4.0 ENVIRONMENTAL CONSEQUENCES

This chapter presents the potential environmental impacts of the Preferred Alternative (Alternative B Modified) and Alternatives A and B based on conceptual plans as discussed in the DEIS that was approved in January 2012. As discussed in Chapter 2, the Preferred Alternative (Alternative B Modified) is a modification of Alternative B. Project impacts will be refined and reevaluated as needed in the design and permitting phases.

The baseline conditions presented in Chapter 3 are the basis for which potential impacts are defined. Three types of impacts are discussed in this chapter: direct, indirect, and cumulative. Under 40 CFR 1508, direct effects are those that are "caused by the action and occur at the same time and place." Indirect effects are "caused by the action and are later in time and farther removed in distance, but are still reasonably foreseeable." Cumulative effect is the "impact on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The No-Build Alternative involves making no improvements to existing SR 126, other than those already proposed by state, county, and local governments. The No-Build Alternative would have no direct impacts to the environment, but would not meet the project purpose and need. It would not improve roadway safety, reduce the crash rate along the corridor, improve roadway geometry and width deficiencies, provide adequate roadway and shoulder widths for vehicles and improve adjacent roadway access and traffic operations. In addition, the No-Build Alternative would not meet secondary goals of minimizing the roadway footprint, complementing the rural nature of the area and improving pedestrian and bicycle connectivity. The No-Build Alternative would contribute to a continuation of existing trends without providing an enhanced roadway for SR 126 within the project area. The following sections describe the impacts of the Preferred Alternative (Alternative B Modified) and Alternatives A and B.

4.1 Land Use Impacts

Land use patterns and transportation patterns directly influence each other. The type of land uses in an area has a direct impact on traffic patterns, which in turn influence project design and development. The existing land uses along the project corridor are varied; the primary land uses are residential and agricultural/forest. While commercial land uses are scattered throughout the project corridor, there are concentrations at each terminus and also where Cooks Valley Road intersects SR 126. Future land use types along the corridor are generally the same; however, future land use projections show an increase of residential and commercial uses, while agricultural/forest uses are reduced. Part of the increased residential and commercial land uses will come from conversion of agricultural/forest land.

<u>Preferred Alternative (Alternative B Modified)</u>

The construction of the proposed project will result in the conversion of approximately 100 acres of land adjacent to SR 126 to highway ROW, changing the use of the land acquired to highway use. This land to be converted abuts existing SR 126 and is generally residential, with agricultural/forest and commercial uses. The Preferred Alternative (Alternative B Modified) is not anticipated to directly affect future land use and is consistent with the plans, policies and regulations adopted by the City of Kingsport, Sullivan County and the KMTPO as shown in the

Sullivan County Regional Plan: A Guide for Land Use and Transportation Development (2008), the KMTPO 2035 LRTP, and city and county zoning maps.

Alternatives A and B

Similar to the Preferred Alternative (Alternative B Modified), Alternatives A and B would both result in the conversion of land adjacent to SR 126 to ROW, though at slightly larger amounts of acreage. Because both of these alternatives generally follow existing alignment, they would convert existing residential, agricultural/forested and commercial land uses. Both Alternative A and Alternative B would be consistent with existing local and regional plans, policies and regulations.

4.2 Farmland Impacts

Congress passed the *Agriculture and Food Act of 1981* (Public Law 97-98) containing the *Farmland Protection Policy Act (FPPA)* Subtitle I of Title XV, Section 1539-1549. The *FPPA* requires federal agencies to take steps to ensure that federal actions do not contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses in cases in which other national interests do not override the importance of protecting the farmland resources. Before farmland can be used for a project utilizing federal funds, an assessment must be completed to determine if prime, unique, or statewide or locally important farmlands would be converted to non-agricultural uses and coordinated with the USDA Natural Conversation Service (NRCS).

The NRCS characterizes farmlands as prime farmland, unique farmland, or farmland of statewide or local significance. The designations are based on NRCS soil type and are protected by federal legislation.

The impacts of the proposed project on farmland were determined in the DEIS through coordination with NRCS, using the U.S. Department of Agriculture's (USDA) *Farmland Conversion Impact Rating Form*. The form was completed in accordance with 7 CFR, Part 658 of the *FPPA.* The form includes a rating of several factors to determine the level of a project impact to farmland.

Each factor is assigned a score relative to its importance. Sites that receive a total site assessment score of 160 points or less are given a minimal level of consideration for protection. Sites with a total site assessment score of 161 points or more would require the consideration of alternative project alignments that would serve the proposed purpose but convert either fewer acres of farmland or other farmland that has a relatively lower value.

Preferred Alternative (Alternative B Modified)

The Preferred Alternative (Alternative B Modified) is within prime and unique farmland in non-urbanized areas and results in approximately five acres of impact. Since the Preferred Alternative (Alternative B Modified) has a slightly smaller footprint than the original Alternative B, there is no need for new coordination with the NRCS. Since the score is below 160, there is no requirement to consider additional alignments to reduce farmland impacts. In addition, no impacts to active farming operations are anticipated.

Alternatives A and B

The site assessment score for Alternative A and Alternative B in the DEIS was 82 points, indicating no need to consider additional alignments, which would reduce farmland impacts. The DEIS estimate for the taking of prime and unique farmland was 15 acres for Alternative A and five acres for Alternative B. Coordination with the NRCS and the *Farmland Conversion Impact Rating Form* is included in Attachment B.

4.3 Social Impacts

This section describes the anticipated social impacts under the Preferred Alternative (Alternative B Modified), Alternatives A and B. Social impacts, which include schools, fire and police, hospitals, cemeteries and utilities are assessed to determine potential impacts of the build alternatives.

Implementation of the proposed project will not substantially change the basic social arrangement or character of the project area. Although no neighborhoods will be split or bisected by the Preferred Alternative (Alternative B Modified), Alternative A or Alternative B, traffic patterns will change for some residences with the closing of some cross roads that currently have direct access to SR 126. The road closings are proposed to improve safety and better manage access along SR 126. Access will remain available to SR 126 via other cross roads nearby. In one instance, access to SR 126 from Holiday Road will be eliminated. However, access will be maintained through a proposed local connector at Parker Street and Shuler Drive. All access modifications will be evaluated and determined during the design phase.

4.3.1 Preferred Alternative (Alternative B Modified)

Schools

The Preferred Alternative (Alternative B Modified) will not impact any school property. Accessibility to and from area schools will be enhanced by improvements to SR 126. SR 126 is the main route for students traveling to schools from areas east of Kingsport. Indian Springs Elementary serves students in the immediate project area. Several Sullivan County bus routes use portions of SR 126 or its connecting roads to transport students between home and school. The improved roadway will provide shoulders and sidewalks that will create a safer environment for school bus passengers.

Fire and Police

A volunteer fire department station (Kingsport Station #3) will be acquired and relocated under the Preferred Alternative (Alternative B Modified). The volunteer fire department is a non-profit organization and is located along SR 126 at the intersection with Heather Lane. It is not occupied full time but is used during emergencies and includes a garage and a small office/organization area. The relocation process will be carried out in such a manner as to ensure that no interruption of service occurs to area residents. No other police, fire, or emergency services facilities will be displaced by the Preferred Alternative (Alternative B Modified).

The Preferred Alternative (Alternative B Modified) will improve emergency response time for police, fire and emergency services due to wider lanes, providing turn lanes and increased shoulder widths, which allow drivers to safely pull over when emergency vehicles need to

access an accident, as well as for emergency vehicles to pass through traffic safely. This will occur along the alignment except where the design of the Preferred Alternative (Alternative B Modified) was modified to avoid environmentally-sensitive resources, as discussed throughout Chapter 4.

Hospitals

As presented in Section 3.2, there are three area hospitals. None of the services provided by these facilities will be impaired by the Preferred Alternative (Alternative B Modified). This alternative will provide adequate shoulder widths for use by emergency response vehicles for situations in which drivers are unable move out of a response vehicle's pathway.

Cemeteries

A large cemetery, East Lawn Memorial Gardens Cemetery, is located on the south side of SR 126 and abuts the existing ROW. There are approximately 11,800 existing grave sites in this cemetery. The Preferred Alternative (Alternative B Modified) was designed to include a reduced width cross-section through this area to avoid impacting grave sites.

Utilities

Relocation of utilities will be required; however, no long-term utility impacts are anticipated under the Preferred Alternative (Alternative B Modified). Temporary service disruptions could result during project construction. Utility relocation will require coordination with local service providers, which will minimize, if not avoid, disruptions.

4.3.2 Alternatives A and B

Schools

Alternative A and Alternative B would not have an impact to any school property. In addition, improved access and safety for project area schools and buses resulting from Alternatives A and B are the same as the Preferred Alternative (Alternative B Modified).

Fire and Police

As with the Preferred Alternative (Alternative B Modified), Alternatives A and B would impact and require the Kingsport Station #3 fire department to relocate. No other facilities would be displaced by Alternative A or Alternative B. Also, similar to the Preferred Alternative (Alternative B Modified), improved roadway design would allow for safer access to accidents for emergency vehicles.

Hospitals

Improvements to traffic flow anticipated under Alternatives A and B are the same as the Preferred Alternative (Alternative B Modified). None of the services provided by the hospitals would be impaired.

Cemeteries

As reported in the DEIS, 350 graves would be impacted by Alternative A and 90 graves would be impacted by Alternative B. This was a result of shifting the proposed alignment for

Alternatives A and B to the south side of the roadway to avoid impacting Yancey's Tavern, a NRHP-listed property.

Utilities

Impacts to utilities within the project area resulting from Alternatives A and B are the same similar to those for the Preferred Alternative (Alternative B Modified).

4.4 Displacements and Relocation Impacts

Displacements are a potential adverse environmental effect associated with the Preferred Alternative (Alternative B Modified), and both Alternatives A and B. An initial Conceptual Stage Relocation Plan (CSRP) was prepared on April 8, 2010, as part of the DEIS to assess the effects of displacements. This assessment considered optional relocation property in the community. Since the approval of the DEIS on January 5, 2012, the KMTPO updated their travel demand model, which resulted in a reduction of projected traffic volumes. This led to a reduction in project impacts through the development of Alternative B Modified.

An updated CSRP was completed for the Preferred Alternative (Alternative B Modified) on August 22, 2012. The updated CSRP confirmed that conditions have not changed for Alternatives A and B since the completion of the original CSRP in 2010, and it provides new information disclosing impacts for the Preferred Alternative (Alternative B Modified). The updated CSRP and the previous CSRP are in Attachment C. A comparison of estimated relocation impacts for the build alternatives is provided in Table 4-1.

Preferred Alternative (Alternative B Modified)

As presented in Table 4-1, under the Preferred Alternative (Alternative B Modified) displacements are anticipated for 81 single-family homes, 22 multi-family homes, one mobile home, 24 businesses, and one non-profit organization (a fire station).

A study of the real estate market in the project area was included in the 2012 CSRP. Because of the built-out nature of the project study area, the residential and business market conditions have not changed since 2012. The CSRP indicated a market that is not capable of supporting the anticipated residential displacements within the immediate project area, due to an insufficient replacement housing availability. Expanding the study beyond the immediate project area reveals a market that can accommodate the projected relocations but with some difficulty. Analysis performed for the CSRP also concluded that it is unlikely that a large number of business displacees can relocate in the immediate project area due to an insufficient number of suitable replacement sites.

The CSRP found that no schools or churches would be either partially or totally acquired by the Preferred Alternative (Alternative B Modified).

Alternatives A and B

Alternative A would result in the displacement of 102 single-family homes, 135 multi-family homes, four mobile homes, 43 businesses, and one non-profit organization (a fire station).

Alternative B would result in the displacement of 90 single-family homes, 69 multi-family homes, three mobile homes, 30 businesses, and one non-profit displacement (a fire station). No schools or churches would be either partially or totally acquired by Alternative A or B.

As previously stated for the Preferred Alternative (Alternative B Modified), the 2012 CSRP indicated a market that is not capable of supporting a large number of residential displacements within the immediate project area. Expanding the study beyond the immediate project area reveals a market that can accommodate the projected relocations but with some difficulty.

Analysis performed for the CSRP also concluded that it is unlikely that a large number of business displacees can relocate in the immediate project area due to an insufficient number of suitable replacement sites.

The CSRP found that no schools or churches would be either partially or totally acquired by the Alternatives A or B.

TABLE 4-1: RELOCATION IMPACTS COMPARISON

Type of Relocation	Preferred Alternative (Alternative B Modified) 2012	Alternative A 2010	Alternative B 2010
Single-Family Homes	81	102	90
Multi-Family Units	22	135	69
Mobile Homes	1	4	3
Businesses	24	43	30
Non-Profit Organizations	1	1	1
Community Institutions	0	0	0

Source: TDOT-Right-of-Way Division (2012 and 2010).

4.4.1 Relocation Assistance

TDOT will make relocation assistance available to all eligible persons impacted by this project, including residences, businesses, farm operations, non-profit organizations, and those requiring special services or assistance. Title VI prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance. The TDOT ROW Division Relocation and Property Management Office will administer the relocation program under the rules, policies, and procedures set forth in the *Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* as amended, the *Uniform Relocation Assistance Act of 1972*, in federal regulations TCA 13-11-101 through 119, the *State of Tennessee Relocation Assistance Brochure* and Chapter Nine of the *State of Tennessee, Department of Transportation, Right-of-Way Manual*.

Relocation resources are available to all displacees without discrimination. The provisions of suitable and acceptable replacement housing, combined with adequate relocation payments, can be expected to minimize relocation impacts. If any situation exists where decent, safe, and sanitary replacement housing within the financial means of the displaced residents is not available, such housing will be made available under the U.S. Department of Housing and Urban Development's Housing of Last Resort provisions. Housing of Last Resort is used when there is no comparable housing available for sale or rent within TDOT's current limitations. Should Last Resort Housing become necessary, supplemental payments or other housing options, as determined by TDOT, can be implemented through procedures provided for in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

At least one relocation agent is assigned to each highway project to carry out the relocation assistance payments program. A relocation agent will contact each person to be relocated to determine individual needs and desires, to provide information, answer questions, and aid in finding replacement property. TDOT provides advance notification of impending ROW acquisition and has all properties appraised on the basis of comparable sales and land values in the area before acquiring ROW. Owners of property to be acquired will be offered fair market value for their property. Relocation services and payment are provided without regard to race, color, religion, sex, or national origin.

No person lawfully occupying real property will be required to move without at least 90 days written notice of the intended vacating date, and no occupant of a residential property will be required to move until decent, safe, and sanitary replacement housing is made available. “Made available” means that either the affected person has by themselves obtained and has the right of possession of replacement housing or TDOT has offered the relocated resident decent, safe, and sanitary housing that is within their financial means and available for immediate occupancy.

4.5 Environmental Justice

Executive Order 12898 (EO 12898), *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs federal agencies to “promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment.” The Order directs federal agencies to ensure that existing plans, programs and activities:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process and;
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

This Environmental Justice (EJ) analysis has been performed in accordance with EO 12898 and the U.S. Department of Transportation (DOT) *Updated Environmental Justice Order 5610.2(a)* (May 2012) and FHWA *Order 6640.23A: FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (June 2012).

<u>Methodology and Analysis</u>

This EJ analysis presents the population characteristics of persons within the study area and determines whether the potential for disproportionately high and adverse impacts exist for study area U.S. Census Block Groups (BGs). To determine the impacts of the build alternatives on minority and low-income populations, the analysis utilized U.S. Census data for the project area and information gathered during a field review of the project area. TDOT also coordinated with local government and the TDOT Division of Civil Rights throughout the DEIS and FEIS process.

According to *DOT Order 5610.2(a)* and *FHWA Order 6640.23A*, minority populations are “*any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or*

Native Americans) who will be similarly affected by a proposed DOT [FHWA] program, policy, or activity." Low-income populations are "*any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT [FHWA] program, policy, or activity.*"

The affected population for this analysis, or population with greatest likelihood of experiencing impacts, is located within 2010 Census Block Groups (BGs) that intersect the project alignment. The BGs that intersect the project alignment are the same for each of the build alternatives. As depicted in Figure 4-1, EJ study area BGs are:

- Tract 408, BG1
- Tract 408, BG2
- Tract 408, BG3
- Tract 409, BG1
- Tract 409, BG2
- Tract 410, BG1
- Tract 422, BG2
- Tract 423, BG1
- Tract 423, BG2
- Tract 423, BG3
- Tract 424, BG1
- Tract 435, BG1
- Tract 434.01, BG3

As stated above, U.S. Census data was utilized in the identification of potential EJ populations. Data on racial and income characteristics was collected for the above-listed BGs, and also for the larger geographic areas of Sullivan County. This larger area would help serve as a baseline for comparison against the BGs that intersect the project alignment.

To identify and compare the racial characteristics of the BGs, Sullivan, 2010 U.S. Census data was used and is reflected in this section. Because low-income data is not available for the 2010 U.S. Census at the BG level, the U.S. Census American Community Survey (ACS) data was used. The most recent five-year ACS data available is from 2006-2010 and was selected for the analysis. Using ACS data to determine low-income populations allows for an appropriate comparison across the state, county and BG level.

Based on methodology from the "*Effective Methods for Environmental Justice Assessment*" report (National Cooperative Highway Research Program Report 532), minority communities are defined as being 10 percentage points higher than the county average, or 50 percent of the total geographic unit.

Table 4-2 provides data on racial demographics for Sullivan County. When combined, minorities (non-white alone) made up 4.2 percent of the County total. Table 4-3 provides racial data for study area BGs. Based on data presented in Table 4-2 and Table 4-3, no BGs within the project area contain concentrations of minority populations that meet either of the EJ criteria constituting disproportionately and high adverse impacts.

