ENVIRONMENTAL IMPACT STATEMENT

James White Parkway (State Route 71)

from Chapman Highway (State Route 71) to Moody Avenue
Knox County, Tennessee

Submitted Pursuant to the

National Environmental Policy Act of 1969

42 U.S.C. 4332(2)(c)

Lead Agencies:

U.S. Department of Transportation
Federal Highway Administration

Tennessee Department of Transportation

Cooperating Agency:

U.S. Army Corps of Engineers

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JAMES WHITE PARKWAY (STATE ROUTE 71)

Knox County, Tennessee

Draft Environmental Impact Statement

Submitted Pursuant to the National Environmental Policy Act of 1969
42 U.S.C. 4332 (2)(c)
by
U.S. Department of Transportation, Federal Highway Administration and
Tennessee Department of Transportation, Environmental Division

9/28/12
Date

Pamela Lambert for Denbowski
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9/4/12
Date

Tennessee Department of Transportation

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EXECUTIVE SUMMARY and LIST of ENVIRONMENTAL COMMITMENTS

ES.0 EXECUTIVE SUMMARY

ES.1 General Project Description

The Tennessee Department of Transportation (TDOT) proposes to construct James White Parkway from Chapman Highway [State Route (SR) 71] to Moody Avenue in South Knoxville, Knox County, Tennessee. The proposed project would connect the existing James White Parkway, which currently ends at Moody Avenue, to Chapman Highway (SR-71) at Governor John Sevier Highway, providing an alternative route between downtown Knoxville and the South Knoxville area helping to relieve some of the traffic pressure on the often congested Chapman Highway (US-441).

ES.2 Need for the Project

The identified needs for the James White Parkway project include:

- reducing traffic congestion on existing highways in the area, especially Chapman Highway;
- providing additional system linkage;
- increasing travel efficiency;
- improving safety by reducing congestion related crashes; and
- providing additional traffic capacity to support expected increases in future travel demand.

ES.3 Purpose of the Project

The purpose of the James White Parkway project is to provide an efficient and safe transportation facility connecting South Knoxville to downtown Knoxville. This completed roadway would:

- relieve traffic congestion and increased traffic capacity/levels-of-service (LOS) on existing roads, including Chapman Highway;
- provide a more efficient connection between the fast growing areas of southern Knox County and the Seymour portion of Sevier County and downtown Knoxville; and
- provide safer travel in the project area by reducing congestion related accidents along existing roadways in the project vicinity.

Ultimately, the final design of the new roadway will be a result of continued coordination and cooperation with various agencies, organizations, and other stakeholders for the project. The overall goal is to provide a facility that would adequately serve the future transportation needs of the area while minimizing adverse human and environmental impacts to the extent practical by implementing impact avoidance, minimization, and/or mitigation efforts.

ES.4 Project Alternatives Evaluated in the Environmental Impact Statement

Three build alternatives were considered as reasonable alternatives in the James White Parkway Environmental Impact Statement (EIS). The No-Build Alternative is included in the study for comparison with the potential impacts of the build alternatives.

No-Build Alternative

The No-Build Alternative, as the name implies, would mean that James White Parkway would not be constructed and no other major improvements or additional roadway alignments will be constructed in the project vicinity between downtown Knoxville and Chapman Highway. Some Transportation System Management (TSM) related projects, including any projects identified in the 2034 Knoxville Regional Mobility Plan (KRMP), for years 2009-2034 (http://www.knoxtrans.org/plans/mobilityplan/index.htm, KRTPO, 2009) and/or Transportation Improvement Program (TIP) for years 2011-2014 (http://www.knoxtrans.org/plans/tip.htm, KRTPO, 2010), may be implemented to improve existing roadways, including Chapman Highway and connecting roadways. Such improvements may include the addition of turn lanes, signal improvements, and other minor improvements to the existing roadway. In addition, improvements or expansion of existing transit systems in the Knoxville region are being planned for the foreseeable future. Such improvements will also occur under the No-Build Alternative.

Build Alternatives

Three developed build alternatives, designated as the Green Alternative, Blue Alternative, and Red Alternative, fulfill the purpose and need for this project. The three proposed build alternatives utilize the same general type of design with variations in the alignment footprints, especially at the southern end along Governor John Sevier Highway and at the southern termini at Chapman Highway. Each of the build alternatives will include construction of a four-lane, fully access-controlled facility on new alignment east of Chapman Highway and extending from Chapman Highway northwestward to the existing terminus of James White Parkway at Moody Avenue.

The proposed design will be a continuation of the design of the existing James White Parkway north of Moody Avenue. The proposed alignment would consist of four traffic lanes (two in each direction) divided by a depressed median. Total median width would be approximately 48 feet. Each of the four traffic lanes would be 12 feet wide. Outside shoulders would be 12 feet wide (10-foot stabilized and 2-foot gravel), and inside shoulders would be 6 feet wide (4-foot stabilized and 2-foot gravel). The minimum ROW would be 300 feet wide. The design speed of the roadway will be 60 miles per hour (mph), but the actual posted speed could be lower based on input from local officials. One interchange is located near the center of each of the alignments at Sevierville Pike to provide access to the roadway for local traffic.

In addition to construction of James White Parkway, additional improvements will be required on the existing Governor John Sevier Highway from near its existing interchange with Chapman Highway northeastward to the point where the proposed new alignment section of each alternative would intersect. The improvements to Governor John Sevier Highway will primarily include widening portions of the existing roadway from two traffic lanes to four traffic lanes, including bridges along the affected segments.

Alternatives Previously Considered and Eliminated from Further Consideration

Several other alternatives, including improvement/widening of existing Chapman Highway, other alternative alignments, and/or implementation of TSM techniques were also considered as potential alternatives for this project, but they were later eliminated from further consideration, because they did not meet the criteria to be considered reasonable alternatives. Further discussion concerning the elimination of certain alternatives is provided in Chapter 2 of this EIS.

ES.5 Summary of Environmental Consequences

Direct, indirect, and cumulative impacts anticipated to occur with implementation of this project are discussed in Chapter 3 of this document. Direct impacts were defined as those impacts that would occur due to construction of the project and would occur at the same time and location. Indirect impacts were studied based on reasonably foreseeable impacts that would occur as a result of the James White Parkway project, but would occur later in time or further removed in space from the project footprint. Cumulative impacts were analyzed by combining the likely impacts of the James White Parkway project with other past, present, and reasonably foreseeable projects or actions in the area. Cumulative impacts analyses including TDOT projects and all other non-related projects or actions that have occurred, or are planned in the reasonably foreseeable future that have impacted, are impacting, or are expected to impact the same resources as the James White Parkway project. The basic concepts discussed in the National Cooperative Highway Research Program (NCHRP) Report 466 "Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects" were used during the indirect impacts analyses. Table ES-1 located at the end of this section contains summary data for this project including basic design information, costs, and environmental consequences for each of the proposed build alternatives for this project.

Land Use Impacts

The project area contains a combination of urban, suburban, and rural land uses. Development consists of business developments along Chapman Highway and Governor John Sevier Highway. The remainder of the project area consists of residential development, with some areas of dense residential development and some areas with less dense development intertwined with pockets of forests and other undeveloped lands. Schools and churches are also located in the project vicinity. Some of the undeveloped forest land is contained within local and county park systems.

These land uses would not be expected to change substantially under the No-Build Alternative in the reasonably foreseeable future. However, due to the proximity to downtown Knoxville, continued urban growth will impact some of the land that is currently undeveloped, including the forested areas. Some of the land in the project area is not highly suited for development due to the steep terrain and numerous karst features, including sinkholes.

Extension of James White Parkway under any of the proposed build alternatives would result in long-term changes in land use for areas within the proposed ROW of the project that are not already being used for transportation purposes. This would primarily include converting undeveloped land, especially forests, into developed highway ROW. A few low-density residential and commercial developments will also be impacted by the project. In addition, the project may promote secondary developments due to improved access and transportation efficiency. This will result in a quicker transition from a rural setting in some areas to more of a suburban or urban setting depending on the suitability of the land for development based on location, terrain, and presences of karst features. Local zoning and development restrictions will also influence the types and amount of development that occurs.

Social Impacts

Social impacts of the No-Build Alternative would primarily be due to traffic congestion and delayed travel times associated with the continued use of Chapman Highway as the primary route for traffic from the South Knoxville region moving to and from downtown Knoxville.

The traffic issues associated with the existing Chapman Highway would continue to result in potential safety issues due to crashes in the area as well as potential delays in response times for emergency vehicles needing to move through the area. Also, the traffic congestion may result in increased air quality problems compared to more free-flowing traffic conditions expected under the build alternatives. No residential or business displacements would be required under the No-Build Alternative.

The build alternatives would have potential for both adverse and beneficial impacts to the social environment. Due to the need to purchase new ROW to support the proposed James White Parkway under any of the proposed build alternatives, up to 68 residential/household units, up to five businesses, and one non-profit organization (church) would be displaced and would need to relocate. The Relocation Assistance Program will be utilized to ensure, to the maximum extent possible, the prompt and equitable relocation and reestablishment of persons and businesses displaced as a result of this project. The Relocation Assistance Program helps to ensure that displaced parties do not suffer disproportionate harm as a result of programs designed to benefit the public as a whole. The relocation of displaced households, businesses, and any other affected party will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646). Comparable replacement housing will be provided to all residential relocatees under the provisions of the above laws. In some instances, the replacement housing may be an improvement compared to the existing home. In addition, the displacement of several families at the same time may result in the sale of some homes that may have been on the real market for a long time due to recent economic conditions.

There would not be any Environmental Justice concerns associated with the displacements of any of the build alternatives because there are no concentrations of low-income or minority populations that would be disproportionately impacted.

Residents living near the proposed new roadway may experience both adverse and beneficial impacts. Adverse impacts will include increased noise and visual impacts and decreased property values due to the presence of the new roadway and associated increase in traffic. Beneficial impacts might include higher property values for strategically located properties with developable land because the project may promote new developments due to the improved access and better transportation efficiency along the route. Other beneficial impacts might include improved commuting times and distances for some residents, less traffic and congestion for residents using or living along Chapman Highway, improved traffic safety, better response times for emergency vehicles, more recreational opportunities due to the proposed James White Greenway, and better community cohesion due to improved travel times between Knoxville and areas to the south and east.

Economic Impacts

The No-Build Alternative would not be expected to have measurable impacts to the local or regional economies compared to baseline conditions. However, continued increases in traffic congestion on Chapman Highway, and other local roads in the area used as secondary routes to avoid the congested areas, would result in increased travel times, higher operating expenses, and potential increased crash rates in the area, which could affect local commuters and businesses. The continued traffic issues could also make the general project area less attractive for new development associated with planned growth areas, which may in turn impact property values and the overall economy in general.

Both short-term and long-term beneficial and adverse economic impacts will occur under the build alternatives. Short-term adverse impacts will occur due to a decrease in the real property tax base and real property tax revenues as a result of the residential and business displacements. Real property tax revenue would also be adversely impacted by the removal of small portions of additional properties from the tax rolls for ROW acquisition. Additional tax revenue losses could also occur due to losses of business-related taxes (e.g., sales, utility, inventory taxes, etc.). However, the tax revenue losses will likely only be temporary (i.e., limited to the construction phase of the project) if displaced residents and businesses relocate within the project vicinity as anticipated. Other short-term adverse economic impacts would include relocation expenses and the temporary loss of business income during the relocation period. Some long-term impacts may occur for businesses along the portions of Chapman Highway that would be bypassed by the proposed James White Parkway. The diversion of traffic away from that area would primarily impact businesses that support daily commuters such as gas stations, convenience stores, and other supporting businesses. Alternatively, some businesses may see increased business after the traffic congestion issues are relieved and traveling to and from the area is more convenient and safer.

Over the long term, the economic impacts of the improved transportation efficiency would be beneficial both locally and regionally. Travel benefits would include decreased travel times, lower operating expenses, and reduced crash rates for both local daily commuters and travelers passing through the area. The project would also result in better access to portions of Knoxville providing benefits to existing businesses and/or future businesses in the area. Improved access to and from some properties or areas surrounding the proposed new interchanges may make those areas more attractive for residential, commercial, and/or industrial developments, resulting in potential increases in property values and other beneficial economic impacts for the local and regional economies. This would be especially true for strategically located parcels that would benefit directly from the improved access due to the new interchanges. However, local zoning and planning may play a role in what types and how much development occurs in these areas depending on their location.

Cultural Resources Impacts

No cultural resources of concern are expected to be impacted by this project. Should any previously undiscovered sites be identified prior to or during construction, TDOT will cease work and coordinate with the State Historic Preservation Office (SHPO) to ensure proper handling and/or mitigation is conducted for those sites.

Noise Impacts

The noise study for this project was conducted in accordance with the TDOT's Policy on Highway Traffic Noise Abatement effective July 13, 2011. The study determined that the project will create traffic noise impacts under each build alternative. A total of 35 properties are predicted to be impacted by the Green Alternative. A total of 24 properties are predicted to be impacted by the Blue Alternative. A total of 26 properties are predicted to be impacted by the Red Alternative. The impacted land uses include Activity Category B residential properties consisting of single-family homes and mobile homes.

Noise abatement was evaluated to mitigate the predicted noise impacts in accordance with TDOT's noise policy. Noise abatement in the form of noise barriers was evaluated for the build alternatives where impacts were predicted and that qualify for abatement consideration. In order for noise barriers to be included in the project plans, they must be determined to be both feasible and reasonable.

Based on preliminary evaluation, a noise barrier would be considered feasible and reasonable for each of the build alternatives and could be constructed to provide noise abatement for residents near the intersection with Moody Avenue. One noise barrier, located along the westbound James White Parkway off-ramp at Moody Avenue, was found to be feasible. This barrier, if constructed, would cover all impacted properties that qualify for abatement along that section of the proposed roadway. However, per TDOT's Noise Policy, the views of benefited property owners and residents will be considered in making final noise abatement decisions and final placement/length of noise barriers. This input will be gathered at the Corridor Public Hearing for the Draft EIS, and/or at subsequent public involvement meetings or hearings during the design phase of the project. The final decision on implementation of abatement measures will be made during the project design phase and after consideration of input from the public involvement process. It is not anticipated the William Hastie Natural Area would be impacted by noise.

Trucks and machinery used for construction could have noise impacts to individuals inhabiting homes along the project area. These individuals may at some time experience perceptible construction noise and vibration from the implementation of this project.

Air Quality Impacts

On November 5, 2010 FHWA and the Federal Transit Administration (FTA) determined that the Knoxville Regional Transportation Planning Organization's (TPO's) KRMP and TIP for FY 2011-2014, both of which include the James White Parkway project, conform to the transportation-related provisions of the Clean Air Act Amendments of 1990, including the 8-hour ozone and PM 2.5 standards. These findings were in accordance with 40 CFR Part 93, "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved under Title 23 USC or the Federal Transit Act."

If the No-Build Alternative were selected, it is anticipated that local air quality may be adversely impacted as LOS would continue to decline and traffic congestion would continue to increase. Increased emissions from vehicles forced to idle in the area would result in potential health risks for adjacent residents. However, the extent of those risks cannot be predicted at this time.

Under the build alternatives, this project is not expected to cause or contribute to any violation of the National Ambient Air Quality Standards (NAAQS). Carbon monoxide and $PM_{2.5}$ hot-spot analyses were not required for this project.

The build alternatives will result in the temporary generation of construction-related pollutant emissions and dust that could result in short-term air quality impacts.

A qualitative Mobile Source Air Toxics (MSAT) assessment was conducted for each of the alternatives studied. Based on those analyses, the build alternatives might result in slightly higher MSAT emissions when compared to the No-Build Alternative. However, increases in MSATs attributable to slightly higher vehicle miles traveled (VMT) could be completely offset due to increases in speeds and reductions in congestion provided by the build alternatives. Additionally, MSAT emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050.

Overall, this project alone is not expected to result in any substantial impacts to air quality. During construction, the contractor will comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures would be

maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

Ecological Impacts

This project would have direct adverse impacts on existing natural resources in the project ROWs, including streams, wet weather conveyances (WWC), aquatic and terrestrial fish and wildlife habitats, forests, and karst features such as sinkholes, groundwater drainages, springs, and caves. This project would impact some habitats that are considered suitable for federally or state-listed threatened and endangered species. However, no known populations of federally-listed species are expected to be impacted.

The current build alternatives were designed to avoid impacts to the Meades Quarry Cave system and associated sinkholes to protect the Berry Cave salamander population it contains. A dye trace study helped identify the direction of groundwater flows through the area and none of the affected sinkholes are believed to flow into the Meades Quarry Cave system.

Suitable summer roost habitat for Indiana bats occurs in the ROW of each build alternative, but no known populations of the bat are known to occur in the area. Additional bat surveys will be conducted following selection of an alternative, should a build alternative be selected.

