Mine Lick Creek Interchange at Interstate 40 and Northern Connector Route
from I-40 to US 70N (SR 24)
Putnam County, Tennessee

Environmental Assessment

Submitted pursuant to 42 U.S.C. 4332(2) (C)
By the
U.S. Department of Transportation
Federal Highway Administration
And the
Tennessee Department of Transportation

Cooperating Agencies:
U. S. Army Corps of Engineers
Tennessee Valley Authority

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12-14-06
Date Approved

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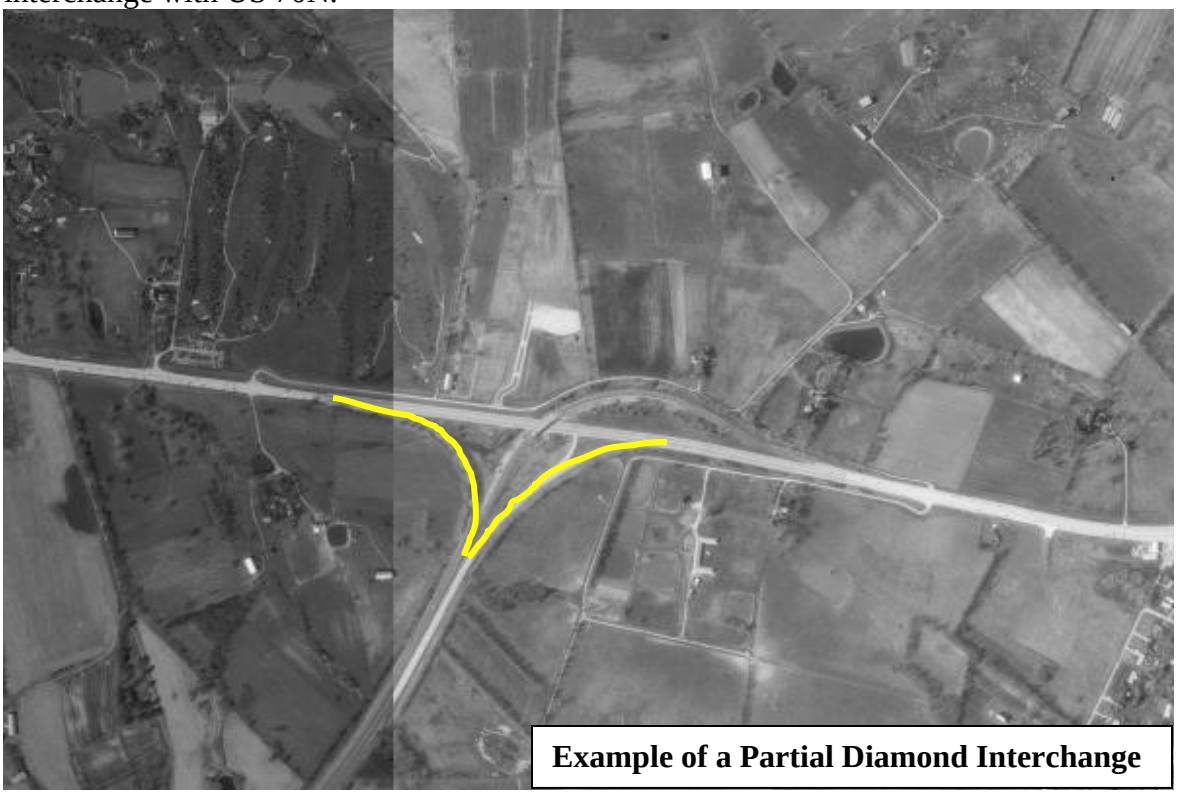
Summary

General Project Description

The Tennessee Department of Transportation and the Federal Highway Administration propose a new highway facility connecting Interstate 40 and US 70 North (US 70N), which is State Route (SR) 24 in Putnam County, just west of the Cookeville City Limits. Please refer to Chapter 1, Figure 1, for a project vicinity map. The proposed route would begin with a Mine Lick Creek Road Interchange on I-40 and extend north and east, connecting with US 70N (SR 24) approximately 0.89 miles west of the Cookeville City Limits. The proposed facility would consist of a four lane divided highway with a modified-diamond interchange with Interstate 40 (I-40), and a partial diamond interchange with US 70N.

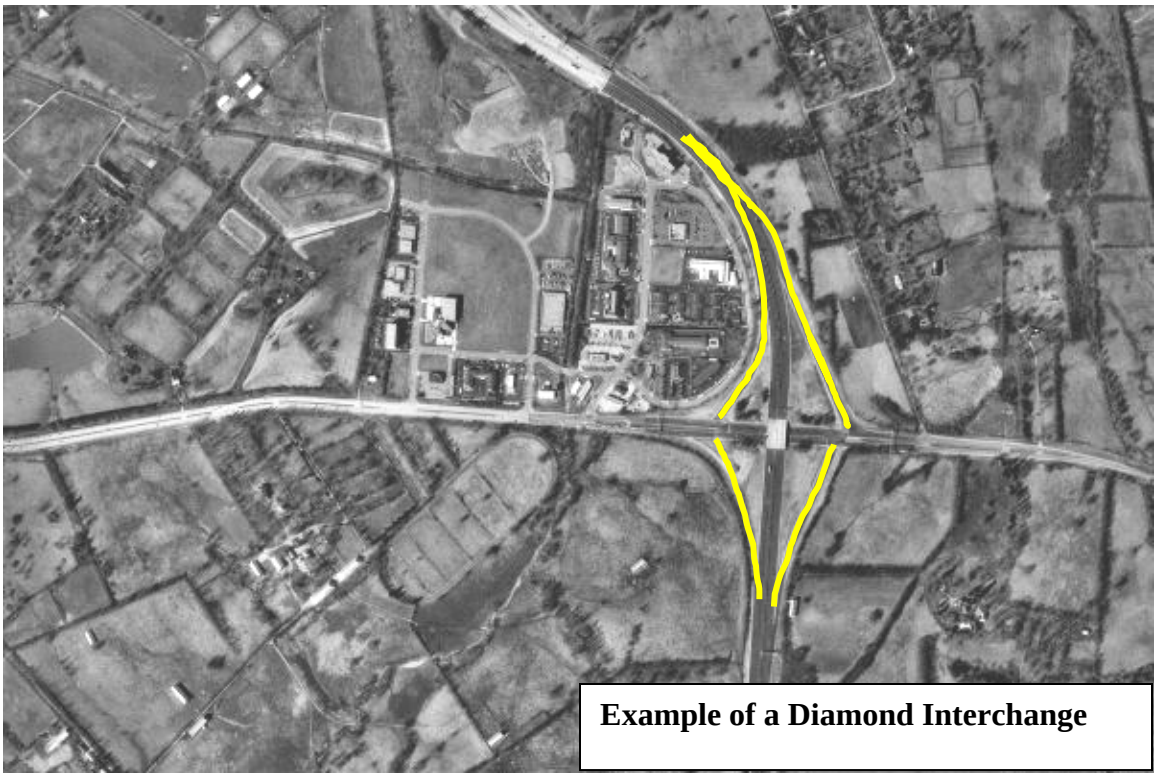


Example of a Partial Diamond Interchange

Summary of Alternatives

The alternatives under consideration in the Environmental Assessment include the "No-Build" Alternative and two "Build" Alternatives, designated as Alternative A and Alternative B. Alternative A would begin at a proposed interchange with I-40, approximately 2.82 miles west of the existing I-40/SR 135 interchange. The proposed alternative extends northeasterly on a new location for approximately 1.63 miles to a typical diamond interchange at Buffalo Valley Road. From this point the alternative continues in a more northerly direction for approximately 1.2 miles before tying into US 70N. Alternative B would also begin with an I-40 interchange, located approximately 0.71 miles west of the existing Mine Lick Creek Road Bridge over I-40.

The proposed alternative would extend northward for approximately 0.80 miles to a typical diamond interchange at Buffalo Valley Road. From this point the proposed alternative would continue in a northeasterly direction for approximately 2.19 miles, before turning northward. At this point, Alternatives A and B share the same alignment, extending northward for approximately 0.48 miles to the project terminus with US 70. The total length of Alternative A is 2.87 miles. The total length of Alternative B is 3.47 miles.



Example of a Diamond Interchange

Summary of Environmental Impacts

The primary beneficial effects of the proposed project include: *1);* Improvement of regional and local accessibility, *2;)* Improvement of traffic capacity along SR 56, SR 135 and SR 136, *3;)* Positive short-term and long-term economic benefits resulting from the existing and potential business development in the area surrounding the I-40/Northern Connector interchange. The primary adverse effects of the proposed project include: 1) The displacement of residences and businesses, 2) Temporary sedimentation and siltation of project area streams, and 3) loss of wetland habitat.

SAFETEA - LU Statue of Limitations Call

A Federal Agency may publish a notice in the Federal Register, pursuant to 23 USC §139(1), 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.

Environmental Mitigation Commitments

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

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

- **Wetlands –** Impacts to two wetlands will occur if Alternative B is selected. 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. There is no wetlands bank in Putnam County, but other impacts in Putnam County have been mitigated using the Coffee County wetland mitigation bank. 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.

- **Relocations** – Relocation needs will be adequately addressed under the standard provisions of the Tennessee Uniform Relocation Assistance of 1972 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to all residential and business displacees, should such occur, without discrimination, in accordance with the Civil Rights Act of 1964, Title VI.

- **Permits –** A Section 401 permit will be obtained from the Tennessee Department of Environment and Conservation during the design phase. The build alternatives that would impact streams and wetlands which are under U.S Army Corps of Engineers jurisdiction. Such activities are subject to USACE permitting authority under Section 404 of the Clean Water Act. An Aquatic Resource Alteration Permit will be required from the Tennessee Department of Environment and Conservation.

- **Terrestrial Ecosystems –** Inspection and cleaning of construction equipment, use of invasive-free mulches, topsoil and seed mixtures, and eradication strategies to eliminate exotic invasive species will be used to prevent the spread of invasive plant species during construction. Proper selection of construction and landscaping techniques and equipment will decrease the likelihood of spreading invasive species. Methods should include appropriate equipment for steep slopes to minimize soil disturbance during vegetation management activities. In addition, re-vegetation shall occur with the use of native plant species that are consistent with local community plant types.

- **Threatened and Endangered Species -** In the absence of surveys for endangered bats, presence of the Indiana and Gray bats is presumed. A Biological Assessment was conducted and submitted in September 2004. Following are the environmental mitigation measures:

- ☑ Tree removal in construction zones must be scheduled between October 15 and March 31 to prevent disturbance to trees that may harbor the Indiana bat summer colonies.
- ☑ Tree cutting will be limited to areas where construction must occur within 100 feet of stream banks within right of way limits. This will maintain a riparian buffer zone.
- ☑ Disturbed areas will be re-vegetated to the maximum possible extent with tree species that produce sloughing bark and snags. Species to consider include white oak, northern red oak, white ash, shagbark hickory, slippery elm, black locust, American elm, shellbark hickory, cottonwood and sycamore. This mitigation measure is especially important in areas where project construction activities cause disturbances to riparian vegetation.
- ☑ Indiana bats forage (hunt) over local waters necessitating preservation of water quality in forage areas. Therefore stream crossings will be limited to direct crossings.
- ☑ Location of construction equipment in streams will be avoided to the greatest extent possible. Stating, refueling, and cleanup areas will not be allowed alongside streams. All TDOT Best Management Practices for stream protection will be implemented during the construction of the project.
- ☑ Project construction is not anticipated to contribute to degradation of water quality in area streams.
- ☑ Avoidance of construction activities within recognized bat habitat areas will occur during periods of known bat activities if bats are identified.

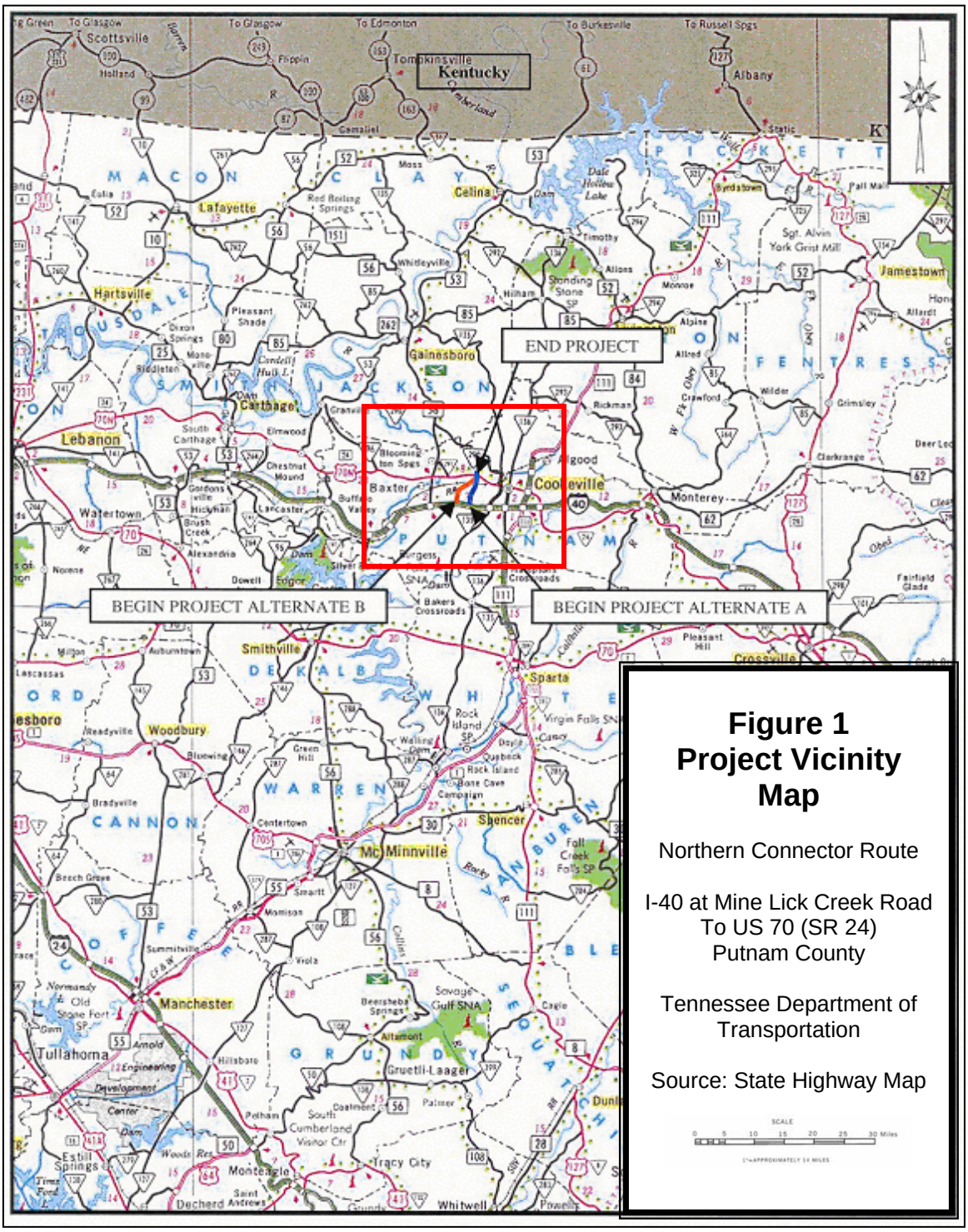
- **Archaeological Resources -** No archaeological sites were discovered during the Phase I survey, which was performed in accordance with criteria established in 36 CFR 60.4.

- **Hazardous Materials and Underground Storage Tanks -** Both Alternatives A and B would impact one property that contains over 55 drums. A full Phase II site assessment is recommended.

- **Construction -** A maintenance-of-traffic plan will be prepared during the design phase. Erosion and sedimentation controls will be used to minimize negative impacts to water quality, wetlands and area streams. Erosion control plans will be developed during the final design phase, best management practices will be implemented during design and construction. Standard noise reducing measures will be implemented during the construction phase. TDOT or its contractors will control fugitive dust. Re-vegetation with native species will be implemented

Chapter I – Purpose and Need

The Tennessee Department of Transportation has proposed a new highway facility connecting Interstate 40 and US 70N (SR 24) in Putnam County, just west of the Cookeville City Limits. Please refer to Figure 1 for a project vicinity map.


END PROJECT
BEGIN PROJECT ALTERNATE B
BEGIN PROJECT ALTERNATE A
Kentucky
Scottsville
Tompkinsville
Albany
Lafayette
Celina
Hartsville
Gainesboro
Carthage
Lebanon
Cookeville
Baxter
Monterey
Watertown
Smithville
Sparta
Woodbury
Shencer
McMinnville
Manchester
Tullahoma
Monteagle
Jamestown
Crossville
Whitwell
Tracy City
Altamont
Gruetli-Laager
Estill Springs
Dechard
Pleasant Hill
Fairfield Glade
Clarkrange
Grimsley
Allardt
Byrdstown
Static
Pall Mall
Sgt. Alvin York Grist Mill
Dale Hollow Lake
Rock Island SP
Fall Creek Falls SP
Savage Gulf SNA
South Cumberland Visitor Ctr
Woods Res.
Normandy Dam
Old Stone Fort SP
Center Hill Dam
Development Center
Engineering
Cumberland
Tennessee
Obed
Caney Fork
Calfkiller
Collins
Rocky
Dry Creek
Hickman
Lancaster
Dowell
Edgar
Bakers Crossroads
Burgess
Silver Springs
Buffalo Valley
Bloomington Springs
Chestnut Mound
Elmwood
Gordonsville
Brush Creek
Alexandria
Noonne
Milton
Auburntown
Lascassas
Readyville
Bradyville
Centertown
Smartt
Morrison
Viola
Beech Grove
Summitville
Beersheba Springs
Altamont
Palmer
Coalmont
Pelham
Tullahoma
Estill Springs
Saint Andrews
Dechard
Powell
Grundy
Warren
Cannon
Coffee
Van Buren
Putnam
Jackson
Smith
Clay
Macon
Pickett
Fentress
Overton
Cookeville
Monterey
Algood
Crawford
Wilder
Rickman
Alpine
Allred
Monroe
Allons
Timothy
Whitleyville
Hilham
Standing Stone SP
Red Boiling Springs
Moss
Gamaliel
Tompkinsville
Frippin
Holland
Dixon Springs
Pleasant Shade
Gordonsville
Hickman
Lancaster
Dowell
Edgar
Silver Springs
Burgess
Bakers Crossroads
Virgin Falls SNA
Rock Island
Bone Cave
Campaign
Doyle
Quebeck
Walling Dam
Green Hill
Blowing
Woodbury
Readyville
Lascassas
Auburntown
Milton
Smithville
Sparta
Crossville
Pleasant Hill
Fairfield Glade
Clarkrange
Grimsley
Allardt
Byrdstown
Static
Pall Mall
Jamestown
Sgt. Alvin York Grist Mill
Dale Hollow Lake
Celina
Gainesboro
Carthage
Lebanon
Watertown
Hartsville
Lafayette
Scottsville
Tompkinsville
Albany
Kentucky
To Glasgow
To Edmonton
To Burkesville
To Russell Spgs
To Glasgow
Green
Holland
Frippin
Gamaliel
Moss
Celina
Red Boiling Springs
Whitleyville
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South Cumberland Visitor Ctr
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Byrdstown
Static
Pall Mall
Jamestown
Sgt. Alvin York Grist Mill
Dale Hollow Lake
Celina

The proposed route would begin with a Mine Lick Creek Road Interchange on I-40 and extend north and east, connecting with US 70N (SR 24) approximately 0.89 miles west of the Cookeville City Limits.

