

ENVIRONMENTAL ASSESSMENT

INTERSTATE 40 INTERCHANGE at STATE ROUTE 196 (HICKORY WITHE ROAD), Fayette County, Tennessee

Submitted Pursuant to the
National Environmental Policy Act of 1969
42 U.S.C. 4332(2)

Lead Agencies:

U.S. Department of Transportation
Federal Highway Administration

Tennessee Department of Transportation, Environmental Division

**Interstate 40 Interchange at State Route 196 (Hickory Withe Road),
Fayette County, Tennessee**

ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to the National Environmental Policy Act of 1969
42 U.S.C. 4332 (2)(c)

by

U.S. Department of Transportation, Federal Highway Administration and
Tennessee Department of Transportation, Environmental Division

1/25/10
Date


Federal Highway Administration

For additional information concerning this document, contact:

Mr. Gary Fottrell
Environmental Program Engineer
Federal Highway Administration
Tennessee Division Office
404 BNA Drive, Suite 508
Nashville, TN 37217
(615) 781-5770

Mr. Jim Ozment
Transportation Manager 2
Environmental Division
Tennessee Department of
Transportation
505 Deaderick Street, Suite 900
Nashville, Tennessee 37243
(615) 741-5373

ENVIRONMENTAL ASSESSMENT SUMMARY

General Project Description

The Tennessee Department of Transportation (TDOT) proposes to construct a new interchange where State Route (SR) 196 (Hickory Withe Road) crosses over Interstate 40 (I-40) in Fayette County. The proposed project (henceforth referred to as the I-40 Interchange) is located in a rural area of Fayette County and would make this the first Fayette County access point along I-40 east of the Memphis Area. The adjacent interchange to the east is at SR-59 at a distance of approximately five miles. The adjacent interchange to the west is at New Airline Road in Shelby County at a distance of two miles.

The purpose of the I-40 Interchange project would be to provide improved interstate access in the area that is compatible with local and regional goals and objectives. This facility would improve efficiency and safety of the regional transportation system by providing more direct access to I-40 for citizens living in or around nearby communities, including Arlington and Gallaway, and by removing traffic from other routes currently used by local commuters to gain access to I-40 at the existing interchanges located to the west and east of the proposed interchange. This project would provide increased traffic capacity to help ensure that the local and regional transportation network will be capable of supporting the continued growth expected to occur in the area in the reasonably foreseeable future.

Summary of Alternatives

The No-Build Alternative and one Build Alternative were considered in this environmental assessment (EA).

No-Build Alternative

The No-Build Alternative would mean that no interchange would be provided at the location where SR-196 crosses over I-40. Access to properties within the project vicinity would continue to be provided by existing local roadways. It is likely that the continued urban growth anticipated in the project vicinity will result in increased traffic volumes that will likely result in a reduced level of service (LOS) and reduced safety on existing secondary roads currently used to provide access to I-40. The No-Build Alternative is used as a baseline comparison for the project Build Alternative.

Build Alternative

The proposed Build Alternative would include construction of a standard diamond interchange that permits future construction of loop ramps within all four quadrants. The cross section of SR-196 would be three lanes within the interchange having 12-foot traveling lanes, 12-foot continuous left-turn lane, and 10-foot shoulders. All interchange ramps would have 16-foot lanes and 6-foot shoulders. Orr Road, which currently intersects SR-196 immediately south of the interstate, would need to be relocated 960 feet south of its present location to allow for the construction of the ramp in the southwest quadrant of the proposed interchange. The realignment of Orr Road would be designed to meet minimum standards. Improvements would also be made on I-40 to accommodate the acceleration and deceleration lanes associated with the exit and entrance ramps.

Summary of Environmental Consequences

The No-Build Alternative

The portion of Fayette County surrounding the proposed I-40 Interchange location would continue to become more developed as anticipated growth occurs. Land use changes associated with this growth is expected to result in increased traffic demand. As the regional traffic volumes increase, the existing secondary roads currently used as routes to and from I-40 would likely experience reduced safety and decreased (LOS). The No-Build Alternative would result in declining traffic service for those who currently depend on those secondary routes. Traffic congestion would increase, which would adversely affect traffic circulation within the vicinity of the project area. As traffic volumes increase, crash rates would become worse resulting in increasing safety issues along the existing secondary routes.

Build Alternative

The Build Alternative would have both beneficial and adverse impacts. The primary benefits of the Build Alternative include:

- improved access to I-40;
- improved safety and traffic conditions in the local area and region;
- enhanced economic development opportunities within the project area;
- improved circulation among the cities and communities in the project area;
- improved regional accessibility to the project area;
- reduced travel times; and
- increased property values with new opportunities for economic development, especially for adjacent properties.

The primary direct adverse impacts of the Build Alternative would include:

- an increase in noise levels in some portions of the project area, especially for residences along existing SR-196 (Hickory Withe Road) between Gallaway and US-64;
- temporary construction impacts (fugitive dust, siltation, construction noise, traffic detours, etc.);
- impacts to surface waters and floodplains; and
- conversion of undeveloped areas to developed or maintained areas within the proposed interchange right-of-way (ROW) resulting in a minor loss of agricultural land, wildlife habitat, and open space.

In addition, the improved capacity and efficiency anticipated with implementation of the Build Alternative may make some of the land within the project area more desirable for development, including residential, retail/commercial, and industrial uses. This would result in indirect adverse impacts associated with future development of currently undeveloped areas along the adjacent highways, especially SR-196 (Hickory Withe Road). Any impacts associated with this project would also be cumulative to other past, present, and reasonably foreseeable projects or activities that have occurred, are occurring, or will occur in the project vicinity. Local planners may be able to control the location, amount, and types of developments that occur in the area by establishing and implementing land use plans and zoning restrictions that ensure that the new interchange does not promote developments or land uses that conflict with local plans,

goals, and objectives. The basic concepts discussed in the National Cooperative Highway Research Program (NCHRP) Report 466 “Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects” were used during the indirect impacts analyses.

Table S.1 provides summary information for the proposed I-40 Interchange Build Alternative. Chapter 3 of this document contains more details regarding the project’s affected environment and environmental consequences.

Table S.1. Summary of project data and resources present within the Interstate 40 Interchange study area in Fayette County, Tennessee.

Resource	Build Alternative
Total Size of Study Area (acres)*	160
Land Uses/Wildlife Habitat Present	
Forest (acres)	18
Old Field (acres)	10
Agriculture (acres)	75
Pasture	15
Developed/Disturbed (acres)	40
Open Water (acres)	3
Residential/Business/Non-Profit Displacements (number)	0
Farmland Conversion Impact Rating Score (out of 260 points possible)	159
Noise Receptors Impacted (number)	0
Aquatic Resources Present	
Streams Present/Impacted (number)	3
Stream Channel in Corridor (feet)	3,377
Number of Streams Channelized (number of feet modified)	1 (2,414)
Ponds Present (acres)	6
Wetlands (acres)	0
100-year Floodplain (acres)	36
Archaeological Sites Impacted (number)	0
Historic Sites Impacted (number)	0
Hazardous Materials Sites Impacted (number)	0
<p>* Unless otherwise noted in the specific categories above, the study area for the land use and natural resources reported in this table was 500-foot wide (including 250-foot on either side of the centerline of each ramp or roadway segment making up the proposed interchange under the Build Alternative). Because the actual ROW is narrower than 500 feet, the actual impacts to many of the resources in this table would be less. This data characterizes the worst case scenario for the impacts that would occur under the Build Alternative. This data can be extrapolated to the narrower ROW boundary in most cases. Exact impacts to the various resources in this table will be refined following development of more detailed design plans.</p> <p><i>Source: Parsons, 2009</i></p>	

Permits

The acquisition of permits would occur prior to initiating construction activities, pursuant to Section 69-3-108(a) of the Tennessee Water Quality Control Act of 1977 and other state and Federal laws and regulations. The following permits are likely to be required:

- Clean Water Act (CWA) Section 404 Permit – required for construction that involves the placement of dredge and fill material in waters of the U.S.. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. Section 404 Permits would be required by the U.S. Army Corps of Engineers (USACE) prior to construction.
- Aquatic Resource Alteration Permit (ARAP) – required for any alterations of state waters, including wetlands, that do not require a federal (Section 404) permit. ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; blueline streams; intermittent blueline streams on the U.S. Geological Survey (USGS) quadrangle map; and any stream that supports any form of aquatic life or is in the vicinity of a State-listed endangered species. ARAP permits are issued by the Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control.
- National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit – required for grubbing, clearing, grading or excavation of one or more acres of land. NPDES permits are issued by TDEC's Division of Water Pollution Control.
- Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP) – required by operators of construction sites in Tennessee.

In addition, the State of Tennessee may require water quality certification under Section 401 of the CWA. Section 401 certification ensures that activities requiring a Federal permit or license will not cause pollution in violation of state water quality standards.

SAFETEA-LU Statute of Limitations on Filing Claims

FHWA may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for the subject 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 Commitments

Social Commitments

Provision of bicycle or pedestrian accommodations will be determined during the remainder of the planning and final design phase of the project. TDOT will continue to work with local officials and citizens to determine what features can be included within the ROW of the new interchange, such as shoulders wide enough to accommodate pedestrians and bicyclists.

Natural Resources Commitments

During development of final design plans, TDOT will attempt to avoid or minimize stream impacts to the extent possible. This would include avoiding rechanneling streams where possible. However, there will be at least some unavoidable stream and pond impacts associated with this project. TDOT will coordinate with regulatory agencies to obtain the appropriate permits to fill or drain the ponds, as necessary. Floodplain impacts will be minimized to the extent possible. As part of the permit process, TDOT will work with the appropriate regulatory agencies to determine what mitigation measures are required based on the specific impacts determined using final design plans developed during the design phase of the project.

Several mitigation measures that will avoid or minimize short-term and long-term adverse impacts to natural resources in the area include:

- Streamside and in-stream construction work will occur during dry periods;
- Removal of vegetation near the streams will occur only as necessary to accomplish the proposed action. Where removal of vegetation is necessary, bank stabilization measures will be used. Stream bank restoration measures will include seeding with native species and the placing of rip-rap or other bank stabilization techniques, as outlined in TDEC's *Riparian Restoration and Streamside Erosion Control Handbook* (TDEC, 1998a); and
- Proper sediment control measures, such as silt fences, will be used as outlined in the Tennessee Erosion and Sediment Control Handbook (TDEC, 2001b) and *Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites* (Smoot et al., 1992).

The following measures will be used to the extent possible to help prevent the introduction and spread of invasive species:

- Native grasses, shrubs, and trees will be planted for beautification purposes or to prevent erosion, wherever needed. Native species will be consistent with local community types;
- Whenever possible, all disturbed soil will be seeded with temporary annual species to reduce the ability of exotics to become established. This will also act to reduce erosion potential during rain events; and
- Consideration will be given to the types and quality of plants and soils at borrow sites. Soil from borrow sites used as project area fill could contain viable plant parts or seeds and could increase the spread of invasive species to new locations.

Cultural Resources Commitments

TDOT, in coordination with the State Historic Preservation Officer (SHPO), commits to making the requisite investigations and mitigation necessary to avoid, minimize, or mitigate potential impacts to any cultural resources sites that may be discovered in the project area during construction.

If any previously unknown archaeological resources are uncovered during construction of the proposed project, all construction activities will be halted in the immediate area until the area is cleared for further activities. TDOT will continue to coordinate with the SHPO should any new cultural resources be discovered.

Visual Commitments

Short-term visual impacts are expected with any construction project due to construction equipment, grading, and storage of materials on site. Most visual impacts due to construction typically end once a project is complete. One of the goals of most modern construction projects, including TDOT projects, is typically to provide structures or facilities that fit into the surrounding setting or context as well as possible so the visual affect is an improvement over existing conditions. If not perceived as an improvement, the goal will be to maintain the general visual quality in an area to the extent practical.

Mitigation measures for visual impacts will include, but will not be limited to:

- Consideration of post-project aesthetic appeal during the project's functional design, surveying and clearing; and
- Preparation of areas within the ROW to permit successful revegetation programs that accommodate, preserve and capitalize on mature and semi-mature stands of vegetation. Where feasible native vegetation will be used during revegetation efforts. This may be accomplished either naturally or through planned seeding.

TDOT will continue to work closely with the local officials and residents to obtain and develop ideas for designing and constructing a new interchange that fits the context of the area and with any future plans for the area.

Construction Commitments

In order to minimize potential detrimental effects from noise, siltation, soil erosion, or possible pollution of area watercourses, the construction contractors will be required to comply with the special provisions of *Standard Specifications for Road and Bridge Construction* (TDOT, 2006) and the *Best Management Practices for Erosion and Sediment Control* (FHWA, 1995). These provisions implement the requirements of the FHWA's Federal-Aid Policy Guide (Subchapter G part 650b).

Contractors will be required to conduct and schedule operations according to these provisions. For example, the contractor will be bound by the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic will be routed during construction in a manner that has the least noise impact practicable upon residential and noise sensitive areas. In addition, coordination with affected utility companies will minimize disruption to utility

services. Furthermore, TDOT will coordinate with local governments during the construction phase to minimize disruption to communities accepting detoured traffic.

Any action involving open burning will be in accordance with Chapter 1200-3-4 ("Open Burning") of the Tennessee Air Pollution Control Regulations. Any action resulting in fugitive dust will be in accordance with Chapter 1200 3 8 ("Fugitive Dust"). The general contractor and all related subcontractors associated with the project will be required to have a valid operation permit from the Tennessee Air Pollution Control Division or to obtain an exception from the regulations through board action.

Solid waste generated by construction activities will be disposed of in accordance with all state rules and regulations concerning solid waste management. Where possible, land debris will be disposed at a registered sanitary landfill site. If the use of a landfill is not possible, the contractor will dispose of the solid waste in a manner that is compliant with appropriate TDEC and/or EPA regulations.

**Interstate 40 Interchange
At State Route 196 (Hickory Withe Road),
Fayette County, Tennessee**

ENVIRONMENTAL ASSESSMENT

Table of Contents

ENVIRONMENTAL ASSESSMENT SUMMARY	S-1
GENERAL PROJECT DESCRIPTION	S-1
SUMMARY OF ALTERNATIVES	S-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES.....	S-2
PERMITS	S-5
SAFETEA-LU STATUTE OF LIMITATIONS ON FILING CLAIMS.....	S-5
ENVIRONMENTAL COMMITMENTS.....	S-6
CHAPTER 1 - PURPOSE AND NEED	1
1.1 PROJECT STATUS	1
1.2 PURPOSE OF PROJECT	3
1.3 NEED FOR PROJECT	3
CHAPTER 2 - ALTERNATIVES.....	11
2.1 THE NO-BUILD ALTERNATIVE.....	11
2.2 THE BUILD ALTERNATIVE	11
2.3 ALTERNATIVES PREVIOUSLY CONSIDERED BUT ELIMINATED.....	14
CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES.....	15
3.1 INTRODUCTION.....	15

3.2	SOCIAL/COMMUNITY AND ECONOMIC RESOURCES (HUMAN RESOURCES) AFFECTED ENVIRONMENT	16
3.3	ECOLOGICAL.....	36
3.4	CULTURAL RESOURCES	53
3.5	AIR QUALITY AFFECTED ENVIRONMENT	57
3.6	NOISE	68
3.7	HAZARDOUS WASTE SITES	76
3.8	ENERGY	77
3.9	SECTION 4(F) PROPERTIES.....	78
3.10	CONSTRUCTION IMPACTS	78
3.11	INDIRECT AND CUMULATIVE IMPACTS ANALYSIS	80
3.12	SUMMARY OF ENVIRONMENTAL CONSEQUENCES	89
3.13	ENVIRONMENTAL PERMITS	91
CHAPTER 4 - PUBLIC INVOLVEMENT		92
4.1	INITIAL COORDINATION WITH FEDERAL, STATE, AND LOCAL AGENCIES.....	92
4.2	SUMMARY AND DISPOSITION OF COMMENTS RECEIVED FROM THE INITIAL COORDINATION.....	95
4.3	PUBLIC INVOLVEMENT MEETINGS	97
APPENDIX A - INITIAL COORDINATION LETTERS.....		A-1
APPENDIX B - CULTURAL RESOURCES COORDINATION EFFORTS AND COPIES OF LETTERS		B-1

List of Tables

Table S.1.	Summary of project data and resources present within the Interstate 40 Interchange study area in Fayette County, Tennessee.	S-4
Table 1.1.	Traffic volume projections for the I-40 Interchange project area in Fayette County, Tennessee.	6
Table 1.2.	Levels of Service for the Proposed I-40 Interchange Ramp Intersections. ...	8
Table 3.1.	Land Use/Land Cover Types within the I-40 Interchange Project Area in Fayette County, Tennessee, 2008.	18
Table 3.2.	Minority and Low-Income Populations within the I-40 Interchange Project Area in Fayette County, Tennessee.	25
Table 3.3.	Top Ten Manufacturers in Fayette County, Tennessee, 2007.	31
Table 3.4.	Retail Sales Trends within the I-40 Interchange Project Area in Fayette County, Tennessee, 2001-2006 (\$million).	32
Table 3.5.	Real Property Appraised Values within Fayette County, 2003-2007 (\$Million)¹	32
Table 3.6.	Prime and unique farmland taken by the I-40 Interchange Build Alternative in Fayette County, Tennessee.	35
Table 3.7.	Streams located within the 500-foot Study Corridor for the I-40 Interchange Build Alternative in Fayette County, Tennessee.	38
Table 3.8.	State-listed species known to occur in Fayette County, Tennessee.	46
Table 3.9.	Total habitat acreages potentially affected by the I-40 Interchange in Fayette County, Tennessee.	49
Table 3.10.	Summary of National Primary Ambient Air Quality Standards.	59
Table 3.11.	Build Alternative Design Year 2030 Sound Levels (dBA) – Undeveloped Areas in Fayette County, Tennessee near the proposed I-40 Interchange.	70
Table 3.12.	Noise Abatement Criteria in 23 CFR 772.	71
Table 3.13.	TDOT Criteria to Define Noise Increase.	71
Table 3.14.	Analysis Area by Resource Category Considered in the Cumulative Impacts Analyses for the I-40 Interchange Project.	82
Table 3.15.	Summary data for the I-40 Interchange project in Fayette County, Tennessee.	90

Table 4.1.	List of agencies, organizations, or community representatives that were sent an Initial Coordination package for the I-40 Interchange project in Fayette County, Tennessee.....	93
-------------------	--	-----------

List of Figures

Figure 1-1.	Project Vicinity Map for the I-40 Interchange at SR-196 Project in Fayette County, Tennessee.....	2
Figure 1-2.	Graphical Depiction of the LOS used to describe Roadway Capacity.	7
Figure 2-1.	General Layout of the proposed Build Alternative for the Interstate 40 Interchange at State Route 196 in Fayette County, Tennessee	12
Figure 2-2.	Layout of the proposed Build Alternative for the Interstate 40 Interchange at State Route 196 in Fayette County, Tennessee	13
Figure 3-1.	City and County Growth Plan Map for Fayette County, Tennessee (January 2008).	17
Figure 3-2.	Land Use/Land Cover within I-40 Interchange Project Area in Fayette, County, Tennessee.....	19
Figure 3-3.	Map of the Census Blocks within the I-40 Interchange Project Area in Fayette, County, Tennessee.....	26
Figure 3-4 .	Streams and Waterbodies within the I-40 Interchange Study Area in Fayette County, Tennessee.....	39
Figure 3-5.	U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 1999-2050*	62
Figure 3-6.	Design Year 2030 Noise Contours for the I-40 Interchange Build Alternative.....	73

CHAPTER 1 - PURPOSE AND NEED

1.1 Project Status

1.1.1 Project Description and Setting

The Tennessee Department of Transportation (TDOT) proposes to construct a new interchange where State Route (SR) 196 (Hickory Withe Road) crosses over Interstate 40 (I-40) in Fayette County, Tennessee. An Environmental Assessment (EA) is being prepared for this project.

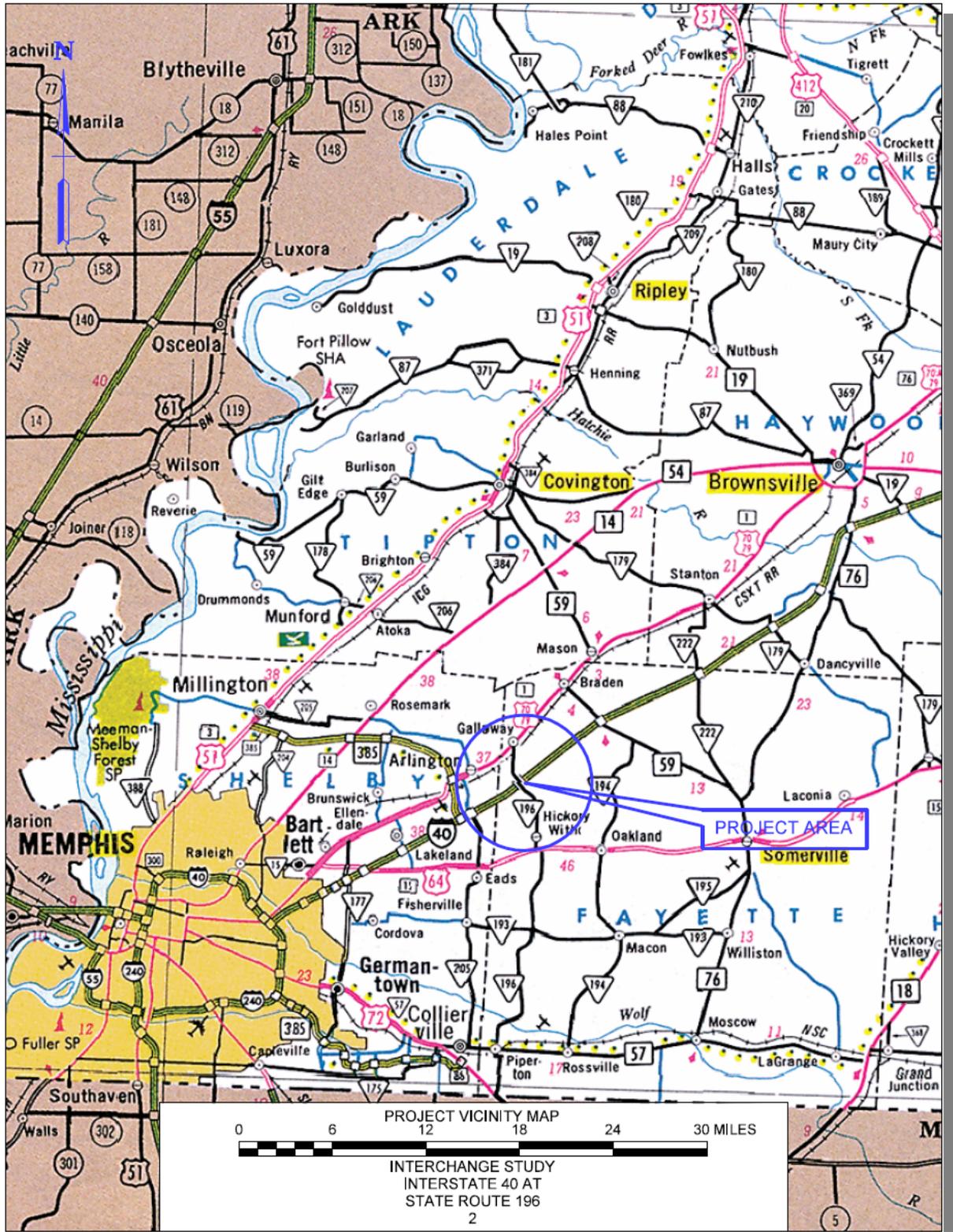
The proposed project is located in a rural area of Fayette County where SR-196 currently crosses over I-40. Construction of this project would make this the first Fayette County access point east of the Memphis Area. The adjacent interchange to the east is at SR-59 at a distance of approximately five miles. The adjacent interchange to the west is at New Airline Road in Shelby County at a distance of two miles.

The closest urban development, the City of Arlington, is located 4.5 miles northwest of the proposed project. A small community, the City of Gallaway, is located 2.0 miles north of the proposed interchange location, and Gallaway has annexed the area north of I-40 at the proposed I-40/SR-196 Interchange. The provision of an interchange at this location would allow access to I-40 from areas along both U.S.-64 and SR-1/ U.S.-70/ U.S.-79. This interchange would provide direct interstate access to Gallaway and an additional route to Arlington and Somerville. Figure 1-1 shows the project vicinity in relation to Memphis and the surrounding communities.

The entire area surrounding the proposed interchange is contained within the Fayette County Planned Growth Area. SR-196 from Gallaway to Piperton is also located within the planning area of the Memphis-Shelby County Department of Regional Services, Memphis Urban Area Metropolitan Planning Organization (MPO). The proposed interchange project is consistent with the MPO's 2026 Long Range Transportation Plan (LRTP). In addition, the project was included in the FY 2008-2011 Transportation Improvement Program (TIP).



Figure 1-1. Project Vicinity Map for the I-40 Interchange at SR-196 Project in Fayette County, Tennessee.



1.1.2 Project History

This project has been undertaken in accordance with the Federal Highway Administration's (FHWA) policy for granting new or modified interstate access. An Interchange Justification Study (IJS) was conducted for this project and received operational approval from the FHWA on January 4, 2005. The IJS is a structured report on existing and anticipated traffic flow conditions that demonstrates that ramp merging and diverging associated with the proposed interchange will operate at acceptable levels of traffic service, that the proposed ramp junctions will not have any adverse effects on ramp operations at nearby interchanges, and that the ramp intersections on the crossroad may be adequately accommodated for the anticipated traffic demands.



1.2 Purpose of Project

The primary purpose of the proposed I-40/ SR-196 Interchange is to provide improved access to the area to address projected and planned development. This growth is anticipated as a result of the project area being identified in the Fayette County Growth Plan, as a "Fayette County Planned Growth Area."

1.3 Need for Project

1.3.1 Transportation Demand

The Fayette County Growth Plan was adopted in August 2003. The entire area surrounding the proposed interchange is contained within the Fayette County Planned Growth Area. SR-196 from Gallaway to Piperton is also located within the planning area of the Memphis MPO. This indicates that continued development is anticipated in the project area that would potentially result in increased traffic volumes being generated that would put additional demand on existing roadways in the area.

1.3.2 Existing and Future Conditions

The existing SR-196 in the immediate project area consists of a rural two-lane, non-access controlled road with a pavement width of 22 feet and approximately 60 feet of ROW.

Local officials are anticipating residential growth along the SR-1/ US-70/ US-79 highway corridor through Gallaway and towards the east as the Memphis metropolitan area continues to grow.

Commuters from this area primarily use I-40 to travel to jobs in urban and suburban Memphis areas. To do this, many of them travel through the City of Arlington. Commuters from areas near the east side of Arlington that are south of the CSX Railroad (CSXRR) tracks use Forrest Street to Walker Road, Polk Road, and Douglass Road to travel through eastern Arlington. These are all two-lane collector roads. Douglass Road provides access to Airline Road, a four-lane undivided road that leads through the school zone for Arlington High School on its way to an interchange with I-40. Commuters in the Gallaway areas north of the CSXRR use SR-1/ US-70/ US-79, which is a two-lane highway that becomes four lanes through Arlington, but does not have left-turn lanes and does have many driveways. The route to I-40 from SR-1/ US-70/ US-79 is to take SR-385, which is a modern freeway connection.

The interchange proposed for I-40 at SR-196 would provide access for several areas to reach I-40 without traveling through Arlington. This interchange would provide opportunities for development in mostly rural Fayette County, particularly in the areas around and east of Gallaway. The City of Gallaway has recently annexed southward to I-40 at the proposed I-40/SR-196 Interchange.

The I-40/ SR-196 Interchange is proposed to be a full diamond-type interchange and would provide for all traffic movements. The proposed layout of the interchange would allow enough space for construction of loop ramps in all four quadrants of the interchange in the future. The recommended interchange design would meet or exceed all American Association of State Highway and Transportation Officials (AASHTO) criteria.

1.3.2.1 Social or Economic Conditions

The fact that the land adjacent to the project site is located within a Fayette County Planned Growth Area as detailed in the Fayette County Growth Plan implies that future residential and commercial development would occur in the immediate area, if the interchange is constructed or not. It is most likely that development would first occur north of I-40 due to the relative ease of extending utilities from Arlington and Gallaway, and Gallaway has recently annexed the area into its' city limits.

Highway-oriented commercial development, to include service stations, fast food restaurants, truck stops, and motels, would most likely be the initial types of development if the interchange is constructed. Local officials are anticipating residential development to increase and have discussed the possibility of a shopping mall in the immediate surrounding area, as well. More detailed information regarding social and economic conditions and potential impacts to these resources are contained in Chapter 3 of this EA.

1.3.2.2 Land Use

Land use in the project area is primarily rural with cotton fields and a sod farm immediately adjacent to the proposed interchange site. The area contains scattered residential and commercial developments along SR-196 to the north and south of I-40.

Construction of this interchange is not expected to require direct acquisition of any residences. Acquisition of some acreage now being used for the

agricultural operations would be necessary, and more detailed information regarding land use is contained in Chapter 3 of this EA.



1.3.2.3 Traffic Analyses

Traffic volume projections were conducted for the I-40 Interchange using a base year of 2010 and a design year of 2030 for the I-40 and SR-196 alignments. Table 1.1 contains a summary of traffic volume projections for the I-40 Interchange project area in Fayette County, Tennessee.