A small portion of the wildlife habitat along the north edge of the William Hastie Natural Area will be impacted by the build alternatives, but with the proposed mitigation, the impact is anticipated to be negligible.

Minor, short-term indirect impacts to water quality for watercourses located outside of the study area could occur during the project construction phase due to stormwater runoff from the site into sinkholes and surface drainages. Runoff from the construction area could result in sedimentation in areas downstream of stormwater outlets that empty directly into streams. The potential for water quality impacts will be minimized through construction techniques that would help control erosion and runoff from the construction area.

Farmland Impacts

Farmland Impact Rating Forms (Form AD 1006) were sent to the Department of Agriculture, Natural Resources Conservation Service for their input. A minor amount of prime farmland could be directly converted under each of the build alternatives. No recent crop production was observed in the areas impacted by the project. In addition, all of the farmland conversion impact rating scores were well within the acceptable range.

Section 4(f) Impacts

Based on the best available information and conceptual layouts of the build alternatives, the James White Parkway project will result in the initial take of 0.79 acres of the William Hastie Natural Area, but with proposed mitigation, the size of the park would be increased by a total of 0.43 acres. Proposed greenways and/or associated trails will be crossed by the build alternative alignments. Adequate crossings/trail connections will be provided as part of the project. None of the existing functions, activities, features, or attributes of William Hastie Natural Area or the greenways/trails are expected to be substantially impacted based on current information. Noise, visual, and air quality impacts are not anticipated to be substantial and would not alter the current primary uses of the site, which include mountain biking, hiking, trail running, and nature viewing.

The proposed roadway would provide improved access to the William Hastie Natural Area from downtown Knoxville via the proposed Sevierville Pike Interchange. The new roadway corridor will also provide a corridor for the proposed James White Greenway, which will

provide additional connections between the existing and proposed recreational facilities in the South Knoxville area.

Unless additional information provided by the public or local officials provides additional evidence that a de minimis finding is not appropriate, TDOT intends to request a de minimis impact finding for the James White Parkway impacts to William Hastie Natural Area and greenways/trails crossed by the project. Should further studies or information indicate otherwise, FHWA will require that a full Section 4(f) Evaluation be conducted to determine if any other reasonable alternatives exist to fully avoid the William Hastie Natural Area.

Construction Impacts

Adverse impacts from construction would be primarily short-term in duration. Construction inconveniences such as noise, dust, and traffic conflicts are likely to be unavoidable, but are greatest during the construction phase only. In order to minimize potential detrimental effects from noise, siltation, soil erosion, or possible pollution of area watercourses, the construction contractors would be required to comply with the special provisions of Standard Specifications for Road and Bridge Construction (TDOT, 2006).

Contractors would be required to conduct and schedule operations according to these provisions. For example, the contractor would be bound by Section 107.01 of the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic would be routed during construction in a manner that has the least noise impact practicable upon residential and noise sensitive areas. In addition, coordination with affected utility companies would minimize disruption to utility services. Furthermore, TDOT would coordinate with local governments during the construction phase to minimize disruption to communities accepting detoured traffic.

Any action involving open burning would be in accordance with Chapter 1200-3-4, Open Burning, of the Tennessee Air Pollution Control Regulations. Any action resulting in fugitive dust would be in accordance with Chapter 1200-3-8, Fugitive Dust.

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

Proper sediment control measures, such as silt fences, would be used as outlined in the Tennessee Erosion and Sediment Control Handbook (TDEC, 2001b) and Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992).

Table ES-1. Summary of Project Data for each of the James White Parkway Alternatives.

Item	No-Build		Green Alternative		Blue Alternative		Red Alternative	
Functional Classification	Urban Principal Arterial		Urban Principal Arterial		Urban Principal Arterial		Urban Principal Arterial	
System Class	Federal Aid Primary System		State Highway System		State Highway System		State Highway System	
Length - Miles	NA		4.7		5.0		5.2	
Average Daily Traffic/Level of Service (ADT/LOS)								
Chapman Highway	2015	2035	2015	2035	2015	2035	2015	2035
Tennessee River to Blount Avenue	41,000/D	66,000/F	34,000/D	51,000/E	36,000/D	54,000/E	37,000/D	56,000/F
Blount Avenue to Moody Avenue	36,000/E	58,000/F	28,000/D	41,000/E	30,000/D	44,000/E	31,000/D	46,000/E
Moody Avenue to Stone Road	34,000/C	54,000/E	19,000/B	32,000/C	20,000/B	35,000/C	23,000/C	38,000/D
Stone Road to Lindy Drive	31,000/C	49,000/E	17,000/B	27,000/C	19,000/B	30,000/C	20,000/B	32,000/C
Lindy Drive to West Dick Ford Lane	31,000/C	50,000/E	15,000/B	26,000/C	17,000/B	29,000/C	19,000/B	31,000/C
West Dick Ford Lane to Governor John Sevier Highway	33,000/C	52,000E	18,000/B	29,000/C	19,000/B	31,000/C	20,000/B	33,000/C
James White Parkway	2015	2035	2015	2035	2015	2035	2015	2035
Tennessee River to Moody Avenue	NA	NA	29,000/C	43,000/D	27,000/C	40,000/D	25,000/C	38,000/D
Moody Avenue to Sevierville Pike	NA	NA	25,000/C	37,000/D	23,000/B	34,000/C	21,000/B	32,000/C
Sevierville Pike to Governor John Sevier Highway	NA	NA	23,000/B	35,000/D	22,000/B	32,000/C	20,000/B	30,000/C
On Governor John Sevier Highway	NA	NA	NA	NA	26,000/D	35,000/D	24,000/D	33,000/D

Item	No-Build	Green Alternative	Blue Alternative	Red Alternative
Estimated Right-of-Way Acquisition (Acres)	0	188	203	206
Displacements				
Residential Household Units[1]	0	65	64	62
Business	0	2	3	5
Non-Profit	0	1	0	0
Noise Receptors Impacted	0	35	24	26
Cultural Resources				
Archaeological Sites Impacted	0	0	0	0
Historic Sites Impacted (number)	0	0	0	0
Section 4(f) Properties Impacted	0	1	1	1
Land Cover/Terrestrial Habitat Impacted in ROW[2]				
Forest (acres)	0	122	123	123
Shrub/Scrub (acres)	0	4	9	7
Old Field (acres)	0	3	6	6
Grassland/Agriculture (acres)	0	1	6	4
Developed/Disturbed (acres)	0	58	60	66
Farmland Conversion Impact Rating Score (out of 260 points possible)	NA	81	88	89

Item	No-Build	Green Alternative	Blue Alternative	Red Alternative
Aquatic Resources Impacted[3]				
Streams Impacted in ROW	0	10	12	13
Stream Channel in ROW (feet)	0	4,099	6,071	5,885
Streams Crossed in ROW	0	7	9	9
Streams Channelized within ROW	0	4	4	5
WWCs Impacted in ROW	0	13	15	15
Springs/Seeps Impacted in ROW	0	7	7	3
Ponds Impacted in ROW	0	4	4	0
Wetlands Impacted in ROW	0	0	0	0
100-year Floodplains Impacted	0	0	0	1
Floodplain Area in ROW (acres)	0	0	0	1.08
Karst Features Impacted[4]	0			
Caves Impacted in ROW	0	2	1	1
Sinkholes Impacted in ROW	0	6	7	9
Sinkhole Area in ROW (acres)	0	0.77	3.20	2.99
Hazardous Materials Sites Impacted (no. of “High” impact potential sites)	0	1	1	1
Estimated Total Construction and Right-of-Way Costs (millions-2009)[5]	0	$103.9	$104.1	$106.9

[1] Includes total of individual single family homes + individual apartment units + mobile homes.

[2] Land cover/wildlife habitat data is provided for comparison purposes only. Acreages derived using GIS based on data collected during the December 2010 field surveys.

[3] Aquatic resources direct impact data is provided for comparison purposes only. Detailed data regarding stream impacts and mitigation will be provided following the final design phase as part of the permit acquisition process.

[4] Preliminary Cost Estimates are provided for general comparison only and include Quantm cost estimates for earthwork, bridges, retaining walls, and drainage and property costs for ROW acquisitions based on 2009 cost data. These cost estimates also include construction of interchanges and widening/improvements to Governor John Sevier Highway necessary for the Blue and Red Alternatives. These estimates do not include relocation costs for displacements, engineering costs, or utility relocation costs. More detailed cost estimates will be developed following selection of a preferred alternative.

[5] Karst features include all features observed on the surface during preliminary field investigations within the study area boundaries. There is potential that additional karst features, including caves could be identified during secondary geotechnical studies that will be conducted after a preferred alternative is selected.

Source: Parsons and TDOT, 2011

ES.6 Required Permits

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

- **Clean Water Act - Section 404 Permit** – required for construction that involves placement of dredge and fill material in Waters of the U.S. and/or impacts to waters of the U.S. where federally-listed Threatened or Endangered species are present. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. Section 404 Permits are issued by the U. S. Army Corps of Engineers (USACE). Individual and/or Nationwide Section 404 permits (NWP) may be required depending on the types of impacts involved.
- **Section 401-** Section 401 Water Quality Certification Pursuant to Section 401 of the Clean Water Act, a certification must be obtained from the state before any activity that may result in a pollution discharge into waters of the U.S. can be permitted by a federal agency. This certification is issued by TDEC, Division of Water Pollution Control, and states that the discharge will comply with the applicable effluent limitations and water quality standards. For Nationwide Section 404 Permits, TDEC provides a blanket approval. For Individual Section 404 Permits, an application must be completed by the permit applicant and submitted to TDEC for review. If the project is acceptable, TDEC will issue the Section 401 Water Quality Certification that states that the discharge complies with the aquatic protection requirements of the State.
- **Aquatic Resource Alteration Permit (ARAP)** – Projects that alter state waters or wetlands and that do not require an individual Section 404 permit must obtain an ARAP from TDEC. The permit application identifies a project's potential impacts to water quality and ensures compliance with the aquatic protection requirements of the state. The ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; blueline streams; intermittent blueline streams on the United States Geologic Survey (USGS) 7.5 quadrangle map; any stream that supports any form of aquatic life; or is in the vicinity of a State-listed endangered species. TDEC, Division of Water Pollution Control issues ARAP permits.
- **Section 26(a) Permit** - Section 26a of the TVA Act of 1933 as amended (49 Stat. 1079, 16 U. S. C. sec. 831y1) prohibits the construction, operation or maintenance of any structure affecting navigation, flood control on public lands or reservations across, along or in the Tennessee River or any of its tributaries until plans for such activities have been reviewed and approved by TVA. This permit is obtained from TVA for construction of projects that are in or along the Tennessee River and its tributaries, i.e., the Tennessee River watershed. (See http://www.tva.gov/river/26apermits/howto.htm). The 26a Permit shares an application form with USACE Permits applied for under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, as described above.

- **National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit** – The responsibility for issuing permits under the NPDES has been delegated by the EPA to TDEC. The legal reference of the NPDES is Section 402 of the Federal Water Pollution Control Act of 1972, as amended by the Clean Water Act (1977 and 1987). The NPDES storm water permitting program is intended to improve the quality of the nation's rivers, lakes, and streams by reducing pollution from non-point sources. All TDOT construction activities disturbing one acre or more of land are required to obtain an NPDES permit. These permits establish pollution control and monitoring requirements. General permits for construction activities require development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to help control erosion, sedimentation, and other project-generated waste. This permitting program is overseen by TDEC's Permit Section of the Division of Water Pollution Control. This division is responsible for the permitting process and also for administration of the Tennessee Water Quality Control Act of 1977.
- **Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP)** – required by operators of construction sites in Tennessee.
- **Underground Injection Control Permit** - This permit is required for any project that discharges industrial/commercial wastes into a subsurface system (other than city sewers) or stormwater into a sinkhole or cave. The permit is issued by TDEC, Division of Water Supply, Ground Water Management Section.

SAFETEA-LU Statute of Limitations on Filing Claims

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

ENVIRONMENTAL COMMITMENTS

Pedestrian and Bicyclist Considerations

Should a build alternative be selected, TDOT will provide existing and proposed public bicycle and pedestrian facilities/trails access over or under the new roadway so that the project does not divide neighborhoods or cut off access to important recreational areas, such as local parks and natural areas.

TDOT will continue to work with local planners, local residents, and other stakeholder groups during the design phase of the project to determine how this project may affect existing or planned bicycle or pedestrian trails and/or greenways. Considerations will be made to determine what opportunities may exist for improving or providing connections for those facilities as part of this project.

Threatened and Endangered Species Commitments

Section 7 of the Endangered Species Act of 1973, as amended, will be completed prior to submission of the Final Environmental Impact Statement. If a build alternative is selected, TDOT will conduct ANABAT and mist net surveys during the summer months of 2012 to determine if any Indiana bats (*Myotis sodalis*) are present within the proposed ROW of that alternative. Should Indiana bats be discovered in the ROW, additional measures will be taken to avoid impacts to possible maternity colonies. Such measures might include detailed surveys of potential roost sites within the impacted area and/or timing of cutting of potential roost sites during winter months when Indiana bats would be in winter hibernacula and would not be present in trees.

If a build alternative is selected, TDOT will conduct additional geotechnical studies of individual sinkhole areas to determine if any additional previously undiscovered caves may be present in the impacted area of that alternative. Should additional caves be discovered, TDOT will determine the potential hazards the cave presents to the roadway as currently planned and/or what additional design modifications may be required. In addition, if access can be obtained to the cave, additional biological surveys will be conducted to determine the presence of any threatened and/or endangered species, including Berry Cave salamanders (*Gyrinophilus gulolineatus*) and endangered bats.

Noise Commitments

Should a build alternative be selected, based on preliminary evaluation, a noise barrier would be considered feasible and reasonable along the westbound lanes of the proposed James White Parkway near the Moody Avenue off-ramp at the northern end of the project area. This barrier warrants construction to provide noise abatement for the residents that would remain adjacent to the proposed roadway in that area. The noise evaluation was conducted based on conceptual project plans. As a result, numerous assumptions had to be made regarding roadway elevations. TDOT will conduct additional noise studies and reassess the feasibility and reasonableness of the evaluated noise barriers during the design phase for the project. The final decision on implementation of abatement measures will take into consideration input received as part of the public involvement process.

Cultural Resources Commitments

Should a build alternative be selected, and should additional caves be discovered, TDOT will conduct cultural resources investigations in the cave. If remains, artifacts, or other archaeological material is uncovered during construction, all construction in the area of the find will cease. The Tennessee Division of Archaeology [(615)741-1588] and the recognized

Native American tribes will be contacted immediately so representatives may have the opportunity to examine and evaluate the material.

Visual Commitments

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

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

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

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

Geotechnical Commitments

TDOT conducted a preliminary geotechnical investigation and located several karst features (caves/sinkholes/springs) within the proposed ROW limits of each build alternative. Additional detailed geotechnical studies will be conducted should one of the build alternatives be selected as the preferred alternative. Any new caves discovered during that time will be studied in more detail.

Due to the surrounding karst terrain, the project area might be susceptible to future sinkhole developments from groundwater removing soil particles via underground streams, and to ground subsidence from the collapses of rock above possible voids and/or caverns. While this potential is not considered a serious hindrance to roadway construction, there are no assurances that future problems related to karst activity will not occur.

The Geotechnical and Geohazards Report prepared for the project determined that acid-producing (pyritic) material is not expected to be encountered in the study area. However, additional geotechnical investigations will be conducted during the design phase, should a build alternative be selected, and if some possibility of encountering acid-producing material is discovered during that study, then an assessment and mitigation plan will be developed at that time.

During the final design phase, TDOT will develop measures to ensure that the aquatic life and groundwater in the area are protected during and after project construction.

TDOT will obtain a Class V Injection Well Permit(s) from TDEC for any impacts to sinkholes.

Section 4(f) Commitments

TDOT will complete the Section 4(f) process prior to submittal of the final environmental document and will continue to work with the City of Knoxville to determine mitigation for

impacts to the William Hastie Natural Area. As presently proposed based on conceptual design plans, should a build alternative be selected, TDOT proposes to mitigate the impacts of the direct take of the two small segments totaling 0.79 acres along the northern boundary of the William Hastie Natural Area by acquiring three small segments of land that will remain from other affected parcels that attach to the existing Natural Area. The total amount of area contained in the proposed mitigation areas is 1.22 acres. Therefore, with the transfer of the 1.22 acres of mitigation property, the total size of the William Hastie Natural Area would become 77.71 acres, for an overall increase in size of 0.43 acre from the existing 77.28 acres. In addition, the resulting northern boundary of the William Hastie Natural Area would become a more regular-shaped area that would line the edge of the proposed James White Parkway ROW boundary. The three small mitigation segments would be purchased during the ROW acquisition phase of the project and immediately transferred to the City of Knoxville to become part of the William Hastie Natural Area.

