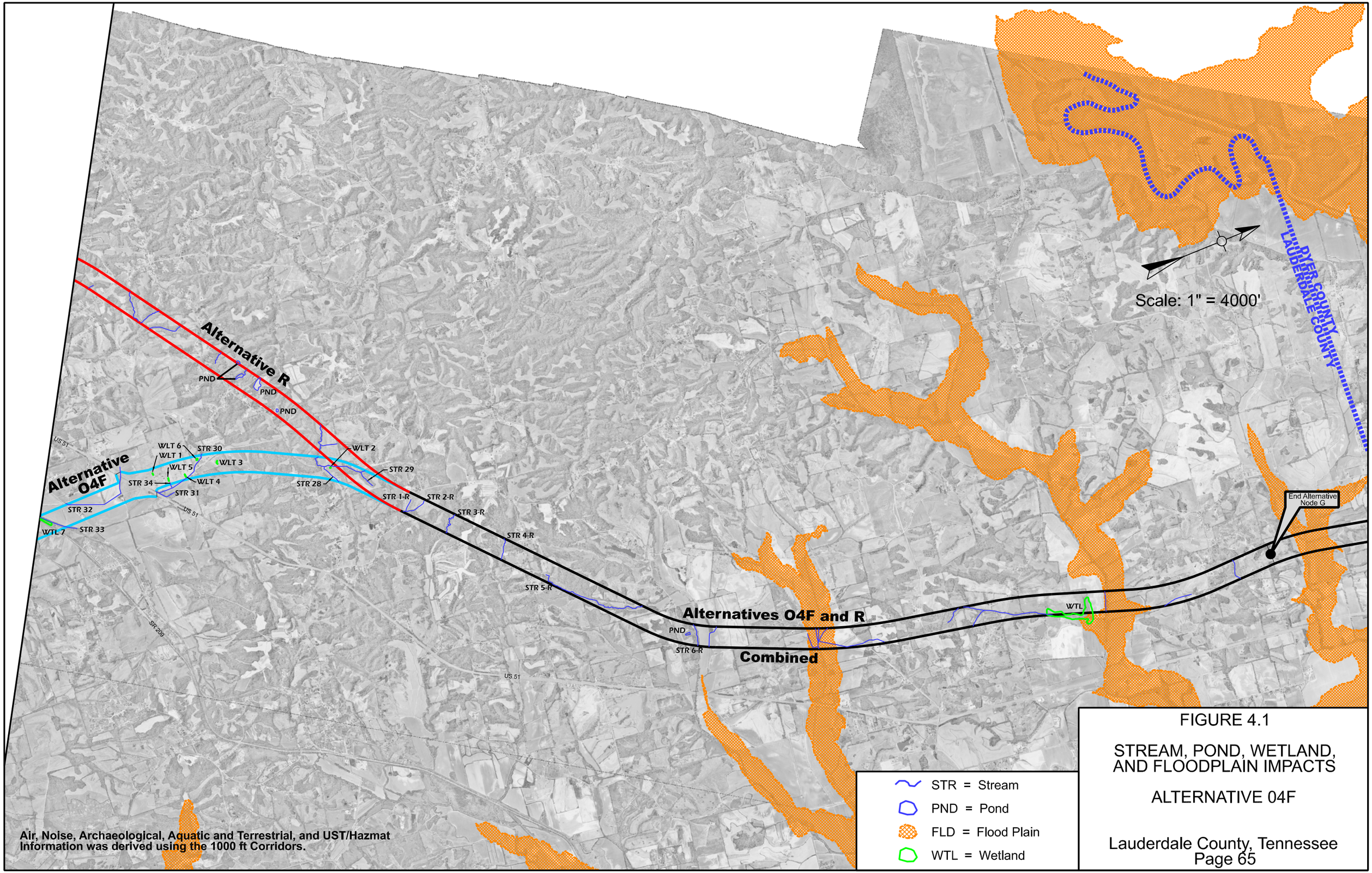


FIGURE 4.1

STREAM, POND, WETLAND, AND FLOODPLAIN IMPACTS

ALTERNATIVE 04F

Lauderdale County, Tennessee

Erosion control devices should limit any adverse effects to area streams. Such devices include filter rings and siltation traps. Maintaining the vegetated buffer zone between the roadway and the streams will minimize the impact of non-point source pollution to the streams. Also, drainage ditches should direct runoff into appropriate areas to allow the non-point source pollutants to filter out of the drainage. To minimize potential runoff impacts to the project streams, all appropriate Best Management Practices will be implemented to ensure water quality in the project area is not adversely impacted during construction. Exact measures will be developed and coordinated with the appropriate permit agencies later in the design phase.

Along streams it is important to leave mature canopy when possible and allow establishment of a dense herbaceous layer of native species. Re-vegetating disturbed areas as soon as possible with native floral species should diminish erosion impacts. Using native species will improve habitats by adding diversity and discouraging invasive species growth. Riparian zones will provide habitat for existing species and attract the lower food chain organisms that may draw fish and invertebrates indigenous to the area.

Heavy equipment should not be allowed directly in the stream. Where possible, diversion channels should be constructed to keep surface flow away from the construction site or to direct flow from the construction site into appropriate sediment control services. Seeding with temporary vegetation to help control sediment runoff should be considered. Construction should not take place immediately following rain storm events.

If these mitigation measures are utilized, there should be no cumulative impacts as a result of the construction of this project.

Wetland Impacts

The total number of wetlands impacted between Nodes K and G are shown in the table below.

Table 4.6 – Impacted Wetlands and Ponds for O4F, between Nodes K and G*

	Alternative O4F (KWG)*
Wetlands Impacted	**39.5 acres**
Ponds Impacted	**16.69 acres**

***The totals for Alternative O4F include areas previously assessed and were combined with the new area of study. Totals for the new area of O4F are in Table 4.7.**

During the field investigation a total of 33 potential wetlands in Alternative O4F were assessed by using the Routine Wetland Determination Data Forms (See Figure 4.1 on the Page 65 for a map showing locations of wetlands). Several of the wetlands were found to have potential hydrologic connections to water of the U.S. Wetlands considered jurisdictional waters of the U.S. that will be directly impacted by the project will require a Section 404 Clean Water Act, permit from the U.S. Army Corps of Engineers and an Aquatic Resources Alterations Permit (ARAP) from the Tennessee Department of Environment and Conservation, Division of Water. The Natural Resources Conservation Service was contacted to determine if there are Wetland Reserve Programs (WRP) easements in Lauderdale County. The response letter is included in Appendix A. The NRCS stated that one easement exists on the northwest bank of the Mississippi River. Due to the distance from the project the 240-acre tract will not be impacted. Following is a chart that illustrates impacts to wetlands for Preferred Alternative O4F:

TABLE 4.7 – IMPACTS TO WETLANDS ON ALTERNATIVE O4F*

Name	Cowardin	WOTUS	Functional Value	Wetlands with in the Corridor in Total Area (Acres)	Wetlands Impacted by Right of Way (Acres)
Alternative O4F					
Wetland 1	PEM1	wetland	water quality	0.04	0.04
Wetland 2	PEM1	wetland	water quality, recharge	0.04	0.04
Wetland 3	PEM1	wetland	water quality	0.10	0.10
Wetland 4	PEM1	wetland	water quality, recharge	0.08	0.01
Wetland 5	PEM1	wetland	water quality, recharge	0.06	0.06
Wetland 6	PEM1	wetland	water quality, recharge	0.12	0.00
Wetland 7	PEM1	wetland	water quality, recharge, wildlife habitat, flood storage	1.82	1.22
Wetland 8	PSS1	wetland	water quality, recharge, wildlife habitat	0.74	0.09
Wetland 9**	PEM1	Pond w/ wetland edge	water quality, wildlife habitat, fish habitat	0.13	0.13
Wetland 10**	PEM1	Pond w/ wetland edge	water quality, wildlife habitat, fish habitat	0.98	0.98
Wetland 11**	PEM1	wetland	water quality, recharge, wildlife habitat, fish habitat, aesthetics	0.79	0.79
Wetland 12	PEM1	wetland	water quality, recharge, wildlife habitat	0.67	0.17
Wetland 13	PFO6	wetland	water quality, recharge, wildlife habitat, flood storage, aesthetics	8.91	2.53
Totals Acreages for Alternative O4F				**14.47 total acres**	**6.14 total acres**

* These figures represent the new area of study within Alternative O4F that was not previously assessed. These totals have been combined with wetlands that were assessed in previous field trips, and the totals are represented in Table 4.6 on the previous page.