Table 1.1. Traffic volume projections for the I-40 Interchange project area in Fayette County, Tennessee.

Roadway	Base Year (2010)	Design Year (2030)			
	AADT	AADT	Percent Trucks in AADT	DHV	Percent Trucks in DHV
I-40 at SR-196	42,890	65,200	42%	5,312	28%
SR-196 at I-40	3,820	11,930	8%	1,312	5%

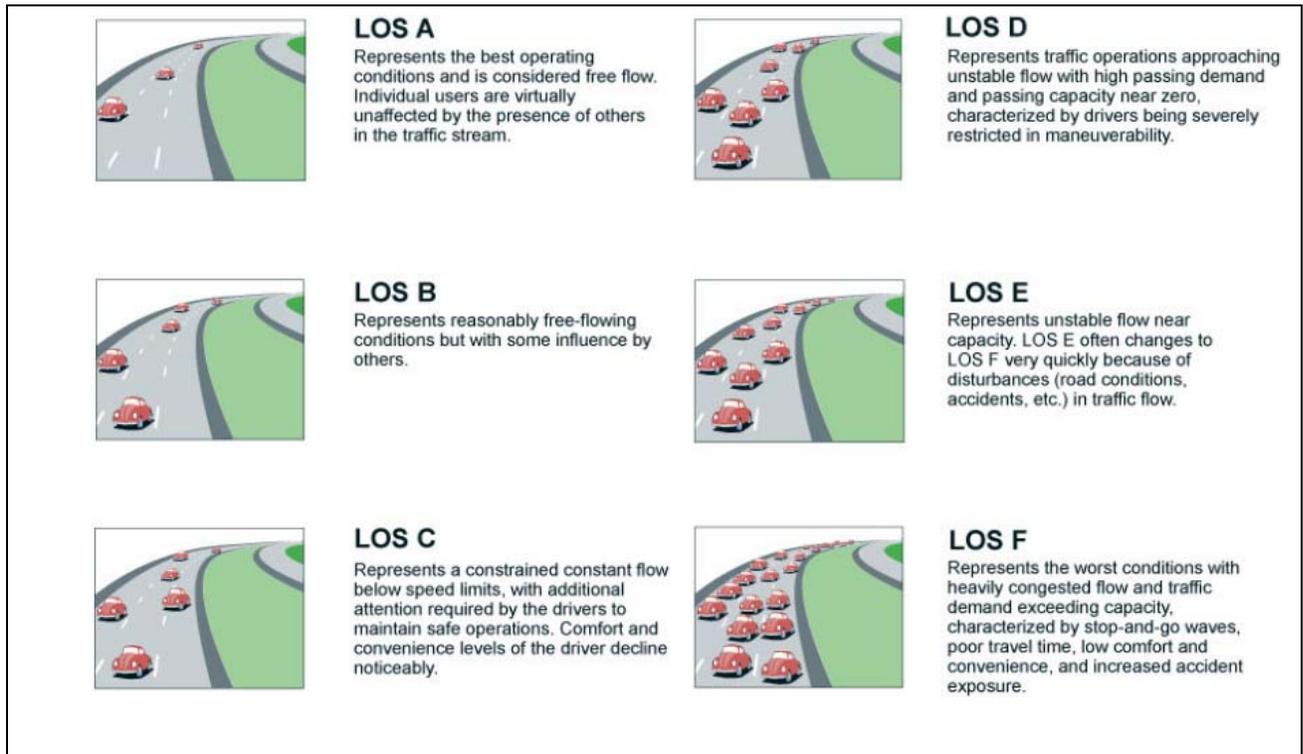
AADT = Annual Average Daily Traffic (number of vehicles)
 DHV = Design Hour Volume (i.e., number of vehicles projected during peak traffic times)
 Source: *TDOT Project Planning Division, 2007*

The anticipated character of future traffic flow was investigated using a process called "capacity analyses," which provides operational characteristics of a highway facility in terms of "Levels of Service" (LOS). The proficiency of roads is described by their LOS. The LOS criteria reflect the ability of roads to accommodate motor vehicle traffic and subsequent physical and psychological comfort levels of drivers. The LOS analysis incorporates several factors including traffic volumes, number of lanes, terrain, percent of no passing zones, directional split, heavy vehicles, and shoulder widths.

LOS is a qualitative measure that describes the character of traffic conditions related to speed and travel time, freedom to maneuver, traffic interruptions, etc. There are six levels ranging from "A" to "F" with "F" being the worst. Each level represents a range of operating conditions.

Figure 1-2 contains a graphical representation of the different LOS to show what each may look like in an everyday situation.

Figure 1-2. Graphical Depiction of the LOS used to describe Roadway Capacity.



Capacity analyses were conducted to determine the relative performance of the proposed interchange using an anticipated base year of 2010 and design year 2030. The Design Hour Volume (DHV) estimates were used in these analyses. The DHV is basically an estimate of the number of vehicles projected during the peak hour of traffic in both the morning (AM) and evening (PM).

Ramp operations were investigated. Ramp merging at both entrance ramps is expected to be able to operate at LOS D or better for peak period traffic through the year 2030. The results of the traffic analyses do not warrant the use of ramp metering at this location.

The intersections of the proposed ramps with SR-196 indicate a decline to LOS F in the anticipated design year, unless they are signalized. Table 1.2 shows the LOS findings for the intersection turns for unsignalized conditions. With traffic signals, operations of these intersections could be maintained at LOS D or better in the peak traffic periods at anticipated year 2030 volumes. This indicates that the future loop ramps provided in the interchange design would not be likely to be required until after that time.

The LOS for portions of I-40 and SR-196 outside the proposed interchange footprint were also analyzed. I-40 is expected to operate at LOS D or better through 2030. SR-196 is expected to decline to LOS E in the areas north and south of the interchange by the year 2030.

The findings of the analyses revealed that the LOS within the proposed interchange project area was no worse than LOS D (if signals are provided at the ramp intersections with SR-196) through the year 2030. This means that if constructed, the proposed interchange would be fully functional and would be capable of providing an important link in the regional transportation network and additional access point that would support the overall purpose and need described in this document.

Table 1.2. LOS for the Proposed I-40 Interchange Ramp Intersections.

Location Description	Movement Type	Build Year (2010) AM		Design Year (2030) AM		Build Year (2010) PM		Design Year (2030) PM	
		DHV* Volume	LOS	DHV Volume	LOS	DHV Volume	LOS	DHV Volume	LOS
SB** SR-196 to EB I-40 RAMP	Left Turn	60	A	180	A	40	A	120	A
NB SR-196 to WB I-40 RAMP	Left Turn	80	A	240	B	50	A	160	A
SB SR -196 to WB I-40 RAMP	Right Turn	120	-	380	-	80	-	250	-
EB I-40 RAMP to NB SR-196	Left Turn	100	B	300	F	150	B	450	F
WB I-40 RAMP to SB SR-196	Left Turn	20	A	60	F	30	A	90	F

Findings given are for turns under unsignalized conditions.
 * DHV = Design Hour Volume;
 ** SB = Southbound; NB = Northbound; EB = Eastbound; and WB = Westbound
 Source: TDOT, 2008; Parsons, 2008

1.3.3 Roadway Deficiencies

This project is primarily being developed to address access issues and anticipated urban growth in the region rather than being due to roadway deficiencies on existing routes. However, the anticipated growth in the project vicinity may potentially result in some of the secondary routes becoming deficient in the reasonably foreseeable future as traffic volumes continue to increase.

Within the project area, I-40 currently consists of a rural four-lane, controlled access facility with a grass median and approximately 300 feet of right-of-way (ROW). There are no foreseeable deficiencies of I-40 within the immediate project area at this time. There is currently no interchange at the SR-196 crossing of I-40, and the roadway is capable of handling existing traffic.

Depending on the amount of growth that occurs, some anticipated access and traffic issues may conceivably be solved by implementing Traffic Systems Management (TSM) projects on the existing secondary routes. However, it is anticipated that providing the proposed additional access point to I-40 would be more of a long-term, proactive solution and would likely supersede the need for some of the other potential future TSM-related projects that would likely be needed without the new interchange.

It is possible other improvement projects to the local roadway system would be necessary even if the proposed interchange is constructed, but the need for some of those improvements could potentially be delayed until some point beyond the reasonably foreseeable future.

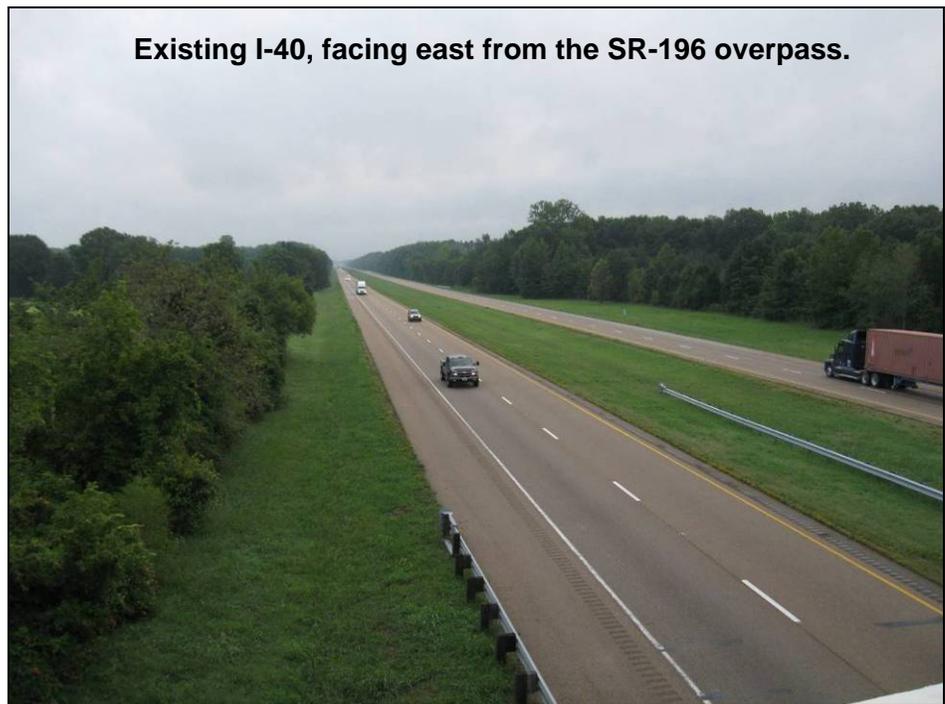
Improvements to existing roadways in the immediate interchange footprint would occur as part of the project, such as widening of SR-196 to accommodate turning lanes for the ramp intersections and relocation of Orr Road. Improvements would also be made on I-40 to accommodate the exit and entrance ramps and merge lanes. Additional improvements could become necessary as the area continues to grow and as the new interchange becomes more heavily utilized. For instance, SR-196 may need further improvements beyond the immediate interchange footprint at some point in the future, such as widening the roadway.

1.3.4 Safety

Without the proposed interchange, much of the anticipated development in Fayette County would still likely occur in the general vicinity, but access to the land would be via secondary, less direct routes. The issues surrounding the proposed project location relate more to access issues than to safety concerns. However, as the anticipated growth occurs in the area and more traffic is generated, there is a possibility that safety issues could be identified as a secondary need for this project.

1.3.5 System Linkage

Within the project area, I-40 currently consists of a rural four-lane, controlled access facility with a grass median and approximately 300 feet of ROW. SR-196 is currently a rural two-lane, non-access controlled road with a pavement width of 22 feet and approximately 60 feet of ROW.



The proposed project would include construction of a standard diamond interchange that permits future construction of loop ramps within all four quadrants. Orr Road, which currently intersects SR-196 immediately south of the interstate, would need to be relocated south of its present location to allow for the construction of the ramp in the southwest quadrant of the proposed interchange. The cross section on SR-196 will be three 12-foot lanes within the interchange: two 12-foot traveling lanes, a 12-foot continuous left-turn lane, and 10-foot shoulders. All interchange ramps would have 16-foot lanes and 6-foot shoulders. The realignment of Orr Road will be designed to meet minimum standards. More details regarding the proposed interchange layout are included in Chapter 2 of this EA.

1.3.6 Modal Relationships

The CSXRR crosses SR-196 and bisects the City of Gallaway approximately 2.0 miles north of the proposed interchange. It is not anticipated that measurable intermodal benefits would be derived from the proposed project, because there are no existing intermodal facilities in the City of Gallaway. Potential safety and traffic flow impacts of the railroad crossing would be considered in the EA.

The Memphis Area Transit Authority system does not extend this far to the east from the central metropolitan areas. The closest bus route is over ten miles away. The Long Range Transit Plan for the region shows a park-and-ride lot in Arlington, which is the closest TSM element in the LRTP for the region.

CHAPTER 2 - ALTERNATIVES

A No-Build Alternative and one Build Alternative are being studied as part of this I-40 Interchange EA.

2.1 The No-Build Alternative

The No-Build Alternative would mean that no interchange would be provided at the location where SR-196 crosses over I-40. Access to properties within the project vicinity would continue to be provided by existing local roadways. It is likely that the continued urban growth anticipated in the project vicinity will result in increased traffic volumes that will likely result in reduced LOS and reduced safety on existing secondary roads currently used to provide access to the interstate. The No-Build Alternative would not meet the purpose and need of this project.

Within the project area, I-40 currently consists of a rural four-lane, controlled access facility with a grass median and approximately 300 feet of ROW. There are no deficiencies of I-40 within the immediate project area at this time. SR-196 is a rural two-lane, non-access controlled road with a pavement width of 22 feet and approximately 60 feet of ROW. SR-196 is capable of handling existing traffic. There is currently no interchange at the SR-96 crossing of I-40.

Local officials are anticipating residential growth along the SR-1/ US-70/ US-79 highway corridor through Gallaway and towards the east as the Memphis metropolitan area continues to grow. Commuters from this area primarily use I-40 to travel to jobs in urban and suburban Memphis areas. To do this, many of them travel through the City of Arlington and surrounding areas on the secondary roads mentioned in Section 1.3.2 above. Under the No-Build conditions, these secondary roads will continue to be the main routes used to access I-40.

Analyses conducted for the No-Build Alternative take into account what, if any, consequences would occur in the project area if the I-40 Interchange were not constructed. In this EA, the No-Build Alternative serves as a baseline comparison for the proposed Build Alternative, which would have inherent adverse and beneficial consequences.

2.2 The Build Alternative

The Build Alternative being considered in this EA involves construction of a standard diamond interchange that permits future construction of loop ramps within all four quadrants. The cross section of SR-196 would be three lanes within the interchange having 12-foot traveling lanes, 12-foot continuous left-turn lane, and 10-foot shoulders. All interchange ramps would have 16-foot lanes and 6-foot shoulders. Orr Road, which currently intersects SR-196 immediately south of the interstate, would need to be relocated 960 feet south of its present location to allow for the construction of the ramp in the southwest quadrant of the proposed interchange. The realignment of Orr Road would be designed to meet minimum standards. Improvements would also be made on I-40 to accommodate the acceleration and deceleration lanes associated with the exit and entrance ramps. Figure 2-1 and Figure 2-2 show the proposed layout of the Build Alternative.

Figure 2-1. General Layout of the proposed Build Alternative for the Interstate 40 Interchange at State Route 196 in Fayette County, Tennessee

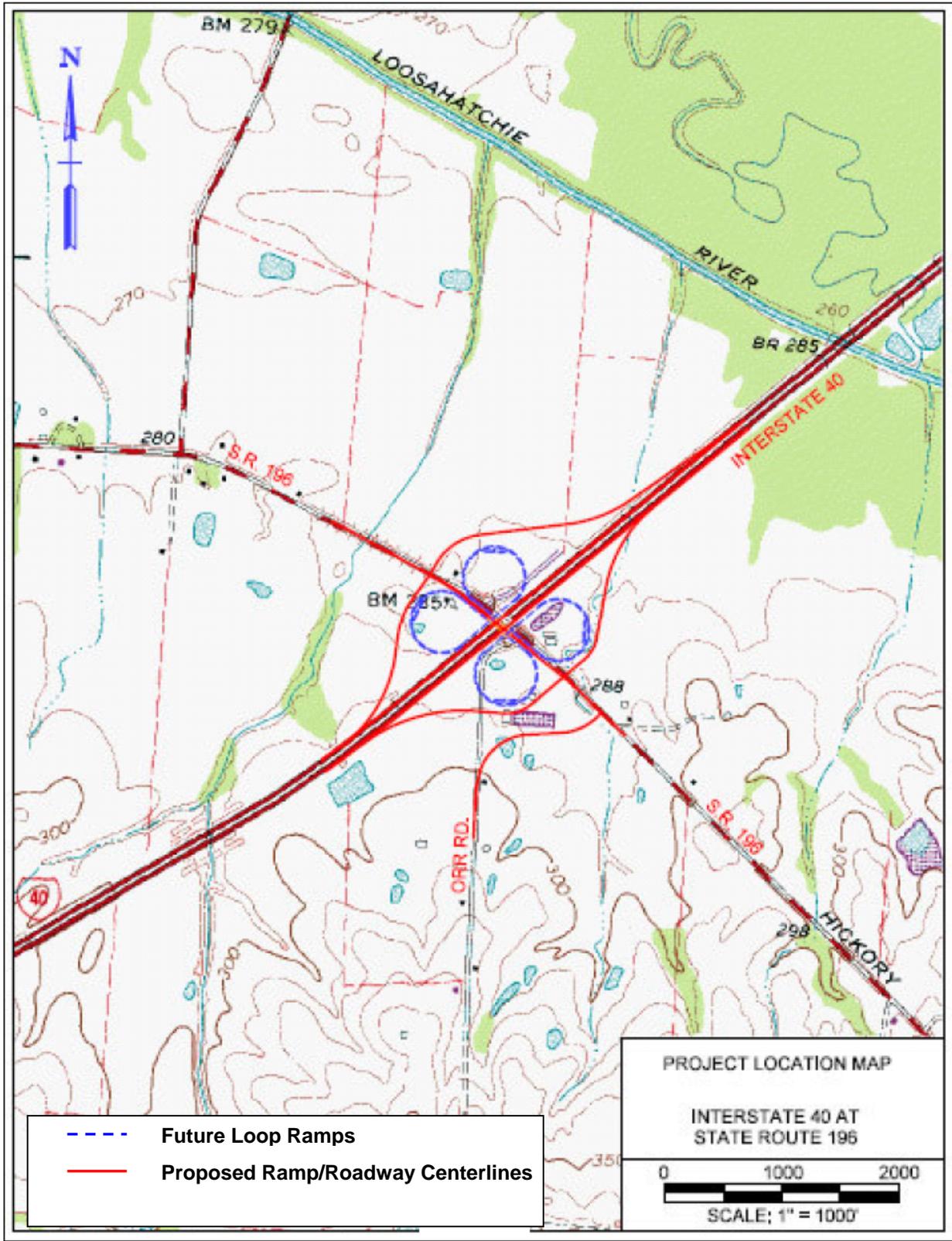
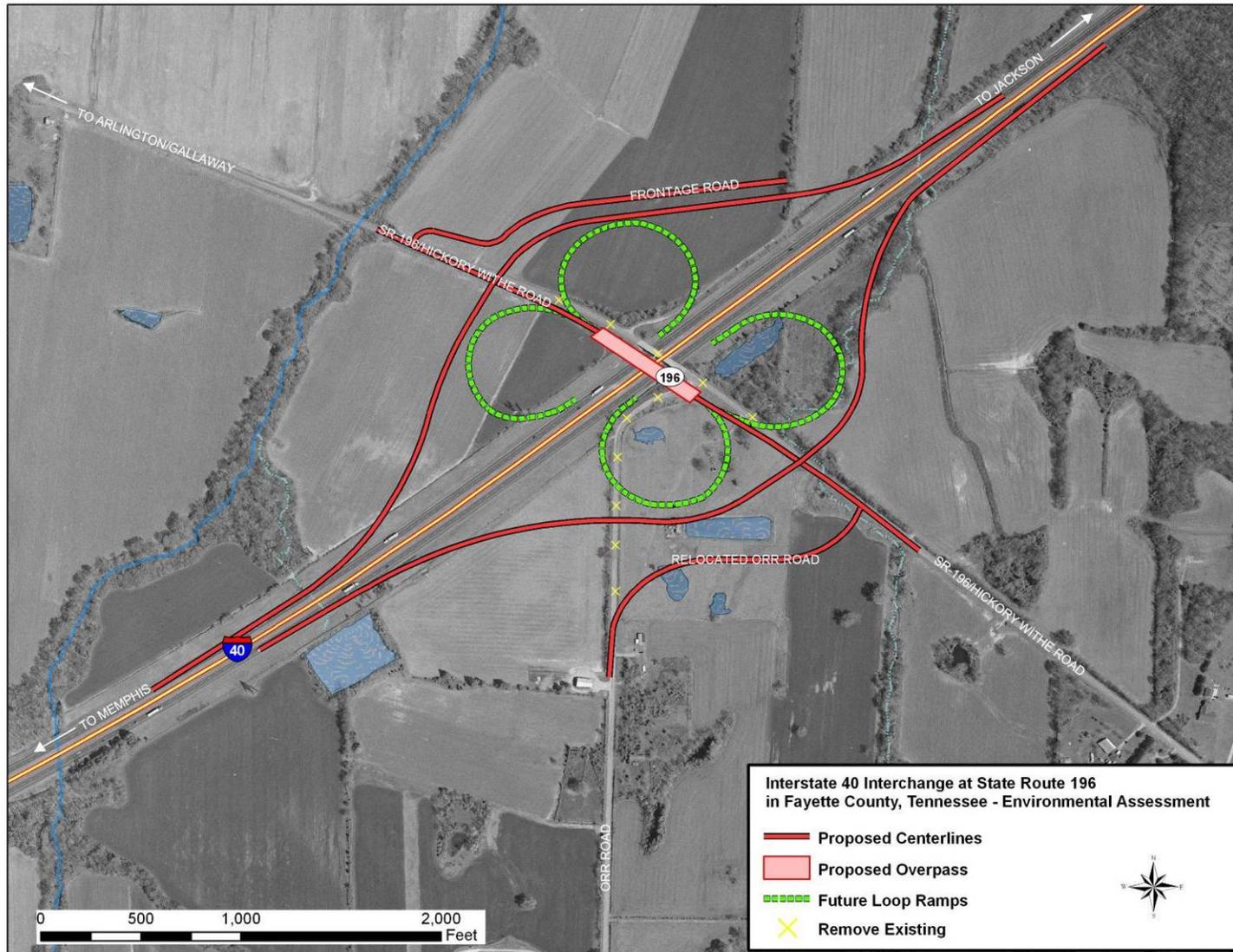


Figure 2-2. Layout of the proposed Build Alternative for the Interstate 40 Interchange at State Route 196 in Fayette County, Tennessee



2.3 Alternatives Previously Considered but Eliminated

A second potential build alternative was studied as part of the IJS for this project completed in December 2004. That alternative involved construction of a modified diamond interchange with a three-lane cross section, 12-foot traveling lanes, 12-foot continuous left-turn lane, and 10-foot shoulders. It would have included standard diamond ramps in the southwest and southeast quadrants with a loop ramp and a standard diamond ramp in the northeast quadrant. The loop ramp would have had a design speed of 30 MPH, and an acceleration lane would have provided vehicles adequate distance to reach interstate traveling speed before being required to merge. The loop ramp would have eliminated the heavy left-turn movement for vehicles traveling from northbound SR-196 to westbound I-40. All ramp lanes would have been 16 feet wide with 6-foot shoulders, and Orr Road would have been relocated to intersect SR-196 south of its present location.

The Build Alternative discussed in the previous section was selected to be carried forward in the EA because it is expected to provide a better long-term design due to allowing adequate space for loop ramps to be developed in all four quadrants of the interchange. This would allow the interchange to handle additional traffic volumes anticipated as the area continues to grow.

Other options, including TSM improvements, such as mass transit and HOV facilities, have been considered. However, none of those options would be expected to be capable of meeting the purpose and need of the project and would therefore not provide adequate access and facilities capable of handling the future projected traffic volumes resulting from urban growth anticipated in the area.

It is anticipated that providing the proposed additional access point to I-40 would be more of a long-term, proactive solution. Providing another access point to I-40 under the proposed Build Alternative would supersede the need for some other potential future TSM-related projects that would likely be needed in order to allow the existing secondary routes to continue to have enough capacity to allow commuters to gain access to I-40 as traffic volumes continue to increase.

The final selection of an alternative for this project will be made only after consideration of impacts discussed in this document and after all public comments have been received and considered following completion of the EA public review period. The public review period includes a Public Hearing for the EA where the public will be presented summary information regarding the impacts of each alternative and an opportunity to submit their comments in person.

CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter of the EA will describe the existing social/community, economic, cultural, and natural resources in the project vicinity (affected environment), followed by a discussion of the potential impacts (environmental consequences) this project may have on those resources. Following the discussion of environmental consequences, mitigation measures are discussed, where appropriate, to explain what efforts have been or would be taken to avoid, minimize, and/or mitigate for environmental consequences resulting from this project. Table 3.15 contains summary data for resources expected to be impacted by this project.

3.1.1 Environmental Consequences

An environmental consequence (hereafter referred to in this document as an impact) is defined as a noticeable change in a resource from the existing environmental baseline conditions caused by the proposed action. The discussion concentrates on aspects of the environment that could potentially be affected by construction and operation of the proposed project.

The analysis of impacts associated with each project alternative has been further divided into direct, indirect, and cumulative impacts. Direct impacts anticipated to occur with implementation of this project are discussed under each resource category discussed throughout Chapter 3. A direct impact is caused by the proposed action and occurs at the same time and place.

Discussions related to potential indirect and cumulative impacts are included in Section 3.11.

3.1.2 Avoidance, Minimization, and Mitigation of Project Impacts

After the potential impacts of the proposed project have been identified, a determination is made as to whether mitigation is appropriate or required. Mitigation measures will be planned and developed to protect or maintain the baseline conditions of the resources that are identified in the affected environment discussions in this chapter.

Because planning for the I-40 Interchange is being developed through the NEPA process, which involves interagency coordination and input provided by private citizens and local, state, and federal stakeholders, it is anticipated that all potential impacts to the social, cultural, and natural environment will be identified thoroughly and fully disclosed to the public and regulatory agencies. This NEPA study has been and will continue to be conducted in a manner that allows for all potential adverse impacts to be addressed in the planning process, so that proactive efforts can be made to avoid, minimize, or mitigate impacts during final design phases of the project.

The resources in the I-40 Interchange project area have been identified through intensive survey efforts, along with input from regulatory agencies, landowners, and the general public. Unavoidable adverse impacts to the environment associated with construction of the new interchange will be mitigated to the extent practical. Mitigation for project impacts will be determined through continued coordination with appropriate regulatory agencies.

Anticipated mitigation efforts are identified, where appropriate, under each of the individual resource categories discussed in this chapter of the EA. The mitigation discussion for each resource occurs after the discussion of the environmental impacts of the project alternatives. Final detailed mitigation plans and actions will be developed during the regulatory permit acquisition phase of the project that would occur after final design plans are approved, but prior to initiation of any construction activities.