All publicly owned greenways/trails crossed by the new roadway will be included in the final design to allow adequate crossings and/or connections to be provided. If necessary, TDOT will reduce visual and/or noise impacts near trails with use of context sensitive solutions/design features, such as vegetation screens and/or other options. These features will be considered during the final design of the project.

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CHAPTER 1

1.0 INTRODUCTION

1.1 Background

The Tennessee Department of Transportation (TDOT), in accordance with the Federal Highway Administration (FHWA), is preparing an Environmental Impact Statement (EIS) for the proposed construction of James White Parkway from Chapman Highway (U.S. 441/ SR-71, hereafter referred to as Chapman Highway) to Moody Avenue in South Knoxville, Knox County, Tennessee. The proposed project would extend the existing James White Parkway, which currently ends at Moody Avenue, southward to Chapman Highway (SR-71) near its intersection with Governor John Sevier Highway (SR-168). This project, hereafter referred to as the James White Parkway Project, would improve access from the South Knoxville area to the Central Business District (CBD) in downtown Knoxville. Figure 1.1 shows the project vicinity in Knox County, Tennessee. Figure 1.2 shows a more detailed view of the local project vicinity.

Originally conceived when Chapman Highway was the primary route to Sevier County and the Great Smoky Mountains National Park, the roadway was intended to bypass the urban portion of that route. It was anticipated that construction of James White Parkway into southern Knox County would relieve Chapman Highway congestion caused in part by visitors passing through the area. Although the subsequent development of the Highway 66 connector from Sevierville to I-40 rerouted most of the non-local traffic from Chapman Highway, the James White Parkway project had developed another purpose. The increasing demand for a better commuter route for the fast growing areas of southern Knox County and the Seymour portion of Sevier County became the new rationale for its completion.

A Final EIS (FEIS) was approved for the South Knoxville Boulevard (i.e. James White Parkway) project on June 24, 1977. That FEIS covered a project that started at Chapman Highway near Longvale Drive and extended northward to SR-158 (CBD Loop) in Knoxville. Since that time, the segment of that project from the CBD Loop southward to Moody Avenue has been constructed and opened to traffic. This roadway is known as the James White Parkway. The segment of the approved project alignment between Old Sevierville Pike and Chapman Highway was subsequently determined to have engineering constraints due to several sinkholes along the route. The approved alignment also required a shift near Redbud Drive to avoid a historic church and residences.

An Environmental Assessment (EA) was prepared to address an alternative alignment between Old Sevierville Pike and Chapman Highway. This portion of the project was referred to as South Knoxville Boulevard. The EA was approved by the FHWA on April 25, 2001. A Corridor and Design Public Hearing was conducted on July 31, 2001. Due to environmental issues identified in the EA and public concerns for the project identified during the hearing, it was suggested that other alternative alignments be studied and evaluated. Many people requested that the project be extended to Governor John Sevier Highway (SR-168). No final environmental document was developed for the project due to the unresolved issues and public concerns.

In January 2002, at the request of a City Councilman, the Knoxville City Council passed Resolution Number R-15-02 authorizing the creation of the City's James White Parkway Extension Task Force. The purpose of the task force, as stated by the City Council, was to evaluate various aspects of the project, including but not limited to, routing and design of the

unfinished portion of James White Parkway; the impact of the proposed project on traffic on Chapman Highway; the project's impact on existing businesses; environmental impact; the project's relationship to development patterns both within and outside the City of Knoxville; and potential impact upon existing neighborhoods.

Figure 1.1 Project vicinity of proposed James White Parkway from Chapman Highway (SR-71) to Moody Avenue in South Knoxville, Knox County, Tennessee.

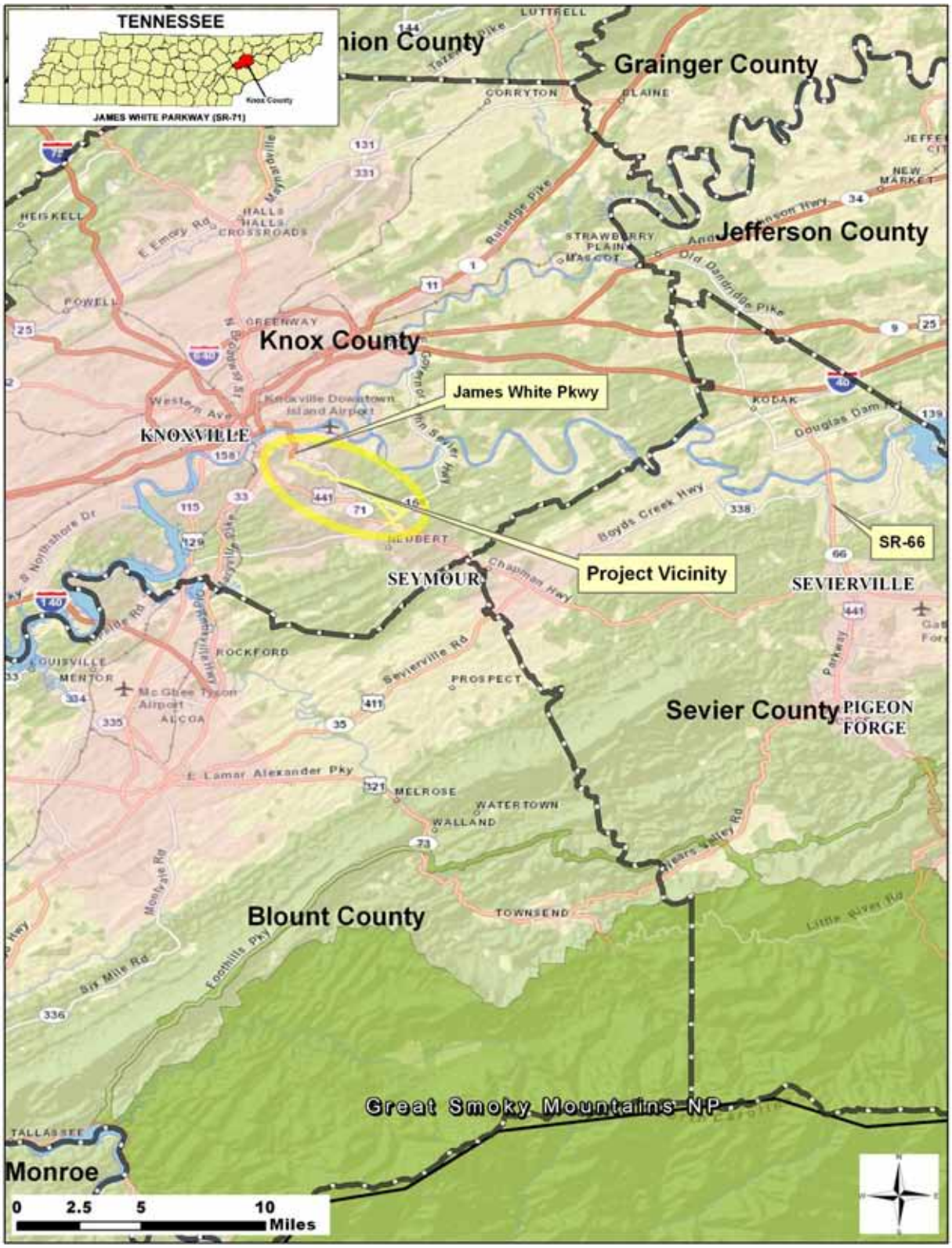

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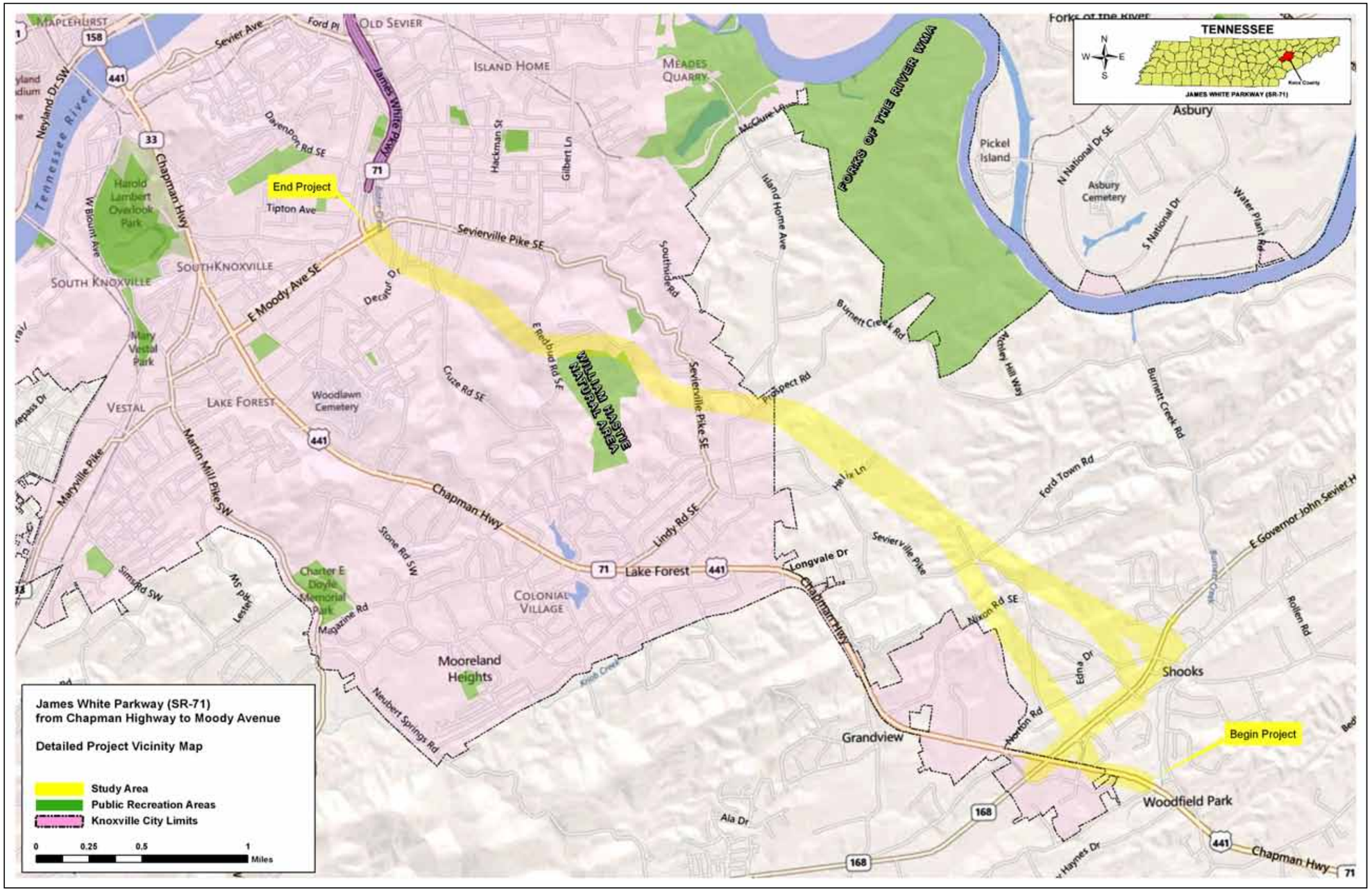
Figure 1.2 Project area and detailed vicinity map of the proposed James White Parkway from Chapman Highway (SR-71) to Moody Avenue in South Knoxville, Knox County, Tennessee.



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In the spring of 2003, TDOT commissioned the University of Tennessee Center for Transportation to review proposed TDOT projects across the state, one of those being the James White Parkway project. Based on that review, TDOT referred the project back to local officials for further review in November 2003. The James White Parkway–Chapman Highway Corridor Study Task Force (hereafter referred to as the Task Force), with technical support from the Knoxville–Knox County Metropolitan Planning Commission and the Knoxville Regional Transportation Planning Organization (TPO), subsequently conducted an extensive review of the project. Although the Task Force had already been authorized in January 2002 by the Knoxville City Council, it was expanded in the spring of 2004 to include stakeholders from both the city of Knoxville and Knox County.

In January 2005, under Resolution R-37-05, the Knoxville City Council accepted and endorsed the Task Force Corridor Study and subsequently submitted the "James White Parkway Extension Recommendation" to TDOT (JWP Task Force, 2005). A copy of the Task Force recommendations is provided on the James White Parkway project website at: http://www.tdot.state.tn.us/sr71/ .

The Task Force made several recommendations for the project, including: conducting an EIS to cover a proposed extension of the southern terminus of the existing James White Parkway to Governor John Sevier Highway (SR-168); making the proposed roadway a full access-controlled highway; reconsidering the location of proposed interchanges along the new roadway; utilizing environmentally sensitive design and context sensitive design to minimize neighborhood disruption; and improving safety and operation of Chapman Highway.

In October 2005, TDOT announced they would consider the recommendations provided by the Task Force and would move forward with studying the extension of James White Parkway in an EIS. An EIS was considered the appropriate environmental documentation for this project due to the potential for meaningful impacts and known public concerns identified during previous public involvement meeting associated with the previous studies for the project.

Environmental Impact Statement (EIS)

NEPA requires that projects receiving federal funding that have the potential for significant adverse environmental effects be reviewed in an EIS. An EIS:

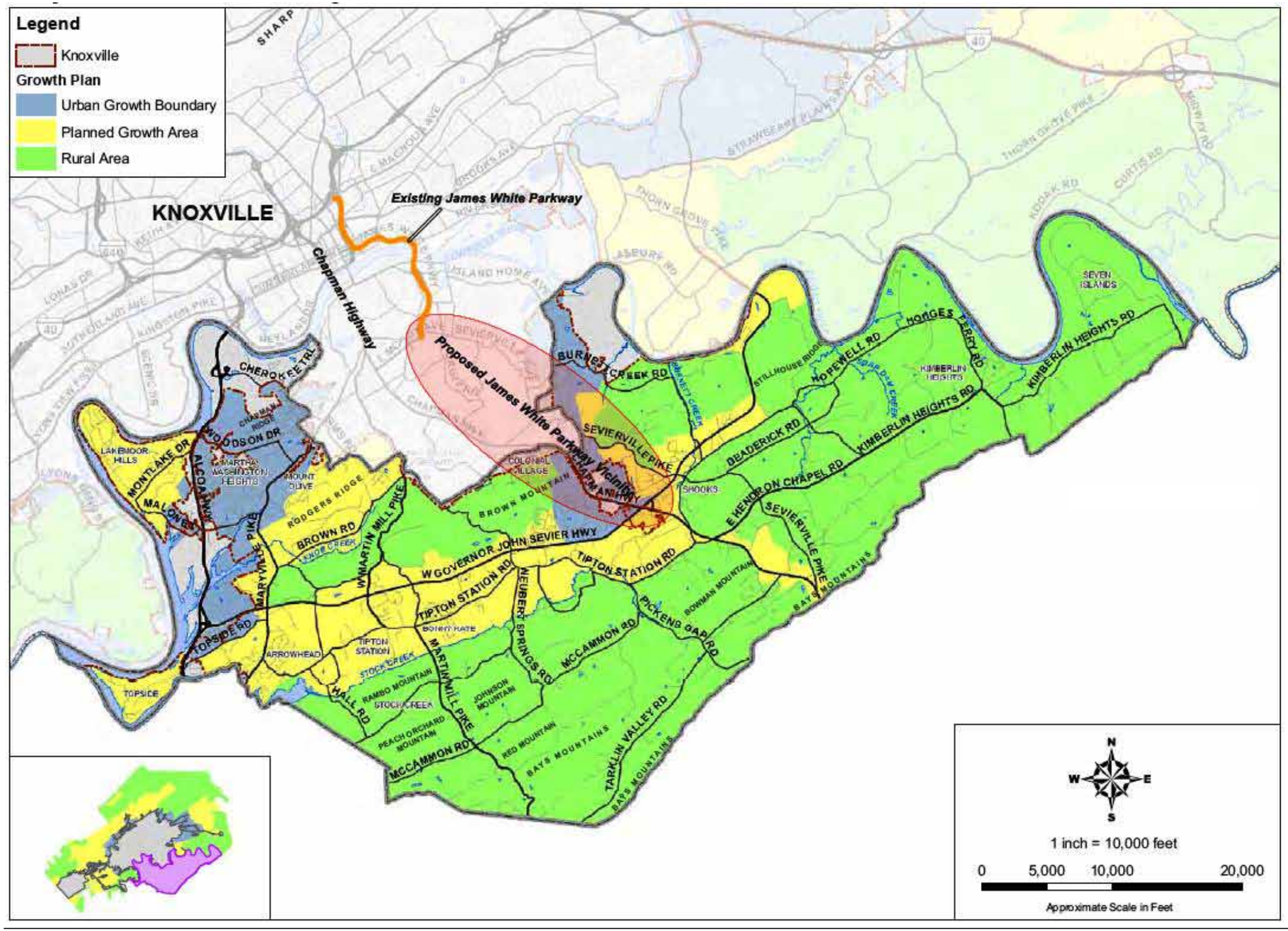
- Identifies alternative solutions that meet the project's purpose and need;
- Provides an assessment of the effects of the alternatives on the natural and built environment; and
- Identifies measures to avoid, minimize, or mitigate negative effects.