Termini are the beginning and ending points for a project. The purpose of this project is to provide an additional north/south route for continually increasing volumes of traffic around Cookeville. In addition, traffic moving between I-40 and US 70N (SR 24) would be provided with a new, efficient route that would improve access to developable areas of Putnam County. Vehicular traffic moving between I-40 and US 70N is currently served mainly by SR-135, SR-136 and SR-56. Please refer to Figure 2 Project Area Detail Map. Ongoing development activities are occurring along I-40 and US 70N. The new north/south connector will provide a roadway to facilitate sustained growth activities in the western area of Cookeville between the downtown commercial business district and State Route 56. An Interchange Justification Study was conducted and approved by the Federal Highway Administration (FHWA) on October 25, 2000.

Figure 2 Project Area Detail Map

Traffic Analysis

SR-135 (South Willow Avenue) is a five-lane, undivided highway fronted on both sides by commercial development. Traffic projections for 2010 indicate that SR-135, between I-40 and US 70N, will carry between 26,600 and 27,500 vehicles per day (vpd). Traffic projections for Design Year 2030 estimate the volumes to increase to between 37,700 and 41,200 vpd for this same area.

SR-136 (South Jefferson Avenue) is a five-lane undivided highway fronted on both sides by commercial development, much like SR-135. Traffic projections for 2010 indicate that SR-136 will carry between 26,900 and 32,000 vpd between I-40 and US 70N. Design Year 2030 traffic projections indicate that vpds within this area will increase to 27,000 and 35,000 vpd.

SR-56 is a two-lane facility connecting I-40 and US 70N approximately 7 miles west of the US 70N/SR 135 intersections. Traffic projections for 2010 indicate SR 56 will carry between 6,300 vpd and 6,950 vpd between I-40 and US 70N. Design Year 2030 traffic projections indicate that volume will increase to between 9,300 and 10,500 vpd in this area.

Table 1 summarizes traffic survey information for segments of State Route (SR) 56, SR 135 and SR 136. Results based on average daily traffic (ADT) counts indicate that substantial amounts of traffic utilize State Routes 135 and 136. These traffic figures do not include estimated traffic from Corridor J. Please refer to pages 10 and 11 for an explanation and exhibit explaining why Corridor J statistics are no longer included in the traffic figures. Large traffic volumes causing congestion have been recorded at the intersections of these two roadways with Interstate 40. Table 1 summarizes and compares estimated figures for 2010 and 2030, the Design Year for the No Build Alternative and for the Build Alternatives. In addition, percentages of truck traffic are included for the No-Build and Build Alternatives.

Table 1: Average Daily Traffic Counts

Road Segments North of Interstate 40	**Average Daily Traffic for No Build Alternative in vehicles per day (year of traffic survey) and % of truck traffic**	**Average Daily Traffic for Build Alternatives A & B in vehicles per day (year of traffic survey) and % of truck traffic**
State Route 56	**5,300 (2010) 5% 7,500 (2030)**	**4,600 (2010) 5% 7,300 (2030)**
State Route 135	**17,700 (2010) 10% 26,300 (2030)**	**15,000 (2010) 10% 21,700 (2030)**
State Route 136	**14,700 (2010) 2% 20,200 (2030)**	**14,300 (2010) 2% 19,600 (2030)**
Road Segments South of Interstate 40	**Average Daily Traffic No Build Alt. vehicles per day (year of traffic survey) and % of truck traffic**	**Average Daily Traffic Build Alt. vehicles per day (year of traffic survey) and % of truck traffic**
State Route 56	**3,300 (2010) 5% 4,900 (2030)**	**2,500 (2010) 5% 3,800 (2030)**
State Route 135	**20,250 (2010) 10% 30,900 (2030)**	**18,650 (2010) 10% 28,500 (2030)**
State Route 136	**23,800 (2010) 2% 25,200 (2030)**	**23,800 (2010) 2% 25,200 (2030)**

A Level of Service (LOS) capacity analysis was conducted for the above referenced system of existing roadways. Level of Service refers to a method of analysis, which quantifies, or rates, congestion along a roadway. Factors considered in such an analysis include traffic, number of lanes, passing and turning sight distances, and terrain. LOS ratings range from A (best) to F (worst). The levels are as 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 and form queues (lines) 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 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 vehicles arriving at the point is greater than the number of vehicles discharged.

Table 2 contains a summary of the existing system traffic data and LOS analysis of those roadways. These conditions would exist if the No-Build Alternative is selected.

Table 2 – Level of Service (LOS) Summary – Existing System Traffic Data

Roadway Section	2010 ADT	2010 LOS	2030 ADT	2030 LOS
I-40 west of SR-56	48,600	C	77,800	E
I-40 from SR-56 to SR-135	49,350	C	79,000	E
I-40 from SR-135 to SR-136	54,000	C	86,500	E
I-40 east of SR-136	54,800	C	87,000	E
US-70 west of SR-56	4,600	A	5,700	A
US-70 between SR-56 & SR-135	6,100-16,000	A - C	8,300-21,000	A - D
US-70 between SR-135 & SR-136	19,800-20,900	D	25,600-28,300	E
US-70 east of SR-136	24,300	E	28,200	E
SR-56 south of I-40	3,300	A	4,900	A
SR-56 between I-40 & US-70	6,300-6,950	A	9,300-10,500	B
SR-56 north of US-70	5,300	A	7,500	A
SR-135 south of I-40	20,250	D	30,900	F
SR-135 between I-40 & US-70	26,600-27,500	B	37,700-41,200	D
SR-135 north of US-70	17,700	C	26,300	D
SR-136 south of I-40	23,800	D	25,200	D
SR-136 between I-40 and US-70	26,900-30,200	E	35,000-35,300	E
SR-136 north of US-70	14,700	B	20,200	C

The addition of the proposed route would reduce traffic volumes on existing roadways within the project area. A similar LOS analysis was conducted for the project area traffic system with the addition of the proposed Northern Connector. The results of that analysis are summarized in Table 3 LOS Summary - Proposed System Traffic Data.

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As shown above, the proposed project would remove a portion of the traffic currently utilizing the existing system of local roadways. This reduction in the volume of traffic on the existing roadways would have a corresponding reducing effect on the likelihood of crashes occurring. As through traffic begins to utilize the proposed route, the interactions of vehicles on the existing system of roadways would be reduced. Consequently, travel times on these existing roadways would improve.

Table 3 – Level of Service (LOS) Summary – Proposed System Traffic Data*

Roadway Section	2010 ADT	2010 LOS	2030 ADT	2030 LOS
I-40 west of SR-56	48,600	C	77,800	E
I-40 between SR-56 & Connector Rd	49,500	C	79,300	E
I-40 between Connector Rd & SR-135	50,100	C	80,400	E
I-40 from SR-135 to SR-136	54,200	C	87,000	E
I-40 east of SR-136	54,800	A	87,700	E
US-70 west of SR-56	4,600	C	5,700	A
US-70 from SR-56 to Connector Rd	4,800-6,800	C	5,800-10,500	A
US-70 from Connector Rd to SR-135	9,700-16,400	A	15,100-19,500	B - D
US-70 from SR-135 to SR-136	17,800-20,200	C	20,900-25,600	C - D
US-70 east of SR-136	24,300	E	28,200	E
SR-56 south of I-40	2,500	A	3,800	A
SR-56 from I-40 to US-70	4,800-5,000	A	7,000-7,700	A
SR-56 north of US-70	4,600	A	7,300	A
Connector Rd south of I-40	2,400	A	3,500	A
Connector Rd from I-40 to US-70	3,800-4,500	A	5,600-6,400	A
Connector Rd north of US-70	3,800	A	5,400	A
SR-135 south of I-40	18,650	C	28,500	E
SR-135 from I-40 to US-70	24,400-24,750	D	33,500-38,700	E
SR-135 north of US-70	15,000	B	21,700	C
SR-136 south of I-40	23,800	D	25,200	D
SR-136 from I-40 to US-70	27,000-30,200	E	34,700-35,400	E
SR-136 north of US-70	14,300	B	19,600	C

*Corridor J, a project under consideration within Putnam County, was included in the original traffic studies for the Mine Lick Connector. Corridor J would have connected to the Mine Lick project, and continued to Algood at SR 111 to the north which would have formed a northern bypass of Cookeville (See dotted line on Exhibit 2A, page 11).

In late 2005, with concurrence by FHWA and Appalachian Regional Commission (ARC), Corridor J was relocated to Clay and Overton Counties. The new designation will follow State Route 111 from Algood to State Route 52 in Livingston. That section is currently a four-lane facility and needs no improvement. From that point Corridor J will follow State Route 52 from Livingston to State Route 53 in Celina. This route fulfills the mission of the ARC, TDOT's goal of connecting the county seat of Celina to Interstate

40. Figure 2A, below, illustrates the revised and current alignment in yellow. The original corridor is illustrated in purple, and the general area of the Mine Lick Connector project is shaded in light green. Note that the area from Cookeville southward and the area from Celina to the Kentucky State line are still illustrated in purple as these areas are part of the original alignment that did not change.

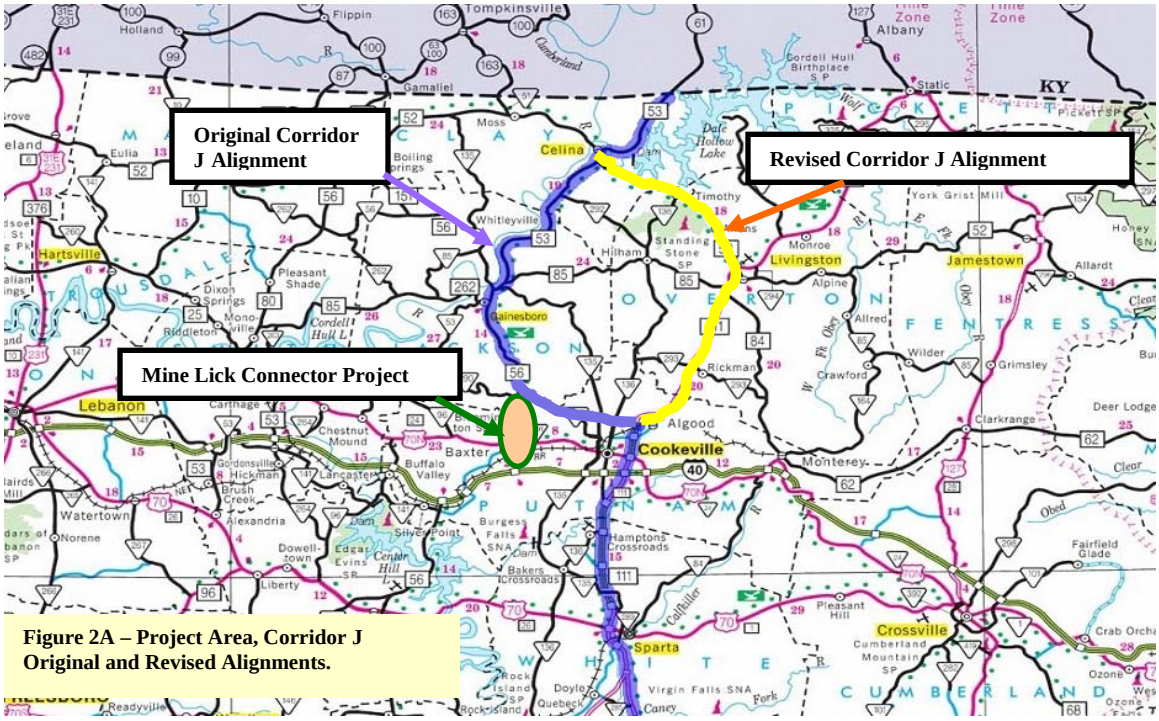

Figure 2A – Project Area, Corridor J Original and Revised Alignments.

<u>Logical Termini</u> Logical termini are defined as the rational end points for a transportation project and for a review of environmental impacts. A project must have independent utility or stand alone (i.e., be usable and reasonable even if no further transportation work is done in an area). A project must not restrict consideration of alternatives for other reasonably foreseeable transportation projects. This project meets all of these considerations as both build alternates provide four lane roadways which connect on both ends with portions of the previously constructed I-40 (that features four lanes) and US 70 North. Interviews and meetings with local officials, population projections and reviews of planning maps have all indicated that the current growth trends in areas west of Cookeville will continue to grow at a rapid pace beyond the Design Year 2030. Reviews of the Cookeville Future Land Use Concept Plan Map indicate that existing and proposed development for commercial/residential mixed land use exists in the areas around the project's termini. Conversations with the planning office revealed that the development is extending into areas beyond the current Urban Service Boundary. As the development continues along US 70 North and the areas around Interstate 40, traffic will continue to increase in the areas immediately associated with the project termini. Therefore, the termini for this project will provide complementary and logical linkage to the existing roadways in the area.

Local and Regional Planning

The proposed project is complementary with local and regional planning efforts. The project is included in the City of Cookeville Major Thoroughfare Plan, as adopted by the Cookeville Planning Commission and City Council in 2000, and the Comprehensive Future Land Use Plan.

Identified as a priority in the Major Thoroughfare Plan, the project would serve to facilitate planned growth in the area. The City of Cookeville recently annexed lands surrounding the I-40/Mine Lick Creek Road interchange for future industrial and commercial development. This area is located in the western half of the city. (See Figure 2B on page 13).

The Comprehensive Future Land Use Plan identifies obstacles to traffic flow within the City Limits as well as the unincorporated planning areas. The Future Land Use Plan cites four primary obstacles to traffic flow, including traffic congestion at the intersections of major thoroughfares, inadequacies of internal north-south and east-west routes, intense commercial development on major thoroughfares, and a lack of a complete circumferential route around the City of Cookeville. Currently traffic that would bypass the city must travel through internal streets. The proposed project would serve to relieve congestion along the existing north-south routes through the center of, and areas just west of Cookeville.

The City of Cookeville's Planning Department stated that a large, industrial/commercial site is planned for the area on the south side of the proposed new Mine Lick interchange. The city has acquired options to purchase several properties in this location to facilitate development. The Tennessee Valley Authority has developed a preliminary plan for the industrial/commercial area project. In addition, the Cookeville/Putnam County Chamber of Commerce is actively recruiting prospects for this area. The Planning Department stated that, "adequate access to this area is vital. Without the construction of a northern connector traffic, to and from the north, will be forced to use substandard 2-lane county roads."

Positive future impacts include a roadway that is capable of handling additional traffic that will result from the residential, commercial and industrial development currently taking place in and near the project area. The development is anticipated to continue into the future according to reviews of municipal planning reports and interviews and conversations with local officials. If a Build Alternative is selected and the project is constructed, the new bypass will facilitate future traffic flow in this area.

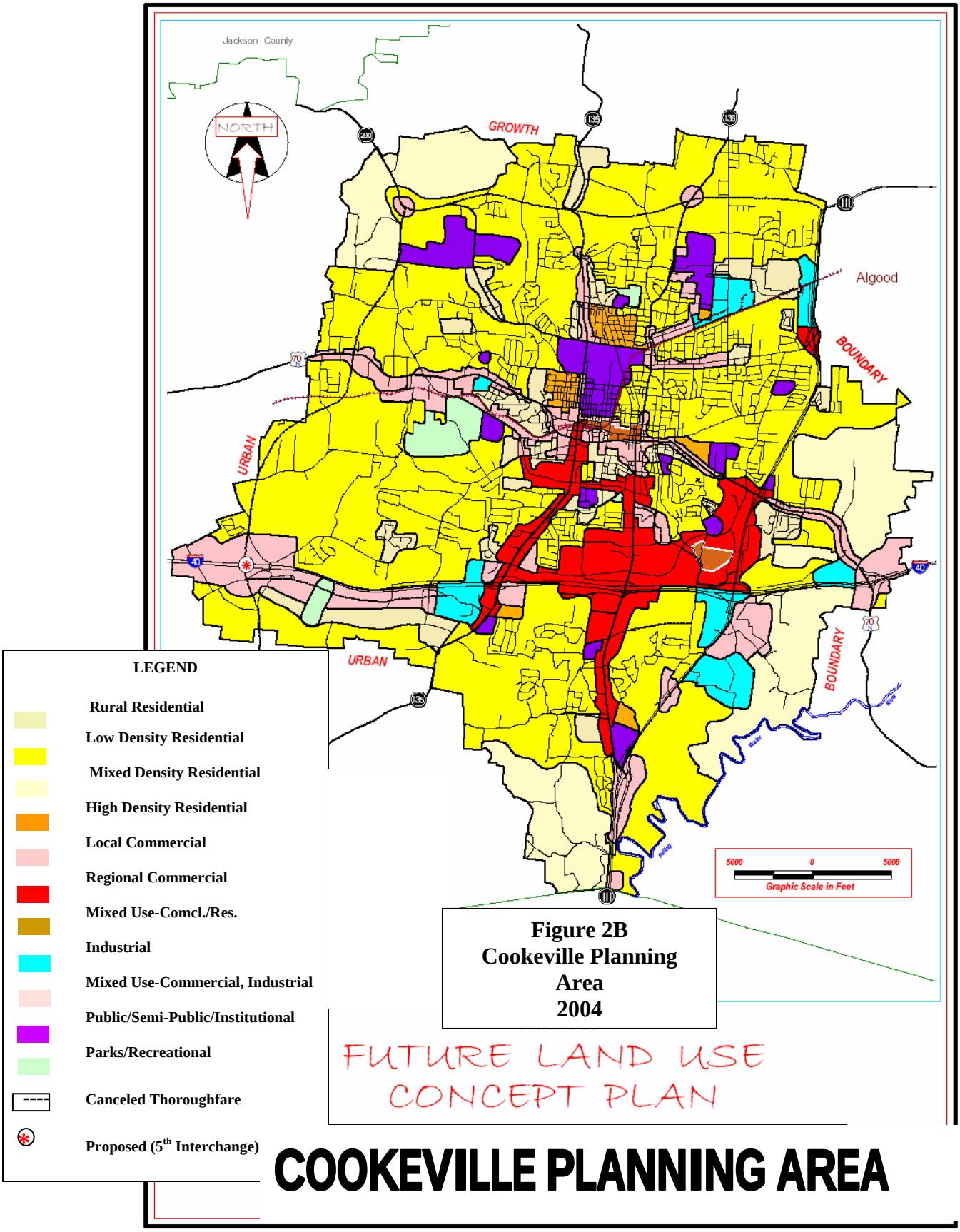

Figure 2B
Cookeville Planning Area
2004

It should be noted that at one time this project was complementary to a second project, which would have provided connection to a bypass or circumferential route. This route was proposed as part of the Corridor J project which was funded, in part, by the Appalachian Development Highway System (APD) funds. This route, as shown on Figure 2A, above, has been eliminated as a result of a change in concept on the Corridor J project. See page 11 for full explanation and exhibit.