3.2 Social/Community and Economic Resources (Human Resources) Affected Environment

3.2.1 Land Use and Infrastructure

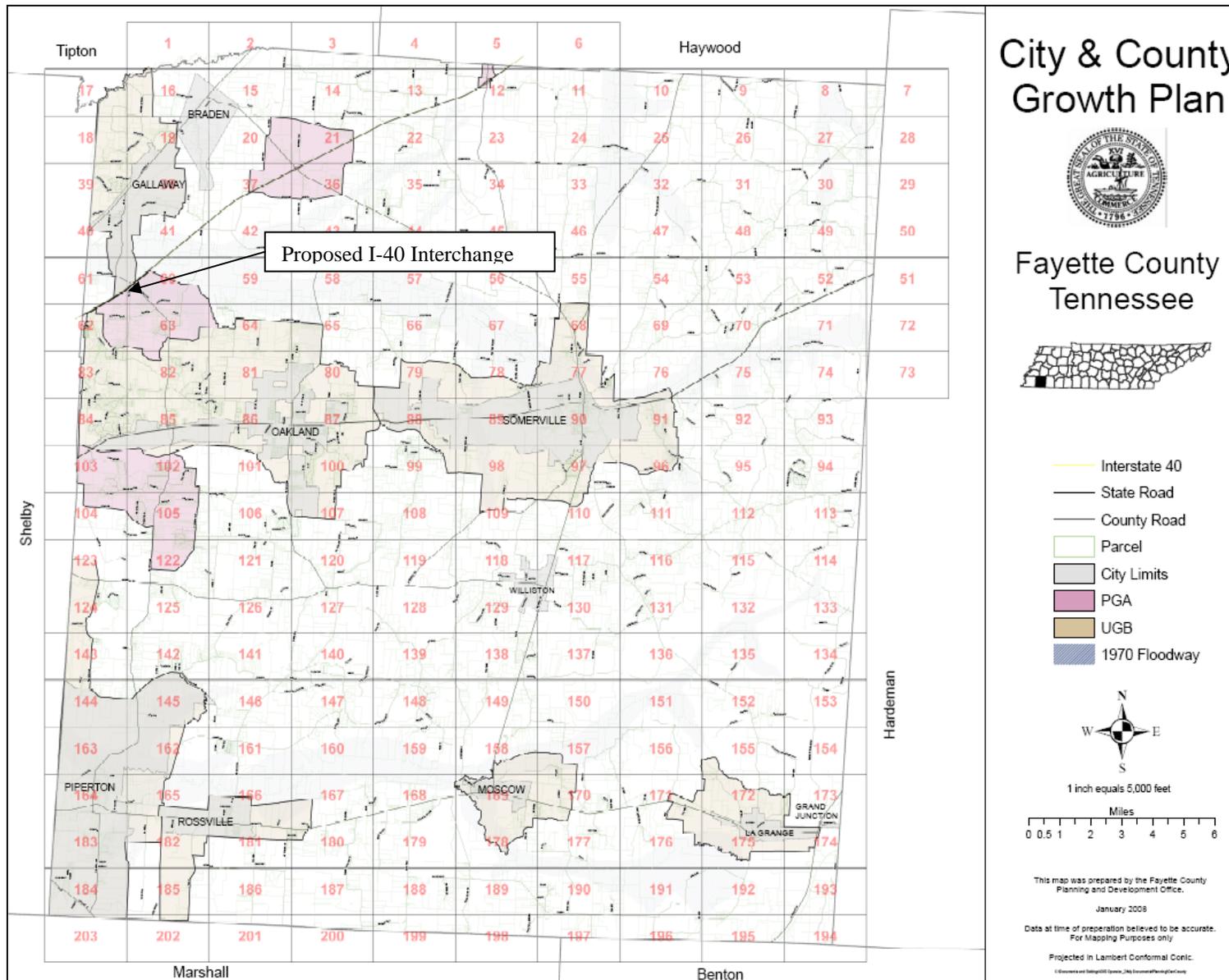
3.2.1.1 Land Use Plans and Policies

There are no known existing zoning restrictions for the land within the immediate I-40 Interchange project area. However the state growth policy law (Public Chapter 1101, Growth Management Law, 1998) mandates all city and county governments to designate an Urban Growth Boundary (UGB) to anticipate and plan for 20 years of growth and change within and around a municipality. Included among the purposes of this legislation are the encouragement of compact and contiguous development, and the establishment of acceptable and consistent levels of public services and community facilities in newly annexed or growth areas. Each growth policy plan identifies the following three distinct types of areas:

- “Urban Growth Boundaries” (UGB), or those areas that are contained within a municipality’s corporate limits, and adjoining unincorporated land where growth is expected to occur, and which can be provided infrastructure and other urban services by an adjacent municipality, and where annexation or new incorporations may occur;
- “Planned Growth Areas” (PGA), or reasonably compact areas outside incorporated municipalities where growth is expected to occur, and which are well suited for urban and suburban development; and
- “Rural Areas” (RA), or those areas which are to be preserved for agriculture, recreation, forest, wildlife, and uses other than high-density commercial or residential development.

The “City and County Growth Plan” (January 2008) contained in Figure 3-1 contains information regarding the “Urban Growth Boundaries” and “Planned Growth Areas” for Fayette County.

Figure 3-1. City and County Growth Plan Map for Fayette County, Tennessee (January 2008).



3.2.1.2 Existing Land Use

Land use within the I-40 Interchange project area consists primarily of rural land uses, with some scattered single lot residential developments north and south of the immediate project area. Much of the land within the project area consists of existing transportation ROW for the existing SR-196, I-40, and Orr Road. The areas surrounding the existing roadways are primarily used for row crops, sod farming, and horse pastures. Some scrub-shrub and forested areas occur along the small streams and tributaries in the project area. There are also several small ponds and borrow pits in the project area. There are no known recreational facilities or lands within the project area. Table 3.1 shows the acreage in each land use/land cover category for land within the 500-foot study area for the I-40 Interchange project. Figure 3-2 displays the layout of the current land use/land cover types within the project area.

The land use/land cover types were broken into five basic categories including:

- Forest - including all forest types;
- Agriculture - including, sod, cotton, and bean fields;
- Pasture - including pastures and hayfields;
- Old Field/Shrub-scrub - including all habitats containing a mixture of grassland and shrub-scrub;
- Open Water – including ponds and borrow pits; and
- Developed/Disturbed – including existing highways, maintained/mowed ROW areas, residential and business areas and associated mowed lawns, and heavily disturbed areas lacking vegetation.

Table 3.1. Land Use/Land Cover Types within the I-40 Interchange Project Area in Fayette County, Tennessee, 2008.

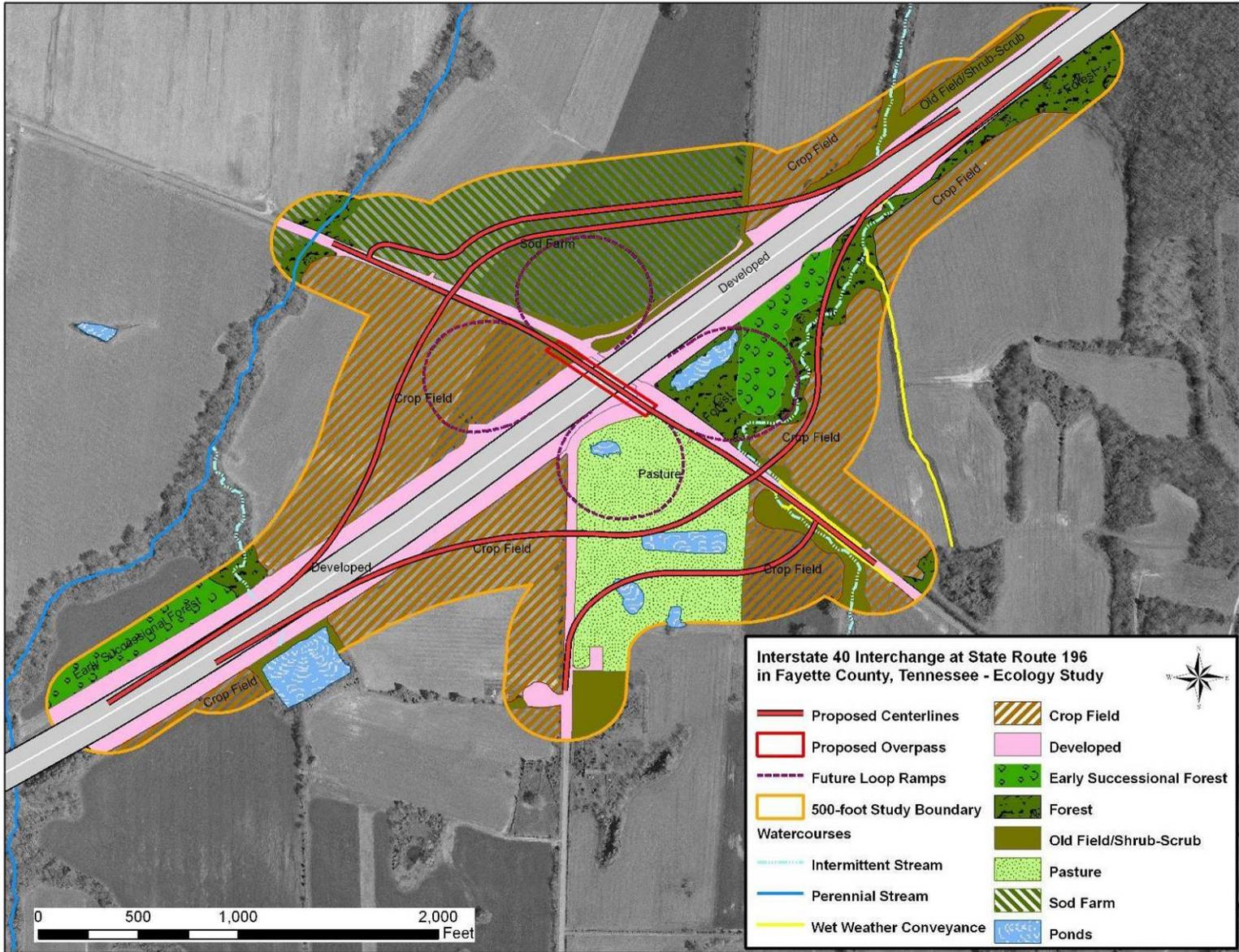
Alternative	Agriculture	Forest	Old Field	Pasture	Water	Developed/ Disturbed	Total
Build Alternative	75.3	17.5	9.6	14.9	3.0	40.1	160.4

Note: Habitat areas shown as acres.

Note: These acreage amounts were calculated based on lands within the 500-foot study corridor for the Build Alternative and are provided to show the basic land uses in the project area. They include all areas, including existing right-of-way (ROW). For example, existing ROW along the existing I-40, SR-196, and Orr Road is included in the habitat calculations, but would not be included in the ROW acquisition amounts shown elsewhere in environmental documents, such as the Environmental Assessment. Not all of the acreages shown in this table would actually be impacted by construction of this project. Only lands needed for actual construction or work zones would be cleared or disturbed.

Source: Parsons, 2008.

Figure 3-2. Land Use/Land Cover within I-40 Interchange Project Area in Fayette, County, Tennessee.



3.2.1.3 Highway and Roadway Network

The existing transportation facilities within the project vicinity include a network of federal, state, and county highways. This system of roadways provides a well-developed interconnection between the rural residential areas and surrounding urban areas, including Memphis. However, as the population rises in Fayette County, the existing network will need to be improved and/or added to in order to provide adequate facilities.

3.2.1.4 Land Use and Infrastructure Impacts

Potential Land Use and Infrastructure Impacts Associated with the No-Build Alternative

Under the No-Build Alternative, not providing the proposed I-40 Interchange would have several adverse long-term direct impacts. The anticipated growth and development in the project vicinity will result in increases in traffic volumes in the reasonably foreseeable future, especially on existing roadways used by commuters to access I-40. Some of those roadways include: SR-1 (U.S.-70/79) to the north; SR-15 (U.S.-64) to the south; Airline Road and SR-385 (Paul W. Barrett Parkway) to the west; and SR-59 to the east. The increased numbers of vehicles on those secondary routes will likely result in traffic congestion issues and decreased safety. The anticipated benefits the improved access to I-40 would provide would not be realized under the No-Build Alternative. Providing the proposed new interchange is expected to alleviate some of the facilitated traffic issues on the secondary routes by providing better, more direct access for many of the commuters currently traveling to and from the surrounding areas.

Although some land use changes would be expected to occur in the general project area, regardless of the new interchange being constructed, it is not expected that land use changes would occur as quickly in the immediate project area, if the interchange is not constructed. The PGA south of I-40 would likely be slower to develop, and the southern portion of the City of Gallaway along SR-196 would also be slower to develop. Therefore, not constructing the new interchange may result in slower economic growth in the City of Gallaway.

Potential Land Use and Infrastructure Impacts Associated with the Build Alternative

The proposed I-40 Interchange will play an important role in the transportation system by providing a more direct route for commuters from near the Arlington, Gallaway, and Hickory Withe areas. This will help reduce traffic on some of the secondary routes currently used to funnel those commuters to and from the Memphis area. The major highways currently serving the project area include I-40, SR-196 (Hickory Withe Road), U.S. 70/79, SR-385, and SR-15 (U.S. 64).

Because the portion of the project area south of I-40 is within a PGA, and the area north of I-40 is within the city limits of Gallaway, it is expected that this area will become more developed in the reasonably foreseeable future. Although there is currently little development along SR-196 in the immediate project area, it is anticipated that this area will be targeted for development, especially if the proposed new interchange is constructed to provide direct access to I-40.

Implementation of the proposed I-40 Interchange under the Build Alternative would complement the anticipated growth in the project vicinity within the northwest portion of Fayette County, including the PGA south of I-40 and within the City of Gallaway north of I-40. The new

interchange would provide several potential beneficial long-term direct impacts. A more efficient and safer transportation infrastructure would yield greater user benefits in respect to vehicle operating costs and travel time. An improved transportation link would be provided between northwest Fayette County and the City of Memphis for the commuting public.

As a result of this transportation improvement and recurring benefits, development would be expected to increase in northwest Fayette County. Enhanced development opportunities would occur in strategic areas, such as near the proposed new interchange along SR-196 and surrounding areas that would become more easily accessible. This new development would result in land use changes, shifting from the more rural land uses to more urban land uses. It is expected that the land use changes would ultimately increase revenue for the City of Gallaway and Fayette County.

Although some land use changes would be expected to occur in the general project area regardless of the new interchange being constructed, it is expected that the new interchange would promote land use changes sooner. The expected land use changes in the project area would be a shift from rural/agricultural land uses to commercial, residential, and industrial land uses. The primary initial direct adverse land use impacts would be the loss of farmland in the immediate project area. Land development in the project area would be expected to increase through induced conversion of rural/agricultural land to more intensive uses, such as higher density residential and commercial uses.

Construction of the I-40 Interchange under the Build Alternative would have several beneficial, long term indirect impacts. Property values and land use intensities would be expected to increase at strategic locations, particularly on property suitable for highway-oriented commercial and higher density residential uses.

Implementation of the Build Alternative would have some adverse, short and-long-term indirect impacts. Real property tax revenues would decrease as a result of public acquisition of private property for additional highway ROW. However, it would be anticipated that new businesses established within the project area would increase jobs, income, and tax receipts in the long term.

3.2.1.5 Mitigation of Land Use and Infrastructure Impacts

Mitigation measures, as defined by the Council on Environmental Quality (CEQ; 40 CFR 1508.20), include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating the impacts over time, and compensating for the impacts. Fayette County has mechanisms in effect to minimize, mitigate, or avoid adverse impacts of project implementation. Such issues as land use, buffering, noise mitigation, etc. can be addressed through implementation and application of the county growth policy plan, city zoning, and any subdivision ordinances, design guidelines, and other special ordinances and/or policies that may be in effect or that may be developed as the area continues to grow.

All land acquisitions and any other affected party would be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and

the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646).

3.2.2 Social Environment and Community Resources

The geographic area considered for analysis of existing social conditions and environmental consequences consists of Fayette County. Environmental Justice issues were analyzed in further detail on the census tract, block group, and block level.

3.2.2.1 Population Trends

According to the 2000 U.S. Census, the population in Fayette County was 28,806 and the population of Gallaway was 666. According to the 2000 U.S. Census, the population density within Fayette County was 41 persons per square mile. The population in Fayette County was classified as rural.

The total population of Fayette County in 2000 was 28,806, which represents a 12.7 percent increase from 1990. This rate of population growth was lower than the respective rate for the State of Tennessee (17 percent) during the 1990-2000 period. The City of Gallaway showed a 12.5 percent decline in population between 1990 and 2000.

Population projections indicate continuing steady population growth within the project area. Current population estimates for July 1, 2010 indicate a population of 32,525 for Fayette County, or a 13 percent increase since 2000. Population projections indicate an increase of approximately eight percent for the City of Gallaway between 2000 and 2010. These growth rates are similar to the projected growth rate of roughly ten percent for the State of Tennessee during the same period.

The age distribution of the population reflects the typical population age pyramid with a greater share of the population found in the young (under 16) and middle-age categories (25-64). There are no substantial differences in age distribution of the population in Fayette County compared to the state.

3.2.2.2 Housing Trends and Household Characteristics

According to the 1990 census, there were 9,115 housing units in Fayette County. As of the 2000 census there were a total of 10,467 households in Fayette County. This represents a 15 percent increase in the number of housing units between 1989 and 1999. The most recent data suggests that the number of housing units has increased at a faster rate since 1999. The most recent estimation of the number of housing units in Fayette County suggests there was a median of 13,416 housing units from 2005-2007. This represents just over a 28 percent increase in the number of housing units since 1999.

Approximately ten percent of the housing units were vacant. Single-family residential is the dominant housing type, comprising approximately 77 percent of the total housing units within the project area. Manufactured housing (mobile homes) comprises approximately 16 percent of the housing units in Fayette County. Approximately 53 percent of the housing units contained 3 bedrooms, followed by 19 percent with 4 bedrooms and 18 percent with two bedrooms. The

rural nature of Fayette County partially explains the greater predominance of single-family dwellings and manufactured housing.

The owner-occupancy rate for Fayette County from 2005-2007 was 76 percent. The median value of owner-occupied housing was \$145,974 in 2007. The overall housing vacancy rate was ten percent.

The median household income within Fayette County was \$40,279 according to the 2000 U.S. Census. This is slightly higher than the median household income for the State of Tennessee, which was \$36,360 in 1999. The City of Gallaway shows much lower median income with \$15,192 in 1999.

3.2.2.3 Environmental Justice and Non-discrimination

On February 11, 1994, President Clinton issued Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. This EO was issued to provide that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." A minority community is classified by the U.S. Census as African American, Hispanic American, Asian and Pacific American, American Indian, Eskimo, or Aluet, and other non-white persons.

According to the Final US DOT Order, a minority population means any readily identifiable groups of minority persons that live in geographic proximity. CEQ guidelines state that minority population should be identified where either (a) the minority population of the affected area exceeds 50 percent; (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Information on race and ethnicity could be analyzed down to the Census Block level utilizing the U.S. Census data. Census Block level data are the most detailed level of population data made available by the US Bureau of Census.

The Final US DOT Order defines low-income persons as those whose "median household income is below the United States Department of Health and Humans Services poverty guidelines." CEQ Guidelines uses the Bureau of the Census definition that identifies low-income populations with the annual statistical poverty thresholds. A low-income community or population was classified as having an aggregated mean annual income level for a family of four, correlating to \$17,463 in 2000, adjusted for inflation. The threshold of poverty for a family of four in 2005 as defined by the U.S. Census Bureau was \$19,806.

A Presidential memorandum that accompanied EO 12898 specified that federal agencies "shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA of 1969." The memorandum further stated that federal agencies "shall provide opportunities for community input into the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities."

The initial step in this process is the identification of minority and low-income populations that might be affected by implementation of the proposed action. For environmental justice considerations, those populations are defined as individuals or groups of individuals that are subject to an actual or potential health, economic, or environmental threat arising from existing or proposed federal actions and policies.

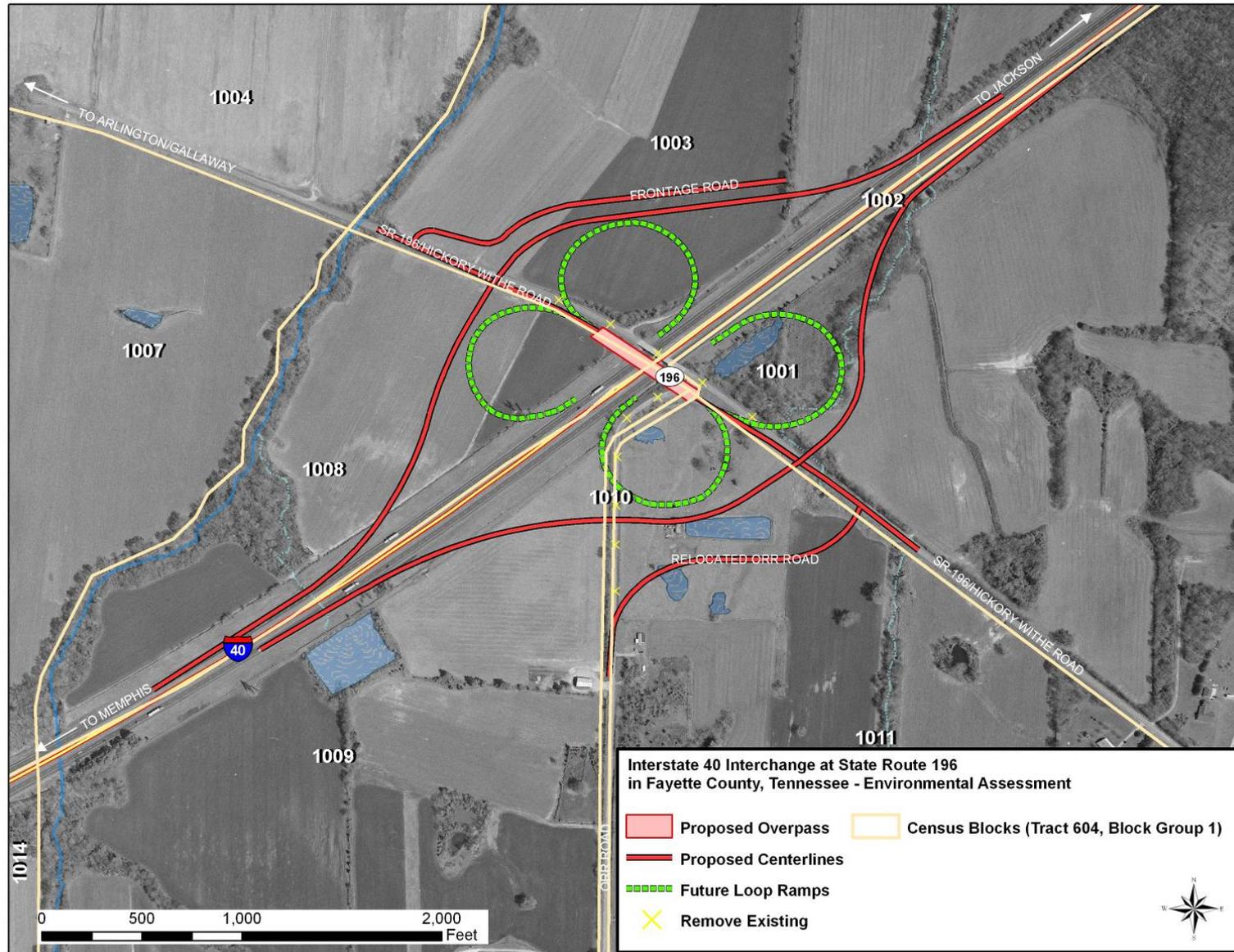
A minority and low-income population comparison for the project area is shown on Table 3.2, and the census tracts, block groups, and blocks traversed by the Build Alternative. Figure 3-3 displays the boundaries of the census blocks studied. All of the census blocks fall within Fayette County Census Tract 604, Block Group 1.

Income levels for the project area exceed the county and state income levels for the same time period. There were two blocks within the project area that contained higher than 50 percent minority populations, Block 1001 and Block 1009. However, when combining all of the blocks that would be affected, the percent minority is 45 percent.

Table 3.2. Minority and Low-Income Populations within the I-40 Interchange Project Area in Fayette County, Tennessee.

County/Census Tract/Block Group/Block ¹	Total Population 2000	Percent Minority Population 2000 (%)	Median Household Income	Percent Below Poverty Level, 2000^{2,3}
Fayette County	28,806	38	\$40,279	14
CT 604	7,976	26	\$46,445	9
BG 1	1,815	23	\$46,346	10
BL 1001	36	58	--	--
BL 1002	0	NA	--	--
BL 1003	0	NA	--	--
BL 1004	0	NA	--	--
BL 1007	3	0	--	--
BL 1008	0	NA	--	--
BL 1009	4	100	--	--
BL 1010	0	NA	--	--
BL 1011	209	42	--	--
All Blocks Affected	252	45	--	--
Tennessee	5,689,283	20	\$36,360	13
CT = Census Tract BG = Census Block Group BL = Block Level -- = Data Not Available at Block Level ¹ Includes those census blocks traversed by the Build Alternative footprint. ² The poverty level for a family of four was \$17,463 in 2000. ³ The poverty level for a family of four was \$19,806 in 2005. <i>Source: U.S. Census Bureau, U.S. Census, 2000; U.S. Census Bureau, Small Area Income & Poverty Estimates, 2005.</i>				

Figure 3-3. Map of the Census Blocks within the I-40 Interchange Project Area in Fayette, County, Tennessee.



3.2.2.4 Displacements and Relocations

Field surveys were conducted along the proposed ROW of the Build Alternative of the I-40 Interchange to determine residential, business, and public/non-profit displacements that could potentially occur because of the proposed construction. The surveys indicated that there are no displacements associated with the Build Alternative. Only one residence and one potential business were located near the project footprint. Both of these structures were located adjacent to the existing Orr Road. The realignment of Orr Road would begin near these two structures but would likely be designed to avoid displacing either of the buildings. However, if the footprint were to change, the area would be reevaluated to ensure there are no displacements.

Procedures and Assurance for Assistance to Displaced Persons

Acquisition of property will be required for this project, but no residential, business, or non-profit displacements are expected. All property acquisitions will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646). If the need arises, comparable replacement housing will be provided to all residential relocatees under the provisions of these laws.

3.2.2.5 Travel Efficiency

One of the main goals of the I-40 Interchange project is to provide improved access and improve travel efficiency for residents living in the adjacent area and communities. The average commuting time for citizens of Fayette County is 35.4 minutes (City-Data.com, 2008). Average travel time to work for the citizens of Gallaway is 24 minutes and for Braden citizens it is 30 minutes (City-Data.com, 2008). Commuters from the immediate project area primarily use I-40 to travel to jobs in urban and suburban Memphis areas. To do this, many of them travel through the City of Arlington and surrounding areas on two-lane collector roads and/or four-lane undivided roads that do not have left-turn lanes resulting in potential safety and efficiency issues.

As discussed in Chapter 1 of this EA, traffic volumes are projected to increase along the existing secondary routes and result in reduced travel efficiency and safety in the long-term. Reduced travel efficiencies can result in both social and economic consequences including increased commuting times, increased response time for emergency vehicles, lower fuel efficiency, and potential impacts on property values as the area could become less desirable to new residents due to traffic issues. The proposed interchange would be expected to improve all of these areas, including increases in property values in the area.

3.2.2.6 Considerations Relating to Pedestrians and Bicyclists

Due to the rural setting of the project area, no bicycle lanes or sidewalks currently exist along the existing roadways that would be impacted by this project, including I-40, SR-196, and Orr Road. Pedestrians and bicyclists are allowed to use SR-196 and Orr Road, but there are no shoulders provided so they must use the existing traffic lanes or the unpaved shoulders. Pedestrians and bicycles are prohibited on I-40 due to safety issues associated with the high speeds along interstates.

No bicycle or sidewalks are planned for the new roadways associated with the I-40 Interchange project. However, the new overpass will provide wide enough shoulders to accommodate pedestrians and bicycles wishing to cross over I-40 on SR-196.

3.2.2.7 Visual Quality

Visually desirable open space, agricultural land, and forests have been increasing in relative importance, because development has diminished their abundance. Any primary or secondary effects during and after highway construction should be examined with these trends in mind.

Roadway projects can have a negative effect on the visual quality due to loss of undeveloped habitats, modification of naturally flowing streams, and alteration of natural topography from cut-and-fill activities. Improper preparation of sites for construction activities can also have aesthetic consequences. Examples of improper preparation include inappropriately located disposal sites, damage to trees, and poorly located access and haul roads.

Roadway projects can also result in improvements to visual quality if the new roadway is constructed in areas otherwise perceived as rundown or poorly maintained. Also, replacing older roadways with newer, better designed features may also be perceived by some individuals as an improvement over the existing, older, more run-down facility.

The I-40 Interchange project area consists primarily of existing roadways, agricultural land, sod fields, pasture, and small wooded area along existing streams and scattered in small blocks in other areas. The I-40 project footprint will primarily be in an area that the viewshed has been altered by past land uses and construction of the existing roadways. No large forested areas or scenic waterways are present in the project area. Some of the existing open space in the project area would likely be converted to developed land, if highway-oriented businesses are developed adjacent to the new interchange. It is likely that much of the developable open space in the area would be converted to more urbanized land uses in the foreseeable future, regardless of the new interchange being constructed, due to the expected growth of Fayette County and the project areas proximity to Memphis.

3.2.2.8 Social Environment and Community Impacts

Potential Social/Community Impacts Associated with the No-Build Alternative

The No-Build Alternative would not provide the necessary transportation improvements needed to support the anticipated growth of the area depicted on the Fayette County and City Growth Plan. The No-Build Alternative would not provide improved access or transportation efficiency for northwestern Fayette County. The No-Build Alternative would not alleviate traffic along secondary routes used to gain access to I-40, including routes through the City of Arlington. Therefore, travel cost savings would not occur. Local roads would continue to eventually become more crowded if population levels increased. This would result in decreased LOS on local roadways. Safety issues would also likely become a bigger concern on the local roadways as traffic increases, especially along the routes used to gain access to I-40 through Arlington. Reduce LOS and travel efficiency would adversely impact response times for emergency vehicles.

The existing residents in the project vicinity would not gain any of the expected benefits the new I-40 Interchange would be expected to provide. The No-Build Alternative would not provide more opportunities for low-income households that would be expected if the new interchange were constructed. One of the potential benefits of the new interchange would be increasing property and home values, which could promote more profits on any sales of those assets. Also, it would be expected that the new interchange would promote creation of additional jobs closer to home, providing more employment opportunities and easier access to work. Without the new interchange, the baseline conditions and trends within the project area would continue. Therefore, the potential positive social benefits of economic growth would be slower to be achieved in the project vicinity.

Potential Social/Community Impacts Associated with the Build Alternative

There would not be any displacements associated with this project. Therefore no substantial adverse social/community impacts would be anticipated.

Direct, long-term, adverse impacts would result from increased traffic along SR-196. Those impacts would be due to traffic-related noise, night-time glare, and other visual effects associated with the increased traffic. Those properties immediately adjacent or in proximity to SR-196 would be most adversely impacted. It is expected that the majority of traffic-related adverse impacts would be associated with heavy truck traffic.

The Build Alternative would not adversely impact, split, disrupt or isolate any low-income, minority, social or ethnic group, as there is no concentration of any of these groups within, adjacent or in the near vicinity of the proposed ROW. The census blocks within the project area contain less than 50 percent minority populations overall. Therefore, any burden associated with the project would be shared relatively equally among all demographics including minority and non-minority populations. The benefits of the project would be shared equally, and there would be no disproportional impacts to minority or low-income populations.