This EIS, which covers the proposed extension of the James White Parkway southward to Chapman Highway near the existing Governor John Sevier Highway interchange, is being developed to further study the anticipated impacts of the project.

1.2 Description of Project Area

The study area for this project is located in southern Knox County within eastern Tennessee (Figure 1.1 and Figure 1.2). The study area lies within the Ridge and Valley physiographic province of the southeastern U.S. with gently rolling hills to steep ridges dissected by creeks and small streams. The northern half and extreme southern end of the proposed James White Parkway lie within the city limits of the Knoxville. The remainder of the proposed project is currently in the unincorporated portions of southern Knox County. According to the Draft 2011 South County Sector Plan prepared by the Knoxville-Knox County Metropolitan Planning Commission, much of the currently unincorporated portion of the study area is included in the Urban Growth and Planned Growth Boundaries of Knox County. Therefore, it is anticipated that the area will continue to grow with residential, commercial, and possibly some industrial developments. The area currently contains a mixture of forested areas and rural open spaces, low to moderate density residential developments, and commercial/retail businesses. Figure 1.3 shows the Urban and Planned Growth Boundaries as shown in the Draft 2011 South County Sector Plan. The land listed as Rural Area is planned to remain mostly undeveloped for general preservation of natural resources or due to steep slopes, karst features, and other issues that limit the land for residential and commercial uses.

Figure 1.3 Urban and Planned Growth Boundaries in Knox County. (Source: 2011 South County Sector Plan)



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1.3 Purpose for the Project

The purpose of the James White Parkway project is to provide an efficient and safe transportation facility that would enhance transportation service by improving access to and from the South Knoxville area and help to relieve traffic congestion on Chapman Highway. This is proposed to be accomplished by construction of the proposed James White Parkway from Governor John Sevier Highway to Moody Avenue in South Knoxville.

1.4 Need for the Project

The completed James White Parkway roadway would enhance transportation service by improving access to and from the South Knoxville area, relieving traffic congestion on existing roads such as Chapman Highway, and by providing a more efficient connection between South Knoxville and medical facilities, educational institutions, and commercial areas in the greater Knoxville metropolitan area. This facility would provide for safer travel in the project area by reducing congestion-related crashes along some of the existing roadways in the project vicinity, especially Chapman Highway, which would see some reduction in traffic volumes due to this project. The needs for the proposed project are discussed in the following subsections.

1.4.1 System Linkage

The proposed project would provide a multi-lane link between the South Knoxville region and downtown Knoxville. James White Parkway was constructed from the CBD Loop southward to Moody Avenue and is open to traffic. The proposed extension of the roadway from Moody Avenue to Governor John Sevier Highway (SR-168) would provide an important link in the regional transportation network. This project would further improve access from the South Knoxville area to the CBD in downtown Knoxville and provide an alternative route to Chapman Highway. This project is included as a transportation improvement project in local plans such as the South County and South City Sector Plans.

The proposed design for the new roadway will be a result of coordination and cooperation with various stakeholders, including local officials, citizens, and project engineers to minimize adverse human and environmental impacts, while providing a transportation facility that will adequately serve the future transportation needs of the area.

1.4.2 Transportation Demand

Chapman Highway is the only north-south arterial connecting South Knoxville with the CBD Loop. Consequently, the traffic demand along this facility often exceeds its capacity and results in traffic congestion. Construction of James White Parkway between Moody Avenue and Governor John Sevier Highway would serve to relieve traffic congestion on Chapman Highway and provide additional capacity for future traffic demands along the north-south corridor. Relieving traffic congestion and providing a connection between Governor John Sevier Highway and the CBD Loop will improve access to the South Knoxville area.

In 2006, both the Knoxville City Council and the Knox County Commission adopted the Chapman Highway Corridor Study, which was prepared by the Knoxville – Knox County Metropolitan Planning Commission. The study includes recommendations for Chapman Highway improvements, such as roadway realignments, connector roads, sight-distance improvements, access management measures, and sidewalk improvements. It also includes recommendations regarding economic redevelopment and parks, parking, and landscaping.

The James White Parkway project was included in the TPO 2009-2034 Knoxville Regional Mobility Plan (KRMP), adopted in May 2009, and the TPO's Transportation Improvement

Program (TIP) Fiscal Year 2011-2014 that was approved in September 2010. The proposed project is also consistent with the State Transportation Improvement Program (STIP), Fiscal Years 2011-2014 and the State's Long Range Transportation Plan (LRTP). The KRMP and TIP sheets are included in Appendix A. The project is listed as "South Knoxville Boulevard (SR-71)" in the KRMP, but refers to the same project listed in the TIP as "James White Parkway (SR-71). The name of the project was changed to James White Parkway after the KRMP was published.

The STIP is a statewide prioritized listing/program of transportation projects covering a period of four years. Through an established process, TDOT solicits or identifies projects from rural, small urban, and urbanized areas of the state. Projects are selected for inclusion in the STIP based on adopted procedures and criteria. The STIP must be consistent with the statewide LRTP and urban area TIPs, and is required for projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53. The STIP is similar to a TIP in that it identifies priorities for transportation projects and must be fiscally constrained. However, the STIP covers all projects within the state, including those covered by each TIP, as well as those projects within all rural areas not covered by a TIP. The TIPs cover local projects falling within the individual Metropolitan Planning Organizations (MPOs) or TPOs planning boundaries. As noted above, TIPs that have been developed by MPOs/TPOs must be incorporated directly, without change, into the STIP. Projects selected by TDOT that fall within the urban boundary of one of the eleven MPOs/TPOs within the State are not individually listed in the STIP, because those projects are listed in the appropriate TIP, which are automatically incorporated directly into the STIP. The James White Parkway project is included in the Knoxville Regional TPO's 2011-2014 TIP and therefore has been incorporated into the state's 2011-2014 STIP. Since the STIP is consistent with the statewide LRTP, all TIP projects are also consistent with the LRTP.

1.4.3 Existing and Future Conditions

1.4.3.1 Traffic Operations

The proposed James White Parkway extension is intended to provide an alternative route for traffic currently handled primarily by Chapman Highway. Existing Chapman Highway is a four-lane highway that experiences traffic congestion and is anticipated to become more congested in the coming years. Chapman Highway has been reviewed and analyzed in recent years in order to develop ways to reduce roadway congestion.

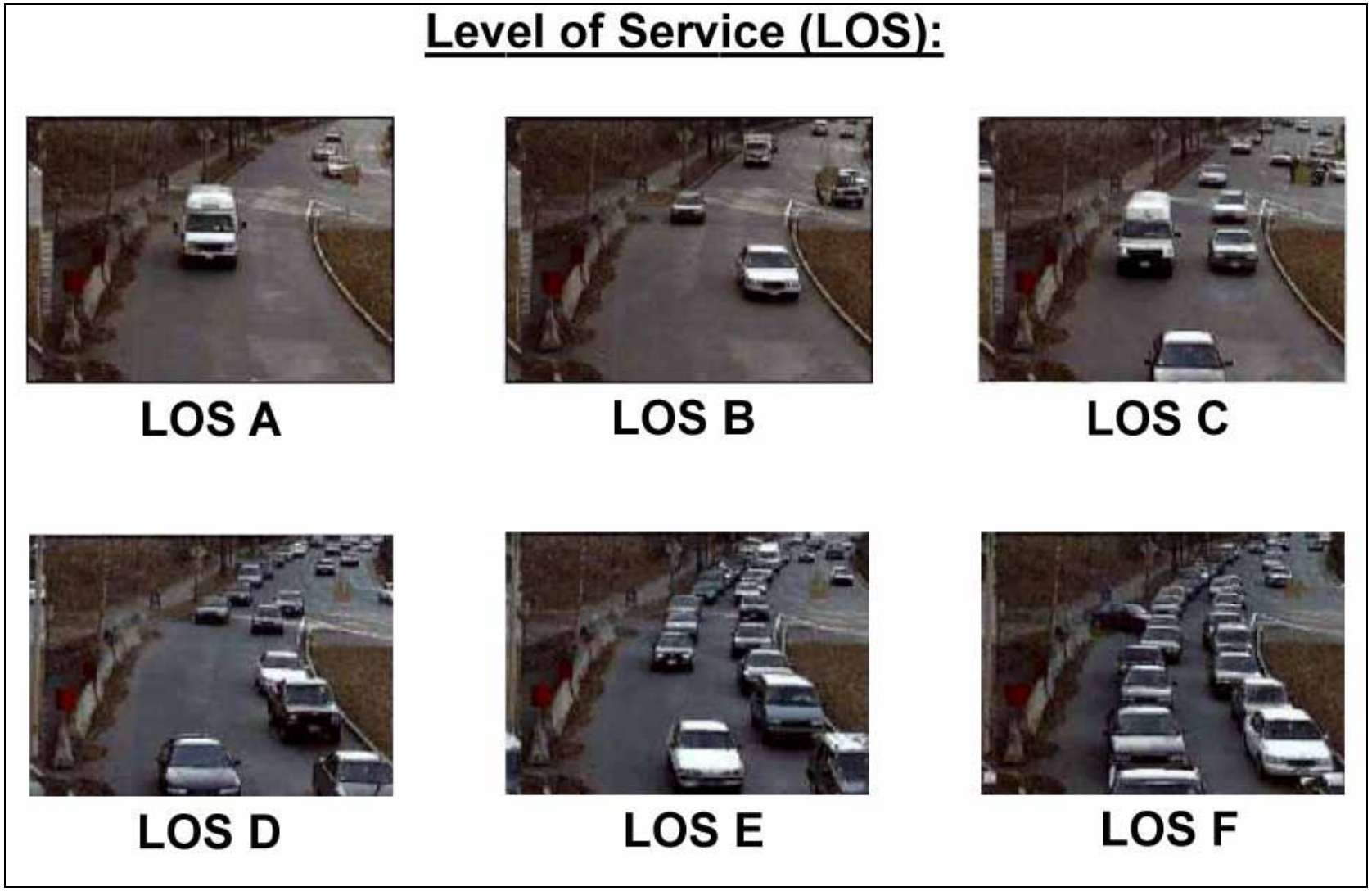
1.4.3.2 Traffic Analyses

Traffic investigations were performed using a process called Capacity Analysis, using methodologies established by the Transportation Research Board and approved by the FHWA. Findings are reported in terms of Levels of Service (LOS). Levels of Service describe the operational character of traffic flow for a particular roadway segment or intersection. The LOS are described below:

- LOS A = Primarily free flow operations;
- LOS B = Reasonably free flow operations;
- LOS C = Stable operation;
- LOS D = Congestion, approaching a range in which small increases in flow will cause substantial deterioration in traffic service;
- LOS E = Extremely unstable operations; and
- LOS F = Forced flow or stop-and-go breakdown conditions.

Figure 1.4 contains a graphical representation of the different LOS to show what each may look like in an everyday situation.

Figure 1.4 Graphical Depiction of the Levels of Service (LOS) used to describe Roadway Capacity.



The Chapman Highway Corridor Study adopted in 2006 includes traffic analyses on a highway segment basis for a future year of 2030, and indicates a LOS E in two of six segments, even with the proposed James White Parkway extension to divert some traffic off Chapman Highway.

In 2007, the "Chapman Highway Corridor Improvement Study" was completed by TDOT. It features functional plans for intersection realignments, connector roads, auxiliary lanes, and street and driveway closures and consolidations. The Chapman Highway Corridor Improvement Study traffic analysis was prepared on an intersection basis for future year 2017 conditions, and it projects LOS F conditions at three intersections and LOS E conditions at three additional intersections, even after proposed improvements are implemented on Chapman Highway.

Updated Capacity Analyses for Chapman Highway were initiated in the spring of 2008 as part of the James White Parkway EIS to determine how Chapman Highway traffic volumes and LOS would change over time if the proposed James White Parkway project is not constructed ("No-Build" condition). Due to subsequent improvements to the TPO's regional travel demand model developed in 2009, the Capacity Analyses were revisited in the spring of 2010. These most recent analyses capture both a change in the methodology used for this project and revisions in traffic data generated by the new travel demand model.

The No-Build Capacity Analyses provides the expected traffic operational character of Chapman Highway if the proposed extension of the James White Parkway is not constructed, and with a few improvements to Chapman Highway during the study period. The capacity analyses were conducted for Chapman Highway for both morning and afternoon peak travel periods using traffic estimates for a base year of 2015 and design year of 2035. A highway segment-based traffic operations analysis procedure was used.

Base Year and Design Year

The Base Year of a project is generally the year following the expected opening of the roadway to traffic. For this project, the base year was estimated to be 2015.

The Design Year of a project is generally 20 years after the roadway opens, assuming the roadway is designed to function well (i.e., accommodate traffic demand) for 20 years into the future. The design year for this project was estimated to be 2035.

The future analysis recognized that operational and safety improvements, including turn lane and signalization improvements, would be made on Chapman Highway but did not assume any cross-street improvements, driveway consolidations, etc., for other streets along the route. The improvements for operational and safety reasons being considered are the improvements expected to occur under the TPO's 2009-2034 KRMP (Project #626). The safety and operational improvements involve minor projects including addition of turning lanes at various locations that can be accomplished within the existing Chapman Highway right-of-way (ROW) from Blount Avenue southward to Boyd Creek Highway (SR-338).

In the segment of Chapman Highway from Blount Avenue to Moody Avenue, LOS F is expected even if the proposed improvements to Chapman Highway are made. This is due to the travel delays introduced by the seven traffic signals in this segment. The roadway

segments from Moody Avenue to Governor John Sevier Highway are anticipated to decline from LOS C to LOS E.

Table 1.1 shows the traffic volumes and LOS for Chapman Highway in the base year 2015 and design year 2035 for the No-Build conditions. The 2035 traffic volumes and LOS for Chapman Highway under the build alternatives are included in Table 1.1 for comparison purposes to show how the proposed James White Parkway extension would affect traffic flows on the existing route by the design year. Based on this information, traffic volumes would be substantially reduced on Chapman Highway under all of the proposed build alternatives. The LOS would improve from LOS E to LOS F under the No-Build Alternative to LOS C to LOS E for most segments under the build alternatives. Only one segment under the Red Alternative would result in a LOS F continuing due to that alternative not diverting as much traffic from Chapman Highway as the other two alternatives due to its distance from Chapman Highway. More detailed traffic and LOS data for the build alternative alignments is provided in Chapter 2 of this EIS. Figures 1.5 and 1.6 show the general results of the updated Capacity Analyses for Chapman Highway under the No-Build conditions.

There is one particular bottleneck that should be noted. The intersection of Chapman Highway with Blount Avenue causes long traffic queues in all directions. There is limited potential to improve this existing intersection, since the Henley Street Bridge, Baptist Hospital, and the railroad underpasses on Blount Avenue all provide constraints on potential road improvements/widening that might increase capacity through this intersection.

Alternative routes to access the Henley Street Bridge, Baptist Hospital, and railroad underpass on Blount Avenue are not available or suitable for handling additional traffic. All routes that are south or west of Chapman Highway lead to the same congested intersection at Blount Avenue at the south end of the Henley Street Bridge. The few routes that exist to the north and east of Chapman Highway have poor vertical and horizontal alignments, many residential driveways, no turn lanes, low capacities, and are already experiencing traffic congestion. The proposed James White Parkway extension would provide an alternative arterial route for travelers in this corridor, leaving Chapman Highway and the local streets less congested for local traffic.

Average Daily Traffic (ADT)

ADT is the total traffic volume during a given period divided by the number of days in that period. For roadways having traffic in two directions, the ADT includes traffic in both directions unless specified otherwise.