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Chapter II – Alternatives

A total of two build alternates and a no-build alternate were considered for the project. The No-Build Alternative and the Build Alternatives are being considered in the decision making process and are described in this chapter.

A. No-Build Alternative

The No-Build Alternative assumes that the facility would be left as is, with no financial expenditures, relocations, or increased environmental concerns. The Tennessee Department of Transportation would continue current cost expenditures and necessary maintenance.

The no-build alternative is a viable option in that it would not involve any additional funds or environmental impacts. However, this alternative does not address the Purpose and Need of the proposed project. This alternative will be used as a baseline, by which all other alternatives are to be compared.

B. Build Alternatives

Two alternatives, identified as A and B, have been proposed for the construction of the Northern Connector between I-40 and US 70N (SR 24) in Putnam County. Originally proposed in the development of a Feasibility Study for the proposed action, these two route locations have been revised where necessary to avoid or minimize potential impacts to sensitive resources, such as existing development, wetlands, historical resources, etc. as well as for design considerations. Please refer to Figure 3 for a map depicting the Build Alternatives.

Alternative A would begin with an I-40 interchange, approximately 2.82 miles west of the existing interchange with SR 135. The proposed alternative extends northeasterly on a new location for approximately 1.63 miles to a typical diamond interchange at Buffalo Valley Road. From this point the alternative continues in a more northerly direction for approximately 1.2 miles before tying into SR 24. A single elevated structure is proposed to connect a relocated section of Mine Lick Creek Road over the proposed facility. Additionally, a single Louisville and Nashville (L&N) rail line would be crossed on parallel, elevated separated structures. The total length of Alternative A is approximately 2.87 miles.

Alternative B would also begin with an I-40 interchange, located approximately 0.71 miles west of the existing Mine Lick Creek Road Bridge over I-40. The proposed alternative would extend northward for approximately 0.80 miles to a typical diamond interchange at Buffalo Valley Road. From this point the proposed alternative would continue in a northeasterly direction for approximately 2.19 miles, before turning northward. At this point, Alternatives A and B share the same alignment, extending northward for approximately 0.48 miles to the project terminus with US 70 (SR-24). Associated with Alternative B is a shift in alignment of approximately 2,900 feet of Hawkins Crawford Road. This shift would allow for an at-grade intersection with Buffalo Valley Road approximately 1680 feet west of the existing intersection and would not require an additional structure to cross Hawkins Crawford Road.

The location of the alignment shift at Hawkins Crawford Road was determined in part to avoid impacts to one wetland (Wetland 2). TDOT explored every opportunity to avoid impacts to the two wetlands within the project corridor. The wetlands are located within the Alternative B corridor (Refer to Figure 7, Aquatic Resources Map, on Page 35). In this particular area of the project, avoidance of Wetland 2 was not possible. Wetland 2 is located on the north side of Locust Grove Road, just west of the proposed interchange between Alternate B and Locust Grove Road. It is approximately 700 feet x 200 feet. Wetland 1 is an estimated 200 feet x 300 feet. The project was unable to avoid taking the Wetland 1 due to the number of residences, 7, that would be required to relocate in the area between Locust Grove and Hawkins Crawford Roads. In order to maintain access to residences situated along the affected section of Hawkins Crawford Road cul-de-sacs (dead-ends) will be constructed, and access road for the western section of Hawkins Crawford Road will tie into Locust Grove Road approximately 825 feet east of the proposed interchange. The junction of the relocated Hawkins Crawford/Locust Grove Roads avoids the larger wetland. As with Alternative A, the single L&N rail line would be crossed on parallel, elevated separated structures. The total length of Alternative B is approximately 3.47 miles.

Both Build Alternatives would provide an additional north/south route for traffic moving between I-40 and US 70. A project involving SR 56, west of the project area near the town of Baxter, is in the early planning stages of a proposed widening. However, this project would not serve to meet the Purpose and Need of this project, which is to provide an additional route that would reduce the volume of traffic on the existing system of local roadways.

Estimated costs for the purchase of right-of-way, utility relocation, construction and preliminary engineering are presented in Table 4 for the alternatives under consideration for the proposed project.

Table 4: 2006 Cost Estimate for the Northern Connector (includes interchange justification study figures)

Alternative	Right of Way	Utility Relocation	Construction	Preliminary Engineering	5-Year Projection (20%)	Total
A	$2,230,000	$453,000	$25,665,000	$2,335,000	$5,600,000	$34,276,000
B	$2,290,000	$65,000	$24,765,000	$2,250,000	$5,400,000	$34,770,000

A comparison of the potential impacts associated with the proposed Build Alternatives is provided in Table 5.

Table 5 Impacts Comparison Matrix

Area of Impact	Alternative A	Alternative B
Wetlands Impacts (Acres)	0.00	2.72
Stream Impacts (Linear feet)	2301	1437
Business Relocations	1	2
Residential Relocations	2	5
Impacted Noise Receivers	2	1
Hazmat Sites	1	1
Historic/ Archaeological	0/0	0/0
Prime-Unique Farmland acres /(LESA Score)*	58.8/(137)	78.8/(143)
Floodplains (Linear Feet)	0	0
Forested Lands	75.22	119.39
Open Areas	102.86	87.67

C. Design Criteria

The proposed project will be located on the west side of the City of Cookeville in Putnam County. Both Build Alternatives will feature four 12-ft. driving lanes, 12-ft. shoulders (outside lane), 6-ft. shoulders (inside lane) and a 48-ft wide depressed, grass median. When ditches are required, they will be located at 16-feet from the edge of the outer shoulder. A design speed of 70 miles per hour will be used for both alternatives, and the access control for the facility will be fully controlled. The average right-of-way limits for the project will be 250 feet in width. The total length of Alternative A is 2.87 miles. The total length of Alternative B is 3.47 miles.

Please refer to Figure 4, page 18, for the proposed Typical Section which illustrates the design criteria information above.

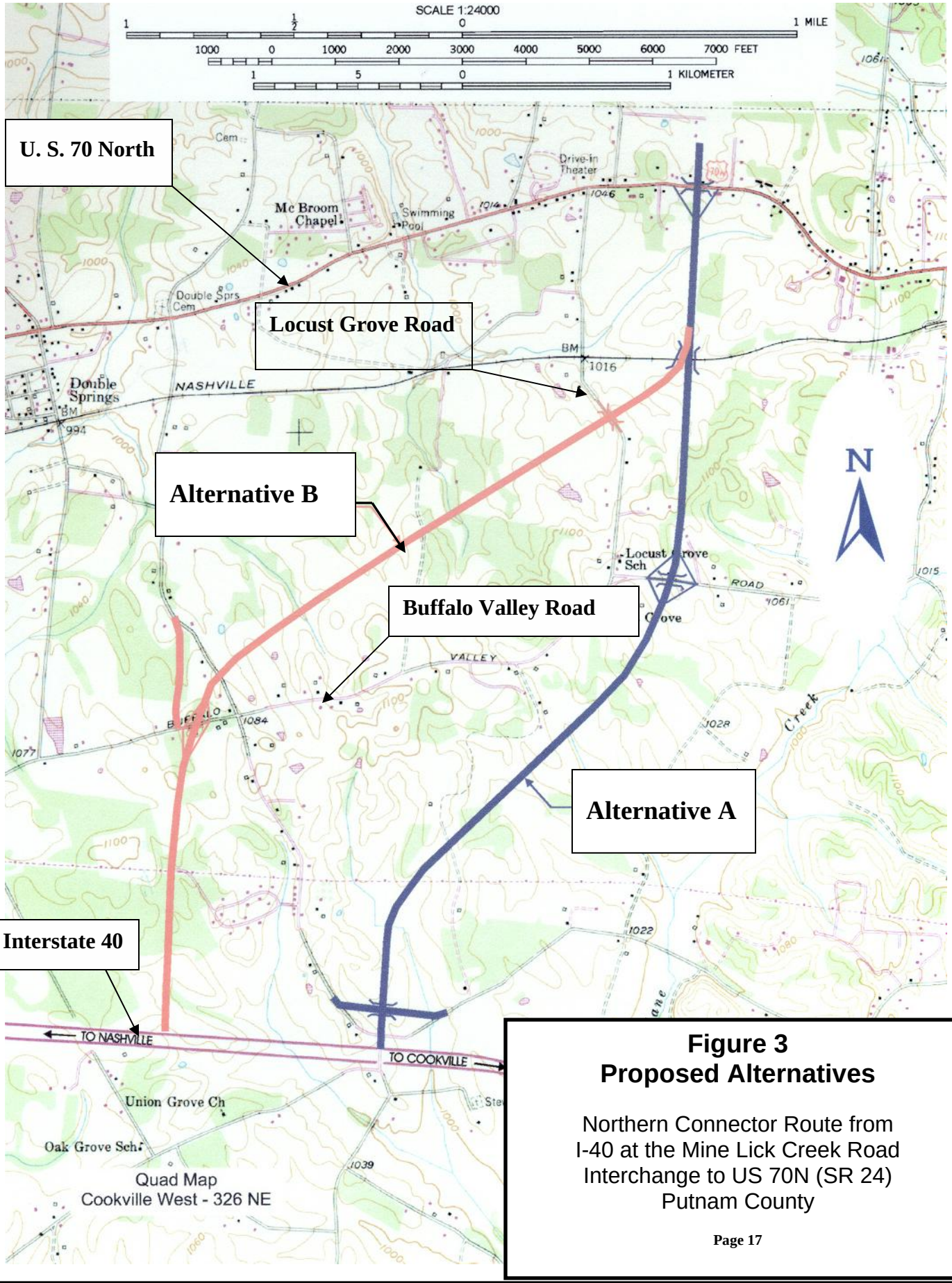


Figure 3
Proposed Alternatives

Northern Connector Route from
I-40 at the Mine Lick Creek Road
Interchange to US 70N (SR 24)
Putnam County

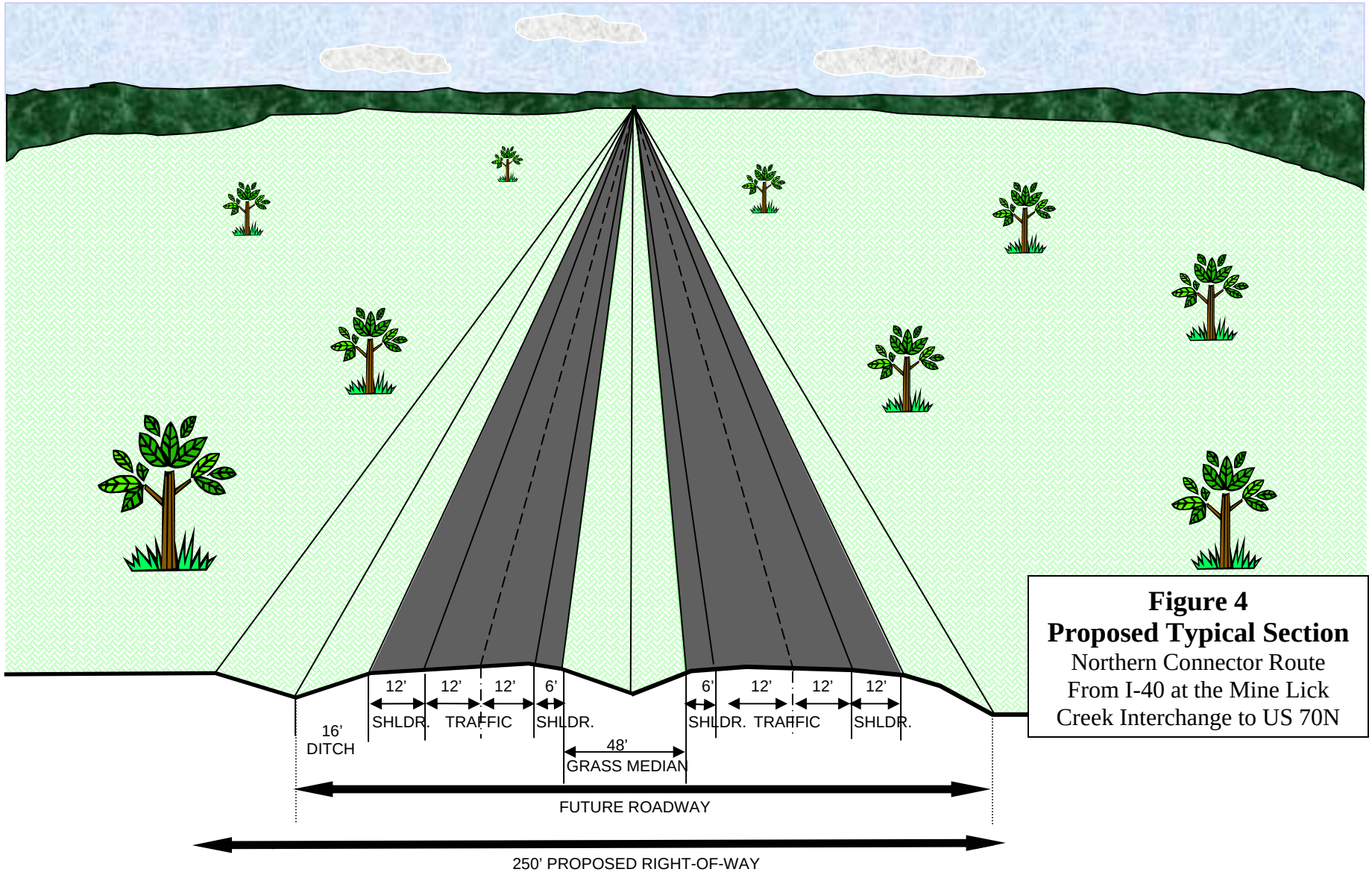


Figure 4
Proposed Typical Section
Northern Connector Route
From I-40 at the Mine Lick
Creek Interchange to US 70N

Chapter III – Impacts

A. Land Use Impacts

Previous impacts that have measurably affected Cookeville are listed below. These impacts have increased land usage incrementally (increasing gradually by regular degrees or additions). They are associated with population increases, and related demands for increased services, infrastructure and job opportunities.

- 1930 – Cookeville Population increases to 3,738.
- 1930 – Highway 70N, first east-west routed modern highway completed.
- 1950 – City population increases to 6,924.
- 1960 – Population increases to 7,805.
- 1960s – Several new industries locate to Cookeville. Annexations are carried out to accommodate residential, commercial and industrial growth. Land has expanded in all directions from the center of town.
- 1960s – Cookeville receives several million dollars from the U.S. Department of Housing and Urban Development through the Model Cities Program.
- 1960s – Tennessee Tech expands operations.
- 1966 – Interstate 40 opens (The implementation of I-40 has been cited by the City as the most significant event affecting development of Cookeville and Putnam County during the second half of the 20th Century.
- 1970 – Cookeville's population almost doubles to 14,403 from its 1960 total.
- 1980 – Population increases to 21,604.
- 1980 to 2000 – Further impacts to land uses changes are attributed to the implementation of several transportation projects including SH 111 (a segment of Corridor J), which is a segment of the Appalachian Highway System, Interstate Drive, Neal Street, Jeffery Circle and West Jackson Street.
- 2000 – Population increases to 27,120.
- 2000 – Cookeville Comprehensive Future Plan cites major transportation related events as major factors in the city's attempts for future development. These events include I-40, SR 111, SR 451 and the proposed Northern Connector.

The increasing population and changing land uses have been facilitated by transportation and utility infrastructures needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions (schools, post offices, etc). As populations increase, demands for services, jobs and roadways intensify. The projected figures indicate that 36,337 residents should live within the city limits by 2020.

The study area is situated entirely in Putnam County, just west of the Cookeville City Limits, and is bounded on the south by I-40, and by US 70N (SR-24) to the north. Land use in the study area is primarily agricultural. Rural residential land use with pockets of

development is present, and is concentrated along US 70N. Businesses present in the study area include auto salvage yards, small restaurants and taverns, as well as a motel and several gas stations.

Neither of the alternatives under consideration for this action would impact any publicly owned parks, recreation areas, wildlife or waterfowl refuges, or historic properties listed or eligible for listing to the National Register of Historic Places. Therefore, there will be no Section 4(f) or Section 6(f) impacts as a result of this project. Land areas displaced by the construction of the proposed project are presented in Table 6.

Table 6 – Land Areas Displaced

Habitat Type	Alternative A	Alternative B
Agricultural	103 acres	88 acres
Developed	4 acres	18 acres
Forested	75 acres	119 acres
Total Area	182 acres	225 acres

As stated previously, the proposed facility would feature full access control, which by design directs development to areas that have access to the facility. Therefore, an indirect impact would occur at the proposed interchanges, particularly the interchange with I-40. A continuation of these indirect impacts is the increased potential for land currently in agricultural use, to be converted for commercial and industrial use as the facility improves access to the area making it more valuable to commercial and industrial trade.

Additional, current information from the City of Cookeville's Planning Department was received July 2005. The City of Cookeville has annexed lands adjacent to the I-40/Mine Lick Creek Road interchange. A large industrial/commercial area is planned for the area on the south side of the proposed new interchange. The city has acquired options to purchase several properties in this area to facilitate the development. The Tennessee Valley Authority has developed a preliminary plan for the development of the industrial/commercial area. The Cookeville/Putnam County Chamber of Commerce is actively recruiting prospects for this area. Local officials have stated that adequate access to this area is vital. Traffic to and from the north would be forced to use substandard two-lane county roads without the construction of the northern connector.

The Cookeville Planning Director stated, "Two of the area's largest employers, TRW and Russell-Stover have recently announced that they are closing, or are laying off, large numbers of employees. At the same time commercial development is soaring in the city. Additional land for commercial development and industrial development if possible, is very important for the economic wellbeing of Cookeville and Putnam County."

TRW announced on June 23, 2005, that it will close its Cookeville plant. The plant has approximately 390 employees. It is anticipated that employees will not be impacted until the middle of 2006. Russell Stover is laying off 400 workers at its plant by late summer 2005. Built in the 1970s, the plant has 800 union workers who make candy for the third-

largest American chocolate manufacturer. Both TRW and Russell Stover indicated that the layoffs were not reflective of Putnam County's economic vitality or its workforce's capabilities.