This document has been reviewed by the TDOT's Civil Rights Staff (Department) 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 subject to discrimination under any program or activity receiving federal assistance." The Department notifies the public of proposed highway projects, and the availability of environmental documents for public inspection is published in local newspapers.

This project is not expected to sever any existing or proposed pedestrian or bicycle routes in the project area. The new overpass over I-40 would accommodate pedestrian and bicycles by providing paved shoulders.

Long-term beneficial impacts are anticipated as related to improved access, travel efficiency, traffic safety, public services, and facilities. Current traffic and future traffic demands would be served in a more efficient and safe manner by construction of the proposed new interchange.

The provision of public services, such as police, fire and emergency medical, would be beneficially impacted in the long-term under the Build Alternative. Improved accessibility and increased efficiency in the transportation system would result in lower response times of these services. Overall, accessibility to public services and facilities would not be adversely impacted under this build alternative. Disruptions to utility services would be minimized under the Build Alternative as it is standard policy for TDOT to coordinate all utility relocations with the affected utility companies.

The I-40 Interchange project may promote adjacent land use changes, generating visual impacts away from the proposed highway. Secondary developments would likely result in loss of open space and/or clearing of vegetation and replacing it with man-made structures. These changes may be perceived as negative by some and positive by others, depending on the types of land use changes that occur. Some view the rural setting as a valuable resource and do not like to see those areas developed, while others view new construction as a sign of progress that can benefit the community as a whole.

3.2.3 Economic Environment

3.2.3.1 Economic Conditions and Trends

Various key indicators of economic conditions and growth within an area include changes in labor force, employment, capital investment, retail sales, and property values. These economic variables are discussed in the context of the Fayette County project area.

The annual labor force in Fayette County approximated 18,020 in 2007 (American Community Survey, 2007). This represents a 33 percent increase from 2000 when the labor force was estimated at 13,526. The statewide labor force increased by 6.5 percent during this same period. The annual unemployment in Fayette County in 2007 was 11.6 percent compared to a statewide unemployment rate of 7.1 percent. Total employment within Fayette County is lower than the resident labor force. Total employment in Fayette County approximated 15,921 in 2007. As a result many workers commute to neighboring counties, primarily Shelby County, for employment. In 2000, there were 12,783 employed in Fayette County. This represented a 19 percent increase in the number of jobs in Fayette County between 2000 and 2007. This also shows that the labor force grew faster in Fayette County than the number of new jobs. Therefore, commuting to Shelby County for employment will likely continue to be the trend, unless more industries and commercial development occurs within Fayette County to provide new jobs.

The management, professional, and related occupations make up the most employment in Fayette County, followed by sales and office occupations. These occupation types make up over 50 percent of the employment in Fayette County. Overall, the project area has a balanced and diversified employment base. The top ten manufacturers are listed on Table 3.3.

Table 3.3. Top Ten Manufacturers in Fayette County, Tennessee, 2007.

Employer	Number Employees
Medegen Medical Products LLC	440
Kellogg Co.	327
Troxel Co.	300
AOC LLC – Resin or Plastic Coated Fabric	200
Windway Capital Corp.	180
AOC LLC – Fabric Coating Mill	150
Alpha Corp. of Tennessee	120
Coil Master Corp	110
Ring Container Technologies Inc.	100
Stabilt America Inc.	100
<i>Source: Tennessee Department of Economic and Community Development, Fayette County Data Sheet, 2008.</i>	

Development Trends

Housing

Recent development trends indicate that annual growth in Fayette County has increased substantially since 2002. Building permits were issued for 3,193 housing units during this six-year period, or an average of 532 permits annually. There was a minor decrease in 2006 and 2007 from the previous year, which likely reflects national trends due to declines in the national housing market during that time.

Industrial

Trends in industrial growth investment (i.e. manufacturing, distribution and selected service projects) during a ten-year period from 1998-2007 were evaluated. Approximately \$114 million were invested in the form of location of 4 new industries and expansion of 35 existing industries in Fayette County.

Retail Sales

Retail sales trends within Fayette County for the 2001-2006 period are shown on Table 3.4. Retail sales increased 79 percent during this period.

Table 3.4. Retail Sales Trends within the I-40 Interchange Project Area in Fayette County, Tennessee, 2001-2006 (\$million).

County	2006	2005	2004	2003	2002	2001
Fayette	186.8	169.7	103.2	88.9	102.2	104.3

Source: Tennessee Department of Economic and Community Development, Community Profiles.

Property Valuation

Property value increases reflect primarily real property and improvements through new construction and expansion of buildings and facilities that are added to the tax rolls. Therefore, property valuation trends are a good indicator of economic growth and construction activity within a jurisdiction.

Real property value trends for the 2003-2007 period for Fayette County are shown on Table 3.5. The County registered a 38 percent increase in total real property value during this period.

Table 3.5. Real Property Appraised Values within Fayette County, 2003-2007 (\$Million)¹

County	% Change 2003-2007	2007	2006	2005	2004	2003
Fayette	38	2,623.1	2,390.7	2,160.5	1,196.7	1,906.5

¹ Appraised values include land and improvement appraised values.
Source: Tennessee Comptroller of the Treasury, Division of Property Assessments.

3.2.3.2 Potential Economic Impacts Associated with the No-Build Alternative

Potential Economic Impacts Associated with the No-Build Alternative

Improvements in regional/local accessibility and traffic movement would not occur under the No-Build Alternative, thereby not realizing a potential increase in travel efficiency and associated travel cost savings in the northwest Fayette County region. In order to spur economic growth in the area, the transportation network needs to be continuously improved to keep up with development. Without the new I-40 Interchange, it is anticipated that growth will be slower than if the interchange was constructed. This slower growth will impact total revenues for the County and the individual communities in the area. The potential for an increased tax base and tax revenues would be minimized as a result of the lack of improved accessibility and enhanced movement of goods and people. In addition, property values could fail to appreciate at expected levels, if travel efficiency to the area makes it less desirable for new residents or businesses to locate there.

Potential Economic Impacts Associated with the Build Alternative

There are two basic categories of economic impacts of major highway investments or improvements, such as the I-40 Interchange. These categories are transportation user or operational impacts and economic impacts. The Build Alternative would result in operational impacts by providing a more efficient roadway system that reduces operating costs, improves travel times, and enhances safety.

Long-term economic benefits may be realized by implementation of the Build Alternative. Improved accessibility and travel efficiency would enhance the potential for new highway-oriented and community-based development. In most instances, both an increase and redistribution of economic activity occurs when a major highway investment is made. Thus, it can logically be expected that the I-40 Interchange could cause some relocation of existing business activity in addition to the generation of new business activity within the immediate area. Much of the land in the project vicinity would be considered easily suited for development, except certain areas within the 100-year floodplain or other areas with natural constraints.

The new interchange would provide expanded opportunities for commercial and industrial growth, and an associated expanded employment base. Business growth can occur in the manufacturing, service, wholesale, and retail sectors of the economy through the expansion of existing businesses; attraction of new businesses to the area; reduction in the cost of moving goods and raw materials; and the servicing of inter-regional traffic flows which can encourage development of travel-related businesses. The impacts on business are reflected in increases in sales, income, employment, and other economic indicators. An overall growth in employment could attract additional workers and families to an area, thereby creating an increased demand for housing. Any substantial new potential development would create a demand for an expansion of existing and new public infrastructure and services (e.g., utilities, police, and fire).

Property values within the vicinity of the I-40 Interchange project area may appreciate due to better access and improved transportation efficiency, making the area more attractive for residential, retail, and industrial uses. The specific impacts on property values would depend on the proximity of a property in relation to the proposed project and the suitability of the land for development. In general, the further away from the proposed I-40 Interchange a property is, the lower the chance of experiencing changes to property values, either positive or negative.

Short-term benefits would result during the construction phase of the I-40 Interchange project due to employment generated by project construction activities and due to potential retail sales for local businesses while construction activities are occurring.

3.2.3.3 Mitigation of Economic Impacts

Mitigation measures, where necessary and feasible, would be utilized to avoid, minimize, reduce, or compensate for local and individual adverse economic impacts. TDOT would provide just compensation, or a monetary payment equivalent to the fair market value of the property, for each property acquired for the new ROW. Every attempt would be made to minimize the creation of uneconomical parcel remnants and landlocked parcels. Temporary access roads would be constructed to maintain access to farm fields and parcels that serve an economic function.

3.2.4 Farmland

The Farmland Protection Policy Act of 1981 (FPPA) seeks to "minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses, and to insure that federal programs are administered in a manner that, to the extent practicable, would 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 Form was submitted to the USDA, Natural Resources

Conservation Service (NRCS), and an assessment score was determined for the Build Alternative. This score is determined by numerous factors including the agricultural value of the land. The score is used to determine which areas should receive the highest level of protection from conversion to non-agricultural uses. The higher the numerical score given to a proposed alternative, the more protection the farmland affected by it would receive. The highest rating possible is 260. Sites receiving a total score of 160 points or less typically do not require further evaluation. If the site receives a score higher than 160 points, alternatives should be developed that would avoid or minimize impacts to farmland.

The Build Alternative ROW was evaluated in accordance with the FPPA. Some soils classified as prime or unique farmland are found within the project area. The approximate amount of prime and unique farmland, as identified by the NRCS for the proposed Build Alternative, is shown on Table 3.6. The NRCS correspondence and Farmland Conversion Rating Forms are included in Appendix A.

Existing crop field in the I-40 Interchange Project Area

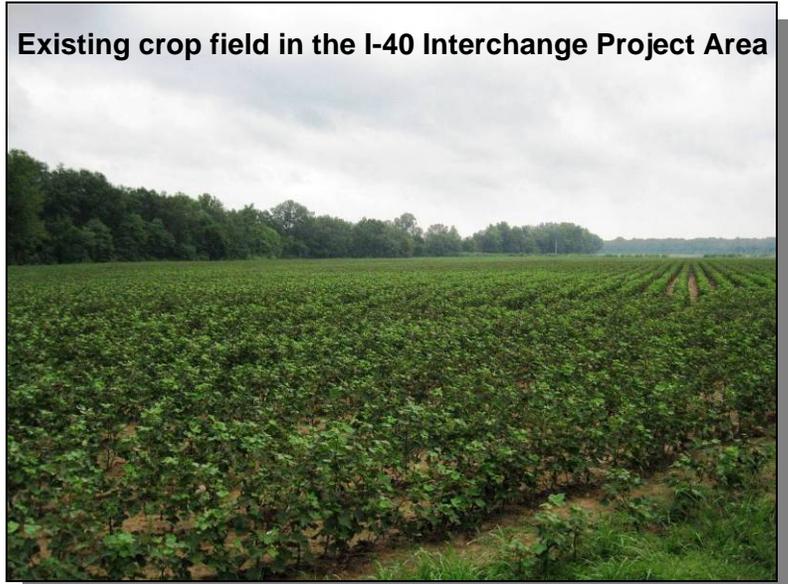


Table 3.6. Prime and unique farmland taken by the I-40 Interchange Build Alternative in Fayette County, Tennessee.

Alternative	Acres of Prime and Unique Farmland Taken¹	Overall Farmland Conversion Impact Rating Assessment Score²
Build Alternative	38	159
<p>¹ Total acres includes the 29 acres expected to be acquired for new ROW as well as land around the perimeter that may be taken out of agricultural production due to the proximity to the new ROW.</p> <p>² The highest possible overall score is 260. Scores over 160 points may require further evaluation and additional efforts to avoid or reduce impacts.</p> <p><i>Source: USDA, 2008</i></p>		

3.2.4.1 Potential Farmland Impacts

Potential Farmland Impacts Associated with the No-Build Alternative

The No-Build Alternative would not result in any substantial changes to farmland impacts. Current land uses and development trends would continue in the project area. However, the growth rate in the area could slow as traffic levels increase on secondary routes currently used to access I-40 from the surrounding area. Any new developments that do occur would possibly result in conversion of farmland into non-farm related uses.

Potential Farmland Impacts Associated with the Build Alternative

The farmland impact rating score for the Build Alternative (159 points) was below the 160 point threshold discussed above. The primary reason impacts to farmland remained below the threshold is due to the lack of major on-farm investments on the land that would be impacted, the amount of land being farmed in the immediate footprint of the project, and the size of the farms being impacted being below the average farm size for Fayette County. There would be some unavoidable farmland impacts due to construction of the new interchange. Most farmland impacts associated with the Build Alternative would involve direct loss of farmland located within the proposed ROW. In general, the impacts to individual farms would be relatively minor due to taking of farmland along the edges of the properties rather than cutting through the middle of properties and further dividing or severing existing farms.

Soils in the project area would be disturbed during construction of the project as earth moving equipment would be used to grade the area. Grading of the project area would primarily involve borrowing soil from existing land in the project area to produce the fill needed to support the new interchange ramps and overpass. Some erosion of soils is expected to occur during the construction phase of the project as exposed soils are unavoidable. Best management techniques would be utilized to control erosion and subsequent sedimentation in and adjacent to the project area. The mitigation section below provides more detail regarding the general actions that would be taken to control soil erosion during and following construction.

3.3 Ecological

3.3.1 Aquatic Resources

3.3.1.1 Water Quality

The primary law to protect water quality in the United States is the Clean Water Act (CWA). Section 303(d) of the CWA requires states to develop a list of streams and lakes that are “water quality limited.” “Water quality limited” waterbodies do not meet one or more water quality standards and are not supporting designated uses.

Waters have many uses which in the public interest are reasonable and necessary. Such uses include: sources of water supply for domestic and industrial purposes; propagation and maintenance of fish and wildlife, including provision of safe consumption of fish and shellfish; recreation in and on the waters, including enjoyment of scenic and aesthetic qualities of the waters; livestock watering and irrigation; navigation; and generation of power.

The Loosahatchie River, located within the project vicinity, is included on the Section 303(d) list (TDEC, 2008). The designated uses for this section of the Loosahatchie River, and the small unnamed tributaries within the I-40 Interchange project area, include fish and wildlife propagation and maintenance; recreation; and livestock watering and irrigation.

The Code of Federal Regulations 40 Part 130.7(b) (4) states that 303(d)-listed waters are to be prioritized for total maximum daily load (TMDL) development. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources.

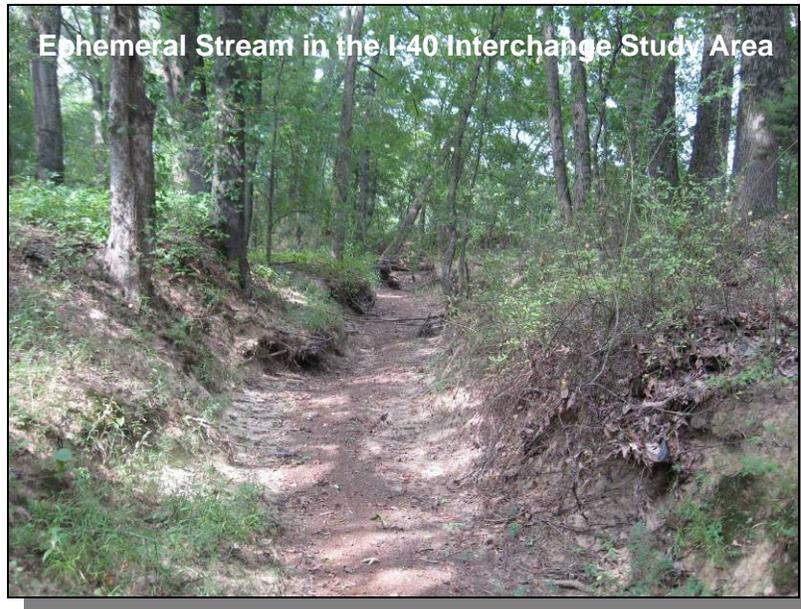
The Loosahatchie River is listed on the 303(d) list as not meeting its designated uses due to channelization. The portion of the Loosahatchie River located just downstream of the proposed I-40 Interchange has been channelized. The unnamed tributaries that would be directly impacted by this project flow directly to the channelized portion of the Loosahatchie River. However, it is not expected that the I-40 project would change or impact any of the use designations for any of the streams in the project area.

The streams that would be crossed or impacted by the Build Alternative were evaluated during field investigations in August 2008. The streams are similar to most small streams in this portion of West Tennessee and showed signs of erosion and soil sloughing along the banks. Some aquatic organisms, including fish, were observed within the perennial stream, and no organisms were observed in the intermittent streams.

3.3.1.2 Streams and Waterbodies

Drainage in the project area is primarily via three small streams, two intermittent and one perennial. The slope of the project area tends to be to the northeast toward the primary feature or watershed in the vicinity, the Loosahatchie River (HUC-12 ID = 080102090201). In addition to the three streams, a total of five wet-weather conveyances, primarily flowing along the existing roadways, were located within the project study limits.

The water resources known to occur in the project area are shown on Figure 3-4. Figure 2-1, located in Chapter 2 of this document, depicted the layout of the project area streams in relation to the Loosahatchie River located to the north. Table 3.7 shows stream information for the proposed Build Alternative. The Ecology Study Technical Appendix prepared for this project contains more detailed descriptions of each of the watercourses potentially impacted by this project and is available upon request from TDOT.



Stream Channelization

Stream crossing points were assessed to determine if any channelization would be required. It was assumed that channelization would be necessary if the angle of the stream crossing to the highway was less than 45 degrees. Stream crossings at angles greater than 45 degrees would be accommodated by culverts or bridges and would require only minimal channelization. At locations where the stream would be spanned by a bridge, it was assumed that any minimal channelization would be corrected as part of the bridge construction. In addition, stream segments not crossed by the road could still be impacted if the build alternative were to be constructed adjacent to the stream, depending on the limits of fill. In these cases, channelization could be necessary as well. Stormwater drainage ditches were not considered channelizations when culverts could be used to carry future stormwater flow. A summary of the number of streams likely requiring substantial channel modification or stream channelization is provided on Table 3.7 below.

Other Waterbodies

Several man-made ponds would also be potentially affected by the Build Alternative. A total of six ponds were located within the 500-foot study area surrounding all of the Build Alternatives. The locations of these ponds are shown on Figure 3-4. More details for each of these features are contained in the Ecology Study Technical Appendix available upon request from TDOT.

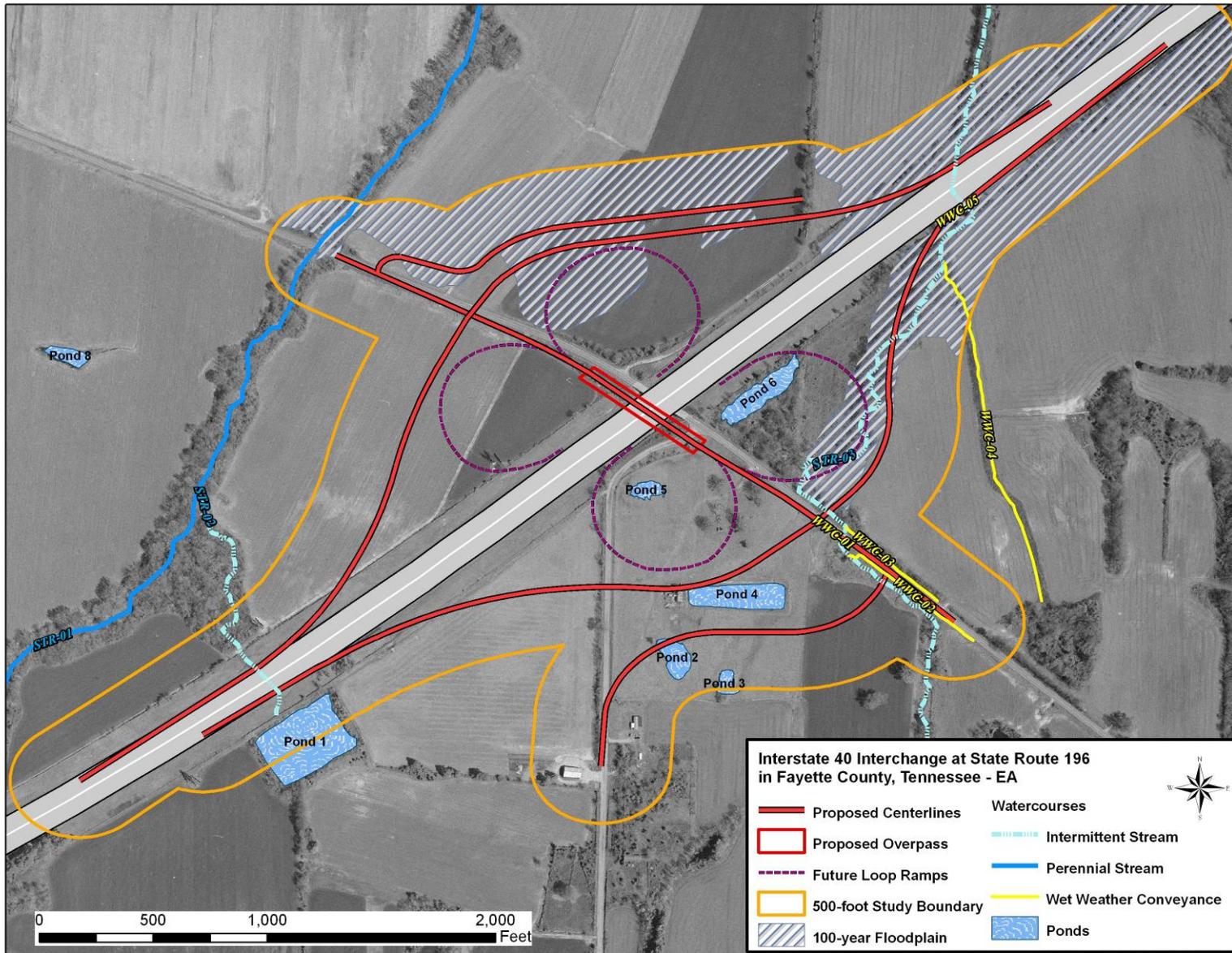
Table 3.7. Streams located within the 500-foot Study Corridor for the I-40 Interchange Build Alternative in Fayette County, Tennessee.

Alternative	Number of Streams in Study Area	Length of Stream Channel in 500-foot Corridor	Number of Streams Directly Crossed	Estimated Length of Stream Channel Modification/Rechannelization (feet)
Build Alternative	3	3,377	3	2,414

The information listed in this table is subject to change once final design of the interchange is complete, as some of the features may be avoided or impacts may be minimized by slight shifts in the design.

Source: Parsons, 2008

Figure 3-4 . Streams and Waterbodies within the I-40 Interchange Study Area in Fayette County, Tennessee.



3.3.1.3 Potential Impacts to Aquatic Resources

Potential Impacts to Aquatic Resources Associated with the No-Build Alternative

Because no new construction activities would occur under the No-Build Alternative, no changes from the baseline conditions of aquatic resources would occur within the immediate project site. However, the anticipated growth in Fayette County will continue to have potential adverse impacts on streams and other aquatic resources in the region. Eventually the area within the project site may become developed, but without the new interchange, it is likely that other areas with better access to I-40 would become developed first.

Potential Impacts to Aquatic Resources Associated with the Build Alternative

The Build Alternative would directly impact a total of three streams and would require substantial channel modification and/or rechannelization of one intermittent stream.

Long-term adverse impacts to streams would occur due to changes in stream flow and channel characteristics caused by necessary channel modifications, where stream channels need to be relocated and where culverts need to be placed in the stream channels to direct the stream under the roadway segments. The primary impacts associated with this project would occur in STR-03, which is an intermittent stream. A large section of this stream channel would need to be relocated to accommodate the proposed interchange ramps and relocated SR-196. It is likely that the stream channel would be shifted to the east of the proposed interchange ramps. Because this is an intermittent stream with limited aquatic organisms, it is anticipated that impacts due to stream channel modifications would be minimal. However, stream channel modifications may increase erosion and sedimentation potential, which may result in impacts to the Loosahatchie River located just downstream. TDOT will continue to coordinate with the Tennessee Department of Environment and Conservation (TDEC) and the USACE to ensure that proper permits are obtained and that all stream impacts are minimized and/or mitigated to the extent possible.

Long-term impacts to water quality would be anticipated for the streams within the Build Alternative footprint. The interchange will increase the amount of paved or impervious area resulting in increased runoff. Pollutants usually contained in highway runoff include de-icing salts, pesticides, and herbicides used for the control of roadside vegetation. De-icing salts are used relatively sparingly in this area and would not likely impact water quality, and pesticides and herbicides can be applied in a manner designed to minimize introduction of these chemicals into the surrounding water bodies. Runoff from bridge surfaces could impact water quality in the immediate area. Also, aquatic benthic habitats may be altered near the piers of bridges due to changes in bathymetry associated with the piers.

Short-term adverse impacts would include interruption or modification of stream flow during construction and water quality impacts associated with site preparation, grading, and construction activities. Other short-term adverse impacts would include increased sediment loading, disruption of bottom substrates and associated macroinvertebrate communities, and removal of tree cover and riparian vegetation resulting in increased erosion and habitat loss. Removal of canopy cover increases sun exposure to the water surface, which can raise stream water temperature. Increased water temperature can alter species composition in the stream.

Contaminant runoff from construction equipment and materials may also adversely affect water quality. Construction-related impacts would be temporary and any affected aquatic communities would be expected to recover after construction had ceased. The degree of impact would vary depending on the width and depth of the stream, the distance of the stream to the primary construction or grading activities, the steepness of the newly established streambanks, and the typical level of flow within the stream.

The Build Alternative would impact six man-made ponds and/or borrow pits. Some of the ponds impacted would need to be completely drained and filled. Impacts to ponds would be avoided or minimized to the extent practical during the final design phase of the project. Draining of ponds may have short-term impacts to downstream watercourses depending on the water quality within the individual ponds.

Efforts would be made during the design phase to maintain hydrology to all streams and wetlands located downstream of the project area to reduce the potential for long-term impacts extending beyond the project limits. Permeable material such as rock fill may be used in some areas to allow movement of water underneath the roadway.

3.3.1.5 Mitigation of Aquatic Resources Impacts

If the Build Alternative is chosen for this project, it would be designed to avoid major impacts to aquatic resources to the extent practicable. Efforts to further minimize impacts would continue throughout the design, permitting, and construction phases. Unavoidable impacts would be mitigated as required by applicable laws and regulations. In an effort to minimize sedimentation impacts, erosion and sediment control plans would be included in the project construction plans. TDOT would also implement its Standard Specifications for Road and Bridge Construction, which include erosion and sediment control standards for use during construction. The State of Tennessee sets water quality criteria for waters of the state; these standards must be met during the construction of the proposed I-40 Interchange.

Adverse impacts to water quality can be minimized by using best management practices, including limiting the construction and/or placement of metal pipes, concrete culverts, and bridges to dry periods, by implementing proper construction techniques and erosion controls, and by avoiding the removal of existing vegetation to reduce soil erosion. Employing bank stabilization measures, such as seeding, placing of rip rap, and/or installing silt fence would also minimize short-term adverse impacts to water quality during stream-side and in-stream construction.

Although short-term and long-term adverse impacts would be anticipated, BMPs would be followed to reduce or mitigate for the overall impact to water quality. Water quality protection measures that would be followed are described in the following documents:

- Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992);
- Tennessee Erosion and Sediment Control Handbook (TDEC, 2001b);
- Riparian Restoration and Streamside Erosion Control Handbook (TDEC, 1998a); and

-
- Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction (TDOT, 2006).

Examples of stream protection measures that may be used include the following:

- When possible, streamside and in-stream construction activities would be performed during dry periods, when stream flow is at a minimum;
- The unnecessary removal of existing vegetation would be avoided as much as possible. Canopy removal along all working or staging areas would be limited to the extent practicable;
- Where removal of vegetation is necessary, bank stabilization and sediment control measures would be employed immediately at the start of construction. Bank stabilization measures would include seeding with native species and placing of silt fences or rip-rap; and
- Control structures would be inspected and properly maintained throughout the life of the project.

Mitigation is required for all impacts that do not meet requirements for general Aquatic Resource Alterations Permits (ARAP; State of Tennessee) or for certain Nationwide Section 404 USACE permits. TDOT's wetland mitigation efforts for this project will be in compliance with all rules and regulations as set by USACE, EPA, and/or TDEC. Where possible, TDOT replaces unavoidable stream and wetland impacts through a process referred to as compensatory mitigation. Compensatory mitigation involves actions taken to offset unavoidable adverse impacts to wetlands, streams, and other aquatic resources authorized by Clean Water Act Section 404 permits and other USACE permits.

Specific mitigation measures for this project would be developed during the permit acquisition process once final design plans have been developed, but prior to any construction activities. All construction activities and associated mitigation requirements would need to be approved by the appropriate agencies responsible for protecting water resources in the project area. Continued coordination with appropriate regulatory agencies would occur during final planning and construction of the project and extend through required monitoring periods that may be established during the initial permit acquisition process.

A spill prevention, control, and counter measures (SPCC) plan would be developed for both the construction process and for operations of the I-40 Interchange after construction. This plan would define the emergency response plan in cases where accidental releases of hazardous substances occurred, including potential spills or releases adjacent to streams or other environmentally sensitive areas.

3.3.2 Wetlands

Section 404 of the Clean Water Act extends authorization to the USACE to regulate activities that affect waters of the United States, including wetlands. The USACE issues Section 404 permits for the discharge of dredged or fill material into wetlands and other waters of the U.S.