Mitigation Measures for Wetlands

Mitigation is required for all wetland impacts which do not meet requirements for general Aquatic Resources Alternations Permits (TDEC, Division of Water) or for certain Nationwide Section 404 permits (U.S. Army Corps of Engineers[USACE]; TDOT, 2004). The minimum replacement ratio for wetlands is 2:1, but could be higher depending on hydrogeomorphic analysis if optimum mitigation sites are unavailable (TDOT, 2004). The first option for any substantial replacement mitigation is on site (near the project, and within the watershed (TDOT, 2004). The mitigation option most favored by regulatory agencies is that of restoration of a former wetland (TDOT, 2004). Enhancement of an existing but degraded wetland may also be an option, but higher replacement ratios are generally required (TDOT, 2004). Both the site selection and the mitigation, when proposed, will be subject to the approval of regulatory agencies (TDOT, 2004). In the event that no acceptable mitigation sites can be obtained locally, the regulatory agencies may allow mitigation sites further away from the project area, or allow use of credits in a mitigation bank (TDOT, 2002).

The total amount of jurisdictional wetland impacted will be determined after final project plans become available (i.e., alternative selected). Permit applications will be developed and coordinated with regulatory agencies at that time. An appropriate mitigation plan to compensate for unavoidable wetland impacts will be required if the impact exceeds 0.1 acre. Wetland mitigation, if required, must follow Section 404(b)(1) guidelines and are subject to USACE approval. Shifting Alternative O4F was considered, but would have resulted in higher relocation impacts, curves in the alignment, and the potential to impact historic and archaeological sites. Greater impacts to floodplains and stream crossings would have resulted in shifts to the alternative also.

In order to protect these wetlands, Best Management Practices to prevent or minimize erosion and sedimentation will be implemented during the design and construction phase of this project. An erosion control plan that adheres to FHWA guidelines will be implemented to ensure that water quality in the project area is not adversely impacted during construction.

Design modifications will be implemented to avoid or minimize wetland impacts to the maximum extent possible. Where wetlands can be avoided but remain near the disturbance limits of the project, they will be designated as “Do Not Disturb” areas on project plans and shall be flagged or temporarily fenced during construction to prevent unintentional encroachment or disturbance. Appropriate erosion and sedimentation control measures shall also be implemented to prevent impacts to these wetlands during and after construction.

4.5.3 Floodplain Impacts

Table 4.8 - Floodplain Impacts, Alternative O4F

	Alternative O4F
Total Area within Corridor	2,892 acres
Impacted Floodplains within the Corridor	386 acres
% of Impacted Floodplains	13.3 %

Executive Order 11988, Floodplain Management, addresses concerns associated with encroachment upon floodplains. Federal agencies must avoid significant impacts to floodplains unless there is no practical alternative. Longitudinal encroachments will be avoided on this project. All crossings are perpendicular.

Reviews of Floodplain Insurance Relief Maps supplied by FEMA indicate that Alternative O4F crosses one floodplain which is perpendicular within the project area being assessed for this environmental document. The floodplain is associated with the Cane Creek and is located approximately 800 feet south of the George Brown Road and 3200 feet north of Country Club Road. See Figure 4.1 on Page 65 for a map, which includes the location of this floodplain in an orange outline. This area of the floodplain was the narrowest area possible and would impact approximately 96.7 acres of the floodplain within the new section of Alternative O4F. Avoidance was not possible, but location of the crossover in other areas would cause greater impacts. The National Flood Insurance Program standard requires no increases greater than a one-foot rise in water for the 100-year floodplain. Any alterations to this floodplain will require close coordination with the Tennessee Division of Water Pollution Control and the United States Army Corps of Engineers. Development in the floodway is restricted to activities that would not interrupt the natural flow of the waterways. Further work on the analysis will be done during the hydraulic design phase. No significant encroachments will occur from the construction of the interstate to floodplains within the project corridor. In accordance with 23 CFR 650, there will be no significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles or that provides an evacuation route. In addition, during the life of the interstate, there will be no significant risk with regard to probability of flooding attributable to the encroachment that would result in loss of property or hazard to life. The construction of the interstate will have no significant adverse impact on the natural and beneficial floodplain values. If these commitments cannot be made, and a significant encroachment is anticipated, an Only Practicable Alternative Finding in accordance with 23 CFR 650.113 must be made.

Terrestrial Impacts

4.5.4 Impacts to Threatened and Endangered Species

Reviews of records, field trips and responses received from federal and state agencies that monitor the status of these species have indicated that no such species will be impacted by the proposed project.

4.5.5 Impacts to State-Listed Species

Reviews of records, field trips and responses from state agencies that monitor the status of state-listed species of plants and animals indicate that no impacts are anticipated for these species.

4.5.6 Invasive Species Impacts

The potential of introducing exotic or invasive species, to the natural and farmed plant communities, not already present in the project area is remote. Habitat fragmentation has already resulted in the establishment of these organisms in the region. Additional fragmentation of habitat and soil disturbance could create more favorable conditions for the existing non-native species. These impacts can be minimized through the utilization of native woody vegetation on cut and fill slopes. Additionally, native herbaceous plants and grasses should be planted in the medians of the Build Alternative selected for construction.

4.6 Cultural Resources

4.6.1 Architectural/Historic Impacts

As included in Chapter 3, Section 3.6.1, a survey was done within the crossover alignment project area. One site, the previously surveyed James A. Langley House (LA-27) property was determined to meet National Register criteria in 2002. No other properties in the area appeared to meet National Register of Historic Places criteria. The Tennessee State Historic Preservation Officer (SHPO) concurred with this report on April 1, 2008. See Appendix A to review the letter.

4.6.2 Archaeological Impacts

The Cultural Resource investigations described in Chapter 3 resulted in the identification of 2 new and 19 previously recorded sites. No sites would be impacted by Alternative O4F. A total of 11 previously recorded archaeological sites are located just east of the northern terminus of Alternative O4F in the area between Flippin and Coffee Shop Road. An additional previously recorded site was located just to the west of the Alternative O4F in this area. In addition, four previously recorded sites are located just to the east of State Route 19 below Brownsville Road. If the Alternative is shifted to the east or west, impacts to these sites are likely to occur.

Two unrecorded sites, identified as Site IF1 and Site IF2, will be avoided. These sites are within the right of way but not the anticipated construction limits of the project. IF1 is located south of Coffee Shop Road and IF2 is located just north of US 51 and east of Chipman Road. Following are descriptions of the sites.

Site IF1 is a glazed brick scatter found in the area of a reported cemetery. Investigation did not result in the uncovering of gravestones and there was no indication of a cemetery on any maps that were used during the literature review process. TDOT will avoid construction activities within this area. The specific information is on file at the TDOT Environmental Division in Nashville and will be reviewed prior to any changes in the design plans to ensure avoidance.

Site IF2 is a wet spring located to the east of the project within a floodplain area. It is likely that deeply buried deposits could be found within this area. TDOT will avoid

construction activities within this area. The specific information is on file at the TDOT Environmental Division in Nashville and must be reviewed prior to any changes in the design plans to ensure avoidance.
Pursuant to Section 106 of the National Historic Preservation act, a letter and project summary data were sent to Native American Groups by TDOT during the original study of the area addressed in the DEIS. The area which contains Alternative O4F was included in this original boundary. No response was received from these groups, and no further coordination is required. Following is a list of the identified Native American Groups within Lauderdale County that were contacted by TDOT:

- The Chickasaw Nation
- Eastern Shawnee Tribe of Oklahoma
- Quapaw Tribe of Oklahoma
- Shawnee Tribe
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee Indians

If archeological material is uncovered during construction, all construction will cease in that area and the Tennessee Division of Archaeology and the recognized Native American Tribes contacted so a representative can have the opportunity to examine and evaluate the material.

The SHPO concurred with the report on November 9, 2007. The letter is included in Appendix A.

4.7 Recreational Impacts

Field trips, reviews of maps and conversations with local officials revealed that no recreational facilities were identified within the northern crossover project area. No mitigation measures will be required.

4.8 Section 4(f) and Section 6(f) Impacts

In accordance with the U.S. Department of Transportation Act of 1966, no Section 4(f) impacts are associated with Alternative O4F between Nodes K and G.

In accordance with Section 6(f)(3) of the Land, Water and Conservation Fund Act, no impacts are associated with Alternative O4F.

4.9 Visual Impacts

The visual character of the project alternates between agricultural, residential, and commercial land uses for Alternative O4F. The proposed roadway will have increased roadway width with a wider median, in comparison with area roadways, such as US 51, which will create larger fill slopes. Due to the terrain of the project area, it is anticipated that minimal cuts will be necessary in constructing the roadway. Existing vegetation within the construction limits of the new interstate, will be lost, consisting mostly of farmland or grass and brush with a few deciduous trees. This would have a low adverse effect upon the quality of views from the highway and would be temporary until roadside vegetation is naturally reestablished. It is anticipated that the view of the new interstate

by local tourists and the view from the road by the low number of permanent residents will create minimal adverse effects.