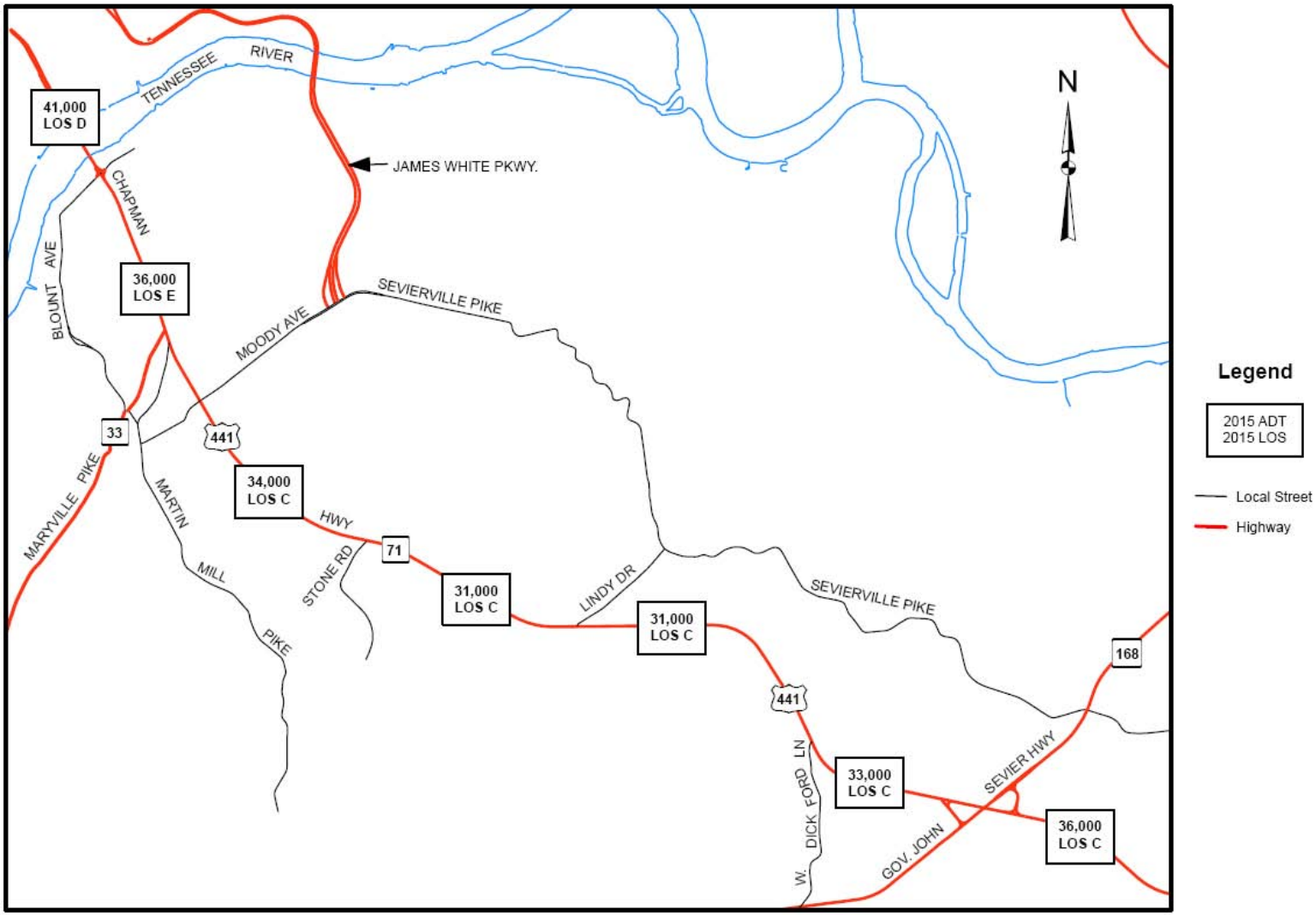
Table 1.1 Traffic Forecasts and Levels of Service for Chapman Highway under the No-Build Alternative and with the proposed James White Parkway Build Alternatives.

Highway Segment	No-Build Alternative		Green Alternative		Blue Alternative		Red Alternative	
	2015 ADT*/LOS	2035 ADT/LOS	2015 ADT*/LOS	2035 ADT/LOS	2015 ADT*/LOS	2035 ADT/LOS	2015 ADT*/LOS	2035 ADT/LOS
Tennessee River to Blount Avenue	41,000/D	66,000/F	34,000/D	51,000/E	36,000/D	54,000/E	37,000/D	56,000/F
Blount Avenue to Moody Avenue	36,000/E	58,000/F	28,000/D	41,000/E	30,000/D	44,000/E	31,000/D	46,000/E
Moody Avenue to Stone Road	34,000/C	54,000/E	19,000/B	32,000/C	20,000/B	35,000/C	23,000/C	38,000/D
Stone Road to Lindy Drive	31,000/C	49,000/E	17,000/B	27,000/C	19,000/B	30,000/C	20,000/B	32,000/C
Lindy Drive to West Dick Ford Lane	31,000/C	50,000/E	15,000/B	26,000/C	17,000/B	29,000/C	19,000/B	31,000/C
West Dick Ford Lane to Governor John Sevier Highway	33,000/C	52,000E	18,000/B	29,000/C	19,000/B	31,000/C	20,000/B	33,000/C

**ADT = Average Daily Traffic*

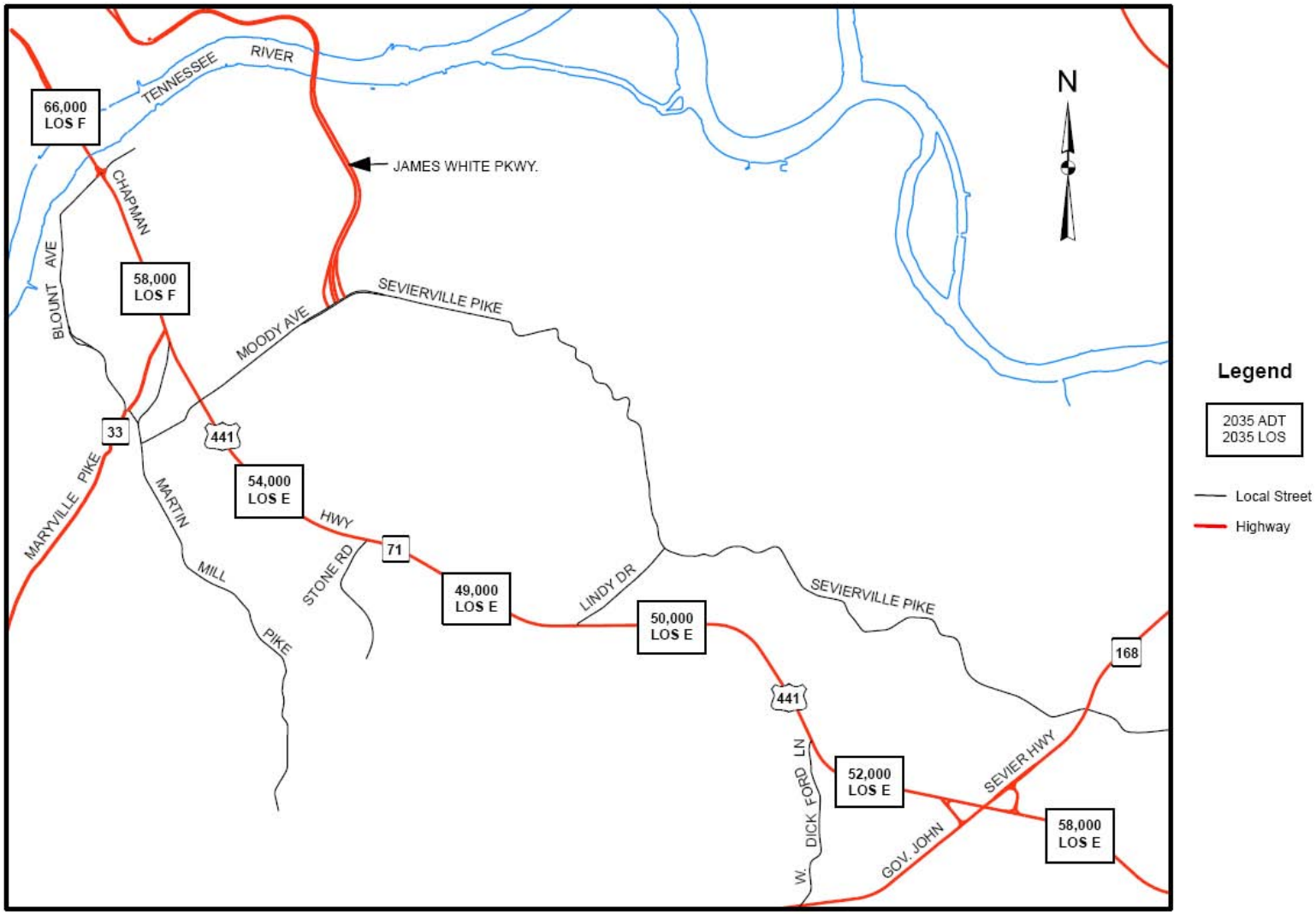
Source: Tennessee Department of Transportation, 2010

Figure 1.5. Base Year 2015 Levels of Service and Average Daily Traffic for Chapman Highway under the No-Build Alternative for the James White Parkway Project in Knox County, Tennessee.



2015 NO-BUILD ADT AND LOS

Figure 1.6. Design Year 2035 Levels of Service and Average Daily Traffic for Chapman Highway under the No-Build Alternative for the James White Parkway Project in Knox County, Tennessee.



2035 NO-BUILD ADT AND LOS

1.4.4 Traffic Safety

Traffic safety was one of the concerns identified by the Task Force that needs to be improved in the South Knoxville region, especially along portions of Chapman Highway. Crash rates and severity of crashes along portions of Chapman Highway are substantially higher than statewide averages for similar roadway types. Improvements to Chapman Highway may reduce crash rates on the existing facility for the near future. However, because of the projected high traffic volumes for the roadway in the future, the removal of some of the projected travel is likely the only way to ensure that crash rates do not worsen in the future. Construction of the proposed James White Parkway would help relieve some of the traffic from Chapman Highway thus helping to reduce the potential for crashes in the long term.

Crash Rate

Section crash rates are calculated based on the number of crashes on a specified section of roadway, the average daily traffic on the roadway, the timeframe for which the crash data was taken, and the length of the roadway section. Crash rates are expressed in terms of crashes per one million vehicle-miles.

Statewide Average Crash Rate

This rate is based on the number of crashes statewide for a specific highway type, such as urban divided highways, urban roadways with turn lanes, urban freeways and rural divided highways.

Statewide Critical Crash Rate

A section's crash rate is compared to a critical crash rate, which is derived from a formula using the statewide average crash rate, average daily traffic on the roadway section, length of the section, and the timeframe for which the crash data was taken. The comparison is expressed as a ratio of the section crash rate to the critical crash rate (resulting in a critical crash rate factor). The critical crash rate is the threshold above which it can be statistically certain (at a 99% confidence level) that the section crash rate exceeds the average crash rate and is not mistakenly shown as higher than the statewide average due to randomly occurring crashes. Sections with a critical crash rate factor greater than one are considered to have crash rates that are statistically higher than the statewide average rate.

Severity Index

A severity index is used to determine how severe the crashes that occur on a section of roadway are relative to similar roadways. This index is calculated by a formula of the sum of four times the number of fatal crashes plus two times the number of incapacitating injury crashes plus the number of other injury crashes divided by the total number of crashes that occurred during the period. The weighting of the fatal and incapacitating injury crashes gives a higher ranking to locations with a large number of more severe crashes to identify areas that may require more immediate attention.

Crash rates were tabulated for Chapman Highway from the Sevier/Knox County line northward to the Tennessee River for a 3-year period from 2007 to 2009. The roadway is considered an urban principal arterial route for the entire length studied. The existing route was broken into seven sections to allow for detailed analyses of the crash data to aid in identifying any high crash rate sections or areas of higher safety concern along the route. Figure 1.7 shows the location of the crash analysis sections along Chapman Highway. A total crash rate was also determined for the entire length of the route within the study area. The first five sections, located between the Sevier County line and Fronda Lane/Overbrook Drive, are classified as "urban four lane undivided" highway. The remaining segments to the north of Fronda Lane/Overbrook Drive are classified as "urban four lane turn lane" highway.

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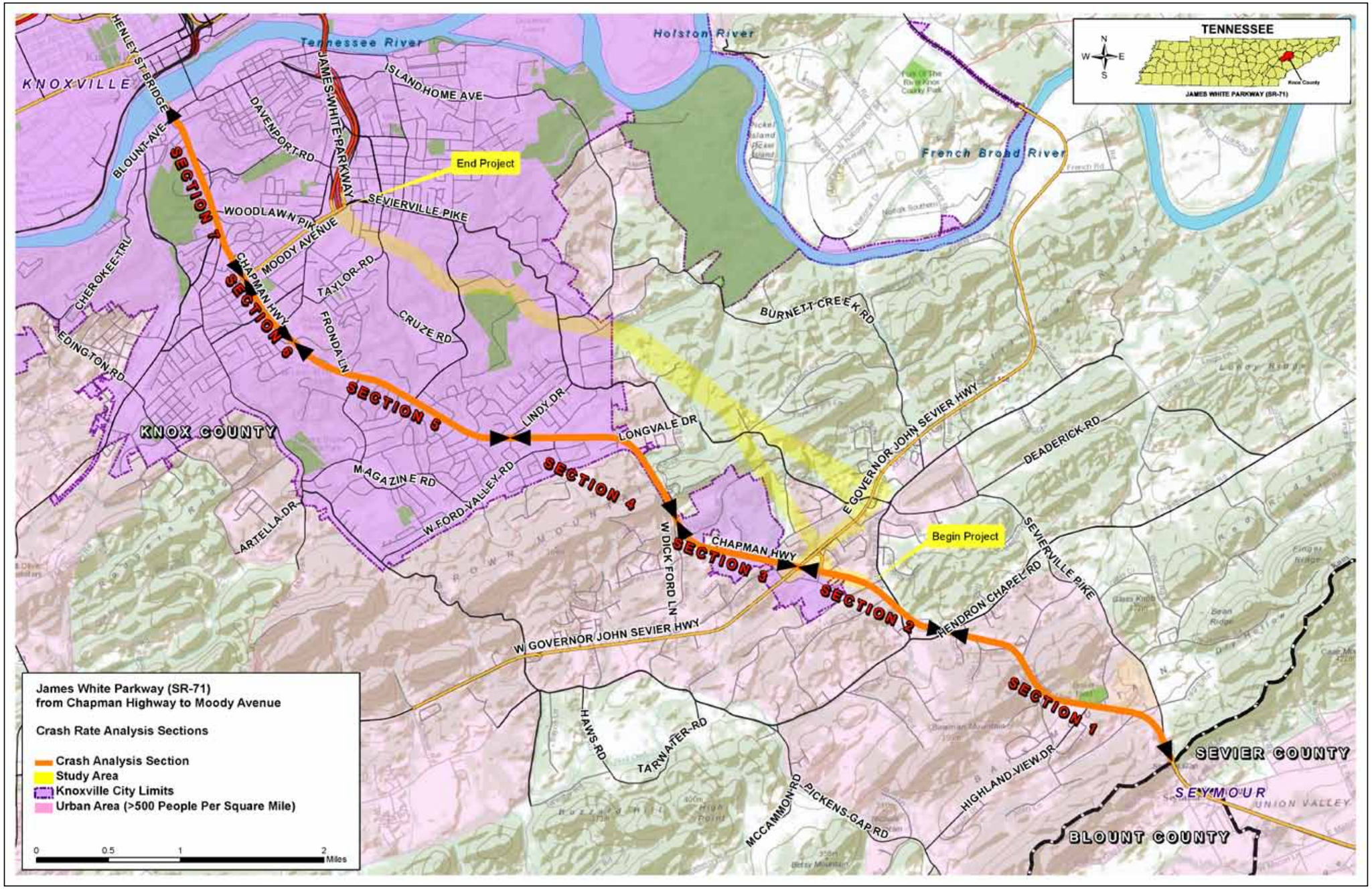
Figure 1.7. Chapman Highway Crash Analysis Section Locations along Chapman Highway in Knox County, Tennessee.



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Based on the 2007-2009 crash data, a total of three segments of Chapman Highway in the crash analysis area were found to have crash rates considered statistically higher than the statewide average crash rate for similar highways based on a critical crash rate factor greater than one. This includes the section extending from Governor John Sevier Highway northward to West Dick Ford Lane, and three sections encompassing the area between Lindy Drive and the Tennessee River at the Henley Street Bridge (see Figure 1.7). A fourth section extending from Fronda Drive to Lindy Drive, had a crash rate that was higher than the statewide average, but not high enough to be considered statistically higher. Regardless, that section of roadway is of concern and will likely continue to decline in safety as traffic volumes increase as anticipated. Based on the overall crash data, the entire length of Chapman Highway between the Sevier County line and the Tennessee River indicates a crash rate that is statistically higher than the statewide rate. Table 1.2 shows the results of crash rate analyses for Chapman Highway.

In addition to comparing the Chapman Highway crash rates to statewide average rates, additional analyses were conducted using the 2007-2009 crash data to provide a better understanding of the types, locations, and severity of crashes that occurred along the roadway. Overall, there were a total of 1,243 crashes over the three year period resulting in 10 deaths and 466 people being injured. Most of the crashes throughout the length of the roadway involved two or more vehicles (as would be expected on an urban route) and most were at intersections and involved rear end crashes and angle crashes. This information indicates that a majority of the crashes are contributed to the number of traffic signals and relatively high volumes of traffic carried by the roadway, which results in congestion and backups at each light, especially during peak travel times.