The project study area was surveyed to determine if wetlands were present. The specific objectives of the wetland surveys were to identify potential jurisdictional wetlands occurring within and immediately adjacent to the Build Alternative ROW; to characterize the wetland resources in terms of wetland type, size, and functional value; and to determine the environmental impacts of each alternative on these wetland resources. Jurisdictional wetlands are defined by the USACE as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE, 1987). Jurisdictional wetlands have hydrophytic vegetation, hydric soils, and occur in areas that are permanently or periodically inundated or saturated with water.

Potential wetlands were preliminarily identified within the project area by reviewing existing United States Geological Survey (USGS) topographic maps, Natural Resources Conservation Service (NRCS) soil survey maps, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, and aerial photographs. Field surveys were conducted to confirm the presence or absence of jurisdictional wetlands within or adjacent to the Build Alternative ROW. Wetland determinations were made utilizing the technique as described in the USACE Wetlands Delineation Manual (USACE, 1987). This approach requires an on-site inspection of the vegetation, soils, and hydrology of an area to make wetland determinations. At least one positive wetland indicator for each of the three parameters must be evident for a positive wetland determination.

No wetlands were located within the 500-foot study area of the Build Alternative.

3.3.2.1 Potential Impacts to Wetlands

Potential Impacts to Wetlands Associated with the Build Alternative

No wetlands were located in the immediate project area that would be directly impacted by the I-40 Interchange project. Therefore, there would be no direct wetland impacts due to this project.

3.3.3 Floodplains

Floodplains perform a variety of important natural functions including storage of floodwater, moderation of peak flows, maintenance of water quality, and groundwater recharge. Floodplains often support wetland ecosystems, due to collection and storage of floodwaters and filtration and deposition of beneficial nutrients from those waters that enter into the soil and help support wetland vegetation. Many floodplains, especially those that flood less frequently during the growing season, provide areas that are suitable for growing crops. Floodplains also provide habitat for wildlife (especially migratory birds, such as waterfowl and shorebirds), recreational opportunities, timber supplies, and aesthetic benefits.

Significant encroachment according to 23CFR650.105(q) refers to a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction-or flood-related impacts: (1) a significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route; (2) a significant risk; or (3) a significant adverse impact on natural and beneficial floodplain values.

Encroachment may diminish or impair the natural functions of the floodplain by decreasing the capacity for the area to convey floodwaters, which increases the potential for flood hazards. Flooding can cause serious damage to homes, businesses, and public works and can pose a threat to the safety of individuals.

Based on the current flood insurance rate maps (FIRM) for the project area, portions of the Build Alternative ROW located east of SR-196 is located within the 100-year floodplain of the Loosahatchie River. There are approximately 36 acres of 100-year floodplain mapped within the 500-foot study area. Less than 18 acres of the floodplain would be impacted by the project. No regulatory floodway occurs with the 500-foot study limits of the project. The 100-year floodplain is depicted on Figure 3-4 above. Table 3.15 located in Section 3.12 contains summary data for each of the Build Alternative, including the estimated number of acres of floodplain impacted. Section 3.3.3.1 below discusses the floodplain impacts in more detail.

3.3.3.1 Potential Impacts to Floodplains

Potential Impacts to Floodplains Associated with the No-Build Alternative

The No-Build Alternative would not result in any changes to the baseline conditions relative to floodplains. Therefore, the No-Build Alternative would not result in impacts to floodplains. It is likely that floodplains in the general area will eventually be encroached upon and/or otherwise impacted due to additional impervious surface area and changes in overall hydrology as the urbanized portions of Fayette County continue to spread into the area.

Potential Impacts to Floodplains Associated with the Build Alternative

Some floodplain associated with the Loosahatchie River extends into the eastern portions of the project area and may be impacted by the project. Although there are 36 acres of 100-year floodplain mapped in the 500-foot study area, less than half of that amount would be impacted. Encroachment of floodplains can diminish or impair the natural functions of the floodplain by decreasing the capacity for the area to convey floodwaters, which increases the potential for flood hazards. However, it is not anticipated that the amount of floodplain that would be impacted by the I-40 Interchange would result in any changes in base flood elevations for any adjacent areas. There would be no significant encroachment [as defined in 23CFR650.105(q)] on floodplains with the Build Alternative.

3.3.3.2 Mitigation of Floodplain Impacts

All regulatory floodplain encroachments would be coordinated with FEMA, and no revisions to the regulatory floodplain limits are anticipated. Attempts will be made to avoid or minimize impacts to floodplains in the area during the design phase of the project.

Because the general location of this project is somewhat predefined by the location of the existing I-40 and SR-196 alignments, there is no practicable alternative that would successfully accomplish the objectives of this project without at least some encroachment on the existing floodplain. To completely avoid the floodplain in the area, the existing main alignment of SR-196 would need to be relocated to the west. This would lead to additional impacts to other resources, especially farmland as well as additional overall costs for the project.

The Build Alternative would be designed to minimize impacts to current drainage patterns and would not increase the base flood elevations upstream from the floodplain crossing. Where feasible, precautions would be taken during construction to minimize in-stream work and other stream disturbances that could alter flood flow. All stream work and mitigation measures would be in compliance with EO 11988, Floodplain Management. Although not anticipated, any regulatory floodway encroachments would be coordinated with FEMA.

3.3.4 Threatened and Endangered Species

3.3.4.1 Federally-Listed Species

Certain species are given protection under the Endangered Species Act of 1973 (ESA), as amended. The ESA, administered by the USFWS and National Marine Fisheries Service, provides Federal protection for all species designated as *threatened* or *endangered*. An *endangered* species is “in danger of extinction throughout all or a significant portion of its range,” and a *threatened* species “is likely to become an endangered species within the foreseeable future.” The “take” of species listed as *threatened* or *endangered* under the ESA is prohibited, unless the take is incidental to otherwise lawful activities. To “take” a listed species includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.

Information from several sources, as well as prior experience with habitats in the area, was used to prepare for field surveys to locate protected species and/or habitats. These sources included database information provided by the U.S. Fish and Wildlife Service (USFWS), TDEC, and the Tennessee Wildlife Resources Agency (TWRA). Based upon the database research, no federally-listed species are known to occur in Fayette County, Tennessee.

3.3.4.2 State-Listed Species

The TDEC database was searched for state-listed species that are known to occur in Fayette County, Tennessee. State-listed species known to occur within the project counties are shown on Table 3.8. None of the known records of state-listed species occurred within the ROW of the Build Alternative. Information received from TDEC is periodically reviewed and updated. If any protected species or their habitats are identified as project development continues, they would be addressed in accordance with applicable laws and regulations.

Table 3.8. State-listed species known to occur in Fayette County, Tennessee.

Common Name	Scientific Name	State Status	County
Fish			
Northern Madtom	<i>Noturus stigmosus</i>	D	Fayette
Birds			
Bachman's Sparrow	<i>Aimophila aestivalis</i>	E	Fayette
Reptiles/Amphibians			
Barking Treefrog	<i>Hyla gratiosa</i>	D	Fayette
Mammals			
Southeastern Shrew	<i>Sorex longirostris</i>	D	Fayette
Southern Bog Lemming	<i>Synaptomys cooperi</i>	D	Fayette
Meadow Jumping Mouse	<i>Zapus hudsonius</i>	D	Fayette
Plants			
Capillary Hairsedge	<i>Bulbostylis ciliatifolia var.coarctata</i>	E-P	Fayette
Heavy Sedge	<i>Carex gravida</i>	S	Fayette
Cluster Fescue	<i>Festuca paradoxa</i>	S	Fayette
Copper Iris	<i>Iris fulva</i>	T	Fayette
Southern Twayblade	<i>Listera australis</i>	E	Fayette
Small-flowered Beardtongue	<i>Penstemon tubiflorus</i>	S	Fayette
Sand Post Oak	<i>Quercus margarettiae</i>	S	Fayette
State Status: E = Endangered, T = Threatened, P = Proposed for Listing, D = Deemed in Need of Management, S = Special Concern			
Sources: TDEC-ESD Natural Heritage Division, List of Rare and Endangered Species by Tennessee County.			

3.3.4.3 Threatened and Endangered Species Assessment

In addition to the TDEC list for Fayette County, TWRA provided data regarding past species observations within a four-mile radius surrounding the center of the I-40 Interchange project area. Based on that data, there are three state-listed species identified within a four-mile area surrounding the project area. These include the Swainson's warbler (*Limnothlypis swainsonii*) listed as D (Deemed in Need of Management), cedar elm (*Ulmus crassifolia*) listed as S (Special Concern), and nodding rattlesnake-root (*Prenanthes crepidinea*) listed as E (Endangered). All of these species were located near the Loosahatchie River well northwest of

the project area. None of the species are known to occur within the 500-foot study area of the Build Alternative.

Following the compilation of the list of threatened and endangered species potentially occurring in the project area, a detailed literature search was completed for the listed species. The potential for species to occur in the project area was estimated using available life history information coupled with recorded observations of known threatened and endangered species occurrences provided by TWRA and observations of habitats made during field surveys of the project area. It is not anticipated that any listed species occur within the proposed ROW of the Build Alternative. Much of the habitat within the study area has been disturbed due to construction of the existing highways and due to the past and present agricultural practices in the area. Based on the TWRA response, they indicated that use of Best Management Practices would be sufficient to minimize impacts to rare species for this project.

3.3.4.4 Potential Impacts to Threatened and Endangered Species

Potential Impacts to Threatened and Endangered Species Associated with the No-Build Alternative

The No-Build Alternative would not result in any changes to the baseline conditions in regards to threatened and endangered species.

Potential Impacts to Threatened and Endangered Species Associated with the Build Alternative

There are no records of listed species occurring within the 500-foot study area of the Build Alternative. In addition, no listed species or suitable habitats were identified during field the 2008 field surveys. With the exception of a few isolated areas, most of the terrestrial and aquatic habitats within the proposed project area have become relatively degraded due to past and/or present disturbances such as agriculture, roadways, utilities, timber harvesting, and other human disturbances. Therefore, the potential for the remaining habitats to support threatened and endangered species is considered low at this time.

3.3.5 Fish and Wildlife Resources

3.3.5.1 Aquatic Wildlife

Aquatic Habitats

Aquatic habitats within the project area consist of a mixture of intermittent streams, perennial streams, and man-made ponds. Most of the streams in the project area contain relatively limited amounts of aquatic habitats due to their small sizes. However, the one perennial stream provides habitats for a variety of species. Characteristics of these habitats are described in more detail in the Ecology Study Technical Appendix prepared for this project.

The perennial stream likely contains several small fish species, reptiles, amphibians, mammals, and various invertebrates that are common in streams of this size in the project vicinity. Several otherwise terrestrial species also utilize the aquatic habitats for drinking and foraging. Most of the aquatic habitats in the project area are of somewhat reduced quality due to past and present human disturbances including past construction and current operation of roadways and

agricultural practices, such as row-crop production, hay production, and horse grazing; and other land uses that tend to degrade natural communities. These disturbances have resulted in a combination of impacts to local aquatic habitats and water quality resulting from removal of riparian vegetation, substantial channel modifications, increased erosion, and changes in hydrology. Loss of wetlands in the project area has also resulted in loss of unique and important aquatic habitats. It is likely that much more wetland habitat formerly occurred in the project vicinity prior to modern day human developments and land uses.

3.3.5.2 Terrestrial Wildlife

Terrestrial Wildlife Habitats

The I-40 Interchange project area provides a limited amount of habitat for resident and migratory species. Typical resident species include mammals, such as white-tailed deer, raccoon, coyote, opossum, and several small rodent species. Resident birds include the Northern bobwhite, woodpeckers, and some songbirds. Some of the migratory species that frequent the project area include waterfowl, such as wood ducks and mallards, and raptors, such as red-tailed hawks, turkey vultures, sharp-shinned hawks, and American kestrels. Some neotropical migrants including warblers, vireos, thrushes, and other songbirds utilize the various habitats within the project area. Reptiles including snakes and turtles, also occur within the project area.

Some of the species listed above were observed during field surveys conducted for this project. Areas with mixtures of small crop fields, pasture, shrub/scrub, old field, and forest fragments typically provide decent habitat for species, such as white-tailed deer and other common species that are adapted to fragmented habitats. However, the presence of I-40 and SR-196, as well as the relative predominance of open crop fields, limit the quality of the habitats in the I-40 Interchange project area for most species. Table 3.9 contains an estimate of the acreages of each habitat type within the I-40 Interchange project area.

Table 3.9. Total habitat acreages potentially affected by the I-40 Interchange in Fayette County, Tennessee.

Alternative	Agriculture	Forest	Old Field	Pasture	Water	Developed/ Disturbed	Total
Build Alternative	75.3	17.5	9.6	14.9	3.0	40.1	160.4

Note: Habitat areas shown as acres.

Note: These acreage amounts were calculated based on lands within the 500-foot study corridor for each alternative and are given for comparison purposes. They include all areas, including existing right-of-way (ROW). For example, ROWs along existing I-40 and SR-196 are included in the habitat calculations, but would not be included in the ROW acquisition amounts shown elsewhere in the EA. Not all of the acreages shown in this table would actually be impacted by construction of this project. This data provides a general summary of what the basic land uses are within each alternative study corridor. Only lands needed for actual construction or work zones would be cleared or disturbed. It is anticipated that the actual ROW for most of the project would be 250 feet wide or less.

Source: Parsons, 2008.

3.3.5.3 Potential Impacts to Fish and Wildlife Resources

Potential Impacts to Fish and Wildlife Resources Associated with the No-Build Alternative

The No-Build Alternative would not change the baseline conditions in the project area. The trend toward more development in the project vicinity would continue and likely result in additional loss and/or fragmentation of existing fish and wildlife habitats. The habitats in the immediate I-40 Interchange project area would likely not be substantially impacted due to their already small size. Much of the habitat is located along the existing streams in the project area and would not be conducive to development.

Potential Impacts to Fish and Wildlife Resources Associated with the Build Alternative

There would be minor, long-term, adverse impacts to terrestrial habitats due to the clearing of existing forests, old fields, pastures, and shrub/scrub areas for conversion to roadway ROW. Due to the limited value of the habitats in the immediate project area and because most of the habitats have been altered/disturbed in the past, it is not expected that the loss of these habitats will have a substantial influence on fish and/or wildlife populations in the area. Only a small amount of the existing habitats would actually need to be cleared for this project. Some of the remaining habitats within the ROW of the project could still be utilized by several of the species common to the project area. However, the quality of the habitats immediately adjacent to the roadway would be further reduced for most species due to highway noise and other factors. Highway noise can affect the utilization of habitats by wildlife in both the short and long term.

Short-term adverse impacts would include interruption or modification of stream flow during construction and water quality impacts associated with site preparation, grading, and construction activities. Other short-term adverse impacts would include increased sediment loading, disruption of bottom substrates and associated macroinvertebrate communities, and

removal of tree cover and riparian vegetation resulting in increased erosion and habitat loss. Contaminant runoff from construction equipment and materials may also adversely affect water quality. Construction-related impacts would be temporary and any affected aquatic communities would be expected to recover after construction had ceased. The degree of impact would vary depending on the width and depth of the stream, the distance of the stream to the final alignment, the steepness of the newly established streambanks, and the typical level of flow within the stream.

Channelization of streams within the project area could result in long-term adverse impacts to aquatic habitats and species living in downstream habitats. These long-term adverse impacts would mainly result from potential changes in aquatic habitat conditions associated with changes in hydrology and water quality over time. Changes in hydrology may impact microhabitat conditions, such as substrate type, stream channel depth and width, and vegetation in portions of these streams. Removal of canopy cover increases sun exposure to the water surface, which can raise stream water temperature. Increased water temperature and other microhabitat changes can alter species composition in the stream. These adverse impacts have potential to affect spawning and larval fish due primarily to the decreased water quality and subsequent decrease in benthic invertebrates.

Potential short-term, adverse impacts on benthic invertebrates, larval fish, and other aquatic species could occur from stormwater runoff, which would increase turbidity and total suspended solids. Erosion would be the primary agent of adverse impacts, potentially resulting in an increased silt load (suspended solids and total solids), turbidity, change in color, and introduction of contaminants, such as petroleum products from heavy equipment. Siltation can cause mortality or impair the growth of the benthic fauna and fish, while increased turbidity and color can impact primary production by plants.

In rural areas adjacent to large cities the pressure to develop existing wildlife habitats into neighborhoods, businesses, and roadways is intense. In the project area and in Fayette County in general, there is an increasing demand for undeveloped land and the amount of forest, grassland, and old field is gradually decreasing.

3.3.5.4 Mitigation of Fish and Wildlife Resources Impacts

Whenever possible, impacts to fish and wildlife resources would be avoided and minimized. In some cases stream relocations can be avoided by slightly shifting the alignment away from the channel. These decisions would be made during the final design phase of the project as more details regarding cut and fill limits and volumes have been developed.

It is expected that the combined use of water quality protection measures during construction and appropriate mitigation measures would result in a reduction in potential impacts to water bodies and wildlife. Although short-term and long-term adverse impacts would be anticipated, BMPs would be followed to reduce or mitigate for the overall impact to fish and wildlife. When possible, streamside and in-stream construction activities would be performed during dry periods, when stream flow is at a minimum. The unnecessary removal of existing vegetation would be avoided as much as possible. Canopy removal along all working or staging areas would be limited to the extent practicable. Where removal of vegetation is necessary, bank

stabilization and sediment control measures would be employed immediately at the start of construction. Bank stabilization measures would include seeding with native species and placing of silt fences or rip-rap. Control structures would be inspected and properly maintained throughout the life of the project. A spill prevention control and countermeasures (SPCC) plan would be developed for both the construction process and for operations of the I-40 Interchange after construction.

All reasonable precautions would be taken to minimize short-term and long-term impacts to both terrestrial and aquatic habitats. While terrestrial resource losses are not given the high priority usually assigned to other habitats such as wetlands, measures can be employed to minimize impacts of the selected build alternative on these resources. Mitigation techniques include strict adherence to state erosion and sedimentation controls, selective clearing and grubbing, selective seeding of native herb, shrub and tree species typical of the habitats impacted, restrictions in the time of use and application of herbicides, and use of selected mowing to maintain ecotone and habitat diversity.

Some precautions may also be taken to minimize impacts to aquatic resources. These precautions include performing streamside and in-stream construction during dry periods, implementing proper sediment control measures, and avoiding unnecessary removal of existing vegetation. Where removal of vegetation is necessary, bank stabilization measures, such as seeding and placing of rip rap and/or silt fences would be employed. Steps would be taken to implement reasonable erosion control measures and to repair any riparian areas disturbed during construction. Timing of construction would dictate the level of adverse impacts on spawning fish and their offspring. Generally, most fish species within the project area spawn between mid-April through mid-July, and larval fish may be present through August.

The Build Alternative, if chosen, would be designed to avoid major impacts to waters of the state to the extent practicable. Efforts to further minimize impacts would continue throughout the design, permitting, and construction processes. Unavoidable impacts would be mitigated as required by applicable laws and regulations. In an effort to minimize sedimentation impacts, erosion and sediment control plans would be included in the project construction plans. TDOT would also implement its Standard Specifications for Road and Bridge Construction, which include erosion and sediment control standards for use during construction. The State of Tennessee sets water quality criteria for waters of the state; these standards must be met during the construction of the proposed project.

Stream channels requiring relocation or channelization would be replaced on-site to the extent possible, using techniques that would replace existing stream characteristics such as length, width, gradient, and tree canopy. Stream or water body impacts that cannot be mitigated on site, such as impacts of culverts over 200 feet, or impacts to springs or seeps which require rock fill to allow for movement of water underneath the roadway, would either be mitigated off-site by improving a degraded system or by making a comparable payment to an in-lieu-fee program, which would perform such off-site mitigation under the direction of state and federal regulatory and resource agencies.

TDOT will work closely with TDEC and the USACE during the permit stage of the project to determine exact impacts to existing watercourses and what mitigation is required for impacts to

those resources. TDOT will continue to work closely with regulatory agencies and other stakeholders to ensure that impacts to important resources are kept to the minimum practical.

3.3.6 Invasive Species

In accordance with EO 13112 *Invasive Species*, field surveys in the project area included visual observations for invasive species populations. The EO directs Federal agencies to expand and coordinate their efforts to combat the introduction and spread of plants and animals not native to the United States. Transportation systems can facilitate the spread of plant and animal species outside their natural range. Those species that are likely to harm the environment, human health, or economy are of particular concern. Nonnative flora and fauna can cause major changes to ecosystems, upset the ecological balance, and cause economic harm to agriculture and recreation sectors. Roadways can provide opportunities for the spread of invasive species in several ways, including: the introduction by automobile traffic; mowing and spraying operations; the importing of dirt, gravel, or sod; or through the use of nonnative plants for erosion control, landscape, or wildflower projects.

Past land and stream alterations, including those completed for construction of existing roads and agricultural purposes, have permanently altered the natural landscape and provided a variety of existing impacts to fish and wildlife. These disturbances have also promoted the spread of invasive species into the area. Some of the most common non-native plant species observed in the proposed project corridor included Japanese honeysuckle (*Lonicera japonica*), sericea lespedeza (*Lespedeza cuneata*), and multiflora rose (*Rosa multiflora*).

No widespread populations of invasive species were observed within the ROW of the Build Alternative. However, small, isolated populations of invasive species were identified in the project area during the field surveys. Isolated populations of other invasive plants are possibly present within the project area as well, but no evidence of widespread infestations was observed during the field surveys.

3.3.6.1 Potential Invasive Species Impacts

Potential Invasive Species Impacts Associated with the No-Build Alternative

The No-Build Alternative would not result in any substantial changes in the baseline conditions of invasive species. Therefore the scattered populations of invasive species would continue to occur in the general project area. Populations of such species would not be expected to spread rapidly unless other projects that result in major land disturbances are implemented.

Potential Invasive Species Impacts Associated with the Build Alternative.

Construction activities associated with the Build Alternative would potentially increase the chance of spreading invasive plant species in the project area, due primarily to soil disturbance and removal of native vegetation. Many invasive species thrive in newly disturbed areas and effectively out-compete native vegetation before it can become reestablished. Areas that already contain a population of invasive species are the areas of most concern. Even if no noticeable populations of invasive species occur in an area, it is possible for seeds from nearby populations to lie idle on the surface, awaiting disturbances that remove the native vegetation and allow them to germinate.

3.3.6.2 Mitigation of Invasive Species Impacts

The FHWA has developed guidance to implement Executive Order 13112. It provides a framework for preventing the introduction of and controlling the spread of invasive plant species on highway ROWs. Controlling invasive plants on ROWs can often be a complex effort involving various governmental jurisdictions, adjacent landowners, and the general public. Incorporating elements of the FHWA guidance into planning and implementation of construction, erosion control, landscaping, and maintenance activities, would facilitate the use of best management practices. Key elements of this guidance would include inspection and cleaning of construction equipment, commitments to ensure the use of invasive-free mulches, topsoils, and seed mixes, and eradication strategies to be deployed should an invasion occur (FHWA, 1999).

The Tennessee Exotic Pest Plant Council (TN-EPPC) has produced a detailed manual, Tennessee Exotic Plant Management Manual (TN-EPPC, 1997), aimed at providing information to help control and manage 20 of Tennessee's worst exotic pest plant problems. This manual provides the entire list of invasive exotic pest plants in Tennessee, detailed species descriptions, and recommended herbicide application methods for controlling these species. This resource would be used as an additional tool to control the spread of invasive species with construction of any of the build alternatives.

The following measures would be used to the extent possible to help prevent the introduction and spread of invasive species:

- Native grasses, shrubs, and trees would be planted for beautification purposes or to prevent erosion, wherever needed. Native species would be consistent with local community types;
- Whenever possible, all disturbed soil would be seeded with temporary annual species to reduce the ability of exotics to become established. This would also act to reduce erosion potential during rain events; and
- Consideration would be given to the types and quality of plants and soils at borrow sites. Soil from borrow sites used as project area fill could contain viable plant parts or seeds and could increase the spread of invasive species to new locations.

3.4 Cultural Resources

Federal laws require TDOT and FHWA to comply with Section 106 of the National Historic Preservation Act of 1966, as amended. This legislation requires TDOT and FHWA to identify any properties (either above-ground buildings, structures, objects, or historic sites or below ground archaeological sites) of historic significance. For the purposes of this legislation, historic significance is defined as those properties which are included in the National Register of Historic Places (NRHP) or which are eligible for inclusion in the National Register. Once historic resources are identified, legislation requires these agencies to determine if the proposed project would affect the historic resource. If the proposed project would have an adverse effect to a historic property, the legislation requires FHWA to provide the Advisory Council on Historic Preservation (an independent federal agency) an opportunity to comment on the effect.

The U.S. Department of Transportation Act of 1966, as amended, also requires FHWA to assess the applicability of Section 4(f). This law prohibits the Secretary of Transportation from approving any project, which requires the "use" of a historic property unless there is no prudent and feasible alternative to that use and unless the project includes all possible planning to minimize harm to the historic resource.

Pursuant to 36 CFR 800.4 which requires TDOT and FHWA to identify historic resources near its proposed projects, architectural historians from TDOT surveyed the area of potential environmental impact for this proposed project in an effort to identify any National Register-included or eligible properties.

An important part of the Section 106 process is consultation with the Tennessee State Historic Preservation Office (SHPO), the ACHP, federally recognized Native American tribes that may attach cultural or religious significance to properties within the project study area, and local governments.

On 13 December 2007 TDOT wrote to representatives of the following ten Native American tribes asking for information regarding the project and if they would like to participate in the Section 106 review process as a consulting party:

- Alabama-Quassarte Tribal Town;
- The Chickasaw Nation;
- Choctaw Nation of Oklahoma;
- Eastern Shawnee Tribe of Oklahoma;
- Kialegee Tribal Town;
- Muscogee (Creek) Nation;
- Quapaw Tribe of Oklahoma;
- Shawnee Tribe;
- Thlopthlocco Tribal Town; and
- United Keetoowah Band of Cherokee Indians.

To date, TDOT has received no responses related to cultural resources.

Appendix B of this document contains a brief summary of the Section 106-related coordination and consultation efforts for this project and copies of coordination letters related to cultural resources issues for this project.

3.4.1 Architectural/Historical Resources

Pursuant to regulations set forth in 36 CFR 800 guidelines, TDOT historians field-reviewed this project on December 1, 2006. The purpose of this survey was to determine if any properties in the project impact area were either eligible for inclusion or are included in the National Register of Historic Places. A project's area of potential effects (APE) is defined in 36 CFR 800.16 (d) as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

The proposed project is located in a rural, built-up area east of Arlington. Downtown Arlington is listed on the National Register as a historic district, but is located nearly three miles from the proposed interchange and is surrounded by considerable new development. It is the opinion of TDOT that the Arlington Historic District is outside the area of potential effect for this project. The proposed project area is located in a transition area with a mixture of open farmland, residential development, and some commercial development.

The APE for this project includes the following:

- a corridor approximately one-half mile surrounding the interchange. Limitations to this corridor would be topographic features, such as the hills that are between the proposed project and other resources in the study corridor;
- areas within the nearby viewshed of the proposed project; and
- areas within the potential noise impact area (up to 500 feet from the proposed improvements).

TDOT checked the survey records of the Tennessee State Historic Preservation Office (TN-SHPO) to determine if any previous surveys had identified any historic properties in the area. The TN-SHPO has not surveyed the area and has identified no properties as eligible for the National Register.

Staff historians conducted field surveys of the project's area of potential effect in October 2007. This field survey sought to identify any previously unidentified resources that merited further evaluation. The survey was also intended to determine the potential for National Register eligibility of any individual resources or historic districts in the area.

Staff surveyed and evaluated for National Register eligibility properties considered to be in the project's area of potential effect. The area surrounding the proposed interchange east of Arlington contains residential architecture dating from the mid-twentieth century to the present. There is no known architectural or historic significance that would make this area eligible for listing on the National Register of Historic Places under Criterion A, B, or C. TDOT historians identified no other properties in the area eligible for the National Register.

TDOT historians surveyed the project area and inventoried three properties in a chart format. These properties are clearly not eligible for the National Register and did not require further National Register evaluation. Therefore, in the opinion of TDOT, no properties within the project area are eligible for listing on the National Register of Historic Places, and there will not be a Section 4(f) use of a historic property. The SHPO agreed with TDOT's determinations stated in the 2008 Historical/Architectural Assessment in a letter dated March 11, 2008. A copy of the SHPO letter is included in Appendix B of this EA.

3.4.1.1 Potential Impacts to Architectural/Historical Resources

There are no architectural/historical resources within the project APE. Therefore there will be no direct or indirect impacts to architectural/historical resources.

3.4.2 Archaeological Resources

A Phase I archaeological assessment was conducted for the proposed I-40 Interchange. The purpose of the Phase 1 study was to identify cultural resources present in the project area and to provide appropriate management recommendations for any identified cultural resources. Significant cultural resources are any material remains of human activity that are eligible for the NRHP. The federal statutes and responsibilities include Section 106 of the National Historic Preservation Act of 1966, as amended; Executive Order 11593; the Advisory Council's Protection of Historic Sites (36 CFR Part 800) effective June 17, 1999; and section 5 of the Abandoned Shipwreck Act of 1987. All field and office work was conducted in accordance with the standards and guidelines established in 36 CFR Part 66, Recovery of Scientific, Prehistoric, Historic, and Archaeological Data: Methods, Standards, and Reporting Requirements (Federal Register, Volume 42, Number 19-Friday, January 18, 1977). All artifacts recovered during the investigation were curated with the Tennessee Division of Archaeology (TDOA) in accordance with TDOA curation requirements, as stipulated in the TDOA permit for this investigation.