As shown in Table 4-4, three BGs (Tract 408 BG1, Tract 408 BG2, and Tract 409 BG2) have percentages of low-income persons that are 10 percent higher than the percentage for Sullivan County.

FIGURE 4-1: MINORITY AND LOW-INCOME POPULATIONS

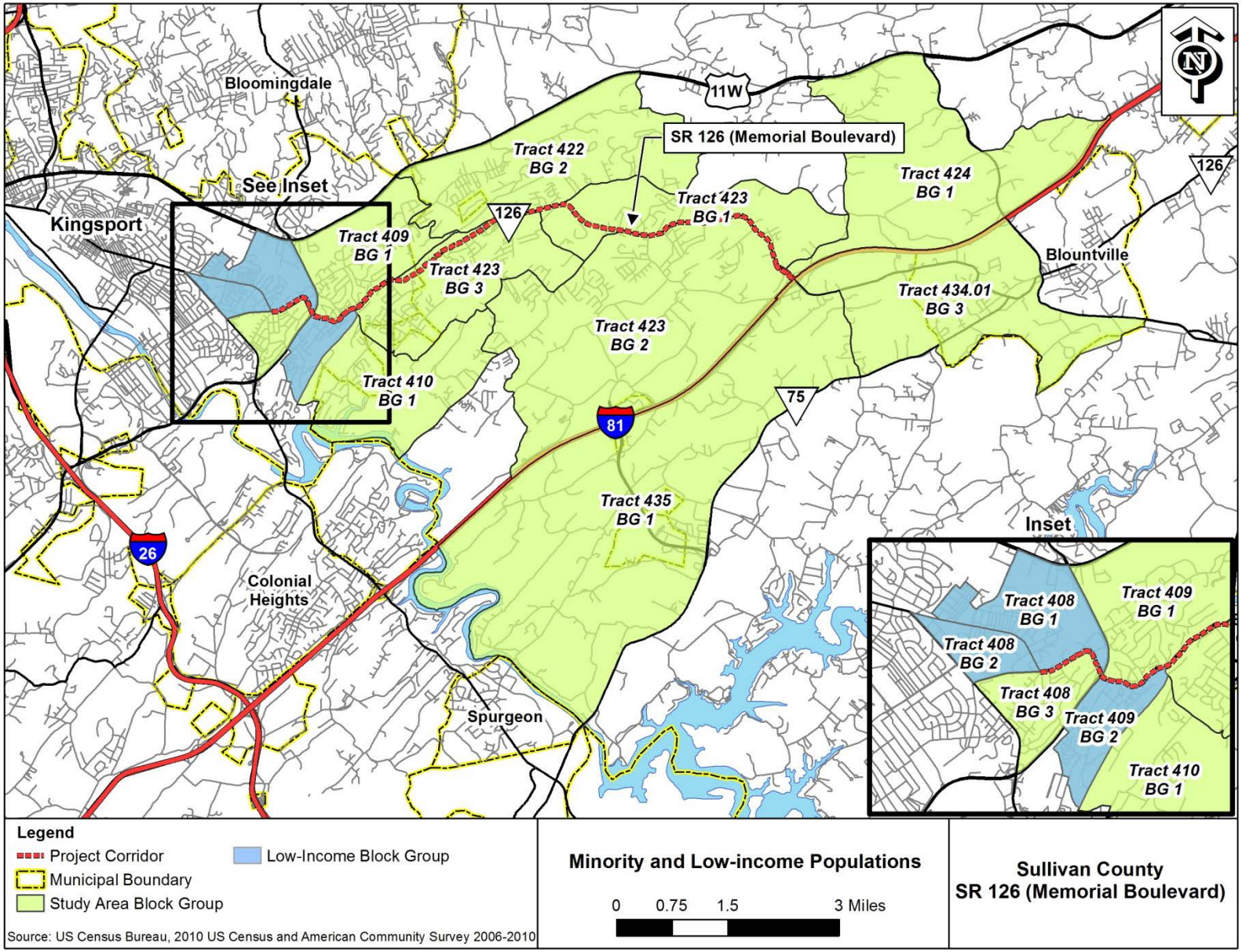


TABLE 4-2: SULLIVAN COUNTY RACIAL DEMOGRAPHICS

Group	Number	Percent of Total**
Total Persons	156,823	100%
White Alone	149,208	95.1%
Black or African American Alone	3,329	2.1%
American Indian and Alaska Native Alone	416	0.3%
Asian Alone	884	0.6%
Native Hawaiian and Other Pacific Islander Alone	34	0.0%
Hispanic or Latino (of any race) *	2,126	1.4%
Total Minority	7,615	4.2%

Source: U.S. Census Bureau, 2010 U.S. Census Summary File 1.
** Hispanic or Latino populations are listed separately under each of the above group classifications.*
***Percent of Total is based on rounding estimates.*

TABLE 4-3: BLOCK GROUP RACIAL DEMOGRAPHICS

Group	Study Area Tracts/Block Groups												
	T408 BG1	T408 BG2	T408 BG3	T409 BG1	T409 BG2	T410 BG1	T422 BG2	T423 BG1	T423 BG2	T423 BG3	T424 BG1	T434.01 BG3	T435 BG1
White Alone	91.3%	94.9%	93.5%	95.1%	90.3%	96.5%	96.9%	98.8%	97.3%	96.6%	97.0%	97.0%	97.6%
Black or African American Alone	3.8%	2.8%	3.2%	1.6%	3.9%	0.5%	0.5%	0.1%	0.3%	0.9%	0.1%	0.4%	0.4%
American Indian and Alaska Native Alone	0.9%	0.3%	0.2%	0.2%	0.2%	0.1%	0.2%	0.4%	0.3%	0.0%	0.1%	0.4%	0.1%
Asian Alone	0.4%	0.1%	0.3%	1.0%	1.5%	1.7%	0.5%	0.2%	0.6%	0.8%	0.5%	0.2%	0.2%
Native Hawaiian and Other Pacific Islander Alone	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
*Hispanic or Latino (of any race)	2.1%	2.0%	3.0%	1.2%	1.0%	1.9%	1.6%	0.0%	0.8%	0.9%	0.8%	0.6%	0.8%
**Total Minority	7.2%	5.2%	6.8%	4.1	6.6%	4.2%	2.8%	0.7%	2.0%	2.7%	1.5%	1.6%	1.5%

Source: U.S. Census, 2010 U.S. Census Summary File 1.
Notes – Percentages are based on rounding, estimates and sampling error; therefore, totals will not equal 100 percent. "T" – Census Tract; "BG" – Block Group.
** Hispanic or Latino populations are listed separately under each of the above group classifications.*
*** Total is based on rounding estimates and may not equal 100 percent.*

TABLE 4-4: STUDY AREA AND SULLIVAN COUNTY POVERTY LEVELS

Group	*Number of Persons Below Poverty	Percent of Person Below Poverty	Meets EJ Criteria?
Tract 408, BG1	369	26.2%	Yes
Tract 408, BG2	238	38.2%	Yes
Tract 408, BG3	150	13.0%	No
Tract 409, BG1	333	15.6%	No
Tract 409, BG2	311	27.9%	Yes
Tract 410, BG1	20	1.4%	No
Tract 422, BG2	370	18.9%	No
Tract 423, BG1	72	7.3%	No
Tract 423, BG2	344	10.2%	No
Tract 423, BG3	99	4.4%	No
Tract 424, BG1	75	10.8%	No
Tract 434.01, BG3	159	11.6%	No
Tract 435, BG1	172	8.2%	No
Sullivan County	24,138	15.9%	---

Source: U.S. Census Bureau, American Community Survey, 2006-2010.
Notes – Percentage are based on rounding and estimates. Margin of error at the Block Group level ranges from two to 15 percent.
**Refers to Below Poverty Ratio of Income to Poverty in the Past 12 Months, estimated in 2010.*

4.5.1 Preferred Alternative (Alternative B Modified)

Adverse impacts include residential and business displacements, changes in access, conversion of existing land uses to ROW, and ecological impacts due to loss of farmland, forested area and streams. These impacts will impact all populations as they will occur throughout the study area corridor. The project also provides beneficial impact associated with roadway safety, improved access, improved pedestrian and bicycle accommodations, and opportunity to facilitate future growth and economic development, while avoiding protected architectural/historic resources.

Based on the EJ analysis conducted in this section, it is determined that impacts resulting from the Preferred Alternative (Alternative B Modified) will not result in a disproportionately high and adverse impact to the BGs that contain EJ (low-income) populations.

Additional research on minority populations was gathered from the KMTPO 2035 LRTP, which included a review of Title VI Assessment in the Kingsport region. Based on census data used in their analysis, minority populations are about five percent of the planning area's total population. This is comparable to that of Sullivan County and the BGs within the SR 126 study area. The KMTPO did not identify any Title VI minority areas.

An EJ analysis was also conducted by the KMTPO for low-income populations and determined that within the Kingsport region, low-income populations are approximately 15 percent, which is similar to the Sullivan County average. As previously stated, the SR 126 study area contains three BGs with low-income populations that exceed the KMTPO average, but they are not high percentages and also will not be subject to disproportionately high and adverse impacts resulting from the project.

4.5.2 Alternatives A and B

As with the Preferred Alternative (Alternative B Modified), Alternatives A and B would result in similar adverse and beneficial impacts. Also similar to the Preferred Alternative (Alternative B Modified), impacts resulting from Alternatives A and B would not result in a disproportionately high and adverse impact to the BGs that contain EJ (low-income) populations.

4.6 Economic Impacts

This section presents a discussion of the anticipated economic impacts associated with the Preferred Alternative (Alternative B Modified), Alternative A and Alternative B.

Preferred Alternative (Alternative B Modified)

Given the CSRP results indicating a market not capable of supporting the large number of anticipated residential or business displacements within the immediate project area, there will be a loss of tax revenues associated with both residential and business relocations out of the project area. Businesses may choose to close or move out of the project area, causing a loss of tax revenues. Also, the conversion of land to ROW for the project will decrease the area property tax base. However, as discussed in Sections 3.1 and 4.1, commercial development is expected to occur within the project area over the next several decades. So while some existing businesses may relocate or close improvements to safety and access as a result of the Preferred Alternative (Alternative B Modified) will help accommodate future economic growth along the corridor. Indirect and Cumulative economic impacts are presented in Section 4.23. No industrial sites are located within or adjacent to the proposed project's limits. No impacts will be imposed upon these resources by the project.

Alternatives A and B

There would be similar long-term adverse economic effects with Alternatives A and B as described for the Preferred Alternative (Alternative B Modified).

4.7 Pedestrians/Bicyclists

This section presents a discussion of the impacts to pedestrians/bicyclists that are associated with the Preferred Alternative (Alternative B Modified), Alternative A and Alternative B.

Preferred Alternative (Alternative B Modified)

The lack of sufficient shoulders or sidewalks creates an unsafe environment for bicyclists and pedestrians along existing SR 126. The Preferred Alternative (Alternative B Modified) provides paved shoulders to accommodate bicyclists throughout the length of the project. Sidewalks to accommodate pedestrians are proposed throughout the project limits except in the rural area and near the interchange with I-81. Sidewalks were not included in this project segment because the design is intended to match the rural character of the area. The paved shoulders range from four feet where sidewalks are provided, to 12 feet where no sidewalks are proposed. The shoulders will be wide enough to accommodate bicycles and pedestrians. The cross-section schematics in Chapter 2 provide the planned shoulder widths. Details such as delineation of bike lanes and sidewalk widths will be determined in the design phase.

Alternatives A and B

As with the Preferred Alternative (Alternative B Modified), Alternatives A and B would provide shoulders along the entire route, sidewalks where appropriate, and sight distance improvements for similar benefits to pedestrians and bicyclists.

4.8 Soils and Geology

This section presents a discussion of the impacts to soils and geology associated with the Preferred Alternative (Alternative B Modified), Alternative A and Alternative B.

Preferred Alternative (Alternative B Modified)

The observations made during the site reconnaissance and reviews of topographic mapping indicate that the majority of roadway improvements will require shifting into the existing hill slopes. This will result in a greater number of constructed cut slopes than embankment fills. The greatest cuts are expected in areas with steeper terrain such as the Sougan Hollow vicinity and the southern flank of Chestnut Ridge. Moderate to steep cuts could occur throughout the project with less steep cuts anticipated in areas of more gentle topography. Other areas along creek bottoms or in areas where the roadway is not shifted into the hill slopes could encounter minor to moderate fills.

The varied topography encountered throughout the project area will require a range of minor to possibly considerable cuts and fills with the Preferred Alternative (Alternative B Modified). A subsurface investigation program with core drilling will be conducted prior to construction.

The potential for slope stability problems within both soil and rock areas will require a detailed evaluation of the actual slope conditions, particularly within the cut slopes of steep and rocky terrain. This evaluation will be conducted to determine the actual stability and slope geometry. Any slope stability problems that might be determined will be addressed in the design and construction phases of the project. The design of any slope stabilization elements for the project will be consistent with any commitments made during the CSS process.

Karst topography, though present in the area, was not identified within or adjacent to the project limits. The underlying geologic formations are susceptible to the formation of sinkholes, which could occur during construction. If sinkholes are discovered, the appropriate permits and, or, mitigation treatments will be implemented before the construction phase.

Pyritic material is not expected to be encountered on the proposed project, and there do not appear to be any significant geological issues associated with the Preferred Alternative (Alternative B Modified) that cannot be addressed during the design or construction phase.

Alternatives A and B

There do not appear to be any geologic issues with these alternatives that cannot be addressed during the design or construction phase.

4.9 Ecological Impacts

This section presents a discussion of the impacts to terrestrial and aquatic resources and also to threatened and endangered species associated with the Preferred Alternative (Alternative B Modified), Alternative A and Alternative B.

4.9.1 Preferred Alternative (Alternative B Modified)

Terrestrial Resources

The majority of the land has been converted to agricultural and residential/commercial uses over the past century. Roads and highways affect wildlife both directly as road kill and indirectly through the degradation, fragmentation, and loss of habitat. Construction of the proposed project will result in the loss of habitat for small mammals and birds through the conversion of open space areas to roadway; however, as a whole, the project will result in minimal loss of wildlife habitat and local wildlife populations.

Construction of the project in previously undisturbed areas will impact native vegetation. Mitigation measures for the disturbances of the floral community will include the establishment of rapid-growing vegetation as soon as possible following land disturbance. Leaving soil exposed to the elements for a prolonged period of time will increase the likelihood of invasion of the area by invasive/exotic plant species and could potentially cause erosion and sedimentation problems in nearby area streams. Plants chosen for the site will be compatible with the hydrology, geology, and land use of the surrounding landscape. The proposed project is along an existing facility, and any removal of native vegetation will occur along the shoulders and will remain minimal.

Improvements to SR 126 through the implementation of the Preferred Alternative (Alternative B Modified) will result in minimal impacts to local terrestrial wildlife and plant communities in the area. The existing roadway will be widened, requiring additional land beyond the current ROW.

Since the project is along an existing facility and lacking extensive forested areas, the impacts to terrestrial plants and animals will be minimal. The Preferred Alternative (Alternative B Modified) will result in 50 acres of scattered forested habitat converted to ROW.

Aquatic Resources

Surface Waters

Perennial streams within the project corridor include: Sougans Branch, Fall Creek, and an unnamed tributary of Sougans Branch. Intermittent streams include: an unnamed tributary of Fall Creek and an unnamed tributary of Reedy Creek. Booher Creek is depicted on USGS topographic mapping as a potential perennial stream. This resource was not characterized in the initial ecological study for the project. Ephemeral streams (wet weather conveyances) may also be considered jurisdictional waters of the U.S. and subject to Section 404 of the *Clean Water Act 1972* permitting requirements administered by the USACE. Figure 4-2 identifies the location of the perennial and intermittent streams in the vicinity of the project.

Impacts to a stream during road construction activities are primarily destruction of habitat and sedimentation. Habitat destruction will directly impact portions of the stream located within the project's ROW limits. Sedimentation may be associated with construction activities. Sedimentation impacts are usually temporary but can impact a stream for hundreds of feet downstream. These impacts include reduced levels of oxygen in the stream and interference with the ability of fish, aquatic insects, mussels and other aquatic organisms to utilize oxygen from the water. Temperature patterns and water flow patterns can be altered.

Siltation (deposition of sediment) increases turbidity (cloudiness from dust and other disturbed particles) which can slow photosynthesis, clog gills in fish and other aquatic life, and covers

macroinvertebrates and fish egg-laying substrates (streambed layers). This can result in long-term negative impacts to streams. Siltation can redistribute itself to increase flooding events, loss of storage capacity in reservoirs, and potential economic impacts associated with increased water treatment costs. Organic chemicals and metals can be reintroduced into the water columns that were previously contaminated.

The impacts to area streams will be minimized by strict adherence to TDEC's standard specifications for soil erosion prevention and sediment control.

Nonpoint source pollution in the project area is related primarily to agricultural practices. However, urban runoff, sewage and construction activities can also be contributing factors. Pollutants from these sources may include: deicing compounds; weed, rodent, and insect control products; surface runoff of pollutants coming from vehicular operations (oil, grease, asbestos and rubber); toxic chemical spills by trucks into a water supply system, and; contamination of surface and groundwater supplies by polluted fill materials. Deicing (removal of snow, ice or frost from a surface) and herbicide/pesticide uses are seasonal and typically result in short-term increases in area waters. Surface runoffs associated with vehicles are unavoidable, but the quantities of these pollutants are typically small and result in negligible impacts. Accidental spills are not predictable, but local emergency procedures are in place in most municipalities that report, contain and clean up hazardous materials.