Based on the 2007-2009 data, the timing of crashes indicates that the number of crashes begins to rise at 6:00 a.m. and continues to increase throughout the daytime hours, peaking during the evening commute, and then gradually decreasing throughout the nighttime and into the early morning hours. The majority of crashes (30 percent of all crashes) occurred during the three-hour period between 3:00 p.m. and 6:00 p.m., corresponding to the evening commute. This compares to 11 percent of accidents occurring during the morning commute hours between 6:00 a.m. and 9:00 a.m. Approximately 56 percent of the crashes during the evening commute hours were in the southbound direction, but a high number of crashes still occurred in the northbound direction at that time indicating that safety issues occur in both directions during the evening commute. In contrast, during the busy morning commute hours, a more unbalanced number of crashes (nearly 70 percent) were in the northbound direction, which would be expected due to the main traffic flow being toward downtown Knoxville at that time. The lower number of crashes during the morning commute, and less noticeable difference in crashes between the northbound and southbound lanes in the evening, might indicate that in the morning there are less people going to and from local businesses on their way to work or school. However, in the evening, the entire Chapman Highway area is busier with more people being active during that time of day and making stops at local businesses on their way home. This extra traffic volume going to and from the numerous side road intersections and business access points results in an overall more crowded and less safe roadway. The fact that a large number of crashes (35 percent of all crashes) occurs during the six-hour portion of the middle of the day between the hours of 9:00 a.m. to 3:00 p.m. also indicates that the numerous businesses along the route likely attract additional traffic throughout the day and contribute to higher crash rates.

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Table 1.2 Crash Rates and Analyses Results for Crashes on Chapman Highway during 2007-2009 in Knox County.

Chapman Highway Section ID (See Fig. 1.7)	Section Description	Functional Class	Roadway Type	Total Number of Crashes (2007-2009)	AADT 2007-2009	Section Length (Miles)	VMT	Exposure (M) (1 MVM)	Statewide Average Crash Rate (2006-2008)	Actual Section Crash Rate (A)	Statewide Critical Crash Rate (C)	Critical Crash Rate Factor (A/C)	Actual Section Rate/ Average Statewide Rate	Total Killed	Total Injured
1	Sevier County Line to Hendron Chapel Road	Urban Principal Arterial	Urban Four Lane Undivided	128	26,490	1.98	52,450	57.43	3.39	2.23	3.97	0.56	0.66	4	73
2	North of Hendron Chapel Road to Governor John Sevier Highway	Urban Principal Arterial	Urban Four Lane Undivided	108	28,320	1.16	32,851	35.97	3.39	3.00	4.12	0.73	0.89	3	53
3	North of Governor John Sevier Highway to West Dick Ford Lane	Urban Principal Arterial	Urban Four Lane Undivided	156	28,851	0.93	26,831	29.38	3.39	5.31	4.20	1.26	1.57	1	52
4	North of W Dick Ford Lane to Lindy Drive	Urban Principal Arterial	Urban Four Lane Undivided	80	29,382	1.47	43,192	47.29	3.39	1.69	4.03	0.42	0.50	0	26
5	North of Lindy Drive to Fronda Drive	Urban Principal Arterial	Urban Four Lane Undivided	207	30,444	1.66	50,537	55.34	3.39	3.74	3.98	0.94	1.10	1	109
6	North of Fronda Drive to Moody Avenue	Urban Principal Arterial	Urban Four Lane Turn Lane	159	35,407	0.56	19,828	21.71	2.65	7.32	3.49	2.10	2.76	0	56
7	North of Moody Avenue to Tennessee River (Henley Street Bridge)	Urban Principal Arterial	Urban Four Lane Turn Lane	405	40,369	1.47	59,342	64.98	2.65	6.23	3.13	1.99	2.35	1	97
Entire Route from Sevier County Line to Tennessee River		Urban Principal Arterial	Urban Four Lane Undivided/ Turn Lane	1243	31,323	9.23	289,111	316.58	3.18	3.93	3.42	1.15	1.23	10	466

= Critical Crash Rate Factor >1, Section Crash Rate Exceeds Statewide Critical Rate (High Crash Rate Section)

= Critical Crash Rate Factor <1, Section Crash Rate Exceeds Statewide Average Rate

= Critical Crash Rate Factor <1, Section Crash Rate Lower Than Statewide Average Rate

Exposure (M) = (ADT x 365 x 3 years analysis period x Section Length)/1,000,000

Section Crash Rate = Total Crashes/Exposure(M); Crash rates are expressed in crashes per 1 MVM (1 million vehicle miles traveled)

Statewide Critical Crash Rate = Statewide Average Crash Rate + K x [sqrt(Statewide Average Crash Rate/M]+1/(2M); Where K = 2.327 which is equal to a probability of 0.99.

Critical Crash Rate Factor = Section Crash Rate/Statewide Critical Crash Rate

Note: For comparison purposes, crash rates for the entire route were derived using averages of the individual sections and weighted by the number of sections within each roadway type, including the overall statewide rates, since the entire length of the roadway consists of two different roadway types (four-lane undivided and four-lane turn lane).

AADT = Annual Average Daily Traffic; MVM = Million Vehicle Miles; VMT = Vehicle Miles Traveled

Table 1.2 continued. Crash Rates and Analyses Results for Crashes on Chapman Highway during 2007-2009 in Knox County.

Chapman Highway Section		Total Severe Crashes*	Actual Section Severity Rate	Statewide Severity Rate	Accident Location				Accident Type								
Chapman Highway Section ID	**Section Description**				Along Roadway	At an Intersection	Ramp	Bridge	Angle	Head On	No Other Vehicle	Rear to Rear	Rear End	Rear to Side	Side Swipe Opposite Direction	Side Swipe Same Direction	Unknown/Other
1	Sevier County Line to Hendron Chapel Road	9	0.45	0.09	55	73	0	0	15	8	27	1	62	0	3	12	0
2	North of Hendron Chapel Road to Governor John Sevier Highway	6	0.45	0.09	47	59	2	0	16	2	12	2	69	0	0	7	0
3	North of Governor John Sevier Highway to West Dick Ford Lane	6	0.31	0.09	43	108	5	0	48	1	7	1	86	0	3	10	0
4	North of W Dick Ford Lane to Lindy Drive	1	0.26	0.09	32	48	0	0	11	1	11	0	50	0	2	5	0
5	North of Lindy Drive to Fronda Drive	15	0.43	0.09	44	163	0	0	39	2	23	2	128	0	3	9	1
6	North of Fronda Drive to Moody Avenue	1	0.24	0.07	36	123	0	0	53	5	6	2	75	1	1	13	1
7	North of Moody Avenue to Tennessee River (Henley Street Bridge)	11	0.22	0.07	88	304	1	12	107	6	18	1	247	1	5	19	1
Entire Route from Sevier County Line to Tennessee River		49	0.32	0.09	345	878	8	12	289	25	104	9	717	2	17	75	3

*Severe Crashes include all crashes involving fatalities or incapacitating injuries.

Severity Rate = (4 x F+2 x II+OI)/N; Where: N =total number of crashes; II =the total number of incapacitating injury crashes; F=total number of fatal crashes, OI=total number of other injury crashes (not including fatal and incapacitating crashes.

The severity rate was calculated by the formula of the sum of four (4) times the number of fatal crashes plus two (2) times the number of incapacitating injury crashes plus the number of other injury crashes divided by the total number of crashes. This weighting of the fatal and incapacitating injury crashes gives a higher ranking to locations with a large number of more severe crashes.

Sources: Crash data for 1/1/2007 to 12/31/2009 provided by TDOT Project Planning Division 10/24/2011; Statewide average crash rates provided by TDOT Project Planning Division 10/24/2011 (2006-2008 latest available; Traffic data (AADT) derived from traffic history data available on TDOT's website at: http://www.tdot.state.tn.us/TrafficHistory

Out of the 1,243 total crashes, there were 49 severe crashes resulting in crash severity rates for all sections being an average of four times higher than the statewide average severity rates for similar types of roadway. Severe crashes include crashes that resulted in fatalities and/or incapacitating injuries. The sections of Chapman Highway between Governor John Sevier Highway and the Tennessee River that would benefit the most from the James White Parkway project all had crash severity rates that cause substantial concern. Reducing traffic volumes along Chapman Highway alone is expected to result in a substantial decrease in crash rates. Reducing the number of crashes would reduce the potential for fatalities and injuries. However, many factors play a role in the severity of crashes beyond just the number of crashes that occur in a given area.

Typically congested urban routes, such as Chapman Highway, have high crash rates due to the numerous congestion related minor property damage crashes. In most cases, those types of crashes do not result in severe injuries or deaths, but based on the observed severity rates, Chapman Highway crashes appear to be more severe than those on comparable roadways throughout the state. One potential reason for this may be due to fluctuating conditions along the roadway within a given day, or from one day to the next. Some days, or certain times within a day, the roadway may not be congested, or may be congested in different areas due to traffic signal timing and associated traffic backups or cues. This inconsistency can cause drivers to not know when or where to expect backups and be less prepared to stop. In some cases, traffic speeds may reach higher levels between signals, but then require sudden stops or speed reductions when approaching a signal. Add in blind spots due to hills, curves, and buildings/signs, numerous driveways, business access points, and side roads with traffic entering and leaving at will, and you increase the potential for crashes. These conditions all occur along existing Chapman Highway. These inconsistent or unpredictable traffic conditions on any given commute will not allow drivers to fully anticipate the conditions at any given location. This is especially true in current times due to an increased number of distracted drivers using cell phones or other electronic devices in the vehicle while driving. When a roadway has various speeds within each section, and you have points where a driver is able to reach full speed before coming up on a congested point and rear-ending a car in front of them, it is likely the injuries to both parties will be more severe.

An example of how traffic speed influences crash severity can be derived from the fact that there were more fatal crashes located south of Governor John Sevier Highway than on other sections studied, even though the actual crash rates were lowest in those sections. The higher crash severity rates south of Governor John Sevier Highway were likely due to average traffic speeds being higher in those sections compared to the sections north of Governor John Sevier Highway, where more congestion occurs. In addition, more head on collisions (40 percent of all head on collisions in the study area) occurred south of Governor John Sevier Highway. Although crash rates are lower in those sections due to less congestion, the higher speed crashes typically result in more severe injuries. It is likely that increased speed enforcement in those areas south of Governor John Sevier Highway could help to lower both the number of crashes and severity of crashes without substantial changes to the existing roadway being required to improve safety. However, should crash rates continue to climb, additional safety improvement projects may need to be considered in those areas. This would be required regardless of James White Parkway being constructed.

Without removal of a substantial amount of traffic or other major improvements to Chapman Highway it is expected that crash rates will continue to worsen due to the increased traffic volumes anticipated by both the base and design years. The severity of crashes may or may not change because it is expected that there will still be some inconsistency in the timing and

location of traffic congestion allowing traffic speeds to continue to fluctuate within each section reducing the level of predictability for drivers.

It is expected that extending James White Parkway to Governor John Sevier Highway will result in substantial reduction in traffic on Chapman Highway, and this should improve the overall crash rates on Chapman Highway and in the region. Safety along James White Parkway itself is expected to be much better than Chapman Highway because it will be constructed using a freeway design. Freeways have been shown to have a much better crash rate than non-access controlled urban roadways like Chapman Highway. The statewide average crash rate for urban freeways is 1.01crashes per million vehicle miles compared to the statewide average rate for roadways similar to Chapman Highway where there are 3.39 crashes per million vehicle miles for four-lane urban undivided roadways, and 2.65 crashes per million vehicle miles for four-lane urban roadways with a center left-turn lane. As mentioned, the overall Chapman Highway crash rate in the study area is even higher than the statewide average rate. Therefore, provision of a freeway to carry much of the traffic through the area would be expected to have meaningful improvements to safety.

1.4.5 Roadway Deficiencies

Based on the above Traffic Capacity and Crash Rate analyses, the existing Chapman Highway has both capacity and safety deficiencies. The LOS F anticipated on Chapman Highway near the Henley Street Bridge is expected to be a continuous problem area that would be difficult to fix due to constraints for constructing improvements in that area. This would continue to cause traffic congestion issues and higher than average crash rates.

Even with recommended improvements to portions of the existing Chapman Highway, it is not expected that the roadway can continue to provide enough capacity to handle the future traffic volumes anticipated. This is due to the horizontal and vertical deficiencies along the route that result in limited sight distances and maneuverability within and between traffic lanes. The limited shoulders in some areas, numerous traffic signals, business access points, and other driveways and side roads along the route result in additional problems. Most of these problems would require substantial improvements to be completed to allow the existing route to function better. To achieve desired results, a substantial number of businesses and homes would need to be displaced and existing utilities and infrastructure would need to be relocated. Additional issues and constraints associated with the No-Build Alternative are discussed in Chapter 2 of this DEIS. Providing an alternative north/south route, such as the proposed James White Parkway, is considered a potential way to relieve the existing and anticipated traffic issues on Chapman Highway and provide better regional traffic movement.

1.4.6 Social and Economic Conditions

This project would be anticipated to have both social and economic impacts due to the existing residential developments and businesses in the general project vicinity. Alternatives involving construction of James White Parkway on new alignment would displace some residences and businesses that are located within the proposed ROW. Therefore, some adverse impacts to the social environment would be anticipated. However, improved safety and efficiency of the transportation system in southern Knox County would also be anticipated with construction of the new roadway. This could result in long-term beneficial impacts to the social environment and local community as a whole.

In terms of economic impacts, the project would be expected to have both adverse and beneficial impacts. Some existing businesses, especially those along Chapman Highway, could be potentially impacted by construction of a new roadway that could result in shifting traffic to new areas and possibly result in loss of some existing business. However, the region as a

whole could benefit economically due to the improved transportation options and access that would be provided. These transportation improvements could promote some additional economic development or growth in the south Knox County region.

More detailed analyses of the social and economic impacts of the project are included in Sections 3.6, 3.7, and 3.8 of this EIS.

1.4.7 Land Use

The project area consists of a combination of urban, suburban, and rural land uses. Much of the project area contains rolling to steep terrain dissected with scattered areas of low to medium density residential land uses and associated local roadways. Commercial land uses occur along some of the primary roadways in the project area, especially along the Chapman Highway corridor. Much of the steeper terrain is undeveloped and is covered by forest. Some of this land is identified as Slope Protection Areas in the Draft 2011 South County Plan and 2011 South City Plan. The forests in these areas are dissected by local roadways containing scattered homes that are primarily located on the less steep slopes and along the wider, more level ridgetops.

As mentioned in Section 1.2, most of the project area lies within the Urban and Planned Growth Boundaries of Knox County. The anticipated growth in these areas is primarily for residential and commercial land uses. The fact that this area is a Planned Growth area indicates that additional development is expected in the area, which would inherently lead to additional traffic being generated in the area.

It is anticipated that construction of the James White Parkway may promote or accelerate the timeframe in which some of the growth and development occurs within the Planned Growth areas. Improved traffic flow and access to southern Knox County and adjacent areas provided by the project may lead to increased residential, commercial, and/or industrial development. Local land use planning and zoning restrictions can be implemented to help control the location, amount, and types of developments that occur. Potential developments and land use changes expected to be promoted by the project are considered in more detail in Section 3.3 of this EIS.

1.4.8 Modal Relationships

Although not a primary purpose of this project, mass transit in the form of buses for commuters could be expanded in the James White Parkway corridor, which in turn would aid in regional traffic relief.

The purpose and need for this project do not specifically include improving intermodal connections and the project would not provide a direct connection to other modes of transportation such as rail, water, or air transportation. There is some potential that the proposed route could be used by industries or other companies to transport freight from one mode to another, but that use would not be considered a primary use of this roadway. Both Chapman Highway and the existing James White Parkway cross over the Gulf of Ohio Railroad Spur, which connects to the Norfolk Southern Railroad line just west of Chapman Highway. Chapman Highway and the existing James White Parkway also both cross over Fort Loudon Lake/Tennessee River, which is used as a water transportation route. Some of the connecting roads provide access to industries or facilities that utilize other modes of transportation. However, it is not anticipated that construction of the James White Parkway extension project would substantially influence the use, development, or operation of those facilities.

1.4.9 Logical Termini and Independent Utility

The James White Parkway project would have logical termini even if no additional transportation improvements are made in the area. The project would connect the existing James White

Parkway to Governor John Sevier Highway (SR-168) and Chapman Highway (SR-71). This project would not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Logical Termini and Independent Utility

FHWA regulation (23 CFR 771.111(f)) outlines three criteria for selecting the end points of a transportation project:

- The end points should connect logical termini (rational end points) that encompass a corridor of sufficient length to ensure that environmental effects are addressed on a broad scope.
- The project limits should represent a project that has independent utility. This means that the project must be usable and a reasonable expenditure even if no other transportation improvements are made in the area.
- The project limits must not restrict consideration of alternatives for other reasonably foreseeable transportation projects.