The APE for the Phase 1 Cultural Resources survey is located in Fayette County approximately 3.2 km south of Gallaway and 4.8 km north-northwest of the community of Hickory Withe. This location can be identified on the Gallaway, TN 7.5 min. quad. The ROW surveyed was divided into four quadrants, as a result of the study area being bisected by I-40 from southwest to northeast, and by SR 196 (Hickory Withe Road) from southeast to northwest.

A literature and records search at TDOA indicated that there were no previously recorded archaeological sites mapped within the study area. In fact there are no archaeological sites in Fayette County that are currently listed on the NRHP.

Fieldwork was conducted in the APE during March 2008. The field investigations were conducted in a manner that is compliant with the general Scope of Work (SOW) for TDOT Phase I Archaeological Assessments (Hodge and Kline 2006), and adhered to the Tennessee Historical Commission Review and Compliance Section Reporting Standards Appendix B: Archaeological and Architectural Resource Identification Studies (Survey Reports) of that SOW.

The field investigations identified six loci, including four archaeological sites and two isolated finds. Three of the identified sites were assigned trinomials by the Tennessee Department of Archives and History (40FY453, 40FY454, and 40FY455). One "site" (Locus 6) was not assigned a trinomial, because there was no archival evidence supporting a pre-1933 occupation at the location of that site. All of the identified loci contain only historic period components; no evidence for prehistoric utilization of the project area was recovered. All three archaeological sites identified within the study area are recommended not eligible for the National Register of Historic Places. Therefore, no further cultural resources work is necessary prior to construction.

The SHPO agreed with TDOT's determinations stated in the 2008 Historical/Architectural Assessment in a letter dated November 14, 2008. A copy of the SHPO letter is included in Appendix B of this EA.

3.4.2.1 Potential Impacts to Archaeological Resources

Based on the Phase 1 Archaeological Surveys, the I-40 Interchange project is not expected to result in impacts to archaeological resources. Much of the construction area will occur in previously disturbed areas with low likelihood of containing intact artifacts. There is a small chance artifacts could be discovered in any previously undisturbed areas within the expanded ROW for the interchange.

3.4.3 Mitigation of Cultural Resources Impacts

TDOT will continue to work in coordination with the SHPO and other consulting parties to ensure all cultural resources impacts are handled according to all applicable laws and regulations.

Should any previously undiscovered cultural resources be discovered during construction of the new roadway, all construction activities would cease in that vicinity until further investigations and coordination with the SHPO are completed. Construction activities would commence in the area once the SHPO has made a determination on the site or until any artifacts are properly documented/recovered.

3.5 Air Quality Affected Environment

3.5.1 Air Quality Background Information

An analysis of the project's potential impacts to the air quality in the project area is required under the Clean Air Act (CAA). Passed by Congress in 1970, the Act is the most comprehensive legislation related to air quality. The CAA was amended in 1977 and recently in 1990 under the Clean Air Act Amendments (CAAA). The CAA of 1970 established six criteria pollutants and required US Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for these pollutants. The six criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead.

The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The standards for the six principal pollutants are shown in Table 3.10.

The EPA Final Conformity Rule, revised on July 1, 1999, requires State Departments of Transportation and Metropolitan Planning Organizations (MPOs) to develop Long Range Transportation Plans and Transportation Improvement Programs (TIPs) that conform to the emissions budget and the implemented schedule of Transportation Control Measures (TCMs) established in the State Implementation Plan (SIP) for air quality. TIPs and Long Range Transportation Plans (LRTPs) are essentially lists of transportation projects that are to be undertaken in the short term and the long term (respectively).

The purpose of air quality conformity is to reduce the severity and number of violations of the NAAQS, to achieve the NAAQS as expeditiously as possible for areas designated as Non-Attainment areas, to ensure compliance with an air quality maintenance plan, and to support the

intent of the 1990 CAAA to integrate transportation, land use and air quality planning. The CAAA establishes three designations for areas based on ambient air quality conditions observed for NAAQS pollutants:

- Non-attainment areas: Areas that currently exceed NAAQS for transportation-related criteria pollutants;
- Maintenance areas: Areas that at one time were designated as nonattainment areas, but have since met NAAQS for transportation related criteria pollutants. Areas are designated “maintenance areas” for 20 years from the date the EPA approves the state’s request for re-designation as a maintenance area; and
- Attainment areas: All other areas.

Table 3.10. Summary of National Primary Ambient Air Quality Standards.

Pollutant	Primary Standard	Averaging Time	Secondary Standard	
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾	None	
Lead	0.15 µg/m ³	Rolling 3-month Average	Same as Primary	
	1.5 µg/m ³	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM ₁₀)	150 µg/m ³	24-hour ⁽³⁾	Same as Primary	
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ⁽⁴⁾ (Arith. Mean)	Same as Primary	
	35 µg/m ³	24-hour ⁽⁵⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁶⁾	Same as Primary	
	0.08 ppm (1997 std)	8-hour ⁽⁷⁾	Same as Primary	
	0.12 ppm	1-hour ⁽⁸⁾	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arith. Mean)	0.5 ppm (1300 µg/m ³)	3-hour ⁽¹⁾
	0.14 ppm	24-hour ⁽¹⁾		

⁽¹⁾ Not to be exceeded more than once per year.

⁽²⁾ Final rule signed October 15, 2008.

⁽³⁾ Not to be exceeded more than once per year on average over 3 years.

⁽⁴⁾ To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

⁽⁵⁾ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).

⁽⁶⁾ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm 9 (effective May 27, 2008).

⁽⁷⁾ (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor in an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

⁽⁸⁾ (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005, EPA has revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas. For one of the 14 EAC areas (Denver, CO), the 1-hour standard was revoked on November 20, 2008. For the other 13 EAC areas, the 1-hour standard was revoked on April 15, 2009.

Source: EPA, 2009

Fayette County is currently considered an attainment area for all air quality parameters. However, Fayette County is located adjacent to Shelby County, which is a non-attainment area for ozone and is a carbon monoxide maintenance area.

3.5.1.1 Carbon Monoxide (CO)

Based upon the analyses of highway projects with similar meteorological conditions and traffic volumes, the carbon monoxide levels of the subject project are expected to be below the NAAQS requirements.

3.5.1.2 Conformity

The 1990 Clean Air Act Amendments (CAAA) and the Tennessee Transportation Conformity Rule require that each new regional LRTP and TIP must be demonstrated to conform to the Tennessee State Implementation Plan (SIP).

Transportation conformity is a way to ensure that federal funding and approval are given only to those transportation projects that are consistent with federal air quality goals. According to the CAA, transportation plans, programs and projects cannot:

- Create new NAAQS violations;
- Increase the frequency or severity of existing NAAQS violations; or
- Delay attainment of the NAAQS.

Federal funding dedicated to transportation projects and programs can be withheld if a region is found to be in violation of conformity standards.

The responsibility for the conformity falls upon the US Department of Transportation (USDOT); the MPOs in Tennessee have assumed responsibility for conformity. These agencies ensure that the transportation plan and program within the metropolitan planning area boundaries conform to the SIP. The policy board of each MPO formally makes a conformity determination in its transportation plan and transportation improvement program prior to submitting them to the USDOT for approval. Verification of project conformity for currently approved TIPs for both MPO and non-MPO projects, including listings of qualifying projects in each MPO area, are on file at the TDOT Project Planning Division. The status of a project is addressed in the MPO-approved TIPs as exempt or analyzed, meaning that the project was included in the conformity analysis for the current TIP.

In August 2007, the Memphis MPO Transportation Policy Board approved the FY 2008-2011 TIP. The Memphis Urban Area 2030 LRTP was approved by the Memphis MPO Transportation Policy Board in March 2008. It was determined that the FY 2008-2011 TIP and the Memphis Urban Area 2030 LRTP conform under the 8-hour ozone and CO NAAQS. The I-40 Interchange Project is included in both of the above plans.

3.5.1.3 Mobile Source Air Toxics (MSATs)

Background

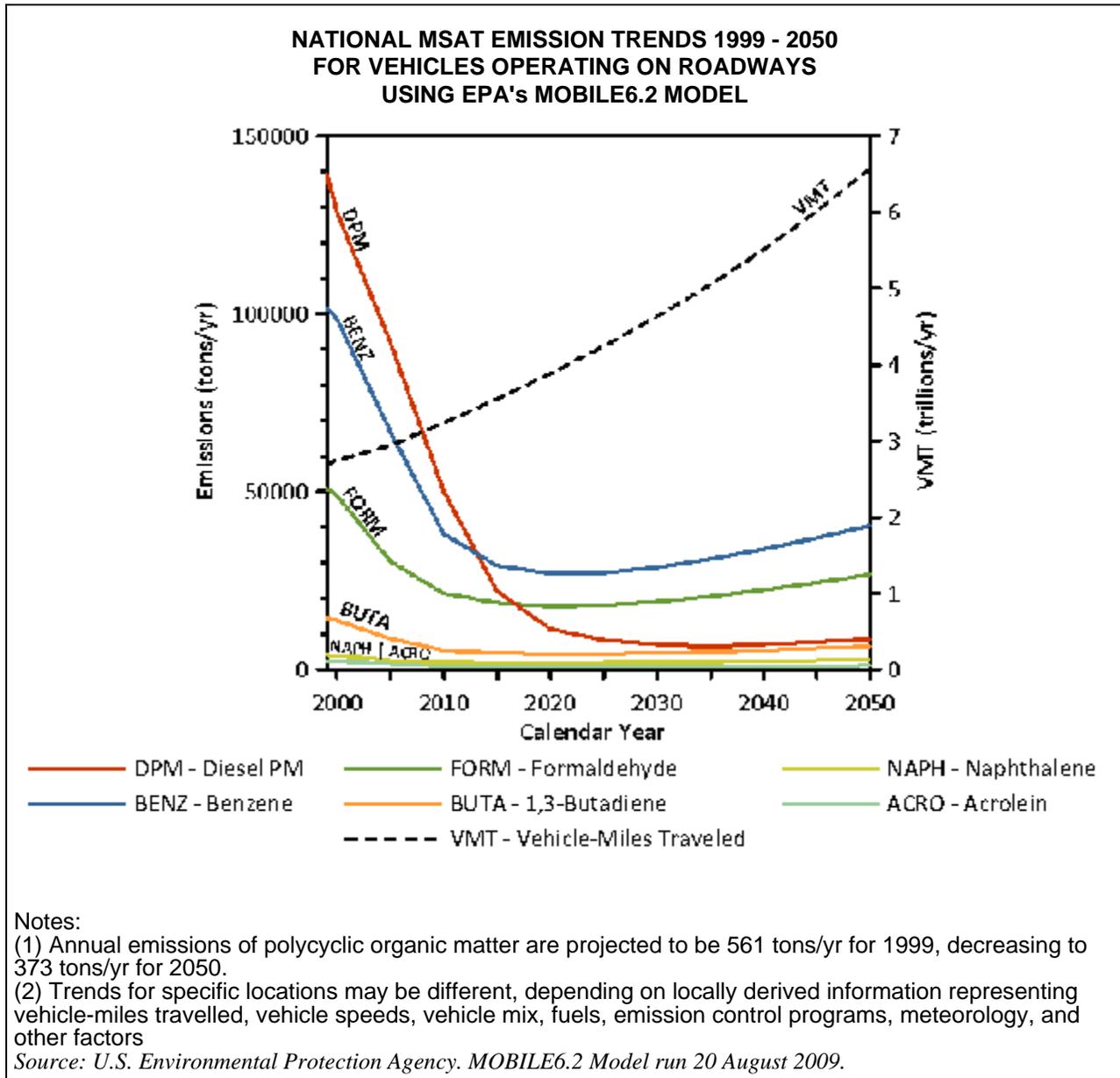
Controlling air toxic emissions became a national priority with the passage of the CAAA of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS)

(<http://www.epa.gov/ncea/iris/index.html>). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA)

(<http://www.epa.gov/ttn/atw/nata1999/>). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145% as assumed, a combined reduction of 72% in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 3-5.

Figure 3-5. U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 1999-2050*



Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA).

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies

to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

On February 3, 2006, the FHWA released "*Interim Guidance on Air Toxic Analysis in NEPA Documents*" (<http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm>). This guidance was superseded on September 30, 2009 by FHWA's "*Interim Guidance Update on Air Toxic Analysis in NEPA Documents*" (<http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm>). The purpose FHWA's guidance is to advise on when and how to analyze Mobile Source Air Toxics (MSATs) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As the science progresses, FHWA will update the guidance.

Incomplete or Unavailable Information for Project Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (<http://www.epa.gov/ncea/iris/index.html>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts with each step in the process building on the model predictions obtained in the previous step. All are

encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupported assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country (three where intensive monitoring was conducted plus an additional seven with less intensive monitoring). The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM.

The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that

cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Mobile Source Air Toxics (MSAT) Qualitative Assessment

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions. The qualitative assessment presented below has been prepared in accordance with FHWA's Interim Guidance derived in part from a study conducted by the FHWA entitled "A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives." (www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm). A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives.

FHWA's Interim Guidance groups projects into the following categories:

- Exempt Projects and Projects with no Meaningful Potential MSAT Effects;
- Projects with Low Potential MSAT Effects; and
- Projects with Higher Potential MSAT Effects.

FHWA's Interim Guidance provides examples of "Projects with Low Potential MSAT Effects." These projects include minor widening projects and new interchanges, such as those that replace a signalized intersegment on a surface street or where design year traffic projections are less than 140,000 to 150,000 AADT. The I-40 Interchange project would qualify as a "Project with Low Potential MSAT Effects" because the relatively low daily traffic volumes on roads and intersections affected by the project would not meet FHWA's volume threshold.. Therefore, this EA provides a qualitative assessment of MSAT impacts associated with the project.

For each alternative in this EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables, such as fleet mix, are the same for each alternative. The VMT estimated for the Build Alternatives could be slightly higher than that for the No-Build Alternative, because the improved access increases the efficiency of SR-196

and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT could lead to higher MSAT emissions for the Build Alternative. However, the improved access may decrease VMT for some commuters because they will have more direct access to the interstate. Therefore, the MSATs along some of the secondary routes currently used to access I-40 would likely show a corresponding decrease in MSAT emissions as traffic is diverted to I-40 via SR-196.

Because the new I-40 Interchange will result in an increase in traffic along SR-196, the localized ambient concentrations of MSATs for residences along that route may be higher under the Build Alternative than the No-Build Alternative. Alternatively, MSATs may be reduced for areas along other secondary routes in the area as traffic is shifted away from those areas due to the additional access point. However, the magnitude and the duration of these potential increases and/or decreases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models.

According to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. However, it is expected that some of the increases in MSATs emissions associated with the higher VMT for the Build Alternative may be somewhat offset by lower MSAT emission rates due to increased average speeds. If commuters can gain access to I-40 more efficiently and take advantage of the higher speeds on I-40, compared to the slower speeds on most of the parallel secondary routes, then the MSAT emissions may decrease.

Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72% from 1999 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

3.5.1.4 Potential Air Quality Impacts

Potential Air Quality Impacts Associated with the No-Build Alternative

The No-Build Alternative would not result in measurable impacts to air quality. Traffic congestion may become worse by the design year, especially along the secondary routes used by commuters in northwest Fayette County to access I-40 or eastern portions of Memphis. The slower speeds and longer idling times for vehicles may result in increased emissions in the area than would occur if the area was provided with an additional interstate access point.

There may be minor adverse impacts to air quality under the No-Build Alternative, because there would be more potential for traffic delays along existing secondary routes in the region as the area continues to grow and traffic volumes increase. The increased congestion on normal routes used by commuters may result in those commuters taking alternate routes and result in

increased VMT. Those increases in VMT could result in increased MSATs emissions. However, this impact is not measureable at this time.

Potential Air Quality Impacts Associated with the Build Alternative

The project is not predicted to result in a measurable project-specific air quality impact and, therefore, would not have a substantial air quality impact. The project is currently in an attainment area and ongoing efforts are being made to improve air quality in the region. This project was included in the MPO's LRTP and TIP, both of which have been determined to conform to the SIP. Therefore, the Build Alternative is not expected to result in substantial air quality impacts.

This project will impact travel patterns on several additional routes in the surrounding area due to the new access point it would create. Some commuters will stop using other routes to use the more direct route provided by the new interchange, thus lowering VMT; while others may choose to drive further out of their way to make use of the more efficient new interchange or to access new development in the area, thus increasing VMT. Overall, it is not anticipated that there will be a substantial impact to VMT one way or the other, which means there would not likely be substantial regional MSAT impacts due to this project.

The new interstate access will increase traffic volumes along SR-196, which may result in increased localized MSATs emissions. There may be localized areas where ambient concentrations of MSATs could be higher than the No-Build Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models.

Even though the Build Alternative may increase MSATs near some receptors, thereby increasing the localized level of MSAT emissions; it is possible that the localized effects could be offset by increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be substantially lower than present baseline conditions.

Substantial construction-related MSAT emissions are not anticipated for this project as construction is not planned to occur over an extended building period. However, construction activity may generate temporary increases in MSAT emissions in the project area. Equipment exhaust and dust would be the primary air quality concerns during construction. It is not anticipated that the construction of the proposed project would occur simultaneously with any other major transportation projects in area.

The project is not predicted to result in any substantial measurable air quality impacts. There may be minor short-term air quality impacts during the construction phase of the project that could temporarily affect areas downwind of the project site.

3.5.1.5 Mitigation of Air Quality Impacts

No violations of the NAAQS are projected for this project. Therefore, no air quality mitigation measures are required for the project improvements.

During construction the contractor must comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures would be maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions can be minimized, if the equipment is well maintained.) The potential air quality impacts would be short-term, occurring only while demolition and construction work is in progress and local conditions are appropriate. The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high wind conditions.

Dust and airborne dirt generated by construction activities would be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor and TDOT will meet to review the nature and extent of dust-generating activities and would cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include minimizing track-out of soil onto nearby publicly-traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those that construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project would not cause any short-term particulate matter air quality impacts.

3.6 Noise

3.6.1 Noise Background Information

Traffic noise is often a primary concern for roadway improvement projects. The level of highway traffic noise depends on three things: (1) the volume of the traffic; (2) the speed of the traffic; and (3) the number of trucks in the flow of the traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires. The loudness of traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline or traffic signals) that causes heavy laboring of motor vehicle engines will also increase traffic noise levels. In addition, there are other, more complicated factors that affect the loudness of traffic noise. For example, as a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles. Traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from more lightly traveled roads.

The noise analysis was completed in accordance with FHWA noise standards, *Procedures for Abatement of Highway Traffic and Construction Noise, 23 CFR 772*, and TDOT's *Policy on Highway Traffic Noise Abatement* and included the following tasks:

- Identification of noise-sensitive land uses in the project area;

-
- Determination of existing sound levels at sensitive receivers in the project area;
 - Determination of future sound levels for each alternative;
 - Determination of impacts for each alternative;
 - Evaluation of noise abatement;
 - Discussion of construction noise; and
 - Coordination with local officials.

3.6.1.1 Identification of Noise-Sensitive Land Uses

Land use in the immediate project area is primarily rural agricultural land with the existing I-40 and SR-196 bisecting the area. Review of available electronic mapping and field reconnaissance revealed only one residence in the immediate project area that has potential to be directly affected by the project. This residence is located on Orr Road near the beginning of the proposed realigned section of that roadway. Several residences are located approximately 0.5 miles south of the proposed interchange along SR-196. The Divine Purpose Baptist Church is also located along SR-196, approximately 1.2 miles south of the proposed interchange. Additional residences are located to the northwest of the project area along Hickory Withe Road and SR-196 in Gallaway. Increased traffic volumes on SR-196 following completion of the new interchange could increase noise levels for those areas. Most of the residences located along these routes have relatively long driveways, so that the actual residences are set back from the highway. This will help reduce the potential for noise impacts due to increased traffic.

3.6.1.2 Determination of Existing Sound Levels

Based on noise model results, existing sound levels at the residence on Orr Road are approximately 58 dBA. The noise generated by traffic along I-40 is the main source of background noise in the project area. In general as the distance from I-40 increases, noise levels continue to drop to levels more indicative of low density residential and/or rural areas with few noise generators. However, terrain, wind speed, vegetation and other factors result in varying noise levels within a given distance from I-40. SR-196 currently does not have large traffic volumes, so noise levels along that route are not considered substantial, but noise levels do fluctuate along the route.

3.6.1.3 Determination of Future Sound Levels

Future Peak Hour Equivalent Sound Levels with Project

The FHWA Traffic Noise Model (TNM 2.5) computer program was used to calculate peak hour equivalent sound levels in the design year 2030 for areas along I-40 and SR-196 to determine the potential for impacts to adjacent residences, churches, and other noise-sensitive land uses in the project vicinity. The data was analyzed out to 500-feet from the existing roadway centerlines and the proposed eastbound I-40 exit ramp, since there is one home located in that vicinity. The data was summarized at various distance categories from the existing roadway centerlines to show how noise levels are expected to vary depending on the proximity of the receptors to the roadway.

The future sound levels for the residence on Orr Road are estimated to be 61 dBA under the Build Alternative conditions in the design year 2030. Table 3.11 presents predicted design year equivalent sound levels for areas along SR-196 where vacant and possibly developable lands

exist. Noise predictions were made at distances between 100 and 500 feet from SR-196 for the year 2030 design hour. These values do not represent predicted levels at every location. Sound levels will vary with changes in terrain and will be affected by the shielding of objects, such as houses.

Table 3.11. Build Alternative Design Year 2030 Sound Levels (dBA) – Undeveloped Areas in Fayette County, Tennessee near the proposed I-40 Interchange.

Distance ⁽¹⁾	2030 Sound Levels (dBA) along SR-196	2030 Sound Levels (dBA) along I-40	2030 Sound Levels along Eastbound I-40 Exit Ramp at Proposed SR-196 Interchange
	$L_{Aeq}(1h)^{(2)}$	$L_{Aeq}(1h)$	$L_{Aeq}(1h)$
100 feet	67	--	--
150 feet	63	77	56
200 feet	61	74	54
300 feet	56	69	50
400 feet	53	66	48
500 feet	51	64	46

(1) Perpendicular distance to the centerline of the roadway.
(2) Reflects at-grade situation.

The future year 2030 noise analysis includes projected traffic volumes for the project as well as forecasted background traffic growth and other planned and programmed projects in the area. As a result, the noise impacts predicted for the noise analysis represent both direct and cumulative noise impacts. For this study, it is assumed that noise levels along SR-196 under the No-Build Alternative would be lower than the projections for the Build Alternative due to lower traffic volumes, if the new interchange is not constructed.

3.6.1.4 Noise Impact Analysis

Noise impact is determined by comparing future sound levels to a set of Noise Abatement Criteria (NAC) for a particular land use category and to existing sound levels.

The FHWA noise standards (contained in 23 CFR 772) and TDOT noise policy state that traffic noise impacts warrant consideration of abatement when worst-hour equivalent sound levels approach or exceed the NAC listed in Table 3.12. TDOT policy defines “approach” as one decibel below the NAC, or 66 dBA for Category B land uses.

Table 3.12. Noise Abatement Criteria in 23 CFR 772.

Activity Category	L _{eq} (1h) dBA	Description of Activity
A	57 (Exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	---	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

The FHWA noise standards and TDOT policy also define a noise impact as a substantial increase in design year sound levels above the existing sound levels when the predicted design year sound levels are between 57 and 67 dBA L_{eq}. Table 3.13 presents the TDOT criteria used to define noise increase.

Table 3.13. TDOT Criteria to Define Noise Increase.

Increase (dB)	Subjective Descriptor
0 to 5	Minor Increase
6 to 9	Moderate Increase
10 or more	Substantial Increase

The primary areas of concern for this project are the residence near the proposed relocation of Orr Road and residential properties and the Divine Purpose Church along SR-196 south of the proposed interchange. Therefore, NAC for Activity Category B would apply. Consequently, impacts would occur if predicted future sound levels are 66 dBA or higher, or if a substantial increase in existing sound levels (10 dB or more) is predicted, and the design-hour sound level is between 57 dBA and 67 dBA.

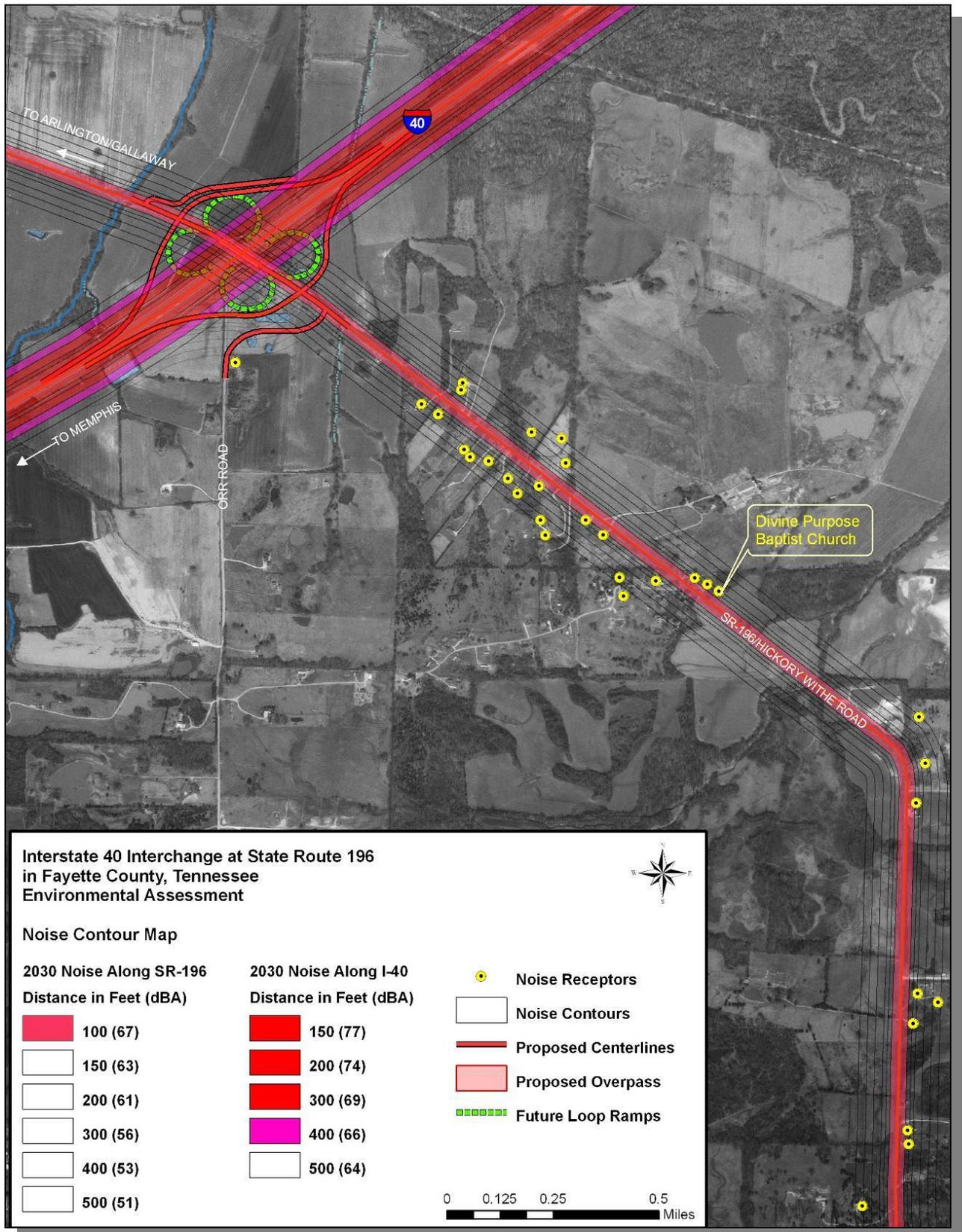
To determine if noise impacts would occur, noise contours were developed for the project area for the design year 2030, based on the data contained above in Table 3.11. Where noise levels were expected to reach above 67 dBA, the noise contours are highlighted in red. Where the

noise levels reached 66 dBA, the noise contours are highlighted in bright pink. The location of the existing residence on Orr Road and the residences and the Divine Purpose Church along SR-196 were mapped in relation to the noise contours shown on the map. Figure 3-6 depicts a summary of the noise impact data for the project area for the year 2030.

Based on the analyses of noise impacts, it was determined that neither the residence on Orr Road, nor the receptors located along SR-196 would experience noise impacts due to the I-40 Interchange being constructed. Additionally, sound level increases are predicted to be less than 5 dB for residences along Orr Road and SR-196 under the Build Alternative. These increases are defined as “minor” in accordance with TDOT’s policy.

Although noise levels would increase in the project vicinity, especially along SR-196, it is not expected that noise levels would approach or exceed NAC levels for any of the adjacent receptors. This is primarily because the receptors are all placed greater than 100 feet from the existing roadway centerline. Should homes or other sensitive receptors be constructed within 100-feet of the roadway before 2030, they would be exposed to noise levels at or above NAC levels. These noise level predictions should be taken into consideration should plans for new residential developments be made along SR-196.

Figure 3-6. Design Year 2030 Noise Contours for the I-40 Interchange Build Alternative.