Local officials are increasing their efforts to attract commercial and industrial business to the area to offset these work losses. As evidenced in Chapter 3, Section C, Cookeville/Putnam County's growth rate exceeds that of Tennessee's statewide rate. Putnam County experienced a 17.2% increase in total population between 1990 and 2000, compared to 13.2% for Tennessee. The forecast growth for Putnam County is 11% in the year 2010, and 9.2% in 2020. The state as a whole is forecast to grow at slightly slower rate, with a projected growth of 9.6% in the year 2010, and 8.8% in 2020. The loss of almost 800 jobs could negatively impact population increases and the economic health of the area.

A study, "*Do New Highways Attract Businesses?"* was conducted for the Transportation Research Board (January 2003); Hodge, Daniel J. (Cambridge Systematics, Inc.), Glen Weisbrod (Economic Development Research Group, Inc.), and Arno Hart (Wilbur Smith Associates, Inc.). Included in the study's methodology was a survey to identify key reasons why companies chose not to expand or relocate in their study area. The top concerns included a lack of transportation access/infrastructure, availability of buildings and an available labor force. Furthermore, comments from participants in the survey included that although transportation is not the only concern among land use and planning practitioners, "it is consistently cited as a key consideration among companies contemplating an expansion or relocation and has influenced companies to relocate elsewhere."

Industrial recruiters, private consultants who work with firms who seek to expand or relocate operations, were interviewed for the study. These consultants work with state and local industrial development authorities to locate proper sites for their representative firms. They cited that at least 67 percent of industrial projects require immediate (1 to 2 miles) highway access and the remaining 33 percent of the projects demand one hour access to an interstate.

The new roadway would provide direct and immediate connection of the development sites to I-40 and US 70 N. Recent layoffs will provide the labor force with approximately 800 capable, available employees for immediate hire. In addition to an available workforce, Putnam County's workforce has improved its educational attainment. The 1990 U.S. Census data indicated that 63.2 percent of Putnam County's residents had attained at least high school diplomas, and that 16.8 percent had attained a bachelor's degree or higher. The 2000 Census figures indicated that the percentages had improved to 72.5 percent for high school diplomas and 20.2 percent for bachelor's degrees or higher. The increases can indicate a more capable workforce, which might aid in attracting industry. In addition, if jobs are created, the per capita personal income and total personal incomes will increase with the better wages that accompany industrial jobs. Conversations with local officials have revealed that the development efforts have been initiated and will continue, even if the No-Build Alternative is selected, however, they

believe the new connector will increase the attraction of industrial and commercial companies wishing to relocate or expand operations. The actual amount of industry that could be attracted to relocate or expand in this area would also be dependent upon the ability of local industrial developers, investments in complementary water, sewer, building spaces, and other infrastructure, labor force training and the recruiting and retention efforts of local officials.

Planning has existed in the Cookeville area for several decades and has been used to manage growth. The population patterns and the transition of farmland to residential and commercial land use are consistent with planning and development efforts in the area. The Northern Connector project has been cited as a vital part of the area's future development plans to facilitate economic development.

B. Farmland Impacts

Farmland impacts associated with the proposed construction of the Northern Connector in Putnam County, TN were evaluated in accordance with the Farmland Protection Policy Act of 1981 (FPPA). The purpose of the FPPA is to minimize the extent to which Federal projects contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. Additionally, the Act insures that Federal programs are administered in a manner that, to the greatest extent practicable, will be compatible with state and local government, and private programs and policies to protect farmland. In accordance with the FPPA, a Farmland Conversion Impact Rating (USDA Form AD-1006) has been completed. This form summarizes farmland impacts for Alternatives A and B. Form AD-1006 is provided in Appendix A.

The Natural Resource Conservation Service (NRCS) determined that Alternative A and B would result in the conversion 55.8 acres and 78.8 acres of Prime and Unique Farmland, respectively (Part IV). Based upon other criteria on the AD-1006 form, the NRCS scored the Land Evaluation Criterion for Alternatives A and B at 58 and 64, respectively (Part V). These scores were then combined with the site assessment criteria points (Part VI) for a total score for each proposed alternative. The total points rating for Alternatives A and B were 152 and 158, respectively. However, review of the AD-1006 form revealed that the incorrect form was used. The correct form is NRCS-CPA-106. This form and its criteria is to be used for projects that have a linear or corridor type site configuration connecting two distant points, and crossing several tracts of land. This includes highway projects. The project was analyzed using the correct form, and the net result was a reduction of total points from the original score. Table 7, below, summarizes the point values assigned to each build alternative.

Table 7 Farmland Impacts Summary

Alternative	NRCS Prime Farmland	Land Evaluation Criteria	Site Assessment Points (Original/Corrected Value)	Total Value (Original/Corrected)
A	**58.8 acres**	**58**	**94/79**	**152/137**
B	**78.8 acres**	**64**	**94/79**	**158/143**

The Federal Highway Administration Technical Advisory T 6640.8A (*Guidance for Preparing and Processing Environmental and Section 4f documents*) states that when a score is 160 points or greater, avoidance alternatives should be discussed. The alternatives discussed above all scored below the 160-point threshold. Therefore, the investigation of avoidance alternatives would not be required and this project is compliant with the requirements of the Farmland Protection Policy of 1981.

C. Social Impacts

This project would not divide any established neighborhoods present in the project area. Therefore, the construction of either of the proposed alternatives would not have any effect on community structure. Relocations, ranging from 2 to 5 residences and 1 to 2 businesses, associated with the proposed alternatives are relatively minor. Therefore, impacts to the existing social environment of the project area are expected to be minimal. However, the construction of the proposed Northern Connector would involve additional commercial and residential development anticipated for the areas surrounding the proposed interchange locations. Future commercial and residential development would require additional support services, such as police and fire protection, as well as education and health services.

Population Trends and Forecasts

As shown in Table 8, which compares populations and projected growth on the county and state level, population growth for Putnam County is greater than that for the state. Putnam County experienced a 17.2% increase in total population between 1990 and 2000, compared to 13.2% for Tennessee. The forecast growth for Putnam County is 11% in the year 2010, and 9.2% in 2020. The state as a whole is forecast to grow at slightly slower rate, with a projected growth of 9.6% in the year 2010, and 8.8% in 2020.

Table 8 Population and Forecast Growth 1990-2020

Geographic Area	Population			
	1990	**2000**	**2010**	**2020**
Tennessee	4,890,525	5,533,762	6,062,695	6,593,194
Change		13.2%	9.6%	8.8%
Putnam County	51,568	60,452	67,128	73,308
Change		17.2%	11.1%	9.2%

Source: *UT Center for Business and Economic Research, March 1999*

Table 8 illustrates the narrowing gap in growth for the state and for Putnam County. The

projected rate of growth is approximately half that of the year 2000, for both Tennessee and Putnam County. As stated in Section A, development is most likely to occur in the areas surrounding the new interchanges. With the added development, increasing populations would be a likely indirect and cumulative impact associated with the construction of a Build Alternative.

Social Groups

According to the 2000 Census, minority population percentages are lower in Putnam County than the overall percentages for the state of Tennessee. The minority population is 19% of the state as a whole, while Putnam County minorities consist of approximately 5.5% of the total population. As shown in Table 9, the project area census tracts, numbered 9 and 11 and depicted in Figure 5, have a lower occurrence of minorities.

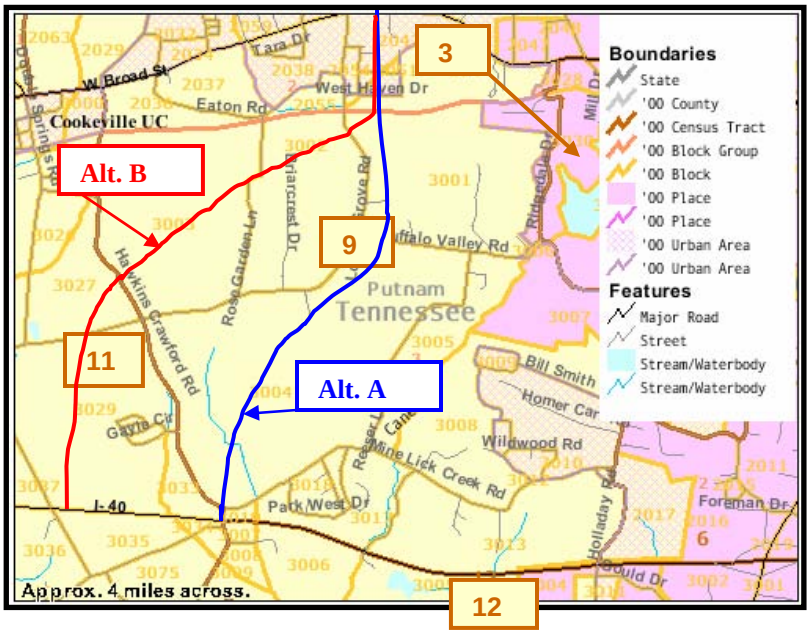


Figure 5 Project Area Census Tracts 3, 9, 11 and 12. See Appendix III for detailed Census Maps and Comparative Charts. 9 represents Census Tracts

Table 9 Population Characteristics by State, County and U.S. Census Tract

Geographic Area	Persons	% Minority	% Age 65 or Older	% Under 18	% High School Graduates (25 Years of Age and Over)
Tennessee	5,689,283	19.8	13.2	24.6	31.6
Putnam County	62,315	5.5	13.2	22.3	32.1
U.S. Census Tract 9	5164	4.2	10.8	26.7	33.6
U.S. Census Tract 11	5753	2.9	14.1	25.0	36.6

Source: *Profile of General Demographic Characteristics: U.S. Census Bureau, Census 2000*

The percentage of residents over the age of 65 is 13.2% of the total population for both Putnam County and for the state of Tennessee. However, the percent of elderly residents varies in the census tracts, with 10.8% and 14.1% respectively, for tracts 9 and 11. Conversely, the percentage of persons under 18 years of age is not as varied. Tennessee has approximately 24.6% of the total population under 18 years of age, whereas Putnam County has 22.3% of its residents being younger that 18. The percentage for the census

tracts is 26.7 and 25% respectively for tracts 9 and 11.

The percentages for High School graduates do not vary much from the state, county and Tract level. Approximately 31.6% of the state population has received their High School Diploma. That rate is slightly higher for Putnam County (32.6%) as well as the project area census tracts, with 33.6 and 36.6% respectively for tracts 9 and 11.

D. Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," ensures that federal departments and agencies identify and address disproportionately high effects and adverse human health or environmental effects of their policies, programs, and activities on minority populations and low-income populations. Special consideration was given to Executive Order 12898 throughout the planning and evaluation of the proposed project.

Minority and/or low-income populations have been identified in areas near the project corridor. Area roadways which intersect with the Northern Connector 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 remain unhindered. The impacts of the project concerning social isolation, segmentation or disruption to these communities are not anticipated. The potential for human health implications or unknown risks from the construction and maintenance of the proposed facility are considered to be remote.

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. If such needs are established, TDOT right of way officials would work with social/family clusters, and groups of minority/low income residents to ensure that relocation efforts would be as minimally disruptive as possible. These measures include efforts to locate parcels that would accommodate the relocation of several homes to keep the clusters intact. Efforts will continue through the design phase, the public involvement process, the environmental process and the right of way phase of the project.

The project avoids direct impacts (relocations) and indirect impacts (neighborhood divisions, segmentations) 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 the Northern Connector would intersect with roadways that provide uninterrupted passage between the communities and regional economic centers, government services, job sites and schools.

Any adverse impacts from the project would not be primarily borne by a minority and/or low-income population. The adverse effects suffered by a minority and/or low-income population will not be more severe or greater in magnitude than the adverse effect that will be suffered by non-minority and/or non-low income population. Consequently, the project would not have a disproportionately high and adverse effect on those populations

and all people living in the project area will equally share in the benefits of the proposed project. Alternative A would require the relocation of two single-family homes and no mobile homes. Alternative B would require the relocation of five single-family homes and no mobile homes. All of the homes appear to be occupied by owners. Direct impacts to minority or low-income residents are not disproportionate and communities comprised of these special interest groups will not be divided or segmented by the project.
`

All people living in the project area will equally share in the benefits of the proposed project. Adverse effects would not be primarily borne by a minority and/or low-income population, and will not be more severe or greater in magnitude, than the adverse effect that will be suffered by the non-minority, and/or non-low income, population.

According to the FHWA's *Actions to Address Environmental Justice* (6640.23), *Adverse Effects* means the totality of meaningful individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of man-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or meaningful delay in the receipt of, benefits of FHWA programs, policies, or activities.

Disproportionately High and Adverse Effect on Minority and Low-Income Populations means an adverse effect that:

(1) Population and/or a low-income population; or

(2) Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or low-income population.

It has been determined that there are no disproportionately high or adverse effects on minority and low-income populations. No divisive impacts will occur to minority or low-income neighborhoods or social/family clusters. It is intended that all people living in the project area will equally share in the benefits of the proposed project. This action complies with Executive Order 12988, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

This document has been sent to the TDOT Civil Rights Division for review. In accordance with Title VI of the Civil Rights Act of 1964, the Department will comply with Title VI to ensure that "No person shall be, on the grounds of race, color or national

origin, excluded from participation in, denied the benefits of, or subjected to discrimination under any program or activity receiving Federal assistance". Census information, broken down by census tract, is on file at TDOT Headquarters, Nashville. The Department notifies the public of proposed highway projects and the availability of environmental documents. Notices of public hearings and the availability of environmental documents for public inspection are published in local newspapers.

The project is located within the following U.S. Census Tracts/Block Groups – Tract 9, Block Groups 2 and 3, and Tract 11, Block Group 3. Following is a comparative chart of the racial composition of these three Block Groups:

Table 9A: Racial Composition of Project Area Census Tract Block Groups

2000 Racial Composition of Residents within the Project Area	**Block Group 2, Census Tract 9, Putnam County, Tennessee**	**Block Group 3, Census Tract 9, Putnam County, Tennessee**	**Block Group 3, Census Tract 11, Putnam County, Tennessee**
Total:	2,193/100%	1,192/100%	1,896/100%
Not Hispanic or Latino:	2,193/100%	1,170/98.2%	1,880/99.2%
White alone	2,131/97.1%	1,117/93.7%	1,878/99.1%
Black or African American alone	40/1.8%	7/0.6%	0/0%
American Indian and Alaska Native alone	0/0%	0/0%	0/0%
Asian alone	0/0%	13/1.1%	0/0%
Native Hawaiian and Other Pacific Islander alone	0/0%	0/0%	0/0%
Some other race alone	0/0%	0/0%	0/0%
Two or more races	22/1.0%	33/2.8%	2/0.1%

2000 Racial Composition of Residents within the Project Area	Block Group 2, Census Tract 9, Putnam County, Tennessee	Block Group 3, Census Tract 9, Putnam County, Tennessee	Block Group 3, Census Tract 11, Putnam County, Tennessee
Hispanic or Latino:	0/0%	22/1.8%	16/0.8%
White alone	0/0%	22/1.8%	2/0.1%
Black or African American alone	0/0%	0/0%	0/0%
American Indian and Alaska Native alone	0/0%	0/0%	0/0%
Asian alone	0/0%	0/0%	0/0%
Native Hawaiian and Other Pacific Islander alone	0/0%	0/0%	0/0%
Some other race alone	0/0%	14/1.2%	14/0.7%
Two or more races	12/0.5%	0/0%	0/0%

No residents of minority status comprised over 1.8% of the total populations within the U.S. Census Tracts and Blocks within the project area. In comparison to other block groups within Census Tracts 9 and 11, these three areas had some of the lowest percentages of minority residents in the area. Due to the low number of relocations, 2 and 5, for Alternatives A and B, respectively no disproportionate impacts are anticipated for minority residents or communities.

Table 9B: Income Status of Populations for Project Area Census Tract Block Groups

Income Status of Populations within the Project Area, 2000	Block Group 2, Census Tract 9, Putnam County, Tennessee	Block Group 3, Census Tract 9, Putnam County, Tennessee	Block Group 3, Census Tract 11, Putnam County, Tennessee
Total Population within Block Groups:	2,193	1,192	1,894
Income in 1999 below poverty level:	241 (11.0%)	49 (4.1%)	204 (10.8%)
Income in 1999 at or above poverty level:	1,952	1,143	1,690

None of the project area reported poverty levels in excess of 11.0%, and as reported previously, Alternative A would require 2 residential relocations and Alternative B would require 5 residential relocations. The homes assessed during the field visits indicated that none of the sites appeared to contain low-income residents. No disproportional impacts are expected.

E. Relocation Impacts

A Conceptual Stage Relocation Plan (CSRP) has been prepared to estimate relocation impacts associated with the proposed project. Residential properties potentially displaced by the project are summarized in Table 10.

Table 10 Residential Relocations

Relocation Type	Alternative A	Alternative B
Single Family Units	2	5
Mobile Home	0	0
Total	2	5

Table 11 details the availability of replacement housing for those potentially displaced by the project. Table 11 also contains information concerning the rental housing market in the event that those displaced need or desire rental units. Information on available properties was obtained on-line from Realtor.com, a multiple listing service and home of the National Association of Realtors.

F. Economic Impacts

The CSRP indicates that the construction of the proposed project could displace up to two businesses if a Build Alternative is selected as the Preferred Alternative. Alternatives A and B would impact an auto salvage yard located along US 70N. In addition, Alternative B would impact a home-based taxidermy business.

The taxidermy business on Alternative B should pose few problems related to the relocation. As it is a typical "home business", a combined residential/commercial property should be considered. Ample sites appear to exist within the community, which can serve as replacement locations. However, such is not the case with the auto salvage yard. Typically, salvage yards and/or junkyards require additional effort in finding and obtaining proper permitting for replacement sites. Given the difficulty in obtaining such permits, as well as their "site specific" nature, it is unlikely that a "ready made" replacement site will be available. Relocation assistance personnel should begin to provide referral and advisory services to this particular business as soon as a final alignment is determined. This will ensure that a maximum amount of time is available to accomplish the relocation.

Table 11 Available Housing

For Sale	Price	Number Available
2 Bedroom	$40,000 to $100,000	25
3 Bedroom	$70,000to $300,000	49
3 BR With Acreage	$55,000 to $300,000	51
>3 BR	$75,000 to $500,000	5
Mobile Homes	$12,900 to $ 42,000	1
For Rent	**Price**	**Number Available**
2 Bedroom	$300 to $600	15
3 Bedroom	$300 to $600	25

Positive economic impacts of the proposed project include both short-term and long-term benefits. Construction activities would require the purchase of local goods and services,

which would cultivate business activity with local merchants. Additionally, construction related jobs could provide opportunities for unemployed laborers. The proposed project would likely generate the development of new businesses, particularly surrounding the proposed interchange locations. These new businesses would generate additional tax revenues, as well as increased employment opportunities, providing long-term benefits to the local economy. Construction of the proposed project would remove land and improvements from the local tax base. However, these losses would be short-term, as anticipated new residential and commercial development would likely offset these impacts in the long term.