This project demonstrates independent utility since it is not dependent upon implementation of any other transportation projects. The defined study area is of sufficient size to address environmental concerns on a broad scope.

1.5 Summary of Purpose and Need for the Project

To summarize, the purpose of the James White Parkway project is to provide an efficient and safe transportation facility that would enhance transportation service by improving access to and from the South Knoxville area and help to relieve traffic congestion on Chapman Highway. This is proposed to be accomplished by construction of the proposed James White Parkway from Governor John Sevier Highway to Moody Avenue in South Knoxville. The need for the project is based on traffic data, safety data, and input from local officials.

CHAPTER 2

2.0 ALTERNATIVES

2.1 Introduction

This chapter contains a description of the proposed reasonable alternatives that were carried forward for analysis in this DEIS, along with discussions of other alternatives that were previously considered, but were not carried forward. Reasons for not carrying those alternatives forward are also provided. Maps are provided for each alternative that was carried forward in this DEIS and for the previously proposed alternatives.

The identification, consideration, and analysis of alternatives are key to the NEPA process and are primary goals of objective decision-making. Consideration of alternatives leads to a solution that satisfies the transportation needs and attempts to avoid and/or minimize impacts to environmental and community resources. If an alternative does not meet the project purpose or need, then the alternative is not considered reasonable. Many other factors exist that could render an alternative unreasonable, including cost and environmental impacts. A full range of reasonable alternatives was considered during the development of the James White Parkway DEIS. This alternatives development process identified potential alternative alignments for the project that are constructible, environmentally sound, and capable of meeting the overall purpose and need for the project and that support local and regional goals and plans.

Four main alternatives are evaluated in this DEIS, the No-Build Alternative and three build alternatives. For the No-Build Alternative, no major improvements would be made to area roadways, including Chapman Highway and James White Parkway, and only routine maintenance activities would continue to be conducted on the existing local roadway.

2.2 Evaluation Criteria Used for Identification of Reasonable Alternatives

A geographic information system (GIS) database was developed for this project and was populated with known environmental constraints and various other available data. The GIS layers were incorporated into the initial efforts to help identify alignments that avoid or minimize the potential impacts to known constraints or sensitive areas to the extent possible.

The Trimble Quantm Alignment Planning (Quantm) system [http://www.trimble.com/alignment/road-alignment.aspx?dtID=overview] was utilized for the James White Parkway project to identify potential build alternative alignments that are constructible and environmentally sound. The Quantm system was populated with information contained in the GIS database, elevation data, and other data and mapping that was available. The system was then used to identify alignments that either avoid or minimize the potential impacts to known constraints or sensitive areas to the extent practical. The alignments generated by the Quantm system were refined throughout the alternatives development process. As new constraints are identified, the system can be used to provide adjusted alignments and updated data to help support the decision-making process. Appendix B contains a more detailed description of the Quantm system technology utilized for this project and explains the benefits of this system over past methods used for developing new roadway alignments for similar projects.

All potential alternatives identified by the Quantm system and other methods were evaluated to determine if they were potential reasonable alternatives. Objective evaluation criteria

were developed based on input from various agencies and project stakeholders to help identify and screen potential reasonable alternatives for the project.

It should be noted that information from previous studies, public input, and recommendations made by the James White Parkway-Chapman Highway Task Force were considered to the extent possible in development of alternatives and proposed design concepts for this project. For instance, the Task Force recommended that the proposed alternatives of the EIS project extend from existing James White Parkway at Moody Avenue all the way south to Governor John Sevier Highway rather than Chapman Highway (JWP Task Force, 2005) The reason for extending the proposed roadway is primarily to avoid congested areas along Chapman Highway north of Governor John Sevier Highway and to allow the new roadway to better meet the overall project purpose. For this reason, all of the build alternatives recommended to be carried forward into the EIS extend to Governor John Sevier Highway. However, the recommendation by the Task Force to consider studying a "parkway" design concept instead of a "freeway" design concept in the EIS is not being proposed at this time.

Parkway

A parkway is a highway that has full or partial access control, is usually located within a park or a ribbon of park-like developments, and prohibits commercial vehicles. Buses are not considered commercial vehicles in this case. Parkways often have landscaped medians and follow the terrain of the area, which sometimes results in more curves and steeper grades. Intersections with other roads may be at-grade or grade separated. Parkways typically support primarily local traffic and are often constructed to move traffic through a suburban setting while maintaining some control over access and developments along the roadway. Parkways are typically more efficient at moving traffic through an area than other local roadways with little or no access control, which are often lined with businesses and/or homes.

Freeway

A divided arterial highway designed for the unimpeded flow of large traffic volumes. Access to a freeway is rigorously controlled and intersection grade separations are required. Commercial vehicles are permitted. Freeway medians are typically not landscaped in order to provide better sight distances for drivers; however, the outside edges of the ROW is often lined with trees to provide a buffer between the freeway from adjacent residential or recreational areas. Freeways typically are constructed with fewer curves and more gradual grades to accommodate higher traffic volumes and commercial vehicles. Freeways typically support both local and through traffic passing through an area. Freeways are typically more efficient and safer than other local roadways with less access control and lower design speeds, including parkways.

TDOT studied a freeway design concept in the EIS for the following reasons:

1) First, to better meet the purpose and need of the project and maximize travel efficiency and safety, TDOT recommends continuing the freeway design concept utilized for the existing James White Parkway from its current terminus just north of Moody Avenue.

2) Second, as the Task Force mentioned in their report, future transit options must be considered when planning the James White Parkway corridor. In response, TDOT recommends that the James White Parkway project be constructed as a freeway design because it would best accommodate any potential future transit projects. The Task Force had recommended the narrower corridor of a parkway design because it would initially minimize impacts to natural resources and perhaps leave more space for a future public transit system to be constructed adjacent to it. However, TDOT believes that the corridor associated with a freeway design for James White Parkway would be better suited, because it would result in a wider, straighter, more level corridor that would better accommodate, or be more easily expanded to accommodate other transit options compared to the narrower, curvier, and less level corridor that would be associated with parkway type design plans.

3) By providing a roadway that follows the existing terrain, which is assumed to mean following the less steep areas along the ridges in the project area, it is more likely that more residential displacements would be required. This is because the existing roadways and homes in the area were constructed on the less steep or more readily developable land along the natural ridges and less steep side slopes leaving primarily steeper areas undeveloped. Although most of the undeveloped land is steeper, with use of the Quantm system, which looks at both the horizontal and vertical aspects of the project, TDOT has been able to identify alignments that can be constructed through the area that balance cuts and fills to reduce environmental impacts and costs to the extent practical.

4) By studying the impacts associated with a wider ROW required of a freeway-type design, this EIS covers the worst-case scenario. Should there be overwhelming support for the roadway to be designed as a parkway instead of a freeway, the impacts will already be identified and disclosed, versus the opposite scenario of studying a parkway, but later deciding a freeway is more appropriate. Studying the wider corridor also provides a better indication of the overall impacts should public transit options be constructed within or adjacent to the new roadway ROW in the future.

Table 2.1 lists the main evaluation criteria and rationale utilized to determine if the various alternatives proposed for this project were considered reasonable.

Table 2.1. Evaluation Criteria Utilized in Identifying Reasonable Alternatives Considered in the James White Parkway EIS.		
Criteria ID	**Evaluation criteria:**	**Method/Measurement used to determine reasonableness of alternative:**
1*	The alternative must meet the stated purpose for the project and help solve the issues that have resulted in the need for this project. In particular the alternative must provide an efficient and safe transportation facility that improves access to and from the South Knoxville area and helps to relieve existing and future traffic congestion and safety issues on Chapman Highway.	Design year LOS on Chapman Highway must be better than would occur under No-Build conditions. Crash rates for Chapman Highway would be expected to be substantially better than would occur under No-Build conditions. To maximize travel efficiency and safety, any proposed new alignments for extending James White Parkway must be designed to provide continuation of the design of the existing James White Parkway. LOS should be acceptable along the length of the new roadway through the design year.
2*	Any build alternative must extend to Governor John Sevier Highway as recommended by the James White Parkway - Chapman Highway Corridor Study Task Force and local officials.	The termini of the alternatives should be consistent with the determination made in the January 2005 Task Force Recommendations that determined the James White Parkway EIS should study alternatives that extend all the way to Governor John Sevier Highway.
3**	Any build alternative should provide a corridor that can accommodate or complement potential future transit options. Because public transit systems typically require straighter, more level layouts to allow for efficient and safe operation, the general layout of the James White Parkway project should also be constructed in a manner that would not lead to horizontal and vertical constraints for potential future transit options. Construction as a freeway design would likely provide the straightest, most level corridor layout for future transit.	Design options that provide a corridor that is more straight and level are considered to be more reasonable in terms of supporting future transit options. It is expected that a more straight and level design would more readily accommodate or complement future transit options than other options that are constructed to follow the existing terrain.

Table 2.1. Evaluation Criteria Utilized in Identifying Reasonable Alternatives Considered in the James White Parkway EIS.		
Criteria ID	**Evaluation criteria:**	**Method/Measurement used to determine reasonableness of alternative:**
4**	To the extent practical, the alternative should avoid or minimize impacts to known environmental constraints or sensitive areas identified during the environmental planning process.	GIS constraints data was utilized in the Quantm system to help map potential build alternative alignments that would avoid and/or minimize environmental impacts to the extent possible. Other potential alternatives identified by agencies or the public were analyzed to determine the potential impacts to known constraints or sensitive areas. Potential alternatives were compared to determine the severity of environmental impacts. Although other potential reasonable alternatives were identified based solely on Criteria 1 and 2, they would have resulted in more substantial environmental impacts than the present alternatives that were developed to better avoid known constraints or sensitive areas. Therefore, the more environmentally sound alternatives that were reasonable (meet Criteria 1 and 2), constructible, and of comparable costs to the less environmentally sound alternatives were carried forward, while the less environmentally sound alternatives were eliminated from further consideration.
**Criteria 1 and 2 must be met in order for an alternative to be considered reasonable.* ***Although an alternative may be considered reasonable because it meets Criteria 1 or 2, if other reasonable alternatives are identified that are more environmentally sound than the alternative in question, then the alternative may be eliminated from further consideration.* *Source: Parsons, 2010*		

2.3 Project Alternatives

A No-Build Alternative and three build alternatives, the Green Alternative, Blue Alternative, and Red Alternative, are considered in this DEIS. Figure 2.1 contains depictions of the approximate centerlines proposed for each of the build alternatives evaluated. Additional build alternatives were previously considered, but were not carried forward for further analysis in the DEIS, because they were not expected to meet the purpose and need of the project, or because they would involve more substantial environmental impacts than other similar, but reasonable alternatives that were carried forward. Those alternatives are discussed in Section 2.4. Other potential reasonable alternatives for design options, location, and transportation system management (TSM) type improvements, such as mass transit, that have been considered are also discussed in Section 2.4.

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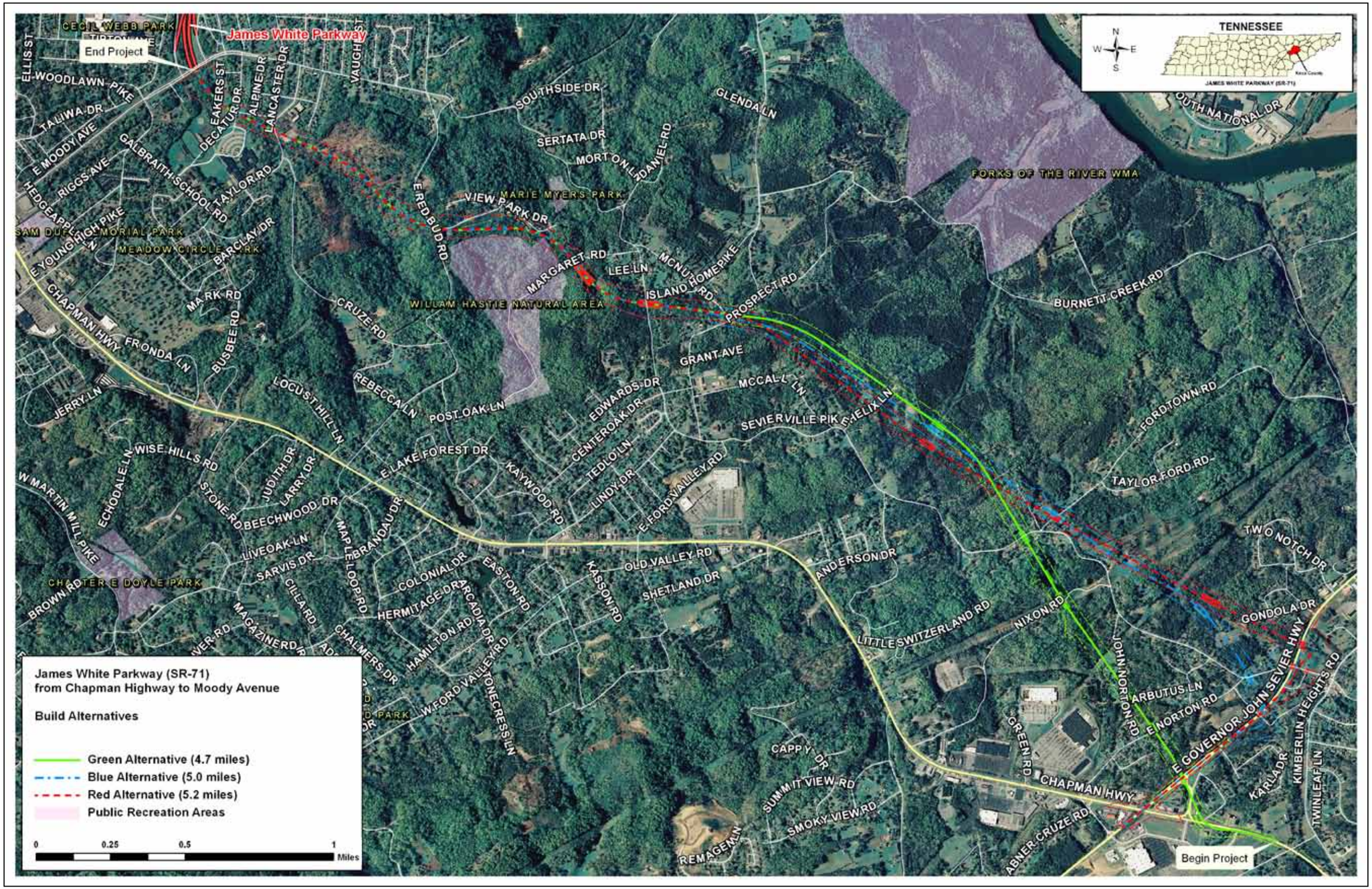
Figure 2.1. Map of the James White Parkway Build Alternatives in Knox County.