4.10 Air Quality Impacts As mentioned in Section 3.9, Mobile Source Air Toxics are addressed in Appendix B.

Alternative O4F contained 9 receptors that were analyzed for air quality impacts. For the I-69 Alternative O4F Crossover, microscale analyses were performed for the Base Year Alternative, the 2030 No-Build Alternative, and the 2030 Alternative O4F Build Alternative (See Table 4.10 on page 73). Areas for analysis incorporate both the maximum traffic volumes and the presence of sensitive receptors to model worst-case conditions in a free flow scenario. Within the project corridor, US 51 in the vicinity of the future interchange with the Alternative O4F Crossover was determined to meet the criteria for calculating maximum one-hour and eight-hour carbon monoxide concentrations. One-hour CO concentrations were obtained directly from the CAL3QHC model runs. Eight-hour CO concentrations were calculated by subtracting the one-hour background concentration of 2.0 parts per million (ppm) from the total one-hour concentrations calculated by the CAL3QHC model. The remainder was then multiplied by a persistence factor of 0.7. To this value an eight-hour background concentration of 1.2 ppm was added to arrive at the eight-hour concentrations.

For the Base Year Alternative, a maximum one-hour CO concentration of 2.5 ppm and a maximum eight-hour CO concentration of 1.6 ppm were calculated at Receptor 3. For the No-Build Alternative, a maximum one-hour CO concentration of 2.6 ppm and a maximum eight-hour CO concentration of 1.6 ppm were calculated for Receptor 3. For the Alternative O4F Crossover, maximum one-hour and eight-hour CO concentrations of 2.5 ppm and 1.6 ppm, respectively, occur at Receptor 3.

The calculated one-hour and eight-hour CO concentrations are listed in Table 4.10 on Page 73. The analysis shows that carbon monoxide levels for all alternatives in the analysis are below the one-hour standard of 35 ppm and the eight-hour standard of 9 ppm. Therefore carbon monoxide levels within the remainder of the project corridor will also remain below both the one-hour and eight-hour standards. Based on the results of the analysis, none of the 9 receptors require mitigation.

Table 4.9 – Air Receptors for Alternative O4F from Nodes K to G

Alternative	Total Number of Receptors	Receptors Requiring Mitigation
O4F	9	0

Table 4.10 Carbon monoxide concentrations, ppm
(Alternative O4F Crossover/US 51 Interchange)

	Base Year		2030 No-Build		2030 Design	
Receptors	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
1	2.2	1.3	2.2	1.3	2.3	1.4
2	2.3	1.4	2.3	1.4	2.4	1.5
3	2.5	1.6	2.6	1.6	2.5	1.6
4	2.4	1.5	2.4	1.5	2.4	1.5
R1 on R-O-W 408 feet and 472 feet off centerlines of I-69 Crossover and US 51 respectively						
R2 on R-O-W 680 feet and 275 feet off centerlines of I-69 Crossover and US 51 respectively						
R3 on R-O-W 561 feet and 140 feet off centerlines of I-69 Crossover and US 51 respectively						
R4 on R-O-W 717 feet and 221 feet off centerlines of I-69 Crossover and US 51 respectively						
	Greater than existing levels					
	Equal to existing levels					
	Less than existing levels					

4.11 Noise Impacts

As described in Section 3.10, noise levels were modeled at five locations along Alternative O4F. The total number of receptors on Alternative O4F include an additional four that were part of the old Alternative G from Node K to the new alignment, and a part of Alternative R where O4F rejoins it south of Node G.

Anticipated Noise Levels for the Design Year

TNM 2.5® was used to model No-Build (2007) and Build Alternative for the year 2030 using traffic information provided by the Tennessee Department of Transportation (TDOT).

Impact Criteria

Federal guidance for handling noise impacts and abatement are contained in 23 Code of Federal Regulations (CFR) Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise." Activity Category B (picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals) is applicable to the receptors on this project. For Category B, the Noise Abatement Criteria (NAC) is 67 dBA L_{eq}.

Alternative O4F Crossover Results

For the Alternative O4F Crossover, five (5) noise sensitive receptors were selected for modeling; of these, one receptor experienced an increase of 5 dBA or less over existing noise levels. None of the sites for Alternative O4F experienced a traffic noise impact of 10 dBA L_{eq} or greater, or levels that approached or exceeded the NAC of 67 dBA L_{eq}. Therefore, noise abatement measures are not required for the proposed project.

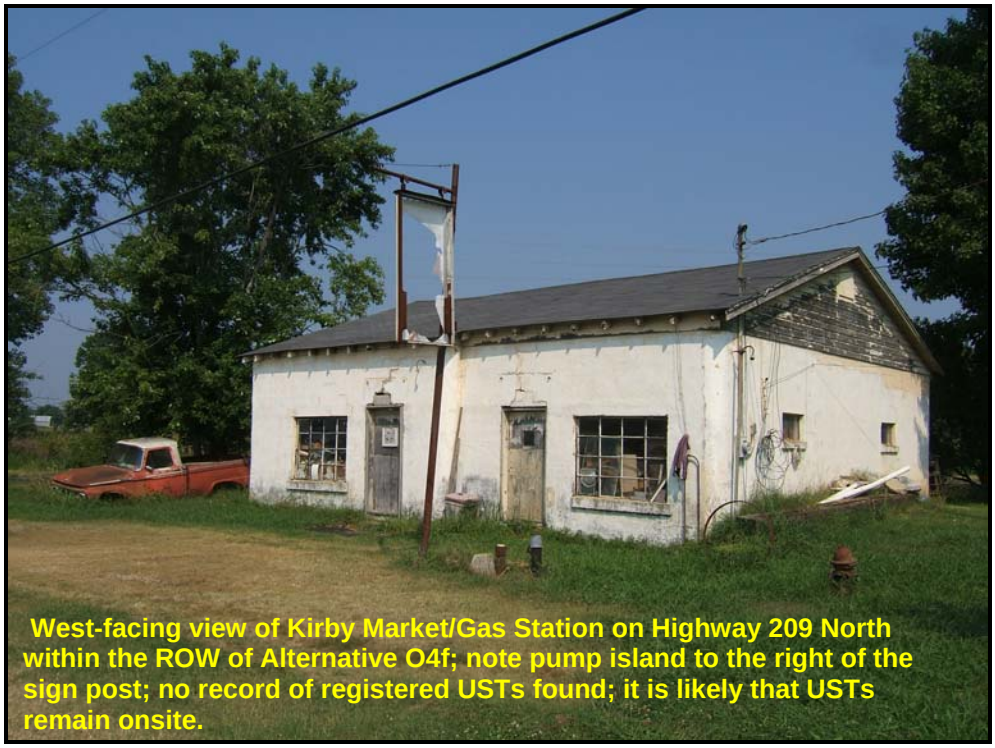
Noise Abatement

Based on the above considerations, noise abatement measures are not required for the sites studied and are not recommended for this project.

4.12 Hazardous Materials Impacts

Alternative O4F was determined to have one site that has the potential for the presence of above ground or underground storage tanks, hazardous wastes or materials or areas of concern that could pose a threat to human health and/or the environment.

Site reconnaissance was conducted in June, July, and August 2006, and February and July 2007. During the visits, sites with potential Recognized Environmental Conditions (RECs) were observed within, adjoining, and neighboring Alternative O4F. Refer to Figure 4.2 on Page 76 for a visual reference of potential Hazardous Materials and Underground Storage Tank sites.



West-facing view of Kirby Market/Gas Station on Highway 209 North within the ROW of Alternative O4f; note pump island to the right of the sign post; no record of registered USTs found; it is likely that USTs remain onsite.

The underground storage tanks (USTs) are assumed to remain onsite at the former Kirby Store (3019 Highway 209 North, Ripley, TN), as evidenced by the presence of the fill ports and vent pipes. No record of registered USTs was found at Tennessee Department of Environment and Conservation (TDEC) for this address, and it appears that the USTs predate the UST registration system in Tennessee. It is probable, based on site observations and the years of operation of the facility, that there are 2 USTs onsite with capacities of less than 1,000 gallons each. If this alternative is chosen, a scope of work will be written by TDOT and bid packages will be assembled for removal of the USTs, product lines, and vent pipes prior to site demolition. The UST removal will be conducted under TDEC Division of Underground Storage Tanks (DUST) rules, but without seeking DUST fund reimbursement. An access agreement, if necessary, will be sought with the site owner prior to removal activities. The UST removal project will be conducted by TDOT.