It is anticipated the relocation needs will be adequately addressed under the standard provisions of the Tennessee Uniform Relocation Assistance of 1972 and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to all residential and business displacees, should such occur, without discrimination, in accordance with the Civil Rights Act of 1964, Title VI.

G. Considerations Relating to Pedestrians and Bicyclists

The facility, as proposed, would consist of four traffic lanes separated by a fifty-two foot depressed grass median, and it would have a design speed of 70 MPH with full control of access. No at-grade intersections with minor roadways or driveways would be included. Typically, this type of design limits traffic to motorized vehicles, such as cars and trucks. Pedestrian and bicycle traffic would be prohibited. Consequently, the preliminary design for the facility would not include accommodations for non-motorized traffic.

Pedestrians and bicyclists will be able to continue using roadways that are crossed by the proposed project. These roadways include Buffalo Valley Road, Hawkins Crawford Road, Locust Grove Road, Mine Lick Creek Road and US 70-North. Provisions in the design of interchanges, overpasses and underpasses have been made in the design process to ensure safe, uninterrupted passage is available to pedestrian and bicycle traffic.

H. Air Quality Impacts

Based upon the analyses of highway projects with similar meteorological conditions and traffic volumes, the carbon monoxide levels of the subject project will be well below the National Ambient Air Quality Standard. This project will have no appreciable impact on the air quality of the area. Indirect and cumulative impacts to the region's air quality are not anticipated.

I. Noise Impacts

The effects of increased noise levels due to the project have been evaluated according to the guidance of Title 23, Article 772 of the Code of Federal Regulations, "Procedures for Abatement of Highway Traffic Noise and Construction Noise" and the Tennessee Department of Transportation Guidelines on Highway Traffic Noise Abatement. Predicted noise levels have been compared to existing levels and the Federal Noise Abatement Criteria (NAC) to determine the impact of highway generated noise on the community.

Table 12 Noise Abatement Criteria (NAC)

Activity Category	Leq (h)	Description of Activity Category
A	57 dBA (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 dBA (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 dBA (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	-	Undeveloped lands.
E	52 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals, and auditoriums.

The existing and design year (2030) peak-hour levels were predicted at sixteen representative receptors within the project area (Figure 6). The sixteen receivers, representing 42 receivers, were analyzed using existing readings and 2030 projected traffic counts. The number of receivers represented at each site was determined by counting the receivers that were approximately the same distance from the ROW boundary as the analyzed receiver. The analyzed receiver was always the one nearest the proposed alternative.

The results of the analyses are presented in Table 13, which shows the measured existing noise levels for the year 2010 and the predicted noise for the build scenario for the design year (2030). For the receivers chosen for noise analysis, existing values ranged from 42 to 63 dBA Leq. The year 2030 predicted noise levels for the proposed project, for the receivers chosen for noise analysis, ranged from 55 to 67 dBA Leq.

According to the current TDOT Noise Policy, highway traffic noise impacts will occur if there is a substantial increase in future noise levels above existing noise levels when the future noise levels are between 57 and 67 dBA. The criteria for a noise level increase are shown in Table 12A.

Table 12A: Noise Level Increase

Increase in Existing Noise Levels (dB)	*Subjective Descriptor*
0 – 5	Minor Increase
6 – 9	Moderate Increase
10 or more	Substantial Increase

Table 13 Noise Analysis Summary

Site	Alternative	Existing (dBA)	Year 2030 Build	Increase over existing	Number of Receptors Represented
1	B	47	63	16	2
2	B	57	55	-2	1
3	B	59	60	1	1
4	B	62	61	-1	3
5	B	60	63	3	1
6	B	55	67	12	3
7	B	42	59	17	2
8	B	51	58	7	1
9	B	54	62	7	1
10	A and B	50 [a]	62/63 [b]	12/13 [b]	13 [a]
11	A and B	62 [a]	56 [a]	-5 [a]	1 [a]
12	A and B	63 [a]	63 [a]	0 [a]	3 [a]
13	A	55	63	7	2
14	A	52	61	9	4
15	A	50	63	13	1
16	A	46	63	17	3

All receivers are residences.
[a] Values are for both alternatives.
[b] Values are listed for Alternative A/Alternative B.

Abatement measures were considered for the sensitive receptors that exceeded criteria. Federal regulation CFR 23 part 772 mandates that abatement measures be both feasible and reasonable. The assessment of barrier mitigation and additional forms of noise reduction are discussed below.

The Noise Levels in Design Year 2030 are predicted to exceed the existing levels by 10 or more dBA for Receptors 1 (2 receptors), 6 (3 receptors), 7 (2 receptors), 10 (13 receptors), 15 (1 receptor) and 16 (3 receptors). Site 14 approaches the criteria with a 9 dBA increase for 4 receptors. Barrier mitigation for all impacted receptors, except those at Site 10, is considered unreasonable due to the limited number of residences that might benefit from barrier abatement.

A total of 13 receptors were predicted to experience increases of 10 dBA or above at Site 10 requiring a barrier analysis. The total predicted noise increases for Site 10 receptors remained under 69 dBA. In order to maximize reduction of noise and minimize cost, the barrier wall was set at a point adjacent to the right of way line of the southbound lane. The four receptors in the row closest to the road were predicted to receive noise reductions of 7dBA and the four sites in the second row of residences were predicted to receive noise reductions of 4.7 to 5.4 dBA. The remaining five receptors were predicted to receive noise reductions of 3.7 to 4.3 dBA and they received a noise reduction of 7

dBA. According to the TDOT Noise Policy (April 2005) considers noise barriers to be reasonable if the cost per benefited residence does not exceed the maximum allowable benefit per residence. Site 10 was determined to neither feasible nor reasonable since all sites exceeded the maximum allowable barrier cost of $42,000 per benefited residence. The minimum cost per benefited receptor was $57,250. The total estimated cost of the noise barrier was $458,334.

Various forms of noise reduction were analyzed, including traffic management measures (such as prohibition of heavy trucks) and alteration of horizontal and vertical alignments. The elimination of truck traffic was determined to be contrary to the major reason for improving the highway, which is to facilitate movement of truck and automobile traffic in the area. Alteration of the horizontal and vertical alignment for the subject project would require undesirable curvature in the alignments or additional construction costs and right-of-way purchases. These methods were found to be neither reasonable nor feasible when compared to any limited noise reduction they could provide. For these reasons, it is unlikely that any form of noise abatement will be incorporated into the design of this project.

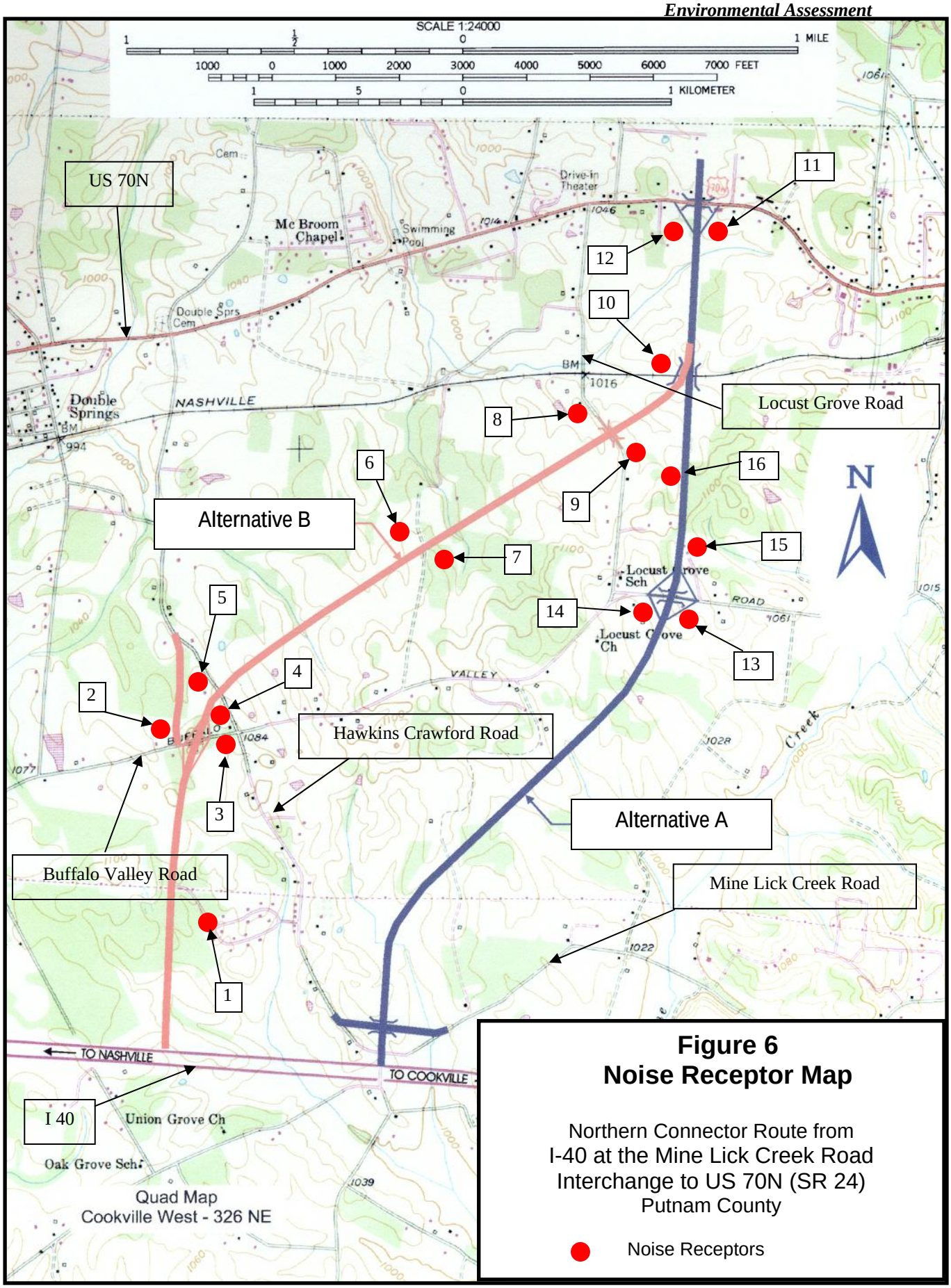


Figure 6
Noise Receptor Map

Northern Connector Route from
I-40 at the Mine Lick Creek Road
Interchange to US 70N (SR 24)
Putnam County

● Noise Receptors

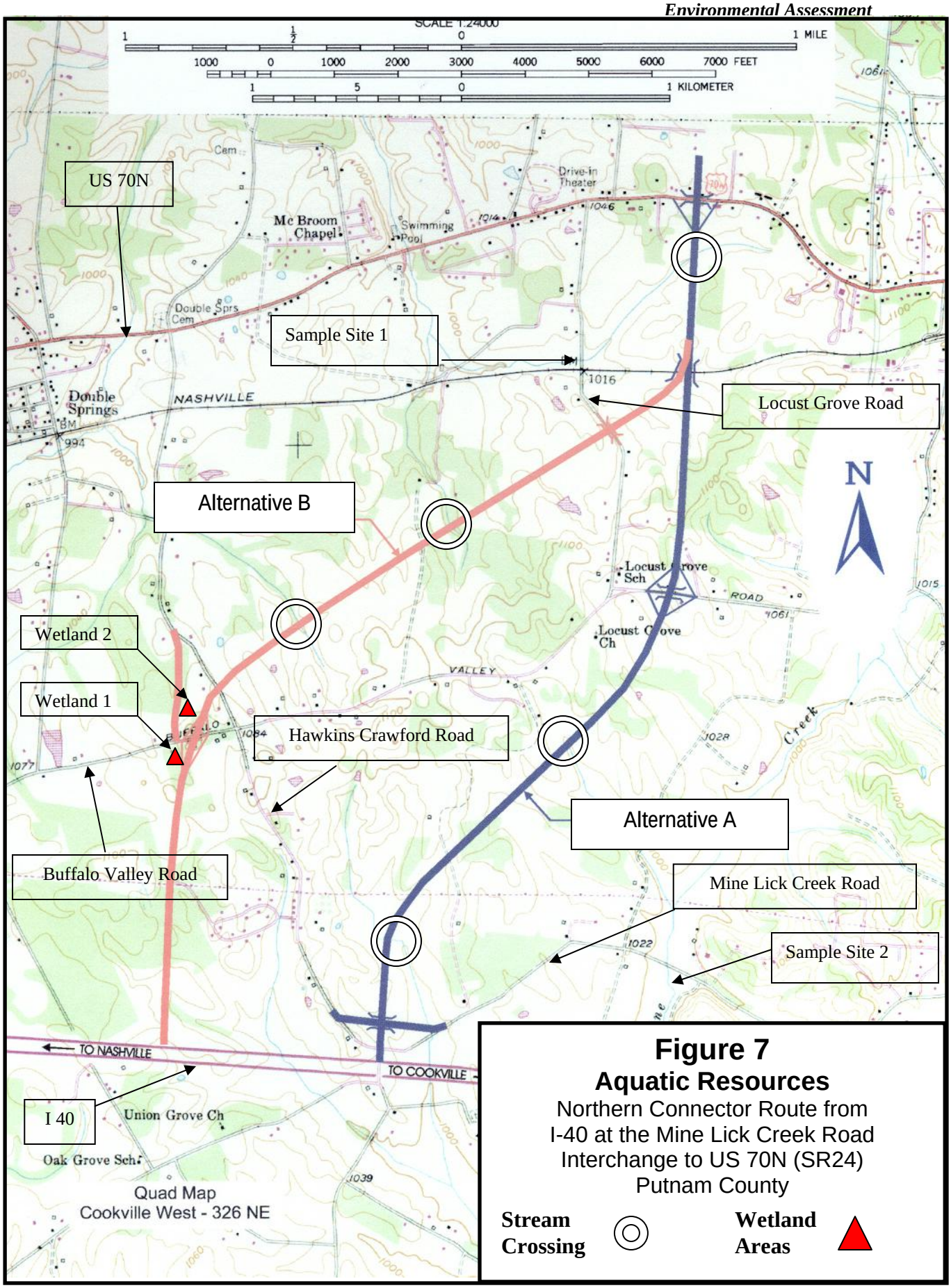


Figure 7
Aquatic Resources
Northern Connector Route from I-40 at the Mine Lick Creek Road Interchange to US 70N (SR24) Putnam County

J. Water Quality Impacts

Results of the water quality sampling are presented in Table 4 of the Ecological Study prepared for this project, and are on file at TDOT's Environmental Division. This report also presents data of all other parameters investigated, including the aquatic habitat and biosurvey conducted along with the water quality impact analysis.

Site 1 is located along a tributary of West Blackburn Fork at its crossing of Locust Grove Road, downstream of the proposed crossing of both Alternatives A and B. Site 2 is along Cane Creek at its crossing of Mine Lick Creek Road.

Past actions in the project area in Putnam County that may have resulted in impacts to groundwater resources include roadway construction, scattered single family residential and farm property development.

Reasonably foreseeable future actions/development as a result of the project, which is expected to be limited and primarily concentrated at proposed interchange locations, will likely result in additional impacts to groundwater resources in Putnam County. Reasonably foreseeable future impacts to these resources are not quantifiable, but could include such impacts as eventual increases in turbidity and dissolved solids and/or the seepage of fuels, lubricants, fertilizers, herbicides/pesticides or other pollutant materials into unique karst habitats and groundwater. However, cumulative impacts to these resources in the project area are expected to be limited (or minor) along the proposed project corridor, and somewhat offset by the use of Best Management Practices and through mitigation as discussed in the project *Terrestrial and Aquatic Ecological Baseline Report* (HMB, December 2003).

Cumulative impacts to karst and groundwater resources in Cookeville are generally less predictable. Continuing residential, commercial, industrial and roadway development in these areas (which is expected to occur whether or not the project is constructed) is likely to result in some groundwater impacts. However, cumulative impacts to these resources in these areas are not quantifiable due to the limited availability of historic records and land use planning information.

Potential indirect and cumulative effects to water quality associated with the proposed project would include changes in runoff from the facility, including road runoff, siltation, reduced in-stream detritus, and elevated water temperatures. Road runoff, such as de-icing compounds, oil, grease, asbestos and rubber will increase with the increase in vehicular traffic. Additionally, an increased likelihood for spillage of toxic chemicals from trucks into the waterways would occur.