Five of the streams within the project corridor will be impacted by the Preferred Alternative (Alternative B Modified). The streams include: Sougans Branch, Fall Creek, an unnamed tributary of Sougans Branch, an unnamed tributary of Fall Creek, and an unnamed tributary of Reedy Creek. The project is not anticipated to impact Booher Creek. None of the five streams have been listed as Tennessee Exceptional Waters within the project impact area and none were impaired to the degree that they have been placed upon the EPA-approved 2010 303(d) list of impaired streams published by TDEC Division of Water Pollution Control. The total amount of stream channel impacted will be determined after final project plans become available and documented for the environmental permitting process; however, stream impacts have been estimated based on conceptual plans for the Preferred Alternative (Alternative B Modified). The Preferred Alternative (Alternative B Modified) will require both culverts and stream relocation for an estimated total of 3,107 linear feet within the proposed ROW. All project stream crossings will consist of either culverts or pipes. Table 4-5 depicts the perennial and intermittent stream impacts anticipated in association with the alternatives considered.

Impacts to streams must be permitted pursuant to regulations promulgated by the TDEC Division of Water Pollution Control and the USACE and the Tennessee Valley Authority (TVA). Coordination with TDEC for a potential Water Quality Certification (401) prior to disturbance of streams is required. Physical alterations to properties of Waters of the State require an Aquatic Resource Alteration Permit (ARAP) or a Section 401 Water Quality Certification. Alterations to waters of the U.S. require either a Section 404 Nationwide or Individual Permit from the USACE and, where applicable, a 26a Permit or Letter of No Objection from TVA.

The Preferred Alternative (Alternative B Modified) will require one or more permits under the ARAP program administered by TDEC for the encapsulation and relocation of streams. Impacts to streams will also require either a Nationwide Permit or Individual Permit under the federal permit program administered by the USACE. The type of permit issued will be determined after the significance of the impacts to the streams is reviewed by the USACE. A TVA Section 26a Permit will also be required for the proposed stream crossings if within a Tennessee River Watershed.

FIGURE 4-2: PERENNIAL AND INTERMITTENT STREAMS IN PROJECT CORRIDOR

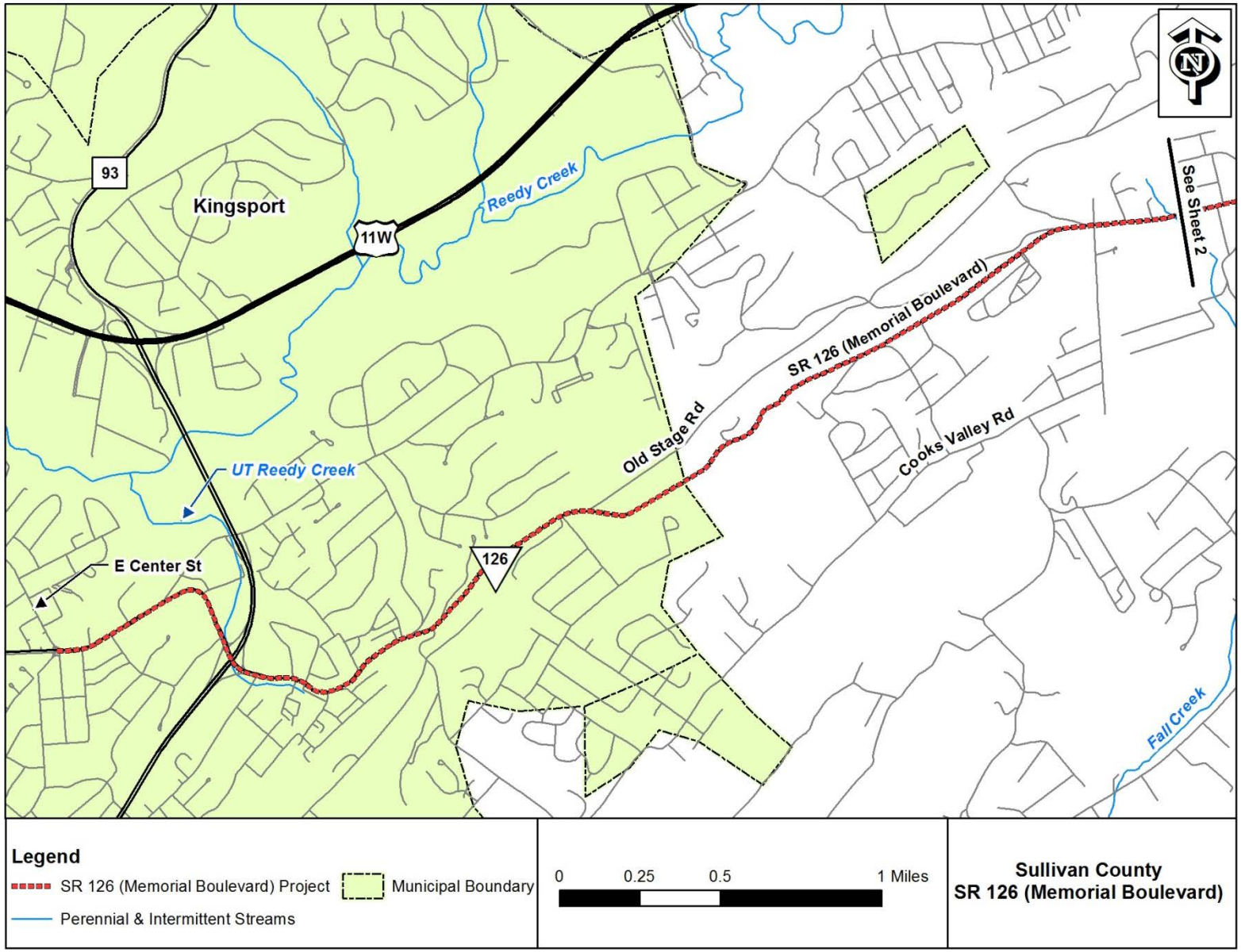


FIGURE 4-2: PERENNIAL AND INTERMITTENT STREAMS IN PROJECT CORRIDOR (CONTINUED)

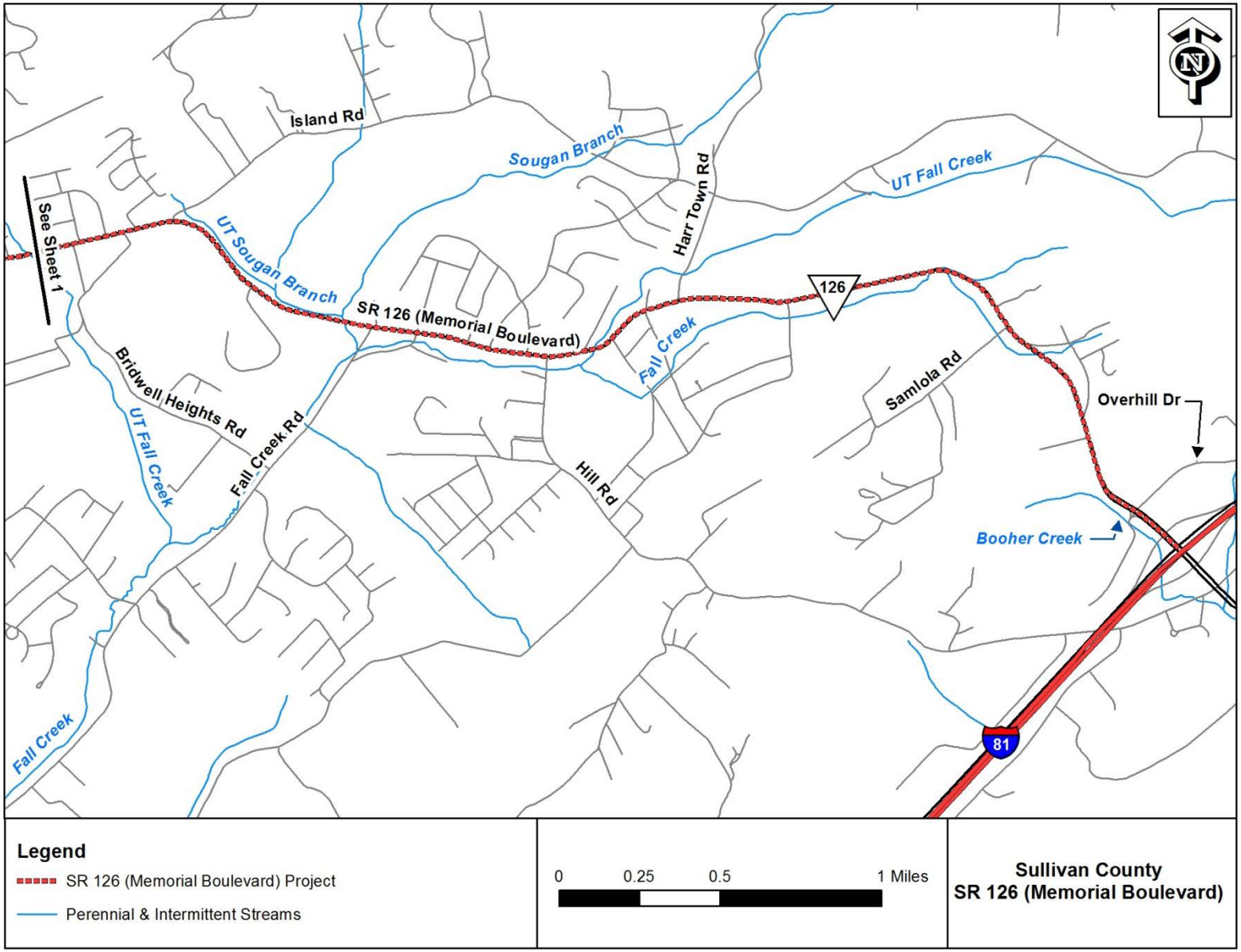


TABLE 4-5: PERENNIAL/INTERMITTENT STREAM IMPACTS FOR THE PREFERRED ALTERNATIVE (ALTERNATIVE B MODIFIED)

Streams Impacted	Drainage Area (acres)	Flow Regime	Preferred Alternative (Alternative B Modified) Linear Feet Impacted	Alternative A Linear Feet Impacted	Alternative B Linear Feet Impacted
Sougans Branch	1,574	Perennial	99	93	99
Fall Creek	2,032	Perennial	874	1,644	874
Unnamed Tributary of Sougans Branch	439	Perennial	1,868	2,506	1,868
Unnamed Tributary of Fall Creek	53	Intermittent	92	192	92
Unnamed Tributary of Reedy Creek	113	Intermittent	174	428	174
			Total: 3,107	**Total: 4,863**	**Total: 3,107**

Note: Impacts are Estimates.

Mitigation is required for stream impacts which do not meet the requirements for TDEC's General ARAP program or for certain Nationwide Section 404 permits issued by the USACE.

To protect water quality and aquatic species, TDOT will design stream crossings perpendicular to the direction of flow. The construction of culverts will be staged during the drier times of the year and construction will not take place immediately following rain events. Locations of these structures will be determined during final design and prior to submission of federal and state permit applications. Culvert improvements will be made during final design, if necessary, based on a hydraulic capacity analysis. Culverts will also be wide enough to pass high flows and will be placed so as not to restrict the movement of aquatic vertebrates within the streams.

In an effort to minimize sedimentation impacts, erosion prevention and sediment control plans will be included in the project construction plans. TDOT will also implement its *Standard Specifications for Road and Bridge Construction* and the *Statewide Storm Water Management Plan (SSWMP)*, which includes erosion prevention and sediment control standards for use during construction. To minimize potential run-off impacts to streams, and subsequent wildlife that utilize those streams, all appropriate best management practices (BMPs) will be implemented during and after construction to prevent erosion and control sedimentation within contributing drainage systems. Some of the BMPs that can be utilized include the following:

- Preservation of roadside vegetation beyond the limits of construction;
- Preservation of mature canopy along streams and establishment of a dense herbaceous layer of native species;
- Early re-vegetation of disturbed areas to hold soil movement to a minimum;

- Utilization of detention/retention structures;
- Prevention of heavy equipment in streams;
- Utilization of diversion channels to keep surface flow away from the construction site or to direct flow from the construction site into appropriate sediment control services;
- Seeding with temporary vegetation to help control sediment runoff;
- Avoiding construction activities immediately following rain events;
- Prevention of the release of chemicals, fuels, lubricants, bitumens, raw sewage, or harmful waste into or alongside of streams or impoundments, or into natural or manmade channels that lead to same and;
- Inclusion of BMPs in the construction plans, specifications, and contract pay items as specified in TDOT *Standard Specifications for Road and Bridge Construction* as well as the *TDOT Design Division Drainage Manual.*

Erosion control devices should limit any adverse effects to area streams. Exact measures will be developed and coordinated with the appropriate permitting agencies later in the design phase. If these mitigation measures are utilized, there should be no cumulative impacts to streams as a result of the construction of this project.

A *General NPDES Permit for Discharges of Stormwater Associated with Construction Activities* will be required for the proposed project. This permit is issued by TDEC's Division of Water Pollution Control pursuant to the federally-promulgated National Pollutant Discharge Elimination System (NPDES) program. The permit requires a Stormwater Pollution Prevention Plan (SWPPP) detailing the erosion prevention and sediment control practices designed to minimize sediment-laden stormwater run-off during precipitation events.

An updated environmental boundary and mitigation report will be completed with appropriate consultation with the USFWS, TWRA, TDEC, and USACE prior to construction. Impacts to perennial, intermittent, and ephemeral streams within the project corridor will be included in this documentation. The Preferred Alternative (Alternative B Modified) will be designed to avoid major impacts to these resources to the extents practicable. Efforts to further minimize impacts will continue throughout the design, permitting, and construction processes. Unavoidable impacts will be mitigated as required by applicable laws and regulations.

Floodplains

The review of FIRMs indicates that 100-year floodplains exist within the SR 126 project corridor. The floodplains are associated with Fall Creek and Sougans Branch, which are currently crossed by SR 126. Table 4-6 compares the floodplain impacts for the alternatives considered. Figure 4-3 illustrates the floodplains within the project corridor.

TABLE 4-6: FLOODPLAIN IMPACTS

Area	Preferred Alternative (Alternative B Modified)	Alternative A	Alternative B
Total Area of land within the 2,000-foot Corridor	2,100 acres	2,100 acres	2,100 acres
Impacted Floodplains within the Corridor	3.2 acres	4.0 acres	3.2 acres

Improvements to SR 126 with the Preferred Alternative (Alternative B Modified) will result in 3.2 acres of floodplain impacts. The project will be designed to minimize floodplain impacts as required by Executive Order 11988 and 23 CFR 650A. Where feasible, impacts will be minimized through the use of a perpendicular stream crossing aimed at reducing fill and/or structures within the floodplain. The floodplain crossing will be designed so that the following criteria are met:

- There is no potential for interruption or termination of the transportation facility that is needed for emergency vehicles or provides the communities' only evacuation route due to the construction of the project;
- The water crossings will convey floodwaters so there will be no increase in flooding due to the encroachment in the floodplain and;
- The Preferred Alternative (Alternative B Modified) will have no substantial adverse impacts on the natural and beneficial floodplain values.

Wetlands

Field surveys were conducted within the project impact area for the 2012 DEIS. In addition, National Wetland Inventory maps and topographical maps were reviewed to determine the possible presence of these resources. Impacts to wetlands are permitted through TDEC and the USACE in the same fashion as stream impacts. No wetlands were identified within the project corridor; therefore the Preferred Alternative (Alternative B Modified) will not result in impacts to wetlands. A review of the wetland and topographic maps since the approval of the DEIS confirms these findings remain valid.

<u>Federally-Listed and Proposed Threatened and Endangered Species</u>

An aquatic and terrestrial ecology report was completed in December 2008 for the DEIS. Through the coordination with federal agencies, it was concluded that no endangered or threatened species or their critical habitats occur within the potentially disturbed limits of the proposed action. No foreseen impacts will occur to those species or their ecological communities. Based on the best information at that time, the requirements of Section 7 of the *Endangered Species Act of 1973*, as amended, were fulfilled for Alternative A and Alternative B. On October 24, 2013, the USFWS responded to the selection of the Preferred Alternative (Alternative B Modified) stating that, based on the best information available at the time, the requirements of Section 7 were fulfilled for all species that currently receive federal protection. An updated environmental boundary and mitigation report for the Preferred Alternative (Alternative B Modified) will be completed with appropriate consultation with the USFWS, TWRA, and TDEC prior to construction.