TDOT will execute all the required notification and project completion paperwork in coordination with the local TDEC Environmental Field Office, with the objective of

obtaining a closure letter for the site. Confirmation samples will be taken from the tank hold pit to assure no contamination remains prior to refilling the pit, as outlined in DUST rules. If contamination beyond the normal scope of work found during the UST removal process, an extended scope of work will be agreed upon and executed. Under usual circumstances, a UST removal of this type is expected to take less than one week of field work. An extended scope of work might extend the field work to three weeks, or longer, depending upon the specific scenario. Refer to Figure 4.3 on Page 77 for a visual reference of the Former Kirby Store site.

Scale: 1" = 4000'

Begin Alternative Node K

Node E

McBride UST Site

Alternative R

Node W

Former Alternative G

Alternative O4F

Summar-Woodard Property Dump Site

SR of Tennessee

SR 87

SR 209

US 51

SR 19

SR 208

WILLIAMS SWITCH RD.

GLIMP RD.

WADSWORTH RD.

HENNING BETHLEHEM RD.

EASTLAND AVE.

COUNTRY CLUB RD.

GEORGE BROWN RD.

OLD BROWNSVILLE ROAD

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

Community Well

FIGURE 4.2

POTENTIAL HAZARDOUS MATERIALS AND UST SITES

ALTERNATIVE 04F

Lauderdale County, Tennessee

Alternative R

Alternative O4F

Lauderdale County Landfill

Former Kirby Market/Gas Station

Veterans of Foreign Wars

Hebert Coppel Property

Reclaimed Gravel Mine

Gillon Property Salvage Yard

Salvage Yard

Alternatives O4F and R Combined

End Alternative Node G

Scale: 1" = 4000'

RYER CREEK COUNTY LAUDERDALE COUNTY

US 51

ROY CRAIN ROAD

CURVE NANKIPOO ROAD

SR 209

RAILROAD

CURVE WOODVILLE ROAD

CONCORD ROAD

JOHN WHITE ROAD

ARMOUR ROAD

DRY HILL ROAD

PENNINGTON ROAD

DUNAWAY RD.

EDITH NANKIPOO RD.

SR 88

SADIE HILLARD RD.

MILL CREEK RD.

Air, Noise, Archaeological, Aquatic and Terrestrial, and UST/Hazmat Information was derived using the 1000 ft Corridors.

Community Well

FIGURE 4.2

POTENTIAL HAZARDOUS MATERIALS AND UST SITES

ALTERNATIVE 04F

Lauderdale County, Tennessee
Page 76

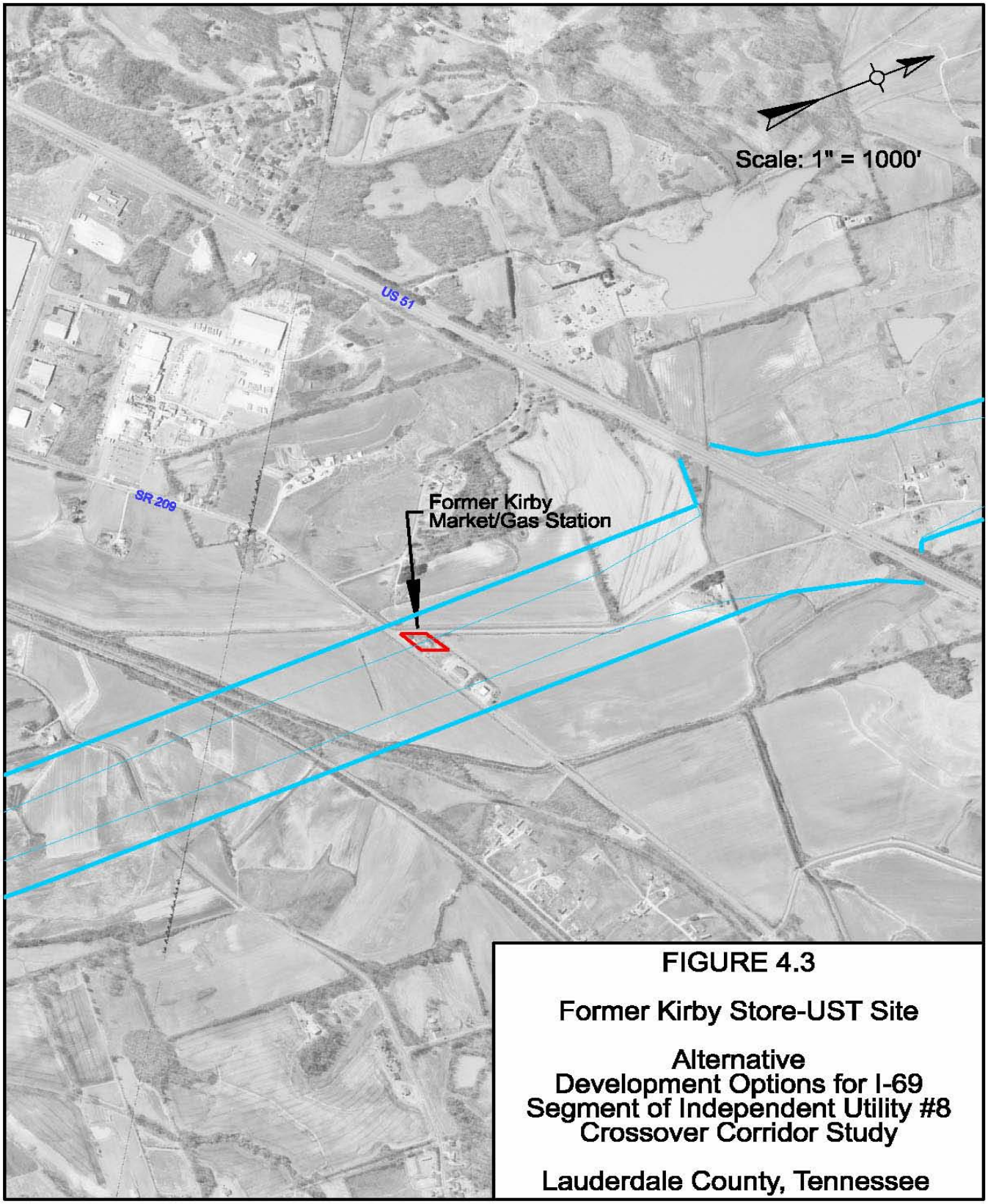


FIGURE 4.3

Former Kirby Store-UST Site

Alternative
Development Options for I-69
Segment of Independent Utility #8
Crossover Corridor Study

Lauderdale County, Tennessee

4.13 Pedestrian and Bicycle Facility Impacts

Under 23 U.S.C. § 217(g), TDOT considered the need to provide bicycle facilities and pedestrian walkways for the project corridor. The new interstate is a limited facility that would ban use by pedestrians and bicyclists. Roadways along the new highway would be intersected by Interstate 69. TDOT will provide safe passages over or under the new proposed project to ensure continued and safe passage of area pedestrians and bicyclists throughout the project area.

4.14 Construction Impacts

Construction activities associated with the proposed northern crossover project are identical to those reported in the DEIS. These impacts include temporary effects to ambient (immediately surrounding area) noise, water quality, air quality, and terrestrial habitat within the immediate vicinity of the project.

An increase in project area noise levels would happen during the construction of the proposed I-69 project. Land uses that would be sensitive to vehicular noise would also be sensitive to noise associated with construction activities. Contract specifications will set construction noise limits for sensitive areas. The actual level of noise impact during this period will be relative to the number and varieties of equipment being used, and the types of construction activities. These activities will include the moving of heavy equipment, pile driving for structural supports and grading of earth.

Noise associated with construction is unavoidable. The contractor will be required to follow TDOT Standard Specifications for Road and Bridge Construction and local ordinances concerning construction noise.

Water quality impacts associated with construction have the potential to increase erosion and sedimentation of soils. Construction impacts such as excavation and grading are temporary in nature and will be controlled by incorporating TDOT Standard Specifications for Road and Bridge Construction. All required permits for impacts relating to the construction of I-69 will be applied for and the contractor will adhere to the recommended mitigation measures therein.

Air pollution associated with construction activities is created by airborne particles. Air pollution will be controlled by watering, or by applying calcium chloride or other approved substances to disturbed areas, and by using Best Management Practices.

Sequence of construction and traffic maintenance will be planned and scheduled to minimize traffic delays throughout the crossover area. Signs will be used as appropriate to provide the traveling public with notice of road closures. Local news media will be notified in advance of construction related activities that might cause disproportionate inconveniences to motorists. Access to properties will be maintained to the greatest extent possible

The removal of debris and structures will occur in accordance with local and state regulatory agencies permitting this operation. The contractor will be held responsible for methods of controlling pollution in borrow pits, other material pits, and areas used for the disposal of waste materials associated with this project. Temporary erosion control features will include temporary seeding, sodding, mulching, the use of sandbags, slope

drains, sediment basins and checks, artificial coverings, and berms. Construction impacts can be mitigated using the following methods:

- Keep proposed grades near existing pavements to facilitate traffic maintenance.
- Develop and maintain traffic plan during construction.
- Develop construction sequence prior to construction phase.
- Employ all practicable methods of silt, erosion, noise and emission controls.
- Provide for fueling and concrete washout areas with specific measures to contain pollutants.