K. Permits

In the event of a Build Alternative being selected as the Preferred, and prior to any construction activities, TDOT would apply for all State and Federal water quality permits required for the project. As noted below in Section L., a Section 404 Permit would be required from the U.S. Army Corps of Engineers for the construction of Alternatives A

Figure 8A

Putnam County Northern Connector from I-40 to US 70N

Alternate B Page 36A

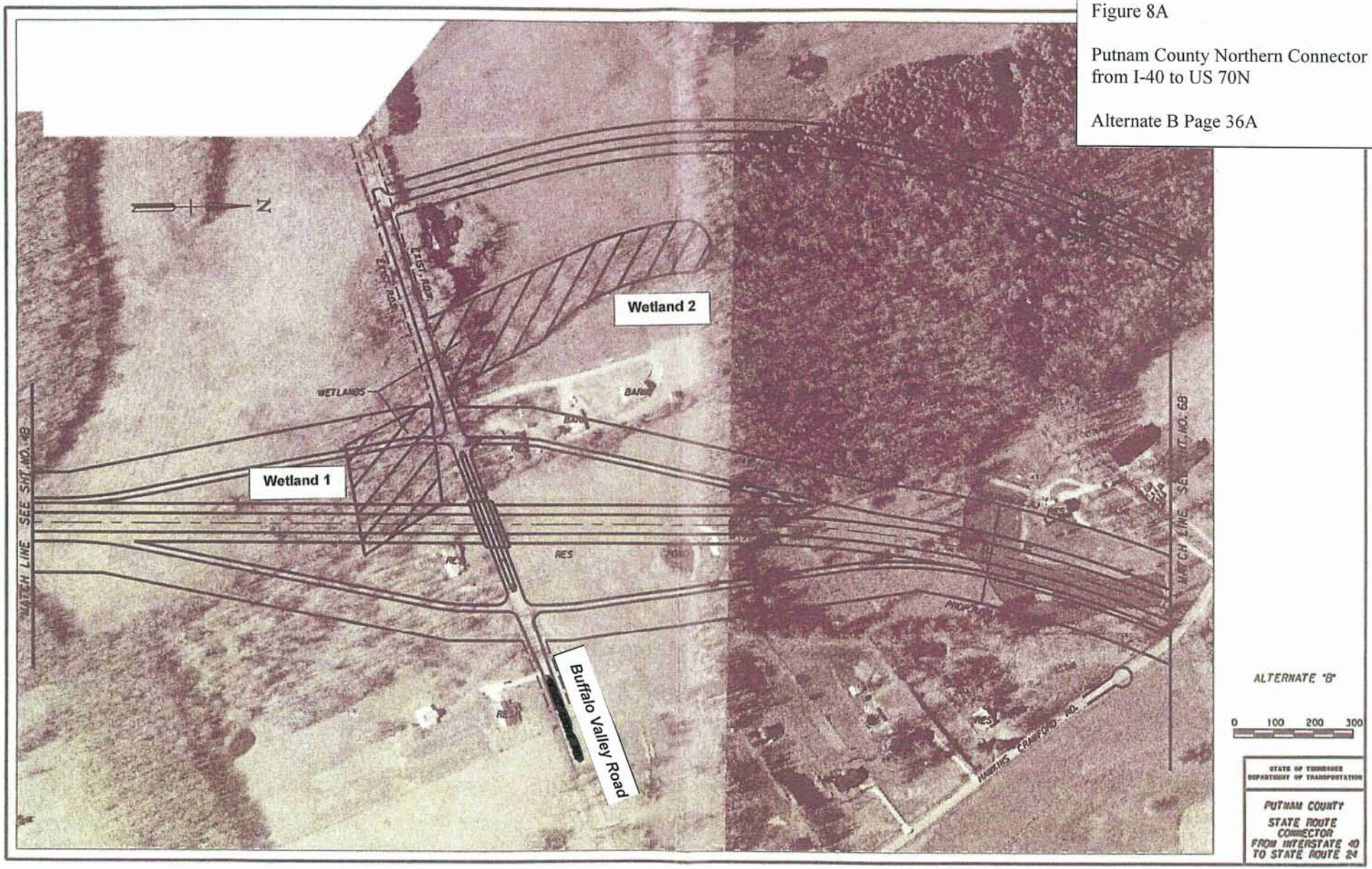
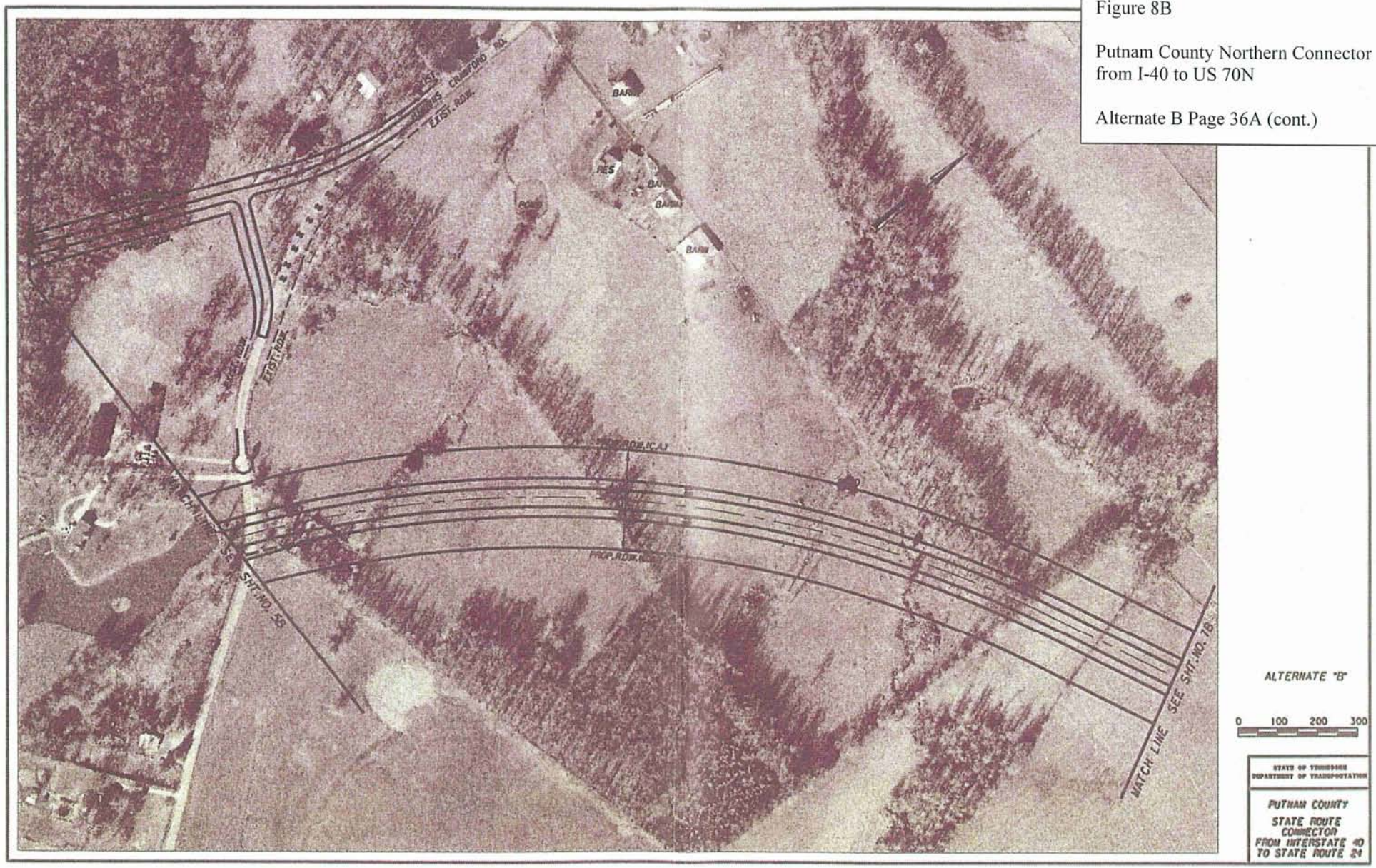


Figure 8B

Putnam County Northern Connector from I-40 to US 70N

Alternate B Page 36A (cont.)



and B. Additionally, an Aquatic Resource Alteration Permit for stream crossings would be required from the Tennessee Department of Environment and Conservation (TDEC), prior construction of either alternative selected as the Preferred. As mandated by the Tennessee Water Quality Control Act, a 401 Water Quality Certification would also be required from TDEC.

L. Wetland Impacts

TDOT is required to explore every means of avoiding impacts to wetlands. If impacts are unavoidable, TDOT is to determine a solution that will minimize impacts to wetlands. Two wetlands, 1 and 2 (Figures 8A and 8B, page 36A), were identified within the project corridor. Alignments were investigated to avoid wetlands along Alternative 2. Wetland 1 is located within the interchange and it is not reasonable to move the interchange to the east due to the potential relocation of Hawkins Crawford Road and Locust Grove. Wetland 2 was originally to be acquired, but the ramp was moved to the west to avoid acquisition of this wetland.

No wetlands were found along the Alternative "A" proposed corridor. A comparison of total wetland area within the proposed right-of-way for each Alternative is located in Table 14. Actual wetland impact area may be reduced once roadway design is complete and construction limits are finalized. Wetlands at each wetland site were identified as Palustrine forested wetlands according to the Cowardin classification (Cowardin et al. 1979). Commonly known as swamps, Palustrine forested wetlands 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.

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.

Both wetlands were generally in good condition. However, both were impacted by the presence of exotic invasive species. Wetland 2 had a greater occurrence of exotic invasive species than did Wetland 1, but most of those occurred in one previously disturbed area. Exotic invasive plant species are opportunistic and will quickly invade a disturbed area and continue to spread.

Table 14 - Wetland Impacts

Build Alternative	Acres of Wetland Impact
A	No impacts
B	2.72 acres (Wetland 1)

Potential impacts to wetlands would be avoided, where practicable, minimized by slight alignment modifications in the final design for the interchange, or mitigated on site, or at an approved wetland bank.

Project area wetlands consist mainly of open-water farm ponds that do not have a high degree of functionality. The larger palustrian forested wetland areas, typical of those impacted by Build Alternative B, are located west of the project area. Consequently, any indirect or cumulative impacts to these resources would likely be associated with Alternative B. These impacts would be associated with development efforts. Development efforts are anticipated to occur initially along the intersections of the Northern Connector with area roadways. This initial development would most likely be highway commercial development, which includes gasoline/food stores, motels, restaurants and similar types of commercial applications that serve travelers and commuters. Further development may include residential and/or light industrial activity. Indirect impacts may cause displacement of wetlands that were initially impacted along the Build Alternative B corridor. Cumulative impacts could occur in the area around the new Connector as development continues throughout the next decade. Expansion activities should show sensitivity to wetlands resources as plans are developed. The U.S. Army Corps of Engineers and the Tennessee Department of Environment and Conservation will require coordination if such activities would impact waters if the United States, including wetlands, and would have some control over mitigation measures for expansion activities including erosion and sedimentation control and replacement of wetlands.

Past actions in the project area that may have in resulted in impacts to wetlands include development of the present-day local roadway network, including existing I-40, US 70N, State Route 135, State Route 136 and State Route 56, draining and clearing mainly from farm property development and related activities, logging and mining. Based on field studies, most natural wetlands in the project area are found in locations that are generally undesirable for activities such residential, scattered commercial and farm property development. Though it is presumed that some amount of wetland habitat was impacted as a result of past actions in the project area, the overall impact on project area wetlands is indeterminable.

Reasonably foreseeable future actions/development as a result of the project, which is expected to be limited and primarily concentrated at proposed interchange locations, and other development not associated with the project, will likely result in some additional impacts to wetlands. Reasonably foreseeable future impacts to these resources are not quantifiable, but could include such impacts as limited amounts of draining and clearing from ongoing roadway, bridge and culvert maintenance activities, scattered single family residential and farm property development, and future commercial and possibly light industrial development within the immediate and nearby area surrounding the proposed project.

Cumulative impacts to wetlands in Cookeville are generally less predictable. Continuing residential, commercial, industrial and roadway development in this area, which is expected to occur whether or not the project is constructed, is likely to result in some level of wetland impacts. However, cumulative impacts to this resource in these areas are

not quantifiable due to the limited availability of historic records and land use planning information.

M. Water Body Modifications and Wildlife Impacts

Construction activities would result in temporary impacts to project area streams. Soil erosion and the placement of fill materials would increase stream sedimentation and turbidity, which could potentially impact habitat for aquatic organisms. These potential impacts would be minimized using best management practices including the installation and maintenance of erosion and sedimentation control measures throughout the construction phase of the proposed project.

As currently proposed, no stream channel relocations have been recommended. However proposed Build Alternatives A and B would impact a number of project area streams. If the streams are impacted from filling or excavation activities, a Section 404 Dredge and Fill Permit will be required from the U.S. Army Corps of Engineers during the final design phase. Table 15 provides details on potential impacts to project area streams associated with the proposed Build Alternatives.

Table 15 Stream Impacts

Aquatic Site and Stream Impacted	Length of Impact, Alternative A	Length of Impact, Alternative B
Tributary of West Blackburn Fork at Site1	251 ft.	271 ft.
Tributary of Cane Creek at Site 2	320 ft.	N/A
Tributary of Cane Creek	253 ft.	N/A
Tributary of Cane Creek	53 ft.	N/A
Tributary of Cane Creek (US 40 crossing)	834 ft.	N/A
Tributary of Cane Creek (US 40 and Local or Rural Rd.)	79 ft.	N/A
Tributary of West Blackburn Fork (Bennett Rd.)	177 ft	N/A
Tributary of Cane Creek (Stewart Cemetery Rd.)	23 ft.	N/A
Tributary of West Blackburn Fork (US 40 crossing)	311 ft.	311 ft.
Tributary of West Blackburn Fork	N/A	299 ft.
Tributary of West Blackburn Fork	N/A	556 ft.
Totals	**2301 ft.**	**1437 ft.**

Examining the loss of habitat associated with a project best assesses potential impacts to terrestrial organisms. A summary of Wildlife Habitat Displacements are provided in Table 16, below. Terrestrial habitat types identified within the project impact area include forested, agricultural and developed areas. Alternative A would have fewer impacts to agricultural areas than Alternative B. Alternative B would impact nearly five times more developed area and approximately 1.6 times the forested area as Alternative A.

Table 16 – Wildlife Habitat Displacement by acres (ac)

Habitat Type	Alternative A	Alternative B
Agricultural	104 ac	126 ac
Developed	4 ac	18 ac
Forested	75 ac	119 ac
Total Area	183 ac	263 ac

Indirect and cumulative impacts to wildlife habitat would be associated primarily with the planned development around the proposed interchanges with I-40 and Buffalo Valley Road. These activities could result in further displacement of wildlife habitat. Local and regional development efforts should show sensitivity to these habitats as plans are made change land usage. Loss of habitat will increase pressure on local fauna to relocate. The area immediately surrounding development areas would realize the greatest pressure as animals would initially relocate there. Floral species, especially those that provide food for animals would experience pressure from increased grazing.

N. Threatened and Endangered Species Impacts

The project team's biologists searched the US Fish and Wildlife Service (USFWS) database and coordinated with US Fish and Wildlife Service biologists to determine if any federally listed endangered or threatened animals and plants occurred in the proposed project area. TDOT sent a letter of coordination to USFWS in Cookeville, TN informing them of the proposed action and requesting information on protected species on January 23, 2003. USFWS responded with a letter dated February 19, 2003, identifying the presence of three federally protected species – the Indiana bat, the gray bat and the American Bald Eagle. The letter has been included in the Appendix III. The federally listed endangered gray bat (*Myotis grisescens*), the Indiana bat (*Myotis sodalis*) and the Bald eagle (*Haliaeetus leucocephalu*s) were identified as species known to exist in the Buffalo Valley and Cookeville West Quadrangle USGS topographic maps. A Biological Assessment (BA) was conducted and submitted on September 9, 2006 to TDOT (Appendix III). The following information is based upon results of the field trips and the BA.

The Gray bat has gray or russet fur and is approximately 3 to 4 inches in length. They roost, breed, rear young, and breed in caves continuously. Gray bats migrate between summer and winter caves and will use transient or stopover caves along the way. The bats are totally reliant on a few caves year-round for their survival. Although no known caves that harbor gray bats occur within the project area, potential Gray bat caves do exist within Putnam County. Riparian corridor deforestation within the foraging range of these caves could decrease the suitability of the caves for Gray bats. However, only partial riparian deforestation along portions of Cane Creek is likely to occur. Gray bats were

detected during an endangered bat survey for the formerly proposed SR 451 (Corridor J) just north and east of the project in the summer of 2002. Ament Cave, a known Gray bat summer roost, is located approximately 1.25 miles south-southeast of Cookeville. The Gray bat's foraging range is approximately 10 miles; therefore it can be assumed that Gray bats use the project area as a travel route and for foraging. Definitive statements about Gray bat use of the project area cannot be made without a bat survey. It was a recommendation of the Harvey (2003) study that "since Gray bats forage over water, and since they usually fly close to wooded areas or follow wooded corridors as they travel to foraging sites, as much as possible, streams, lakes, ponds, and wooded areas should be avoided during the time of year that Gray bats are (potentially) present (roughly April through October), and that these habitat types be impacted as little as possible." The gray bat was identified in 2003 in an area just north of the Northern Connector project. As with the Indiana bat, most of the streams in the area are too small and cluttered for foraging and travel corridors. Cane Creek and an unnamed tributary of the West Blackburn Fork are considered moderately suitable as sites for the gray bat's hunting and travel purposes. Appropriate mitigation measures for the Indiana and Gray bat would be followed in accordance with USFWS guidance and consultation, and these measures are listed below.

The Indiana bat is a small bat, less than 2 inches in length, with dark gray to brownish black fur. Indiana bats typically roost under loose bark in the summer and in caves during the winter. Small tracts of forest suitable for Indiana bat summer use exist within the proposed project area. These small, isolated areas are considered to be poor to marginal habitat for this species. Most of the streams within the project corridor are too small and cluttered for use by the Indiana bats for foraging or as a travel corridor. Cane Creek, immediately south and east of Alternative A and an unnamed tributary of West Blackburn Fork, immediately west of Alternative B, were assessed as moderately suitable foraging and travel corridors. No caves suitable for Indiana bat hibernation were located within or near the project area. In the absence of a field study, the presence of the Indiana bat is assumed for the project area. Mitigation measures will be required to avoid adverse impacts, and these measures are listed below.

The project will impact several unnamed tributaries of West Blackburn Fork. Gray bats were documented using West Blackburn Fork in an Endangered bat survey conducted in the summer of 2002 for the formerly proposed SR 451 (Corridor J) (Harvey 2003). Strict erosion control measures must be utilized during construction of this project, especially if Alternative B is selected, to prevent sedimentation of this receiving stream.

Through the use of appropriate mitigation, substantial adverse impacts to the Indiana and gray bat species can be avoided. If a Build Alternative is selected, the following mitigation measures will be implemented:

- Tree removal in construction zones must be scheduled between October 15 and March 31 to prevent disturbance to trees that may harbor the Indiana bat summer colonies.

- Tree cutting will be limited to areas where construction must occur within 100 feet of stream banks within right of way limits. This will maintain a riparian buffer zone.
- Disturbed areas will be re-vegetated to the maximum possible extent with tree species that produce sloughing bark and snags. Species to consider include white oak, northern red oak, white ash, shagbark hickory, slippery elm, black locust, American elm, shellbark hickory, cottonwood and sycamore. This mitigation measure is especially important in areas where project construction activities cause disturbances to riparian vegetation.
- Indiana bats forage (hunt) over local waters necessitating preservation of water quality in forage areas. Therefore stream crossings will be limited to direct crossings.
- Location of construction equipment in streams will be avoided to the greatest extent possible. Stating, refueling, and cleanup areas will not be allowed alongside streams. All TDOT Best Management Practices for stream protection will be implemented during the construction of the project.
- Project construction is not anticipated to contribute to degradation of water quality in area streams.
- Avoidance of construction activities within recognized bat habitat areas will occur during periods of known bat activities if bats are identified.

The bald eagle is a striking, dark-brownish/black bird with a white head and tail. Juvenile birds are a mottled brown with white blotches. They do not obtain the full distinctive plumage of the adults until they are four or five years old. Bills, legs, and feet are a deep yellow. They dwarf most other North American raptors. Their wingspans range from six and a half to seven and a half feet, while body length varies from about three to three and a half feet. Bald eagles weigh from six to eight pounds. Females are larger than males and have a slightly longer wingspan.

Appropriate bald eagle nesting or roosting habitat does not occur within the project area. Some commonly known nesting trees, including pines, oaks, and poplars occur, but forested areas are fragmented and most are located within proximity to developed areas, including the city of Cookeville, which is approximately five miles from the project area. Two relatively large bodies of water, Center Hill/Caney Fork River, and Cordell Hull Lake/Cumberland River, are located an estimated 11 and 13 miles from the project, respectively. Eagles have been identified within 16 miles of the project area. However, the proposed project is located within an area that is predominately fragmented with suburban development. Some small areas of fairly mature second growth forest occur within the project area, but they are surrounded by residential, agricultural and urban development and are not anticipated to attract foraging eagles. The proposed action is not likely to adversely affect the American bald eagle.
Additionally, the following species of Management Concern may occur within the project area: Rafinesque's big-eared bat (*Plecotus rafinesquii*), Alleghany (Eastern) woodrat (*Neotoma magister*), Bachman's sparrow (*Aimophila aestivalis*), the dirty darter (*Etheostoma olivaceum*), and the Obey crayfish (*Cambarus obeyensis*).