FIGURE 4-3: FLOODPLAINS IN PROJECT CORRIDOR

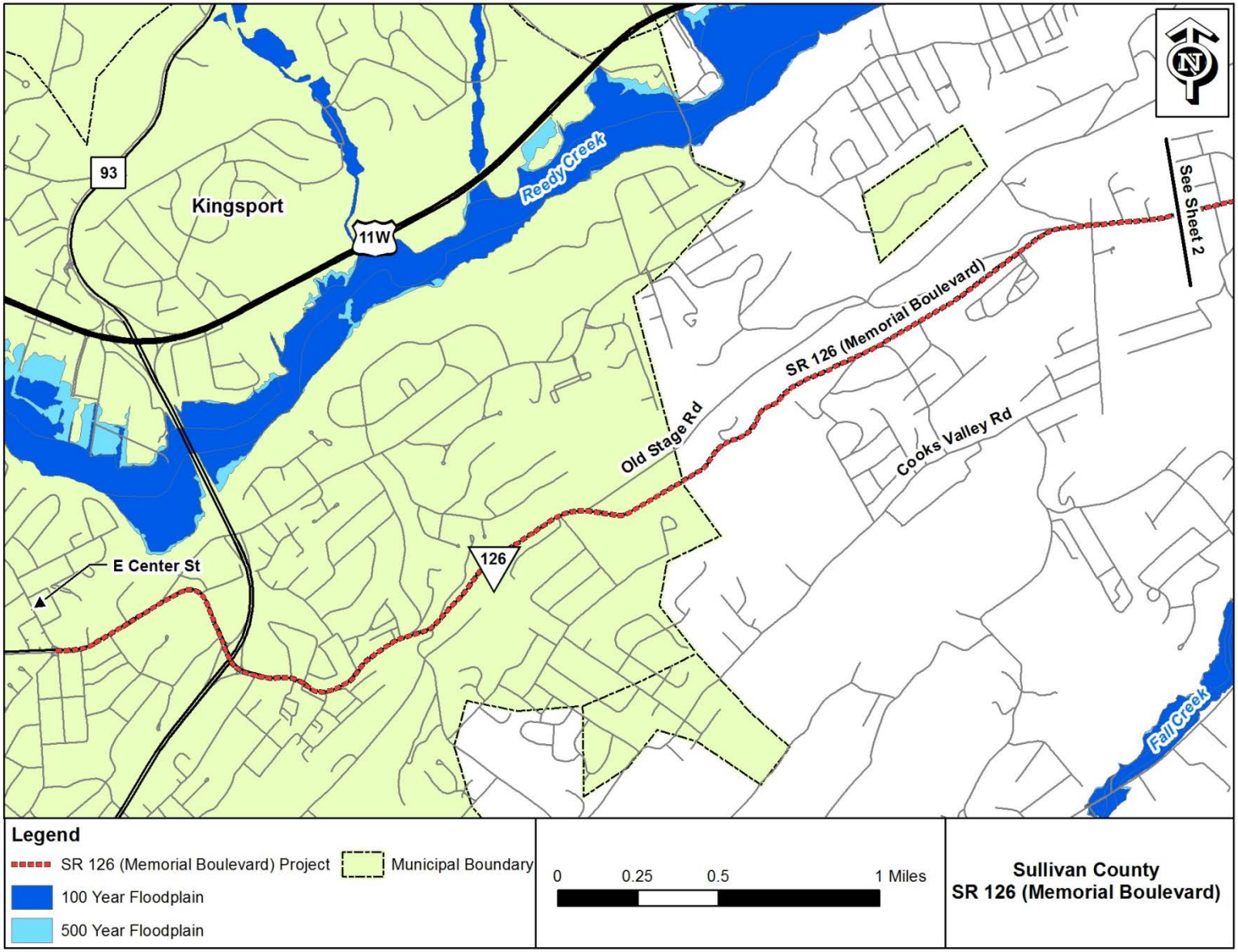
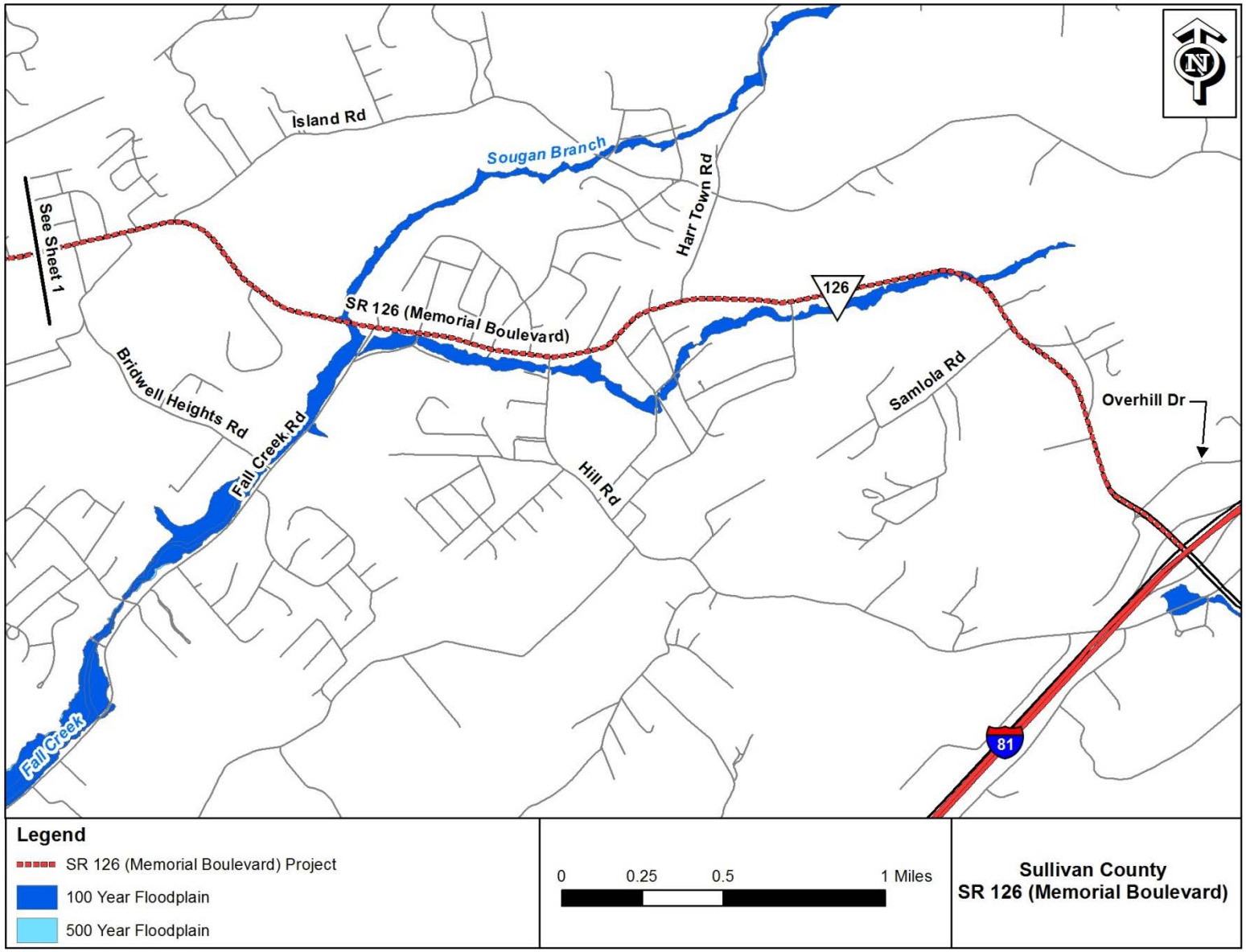


FIGURE 4-3: FLOODPLAINS IN PROJECT CORRIDOR (CONTINUED)



Since the Preferred Alternative (Alternative B Modified) is a modification of Alternative B, it is within the limits of the previously-studied corridor for federally-threatened and endangered species. The updated report will include the review of federally-listed and proposed threatened and endangered species and the potential impacts by the Preferred Alternative (Alternative B Modified). An updated bat survey will be conducted in the project area prior to construction letting.

The TDEC Natural Heritage Inventory Program database was reviewed in December 2008 and again in December 2013. The 2013 database review indicated nine species that are federally-listed as threatened or endangered in Sullivan County, Tennessee. The species are listed in Section 3.4.

The species review indicated that the bald eagle (*Haliaeetus leucocephalus*), Swainson's warbler (*Limnothlypis swainsonii*), the common raven (*Corvus corax*), and the common barn owl (*Tyto alba*) are known to exist in Sullivan County. Field surveys in 2008 did not identify either bald eagles or nests. If any of these four species were to locate within the project's Area of Potential Effect at any time during the construction phase, they will be protected under the *U.S. Migratory Bird Treaty Act of 1918* (MBTA) and TDOT will obtain a permit issued pursuant to federal regulations.

Although the Indiana bat (*Myotis sodalis*) is not known to occur in the project area, a bat survey for this federally-listed endangered species was conducted at the request of the USFWS. Mist netting and field reviews were conducted in the project impact area from August 3 to August 10, 2011. No Indiana bats were documented.

An *Indiana bat (Myotis sodalis) Mist Net Survey* report was completed in October 2011, and was provided in the appendix of the DEIS. The report covered the August 2011 field review. This study expired on April 1, 2014; however, according to USFWS, one bat survey will meet the USFWS' needs to fulfill Section 7 during the NEPA phase of a project. Correspondence from the USFWS on May 9, 2014, confirms that an initial bat survey during the NEPA phase and additional bat survey(s) prior to construction letting are sufficient at this time to document this effort. The USFWS also reconfirmed that Section 7 [of the *Endangered Species Act of 1973*] clearance was still valid. A copy of the USFWS correspondence is in Attachment D.

The project was evaluated for the Indiana bat (*Myotis sodalis*) and was deemed "not likely to adversely affect" the species. The northern long-eared bat (*Myotis septentrionalis*) has similar habitat requirements, so it is unlikely that the proposed project will jeopardize the existence of the northern long-eared bat. However, while awaiting additional information from USFWS, it will be assumed that the bat is present. Addressing the impacts to the species will be accomplished through whatever means that the USFWS deems necessary, including avoiding, minimizing, or mitigating potential effects, and adhering to all USFWS requirements prior to the letting and construction of the project.

State-Listed Species

According to the TDEC Natural Heritage Inventory Program database review in December 2013, there are 55 state-listed species that have been designated as endangered, threatened, deemed in need of management, or of special concern in Sullivan County, Tennessee. The species are listed in Section 3.4.

The December 2008 ecology report for the DEIS indicated that no state-listed species will be impacted by Alternative A or Alternative B. Through the coordination with state agencies, it was concluded that no endangered or threatened species or their critical habitats occur within the potentially disturbed limits of the proposed action. No foreseen impacts will occur to these species or their ecological communities. An updated environmental boundary and mitigation report for the Preferred Alternative (Alternative B Modified) will include the review of state-listed species as well as species protected under the MBTA for potential impacts.

Invasive Species

The potential for introducing additional exotic or invasive species to the natural and farmed plant communities in the project area is remote. Habitat fragmentation has already resulted in the establishment of these organisms in the region. Additional fragmentation of habitat and soil disturbance could create more favorable conditions for the existing non-native species. These impacts will be minimized by planting native vegetation on cut and fill slopes and in the medians of the selected Preferred Alternative (Alternative B Modified).

4.9.2 Alternatives A and B

Terrestrial Resources

Alternatives A and B are along the existing facility which also lacks extensive forested areas. Alternative A would require the most ROW acquisition of the alternatives; the conversion of approximately 75 acres of scattered forested habitat to ROW. Alternative B would result in the conversion of 55 acres of scattered forested habitat to ROW.

Aquatic Resources

Surface Waters

The same streams impacted by the Preferred Alternative (Alternative B Modified) would be impacted by Alternative A. Culverts or pipes would be used for stream crossings. Alternative A would require both culverts and stream relocation for an estimated total of 4,863 linear feet within the proposed ROW. This alternative would have the most stream impacts of the alternatives considered.

The same five streams as previously mentioned would also be impacted by Alternative B. Alternative B would require both culverts and stream relocation for an estimated total of 3,107 linear feet within the proposed ROW. This alternative would have similar stream impacts as the Preferred Alternative (Alternative B Modified).

Refer to Table 4-5 in the Preferred Alternative (Alternative B Modified) discussion for a comparison of stream impacts for each of the three Build Alternatives.

Floodplains

Alternatives A and B cross the same two floodplains as does the Preferred Alternative (Alternative B Modified). Alternative A would impact approximately four acres of floodplain. Alternative B would impact approximately 3.2 acres.

Refer to Table 4-6 in the Preferred Alternative (Alternative B Modified) discussion for a comparison of floodplain impacts for each of the three Build Alternatives.

Wetlands

Improvements to SR 126 through the implementation of either Alternative A or Alternative B would not result in impacts to wetlands.

Federally-Listed and Proposed Threatened and Endangered Species

Both Alternatives A and B were reviewed for federally-threatened and endangered species in December 2008. Based on the best information at that time, the requirements of Section 7 of the *Endangered Species Act of 1973*, as amended, were fulfilled.

An *Indiana bat (Myotis sodalis) Mist Net Survey* report was completed in October 2011, and was provided in the appendix of the DEIS. The report covered the August 2011 field review. This study expired on April 1, 2014; however, according to USFWS, one bat survey will meet the USFWS' needs to fulfill Section 7 during the NEPA phase of a project. Correspondence from the USFWS on May 9, 2014, confirms that an initial bat survey during the NEPA phase and additional bat survey(s) prior to construction letting are sufficient at this time to document this effort. The USFWS also reconfirmed that Section 7 [of the *Endangered Species Act of 1973*] clearance was still valid. A copy of the USFWS correspondence is in Attachment D.

The project was evaluated for the Indiana bat (Myotis sodalis) and was deemed "not likely to adversely affect" the species. The northern long-eared bat (Myotis septentrionalis) has similar habitat requirements, so it is unlikely that the proposed project would jeopardize the existence of the northern long-eared bat. However, while awaiting additional information from USFWS, it will be assumed that the bat is present. Addressing the impacts to the species will be accomplished through whatever means that the USFWS deems necessary, including avoiding, minimizing, or mitigating potential effects, and adhering to all USFWS requirements prior to the letting and construction of the project.

State-Listed Species

Both Alternatives A and B were reviewed for state-threatened and endangered species in December 2008. Neither Alternative A nor Alternative B would impact species protected under state law.

Invasive Species

Impacts caused by the introduction of invasive species would be minimized by planting native vegetation on cut and fill slopes and in the medians of either Alternative A or Alternative B.

4.10 Air Quality Impacts

A copy of the *Air Quality Technical Report for State Route 126 from East Center Street to Interstate 81* (updated January 2014) is in Appendix B. The analysis was conducted in accordance with Section 5.3.5 (Air Quality) of the *Tennessee Environmental Procedures Manual*.

4.10.1 National Ambient Air Quality Standards (NAAQS)

The EPA has established allowable concentrations and exposure limits called the National Ambient Air Quality Standards (NAAQS) for various "criteria" pollutants. These pollutants

include carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur oxides (SO_x), and lead (Pb).

In accordance with the *Clean Air Act Amendments of 1990* (CAAA of 1990), the EPA identified areas that did not meet the NAAQS for the criteria pollutants and designated them as "nonattainment" areas. Once a nonattainment area meets the NAAQS, it is re-designated as a "maintenance" area. Sullivan County is in attainment for all transportation-related criteria pollutants.

Preferred Alternative (Alternative B Modified)

Based on the screening procedure in the *Tennessee Environmental Procedures Manual*, the Preferred Alternative (Alternative B Modified) does not meet the criteria requiring a CO project level hot-spot analysis and will not produce a projected violation of the CO NAAQS.

Alternatives A and B

As with the Preferred Alternative (Alternative B Modified), Alternatives A and B do not meet the criteria requiring a CO project level hot-spot analysis and would not produce a projected violation of the CO NAAQS.

4.10.2 Transportation Conformity

Transportation conformity is a process required of Metropolitan Planning Organizations (MPOs) pursuant to the CAAA. CAAA requires that transportation plans, programs, and projects in nonattainment or maintenance areas that are funded or approved by the FHWA be in conformity with the State Implementation Plan (SIP), which represents the State's plan to either achieve or maintain the NAAQS for a particular pollutant.

This project is located in Sullivan County, which are in attainment for all transportation-related criteria pollutants. Therefore, a transportation conformity determination is not required.

4.10.3 Mobile Source Air Toxics (MSATs)

On February 3, 2006, the FHWA released *Interim Guidance on Air Toxic Analysis in NEPA Documents*. This guidance was superseded on September 30, 2009 and most recently on December 6, 2012 by FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents*. The purpose of 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 MSATs science is still evolving. As the science progresses, FHWA will update the guidance.

The qualitative analysis presented below provides a basis for identifying and comparing the potential differences among MSATs emissions, if any, for the build alternatives. The assessment is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*.

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

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

FHWA's Interim Guidance provides examples of "Projects with Low Potential MSATs Effects." These projects include minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic projections are less than 140,000 to 150,000 AADT (Annual Average Daily Traffic).

The Preferred Alternative (Alternative B Modified) includes the widening of SR 126 in some locations and the improvement of SR 126 in other locations. The highest projected design year 2037 AADT on SR 126 is 20,380 and substantially lower than the FHWA criterion. Therefore, the project meets the criteria for a "Project with Low Potential MSATs Effects."

For the No-Build and build alternatives, 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 estimated VMT for the Preferred Alternative (Alternative B Modified) is essentially the same as the VMT for the No-Build Alternative. Therefore, it is expected that there would be no appreciable difference in overall MSATs emissions between the No-Build and Preferred Alternative (Alternative B Modified).

Any emissions increases would also be offset somewhat by lower MSATs emission rates due to increased speeds; according to the EPA's MOVES2010b model, emissions of all of the priority MSATs decrease as speed increases. Travel speeds for the Preferred Alternative (Alternative B Modified) are expected to be higher than for the No-Build Alternative.

Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of the EPA's national control programs that are projected to reduce annual MSATs emissions by over 80 percent between 2010 and 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 MSATs emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated for the Preferred Alternative (Alternative B Modified) will have the effect of moving some traffic closer to nearby sensitive land uses; therefore, under the Preferred Alternative (Alternative B Modified) there may be localized areas where ambient concentrations of MSATs could be higher than under the No-Build Alternative.

However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSATs health impacts.

<u>Preferred Alternative (Alternative B Modified)</u>

When SR 126 is widened, the localized level of MSATs emissions for the Preferred Alternative (Alternative B Modified) could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSATs emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover (replacement of older cars with newer ones), will cause substantial reductions over time that, in almost all cases, will cause region-wide MSATs levels to be significantly lower than today.

Alternatives A and B

As with the Preferred Alternative (Alternative B Modified), the localized level of MSATs emissions for Alternatives A and B could be higher relative to the No-Build Alternative but lower in other locations when traffic shifts away from them. EPA's vehicle and fuel regulations, coupled with fleet turnover, would cause substantial reductions in region-wide MSATs levels in the future.