4.15 Required Permits

A U.S. Army Corps of Engineers (USACE) permit subject to Section 404 of the Clean Water Act will be required. Federal permits are required for projects involving the discharge of dredged or fill material into the waters or wetlands of the United States. These permits must be obtained prior to the conducting of any activities that obstruct or alter any of the waters by excavating, filling, or crossing waters under the jurisdiction of the USACE.

Persons who conduct any activities involving the alteration of waters of the State of Tennessee will be required to obtain an Aquatic Resource Alteration Permit. Examples of stream alterations include dredging, bank stabilization, straightening, alteration of up to one acre of wetland, and construction of road crossings of waters. Water quality standards will comply with Section 401 of the Clean Water Act (Public Law 95-127). Application for Section 401 Water Quality Certification will be made to the Tennessee Department of Environment and Conservation (TDEC). In addition, a National Pollution Discharge Elimination System (NPDES) Storm Water Construction permit will be required by TDEC.

4.16 Short-term Use of Environment vs. Long-term Productivity

Short term impacts relating to the building of an interstate would occur in the immediate vicinity of construction activities. Interruptions to the movement of traffic in the project area would be likely to occur. These interruptions would be temporary, and mitigation measures would include maintenance of traffic plans to minimize inconveniences to area motorists.

Long term benefits anticipated to result from the new interstate would include a decrease in travel time between the communities along the defined project area. Safer existing roadways with increased levels of service in the surrounding area are anticipated if I-69 is constructed. The improved free flow of traffic would result in increased efficiency of energy use. Additionally, the construction of an interstate highway would provide an improved method of multimodal transfer of cargo which could provide economic benefits from the establishment of new commercial enterprises in the project area. These efforts will depend on local and regional efforts to recruit, expand and retain such enterprises.

4.17 Irreversible and Irretrievable Commitment of Resources

Resources expended during the construction of the proposed project would include fossil fuels, concrete, aggregate and steel. These materials are readily abundant and no shortages are foreseen in the near future.

Construction of the facility would involve a range of natural, human and funding resources. In addition to the materials discussed above, labor and additional natural resources would be utilized in the fabrication and preparation of construction materials. These materials would not be recoverable. However, these materials too, are readily abundant and the expenditure of these materials would not have an adverse effect on their continued availability in the near future. Any funding used in the construction of the proposed facility would not be considered retrievable.

The use of these resources is based upon the concept that residents and visitors of the area would benefit from an improved transportation system. These benefits include a savings of time through improved traffic flow and increased economic opportunities.

Based upon an evaluation of the context and intensity of the effects described above, no significant impacts resulting from the irreversible and irretrievable commitment of resources on the project area are anticipated.

4.18 Indirect and Cumulative Impacts

Indirect and Cumulative Impacts for the Human and Natural Environments associated with Alternative O4F are similar to those included in the approved DEIS. The impacts addressed in the DEIS include:

- Land Use
- Farmland Conversion
- Terrestrial Habitat
- Aquatic Habitat
- Threatened and Endangered Species
- Air Quality
- Traffic Noise
- Historic Resources
- Archaeological Resources.

Although direct impacts are not anticipated for Threatened and Endangered Species, Archaeological or Historic Resources, as reported in the DEIS, these areas of concern could experience indirect and cumulative impacts. Indirect impacts would be associated with commercial and residential development efforts that would be located along and in proximity to I-69 while cumulative impacts could be associated with other highway improvements and accompanying growth as economic development activities increase.

Indirect and Cumulative Benefits are also consistent with those included in the DEIS. These include economic vitality resulting from improved linkage between residents and jobs, improved recreational opportunities, preservation of natural and cultural resources through controlled development efforts and improved travel and safety conditions.

4.19 Comparison of Impacts between Alternative R and Alternative O4F

Upon completing the technical studies and analyses for impacts to the environment that are associated with Alternative O4F, the results have been compared to the impacts for Alternative R. Following is a summary for both alternatives, which will be considered along with the costs of the projects and public input as components in the decision making process. The tables comparing the impacts and project costs that were represented in the Summary are included here for easy reference.

Alternative R (52 relocations) has one less relocation than Alternative O4F (53 relocations). Each of the projects avoids relocating businesses, and only Alternative O4F would relocate a non-profit organization, a Veterans of Foreign War facility. No cemeteries, schools, or churches will be affected by either alignment. Alternative O4F also has higher impacts to prime and unique farmland, although the total acres of farmland required for right-of-way is slightly higher for Alternative R.

The total areas of floodplains located within the project corridor totaled 2,867 acres for Alternative R and 2,892 /acres for Alternative O4F. The impacts to floodplains are slightly higher for Alternative O4F (386 acres or 12.9% of the total floodplain area) than Alternative R (369 acres or 13.3% of the total floodplain area). The total length of culverts, stream crossings and stream relocations are greater for Alternative R than Alternative O4F. No impacts to threatened and endangered species are associated with either alternative. Alternative O4F impacts 39.5 acres of wetlands, while Alternative R impacts 16 acres. The total acres of ponds impacted totaled 15.99 acres for Alternative R and 16.69 acres for Alternative O4F.

No adverse impacts to historic sites or archaeological sites will occur by either alternative. No Section 4(f) or Section 6(f) resources will be impacted by either Alternative R or Alternative O4F.

Both Alternatives impact a hazardous material site. Alternative O4F was determined to have one site (The former Kirby Store) that has the potential for the presence of above ground or underground storage tanks, hazardous wastes or materials or areas of concern that could pose a threat to human health and/or the environment. The DEIS states that Alternative R would require further analysis for one site (the McBride site) (See Figure 4.2, page 76). Four UST fill ports, vent pipes, and fueling pumps were observed at this site. The USTs are 1000 gallon tanks.

Alternative R encompassed a total of 11 receptors within its corridor that were analyzed for potential air quality impacts associated with traffic from the new interstate. Alternative O4F contained 9 total receptors. The air quality modeling revealed that no impacts are associated with the project requiring mitigation for either alternative. The total project cost estimations indicate that Alternative O4F would be approximately $8.6 million (3.0%) greater than Alternative R.

Table 4.11: Estimated Project Costs for Alternatives R and O4F

Project Alternative	Nodes	Length	Const. Costs*	Utility Costs	ROW Costs	Total*
R	KEG	23.84 miles	$279,346,402	$1,434,921	$3,370,000	$284,151,323
O4F	KWG	23.96 miles	$285,695,899	$2,242,056	$4,835,000	$292,772,955

- Includes estimated costs for stream mitigation.

Table 4.12: Impacts Matrix of Alternatives O4A (Nodes KWG) and R (Nodes KEG)

Project Alternative	Residential Relocations	Business Relocations	Total Acres of Farmland /Prime & Unique	Non-profit Relocations	Floodplains Impacts (Acres)	Adverse Impacts to Historic Sites	Impacts to Archaeological Sites
R	52	0	1,167/316	0	369	0	0
O4F	53	0	1,125/489	1	386	0	0

Project Alternative	Culverts (ft)	Stream Crossing/ Bridge (ft)	Stream Relocation (ft)	Threatened and Endangered Species	Wetlands Impacts in Acres	Hazardous Materials Sites Requiring Additional Work
R	1,809	883	4,457	None	16.2	1
O4F	1,652	709	3,230	None	39.5	1

5.0 COMMENTS AND COORDINATION

This section describes the agency coordination process and public involvement activities that were conducted in association with the Northern Crossover portion of the Interstate 69, Section of Independent Utility project. Upon approval of the SDEIS, copies will be sent to the following agencies for their review and comments.