Potential Noise Impacts Associated with the No-Build Alternative

Based on the analyses conducted for design year sound levels for the Build Alternative, it is assumed that no noise impacts would occur under the No-Build Alternative. Although noise levels would increase along SR-196 due to gradual increases in traffic volumes, it is not expected that noise levels would reach or exceed NAC levels for any receptors in the vicinity. Any increases would be defined as “minor” in accordance with TDOT noise policy. No residences will experience a substantial increase in sound levels under the No-Build Alternative.

Potential Noise Impacts Associated with Build Alternative

Design year sound levels under the Build Alternative are predicted to be below 66 dBA for all receptors along SR-196. Any sound level increases associated with the I-40 Interchange would be defined as “minor” or “moderate” in accordance with TDOT noise policy. No receivers will experience a substantial increase in sound levels under the Build Alternative.

The project will result in intermittent and temporary noise above existing ambient levels due to construction activities in the project vicinity. Land uses that would be sensitive to vehicular noise would also be sensitive to construction noise. There is only one residence located on Orr Road in the vicinity of the new interchange that would be exposed to construction noise associated with the new interchange and relocation of Orr Road. The actual level of noise impact during this period; however, will be a function of the number and type of equipment used, as well as the type of construction activities. This may include heavy equipment movement and grading. However, the construction noise increases would be temporary and would not constitute a noise impact as defined by the FHWA noise standards and TDOT’s noise policy.

Implementation of the project could cause some redistribution of traffic on the surrounding roadway network beyond the modeled network. The project could also affect development and land use patterns in the project area. These situations could result in higher traffic volumes and noise impacts at locations near roadways beyond the project limits. The traffic volumes used in the noise analyses took into consideration some of the expected urban growth in the project vicinity, and therefore noise level predictions account for some future development whether it is promoted by the new interchange or not.

3.6.1.5 Mitigation of Noise Impacts

Noise abatement activities or noise barriers are not required for this project since no noise impacts would occur.

TDOT currently has an active Type II Noise Barrier Program to facilitate the construction of “retrofit” noise barriers along existing highways. To be eligible for a Type II noise barrier, an area must meet the following criteria:

- The neighborhood must be located along a limited-access roadway;
- The neighborhood must be primarily residential;
- The majority (more than 50%) of residences in the neighborhood near the highway pre-dated the initial highway construction;

-
- A noise barrier for the neighborhood must not have been previously determined to be not reasonable or not feasible as part of a new highway construction or through-lane widening study (Type I project);
 - Existing noise levels measured in the neighborhood must be above the Noise Abatement Criteria (NAC) of 66 dBA;
 - A barrier must be feasible to construct and will provide substantial noise reduction; and,
 - A barrier must be reasonable (barrier cost per benefitted residence) in accordance with TDOT's noise policy. A residence is considered "benefitted" if the noise barrier will reduce the traffic noise by at least 5 dB.

Construction Noise

If TDOT's construction specifications apply to this project, construction procedures shall be governed by the *Standard Specifications for Road and Bridge Construction* as issued by TDOT and as amended by the most recent applicable supplements. The contractor will be bound by Section 107.01 of the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic shall be routed during construction so as to cause the least practicable noise impact upon residential and noise sensitive areas.

Coordination with Local Officials

Local planners and developers should consider the potential for noise impacts along SR-196 and I-40 when determining which land uses or types of developments are allowed to occur in the area. The areas directly adjacent to SR-196 and I-40 would be most suited for commercial and industrial areas, with hotels, residential areas, and other more noise sensitive developments being placed further from the roadway centerlines. The noise projections included in Table 3.11 above can be used as general guidance to help planners determine the potential for noise impacts for future developments. However, it is noted that sound levels will vary with changes in terrain and will be affected by the shielding of objects or vegetation.

TDOT encourages local communities and developers to practice noise-compatible land use planning in order to avoid future noise impacts. The following language is included in TDOT's noise policy:

"Highway traffic noise should be reduced through a program of shared responsibility. Local governments should use their power to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway or that the developments are planned, designed and constructed in such a way that noise impacts are minimized."

Additionally, TDOT's noise policy states that:

"noise abatement will also not be considered reasonable for land uses constructed after the date of adoption of this noise policy (based upon local Assessor's records), except for projects involving construction of a roadway on a new alignment."

TDOT's noise policy was adopted in April, 2005. Development constructed after this date will not be eligible for noise abatement for future projects.

3.7 Hazardous Waste Sites

3.7.1 Hazardous Waste Background Information

A site review and database search was conducted to determine whether the condition of properties within or adjacent to the I-40 project area indicated that hazardous substances or petroleum products may be present from past releases or land uses.

The site review and database search included reviews of aerial photographs, the U.S. EPA Envirofacts Web site (www.epa.gov/enviro), List of Underground Storage Tank (UST) Facilities from the TDEC database, and a visual assessment of properties in the project area.

Based on this site investigation and known historical information, none of the properties within or adjacent to the I-40 Interchange proposed project ROW, nor 500-foot study area, had any evidence of environmental concerns related to hazardous or toxic materials. No USTs were identified in the immediate project area.

3.7.1.1 Potential Impacts to Hazardous Waste Sites

Potential Impacts to Hazardous Waste Sites Associated with the No-Build Alternative

The No-Build Alternative would not result in any noticeable changes from the baseline conditions in relation to hazardous waste sites. Regardless of whether or not the I-40 Interchange is constructed, the expected growth in the region may result in an increase in the number of facilities handling or storing hazardous wastes or other products of environmental concern. Also, there would be a slight increase in risks related to transportation of hazardous materials through the area. Without improvements to the existing roadway network, LOS would deteriorate over time, resulting in increased potential for crashes, some of which could include a remote possibility of crashes involving trucks carrying hazardous materials.

Potential Impacts to Hazardous Waste Sites Associated with the Build Alternative

The Build Alternative is not expected to result in any impacts to known hazardous waste sites or other EPA-regulated facilities in the region.

3.7.1.2 Hazardous Waste Sites Mitigation

If any hazardous wastes are encountered within the proposed ROW they would be remediated in accordance with the applicable sections of the Federal Resource Conservation and Recovery Act (RCRA), the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Tennessee Hazardous Waste Management Act of 1983. All project-related activity that involves USTs would adhere to the Tennessee Petroleum Underground Storage Tank Act of 1998 (Tennessee Code Annotated, section 68-215-101 et seq.) and the rules set forth by TDEC's Underground Storage Tank Program (Tennessee Code Annotated, section 68-215-201 et seq.).

3.8 Energy

3.8.1 Energy Background Information

The current commitment of energy resources (mainly gasoline and diesel fuels) in the project area is influenced by traffic flow patterns and travel efficiency. When travel efficiency is reduced or limited, which is the case in the I-40 Interchange area due to access issues, higher consumption of fuel is required than when traffic flow is flowing more freely and travel efficiency is increased.

There are no energy sources in the I-40 Interchange project area that would be potentially impacted. If electrical lines and gas pipelines are impacted in the project construction zone, they would be relocated as part of the project. Details regarding utility relocations would be determined during the design phase of the project.

3.8.1.1 Potential Energy Impacts

Potential Energy Impacts Associated with the No-Build Alternative

The No-Build Alternative would potentially result in adverse impacts to energy in terms of decreased fuel efficiency due to continued decreases in LOS, especially along secondary routes in the area normally used to gain access to I-40. These impacts would gradually become more of an issue as the area continues to grow and more traffic volume is introduced to the area.

The No-Build Alternative would potentially result in additional fuel consumption in the long term due to less efficient travel in the area. This would gradually worsen over time as the secondary routes used to access I-40 become more crowded. In addition, VMT may increase as people look for alternative routes in order to avoid areas that begin to experience frequent traffic delays. This increase in VMT would result in additional fuel consumption.

Potential Impacts to Energy Associated with Build Alternative

Equipment used to construct the I-40 Interchange under the Build Alternative would require additional energy in the short-term when compared to baseline conditions. There would also be short-term adverse impacts due to decreased fuel efficiency during construction activities due to potential construction delays and detours. However, the short-term uses of extra energy during construction are expected to be offset by the energy resources saved due to improved travel efficiency for commuters using the improved facility in the long-term. There would be beneficial impacts on energy consumption in the long term associated with improved traffic flow and efficiency.

There is some potential the new interchange could result in some commuters traveling additional miles to take advantage of the improved travel efficiency and reduced commuting times. This could result in an increase in VMT. However, the more efficient travel and reduced travel times expected due to the improved access may offset any increases in VMT. Regardless, the project is not expected to have any substantial adverse impacts on energy consumption rates.

Secondary commercial and residential development could increase following completion of the proposed project due to improved transportation facilities and improved access to adjacent areas. Increased construction activities resulting from new developments, along with subsequent increases in populations, would likely result in increased energy demands within the area. However, it is likely that this area will continue to become more populated and developed regardless of this project. Therefore, when compared to expected baseline conditions or No-Build conditions, this project would not have measurable impacts. The timing in which the immediate project area becomes developed may be reduced. The improved traffic efficiency the new interchange would provide would offset much of the increased energy consumption that could be attributed to secondary developments that are promoted by the project.

3.9 Section 4(f) Properties

According to Section 4(f) of the Department of Transportation Act of 1966, recodified as 49 United States Code Section 303, "The Secretary [of Transportation] shall not approve any program or project which requires the use of any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic structure of National, State, or local significance determined by such officials unless:

- There is no feasible and prudent alternative to the use of such land; and
- The project includes all possible planning to minimize harm to the land resulting from such use.

No Section 4(f) eligible properties are expected to be impacted by this project. It is also the opinion of TDOT, pursuant to 36 CFR 800.5, that the project would have no adverse effect to any NRHP-eligible properties.

3.10 Construction Impacts

Adverse impacts from construction would be primarily short-term in duration. Construction inconveniences such as noise, dust, and traffic conflicts are likely to be unavoidable yet are greatest during the construction phase only.

In order to minimize potential detrimental effects from noise, siltation, soil erosion, or possible pollution of area watercourses, the construction contractors would be required to comply with the special provisions of *Standard Specifications for Road and Bridge Construction* (TDOT, 2006) and the *Best Management Practices for Erosion and Sediment Control* (FHWA, 1995). These provisions implement the requirements of the FHWA's Federal-Aid Policy Guide (Subchapter G part 650b).

Contractors would be required to conduct and schedule operations according to these provisions. For example, the contractor would be bound by the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic would be routed during construction in a manner that has the least noise impact practicable upon residential and noise sensitive areas. In addition, coordination with affected utility companies would minimize

disruption to utility services. Furthermore, TDOT would coordinate with local governments during the construction phase to minimize disruption to communities accepting detoured traffic.

Any action involving open burning would be in accordance with Chapter 1200-3-4 (“Open Burning”) of the Tennessee Air Pollution Control Regulations. Any action resulting in fugitive dust would be in accordance with Chapter 1200 3 8 (“Fugitive Dust”). The general contractor and all related subcontractors associated with the project would be required to have a valid operation permit from the Tennessee Air Pollution Control Division or to obtain an exception from the regulations through board action.

Solid waste generated by construction activities would be disposed of in accordance with all state rules and regulations concerning solid waste management. Where possible, land debris would be disposed at a registered sanitary landfill site. If the use of a landfill is not possible, the contractor would dispose of the solid waste in a manner that is compliant with appropriate TDEC and/or EPA regulations.

If any previously unknown archaeological resources are uncovered during construction of the proposed project, all construction activities would be halted in the immediate area until the area is cleared for further activities. TDOT would continue to coordinate with the SHPO should any new cultural resources be discovered.

Short-term adverse impacts to fish and wildlife would likely result from construction activities. Noise impacts could alter wildlife behavior and inhibit mating, breeding, nesting, and feeding/foraging activities. Construction activities could result in direct mortality to less mobile terrestrial and aquatic species. All reasonable precautions would be taken to minimize short-term and long-term impacts to plants and wildlife and their habitat. Several mitigation measures that would avoid or minimize short-term and long-term adverse impacts to species would be required conditions of the build alternative. These would include:

- Streamside and in-stream construction work would occur during dry periods;
- Removal of vegetation near the streams would occur only as necessary to accomplish the proposed action. Where removal of vegetation is necessary, bank stabilization measures would be used. Stream bank restoration measures would include seeding with native species and the placing of rip-rap or other bank stabilization techniques, as outlined in TDEC’s *Riparian Restoration and Streamside Erosion Control Handbook* (TDEC, 1998a); and
- Proper sediment control measures, such as silt fences, would be used as outlined in the *Tennessee Erosion and Sediment Control Handbook* (TDEC, 2001b) and *Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites* (Smoot et al., 1992).

3.11 Indirect and Cumulative Impacts Analysis

Sections 3.2 through 3.10 describe the direct impacts anticipated to be associated with the No-Build Alternative and the Build Alternative for the I-40 Interchange project. This section presents a summary of the potential indirect and cumulative impacts associated with the I-40 Interchange project. A more detailed Cumulative Impacts discussion is contained in a separate Cumulative Impacts Analysis Report prepared for this project. That report is on file with the TDOT Environmental Division.

3.11.1 Definitions of Key Terms Used in the Indirect and Cumulative Impacts Analyses

An indirect impact is caused by the proposed action and occurs later in time or is farther removed in distance but is still reasonably foreseeable. Cumulative impacts are impacts on the environment that result from the incremental impact of a project when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions. Cumulative impact analyses look at the combined effect on an entire resource due to multiple projects or actions, whereas direct and indirect impact analyses refer to more specific impacts on a given resource that can be attributed to one specific project, such as a new roadway or roadway improvement.

The cumulative impact analyses for this project have been conducted at a level of detail that is reasonable and appropriate to support an informed decision in determining if the proposed project should be implemented. Cumulative impacts analyses typically focus on the impact to an entire resource and at a broader scale than the initial analysis of direct and indirect impacts associated with a specific individual project or action.

3.11.1.1 Past and Present Actions within the I-40 Interchange Project Vicinity

Past Actions

Past actions are defined as actions within the cumulative impact analysis area that occurred before the current NEPA study was initiated. These include past actions in the project area, and past demographic, land use, and development trends in the areas that surround the project area. Past actions are discussed in greater detail below. In most cases, the characteristics and results of these past actions comprise the baseline conditions that set the framework for determining what impacts the proposed project would have on those existing or remaining resources.

Present Actions

Present actions include:

- Current activities within the cumulative impact analysis areas; and
- Current resource management programs, land use activities, and development projects that are being implemented by other governmental agencies and the private sector (where they can be identified) within the cumulative impact analysis areas.

The affected environments of the social, economic, natural, and cultural resources occurring within the I-40 Interchange project area are discussed in Sections 3.2 through 3.10 of this EA. The affected environments of the various resources considered have resulted from all past and

present actions in the project area. These actions have provided the baseline conditions against which to evaluate any cumulative impacts that could result from the proposed project.

Additional details regarding some of the resources are contained in the various Technical Study Documents that have been prepared in support of the EA. These reports include: the Ecology Study Report, Historical and Architectural Survey Report, Phase I Archaeological Resources Survey Report, and Air Quality and Noise Evaluation Report. These documents are available upon request through the TDOT Environmental Division.

3.11.1.2 Reasonably Foreseeable Future Actions within the Surrounding Area

Reasonably-Foreseeable Future Actions

Reasonably-foreseeable future actions may include those actions in the planning, budgeting, or execution phases. Actions may be those of the federal government, state government, local government, private organizations or companies, or individuals.

Cumulative effects can be analyzed with respect to all resource areas, including ecological resources, physical resources, historical and archaeological resources, economic resources, and social conditions. Cumulative effects can be both beneficial and adverse.

The following reasonably foreseeable future actions would likely occur near and within the project area regardless of whether the proposed project is implemented:

- **Continuation of private project development and activity trends including:**
The conversion of agricultural and open land to urban land uses including residential, commercial, and industrial uses. These developments would likely occur first near the existing communities, such as Arlington and Gallaway, and along the secondary routes currently used to provide access to the existing I-40 interchanges located west and east of the proposed I-40 Interchange project area.

Development of new residential neighborhoods on subdivided tracts with relatively small lot sizes.

- **Minor improvements and/or maintenance of existing roadways and bridges:**
Routine roadway, bridge, and ROW maintenance activities and other minor improvements would continue to be required on existing local and regional roadways to improve safety and traffic flow, and to support the anticipated increases in vehicular traffic within the region.

Maintenance activities may include resurfacing roadways, widening or repairing shoulders, repairing or replacing culverts and small bridges, improving intersections by adding turn lanes and/or signals, mowing, snow removal, and various other activities. Most of these activities are expected to have minor environmental impacts due to their small area of impact and short-lived construction period. Therefore, those activities would not have a high potential to result in cumulative impacts with other projects such as this I-40 Interchange project.

- **Continuation of Urban Growth in Fayette County:** Urban growth is expected to continue in Fayette County. This development is part of the overall outward expansion of Memphis and its suburbs. This growth is anticipated to become more prevalent in the proposed I-40 Interchange project area in the near future. The project area is identified as a Planned Growth Area as detailed in the Fayette County Growth Plan.

3.11.1.3 Cumulative Impact Analysis Area

Because the cumulative impacts analyses were focused on the individual resources present in the I-40 Interchange project vicinity, the analysis area studied varies in size by individual resource category. This differs somewhat from the direct and indirect impacts analyses because those analyses are focused more on the site specific impacts to those resources anticipated to be caused by the action of constructing the I-40 Interchange or the secondary developments anticipated to be induced by the new interstate access. In the cumulative impacts analyses, the direct or indirect impacts of the project are analyzed in addition to the direct and indirect impacts of other non-related projects in the vicinity that could cumulatively affect the same resources, but on a broader scale.

The cumulative impact analyses included that area that had a reasonable potential to be noticeably affected by implementation of the proposed I-40 Interchange project, in combination with other past, present, and reasonably foreseeable projects. The boundaries of the cumulative impact analysis area for each resource category are identified on Table 3.14.

Table 3.14. Analysis Area by Resource Category Considered in the Cumulative Impacts Analyses for the I-40 Interchange Project.

Resource Category	Analysis Area
Land Use and Infrastructure	Cumulative impacts to Land Use and Infrastructure were assessed based upon a 2-mile buffer from the approximate center of the I-40 Interchange Build Alternative. These impacts were assessed relative to development projects identified in the field in the immediate area and in relation to known projects or plans provided by state and local government planning organizations with known projects in the vicinity.
Social Environment and Community Resources	In general, cumulative impacts to the Social Environment and Community Resources were assessed relative to Fayette County. Some of the various Social Environment and Community Resources were assessed at more local levels as appropriate based on the level of available data.
Economic Environment	Cumulative impacts to the Economic Environment were assessed relative to Fayette County.

Resource Category	Analysis Area
Farmland	Cumulative impacts to Farmland were assessed relative to Fayette County.
Aquatic Resources	Cumulative impacts to Aquatic Resources were assessed within the Loosahatchie River Watershed, which is the watershed that drains the project area. Assessment of impacts considered reaches both upstream and downstream of the project area. Downstream consideration terminates 4 miles from the centerline of each Build Alternative stream crossing or modification.
Wetlands	Cumulative impacts to wetlands were assessed relative to the immediate watershed containing them.
Floodplains	Cumulative impacts to floodplains were considered based upon the Loosahatchie River floodplain and associated watershed. Downstream consideration terminated 4 miles downstream of the nearest Build Alternative floodplain impact.
Threatened and Endangered Species	Cumulative impact consideration for endangered species was dependent upon the organism. Cumulative impacts to listed aquatic organisms were assessed to 4 miles downstream and 1-mile upstream of the project. Cumulative impacts to listed terrestrial species were assessed in a 1-mile buffer from the project center point. Cumulative impacts to endangered bats were considered for any known populations within 5 miles of the project center point.
Fish and Wildlife Resources	Cumulative impacts to aquatic habitats and species were assessed based upon the Loosahatchie River Watershed. This assessment considered impacts both upstream and downstream of the project area. Downstream consideration terminated 4 miles downstream of each Build Alternative stream crossing. Cumulative impacts to terrestrial wildlife were assessed based upon a 1-mile buffer surrounding the project center point.
Cultural Resources	Cumulative impacts consideration was based upon the Area of Potential Effect (APE) for Cultural Resources which includes all areas within and immediately adjacent to the proposed ROW of the Build Alternative.
Air Quality	Cumulative impacts to Air Quality were assessed relative to the attainment status of Fayette County.
Noise	Cumulative impacts of Noise were assessed based upon a 1-mile

Resource Category	Analysis Area
	buffer from the project construction limits.
Hazardous Materials	Cumulative impacts to Hazardous Materials were assessed based upon a 1-mile buffer surrounding the project center point.
<i>Source: Parsons, 2008</i>	

3.11.1.4 Indirect Impacts

The proposed I-40 Interchange project could encourage secondary development within the general vicinity of the new interchange due to the improved interstate access. The primary considerations of this secondary growth used for the indirect impacts analyses include:

- An increase in conversion of land near the proposed new interchange to commercial land uses, especially service or vehicle oriented facilities such as restaurants and gas stations;
- Conversion of low-density rural residential areas to single-family and multi-family residential communities; and
- An increase in conversion of land near the new interchange to industrial land uses due to anticipated improved access for large trucks typically used to ship products or supplies to and from such facilities in Tennessee.

The basic concepts discussed in the National Cooperative Highway Research Program (NCHRP) Report 466 “Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects” were used during the indirect impacts analyses.

3.11.2 Potential Indirect and Cumulative Impacts Associated with the No-Build Alternative

The No-Build Alternative would have indirect and cumulative impacts as follows:

- Growth in northwestern Fayette County, including the area surrounding Gallaway, would likely occur at a slower rate. Therefore, overall land use changes in the area would be slower to occur than would be expected if a new interchange were constructed at SR-196 to provide improved access to the area. However, because a portion of the area is included in the Planned Growth Boundary for Gallaway, it is expected that much of the project vicinity will eventually become developed with or without the new interchange.
- Not constructing the I-40 Interchange would contribute to continued declines in travel efficiency due to the gradual increases in traffic volumes with the anticipated growth in the area. Increasing traffic volumes will gradually result in a decrease in LOS on the secondary routes currently used to access I-40 and may also result in declining safety along those routes.

-
- Economic growth would be slow in the project vicinity if the new interchange is not constructed, due to poor access to much of the area and limitations on some of the secondary routes to support increased traffic, especially related to industrial developments. This could result in adverse cumulative impact for areas that may already be seeing depressed income levels and lack of economic growth. Tax revenues for local communities may also be slow to increase due to slower development of the area under the No-Build Alternative.
 - Property values may increase more slowly in the project vicinity if the access to the area is not improved. It is likely that some growth would continue to occur in the area regardless of the new interchange, but it would occur at a slower pace and not likely result in a substantial increase in property values in the immediate project vicinity due to limited access to the interstate.
 - Response times for emergency vehicles may increase as growth continues to occur in Fayette County and traffic volumes continue to increase on existing routes.
 - The potential for transportation savings for local residents would not be realized under the No-Build Alternative. Although other roadway improvements may occur in the region, and more fuel efficient vehicles may become available to help reduce some costs; the increased travel times and potential for accidents, as secondary roadways become more crowded, would result in potential increased costs.
 - Farmland would continue to be converted to other land uses in the project vicinity regardless of whether the new interchange is constructed or not. However, the conversion would likely occur at a slower rate than would occur if the interchange is built.
 - Ecological resources including streams, forests, wetlands, and other fish and wildlife habitats would continue to be impacted in the project vicinity due to the continued growth and development of the area regardless of whether the new interchange is constructed or not. However, the conversion of undeveloped areas to developed areas would likely occur at a slower rate than would occur if the interchange is built.
 - It is anticipated that not constructing the I-40 Interchange project would result in potential adverse impacts to air quality in the area due to continued reduction in travel efficiency and increased congestion on secondary routes. These adverse impacts would offset some of the beneficial impacts to air quality expected to occur with other programs aimed at improving the regional air quality, including EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020.

3.11.3 Potential Indirect and Cumulative Impacts Associated with the Build Alternative

The I-40 Interchange Build Alternative would have indirect and cumulative impacts as follows:

- Growth in northwestern Fayette County, including the area surrounding Gallaway, would likely occur at a faster rate if the new I-40 Interchange is constructed because

access to the surrounding land would be improved. This faster growth in the area would result in land use changes that would result in loss of open space and farmland. The surrounding area would eventually become less rural as more development occurs. Local land use planners can help ensure that the growth in the area occurs in a controlled manner so that adverse impacts to local communities and other resources can be minimized.

- If the I-40 Interchange is constructed at the proposed location, it is likely that new developments would follow. Highway-oriented commercial development, to include service stations, fast-food restaurants, truck stops, and motels, would most likely be the initial types of development if the interchange is constructed. Local officials are anticipating residential development to increase and have discussed the possibility of a shopping mall in the immediate surrounding area.
- Construction of a new I-40 Interchange at SR-196 would improve travel efficiency for commuters living in the area and would help to alleviate potential problems on other secondary routes currently used to gain access to I-40.
- Provision of the new I-40 Interchange would promote economic growth in the project vicinity, including the Gallaway area. This would help improve personal income levels in the area as well as tax revenues for local communities.
- It is expected that there could be a potential increase in property values for those properties with increased accessibility and development potential at key areas in proximity to the I-40 Interchange. The increases in property value would complement any other increases that are likely to occur as a result of more services, utilities, retail stores, restaurants, and other developments being added in the area as Fayette County continues to grow. As growth occurs, the demand for developable land will increase and likely result in increases in property values.
- The I-40 Interchange project may help improve economic conditions in the immediate project vicinity. Induced development could result in an increased real property tax base and tax revenues. The potential induced development could result in a local increase in employment and personal income, and an increase in sales and other business-related taxes. The new jobs that would likely be created in the area would help to improve income levels in the area, especially the City of Gallaway, where median household income lags behind the median income for the county as a whole.
- Response times for emergency vehicles would likely improve due to the improved access provided by the new I-40 interchange. These improvements would complement other improvements that would likely occur as the area continues to become more developed, as is currently planned. Improvements would likely include addition of new fire stations, ambulance stations, and other public services that would need to be developed as the population increases.

-
- There would be a continued loss of open space as the area is transformed from a rural setting to more of a suburban setting. The loss of open space would result in visual impacts in the project area. However, this would not differ substantially from the No-Build Alternative in the long-term. Construction of new buildings and newly landscaped areas may actually result in visual improvements in some areas. Perception of visual impacts is typically different among individuals, so it is often difficult to determine if conversion of open agricultural fields to newly constructed homes or other buildings with trees and other landscaping surrounding them is considered adverse or beneficial.
 - There would be potential transportation cost savings with implementation of the Build Alternative because of the improved access, which would reduce travel times and likely reduce the accident potential on secondary routes. These improvements would complement other transportation cost improvements resulting from other roadway improvements and more fuel-efficient vehicles.
 - Farmland would continue to be converted to other land uses as the area continues to grow and become more suburban. Farmland and soils adjacent to the new I-40 Interchange could be indirectly impacted through secondary development. The project is expected to encourage new development, especially along SR-196 near the proposed interchange. Given the rural nature of this area and amount of land currently being used for agriculture in the surrounding area, it is likely that some of this new development would occur on farmland. Based on the Fayette County and City Growth Plan, some new development would be expected to occur in this area regardless of the new interchange being constructed, so not all of the conversion of land to urban uses in the area would be attributable to the new interchange. The interchange may promote earlier development of the area.

Some of the secondary impacts to farmland could be controlled by local zoning and land use planning efforts. Also, the landowners would have the choice whether or not to stop farming their land to convert it to other uses or to sell their property to private developers. When land values increase in an area, such as would be expected for land adjacent to the new I-40 Interchange, it often makes sense for farmers to sell their strategically located property at the new elevated price and then to purchase new property to farm in areas less strategically located for development (land further from the new interchange) Because the value of the land they are selling may be worth more than the land they are purchasing, those farmers may end up being able to purchase more acres to farm than they farmed on their current property.

- Ecological resources including streams, forests, wetlands, and other fish and wildlife habitats would be impacted in the project vicinity due to the continued growth and development of the area. Although this development would likely occur in the long term, regardless of whether the new interchange is constructed or not, the new interchange would likely increase the rate at which the area becomes developed. Human activity has already extensively modified the natural resources of the study

area, and virtually all of the land in the project area has been developed or altered to some extent. The habitat types are already fragmented and modified by the existing agricultural land uses, residential developments, and construction of the existing roadways and other infrastructure. Consequently, there are no substantial reasonably foreseeable, cumulative impacts to natural resources associated with the proposed project.