4.10.4 Greenhouse Gas Emissions (Climate Change)

Climate change is an important national and global concern. To help address the global issue of climate change, USDOT is committed to reducing GHG emissions from vehicles traveling on our nation's highways. USDOT and EPA are working together to reduce these emissions by substantially improving vehicle efficiency and shifting toward lower carbon intensive fuels. The agencies have jointly established new, more stringent fuel economy and first ever GHG emissions standards for model year 2012-2025 cars and light trucks. On October 15, 2015, the agencies finalized even more stringent standards for model year 2017-2025 vehicles, with an ultimate fuel economy standard of 54.5 miles per gallon for cars and light trucks by model year 2025. Further, on September 15, 2011, the agencies jointly published the first ever fuel economy and GHG emissions standards for heavy-duty trucks and buses. [2] Increasing use of technological innovations that can improve fuel economy, such as gasoline- and diesel-electric hybrid vehicles, will improve air quality and reduce CO_2 emissions future years.

Consistent with our view that broad-scale efforts hold the greatest promise for meaningfully addressing the global climate change problem, FHWA is engaged in developing strategies to reduce transportation's contribution to GHGs—particularly CO_2 emissions—and to assess the risks to transportation systems and services from climate change. In an effort to assist States and MPOs in performing GHG analyses, FHWA has developed a Handbook for Estimating Transportation GHG Emissions for Integration into the Planning Process. The Handbook presents methodologies reflecting good practices for the evaluation of GHG emissions at the transportation program level, and demonstrates how such evaluation may be integrated into the transportation planning process. FHWA also refined a web-based tool, The Energy and Emissions Reduction Policy Analysis Tool (EERPAT), for use at the statewide level to model a large number of GHG reduction scenarios and alternatives for use in transportation planning, climate action plans, scenario planning exercises, and in meeting state GHG reduction targets and goals. To assist states and MPOs in assessing climate change vulnerabilities to their transportation networks, FHWA has developed a climate change and extreme weather vulnerability and risk assessment framework.

Preferred Alternative (Alternative B Modified)

The GHG emissions from the Preferred Alternative (Alternative B Modified) will be insignificant. For these reasons, no project-level GHG analysis was performed for this project.

[2] For more information on fuel economy proposals and standards, see the National Highway Traffic Safety Administration's Corporate Average Fuel Economy website: http://www.nhtsa.gov/fuel-economy/.

Alternatives A and B

As with the Preferred Alternative (Alternative B Modified), the GHG emissions for Alternatives A and B would be insignificant compared to global emissions.

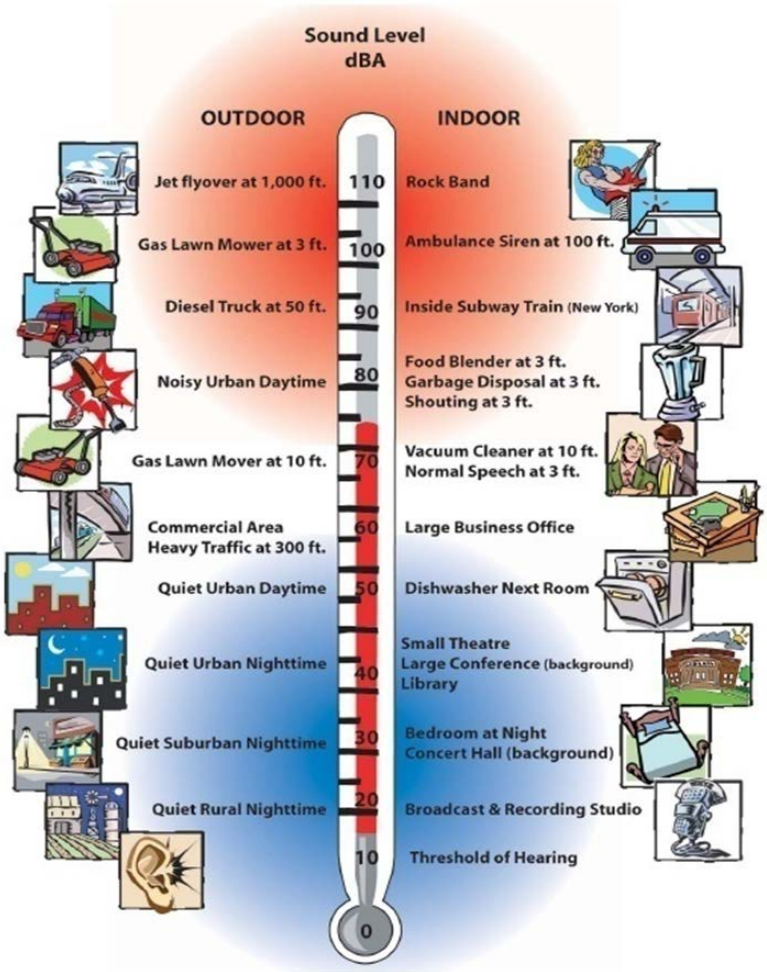
4.11 Noise Impacts

The noise evaluation for this project was conducted in accordance with federal guidance for handling noise impacts and abatement contained in 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* and the TDOT's *Policy on Highway Traffic Noise Abatement*, effective July 13, 2011. A copy of the *Noise Evaluation Update for State Route 126 from East Center Street to Interstate 81* (updated January 2014) is in Appendix C.

Fundamentals of Sound and Noise

The intensity or loudness of sound is measured in units called decibels (dB). However, because the human ear does not hear sound waves of different frequencies at the same subjective loudness, an adjustment or weighting of the high-pitched and low-pitched sounds is made to approximate how an average person hears sounds. When such adjustments to the sound levels are made, they are called "A-weighted levels" and are labeled "dBA." Figure 4-4 shows some common indoor and outdoor sound levels.

FIGURE 4-4: COMMON INDOOR AND OUTDOOR NOISE LEVELS



Noise is defined as unwanted sound. Since highway traffic sound is normally unwanted, it is usually called highway traffic noise. The level of highway traffic noise is never constant; therefore, it is necessary to use a statistical descriptor to describe the varying traffic noise levels. The equivalent continuous sound level (L_{eq}) is the statistical descriptor used in a noise impact analysis. The L_{eq} sound level is the steady A-weighted sound level, which would produce the same A-weighted sound energy over a stated period of time.

Criteria for Determining Impacts

FHWA regulations establish Noise Abatement Criteria (NAC) that must be used by states to determine if noise-sensitive land uses will be impacted by a project.

The regulations state that noise mitigation should be evaluated for any receptor or group of receptors where predicted traffic noise levels, using future traffic volumes and roadway conditions, approach or exceed the NAC shown in Table 4-7.

TABLE 4-7: FHWA NOISE ABATEMENT CRITERIA IN 23 CFR 772

Activity Category	L_{Aeq} (1h)	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B(1)	67	Exterior	Residential.
C(1)	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio stations, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, and television studios.
E(1)	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D, or F.
F	---	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---	---	Undeveloped lands that are not permitted.

Traffic noise is considered to “approach” a criterion at a level of one dBA less than the criterion (e.g., 66 dBA for Category B receptors).

The FHWA regulations and TDOT’s noise policy also define impacts to occur if there is a substantial increase in design year sound levels over existing sound levels. Table 4-8 presents TDOT’s criteria to define substantial noise increase.

The determination regarding substantial increase depends on 1) the existing level, and 2) the increase in the existing level caused by the project. If the existing level is 42 and the project will increase that level by 15 dB or more (i.e. 42 to 57 or higher), then that would constitute a substantial increase. If the level was increased from 42 to 55 dB, then that would not be an impact because the increase was less than 15 dB.

Identification of Noise-Sensitive Land Uses

Review of available electronic mapping revealed over 200 Category B residences adjacent to SR 126 that might be impacted by the project. These uses include both single-family homes and apartments.

The Holston Manor nursing home and the East Lawn Memorial Park cemetery are also located near SR 126 within the project limits. The exterior of the nursing home and cemetery are classified as Category C land uses. For cemeteries, frequent human use areas include exterior areas where services are held on a regular basis but do not include individual grave sites. Therefore, only the exterior of the cemetery building used for services was assessed for impacts.

TABLE 4-8: SUBSTANTIAL NOISE LEVEL INCREASE

Existing Noise Level (dBA) (1)	Predicted Design Year Noise Level Increase (dB) (2)
42 or less	15 or more
43	14 or more
44	13 or more
45	12 or more
46	11 or more
47 or more	10 or more

(1) Worst hour noise level from the combination of natural and mechanical sources and human activity.
(2) Predicted design year noise level minus existing noise level.

Noise impacts at the residences, nursing home, and cemetery were identified, and noise abatement was considered if design year sound levels are 66 dBA or higher or if there is a substantial increase in existing sound levels.

There are some Category F industrial and retail properties located within the project limits. As indicated in Table 4-9, these land uses are not noise-sensitive and do not have an NAC. Therefore, they have not been included in the noise study.

Finally, there are some tracts of Activity Category G undeveloped lands that exist along the project. These undeveloped lands are not noise-sensitive and have not been included in the noise analysis. However, noise impacts could occur in the future if noise-sensitive land uses are constructed near SR 126. A discussion of future sound levels and the need for noise-compatible land use planning is provided later in this report.

Properties that are shown in the conceptual plans to be acquired have not been included in the noise analysis.

Determination of Existing Sound Levels

Noise measurements were conducted at several noise-sensitive land uses in the project area to characterize the existing noise environment. Existing peak hour sound levels at the measurement locations range from 44 to 66 dBA. Traffic noise from SR 126 is the dominant noise source in the area.

Determination of Future Sound Levels

Sound levels for the No-Build Alternative are predicted to be approximately one dB higher than existing sound levels.

Noise modeling of the Preferred Alternative (Alternative B Modified) was completed using the FHWA Traffic Noise Model (TNM 2.5) computer program. The program calculated year 2037 design-hour equivalent sound levels at the noise-sensitive land uses in the project area, including the measurement locations. The predicted sound levels are summarized in Table 4-9. The predicted sound levels at each noise-sensitive land use are provided in the noise evaluation update report.

TABLE 4-9: DESIGN YEAR 2037 SOUND LEVELS AND IMPACTS

Alternative	Design Year Sound Levels (dBA)	Impacted based on NAC?	Number of Impacts
Preferred (Alternative B Modified)	44 – 68	Yes	18

4.11.1 Determination of Future Sound Levels for the Preferred Alternative (Alternative B Modified)

Design year sound levels for the Preferred Alternative (Alternative B Modified) are predicted to between zero and four dB higher than existing sound levels, as shown in Table 4-9. These increases are not substantial according to TDOT's Noise Policy. Therefore, none of the receivers are predicted to be impacted by a substantial increase in sound level. Additionally, sound levels at some residences will be reduced in many locations due to a reduced roadway cross-section. Noise levels under the Preferred Alternative (Alternative B Modified) will lower than those projected under Alternatives A and B in part due to reduced traffic projections under the Preferred Alternative (Alternative B Modified).

Design year sound levels at most receivers are predicted to be below the NAC. However, 18 residences are predicted to be impacted with design year sound levels of 66 dBA or higher. The nursing home and cemetery are not predicted to be impacted.

4.11.2 Determination of Future Sound Levels for Alternatives A and B

Design year sound levels for Alternatives A and B are predicted to between zero and eight dB higher than existing sound levels. None of the receivers are predicted to be impacted by a substantial increase in sound level. Additionally, sound levels at some residences would be reduced in many locations due to a reduced roadway cross-section.

Design year sound levels at most receivers are predicted to be below the NAC. However, 35 residences are predicted to be impacted by Alternative A with design year sound levels of 66

dBA or higher. Similarly, 45 residences are predicted to be impacted under Alternative B. The increased number of impacts for Alternative B is primarily the result of fewer properties being acquired and some residences remaining in close proximity to SR 126.

Noise Abatement Evaluation

Abatement is generally evaluated when impacts are predicted to occur. Noise barriers were evaluated to reduce sound levels for impacted land uses. In order for noise barriers to be included in a project, they must be determined to be both feasible and reasonable in accordance with TDOT's Noise Policy as discussed below.

Feasibility means that: the construction of a barrier would not be anticipated to pose any major design, construction, maintenance, or safety problems; and the noise barriers will provide a noise reduction (or insertion loss) of five dB reduction in design year highway traffic noise levels for the majority of the impacted first-row receptors.

SR 126 is not a limited access facility. In fact, all of the impacted residences have direct driveway access to SR 126. Noise barriers are not feasible to mitigate impacts at these residences because a noise barrier would limit access from these properties and adjacent properties.

Some of the impacted residences are also isolated from other impacted residences. Noise barriers for isolated residences are not reasonable since the required area per benefited residence will greatly exceed the allowable area for benefited residence. As a result, noise barriers were determined not to be feasible or reasonable for this project.

Statement of Likelihood

Noise abatement is not proposed for this project.

Information for Local Officials

There are tracts of undeveloped land adjacent to SR 126. TDOT encourages the local governments with jurisdiction over these lands, as well as potential developers of these lands, to practice noise compatibility 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."*

Table 4-10 presents design year sound levels for areas along SR 126 where vacant and possibly developable lands exist. Noise predictions were made at distances between 50 and 300 feet from the centerline of the near lane for the design year 2037. As indicated, sound levels within approximately 50 to 100 feet of the centerline of the near lane of SR 126 will approach or exceed the NAC of 66 dBA. Noise-sensitive land uses should generally not be constructed in these areas unless noise mitigation measures are provided.

Finally, TDOT currently has an active Type II Noise Barrier Program to facilitate the construction of "retrofit" noise barriers along existing highways.

Noise levels in the project area will be increased during construction. The sound levels resulting from construction activities at nearby noise-sensitive receivers will be a function of the types of equipment utilized, the duration of the activities, and the distances between construction activities and nearby land uses.

TABLE 4-10: DESIGN YEAR 2037 SOUND LEVEL IMPACTS

Distance(1)	L_{eq} (1h) (dBA)(2)
50 feet	67
100 feet	64
200 feet	59
300 feet	55

(1) Perpendicular distance to the center of near lane. (2) At-grade situation.

TDOT's construction specifications will apply to this project. As a result, 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 on noise-sensitive areas.

4.12 Historic/Architectural Impacts

Surveys of potential historic resources were performed in accordance with Section 106 of the *National Historic Preservation Act of 1966*. In September 2008, TDOT identified two properties within the APE that are eligible for, or listed in, the NRHP. The properties are the Shipley-Jarvis House located at 3309 Memorial Boulevard (SR 126) and Yancey's Tavern located on SR 126 at its intersection with Chestnut Ridge Road. The Shipley-Jarvis House is eligible for listing on the NRHP and Yancey's Tavern is listed on the NHRP. The historic resources are depicted in Figure 4-5 and Figure 4-6.

<u>Shipley-Jarvis House</u>

This Shipley-Jarvis House is located on the south side of SR 126 in a residential and commercial section of East Kingsport. The house is located on a 1.6-acre tract near the project's East Center Street terminus. It exemplifies the adaptation of 19th century dwellings to conform to 20th century architectural tastes. Its architectural features continue to illustrate both mid-19th century building methods and 20th century stylistic changes.

<u>Yancey's Tavern</u>

Yancey's Tavern is located on the northern side of SR 126 on Chestnut Ridge Road. This property was listed in the NRHP in 1972 under Criterion A for its significance in the early settlement of Sullivan County. According to the NRHP listing, the structure was constructed in 1782 as a double log house with a dogtrot. It is currently used as a community event and meeting place.