5.1 Federal Agency Coordination

The following federal agencies will be sent copies of the SDEIS for review and comments:

U.S. Environmental Protection Agency
Federal Emergency Management Agency
Federal Energy Regulatory Commission
Federal Railroad Administration, Office of Economic Analysis
Federal Aviation Administration
Tennessee Valley Authority, Environmental Management
U.S. Army Corps of Engineers, Memphis District
U.S. Department of Agriculture, Natural Resources Conservation Service for determination of impacts to farmland
U.S. Department of Agriculture, Natural Resources Conservation Service for determination of impacts to Wetland Reserve Program easements
U.S. Department of Commerce, Ecology and Environmental Conservation Office
U.S. Department of Commerce, National Oceanic and Atmospheric Administration
U.S. Department of Housing and Urban Development
U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, National Parks Service
U.S. Geological Survey, District Chief, Nashville, TN
U.S. Geological Survey, National Center, Reston, VA

5.2 State of Tennessee Agencies

The following state agencies will be sent copies of the SDEIS for review and comments:

Tennessee Historical Commission-State Historic Preservation Officer
Tennessee Department of Agriculture
Tennessee Department of Economic and Community Development, Jackson, TN
Tennessee Department of Education
Tennessee Wildlife Resources Agency
Tennessee Department of Environment and Conservation
- Division of Air Pollution Control
- Division of Natural Heritage
- Division of Groundwater Protection
- Division of Solid Waste/Hazardous Waste Management
- Division of Water Supply
- Division of Remediation
- Division of Water Pollution Control

5.3 Other Organizations

Regional Agencies
Northwest Tennessee Development District
Memphis Area Association of Government
Memphis and Shelby County Office of Planning and Development
Memphis Area Transit Authority
Sierra Club, Memphis, TN
Sierra Club, Knoxville, TN
Tennessee State Chapter of the Sierra Club
Tennessee Conservation League Mississippi River Trail Corporation
Tennessee Environmental Council
The Nature Conservancy

Local Governments
County Mayors
- Dyer County, TN
- Lauderdale County, TN
- Shelby County, TN
- Tipton County, TN

Mayors
- Arlington
- Atoka
- Covington
- Henning
- Munford
- Millington
- Ripley
- Dyersburg

5.4 Section 106 Coordination

Pursuant to Section 106 of the National Historic Preservation act, a letter was sent along with project summary data to the appropriate Native American Groups during the initial corridor studies. The area which contains Alternative O4F was included in this original boundary. No response was received from these groups, and no further coordination is required. Following is a list of the identified Native American Groups within Lauderdale County that were contacted by TDOT:

- The Chickasaw Nation
- Eastern Shawnee Tribe of Oklahoma
- Quapaw Tribe of Oklahoma
- Shawnee Tribe
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee Indians

5.5 Public Involvement

Public Involvement Activities Leading to the Consideration of Alternative O4F

On May 17, 2006, the Tennessee Department of Transportation (TDOT) announced that Interstate 69, Segment of Independent Utility #8 from Paul Barrett (SR 385) in Millington to Interstate 155 in Dyersburg, would utilize Alternative R (also known as the Red or Western alignment) for most of the project length. Alternative R will be used from the southern terminus (endpoint) in Millington to a point just north of the Hatchie River. Alternative R was also selected and announced from a point at Nankipoo Road in Lauderdale County to the northern terminus in Dyer County at I-155 in Dyersburg. Comments received during the Public Hearing process in November 2005 included inquiries as to whether a "northern crossover" had been considered. The comments were focused upon the area between Ripley and Dyersburg. Comments were expressed that area residents in Lauderdale County would continue to be isolated from opportunities for growth and from reliable and efficient roadways. TDOT considered these concerns, which resulted in the study of a new northern crossover.

As a result of the Public Hearing comments, a public workshop was conducted on June 20, 2006. The purpose of the workshop was to present a corridor and to receive comments from the public on a new corridor. The corridor, approximately seven miles long and five miles wide, was presented to the public in handouts and on wall displays. A total of 106 citizens were recorded on the sign-in sheets. The TDOT staff was in attendance to provide guidance, to answer questions, and to receive comments from the public.

A total of 56 comments were received. The 47 written and 9 verbal comments (5 of which also submitted written comments) received, a total of 34 citizens voiced support of a crossover option with 22 of the 34, stating general support with no specific alignment. Two of the 34 prefer an eastern alignment because the Red Alternative would split their properties. An additional two citizens suggested a crossover as far to the north as possible near the proposed rest area. A total of eight citizens suggested a crossover as near Ripley as possible. Respondents provided 18 comments that stated preferences for the original Red Alternative to the west but not in a crossover option.

The comments received from the public at the June 20, 2006 meeting were collected and reviewed by TDOT, and in response to these actions, three crossover alignments were developed. These crossovers were presented to the public at a subsequent meeting on November 9, 2006. At the meeting, officials communicated to the public that upon approval of a Supplemental Draft Environmental Impact Statement, a Public Hearing will be held to discuss the document.

Written and oral comments were collected and reviewed at the November 9, 2006 meeting. The purpose of this meeting was to receive comments from the public for preferences on the three alignments being considered for the new crossover option. These alternatives, O4A, O4B and O4F, were illustrated on maps and handouts. TDOT officials were present to provide guidance to the public, answer questions and receive comments on the three alignments.

The results of the Public Meeting in November revealed that 56 respondents preferred Alternative O4F, while 38 preferred Alternative O4B and 28 preferred Alternative O4A. In addition early field work has been conducted throughout the corridor to determine areas which might cause measurable impacts to the human and natural environments. Upon receipt of the comments, the field information, and the technical studies, it was decided that Alternative "O4F" would be the alignment recommended for the crossover option.

Upon approval of the SDEIS, the public will be invited to attend a Public Hearing to discuss the Preferred Alternative O4F. The SDEIS and the Public Hearing will provide a comparison of Alternative O4F and Alternative R within the area between Nodes K and G. All comments will be collected and reviewed. TDOT will reconvene to analyze and make an informed decision on which alignment best suits the Project Purpose and Need while avoiding as many environmental impacts as possible. The results of the Public Hearing and the ensuing decision will be documented and included in the Final Environmental Impact Statement (FEIS).

Public Involvement Activities Concerning an Eastern Alignment in Ripley

Additional concerns in the project area were voiced at the Public Hearing on November 15, 2005 for SIU#8 in Lauderdale County relating to the location of an eastern alignment in respect to Ripley. This portion of Alternative G would serve as a connector between Alternative R and Alternative O4F if the crossover option is selected as the build alternative. The concerns were expressed about a section of Alternative G that was relocated to avoid minority and low-income residents in the southeast area of Ripley.

In the spring of 2003, census data and field trips indicated that a predominately minority community lived in the area where Alternative G would cross SR 19 east of Ripley. In the 2006, census data, field surveys, and interviews indicated that a predominately minority community lived in this area of Ripley. In June 2003, TDOT relocated the alignment of Alternative G in an attempt to avoid or minimize divisive or disruptive effects to the community. At the SIU #8 Public Hearing for the DEIS, conducted on November 15, 2005 in Lauderdale County, citizens stated that they would prefer the original location of Alternative G and not the avoidance section. In response to those concerns, TDOT conducted a community meeting on August 17, 2007, and the area residents were invited to attend and voice their opinions, concerns and comments about the location of the alignment. A total of 11 comments were collected and reviewed, and 8 participants preferred relocating the alignment back to the original configuration. Participants preferring the avoidance alternative totaled 3. TDOT reviewed the comments and has relocated this portion of the alignment back to its original location.

6.0 SELECTED SOURCES

Palmer Engineering Company

2007 Phase I Environmental Site Assessment of Underground Storage Tanks and Hazardous Materials Sites. From State Route 19 to Double Branches Creek, Crossover Corridor Study in Lauderdale County, Tennessee for Segment of Independent Utility #8 of Interstate 69.
August 2007.

2007 Air Quality Analysis of Interstate 69, Segment of Independent Utility #8, Alternative O4F Crossover in Lauderdale County, Tennessee.
April 2007.

2007 Traffic Noise Impact Analysis of Interstate 69, Segment of Independent Utility #8, Alternative O4F Crossover in Lauderdale County, Tennessee.
April 2007.

2007 Aquatic and Terrestrial Crossover Corridor Study of Interstate 69, Segment of Independent Utility #8, Alternative O4F Crossover in Lauderdale County, Tennessee.
June 2007.

Weaver & Associates

2007 Phase I Archaeological Survey of the Crossover Corridor of Interstate 69, Segment of Independent Utility #8 in Lauderdale County, Tennessee.
June 2007

Thomason & Associates

2007/08 Historical and Architectural Survey and documentation for effect under 36 CFR 800 evaluation for the Crossover Option of Interstate 69, Segment of Independent Utility #8 in Lauderdale County, Tennessee
July 2007, January 2008.

HMB Professional Engineers, Inc.

2005 Draft Environmental Impact Statement, Interstate 69, Segment of Independent Utility #8, from SR 385 in Millington, TN to I-155/US 51 in Dyersburg, TN, Shelby, Tipton, Lauderdale and Dyer Counties, Tennessee.
August 2005.

Chapter 7.0 List of Preparers

Federal Highway Administration - Tennessee Division

Gary Fottrell
Environmental Program Engineer

Tennessee Department of Transportation Environmental Division

Tom Love TDOT Project Manager	B.S., Agriculture, NEPA Documentation 1972-Present

HMB Professional Engineers, Inc.