- As more development occurs, there would be additional access roadways, parking lots, and driveways built. This will result in an increase in the percentage of impervious surface in the project area. As the amount of impervious surfaces increases, stormwater runoff would increase. Stormwater runoff often carries chemicals associated with roads and lawn fertilizer from new residences, which would degrade downstream water quality and aquatic habitats.
- The continued growth and development of the area is likely to result in some construction in floodplains. This would likely be more of an issue further into the future as the more developable upland areas become fully developed and the more readily-developable lands become more scarce. However, there is currently a large amount of undeveloped upland areas in the project vicinity, so impacts to floodplains is expected to be minimal at this time.
- Secondary developments associated with the I-40 Interchange would result in additional land disturbances that could result in the spread of invasive plant species.
- It is anticipated that the I-40 Interchange project would result in long-term beneficial impacts to air quality in the region by improving travel efficiency. The improved transportation would combine with the positive impacts of other programs aimed at improving the regional air quality, including EPA's national control programs that are projected to reduce MSAT emissions by 72% percent from 1999 to 2050.
- Some localized adverse air quality impacts could occur depending on the types of new developments that occur in the area. Due to this project being a new interstate interchange with developable land surrounding it, it is likely that secondary developments may include truck stops and/or other gas stations. These facilities could result in increased emissions in the local area that could reduce the air quality in the immediate area. However, the impacts of this can not be quantified at this time, because the amount and type of secondary developments is currently unknown. Local land use planners could play a role in the types of development that occur in the area. Also, all new developments in the area would be required to comply with all local, state, and federal regulations related to air quality and other environmental issues
- It is anticipated that the Build Alternative would result in higher noise levels for residences along SR-196 due to increased traffic associated with the new interchange. This increased noise would combine with any other new noise generators that may be developed in the project vicinity. Since most of the residences in the immediate project vicinity have relatively long driveways and are

therefore further from the centerline of SR-196, traffic noise is not anticipated to result in substantial noise impacts for existing residences. Local planners can help reduce impacts due to noise by proper land use planning that results in placement of new residential areas and other noise sensitive land uses in areas that are away from noise generating land uses such as highways, industrial sites, railroads, etc., which are known or expected to conflict with the sensitive land uses.

- It is anticipated that the continued growth and development in the area will result in an increase in the number of facilities transporting, handling, and/or storing hazardous materials. The new I-40 Interchange may result in faster development in the area and may promote development of gas stations, industrial sites, and other facilities that handle and/or store hazardous or toxic materials. Regulatory agencies will monitor all new developments to help ensure that all hazardous materials are handled, stored, and transported properly to avoid spills or other potential adverse impacts associated with those materials. Spills on highways are a potential source of water quality degradation and a possible public health hazard. The likelihood of such spills or leaks impacting such resources would be considered low. Spill response teams in the area can normally contain accidental spills or leaks in a timely manner limiting the adverse impacts of such events to the localized area of the spill site. The Tennessee Emergency Management Agency (TEMA) has the responsibility and authority for coordination of all state and local agencies during accidents involving hazardous materials. The TEMA has demonstrated its ability to effectively manage such incidents.
- Regardless of whether or not the new I-40 Interchange is constructed, portions of the project study area are likely to become developed in the reasonably foreseeable future due to the proximity of the entire area to Memphis and I-40. Fayette County has mechanisms in effect to minimize, mitigate, or avoid adverse impacts of project implementation. Such issues as land use buffering and noise mitigation can be addressed through implementation and application of the County Growth Policy Plan, city zoning, and any subdivision ordinances, design guidelines, and other special ordinances and/or policies that may be in effect, or that may be developed as the area continues to grow. Regulatory agencies will be responsible for monitoring private developments in the project area to help ensure no substantial water quality impacts or other major environmental impacts occur. Proper planning can be beneficial to the residents that currently live in the project vicinity, to future residents that will live in the area, and to the natural environment. Cumulative environmental impacts can be minimized if proactive measures are taken as each new development or project is implemented.

3.12 Summary of Environmental Consequences

Table 3.15 contains summary environmental consequences information for the proposed I-40 Interchange Build Alternative.

Table 3.15. Summary data for the I-40 Interchange project in Fayette County, Tennessee.

Resource	Build Alternative
Total Size of Study Area (acres)*	160
Land Uses/Wildlife Habitat Present	
Forest (acres)**	18
Old Field (acres)	10
Pasture	15
Agriculture (acres)	75
Developed/Disturbed (acres)	40
Open Water (acres)	3
Residential/Business/Non-Profit Displacements	0
Farmland Conversion Impact Rating Score (out of 260 points possible)	159
Noise Receptors Impacted	0
Aquatic Resources Present	
Streams Present/Impacted (number)	3
Stream Channel in Corridor (feet)	3,377
Streams Channelized (number of feet modified)	1 (2,414)
Ponds Present (number)	6
Wetlands (acres)	0
100-year Floodplain (acres)	36
Archaeological Sites Impacted (number)	0
Historic Sites Impacted (number)	0
Hazardous Materials Sites Impacted (number)	0
<p>* Unless otherwise noted in the specific categories above, the study area for the land use and natural resources reported in this table was 500-foot wide (including 250-foot on either side of the centerline of each ramp or roadway segment making up the proposed interchange under the Build Alternative). Because the actual ROW would narrower than 500 feet, the actual impacts to many of the resources in this table would be less. This data characterizes the worst case scenario for the impacts that would occur under the Build Alternative. This data can be extrapolated to the narrower ROW boundary in most cases. Exact impacts to the various resources in this table will be refined following development of more detailed design plans.</p> <p>Source: Parsons, 2009</p>	

3.13 Environmental Permits

The acquisition of permits would occur prior to initiation of construction activities, pursuant to Section 69-3-108(a) of the Tennessee Water Quality Control Act of 1977 and other State and Federal laws and regulations. These permits could include:

- Clean Water Act Section 404 Permit – required for construction that involves placement of dredge and fill material in Waters of the U.S. and/or impacts to Waters of the U.S. where federally listed Threatened or Endangered species are present. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. Section 404 Permits are issued by the U.S. Army Corps of Engineers (USACE);
- Aquatic Resource Alteration Permit (ARAP) – required for any alterations of State waters, including wetlands that do not require a Federal (Section 404) permit. The ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring-fed or impacts springs; reservoirs; wetlands; blue line streams; intermittent blueline streams on the United States Geologic Survey (USGS) 7.5 quadrangle map; any stream that supports any form of aquatic life; or is in the vicinity of a State-listed endangered species. Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control issues ARAP permits;
- National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit – required for grubbing, clearing, grading, or excavation of one or more acres of land and for stormwater discharges. TDEC’s Division of Water Pollution Control issues NPDES permits; and
- Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP) – required by operators of construction sites in Tennessee.

In addition, the State of Tennessee would require water quality certification under Section 401 of the CWA. Section 401 certification ensures that activities requiring a Federal permit or license will not cause pollution in violation of State water quality standards.

CHAPTER 4 - PUBLIC INVOLVEMENT

4.1 Initial Coordination with Federal, State, and Local Agencies

On March 10, 2008, an initial coordination package was sent to a total of 49 Federal, State, local, and regional agencies and officials, as well as other interested organizations. This package consisted of a letter requesting review and comment, a project data summary, and a copy of the project's Coordination Plan. The data summary contained a project location map and a map showing the conceptual layout of the project, which was later accepted as the Build Alternative analyzed in the EA. The initial coordination packages were sent out by e-mail unless an agency requested hard copies or CD's be sent instead.

This initial coordination effort afforded concerned agencies and local officials an opportunity to provide input into the project planning process during the early stages of project development. This process helps to ensure that all foreseeable impacts and concerns are considered in the environmental and location studies.

The U.S. Army Corps of Engineers (USACE) was requested to become a Cooperating Agency by TDOT. Several of the Federal and State agencies that were sent the initial coordination packages were invited to become Participating Agencies, along with some of the local governments. A list of all agencies, organizations, and other community representatives that were sent an initial coordination package are shown below on Table 4.1. This table also shows which agencies were invited to become Cooperating and/or Participating Agencies for this project.

Table 4.1. List of agencies, organizations, or community representatives that were sent an Initial Coordination package for the I-40 Interchange project in Fayette County, Tennessee.

AGENCY TYPE	NAME	RESPONSE
Federal*	United States Department of Defense U.S. Army Corps of Engineers, Memphis District	
Federal	Tennessee Valley Authority NEPA Policy Program Manager	X
Federal	U.S. Department of Agriculture Natural Resources Conservation Service	X
Federal	Department of Housing and Urban Development Environmental Officer	
Federal	U.S. Department of Commerce National Oceanic and Atmospheric Administration	
Federal	Federal Railroad Administration Office of Economic Analysis	
Federal**	Environmental Protection Agency Environmental Assessment Office	
Federal	Environmental Protection Agency Office of Federal Activities	
Federal	U.S. Department of the Interior Office of Surface Mining	
Federal	Federal Energy Regulatory Commission	
Federal	U.S. Department of Interior U.S. Geological Survey Office of Environmental Affairs	
Federal	Federal Aviation Administration Memphis Airport District Office	
Federal	Federal Emergency Management Agency Regional Environmental Officer	
Federal	U.S. Department of Interior U.S. Geological Survey Water Resources Division	
Federal**	U.S. Department of Interior U.S. Fish and Wildlife Service	
Federal	U.S. Department of Interior Office of Environmental Policy and Compliance	
Federal	Advisory Council on Historic Preservation	
State	Tennessee Department of Agriculture NEPA Contact	
State	Tennessee Department of Economic & Community Development Office of Special Projects	X
State	Tennessee Department of Economic & Community	

AGENCY TYPE	NAME	RESPONSE
	Development Local Planning Assistance Office	
State	Tennessee Department of Education Director of Operations	
State**	Tennessee Department of Environment & Conservation TDEC.TESA@state.tn.us	
State**	Tennessee Wildlife Resources Agency NEPA Contact	X
State	Tennessee Housing and Development Agency	
Local**	Memphis and Shelby County Office of Planning and Development, Memphis Urban Area Metropolitan Planning Organization (MPO)	
Local**	Memphis Area Rural Planning Organization (RPO)	
Local	Dr. W. W. Herenton Mayor of Memphis	
Local	Mr. Rhea "Skip" Taylor Mayor of Fayette County	
Local	Mr. Chester Cocke Mayor of Braden	
Local	Ms. Patricia Garrett Mayor of Gallaway	
Local	Mr. Bill Mullins Mayor of Oakland	
Local	Mr. Buck Chambers Mayor of Piperton	
Local	Mr. Robert S. "Bob" Morris Mayor of Somerville	X
Local	Mr. Russell Wiseman Mayor of Arlington	
Local	Mr. John Pitner Fayette County Planning and Development Office	
Local	Honorable Dolores R. Gresham State Representative	
Local	Honorable John Shelton Wilder State Senator	
Local	Ms. Julie Perrine, Executive Director Fayette County Chamber of Commerce	
Local	Tennessee Trails Association	
Local	Memphis Area Association of Governments	
Local	State Review Board	
Local	West Tennessee Historical Society	
Private	Tennessee State Chapter of the Sierra Club	
Private	Sierra Club	
Private	Tennessee Conservation League	

AGENCY TYPE	NAME	RESPONSE
Private	World Wildlife Fund	
Private	Tennessee Environmental Council	
Private	The Nature Conservancy	
Private	NAACP	
* <i>Agency to be invited to become a Cooperating and Participating Agency</i>		
** <i>Agency to be invited to become a Participating Agency</i>		

4.2 Summary and Disposition of Comments Received from the Initial Coordination

There were five replies to the initial coordination package that was sent to the 49 Federal, State, and local planning/resource management agencies, and private groups. This low response rate is likely due to the relative small scope of this project and the resulting lower potential for environmental impacts. Several Federal and State agencies are also involved with the project through the Tennessee Environmental Streamlining Agreement (TESA) for the Environmental and Regulatory Coordination of Transportation Projects. Therefore, several agencies that did not provide a direct response to the Initial Coordination efforts have provided input throughout the early planning stages of the project, including the NEPA process, and will continue to have an opportunity to be involved with the remaining planning efforts for the project. The following is a brief summary of the comments contained in the initial coordination responses. Copies of the full response letters and/or e-mails are attached in Appendix A.

4.2.1 Federal Agencies

Tennessee Valley Authority – NEPA Policy Program Manager

SUMMARY:

“I have reviewed this initial coordination package, and have no comments on it. It does not appear that any TVA resources would be affected and the project does not need a Section 26a permit or other approval from TVA.”

DISPOSITION:

TDOT concurs that this project would not impact TVA resources and would not require a Section 26a permit.

U.S. Department of Agriculture – Natural Resources Conservation Service

SUMMARY:

“Enclosed is the completed AD-1006 Farmland Conversion Impact Rating for the above mentioned project. Also I would like to bring to your attention that some of the soils mapped in the project area are on the local hydric soil list. Therefore, wetlands may exist in the project area.”

DISPOSITION:

TDOT has incorporated the AD-1006 Farmland Conversion Impact Rating into the farmland impact analyses in Section 3.2.4 of this EA. No substantial farmland impacts are expected due to the small size of this project. The project area was also investigated for the presence of wetlands. No wetlands were located within the immediate 500-foot study area surrounding the proposed interchange. Past land uses, stream channelizations, other drainage modifications, and disturbances associated with construction of the existing I-40 and SR-196 have likely resulted in the loss of any wetlands that may have existed in the immediate project area. There are likely some remnant wetlands located to the east of the project area near the Loosahatchie River. However, those wetlands would not likely be impacted by this project.

4.2.2 State Agencies**Tennessee Wildlife Resources Agency****SUMMARY:**

“The Tennessee Wildlife Resources Agency has received and reviewed the information your office provided to us regarding the invitation to become a participating agency in the development of an Environmental Impact Statement for the proposed Interstate 40 Interchange at State Route 196 in Fayette County. We accept the invitation to participate.”

DISPOSITION:

TDOT appreciates the Tennessee Wildlife Resources Agency (TWRA) accepting the invitation to participate in this project. TWRA is one of the TESA agencies that has provided input for this project throughout the early planning stages of the project. TDOT will continue to coordinate with TWRA throughout the NEPA and planning process for this project to ensure that all fish and wildlife impacts are avoided or minimized to the extent possible.

Tennessee Department of Economic and Community Development –**Office of Special Projects****SUMMARY:**

“We prefer the Build Alternative involving construction of a full diamond interchange with space for construction of loop ramps in all four quadrants.”

DISPOSITION:

TDOT will take this comment into consideration during the selection of a preferred alternative for the project.

4.2.3 Local Agencies/Organizations

City of Somerville – City Administrator

SUMMARY:

“From a Somerville position, there seems be no effect on this proposed project.”

DISPOSITION:

TDOT appreciates the City of Somerville responding to the coordination efforts. TDOT concurs that this project would not have a substantial impact to the City of Somerville. However, the overall improvement to the regional transportation network will likely benefit some residents of the City of Somerville by providing potential alternative access to I-40.

4.3 Public Involvement Meetings

A Public Meeting was held for the project on December 13, 2007 at the Oakland Elementary School, 14925 Highway 194 North, Oakland, Tennessee. The purpose of the meeting was to make available to the public all information concerning the project, present the possible Build Alternative layout for viewing and discussion, and solicit comments and suggestions on alternatives for consideration by TDOT. The meeting was from 5:30 to 7:30 p.m, and consisted of a viewing of displays of the proposed Build Alternative layout, a PowerPoint presentation describing the project and NEPA process, and a question and answer period led by TDOT.

A total of 6 TDOT staff and their consultants were available at the meeting to assist the public attendees. A total of 48 people signed-in at the meeting. One state representative was in attendance, as well as county and local officials from Fayette County, the Memphis Area Association of Governments (Rural Planning Organization) (RPO) coordinator, and the City of Gallaway.

Comments were taken from the public in the form of written comments turned in at the meeting, recorded comments made to the court reporter, and comments submitted by mail and e-mail. All forms of comments were collected and made part of the official transcript of the meeting.

4.3.1 Question and Answer Period

The following comments were made during the question and answer period:

- One commenter would like to see the I-40 Interchange expedited.

TDOT Response: The TDOT representative explained the planning process to the commenter and explained how it was difficult to expedite projects such as this due to the involvement of many regulatory agencies and having to go through all required environmental studies, etc.;

- One commenter would like to know the priority of this project in TDOT’s list of projects and if funding was available to construct the new interchange.

TDOT Response: The TDOT representative stated that the local MPO and/or RPO may have information on the priority of the project and that TDOT has many projects that are in various stages of development at all times. He noted that funding was only available for the environmental studies phase of the I-40 Interchange at the current time and that funding for design and construction would be obtained once the environmental phase was complete;

- One commenter wanted to know if TDOT was planning to widen SR-196 to accommodate the traffic for the new interchange.

TDOT Response: The TDOT representative explained that widening SR-196 was not being considered as part of the I-40 Interchange project but that local officials had also discussed the idea of widening SR-196 and that those officials have mechanisms available to them to help get a SR-196 widening project on the agenda for consideration by TDOT. Another commenter, who is an RPO coordinator for the Memphis Area Association of Governments stated that local officials have already begun the process of trying to get SR-196 listed as a project they would like TDOT to study;

- One commenter wanted to know how long the project would take to complete from start to finish, including construction.

TDOT Response: The TDOT representative explained that on average it may take six to eight years to get through all of the planning, design, and construction phases for a project of this magnitude; and

- One commenter wanted to know if there would be more public meetings for the project and if they could get copies of the map shown at the meeting online.

TDOT Response: The TDOT representatives explained that there would be more public involvement opportunities, including a NEPA public hearing that would occur after completion of the Environmental Assessment. They also explained that the project information and public involvement opportunities would be included on the TDOT website, including project maps that could be printed. They also stated that local newspapers and local flyers would be used to advertise future public meetings and the NEPA public hearing.

Written Comments (left at the meeting, mailed, or e-mailed)

A total of 26 written comment forms or letters were submitted during the public comment period for the December 13, 2007 public meeting that ended on January 3, 2008. The following summary was taken from the written comments/comment forms that were submitted:

Need for Project:

- Twenty-five cited providing a more direct route/better travel efficiency as a need for the project;
- Sixteen cited economic development as a need for the project;

-
- Twenty-two cited improved access as a need for the project;
 - Four cited safety concerns on other existing routes as a need for the project;
 - Three cited traffic congestion or overcrowding on other existing routes as a need for the project; and
 - Three cited improved emergency vehicle access (fire, police, ambulance) as a need for the project.

Issues/Concerns:

- Two cited environmental impacts (natural resources) as a concern for the project;
- Nine cited impacts to existing developments/homes as a concern for the project;
- Five cited air quality or noise impacts as a concern for the project;
- One cited a concern related to the project causing increased traffic in the area and associated safety issues;
- Two cited concerns related to the types of secondary developments that could occur near the interchange, such as truck stops, and how that may affect their property values;
- One cited concerns that not building the interchange may slow economic development in the area;
- One cited concerns that not building the interchange could result in safety issues on other existing routes in the area; and
- Seven cited concerns related to the length of time the project was expected to take to be opened to traffic and want to see the project expedited or built as soon as possible.

Preferred Alternative

- Twenty-two cited that they preferred the Build Alternative as presented at the public meeting;
- Two cited that they preferred a different Build Alternative that would include loop ramps being constructed immediately, instead of waiting until traffic volumes warranted it in the future. One of these commenters would also like to see SR-196 widened through the interchange to accommodate more traffic. This would include widening SR-196 and the proposed I-40 overpass to five lanes, including two lanes in each direction and one center turn lane; and
- One of the commenters that discussed preference for a Build Alternative including loop ramps immediately, also selected the No-Build Alternative as one of their choices for a preferred alternative. Based on their associated comments, TDOT assumes they are for the project, but prefer a Build Alternative different from the Build Alternative presented in the EA.

Other Comments

- Three commenters had questions regarding the widening of SR-196 outside of the I-40 Interchange project area. Widening of SR-196 is not considered part of this project;
- One commenter had questions regarding widening of New Airline Road. New Airline Road improvements are not part of this project; and

-
- One commenter wanted the intersection of Orr Road and SR-196 improved. If the Build Alternative is constructed, the intersection of Orr Road and SR-196 would be moved to the south of the existing location and is expected to be a safer design than the existing intersection.

The public will have the opportunity to provide additional comments on the alternatives during the EA public comment period, which will include a Public Hearing. These comments will be evaluated and considered in development of the Final EA and will be used by decision-makers for the project. Selection of an alternative would be made after all public comments have been reviewed and all environmental impacts have been considered.

4.3.2 Oral Comments (Provided to the Court Reporter at the Meeting)

All four commenters were for building the new I-40 Interchange and cited improved travel efficiency, less congestion, improved safety, and economic development as reasons why they supported the project. The following oral comments were provided by four individuals:

- One commenter was concerned there were no plans to widen the existing two-lane section of Highway 70 between Gallaway and Arlington to four lanes in the foreseeable future. The commenter stated that the I-40 Interchange at SR-196 would “greatly relieve traffic congestion for businesses and industries in Gallaway.” The same commenter stated that there were two planned communities in Gallaway, one with 100 homes and one with 50 homes, that were slated for spring and summer of 2008 and indicated that the I-40 Interchange would also be helpful to support those new residential developments;
- One commenter who lives on Orr Road stated that their current route requires them to drive through Arlington in order to gain access to I-40 to get to Memphis. This person was very supportive of the new interchange due to the time savings it would provide them;
- One commenter lives south of I-40 near U.S. 64 and stated that with the recent boom in the housing market and economic development in Fayette County, there is an increase in traffic on U.S. 64, causing a lot of traffic accidents. This person was very supportive of the I-40 Interchange project, because it would help support the continued growth in Fayette County and provide an alternative route for traffic. They also cited potential improvements to safety as an important aspect of the new interchange; and
- One commenter was concerned about the effects of increased traffic on Orr Road that may result from the new I-40 Interchange. This person stated that people may come from four or five miles away to gain access to the new interchange and that Orr Road was not adequate to handle much more traffic. This person would like to see Orr Road widened or otherwise improved to be able to handle more traffic and support truck traffic.

APPENDIX A - INITIAL COORDINATION LETTERS

Joe Matlock - RE: Initial Coordination I40 Interchange SR 196 (Hickory WitheRoad) Fayette County, Tennessee Pin 105597.00 NPA

From: "Nicholson, Charles P" <cpnicholson@tva.gov>
To: "Joe Matlock" <Joe.Matlock@state.tn.us>
Date: Tuesday, March 11, 2008 1:44 PM
Subject: RE: Initial Coordination I40 Interchange SR 196 (Hickory WitheRoad) Fayette County, Tennessee Pin 105597.00 NPA

Mr. Matlock,

I have reviewed this initial coordination package, and have no comments on it. It does not appear that any TVA resources would be affected and the project does not need a Section 26a permit or other approval from TVA.

Sincerely,

Charles P. Nicholson, PhD
NEPA Policy Program Manager
Tennessee Valley Authority
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902-1499
Phone: 865-632-3582
Fax: 865-632-2345

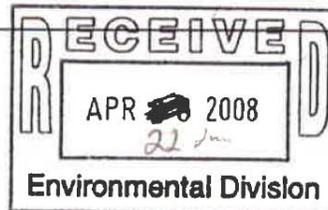
United States Department of Agriculture



Natural Resources Conservation Service
235 Oil Well Road
Jackson, Tennessee 38305

Date: April 14, 2008

Mr. Charles E. Bush
State Of Tennessee Department Of Transportation
Environmental Division
Suite 900-James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243



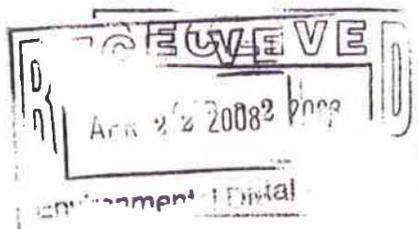
Re: Proposed Interstate 40 Interchange at State Route 196, Farmland Impact Rating

Mr. Bush:

Enclosed is the completed AD-1006 Farmland Conversion Impact Rating for the above-mentioned project. Also, I would like to bring to your attention that some of the soils mapped (Fayette County Soil Survey) in the project area are on the local hydric soil list. Therefore, wetlands may exist in the project area.

If you have any additional questions, please contact me at (731) 668-0700.

Charles L. Davis
Resource Soil Scientist



Helping People Help the Land

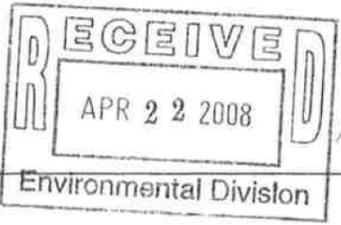
An Equal Opportunity Provider and Employer

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 3/12/08			
Name Of Project Interstate 40/State Route 198 Interchange		Federal Agency Involved Federal Highway Administration			
Proposed Land Use New Interchange/Transportation		County And State Fayette County, Tennessee			
PART II (To be completed by NRCS)		Date Request Received By NRCS 3/12/2008			
Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply -- do not complete additional parts of this form).		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Acres Irrigated NA	Average Farm Size 378 ac.
Major Crop(s) CORN	Farmable Land In Govt. Jurisdiction Acres: 321,141 % 71	Amount Of Farmland As Defined In FPPA Acres: 193,476 % 60		Date Land Evaluation Returned By NRCS 4/14/2008	
Name Of Land Evaluation System Used FAYETTE CO.	Name Of Local Site Assessment System NA				
PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	61.1				
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site	61.1	0.0	0.0	0.0	
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland	38				
B. Total Acres Statewide And Local Important Farmland	NA				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.02				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	67				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)		0	67	0	0
PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))		Maximum Points			
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	20	10			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	15	15			
6. Distance To Urban Support Services	15	10			
7. Size Of Present Farm Unit Compared To Average	10	2			
8. Creation Of Nonfarmable Farmland	10	0			
9. Availability Of Farm Support Services	5	3			
10. On-Farm Investments	20	2			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	5			
TOTAL SITE ASSESSMENT POINTS	160	0	92	0	0
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100	0	67	0	0
Total Site Assessment (From Part VI above or a local site assessment)	160	0	92	0	0
TOTAL POINTS (Total of above 2 lines)	260	0	159	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Reason For Selection:		





TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

March 17, 2008

Joe Matlock
State of Tennessee
Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

Re: Invitation to Participate in the Development Process for an Environmental Impact Statement for a Proposed Interstate 40 Interchange at State Route 196 in Fayette County

Dear Mr. Matlock:

The Tennessee Wildlife Resource Agency has received and reviewed the information your office provided to us regarding the invitation to become a participating agency in the development of an Environmental Impact Statement for the proposed Interstate 40 Interchange at State Route 196 in Fayette County. **We accept the invitation to participate.**

Sincerely,

Robert M. Todd
Fish and Wildlife Environmentalist

cc: Steve Seymour, Region I Habitat Biologist
Jerry Strom, Region I Assistant Manager

The State of Tennessee

IS AN EQUAL OPPORTUNITY, EQUAL ACCESS, AFFIRMATIVE ACTION EMPLOYER

From: Mike Atchison
To: Matlock, Joe
Date: 3/13/2008 12:48 PM
Subject: Re: Initial Coordination I40 Interchange@ SR 196 (Hickory Withe Road), Fayette County, Tennessee Pin

Mr. Matlock,
we received your CD. We prefer the Build Alternative involving construction of a full diamond interchange with space for construction of loop ramps in all four quadrants. Thanks.

Michael Atchison, Director
Office of Special Projects
TN Dept. of Economic & Community Development
312 8th Ave. N., 11th Floor
Nashville, TN 37243-0405
Phone: 615-532-9047
Fax: 615-741-5829

Joe Matlock - I-40/State 196 Project Assessment

From: "Eddie Yaun" <eddieyaun@bellsouth.net>
To: <Joe.Matlock@state.tn.us>
Date: Wednesday, March 12, 2008 8:50 AM
Subject: I-40/State 196 Project Assessment

Joe,
From a Somerville position there seems be no effect on this proposed project.

Should you require any additional information, please advise.

Thanks,

Eddie Yaun
City Administrator

**APPENDIX B - CULTURAL RESOURCES COORDINATION EFFORTS and COPIES OF
LETTERS**

B.1 Section 106 Coordination Efforts

On December 13, 2007 TDOT wrote to representatives of the following ten Native American tribes asking for information regarding the project and if they would like to participate in the Section 106 review process as a consulting party:

- Alabama-Quassarte Tribal Town;
- The Chickasaw Nation;
- Choctaw Nation of Oklahoma;
- Eastern Shawnee Tribe of Oklahoma;
- Kialegee Tribal Town;
- Muscogee (Creek) Nation;
- Quapaw Tribe of Oklahoma;
- Shawnee Tribe;
- Thlopthlocco Tribal Town; and
- United Keetoowah Band of Cherokee Indians.

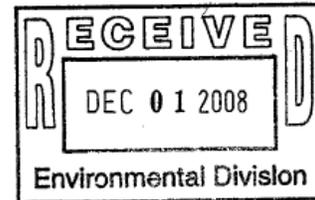
On December 13, 2007, TDOT wrote to the local government official and asked for information about the project and asked if he wished to be a consulting party in the Section 106 review process.

B.2 Cultural Resources/Section 106 Coordination Letters

Copies of cultural resources coordination letters are contained below.



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



JWM

November 14, 2008

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

RE: FHWA, ARCHAEOLOGICAL ASSESSMENT, I-40 AT SR-196 INTERCHANGE,
UNINCORPORATED, FAYETTE COUNTY

Dear Mr. Kline:

At your request, our office has reviewed the above-referenced archaeological survey final report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). We find that the report meets the Tennessee SHPO Standards and Guidelines For Archaeological Resource Management Studies.

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

Your continued cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.

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

EPM/jmb

*Copy to Consultant
01 Dec 08
jmb*



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

March 11, 2008

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

RE: FHWA, ARCHITECTURAL SURVEY REPORT, I-40 INTERCHANGE/SR-196,
UNINCORPORATED, FAYETTE COUNTY

Dear Ms. Carver:

In response to your request, received on Wednesday, February 27, 2008, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

Considering the information provided, we find that the area of potential effect contains no architectural resources eligible for listing in the National Register of Historic Places affected by this undertaking. You should notify interested persons and make the documentation associated with this finding available to the public.

All borrow areas outside proposed rights-of-way will require separate certification as specified under Section 107.06-Federal Aid Provisions. If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact us to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. This office appreciates your cooperation.

Sincerely,

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

EPM/jyg