FIGURE 4-5: SHIPLEY-JARVIS HOUSE

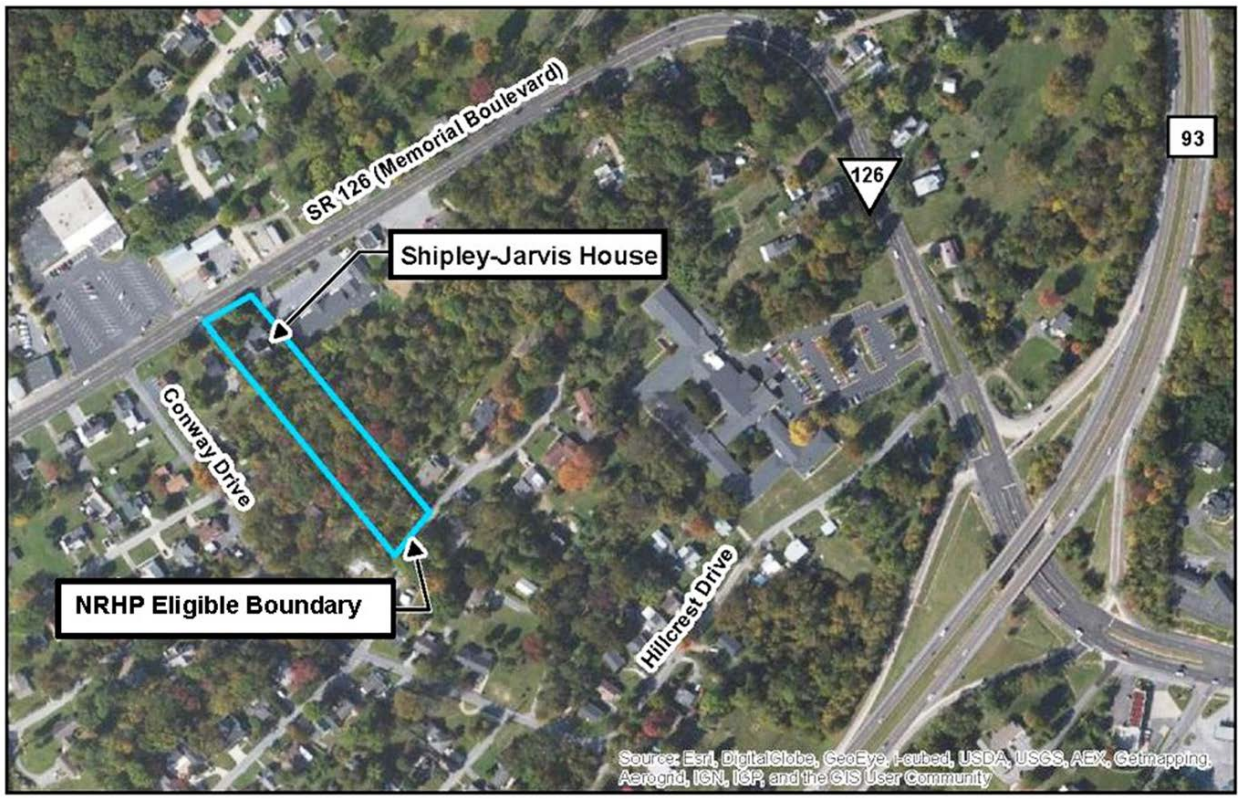
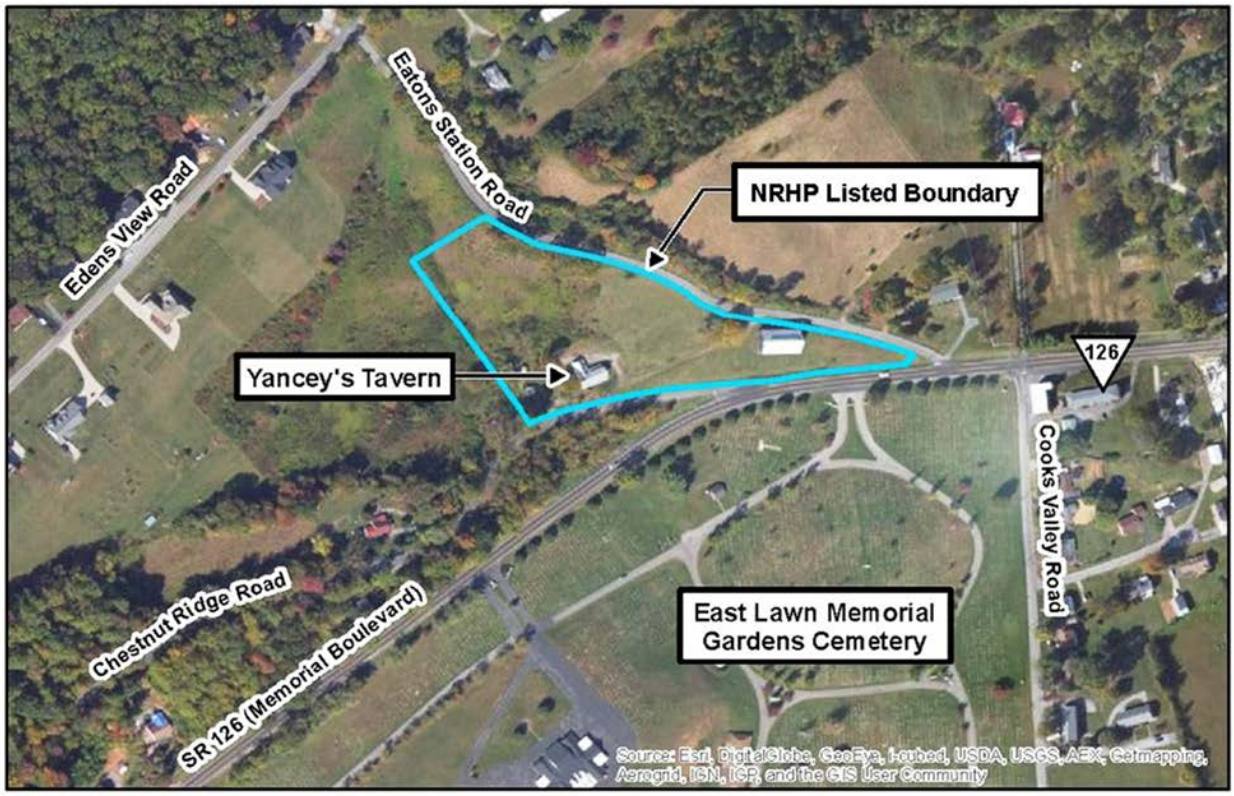


FIGURE 4-6: YANCEY'S TAVERN



4.12.1 Preferred Alternative (Alternative B Modified)

Shipley-Jarvis House

The Preferred Alternative (Alternative B Modified) proposes the widening of the roadway in front of the Shipley-Jarvis House to be shifted away from the property as necessary. This widening will not acquire any ROW within the proposed NRHP boundary of the property. The widening will not have an adverse effect on this property. The SHPO concurred with this finding in a letter dated November 3, 2008, for Alternative B, which is identical to the Preferred Alternative (Alternative B Modified) in this area. The SHPO letter is in Attachment E, and also in the DEIS, which is in Appendix J.

Yancey's Tavern

The Preferred Alternative (Alternative B Modified) is a modification to Alternative B. As described in the DEIS, the SHPO commented on November 3, 2008, that an adverse impact on Yancey's Tavern would occur with Alternative B. On February 26, 2010, the SHPO advised that the ACHP should be consulted regarding this adverse impact. Upon receiving written notification and information regarding the adverse impact to Yancey's Tavern, the ACHP responded on February 18, 2011, that there is no need for their participation to resolve the adverse effect. A Memorandum of Agreement (MOA) is not required since there is no adverse effect.

In an effort to minimize impacts to Yancey's Tavern associated with the Preferred Alternative (Alternative B Modified), TDOT considered avoidance options. On June 3, 2013, TDOT submitted to the SHPO an Addendum Documentation of Effects report outlining proposed measures associated with the Preferred Alternative (Alternative B Modified). The SHPO responded on June 11, 2013, that the project as proposed with the Preferred Alternative (Alternative B Modified) will not adversely affect Yancey's Tavern under Section 106, which is explained in Section 3.5 of this document. The Preferred Alternative (Alternative B Modified) includes a compressed three-lane cross-section as it passes between Yancey's Tavern and the East Lawn Memorial Gardens Cemetery. This alternative avoids taking property from Yancey's Tavern and avoids displacing any known graves from the cemetery. Since the Preferred Alternative (Alternative B Modified) will not adversely affect Yancey's Tavern, an MOA is not required. Figure 4-7 indicates the Yancey's Tavern and East Lawn Memorial Gardens Cemetery location.

Figure 4-8 details the proposed mitigation for the area. The compressed section for the Preferred Alternative (Alternative B Modified) is discussed in greater detail in Chapter 2.

The following design commitments will be carried out in association with the Preferred Alternative (Alternative B Modified):

- The proposed project will shift the ROW from Yancey's Tavern to the south onto the East Lawn Memorial Park and Cemetery, but will not be shifted so far to the south that known occupied graves will need to be relocated;
- Only a temporary construction easement will be needed within the National Register boundary of Yancey's Tavern and that construction easement will be returned to the current grade and appearance after construction is completed;
- TDOT is proposing an aesthetic treatment to the retaining wall that will be compatible with the historic landscape and will be minimalist in its design. TDOT will consult with the

SHPO and consulting parties in designing the retaining wall in order to get their review and comments on the proposed design feature;

- The cross-section is reduced by the removal of the sidewalk on the northern side of SR 126, but the sidewalk on the south side will be retained;
- In order to re-screen the area in front of Yancey's Tavern, TDOT is proposing a detailed landscaping plan that will be created in consultation with the SHPO and consulting parties to provide appropriate plantings for the area;
- Landscaping and aesthetic details will be presented to the SHPO and consulting parties for review and comment;
- Chestnut Ridge Road will end slightly to the southeast of the historic property itself and a branch turn-around will be provided at the dead end to give travelers the opportunity to turn around. Having a branch turn-around rather than a cul-de-sac will give the dead end a more rural feel rather than the suburban feel of a bulb-out cul-de-sac and;
- The branch turn-around will require some of the mature trees to the southwest of Yancey's Tavern to be removed; however, TDOT will develop a detailed landscaping plan, in consultation with the SHPO and consulting parties, that will replace the vegetation that will need to be removed with the branch, turn-around design.

4.12.2 Alternatives A and B

Shipley-Jarvis House

Alternatives A and B include the same plan for widening of the roadway in front of the Shipley-Jarvis House as the Preferred Alternative (Alternative B Modified). The widening would not acquire any ROW from the property. It was determined by TDOT that these alternatives would not have an adverse effect on this property and no mitigation is required. The SHPO concurred with this finding in the letter dated November 3, 2008. The SHPO letter is in the appendix of the DEIS.

Yancey's Tavern

The SHPO commented on November 3, 2008 that an adverse impact on Yancey's Tavern would occur with either Alternative A or B. On February 26, 2010, the SHPO advised that the ACHP should be consulted regarding this adverse impact. Upon receiving written notification and information regarding the adverse impact to Yancey's Tavern, the ACHP responded on February 18, 2011, that there is no need for their participation to resolve the adverse effect. The ACHP correspondence also noted that supporting documentation along with a final MOA must be filed with the ACHP. Coordination related to Yancey's Tavern is in Attachment E.

Conclusion

As stated above, for the Preferred Alternative (Alternative B Modified), coordination occurred with the property owner of Yancey's Tavern and the SHPO to avoid an adverse effect under Section 106. Because there is no adverse effect, an MOA was deemed unnecessary.

4.13 Archaeological Impacts

Beginning in October 2001, investigations were conducted to provide information on the distribution of important archaeological properties within the project area. This information was used to make informed management decisions relating to the design, improvements, and construction of SR 126.

As stated in Chapter 3, archaeological investigations were conducted in phases: Phase 1a and Phase 1b. Phase 1a consisted of a literature and records search for the areas surrounding the proposed alternatives. Phase 1b, the second phase of the investigation, consisted of a systematic pedestrian survey of high-probability areas resulting from the predictive model for archaeological resources within the proposed alternatives.

A pedestrian survey involves walking the surface of an archaeological site or large region in stratified patterns, and either marking the location of identified artifacts, or collecting a sample for further investigation. High-probability areas are locations where there is a strong possibility of artifacts present.

A Phase I Archaeological Survey for the APE was completed in September 2009. Thirteen sites were identified. Four of them were considered potentially eligible for the National Register, warranting additional investigation to determine their National Register status if they could not be avoided by the build alternatives. One site (40SL419) encompasses all of the area within the boundaries of the NRHP-listed Yancey's Tavern property.

Alternatives A and B

During the development of the DEIS, an archaeological avoidance plan was developed. By implementing minor modifications to Alternatives A and B, the plan avoided all four of the archaeology sites considered potentially eligible for the National Register. The archaeological avoidance plan was submitted to the SHPO on July, 1, 2010 and on July 14, 2010, the SHPO stated that the revised project area contained no archaeological resources eligible for listing in the NRHP.

Preferred Alternative (Alternative B Modified)

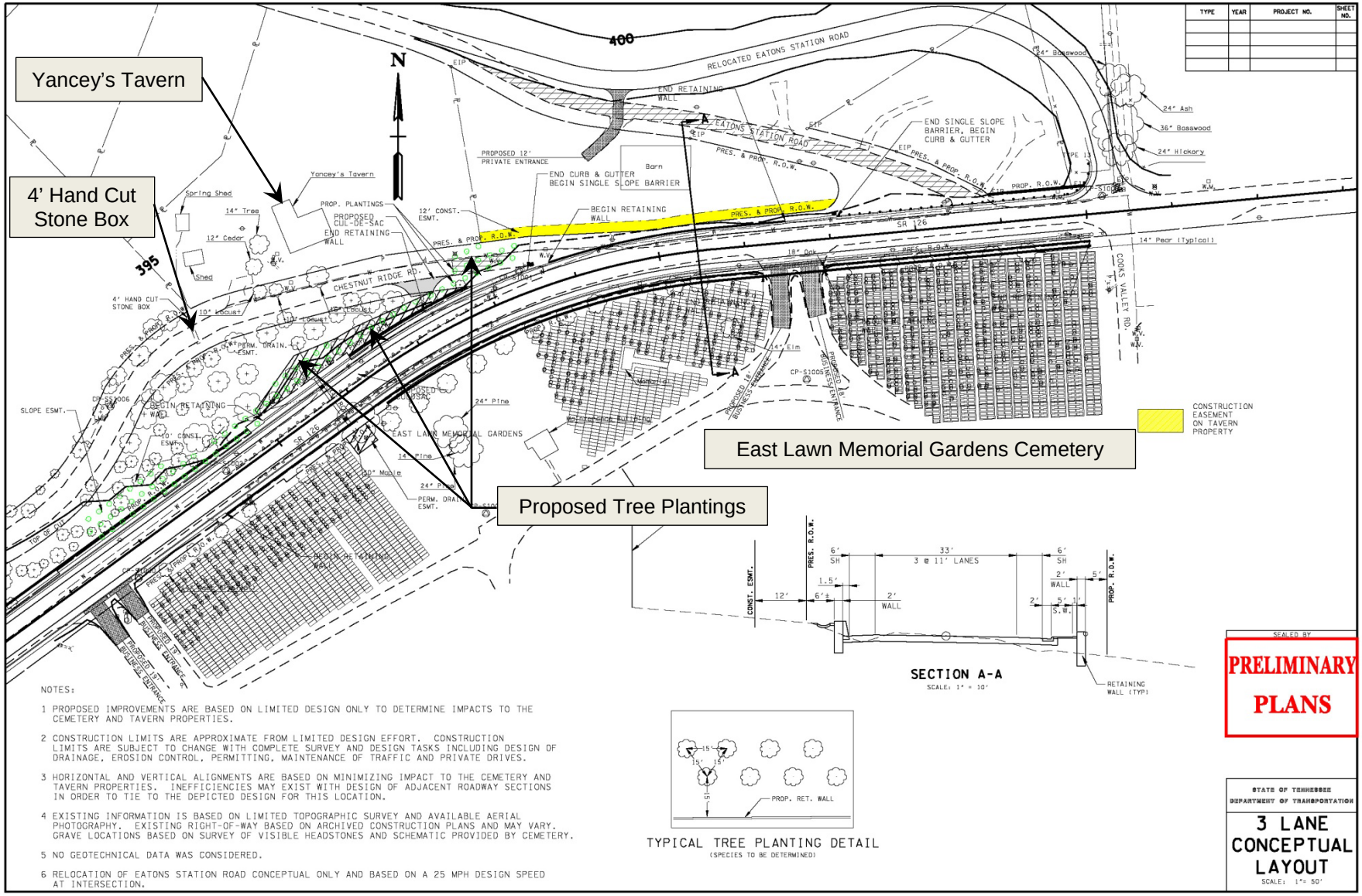
As part of the development of the Preferred Alternative (Alternative B Modified), the project design was refined to avoid impacts on the Yancey's Tavern historic property. The roadway section was reduced and a retaining wall was included to keep project impacts outside the NRHP boundaries of the property. This effectively avoided prehistoric and historic archaeological deposits that may be present there. In a letter dated June 11, 2013, the SHPO states that the project as proposed under the Preferred Alternative (Alternative B Modified) will not adversely affect Yancey's Tavern.

Tribal coordination was conducted for the project on January 9, 2012. As a result of this coordination, both the Cherokee Nation and United Keetoowah Band of Cherokee Indians in Oklahoma indicated that they were unaware of any sites and had no objections to the project as proposed. Both tribes will be notified if human remains or objects are discovered. Additional coordination was sent to the Muscogee (Creek) Nation of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Shawnee Tribe, United Keetoowah Band of Cherokee Indians, Eastern Band of Cherokee Indians and the Cherokee Nation on February 27, 2014, but no responses were received.

If archaeological material, including human remains and objects, is uncovered during construction, all construction will cease in that area, and the Federal Highway Administration, federally recognized Native American tribes and Tennessee Division of Archaeology will be contacted to resolve disposition of the discovery. This is pursuant to compliance with 36 CFR 800.13, Post-review discoveries. Archaeological coordination is in Attachment F.

FIGURE 4-7: PROJECT IN VICINITY OF NRHP-LISTED YANCEY'S TAVERN

FIGURE 4-8: PREFERRED ALTERNATIVE (ALTERNATIVE B MODIFIED) AT YANCEY'S TAVERN



4.14 Section 4(f) Impacts

Section 4(f) of the United States Department of Transportation Act of 1966, promulgated in 23 CFR 774, requires US DOT agencies to take special efforts to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.

The proposed project would not directly impact any public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The proposed project also would not result in noise or visual proximity impacts that would constitute a constructive use of any Section 4(f) protected property.

Preferred Alternative (Alternative B Modified)

No Section 4(f) properties would be impacted.

Alternatives A and B

No Section 4(f) properties would be impacted.

4.15 Section 6(f) Impacts

The *Land and Water Conservation Fund* (LWCF) was established by the *LWCF Act of 1965* which was enacted to assist in preserving, developing, and assuring accessibility to outdoor recreational facilities by: (1) providing funds for and authorizing federal assistance in planning, acquisition, and development of needed land and water areas and facilities and (2) providing funds for the federal acquisition and development of certain lands and other areas. Section 6(f) of the LWCF Act prohibits the conversion of properties acquired or developed with LWCF monies to non-recreational purposes without approval from the U.S. Department of the Interior's National Park Service (NPS).

Preferred Alternative (Alternative B Modified)

The Preferred Alternative (Alternative B Modified) will not take any property acquired through the LWCF Act.

Alternatives A and B

Neither Alternative A nor Alternative B would take property acquired through the LWCF Act.

4.16 Hazardous Materials Impacts

4.16.1 Regulations

Hazardous materials are substances that have, or will have (when combined with other materials), a harmful effect on the human and natural environment. Hazardous materials are primarily regulated under the Federal Resource Conservation and Recovery Act (RCRA), as amended; the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980*; and the *Superfund Amendments and Reauthorization Act (SARA) of 1986*.