John W. Brown SDEIS Preparation	B.A., Communications 11 years experience in NEPA studies and documentation. Graduate studies in Public Administration
Richard D. Dutton SDEIS Review and Coordination	B.S., Civil Engineering Over 30 years transportation Experience

Thomason and Associates, Inc.

Philip Thomason Principal Investigator	B.S., Historical Preservation 23 years experience. Historic/Architectural Cultural Resource Analysis

Palmer Engineering

Eric E. Fischer, P.E. Air and Noise Impact Analysis	B.S., Civil Engineering 20 years transportation experience
Charles O. Danison Jr. Air and Noise Impact Analysis	B.S., Meteorology 30 years transportation experience
Chris Blevins Socioeconomic Analysis experience	B.S. Geography 10 years transportation
Karis Day Socioeconomic Analysis	M.S. Geography 1 year transportation experience

Robert Oney Aquatic & Terrestrial Analysis	B.S. Wildlife Management 4 years transportation experience
Ralph Schuler Aquatic & Terrestrial Analysis	M.S. Biology 2 years transportation experience
Lee Carolan UST/HAZMAT Analysis experience	B.S. Biological Science 10 years transportation
William R. Davis, Jr. UST/HAZMAT Analysis	B.S. Mechanical Engineering 35 years experience
Jon Totty GIS Specialist	B.S. Industrial Technology 6 years transportation experience

Weaver and Associates

Guy Weaver Project Manager	M.S., Anthropology Over 30 years experience. Archaeological Cultural Resource Analysis
Brian Collins Field Director	M.S., Anthropology 16 years experience.
Warren Oster	M.S., Anthropology 5 years experience.
Thomas Carty Field Director	M.S., Anthropology 7 years experience.
Debbie Shaw Lab Director	M.S., Anthropology 5 years experience.

APPENDIX A

CORRESPONDENCE

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
675 US Courthouse
801 Broadway
Nashville, Tennessee 37203

January 9, 2008

Robert C. Oney, Environmental Biologist
Palmer Engineering
400 Shoppers Drive
P.O. Box 747
Winchester, Kentucky 40392-0747

Dear Mr. Oney:

SUBJECT: I-69, Segment of Independent Utility #8, Crossover Corridor Study
Lauderdale County, Tennessee

The Natural Resources Conservation Service (NRCS) currently has one Wetland Reserve Program (WRP) easement filed in Lauderdale County. The easement is located on the northwest bank of the Mississippi River. This 240-acre tract will not be impacted by the proposal for the I-69 Segment of Independent Utility #8 Crossover Corridor, as indicated on your map.

We appreciate your inquiry as to the project's effect on protected wetlands in the area. If our agency can be of further service, please feel free to contact my office.

Sincerely,

Susan M Hopkins, Acting

KEVIN BROWN
State Conservationist

cc:
John Rissler, ASTC (P), NRCS, Nashville, TN
Vic Simpson, SRC, NRCS, Nashville, TN
Richard West, AC, NRCS, Jackson, TN
Richard Cooke, DC, NRCS, Ripley, TN

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 6 MAR 07	4. Sheet 1 of 1
1. Name of Project I-69 CROSSOVER	5. Federal Agency Involved FHWA	
2. Type of Project NEW INTERSTATE CONSTRUCTION	6. County and State LAUDERDALE CO., TN	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 03/27/2007	2. Person Completing Form C. DAVIS
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated NA	Average Farm Size 380 AC
5. Major Crop(s) CORN	6. Farmable Land in Government Jurisdiction Acres: 194,258 % 60	7. Amount of Farmland As Defined in FPPA Acres: 84,474 % 43
8. Name Of Land Evaluation System Used LAUDERDALE CO.	9. Name of Local Site Assessment System NA	10. Date Land Evaluation Returned by NRCS 04/05/2007

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment Nodes W to G			
	Corridor 04F	Corridor 04B	Corridor 04A	Corridor
A. Total Acres To Be Converted Directly	1,167.0	1,100.1	1,125.0	
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor				
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	489	187	316	
B. Total Acres Statewide And Local Important Farmland	NA	NA	NA	
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.6	0.2	0.4	
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	84	84	84	
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	100	100	98	
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15	8	8	8	
2. Perimeter in Nonurban Use — 10	10	10	10	
3. Percent Of Corridor Being Farmed — 20	15	15	15	
4. Protection Provided By State And Local Government — 20	0	0	0	
5. Size of Present Farm Unit Compared To Average — 10	0	0	0	
6. Creation Of Nonfarmable Farmland — 25	0	0	0	
7. Availability Of Farm Support Services — 5	5	5	5	
8. On-Farm Investments — 20	3	3	3	
9. Effects Of Conversion On Farm Support Services — 25	0	0	0	
10. Compatibility With Existing Agricultural Use — 10	0	0	0	
TOTAL CORRIDOR ASSESSMENT POINTS — 160	41	41	41	
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100	100	100	98	
Total Corridor Assessment (From Part VI above or a local site assessment) — 160	41	41	41	
TOTAL POINTS *(Total of above 2 lines)* — 260	141	141	139	

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
			YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE 10 APRIL 07

NOTE: Complete a form for each segment with more than one Alternate Corridor

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

April 1, 2008

Ms. Martha Carver
Tennessee Department of Transportation
505 Deaderick St/900
Nashville, Tennessee, 37243-0349

RE: F HWA, E FFECT D ETERMINATION, I-69 C ROSSOVER ALIGNMENT, U NINCORPORATED, LAUDERDALE COUNTY

Dear Ms. Carver:

Pursuant to your request, received on Monday, March 31, 2008, this office has reviewed documentation concerning the above-referenced undertaking. This review is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739)

Based on the information provided, we find that the project area contains a cultural resource eligible for listing in the National Register of Historic Places, the James A. Langley House. We further find that the project as currently proposed will not adversely affect this resource.

Unless project plans change, this office has no objection to the implementation of this project. Should project plans change, please contact this office to determine what additional action, if any, is necessary. Questions and comments may be directed to Joe Garrison (615) 532-1550-103. Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jyg

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

November 9, 2007

Mr. Gerald Kline
Tennessee Department of Transportation
Environmental Planning and Permits Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243-0334

RE: FHWA, ARCHAEOLOGICAL ASSESSMENT ADDENDUM, I-69/SIU 8
MILLINGTION - DYERSBURG, UNINCORPORATED, MULTI COUNTY, TN

Dear Mr. Kline:

At your request, our office has reviewed the above-referenced archaeological survey report addendum in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we find that the project area for the proposed cross-over alternative contains no archaeological resources eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

RECEIVED
AUG 12 2006
PALMER
ENGINEERING

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

August 11, 2006

Mr. Robert C. Oney
Biologist
Palmer Engineering
400 Shoppers Drive
P.O. Box 747
Winchester, Kentucky 40392-0747

Subject: Interstate 69, Segment of Independent Utility #8, Crossover Corridor Study, Lauderdale County, Tennessee.

Dear Mr. Oney:

Fish and Wildlife Service (Service) personnel have reviewed the information that you provided regarding the subject Crossover Corridor Study. Please consider the following comments during further development of the Interstate 69 project plans.

Upon review of the National Wetlands Inventory database, we note that a number of wetlands occur within the study corridor boundary. In general, the Cane Creek watershed appears to contain some of the larger wetland complexes in this area. We recommend that existing highways be improved to the greatest extent feasible, versus constructing new highways, in order to avoid additional wetland fills. We would gladly comment further about potential wetland impacts if you provide greater details regarding potential highway alignments.

Endangered species collection records available to the Service do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. Based on the best information available at this time, we believe that potential endangered species concerns have been adequately coordinated. Species concerns should be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

We appreciate the opportunity to review the information regarding the subject Crossover Corridor Study. Please contact David Pelren of my staff at 931/528-6481 (ext. 204) if you have questions about these comments.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL PLANNING AND PERMITTING DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334
(615) 741-3653

J. BRUCE SALTSMAN, SR
COMMISSIONER

DON SUNDQUIST
GOVERNOR

November 2, 2001

Mr. Charles D. Enyart
Chief
Eastern Shawnee Tribe of Oklahoma
P.O. Box 350
Seneca, MO 64865

SUBJECT: Initial Coordination, Proposed Corridor 18/Interstate 69 Project from State Road 385 in Millington to US 155 at Dyersburg, Shelby, Tipton, Laurderdale and Dyer Counties, TN

Dear Mr. Charles D. Enyart:

The Tennessee Department of Transportation (TDOT) in cooperation with the Federal Highway Administration is in the planning stages of evaluating the above referenced project for possible implementation. The location of the proposed project is shown on the enclosed map.

The 2001 Advisory Council on Historic Preservation regulations stipulate that Indian tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking be invited to participate in the project review process as consulting parties, pursuant to 36 CFR 800. TDOT would like to invite you to participate as a consulting party for the proposed project. This letter is also TDOT's request for comments on the identification of historic properties in the project's area of potential effect that may be of religious and cultural significance to your tribe.