Because bat netting was not performed along stream corridors that constitute potential foraging habitat, the presence of Indiana and gray bats was not confirmed in the area. Assuming presence of these species, it is reasonable to anticipate that these bats would use the forest-lined stream segments as foraging habitat, as well as much of the forested areas along both proposed corridors as Indiana bat maternity roosting habitat and foraging areas.

Potential indirect and cumulative impacts to protected species would include additional habitat loss to the anticipated development in the areas surrounding the proposed interchanges. Past impacts are evident in the area where urban, residential and agricultural land use is situated. Habitat has been removed for these purposes, except for fragments of forested areas. Land use has shifted to commercial and residential use. Additional pressures will be placed on floral and faunal species. Species will be forced to migrate into increasingly crowded conditions. Local development efforts should include sensitivity to biohabitats and the effects of displacement when considering land use changes.

During the review process of the BA, the US Fish and Wildlife Service was notified by the American Speleological Society of the presence of a cave and sinkhole complex containing colonial bats that appeared to be located in the immediate vicinity of the two project alternatives. Based on this information USFWS requested that the BA be deferred until they located and surveyed the cave complex to determine if the presence of gray and/or Indiana bats were occupying the site. The person who identified the cave refused to identify the location of the cave. USFWS attempted through other methods to locate the cave. The agency talked to landowners in the vicinity of the alignments, visited shallow, cave like areas, but found no caves that feature climatic and other conditions that would be suitable habitat for gray or Indiana bats.

Upon conclusion of the field investigations, USFWS withdrew concerns that the project as presented in the BA would adversely affect endangered bats. This satisfies compliance with Section 7. The BA and USFWS letter are included in Appendix III.

A total of 3.5 years had passed since the Threatened and Endangered Species list was consulted. A species search was completed using the TDEC DNA database on June 29, 2006; no species were found within the project area. No further work is necessary.

O. Floodplain Impacts

Impacts to project area floodplains were analyzed using Flood Insurance Rate Maps (FIRM), U.S. Geologic Survey (USGS) Topographic Quadrangle Maps and field reviews. Please refer to Figure 7 for a copy of the project area FIRM. Based upon the analysis of these materials, the proposed Build Alternatives A and B would not impact the 100-year floodplain of any project area stream.

Field observations indicate that past floodplain encroachment within the proposed project area has occurred primarily as a result of scattered residential and farm property development and maintenance, and roadway construction. The majority of this encroachment has come in the form of vegetation removal, soil tilling, and grading, and to a lesser extent bank shaping, channeling and other riparian modifications.

Reasonably foreseeable future impacts to 100-year floodplain are not quantifiable, but could include impacts related to continued residential and farm property maintenance and development that includes removal of vegetation, soil tilling and grading, and to a lesser extent bank shaping, channelization, and other riparian modifications. Reasonably foreseeable future impacts as a result of roadway construction are not expected as a FEMA "No Rise" certification would be required for any future transportation projects in the area.

Although the project will not impact floodplains, development activities may unintentionally include construction within or near floodplains. Development efforts within the floodplain areas would require coordination with FEMA and the U.S. Army Corps of Engineers. It is unlikely that these agencies would condone such activity within floodplains. Consequently, indirect and cumulative impacts associated with the proposed project are not anticipated. However, local and regional development activities should include reference to Flood Insurance Rate Maps (FIRM) provided by the Federal Emergency Management Agency (FEMA) to ensure encroachment does not occur.

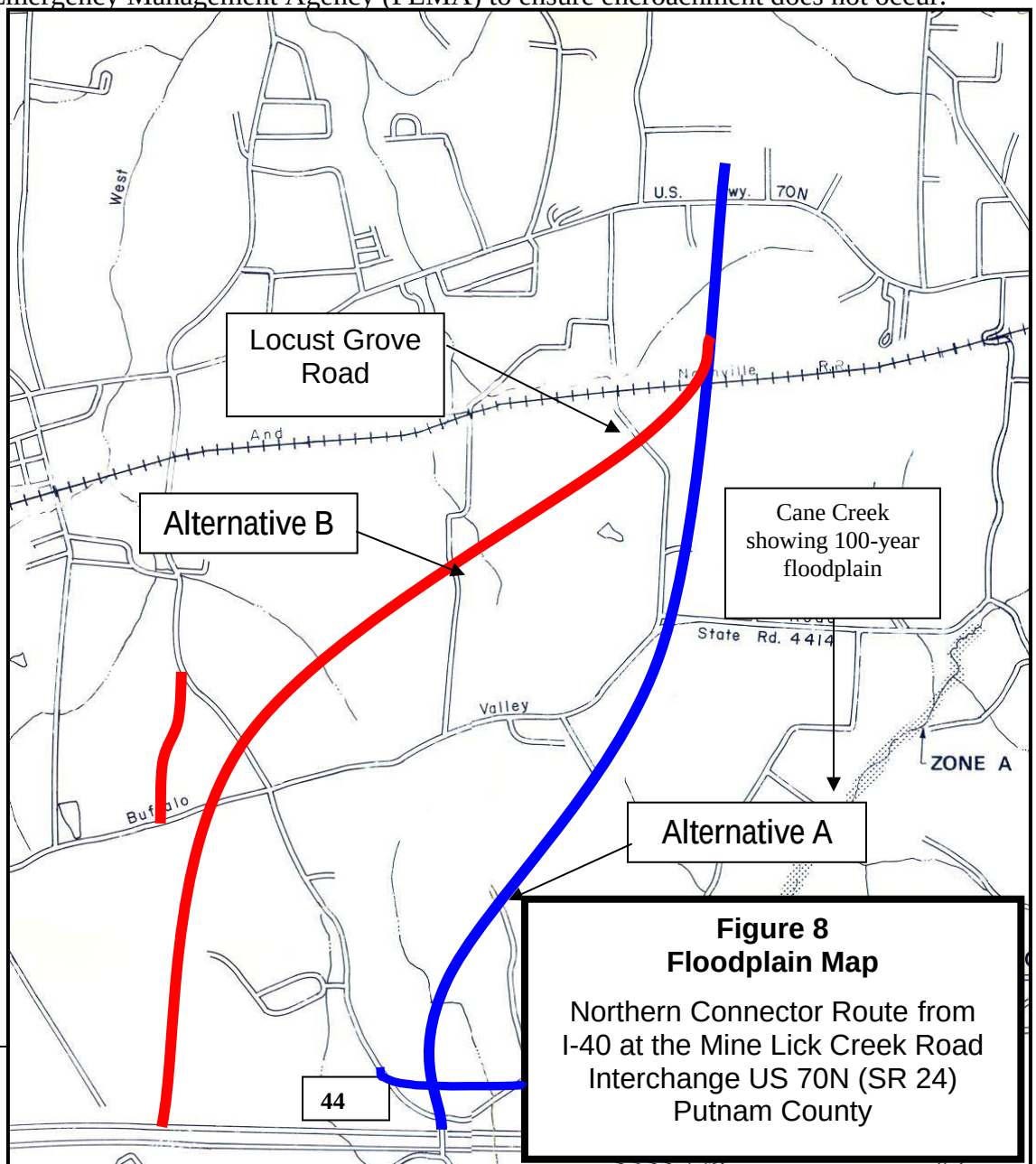


Figure 8
Floodplain Map

Northern Connector Route from I-40 at the Mine Lick Creek Road Interchange US 70N (SR 24) Putnam County

Cumulative impacts to FEMA 100-year floodplain in Cookeville are less predictable. Cumulative impacts to 100-year floodplain in are expected to include influences from residential, commercial and industrial development mainly as a result of vegetation removal, grading, and to a lesser extent bank shaping, channeling and other riparian modifications. However, cumulative impacts to this resource in these areas are not quantifiable due to the limited availability of historic records and land use planning information.

P. Historic Properties Impacts

In the spring of 2003, historians surveyed and documented structures in the project area in an effort to identify properties listed, or potentially eligible for listing, on the National Register of Historic Places (NRHP). The findings of this report are detailed in the Architectural/Historical Assessment and Documentation of Adverse Effect (Pursuant to 36 CFR 800), which is on file at TDOT Environmental Division. One property, the Union Grove Presbyterian Church, was identified as a concern. The assessment was coordinated with the Tennessee Historical Commission, which issued a response, dated April 9, 2003 and is provided in Appendix II of this document. The Tennessee Historical Commission Executive Director and Deputy State Historic Preservation officer issued a finding of "No Adverse Effect" to any properties eligible for listing in the NRHP, specifically the Union Grove Presbyterian Church. Therefore, this project is found to be compliant with the requirements of Section 106 of the Historic Preservation Act.

Although the project is not anticipated to have measurable direct impacts upon cultural resources, indirect and cumulative impacts are possible. These impacts would be associated with sites located near primary connector roads and interchanges. These interchanges usually experience land use changes. Commercial highway development is typical at these locations and includes gasoline/convenience stores, motels, and restaurants to serve travelers. Indirect effects might include additional noise and visual impacts associated with the construction of these commercial sites and the traffic generated as they become operational. Cumulative impacts include further displacements and additional noise and visual impacts if development is continual over several years or decades. Local and regional development efforts should include sensitivity to historic properties as plans in the project corridor for future growth are considered.

Indirect impacts may also include residential development causing further potential displacement of historic properties or additional visual and noise impacts. Residents from Cookeville may elect to move to areas near the Northern Connector Route if local development efforts include residential developments in the area. Although this area has not experienced rapid land use change or development in past years, a new roadway would provide an efficient route for commuting within and through the region. Cumulative impacts from the possible development include possible removal of historic properties in the area and continued noise and visual. Local and regional developers should show sensitivity to these sites as they consider development plans in the project area.

Q. Archaeological Impacts

In October 2003 a Phase I archaeological survey was conducted on the proposed Northern Connector form I-40 to US 70N (SR 24) in Putnam County. The purpose of this survey was to assess potential archaeological and historical resources that may be affected by the proposed facility. All investigations were conducted in accordance with Section 106 of the Historic Preservation Act of 1966; the "Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation Activities, as published in the Federal Register on September 29, 1983, Vol. 48 Part No. 190, Part V (48 CFR 800.9 and CFR 800.9 (c) (1).

A review of the site files at the Tennessee Division of Archaeology (TDOA) showed that no sites had been previously recorded within the project area.

No sites were located, and due to the findings of this survey, no further archaeological work is recommended. In the unlikely event that human remains are encountered during construction, operations should cease in the subject area and the State Archaeologist should be notified immediately.

Although the project is not anticipated to have measurable direct impacts upon cultural resources, indirect and cumulative impacts are possible. These impacts would be associated with sites located near primary connector roads and interchanges. These interchanges usually experience land use changes. Commercial highway development is typical at these locations and includes gasoline/convenience stores, motels, and restaurants to serve travelers. Indirect effects might include additional noise and visual impacts associated with the construction of these commercial sites and the traffic generated as they become operational. Cumulative impacts include further displacements and additional noise and visual impacts if development is continual over several years or decades. Local and regional development efforts should include sensitivity to historic properties as plans in the project corridor for future growth are considered.

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Pursuant to Section 106 of the National Historic Preservation act, a letter and a summary of project data were sent to the following Native American Groups: The Eastern Band of Cherokee Indians, the Cherokee Nation of Oklahoma, the Chickasaw Nation, the Choctaw Nation of Oklahoma, the Muscogee (Creek) Nation, the Seminole Nation of Oklahoma, the United Keetoowah Band of Cherokee and the Eastern Shawnee Tribe of

Oklahoma. The information was sent to invite these tribes, and no response was received.

R. Hazardous Materials Impacts

During the course of field investigations related to the proposed project, one property was identified as containing materials that could pose a threat to human health and the environment. This property, an auto salvage yard, is located along US 70N and is impacted by both proposed alternatives that may require relocation. Please refer to Figure 12 for the location of this potential hazardous materials site.

Figure 9 - 55 gal. drums along US 70N

The field investigation of the subject property revealed the presence of more than fifty 55-gallon barrels stacked along the present-day right-of-way for US 70N. Some of the barrels, depicted in Figure 8, appeared to be empty of contents. However, due to safety concerns, none of the barrels were opened or inspected other than visually from a small distance. Several of the barrels were labeled as containing the following compounds: Phosflex⑩ 71B, and 1,4 Butanediol.

Figure 10 - Auto Salvage Yard

Material Safety Data Sheets (MSDS) available on the Internet indicates Phosflex⑩ 71 B is manufactured by AKZO Nobel Chemicals, Inc. of Dobbs Ferry, NY. This compound is utilized as a flame-retardant plasticizer. An Internet search for MSDS information revealed that 1,4 Butanediol is utilized as in the production of industrial cleaners, polyurethane, and Spandex⑩, as well as abused a recreational drug.

Figure 11 - Stream bisecting potential hazardous materials site

In addition to the barrels described above, the site also contained materials typical of those found in an auto salvage yard. The site contained numerous cars in varying conditions, as well as various parts of automobiles scattered about the site (Figure 10). During the field inspection of this site, runoff from rainfall followed an intermittent stream channel, which bisected the site from east to west. As depicted in Figure 11, this runoff has the potential to carry pollutants from the site onto the adjacent properties. TDOT will investigate avoidance of this site during the design phase.

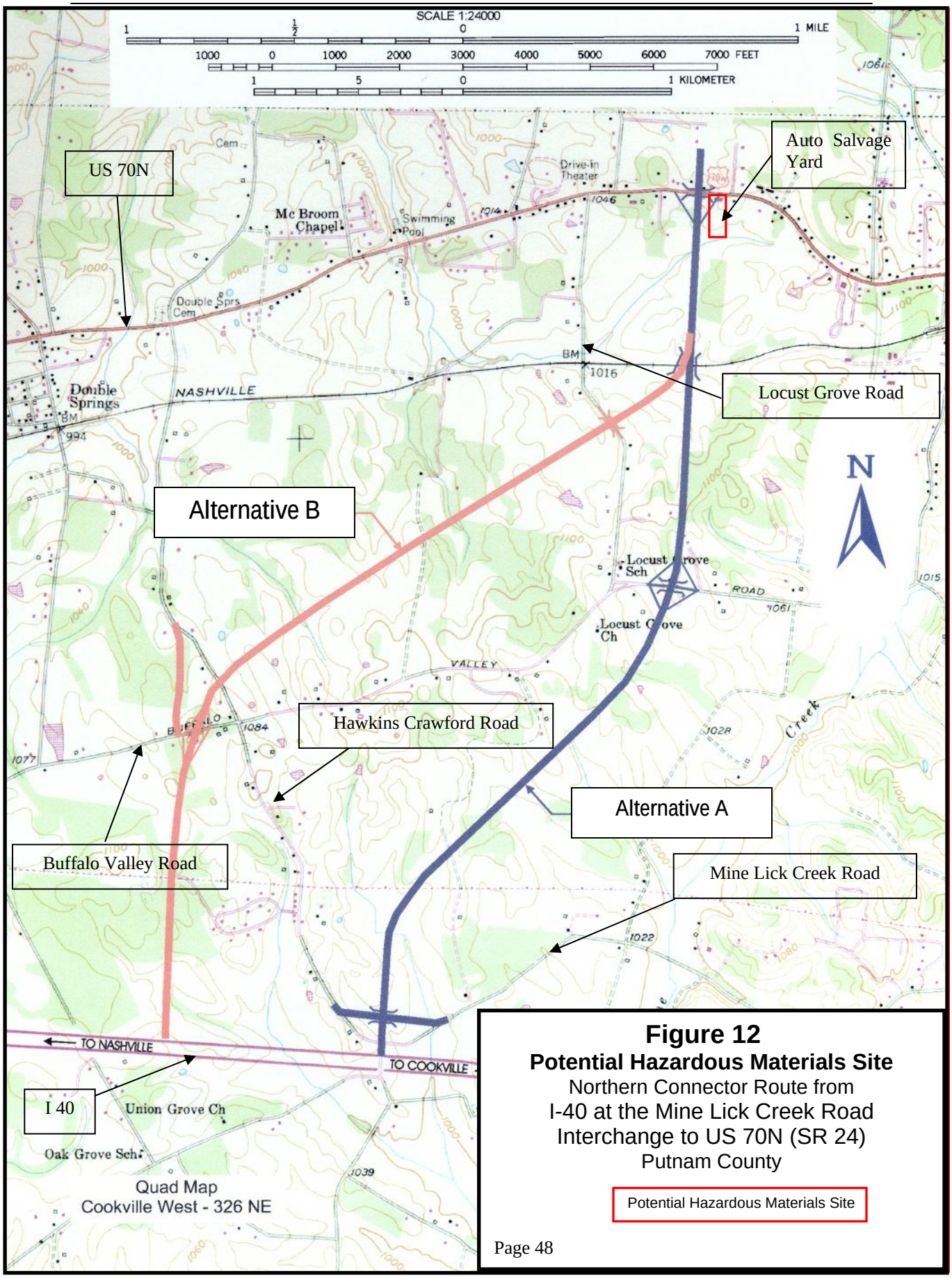

Figure 12
Potential Hazardous Materials Site
Northern Connector Route from
I-40 at the Mine Lick Creek Road
Interchange to US 70N (SR 24)
Putnam County

Potential Hazardous Materials Site

S. Construction Impacts

Construction activities associated with the proposed project would result in temporary impacts to water, noise, and air quality, as well as the terrestrial habitat in the immediate vicinity of the project. In order to minimize potential adverse effects due to the siltation, soil erosion, or possible pollution of area streams, the contractor would be required to comply with all provisions outlined in the Standard Specifications for Road and Bridge Construction, as issued by TDOT, and as amended by the most recent applicable supplements. These provisions implement the requirements of the FHWA Federal-Aid Policy Guide Chapter 1, Subpart G, Part 650, and Subpart B. When regulations from these two policies conflict, the more stringent of the two would be applied. Additionally, the contractor would be required to schedule and conduct operations according to these provisions, which contain precautionary measures to reduce siltation.

Disposal of surplus materials, as well as solid waste generated by construction activities, would be conducted in accordance with all applicable solid waste rules and regulations. TDOT would be responsible for coordinating all utility relocations with the respective utility providers.

Traffic would be maintained at all times. A maintenance-of-traffic plan will be prepared during the design phase. Access to properties would be maintained during any construction activities.

T. Indirect and Cumulative Impacts

By United States Code of Federal Regulations (CFR) definition, *direct effects (or impacts)* are caused by the action and occur at the same time and place (40 CFR § 1508.8). *Indirect effects (or impacts)*, are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR § 1508.8). *Cumulative effects (or impacts)* are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR § 1508.7).