Agencies whose records were reviewed for this analysis included the EPA and the Tennessee Department of Environment and Conservation, Division of Underground Storage Tanks (UST)

and Division of Solid and Hazardous Waste Management. Database searches revealed the following results:

- The National Priorities List (NPL) is a federal list of sites subject to cleanup directed by the EPA. These sites are part of the national Superfund program. This list revealed no NPL sites in the project study area;
- The *Comprehensive Environmental Response, Compensation and Liability Act* Information System (CERCLIS) is also part of the national Superfund program. Inclusion in CERCLIS is the first step in the ranking of potentially hazardous sites to determine whether they meet the criteria for inclusion in the NPL. There are no active CERCLIS sites within the project area and;
- Superfund also has an archive designation. The "archive status" means that assessment at a site has been completed, and the EPA has determined that no steps will be taken to designate the site as a priority by listing it on the NPL. There are no Superfund archive sites in the project study area.

4.16.2 Project Background

An initial hazardous materials study was conducted for this project from 2007-2008. Phase I Environmental Site Assessments (ESAs) were conducted in accordance with the scope and limiting conditions set forth in the American Society for Testing and Materials (ASTM). Recognized Environmental Conditions (RECs) were identified for properties within, or adjacent to, the proposed ROW limits of the build alternatives under consideration in the DEIS. The ESAs identified a total of nine RECs in the study area that consisted of a 2,000-foot wide corridor, 1,000 feet from either side of the existing centerline of SR 126.

The goal of the assessment was to determine the potential presence of aboveground and/or underground storage tanks, hazardous wastes or materials, solid and special wastes, and areas of potential hazardous waste concerns which may pose a threat to human health and/or the environment. The results of the Phase I ESAs were used to determine the need for Phase II Site Assessments.

The DEIS recommended a Phase II ESA be performed for ROW acquisition on the following three parcels identified in the 2008 Phase I Hazardous Materials Survey Report:

- Site 2 – Roadrunner Market (4001 Memorial Boulevard, Kingsport, TN);
- Site 5 – B&W Cleaners (3200 Memorial Boulevard, Kingsport, TN) and;
- Site 7 – Greenwood Market (Market and Deli) (5121 Memorial Boulevard, TN).

The following three sites, identified by TDEC in comments they provided on a preliminary draft of the DEIS during the Tennessee Environmental Streamlining Agreement (TESA) review process (September 19, 2011), were also evaluated as potential hazardous waste sites in 2013.

- Site 10 - English Cabinet Shop (5236 Memorial Boulevard, Kingsport, TN);
- Site 12 - People's Food Store (3104 Memorial Boulevard, Kingsport, TN) and;
- Site 15 - Riviera Apartment Complex (former Richard Chadbourne Property) (5340 Memorial Boulevard, TN).

4.16.3 Site Investigations

If the Preferred Alternative (Alternative B Modified) alignment requires acquisition of portions of the properties with RECs, the sites will be further analyzed through a Phase II ESA, which would include soil and groundwater sampling, to further clarify potential contamination concerns. The following section provides a summary of the site investigations performed for the Preferred Alternative (Alternative B Modified). Figure 4-9 provides the location of all investigated properties. Site investigation reports are included in Appendix F.

Preferred Alternative (Alternative B Modified)

Sites that have the potential to contain hazardous materials which could be impacted by the Preferred Alternative (Alternative B Modified) are presented in Table 4-11. There are six sites that could be impacted by the Preferred Alternative (Alternative B Modified). Where warranted, Phase II Environmental Site Assessments will be performed on these sites during the design phase of the project. Correspondence from the TDOT Hazardous Materials section is in Attachment G.

In the event that hazardous substances/wastes are encountered within the proposed ROW prior to or during construction activities, the appropriate authorities will be notified, permits will be secured, and cleanup activities will take place. Their disposition shall be subject to the applicable sections of the RCRA, as amended; the CERCLA, as amended; and the *Tennessee Hazardous Waste Management Act of 1983*.

Alternatives A and B

As with the Preferred Alternative (Alternative B Modified), sites that have the potential to contain hazardous materials, which could be impacted by Alternative A or B, are presented in Table 4-11. There are eight sites that could be impacted by Alternative A, the most of any of the build alternatives. There are six sites that could be impacted by Alternative B.

Where warranted, Phase II Environmental Site Assessments would be performed on these sites during the design phase of the project. Their disposition shall be subject to the applicable sections of the RCRA, as amended; the CERCLA, as amended; and the *Tennessee Hazardous Waste Management Act of 1983*.

FIGURE 4-9: HAZARDOUS MATERIALS/UNDERGROUND STORAGE TANK SITES

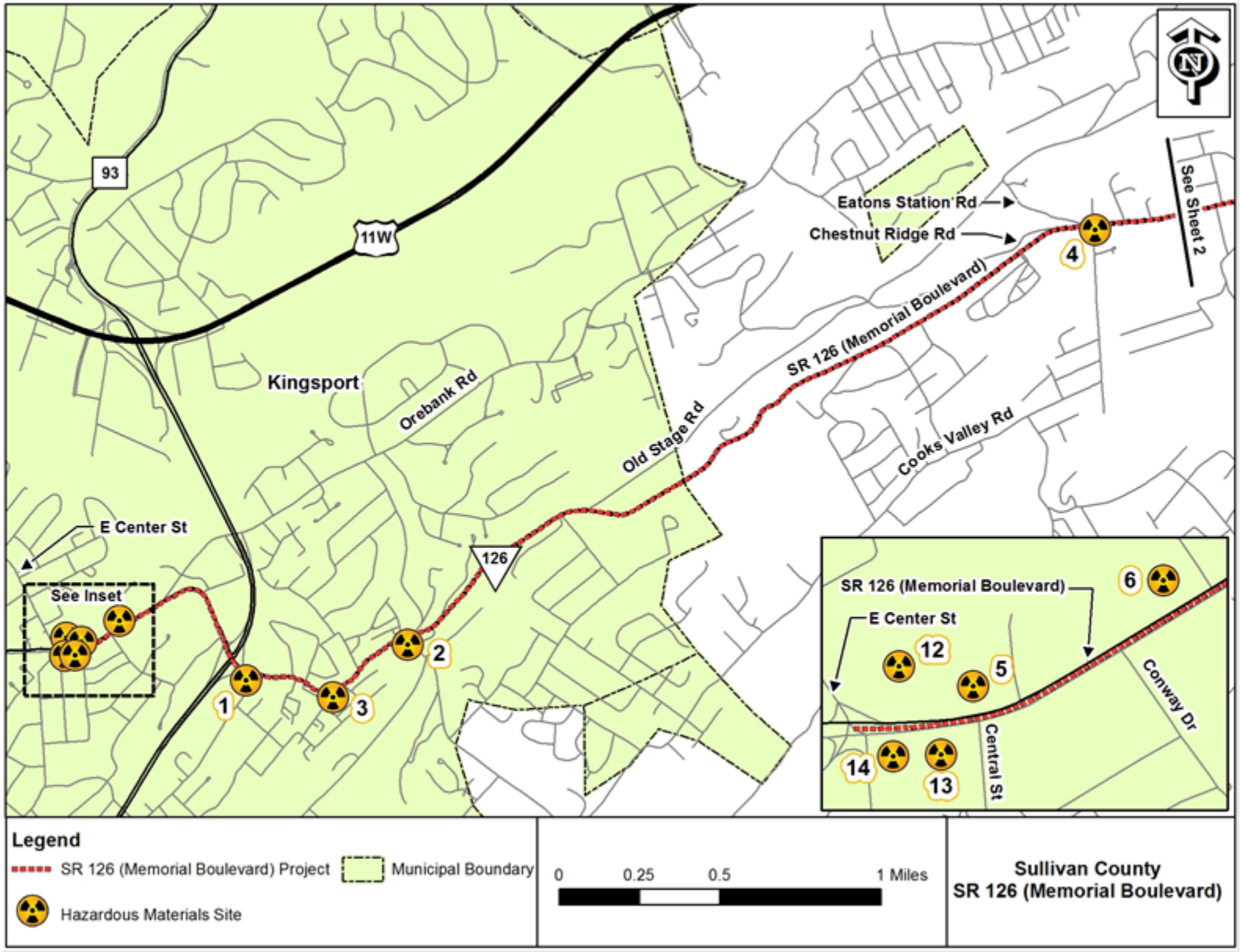


FIGURE 4-9: HAZARDOUS MATERIALS/UNDERGROUND STORAGE TANK SITE (CONTINUED)

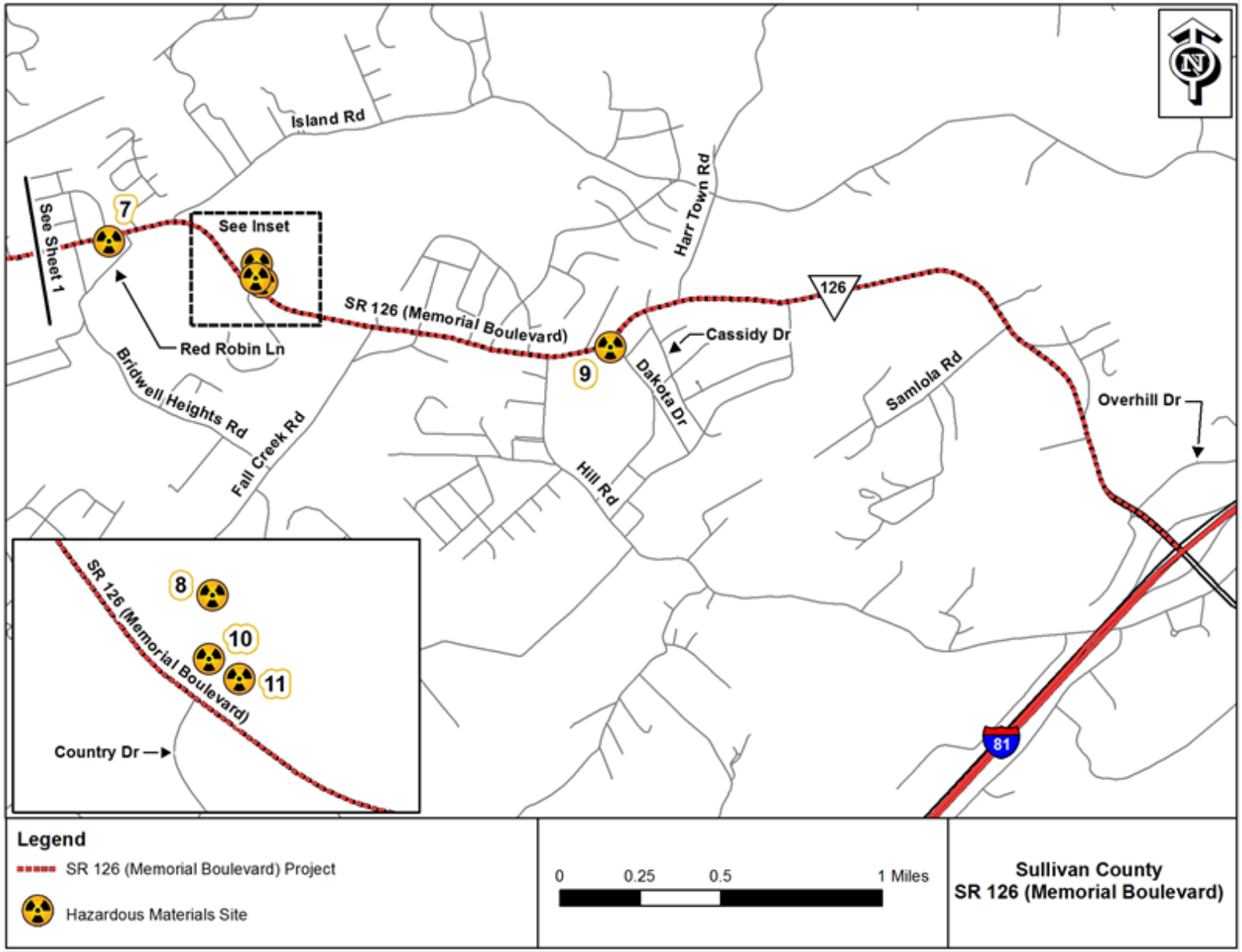


TABLE 4-11: BUILD ALTERNATIVE COMPARISON OF HAZARDOUS MATERIALS IMPACTS

Site No.	Facility/Address	History/Status	Concern/Determination	Alternative Causing Impact
1	Gas Station; 3717 Memorial Boulevard, Kingsport, TN 37663	Active gas station with former leaking UST (LUST) (1991).	Mitigated, no concerns.	None
2	Roadrunner Market (Fuel and Convenience Store): 4001 Memorial Boulevard, Kingsport, TN 37664	Active gasoline station and convenience store with five underground gas storage tanks. Two tanks are in use and three are permanently out of use.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	Preferred (Alternative B Modified), A, B
3	Pool and Spa Supplies Store: 3933 Memorial Boulevard, Kingsport, TN 37664	Former gas station currently occupied by a retail pool and spa store. A 1,000 gallon gas UST was removed 20 years ago.	No environmental concerns exist.	None
4	Upholstery and Fabric Store: 5001 Memorial Boulevard, Kingsport, TN 37664	Former gas station, currently upholstery and fabric store. Three former USTs have been removed.	No environmental concerns exist.	None
5	B&W Cleaners (Dry Cleaning Service): 3200 Memorial Boulevard, Kingsport, TN 37660	Dry cleaner has been identified as a RCRA site. TDEC records database indicated that there are no environmental concerns associated with this site however because of chemicals used for dry cleaners further analysis is recommended for the selected alternative.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	Preferred (Alternative B Modified), A, B
6	Automobile Repair: 3310 Memorial Boulevard, Kingsport, TN 37664	Automobile repair business is former site of s full-service gas station. Gas USTs have been removed.	No environmental concerns exist.	None
7	Greenwood Market (Market and Deli): 5121 Memorial Boulevard, Kingsport, TN 37664	Active gasoline station and convenience store with two active gas USTs. An inactive kerosene tank was reported as leaking in the past. Records also indicate the presence of a 2,000 gallon diesel.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	Preferred (Alternative B Modified), B
8	Unnamed Construction Site: (Adjacent to 5234 Memorial Blvd.), Kingsport, TN 37664	This construction site contains tires, trucks, construction equipment and scrap material.	Site has a high potential for contamination; however, project-related impacts are not anticipated and no further analysis is required.	None

TABLE 4-11: BUILD ALTERNATIVE COMPARISON OF HAZARDOUS MATERIALS IMPACTS (CONTINUED)

Site No.	Facility/Address	History/Status	Concern/Determination	Alternative Causing Impact
10	English Cabinet Shop: 5236 Memorial Boulevard, Kingsport, TN 37664	Fabricated wood cabinets have been used on-site since the 1980s. Chemicals associated with the wood fabrication process were used and stored onsite; however, the site currently does not utilize fabrication chemicals.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	A
11	Clymens Automotive Repair: 5242 Memorial Boulevard, Kingsport, TN 37664	Automobile repair business, containing a 55-gallon capacity drums of used automotive fluids.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	A
12	Peoples Food Store: 3104 Memorial Boulevard, Kingsport, TN 37664	Gas station and convenience store. According to research, the site currently has one 5,000-gallon capacity UST, one 10,000-gallon capacity UST, and one 15,000-gallon capacity UST in operation. According to TDEC, the site has had no reported spills or leaks since installing the tanks in 2010.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	Preferred (Alternative B Modified), A, B
13	Garden Basket Convenience Store: 3109 Memorial Blvd., Kingsport, TN 37664	Convenience store located in front of the Model City Motel. According to research, the convenience store has two 6,000-gallon USTs and one 4,000-gallon UST permanently out of use.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	Preferred (Alternative B Modified), A, B
14	Amoco Service Station: 3101 Memorial Boulevard, Kingsport, TN 37664	Former gas station with two 4,000-gallon capacity USTs and one 6,000-gallon capacity UST all permanently out of use. According to TDEC records, the three USTs were removed in 2002. Site also has a past LUST.	Phase II ESA will be performed during design phase if selected alternative causes an impact.	Preferred (Alternative B Modified), A, B
15	Riviera Apartment Complex (Former Richard Chadborne Property): 5340 Memorial Boulevard, Kingsport, TN	Multi-tenant apartment structure with two outbuildings used for storage and maintenance. Site also has two mobile trailer structures currently occupied with residents.	No further investigation is required.	A

4.17 Visual Impacts

Viewer groups in the SR 126 project area fall into two categories; persons with a view of the surrounding area from the existing roadway and persons with a view of the existing roadway from the surrounding area. The proposed project passes through commercial, residential, and agricultural areas, including Chestnut Ridge. Chestnut Ridge is an area located within and around a large portion of the project, contains views of rolling hillsides and displays the rural nature of this region.

The dominant visual elements in the western portion of the project, extending from East Center Street to SR 93 (John B. Dennis Highway), are buildings. The development is typical of developed areas commonly found around cities and does not indicate visual sensitivity or unique visual importance. The dominant visual element from SR 93 (John B. Dennis Highway) to east of Old Stage Road is predominantly commercial developments with scattered residential developments. In the last segment of the project, from near Old Stage Road to the end of the project at I-81, the dominant visual element through this segment is predominantly residential with some commercial and agricultural property and the local cemetery.

Preferred Alternative (Alternative B Modified)

The visual impacts of the Preferred Alternative (Alternative B Modified) to the surrounding landscape will be minimal. Much of the corridor is developed with commercial and residential properties. The project will widen the road along its existing alignment to provide additional lanes, thus minimizing impacts to the surrounding area.