If you choose to participate as a consulting party on the above-referenced project, you will receive copies of cultural resource assessments that identify Native American related resources. You will also be invited to attend project-related meetings with FHWA, TDOT and the Tennessee State Historic Preservation Office (TN-SHPO), if any are held.

We respectfully request written responses to project reports and other materials within thirty (30) days of receipt.

If you would like to participate as a consulting party, please respond to me at the above address via letter, telephone or E-mail. To facilitate our planning process, please respond within 30 days of receipt of this letter. If you do not respond, TDOT will not send any reports related to this project unless you specifically request such copies at a later date. Thank you for your assistance.

Sincerely,

Gerald Kline
Archaeologist Supervisor

Attachments

cc: Mr. Herbert Harper, TN-SHPO

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
WATER SUPPLY
9th Floor, 401 Church Street
Nashville, Tennessee 37243-1539
Phone: (615) 532-0191; Fax: (615) 532-0503

December 12, 2006

Mr. Robert C. Oney
Palmer Engineering
400 Shoppers Drive
P. O. Box 747
Winchester, KY 40392-0747

RE: Interstate 69 Crossover Corridor

The Division of Water Supply appreciates the opportunity to provide water supply information in the furtherance of transportation projects. A review of the community water supplies in the area show that the proposed routes have no community public wells, springs or wellhead protection areas or surface water intakes in the vicinity. The nearest wellfield/wellhead protection area would be for the community of Gates. I have enclosed a map showing the wells and wellhead protection areas in the general area of the proposed construction corridor.

Feel free to contact me at (615) 532-0170 or tom.moss@state.tn.us if you have further questions.

Sincerely,

Thomas A. Moss

Thomas A. Moss
Source Water Protection Coordinator
Manager, Ground Water Management Section
Division of Water Supply

c: Robert Foster, DWS Deputy Director
Brian Caton, DWS Manager, Jackson Regional Environmental Field Office

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
USDA Service Center
301 Lake Drive, Suite A
Ripley, Tennessee 38063-3507

November 9, 2006

Mr. Robert C. Oney
Environmental Biologist
Palmer Engineering
400 Shoppers Drive
Winchester, Kentucky 40392-0747.

Dear Mr. Oney:

As requested, I am sending to you the Hydric Soils list for Lauderdale County, Tennessee; the Highly Erodible Land Legend for Lauderdale County, Tennessee; and the Prime Farmland Soils List for Lauderdale County.

If I can be further assistance to you, please contact me at the above address or telephone me at (731) 635-7686 Extension 113.

Sincerely,

Dwaine Johnston

Dwaine Johnston
Soil Conservationist
USDA-NRCS-Ripley Field Office

Enclosures (3)

APPENDIX B

MOBILE SOURCE AIR TOXICS ANALYSIS

1. MOBILE SOURCE AIR TOXICS

In addition to the criteria pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources including on-road mobile sources, non-road mobile sources (e.g. airplanes) area source (e.g. dry cleaners) and stationary sources (e.g. factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3 butadiene, and acetaldehyde by 57% to 65%, and reduce on-highway diesel PM emissions by 87%.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 201(l) that will address these issues and could make adjustments to the full 21 and six primary MSATs.

1.1 Mobile Source Air Toxic (MSAT) Health Impacts

The construction of I-69 along with the Alternative O4F Crossover includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in the I-69 project. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Information that is Unavailable or Incomplete: Evaluating the environmental and health impacts from MSATs on a proposed highway would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- **Emissions:** The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

  These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends, and performing relative analysis between alternatives for very large projects, but is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- **Dispersion:** The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- **Exposure Levels and Health Effects:** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions

about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATS: Research into the health impacts of MSATs is ongoing. For different emissions types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposures to toxics have been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.

- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

- **Formaldehyde** is a probable human carcinogen based on limited evidence in humans and sufficient evidence in animals.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.

- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male or female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust (DE)** is likely to be carcinogenic to humans by inhalation from environmental exposures. **Diesel exhaust** as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways, The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the studies is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes - - particularly respiratory problems. Much of this research is not specific to MSATs, instead of surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community: Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment".

In this document, The Department has provided a qualitative assessment of MSAT emissions relative to the various alternatives and has acknowledged that the 2010 and 2030 No-Build Alternatives, Alternative R (Nodes KEG) for the years 2010 and 2030, and Alternative O4F (Nodes KWG) for the years 2010 and 2030 may result increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

1.2 Qualitative Analysis

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate health impacts of MSATs at the project level, it is possible to qualitatively assess the level of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions-if any –from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

For each alternative in the I-69 O4F Crossover project, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative. Because the VMT for the 2030 No Build Alternative is lower than any of the 2030 Build Alternatives, higher levels of regional MSATs are expected compared to the 2030 No-Build Alternative. See Table 1.

Table 1 Project vehicle miles traveled (Daily VMT)

Facilities	2010 No-Build Alternative	2010 Alternative R*	2010 Alternative O4F**	2030 No-Build Alternative	2030 Alternative R*	2030 Alternative O4F**
US 51	227,162	208,576	196,891	454,560	403,330	377,634
I-69	0	249,936	248,926	0	501,849	525,346
Total VMT	*277,162*	*458,512*	*445,817*	*454,560*	*905,179*	*902,980*

*** Includes Nodes KEG**
**** Includes Nodes KWG**

In addition, because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than 3 percent for the year 2010 and less than 1 % for the year 2030, it is expected that there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will be likely lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates,

and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all cases.

Because of the specific characteristics of the project alternatives [i.e. new connector roadways], under each alternative there may be localized areas where VMT would increase and other areas where VMT would decrease. Therefore it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built at the interchange of I-69 with US 51 at Node K and the interchange of Alternative O4F with US 51 and along Alternative R (Nodes KEG) and Alternative O4F (Nodes KWG) for the years 2010 and 2030, respectively. However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.

In sum, although increased VMT associated with all 2010 and 2030 Build Alternatives may produce higher MSAT emissions in the immediate area of the project relative to the 2010 and 2030 No-Build Alternatives, total future MSAT emissions levels may be reduced due to EPA's MSAT reduction programs. In comparing various project alternatives, MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

1.3 MSAT Mitigation Strategies

Lessening the effects of mobile source air toxics should be considered for projects with substantial construction-related MSAT emissions that are likely to occur over an extended building period, and for post-construction scenarios where the NEPA analysis indicates potentially meaningful MSAT levels. Such mitigation efforts should be evaluated based on the circumstances associated with individual projects and they may not be appropriate in all cases. However, there are a number of mitigation strategies and solutions for countering the effects of MSAT emissions.

Mitigating for Construction MSAT Emissions: Construction activity may generate a temporary increase in MSAT emissions. Project-level assignments that render a decision to pursue construction emission mitigation will benefit from a number of technologies and operational practices that should help lower short-term MSATs. In addition, the SAFETEA-LU has emphasized a host of diesel retrofit technologies in the law's CMAQ provisions-technologies that are designed to lessen a number of MSATs.

Construction mitigation includes strategies that reduce engine activity or reduce emissions per unit of operating time. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits when sites are near vulnerable populations. For example, agreements that stress work activity outside normal hours of an adjacent school campus would be operations-oriented mitigation. Also on the construction emissions front, technological adjustments to equipment, such as off-road dump trucks and bulldozers, could be appropriate strategies. These technological fixes could include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. The use of clean fuels, such as ultra-low sulfur diesel, also can be a very cost beneficial strategy.

The EPA has listed a number of approved diesel retrofit technologies; many of these can be deployed as emissions mitigation measures for equipment used in construction. This listing can be found at: www.epa.gov/otaq/retrofit/retroverifiedlist.htm.

Post Construction Mitigation for Projects with Potentially Significant MSAT Levels: Longer-term MSAT emissions can be more difficult to control, as variables such as daily traffic and vehicle mix are elusive. Operational strategies that focus on speed limit enforcement or traffic management policies may help reduce MSAT emissions even beyond the benefits of fleet turnover. Well-traveled highways with high proportions of heavy-duty diesel truck activity may benefit from active Intelligent Transportation System programs such as traffic management centers or incident management systems. Similarly, anti-idling strategies, such as truck stop electrification can complement projects that focus on new or increased freight activity.

Planners also may want to consider the benefits of establishing buffer zones between new or expanded highway alignments and areas of vulnerable populations. Modifications of local zoning or the development of guidelines that are more protective also may be useful in separating emissions and receptors.

The initial decision to pursue MSAT emissions mitigation should be the result of interagency consultation at the earliest juncture. Options available to project sponsors should be identified through careful information gathering and the required level of deliberation to assure an effective course of action.