An analysis of indirect and cumulative impacts for a project of this nature involves an assessment of the direct and indirect environmental effects of the proposed action, and a discussion of incremental, resource-specific impacts when considering *other past, present and reasonably foreseeable future actions*. Specifically, this consists of: 1) an identification of the environmental resources and features directly and indirectly impacted by the project, as determined in in-depth environmental base studies completed for this study, 2) an identification of other past, present and foreseeable future actions that have impacted (or will impact) the resources affected by the project, 3) an identification of appropriate geographic and temporal limits for the analysis, and 4) an assessment of

cumulative impacts on resources affected by the project when considering resource conditions and all relevant past, present and future actions.

Land Use

The construction of the Northern Connector would not significantly alter the land use by direct impacts. Development activities mentioned in the Cookeville Comprehensive Land Use Plan, 2000, have been identified for the area within and adjacent to the proposed Northern Connector Project. Some development is occurring currently along I-40 and US 70N. These activities will continue even if the project is not constructed.

If selected, Alternate A would require an estimated 104 total acres, and Alternate B would require an estimated 126 acres. The indirect and cumulative impacts associated with land use change would be initially located at interchanges where the Northern Corridor intersects with primary and secondary routes such as Buffalo Valley Road, Hawkins Crawford Road, Locust Grove Road and US 70 North. Initial development will most likely be highway commercial development. Indirect effects associated with this project include development of gasoline/service stations, hotels, restaurants and similar applications that serve travelers and commuters. The indirect effects would be likely to occur within the first five years after implementation of the project.

The area will realize a transition from agricultural activities. Cumulative impacts include the possible development of residential areas and ultimately expanded commercial and light industrial development. These changes would most likely occur over the next two decades.

Farmland Indirect and cumulative impacts to farmland are expected if the No-Build or a Build Alternative is selected. Development activities are occurring adjacent to the project corridor at the present time, and according to local officials, these efforts are anticipated to continue into the foreseeable future. Loss of farmland in the area is reflective of state and national trends. The loss is associated with increasing expenses/diminished profitability of operating farms, and with land use changes. It has become more profitable to sell farmland for changing land uses than to continue operating farms as primary means of income. This trend has been accelerating over the past two decades. The project will complement local development efforts, which will contribute to this trend. If a Build Alternative is selected, the impacts associated with farm loss will be slightly accelerated in relation to the No-Build Alternative, but as mentioned in the Land Use section above, development activities are ongoing in this area. Local and regional development efforts should consider this trend and show sensitivity to loss of farmland and prime and unique soils when considering site locations for future business, residential and industrial development efforts. Indirect effects would be associated with farms that are located near intersections along the proposed Northern Connector. These farms would be likely to sell portions or all of their land to meet the demands for highway commercial development in the near future. Long term, cumulative impacts include further loss of farmland in planned residential, commercial, and industrial land use change. These losses would occur most likely adjacent to or

within corporate city limits and along State and US highways that would intersect with the Northern Connector. If the No-Build Alternative is selected, farm loss will continue to occur, especially within and next to the Urban Service Boundary, but at a slower rate than if a Build Alternative is selected. Development goals should include sensitivity to farms and prime and unique farmlands when planning for expansion in the area.

Economic Positive indirect and cumulative economic impacts of the proposed project consider both short-term and long-term benefits. Indirect effects could be associated with construction activities. These activities would require the purchase of local goods and services, which would cultivate business activity with local merchants. Additionally, construction related jobs could provide opportunities for unemployed laborers. The proposed project would likely generate the development of new businesses, particularly surrounding the proposed interchange locations. These new businesses would generate additional tax revenues, as well as increased employment opportunities, providing long-term benefits to the local economy. Construction of the proposed project would remove land and improvements from the local tax base. However, these losses would be short-term, as anticipated new residential and commercial development would likely overtake these impacts in the long term.

Long term, cumulative impacts would be associated with activities such as population growth, recruitment and construction of industrial and commercial facilities in the area and loss of farmland as an economic factor. These activities are already planned for, and in some cases, activity is already occurring in the areas around US 70 and Interstate 40 as cited earlier in this document. The project is complementary to these efforts and will facilitate (speed up) the efforts of local and regional officials. The new roadway would be complementary to future efforts to bring economic development to this area of Cookeville. The rate of development will be primarily related to the efforts of local and regional development activities.

Population Indirect and cumulative impacts related to population are anticipated for both Build Alternatives and the No-Build Alternative. If the No-Build Alternative is selected, the rate of development activities in western Cookeville is not anticipated to increase. In addition, the lack of adequate roadways in this area would require trucks hauling raw materials and finished products, and commuters, to rely on substandard or remotely located roadways to access business sites. If adequate transportation conditions are not available the Cookeville/Putnam County area would not be likely to attract and retain commercial and industrial activity. If new jobs are not created, the population will be required to travel longer distances or relocate to sustain a living. This could result in an inactive or negative trend in population patterns.

Terrestrial Habitat Indirect and cumulative impacts to terrestrial habitat are associated with the conversion of land use from forested and other types of natural habitat to rural agricultural and eventually to residential, commercial, industrial and infrastructure applications. These improvements have caused loss of habitat to wildlife inhabiting the area. The changes are primarily located within or near the corporate limits of Cookeville.

The new northern connector will cause loss of 104 or 126 acres of land, depending upon which alternative is selected for construction. Although the direct impacts seem to be minimal, development activities are anticipated to cause indirect impacts from additional loss of habitat adjacent to intersections with the new roadway. The area immediately surrounding the new highway is anticipated to cause indirect impacts to terrestrial habitat further displacing faunal species. Cookeville's population is predicted to continue increasing over the next two decades, and pressure for land required for develop new residential and business sites will accompany this trend. Additional loss of habitat will be cumulatively impacted by being pressured to move to outlying areas of Putnam County causing crowding of species. In addition to loss of habitat, indirect and cumulative impacts could include spreading of invasive and exotic plants through the development of agricultural lands. Indirect impacts would be associated with areas disturbed by construction activities within and adjacent to the project's right of way. Cumulative impacts would be associated with additional residential, commercial and industrial activities that might occur near the project corridor. These activities would be related to population increases, residential development activities, and efforts to recruit commercial and industrial business to the area just west of Cookeville. Local and regional officials should show sensitivity and consider plans to reseed disturbed areas with local, non-invasive plants to complement the efforts created by the project.

The highway project would be constructed in part to complement local and regional efforts to stimulate the area economy. As area populations continue to increase as predicted over the next two decades, and pressure for land required to develop new residential and commercial areas occurs in response to the population increases, future demands for land use changes will continue causing further loss of habitat. The loss of habitat will occur whether the No-Build Alternative or any one of the Build Alternatives is selected; however a Build Alternative would accelerate development activities and ultimately loss of terrestrial habitat. In addition to loss of habitat through conversion of land use, cumulative effects would also involve continued spreading of invasive and exotics through the development of agricultural lands.

Aquatic Habitat The project would have indirect and cumulative impacts associated with the conversion of land from undeveloped and agricultural applications to initially highway commercial, and ultimately residential, commercial and industrial usage. Although the project is anticipated to accelerate these changes, the impacts would occur if the No-Build is selected because Cookeville is already developing in areas adjacent to the project corridor and will continue to do so whether or not the highway is constructed. Indirect impacts in the area adjacent to project could result in loss of wetlands including fragmentation or division of wetlands, change of water quality or loss of water, creations of barriers to species and processes (including the riffle pool complex), increased sedimentation and shading. Cumulative impacts would include the incremental reduction of base flow of area streams as development occurs on undeveloped lands. The rate of development is dependent upon local efforts.

Local officials are aware of wetlands located within and near the project area, and should consider plans to avoid removal or alteration of these resources by restricting

development activities within these sensitive areas. Sensitivity to floodplains should also be monitored and coordinated with FEMA.

Threatened and Endangered Species Past actions involving roadway construction, residential and commercial developments have resulted in the removal of some preferred habitat or the degradation of areas of preferred habitat by threatened and endangered species of plants and animals. The extent of the combined effects of past and present actions upon these species of concern is not currently evident. Reasonably foreseeable future actions in relation to the project are expected to be limited and would be concentrated mainly upon proposed intersections and developments not associated with the project. These developments could result in additional loss of terrestrial and aquatic habitats that support threatened and endangered species. Continued land use changes are expected to continue whether or not the project is constructed. In activities adjacent to urban areas, measurable indirect and cumulative impacts are not anticipated, but they should be monitored in undeveloped areas. Local and regional development efforts should show sensitivity toward threatened and endangered species as development efforts continue to push beyond the existing boundaries between urban and rural areas. Consultation with TDEC, the USFWS and the Nature Preserves Commission would ensure that sensitive habitats could be avoided.

Air Quality and Noise Impacts Land use changes are anticipated along US 70 North and Interstate 40 if construction and implementation of the Northern Corridor occur. However, these changes would occur even if the No-Build Alternative is selected. Officials have indicated that development efforts are ongoing, and are reflective of past practices, which have been primarily contained within the urban service limits of Cookeville. The new highway would accelerate the changes, but it is difficult to predict the rate of change because it is dependent upon local and regional efforts to attract and retain commercial and industrial business. If the Northern Connector is implemented, and these developments become operational, additional traffic would use the new roadway and the connecting routes in the area for commuting, shopping, access to public services and recreational travel. The additional vehicles would generate additional air pollutants and traffic noise. The pollutants are not anticipated to alter the air quality attainment status of Putnam County, however local and regional development officials should include efforts to ensure air pollutant noise standards are not exceeded. In addition, local and regional efforts should be continued to ensure that noise levels do not provide short- or long-term impacts to area residents and businesses. Predicted future noise impacts will be mitigated where determined to be feasible and reasonable within the guidelines set forth by TDOT and FHWA. If the No-Build Alternative is selected, development activities and land use changes are ongoing in the area resulting in additional traffic along US 70N, Interstate 40 and area roadways.

Historic and Archaeological Resources Following the initial settlement efforts within the project area, the primary actions that affected historic and archaeological resources were associated with the construction of roadways, residential/commercial developments and agricultural clearing and grazing. These actions have occurred of extended periods of time prior to the 1800s through present day activities. It is not possible to quantify the

cumulative impacts attributed to the losses of historic and archaeological resources.

Indirect impacts could result from the development efforts along the project corridor, primarily at intersections and along US 70N. Land use changes resulting from the conversion of farm property to residential and commercial use could result in cumulative impacts associated with further loss of historic and archaeological resources. Indirect impacts could result from development along the areas immediately associated with the new connector including acquisition and demolition of historic structures and their associated lands, and/or removal of archaeologically significant sites (burial sites, religious or occupationally significant sites). Additional noise and visual impacts would also be likely from developments in proximity to the resources. Local and regional officials should show sensitivity when considering land use changes in respect to historic and cultural resources.

Indirect and Cumulative Benefits As noted, indirect and cumulative impacts in past, present and future contexts, have affected and will continue to impact environmental resources associated with the Northern Connector corridor. Some of these actions have or would result in loss of modification of the area's resources. However, notable benefits have been associated with the project.

Improved community and regional connectivity between businesses and residents could be realized. These improvements would contribute to the economic improvement efforts and quality of life improvement goals as set forth by local and regional officials. These efforts are being made to reduce poverty and unemployment rates, and to improve income. The Northern Connector project is considered by the City of Cookeville to be complementary to its plans to provide improved linkage in the western Cookeville and Putnam County area to reinforce efforts to sustain economic vitality. The Northern Connector roadway would provide support in alleviating anticipated traffic pressures associated with ongoing development activities from existing roadways in the area.

Based upon this information, the cumulative benefits of the project in relation to past, present and future actions in the area include:

1. Continued economic vitality resulting from improved linkage between residents and jobs.
2. Improved recreational opportunities provided by better connection to recreational areas in the region.
3. Preservation of natural and cultural resources through controlled development efforts.
4. Improved travel and safety conditions as population increases in the next two decades.

Chapter IV – Interagency Review

On January 23, 2003, a description of the proposed project and a project data summary sheet were sent to the various Federal, State and local agencies and officials. These agencies and officials were requested to review the materials provided them and to submit comments outlining any concerns they may have concerning any effects the proposed action may have upon programs being planned or executed by their organization. The purpose of the solicitation of comments concerning the proposed actions was to address areas of specific concern the agencies may have during the development of the environmental and location studies. In this Chapter, Section A lists the agencies and organizations that received this information and indicates if a response was provided, Section B provides a summary and disposition of these comments, and Section C lists all Cooperating Agencies.

A. Agencies and Organizations

Federal Agencies	Response
Tennessee Valley Authority Environmental Policy and Planning	X
U.S. Army Corps of Engineers, Nashville District, Regulatory Branch (CELRN-OP-F)	X
U.S. Department of Agriculture Natural Resources Conservation Service	X
Appalachian Regional Commission	X
Department of Housing and Urban Development	
U.S. Department of the Interior National Park Service Planning and Compliance Division	
U.S. Department of the Interior U.S. Geological Survey Office of Environmental Affairs	
U.S. Department of the Interior U.S. Geological Survey Water Resources Division	
U.S. Department of the Interior Office of Surface Mining	

U.S. Department of the Interior U.S. Fish and Wildlife Service	X
Department of Commerce National Oceanic and Atmospheric Administration	
U.S. Department of the Interior Great Smoky Mountains National Park	
Federal Energy Regulatory Commission Office of Energy Projects Division of Environmental and Engineering Review	
Federal Railroad Administration Office of Economic Analysis (RRP-32)	
Environmental Protection Agency Environmental Assessment Office EIS Review Section	

State Agencies	**Response**
Tennessee Department of Environment and Conservation	
Tennessee State Planning Office Upper Cumberland Section	X
Department of Economic and Community Development TDECD NEPA Contact	X
Tennessee Department of Environment and Conservation Tennessee Division of Natural Heritage	X
Tennessee Department of Environment and Conservation Division of Water Pollution Control	X
Tennessee Department of Environment and Conservation Division of Water Supply	
Tennessee Department of Environment and Conservation Division of Ground Water Protection	X
TN Department of Environment and Conservation	

Division of Solid/Hazardous Waste Management	X
TN Department of Environment and Conservation Division of Air Pollution Control	X
Tennessee Wildlife Resources Agency	
Tennessee Historical Commission Deputy State Historic Preservation Officer	X
Tennessee Department of Agriculture	
Tennessee Department of Education	

Indian Tribes	**Response**
Eastern Band of Cherokee Indians Qualla Boundary	
Cherokee Nation of Oklahoma	
Chickasaw Nation	
Choctaw Nation of Oklahoma	
Muscogee (Creek) Nation	
Seminole Nation of Oklahoma	
United Keetoowah Band of Cherokee	
Eastern Shawnee Tribe of Oklahoma	

Other Organizations	**Response**
Tennessee Trails Association	
Sierra Club	
Tennessee State Chapter of the Sierra Club	
The Nature Conservancy	
Tennessee Conservation League	

World Wildlife Fund

Tennessee Environmental Council

Local Agencies	**Response**
Putnam County Historian	
Putnam County Executive	
Upper Cumberland Development District	
Cookeville Planning and Codes	X
Cookeville Public Works and Engineering Department	

B. Summary and Disposition of Comments

U.S. Department of the Army (Army Corps of Engineers) – Project could impact several area streams that are considered Waters of the US, as well as associated wetlands, that fall under their regulatory control.

> Disposition – TDOT will acquire all required permits, including a Section 404 Permit, prior to any construction activities.

Appalachian Regional Commission – project would not have any adverse effect on the Appalachian Development Highway System.

> Disposition – None required.

Tennessee State Planning Office – Putnam County Regional Planning Commission supports Alternative A due to fewer impacts to properties, lesser amount of required right-of-way and construction materials.

> Disposition – None required.

TDEC Division of Water Pollution Control – Agency was delegated authority from the U.S. Environmental Protection Agency to administer certain portions of the Clean Water Act. The Act requires the acquisition of permits for activities involving area streams.

> Disposition – TDOT will acquire all required permits, including storm water discharge permits, prior to any construction activities.

TDEC Division of Solid Waste Management – concerns include proper disposal of solid/hazardous wastes generated by the project. States project could have a positive effect on the transportation of waste materials in the area.

Disposition – None required.

U.S. Fish and Wildlife Service – three listed or proposed endangered or threatened species may occur in the project area. Request a copy of biological assessment for review and concurrence in the event project "may effect" listed or proposed species.

Disposition – Potential impacts to federally protected species will be analyzed, and further coordination, if required, will be completed.

Natural Resource Conservation Service – project will result in the conversion of Prime Farmland as defined in the Farmland Protection Policy Act. Farmland Conversion Impact Rating Form AD-1006 provided for completion.

Disposition – Form AD-1006 Farmland Conversion Impact Rating has been completed and is provided in Appendix A, of this document. See Chapter 3, Section B, for additional information.

City of Cookeville Department of Planning – Supports Alternative A, and recommends construction occur in two distinct phases beginning with the completion of the Mine Lick Creek Road/I-40 interchange, and ending with the completion of the proposed Northern Connector Route.

Disposition – None required.

Tennessee Valley Authority (TVA) – no TVA approvals or other involvement required. If project involves the relocation of any TVA transmission lines, notify TVA.

Disposition – None required.

Tennessee Department of Economic and Community Development (TDECD) – supports proposed Alternative A due to the better access and lesser impacts to large tracts of property.

Disposition – None required.

TDEC Historical Commission – project may affect properties that are eligible for listing to the National Register of Historic Places.

Disposition – Impacts to properties listed or eligible for listing to the National Register of Historic Places have been evaluated and are included in Chapter 3, Sections P and Q, of this document.

TDEC Division of Natural Heritage – concerns include impacts to protected species, streams.

Disposition – impacts to protected species have been evaluated and included in Chapter 3, Section N, of this document.

TDEC Division of Ground Water Protection – project is likely to impact subsurface sewage disposal (SSD) systems located along the length of the proposed facility.

Disposition – impacts to project area utilities would be addressed in the final engineering phase.

TDEC Air Pollution Control Division – concerns include emissions of fugitive dust, exhaust from construction equipment, assurance of removal of asbestos from structures requiring demolition, compliance with regulations controlling the practice of open burning.

Disposition – None required.

C. Cooperating Agencies

A preliminary Environmental Assessment has been sent to TVA and the Army Corps of Engineers (ACOE) for their review and comment.

TVA – Chapter 1, Purpose and Need, Local and Regional Planning, page 9, last paragraph, last sentence. Change the last sentence to read, "If a Build Alternative is selected and the project is constructed, the new bypass would facilitate future traffic flow in this area.

Disposition – The statement has been included on what is now page 11.

Chapter III.N. Threatened and Endangered Species, page 39, last paragraph, last sentence. It is noted that Section 7 consultation requirements have been satisfied (page 40, third paragraph). Therefore we suggest that the first sentence be modified. One suggested rewording: "Because bat netting was not performed along stream corridors that constitute potential foraging habitat, the presence of Indiana and gray bats was not confirmed in the area. Assuming presence…"

Disposition – The suggested wording was added verbatim and is not located on page 42.

USACOE – Summary (page 2): At Item 1, under "Permits Required for the Proposed Project," delete the phrase "for the construction of Alternative B."

Disposition – The phrase has been deleted.