There may be, however, some visual impact to the Chestnut Ridge area as a result of the project. The Preferred Alternative (Alternative B Modified) will widen the roadway footprint, and will include the removal of vegetation, changing of contours, change the roadway character from a shoulder and ditch roadway to a roadway with curb and gutter. These actions will increase the roadway's visibility within the existing visual setting. However, this alternative was developed in a way that will reduce visual impacts to Chestnut Ridge where feasible, including the utilization of existing alignment, and reduction of roadway width in the more visually-sensitive locations. Such visually-sensitive locations include Yancey's Tavern and the East Lawn Memorial Gardens Cemetery, which are located within the Chestnut Ridge area.

As stated in Section 4.12, the Preferred Alternative (Alternative B Modified) is the only alternative that does not have an adverse visual effect to Yancey's Tavern, a NRHP-listed site.

Alternatives A and B

As stated in Section 4.12, both Alternative A and Alternative B would have an adverse visual impact to Yancey's Tavern. Also, both alternatives would have some visual impact to the Chestnut Ridge area.

4.18 Wild and Scenic Rivers Impacts

The *Wild and Scenic Rivers Act 1968* established a National Wild and Scenic Rivers System for the protection of certain selected rivers of the Nation which, with their immediate environments, possess "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values." These rivers are to be preserved in free-flowing condition and their immediate environments are to be protected for the benefit and enjoyment of present and future generations.

The Obed River and its two main tributaries, Clear Creek and Daddys Creek, located in Cumberland County and Morgan County, is the only federally-designated Wild and Scenic River system in the State of Tennessee.

Preferred Alternative (Alternative B Modified)

The Preferred Alternative (Alternative B Modified) will not impact resources protected under the Wild and Scenic Rivers Act.

Alternatives A and B

Neither Alternative A nor Alternative B would impact resources protected under the Wild and Scenic Rivers Act.

4.19 Energy Impacts

Construction of the Preferred Alternative (Alternative B Modified), Alternative A or Alternative B will involve the commitment of energy resources both during the short-term construction period and throughout the long-term operation of the facility. The energy requirements of the Preferred Alternative (Alternative B Modified) are greater than the energy requirements of the No-Build Alternative.

The energy used by the Preferred Alternative (Alternative B Modified), Alternative A or Alternative B can be characterized as follows:

> Construction: Energy would be used for the manufacturing and transport of the construction components and by the heavy equipment utilized for roadway and bridge construction.
>
> Maintenance: The project would require routine maintenance that could result in energy use for the maintenance actives. Traffic delays could accompany the maintenance activities and could result in temporary increases in energy use.
>
> Motor Vehicle Use: Improved traffic flow and reduced travel time could result in a decrease from existing energy use.

In summary, the amount of energy required to construct a roadway project of this type is substantial but temporary in nature. This type of project generally leads to reduced operating costs once the project is completed. A reduction in cost and energy use could result from improved access, reduced travel time and increased safety.

4.20 Construction Impacts

Construction impacts would be the same under each of the Build alternatives. Each build alternative would likely inconvenience or disturb residents, businesses, and business customers. In the case of improvements to an existing highway, inconvenience to highway users also occurs. Maintenance of traffic, access to properties adjoining the road, and utility relocations are specific construction-related impact issues that must be addressed with this project.

Without proper planning and implementation of controls, traffic disruption, loss of access, and utility relocation could adversely affect the comfort and daily life of residents and disrupt the flow of customers, employees, and material/supplies to and from businesses. Construction impact

controls would be integrated into the project's contract specifications and traffic control plans. Construction impacts detailed below would occur with the Preferred Alternative (Alternative B Modified), Alternative A or Alternative B. With the implementation of appropriate controls, no cumulative or secondary impacts are foreseeable with any build alternative. The following construction issues are addressed below:

- Maintenance of traffic and access
- Economic benefits
- Waste disposal
- Utility relocation
- Discovery of unknown archaeological sites
- Borrow pits
- Erosion control
- Air quality
- Noise abatement

Maintenance of Traffic and Access: Traffic will be maintained on existing roadways during construction or detours will be developed. Access to all properties will be maintained during construction.

Economic Benefits: The construction activities may result in short-term economic benefits to the local area that would include increased revenue to local businesses through the sale of construction supplies and material and retail/service purchases by construction personnel. Construction jobs also could be available for persons residing in the area. These short-term revenues and jobs are not expected to be locally or regionally significant.

Construction could result in adverse economic impacts to the local businesses along the corridor that are not relocated by the project. Motorists may avoid the corridor during construction thus lessening the potential number of customers for some businesses. The construction-related adverse impacts will be minimal and short-term.

Waste Disposal: Solid waste will be generated by project construction (i.e., through removal of structures that cannot be relocated). The quantity of disposed waste would represent a negligible proportion of the total amount directed toward local landfills.

Any toxic and hazardous materials would be handled and used in accordance with package labels and manufacturer's directions. Wastes will be segregated, labeled and stored in a manner that would prevent their release into the environment from an accident or spill. The contractor will dispose of these materials and their containers in accordance with applicable state and federal regulations.

Disposal of excess material would be the responsibility of the contractor who will be contractually required to handle and dispose of the material in accordance with the TDOT *Standard Specifications for Road and Bridge Construction.* These specifications require that the contractor comply with open burning regulations and be supervised by a competent watchman; that material is disposed of in accordance with all applicable laws and ordinance; and that material will only be disposed of on private property when there is a signed agreement with the property owner.

Utility Relocation: The relocation of utilities will be included in final design plans. As appropriate, TDOT and the City of Kingsport will coordinate with the appropriate representatives to avoid or minimize damage or disruption of existing services.

Discovery of Unknown Archaeological Sites: If archaeological materials are uncovered during construction, all construction work in the area of the find will cease. The Tennessee Division of Archaeology and the recognized Native American Tribes will be immediately contacted so a representative of each office may have the opportunity to examine and evaluate the materials.

Borrow Pits: Should earth fill be required for this project, the applicable TDOT borrow provisions will be followed and permits obtained.

Erosion Control: The Preferred Alternative (Alternative B Modified) will disturb land that has a tendency to erode when disturbed. The contractor will be required to employ BMPs to prevent erosion and control sediment movement from the project.

A sediment control plan will be formulated in accordance with the TDOT *Standard Specifications for Road and Bridge Construction* and will include, but not be limited to, the following measures:

- Temporary erosion control devices, such as silt fences, straw bales, burlap, jute matting, grading, seeding and sodding will be used to minimize erosion and sedimentation;
- Minimization of vegetation removal;
- Construction and stabilization of fill slopes during the growing season should be accomplished through the establishment of non-invasive vegetation and;
- Planting of native woody and herbaceous vegetation.

Air Quality: Even though the NAAQS are not exceeded in the design year, all phases of construction operations associated with the Preferred Alternative (Alternative B Modified), Alternative A or Alternative B could temporarily contribute to air pollution. Particulates would increase slightly along the project as dust from construction activities collects in the air surrounding the project. The construction equipment would temporarily produce minor amounts of exhaust emissions. The emission of air pollutants would be reduced by the use of properly maintained equipment and the use of tarp covers on trucks transporting refuse and construction waste products.

Any burning of wastes and control of dust will be the responsibility of the construction contractor. The contractor must meet the burning and dust control requirements of TDOT's *Standard Specifications for Road and Bridge Construction* and is required to comply with applicable state and local laws, ordinances and regulations regarding these emissions.

Substantial construction-related MSATs 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 MSATs emissions in the project area.

Construction Best Management Practices represent practicable project-level measures that, while not substantially reducing global GHG emissions, may help reduce GHG emissions on an incremental basis and could contribute in the long term to meaningful cumulative reduction when considered across the federal-aid highway program.

Construction Noise Abatement: Temporary noise impacts will occur within the immediate vicinity of the construction activities under the Preferred Alternative (Alternative B Modified), Alternative A or Alternative B. The sound levels resulting from construction activities at nearby noise-sensitive receivers will be a function of the types of equipment utilized, the duration of the

activities, and the distances between construction activities and nearby land uses. The exact noise levels cannot be predicted because the specific types of construction equipment, methods and schedule are unknown at this time.

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 on noise-sensitive areas.

4.21 Short-term vs. Long-term Impacts

Short-term impacts occurring during construction operations would be the same under each of the build alternatives. Some interruption to vehicular traffic flow is inevitable; however, appropriate maintenance of traffic phasing will be employed to minimize inconvenience. Traffic control plans will be developed to minimize congestion and delays during construction.

Temporary air impacts from dust and exhaust fumes, and noise associated with construction operations cannot be avoided. Every effort will be made to minimize these effects by using best management practices.

Many long-term benefits are anticipated to result from the proposed project, such as a decrease in travel time and traffic congestion and an improved level of service. Accidents along segments of existing highways may also decrease over the long term. Elimination of congestion is expected to result in more efficient use of energy. In the long term, the construction of the roadway through the area will provide a better modal connection.

<u>No-Build Alternative</u>

Long-term impacts associated with the No-Build Alternative are anticipated to include increases in travel time, traffic congestion, and a deteriorating level of service.

4.22 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same under each Build alternative. Irretrievable resources necessary to build the proposed roadway include energy (fossil fuel), concrete, aggregate and steel. None of these materials are in short supply. Implementation of the proposed project involves a commitment of a range of natural, physical, human and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if the highway facility is no longer needed, the land can be converted to another use.

Considerable amounts of fossil fuels, labor and roadway construction materials such as cement, aggregate and bituminous materials will be expended. Additionally, large amounts of labor and natural resources will be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Construction will require a one-time expenditure of both state and federal funds, which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, state and region will benefit by the improved quality of the transportation system. These

benefits will consist of improved accessibility and safety, savings in time and greater availability of quality services that are anticipated to outweigh the commitment of these resources.

No-Build Alternative

There are no irreversible or irretrievable resource commitments associated with the No-Build Alternative other than through routine maintenance.

4.23 Indirect and Cumulative Impacts Associated with Build Alternatives

By the United States Code of Federal Regulations (CFR) definition, direct effects (or impacts) are caused by the action and occur at the same time and place (40 CFR § 1508.8). Indirect effects (or impacts), are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR § 1508.8).

Cumulative effects (or impacts) are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR § 1508.7).

Indirect and Cumulative Impacts for the human and natural environments associated with the SR 126 project include land use changes and farmland conversion; and changes to existing terrestrial and aquatic habitat.

Indirect Impacts to Growth and Development

A review of project area maps were and aerial photography from the 1950s through 2006, combined with field visits, and conversations with local officials were conducted to determine the types of growth that have been experienced in East Kingsport and Sullivan County. The area of potential effect was defined as the area circumscribed by U.S. 11, SR 126 at East Center Street, Falls Creek Road and the intersection of SR 126 with I-81. This area has experienced slow, sustained residential growth throughout a 50-year period.

Neighborhoods between SR 126 and Falls Creek Road are currently adding new homes in the area. Local officials indicate that this rate of growth and type of development will continue whether the improvements to SR 126 are implemented using the Preferred Alternative (Alternative B Modified) or either of the Build Alternatives. In the eastern portions of this project, development activities are minimal and not expected to substantially increase in the next 20 to 25 years.

The implementation of an improved SR 126 with safety improvements and new shoulders, as planned, will not measurably increase or decrease the current patterns. The Preferred Alternative (Alternative B Modified) only adds one west bound lane for a short (0.5-mile) section between Heather Lane and Harbor Chapel Road. Because the Preferred Alternative (Alternative B Modified) does not effectively add travel lanes to the study corridor, implementation of the proposed improvements likely will not result in an increase in the rate of land development, nor

will it be likely to induce a major change in the types of land uses (i.e., shifting to industrial from residential or light commercial). Alternatives A and B add lanes to a small portion of the project length, but project similar effects as the Preferred Alternative (Alternative B Modified). Should land use changes occur, those uses would continue regardless of the build alternative chosen.

Many of the commercial sites in the area are geographically dependent to consumers in the surrounding neighborhoods. They provide goods and services that include convenience stores/gas stations, groceries, veterinary services, clothing, and auto repair. These commercial sites may experience some interruption from the construction of the improved facility and changes in land use along the corridor due to an improved SR 126 corridor. Improvements to the corridor may cause some properties to become more attractive as a non-commercial site. Those commercial sites not relocated by the project will be better served with the increased efficiency, access and improved safety conditions of a new roadway.

Indirect beneficial impacts would be realized from the additional jobs created both on- and off-site during construction and project development. Indirect employment would result in the form of jobs associated with the provision of supportive goods, supplies, and services necessary for the construction phase of the project. This creation of indirect employment would result in additional indirect personal income for the purchase of goods and services within the project study area and surrounding region.

Cumulative Impacts to Growth and Development

Cumulative impacts associated with this project in combination with other past, present, and reasonably foreseeable future projects would include potential land use changes, including increased commercial and residential development, overall improvement of the transportation infrastructure resulting in improved traffic flow, improved access management and safety. The cumulative impacts to land use in the study area as a result of past and future transportation and infrastructure projects has been anticipated by local governments for many years. Local land use plans have identified areas for future growth and local services.

The Preferred Alternative (Alternative B Modified) and both Build Alternatives, as previously discussed in this document, are located mostly along the existing roadway. Future land use changes in the project impact area would be influenced by other factors in addition to the proposed project. Changes in the local economy, changes in land use by local jurisdictions and other infrastructure changes can all affect how, when, and to what degree land is developed and redeveloped. A positive cumulative effect in transportation service to the surrounding area will occur with the proposed improvements to SR 126.

The improved transportation infrastructure and potential commercial developments may promote increased residential development in the surrounding areas, which would maintain and enhance residential land uses. The combination of all past, present, and reasonably foreseeable future development projects may result in additional infrastructure projects needing to be implemented to continue to provide adequate facilities capable of supporting the growth. The project will provide a safer, less congested roadway for local travelers, as well as a safer environment for pedestrians and bicyclists. Combined with other projects initiated by various transportation agencies, this project will contribute to an improved overall local and regional transportation network.

Indirect Impacts to the Natural Environment, Air Quality and Noise

The residential and agricultural activities in the area have already displaced forested areas, natural habitat areas and farmland. These rates will not appreciably change, with the improvements proposed by the Preferred Alternative (Alternative B Modified) or from either of the build alternatives. Therefore, additional pressures to animals, plants, wetlands, and streams are not expected to substantially increase. Losses of floral and faunal habitat, degradation of water quality in streams, and conversion of farmland are not anticipated to experience additional cumulative or indirect pressures from the proposed action.

In general, roadway projects most commonly result in indirect impacts to land use, farmland, community and economic resources, water quality, wetland, and terrestrial ecology. Future construction activities along the corridor may result in a decline in the local wildlife populations due to the removal of habitat. Increased noise levels may also affect wildlife populations in the vicinity.

Potential short-term indirect adverse impacts on aquatic species could occur from stormwater runoff, which would increase turbidity and total suspended solids. Erosion would be the primary source 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 aquatic animal species, while increased turbidity and color can impact primary production by aquatic plants.

Streams within the project area could be impacted during construction due to surface runoff and subsequent sedimentation. It is not anticipated that these streams would be substantially impacted due to the BMPs and other mitigation measures that will be used during construction to help reduce runoff and stream sedimentation downstream of the project area.

Forecasted traffic volumes for most projects typically account for any redistribution of traffic that would occur as a result of the project. The air quality analysis summarized in Section 4.10 addresses any indirect traffic-related air quality impacts that might occur.

Indirect noise impacts associated with the project are anticipated, though negligible. Areas where new development occurs would likely increase traffic volumes and would result in potential increased noise levels.

Cumulative Impacts to the Natural Environment, Air Quality and Noise

It is anticipated that SR 126 would promote some secondary commercial and residential developments within the project area resulting in increased potential for water quality impacts. Regulatory agencies would be responsible for monitoring private developments in the project area to help ensure no substantial water quality impacts occur. Any adverse cumulative impacts associated with future projects constructed in the watersheds crossed by the project have potential to add to the adverse impacts to water quality associated with construction and operation of SR 126 in these watersheds. However, since adverse impacts associated with new construction projects are often temporary, it is not anticipated that substantial long-term water quality impacts would occur.

Forecasted traffic volumes for most projects typically account for any redistribution of traffic that would occur as a result of the project. Therefore, the forecasted traffic volumes include

expected traffic growth and other planned and programmed projects in the area. As a result, the air quality analysis addresses the traffic-related cumulative air quality impacts of the project.

Implementation of any of the build alternatives would result in potential cumulative noise impacts when combined with other potential infrastructure projects expected to occur in the reasonably foreseeable future. It is probable that the projects would result in increased construction noise levels and long-term noise levels. A noise study for those projects, and identification of noise abatement measures, if determined to be necessary, would likely help reduce the potential for cumulative noise impacts in the project area.

No-Build Alternative

Indirect and cumulative impacts are also associated with the No-Build Alternative. Based on land use changes for the project area, residential development will occur with or without the project. In addition, farmland would continue to be converted to other land use types in the project area regardless of whether the project is constructed or not.

The No-Build Alternative would not address the current access issues facing SR 126. Without safe and controlled access, growth or sustained commercial development along the route may also be inhibited. Poor access would not only slow economic growth along the route, but could also impact adjacent areas. This could result in an adverse cumulative impact for areas that may already be seeing depressed income levels and lack of economic growth.

The No-Build Alternative would contribute to increased congestion and reduced LOS along SR 126. Increasing traffic volumes will decrease the LOS on secondary routes as well. These conditions could contribute to higher crash rates and would likely increase response times of emergency vehicles.

Ecological resources including streams, forests, wetlands, and other fish and wildlife habitats would continue to be impacted in the project area due to the continued growth and development of the area even under the No-Build Alternative.

Impacts to the human environment will be lessened due to more efficient facility for transportation within the corridor.