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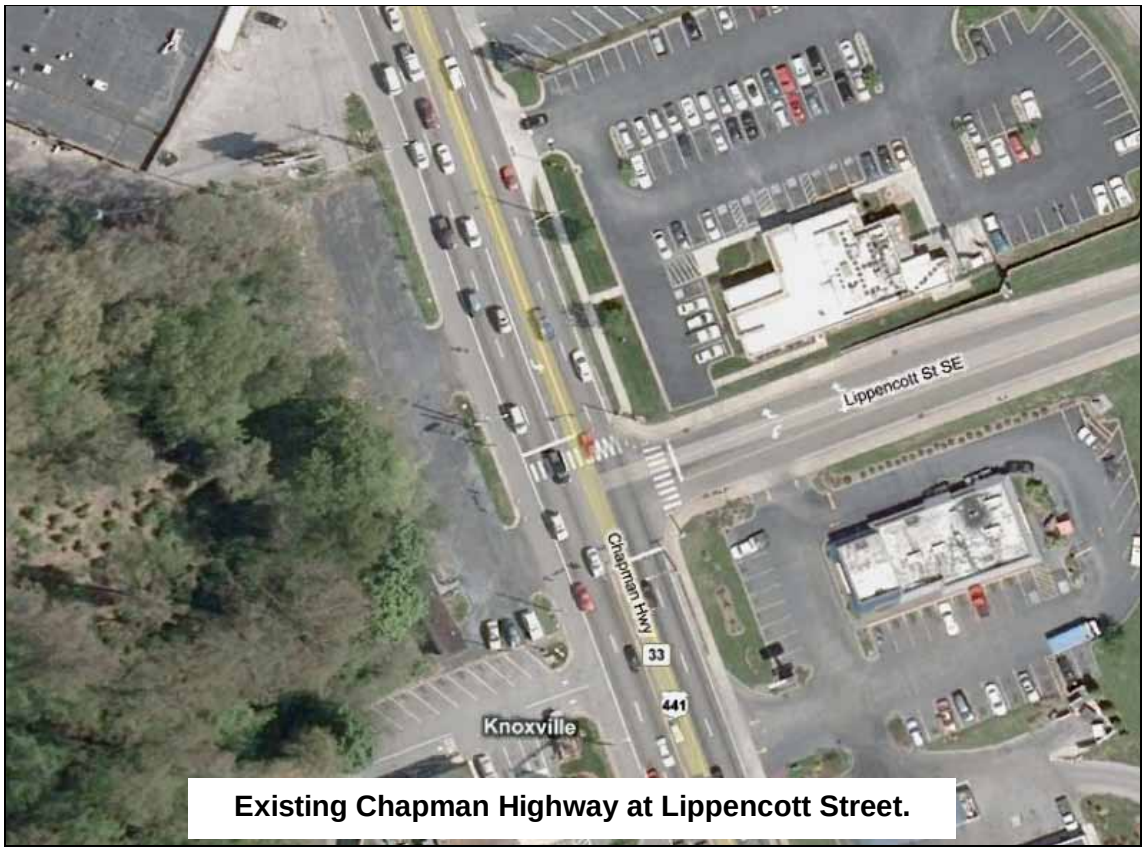
2.3.1 No-Build Alternative

Under the No-Build Alternative, the James White Parkway extension would not be constructed and no other major improvements or additional roadway alignments would be constructed in the project vicinity between downtown Knoxville and Governor John Sevier Highway. Other related projects, including those identified in the 2009-2034 Knoxville Regional Mobility Plan and/or Knoxville Regional TPO's FY 2011-2014 TIP, may be implemented to improve existing roadways, including Chapman Highway and connecting roadways. Such improvements may include the addition of turn lanes, signal improvements, and other minor improvements to the existing roadway. In addition, improvements or expansion of existing bus service in the Knoxville region have occurred, or are being planned for the foreseeable future, based on information provided in the TPO's Knoxville Area Transit (KAT) Plans and Regional Transportation Alternatives Plan (RTAP) (http://www.knoxtrans.org/plans/katplans.htm; www.knoxtrans.org/rtap/index.htm). Some of these improvements are discussed in more detail in Section 2.4.6.2. Many of these planned improvements to other roadways and transit systems in the region would occur under the No-Build Alternative. However, transportation system management (TSM) projects, as discussed later, would not be capable of meeting the purpose and need of the James White Parkway project in terms of improving the north-south traffic flows between Knoxville and adjacent communities to the south, reducing existing and expected peak time traffic congestion issues on Chapman Highway, and improving traffic safety in the area.



Existing Chapman Highway at Lippencott Street.

The No-Build Alternative would not result in any major construction efforts on new alignment that would potentially result in substantial adverse impacts to the environment. However, the beneficial impacts to local and regional traffic flow and safety offered by the proposed

James White Parkway project would also not occur. It is likely that the continued urban growth and development anticipated in the project vicinity, especially areas to the south, will result in increased traffic volumes that will result in continued reductions in LOS and reduced safety on Chapman Highway, and other secondary routes in the area.

Analyses conducted for the No-Build Alternative considered what, if any, consequences would occur in the project area if the James White Parkway project was not constructed. The No-Build Alternative serves as a baseline for comparison with the proposed build alternatives, which would have inherent adverse and beneficial consequences.

2.3.2 Build Alternatives

In addition to the No-Build Alternative, five build alternatives were considered for further study in this DEIS. These build alternatives were presented to the public and local officials at a public meeting on February 17, 2009. The alternatives were also reviewed by the agencies that participate in the Tennessee Environmental Streamlining Agreement (TESA),

Tennessee Environmental Streamlining Agreement (TESA)

The purpose of the TESA is to establish a coordinated planning and project development process for transportation projects in Tennessee in order to ensure agency participation/involvement early and throughout the project development process.

This streamlined environmental process is intended to achieve the timely and efficient identification, evaluation, and resolution of environmental and regulatory issues, by:

- Improving cooperation, consultation, and efficiency of the various agencies;
- Allowing documentation developed by FHWA and TDOT, to serve as a substantial part of the documentation required by other permitting and funding agencies;
- Streamlining and coordinating the NEPA and environmental permitting processes and requirements (Section 404 of the Clean Water Act, Section 401/State water quality certification, and the Aquatic Resource Alteration Permit (ARAP) requirements);
- Linking the transportation planning process to the NEPA process;
- Implementing the environmental stewardship and environmental review process improvements established by SAFETEA-LU;
- Accomplishing the project development coordination functions and public involvement functions called for under Section 106 of the National Historic Preservation Act; and
- Facilitating more realistic and predictable transportation projects, schedules and budgets.

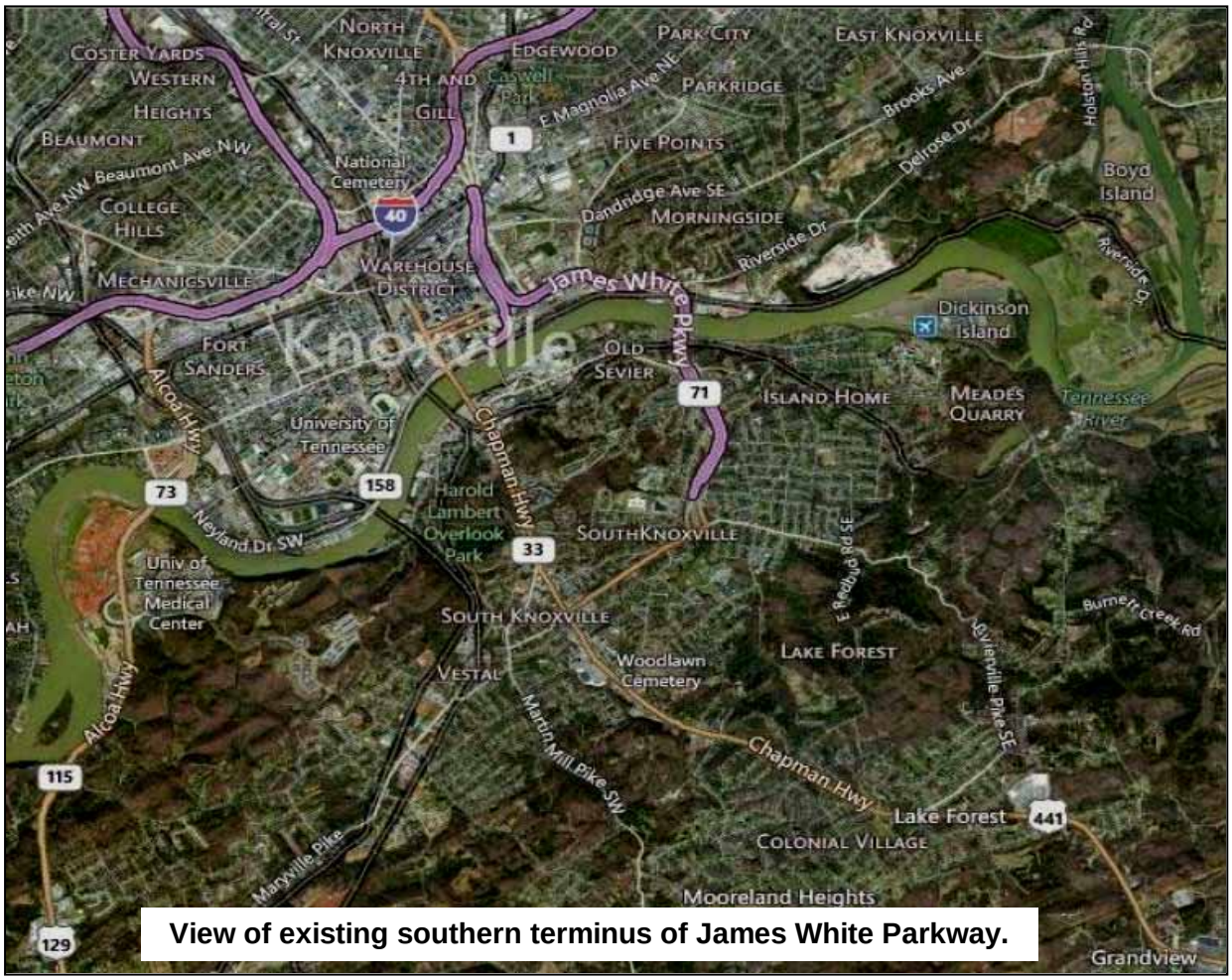
This Agreement establishes “one decision-making process” to identify and address agency issues at four (4) key points, termed “concurrence points”, during the planning and NEPA process for transportation projects:

- Purpose and Need and Study Area;
- Project Alternatives to be Evaluated in the Environmental Document;
- Preliminary Draft Environmental Document; and
- Preferred Alternative and Preliminary Mitigation.

which includes State and Federal Agencies. The TESA agencies conducted an agency field review on April 1, 2009 to review the project area and proposed alternatives. The TESA process is described below and discussed again in Section 4.1.2.

Because some of the alternatives are expected to result in more substantial adverse environmental impacts, when compared to other similar alternatives, two of these five potential alternatives, Alternative 1 (Task Force Alignment) and Alternative 5, were dropped from further consideration. (Note: "Alternative 1" and "Alternative 5" were the names assigned to these build alternatives during the February 17 public meeting.).

All of the proposed build alternatives that were considered would include construction of a four-lane, fully access controlled facility extending from Governor John Sevier Highway northwestward to the existing terminus of James White Parkway at Moody Avenue. Several potential southern termini are being considered along Governor John Sevier Highway for the project as discussed under each of the proposed alternatives below. At least one interchange would be proposed near the center of each of the alignments at Sevierville Pike to provide access to the roadway for local traffic.



View of existing southern terminus of James White Parkway.

The proposed design is a continuation of the design of the existing James White Parkway north of Moody Avenue. The proposed alignment would consist of four lanes divided by a depressed median. Total median width would be approximately 48 feet, consistent with the existing James White Parkway. Each of the four traffic lanes would be 12 feet wide.

Outside shoulders would be 12 feet wide (10-foot stabilized and 2-foot gravel), and inside shoulders would be 6 feet wide (4-foot stabilized and 2-foot gravel). The minimum ROW would be 300 feet wide. The design speed of the roadway will be 60 mph, but the actual posted speed could be lower based on input from local officials. Figure 2.2 contains a graphical depiction of the typical section of the proposed roadway.

Figure 2.2. Graphical Depiction of the Typical Section for the Four-Lane Divided Highway Proposed for the Build Alternatives for James White Parkway in Knox County, Tennessee.

*Note: The 12-foot outside shoulders will include 10 feet of pavement with 2 feet of gravel at the outside edge. The inside shoulders will include 4 feet of pavement and 2 feet of gravel on the inside edges.

In addition to construction of the extension of James White Parkway, additional improvements would be required on the existing Governor John Sevier Highway. This would primarily be due to the need to widen portions of the existing Governor John Sevier Highway from two to four traffic lanes, including bridges along the affected route. The section that would need to be widened or otherwise improved would be between Chapman Highway and the southern termini of each of the James White Parkway build alternatives. The improvements would be necessary to accommodate the anticipated traffic volumes that would occur due to Chapman Highway commuters using the roadway to gain access to and from James White Parkway.

The design of the improvements to Governor John Sevier Highway, whether it should be a four-lane divided roadway, four-lane roadway with a concrete barrier in the median, or a five-lane roadway (four traffic lanes and a continuous center turning lane), will be refined later in the environmental and/or design phases of the project. Figure 2.3 contains detailed drawing of one of several design options that could be used for the widened sections of Governor John Sevier Highway. The example shown includes curb and gutter and sidewalks. However, other designs could include a five-lane section with paved shoulders similar to those shown on Figure 2.2 for the four-lane divided roadway option.

The length of Governor John Sevier Highway that would require improvements varies between the alternatives. The Green Alternative would require the least amount of improvements to Governor John Sevier Highway due to its southern termini being near the existing Chapman Highway. The Red Alternative would require the most improvements needed due to the greater distance of its southern termini from Chapman Highway. It is anticipated that the longer the section of Governor John Sevier Highway that needs to be improved, the more potential there would be for additional adverse environmental impacts.

For each build alternative, a planning-level review was conducted to consider potential configurations of the interchange with Governor John Sevier Highway at the southern termini of the project. In addition, each of the Build Alternatives includes changes to the configuration of the existing Chapman Highway/Governor John Sevier Highway interchange. The final interchange configurations for each build alternative are shown on Figure 2.4 through Figure 2.8, and are described in more detail in the following sections. The resulting interchange recommendations are expected to provide exceptional functionality and be more than capable of accommodating the forecasted traffic demand.

All proposed build alternative corridors are capable of supporting future transit system projects.

Figure 2.3. Graphical Depiction of an Example Urban Five-lane Design that could be used for the Widening of Governor John Sevier Highway as part of the James White Parkway project.

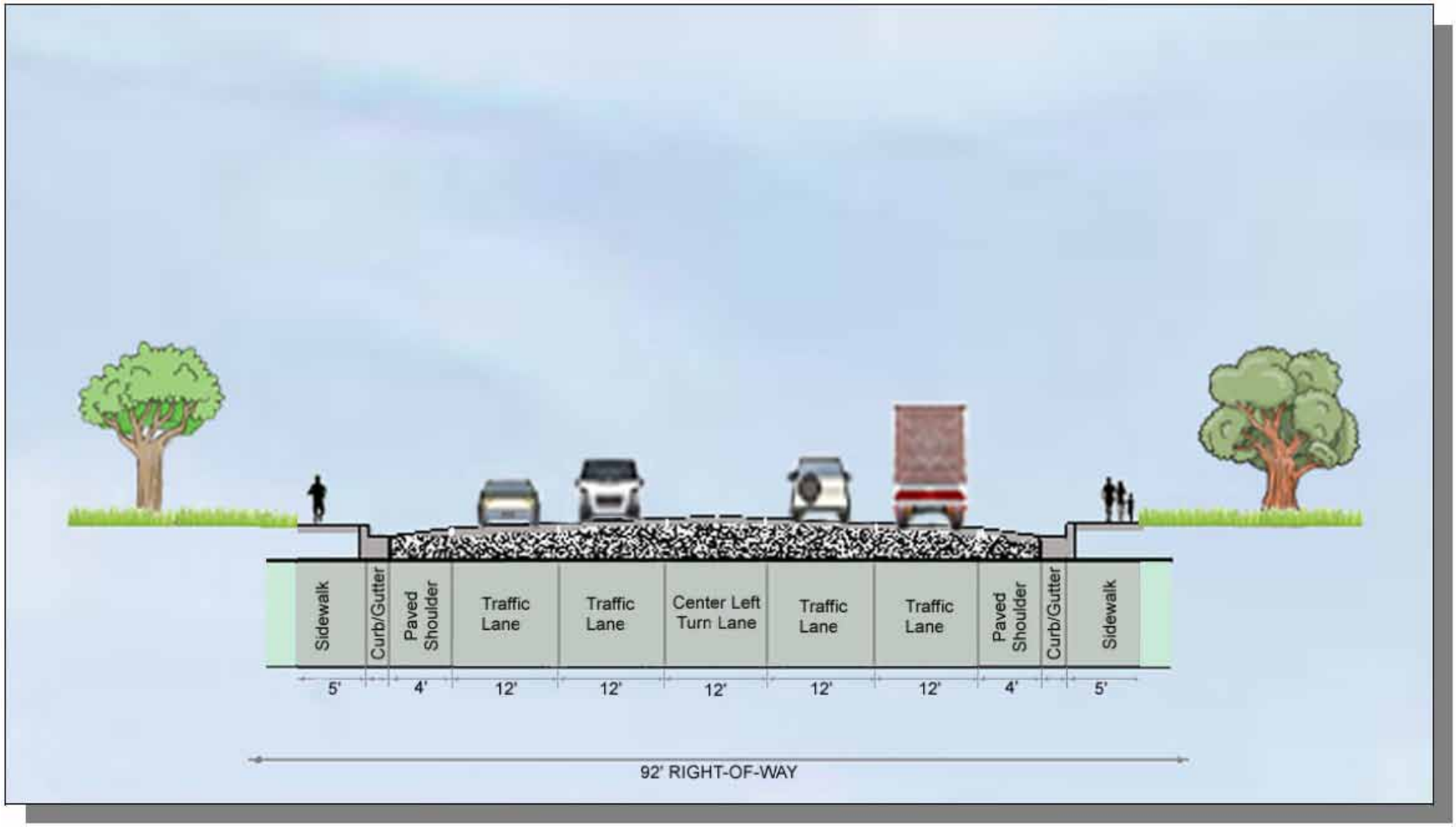


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Figure 2.4. Conceptual Layout of the James White Parkway/Chapman Highway Interchange and James White Parkway/ Governor John Sevier Highway Interchange for the Green Alternative.

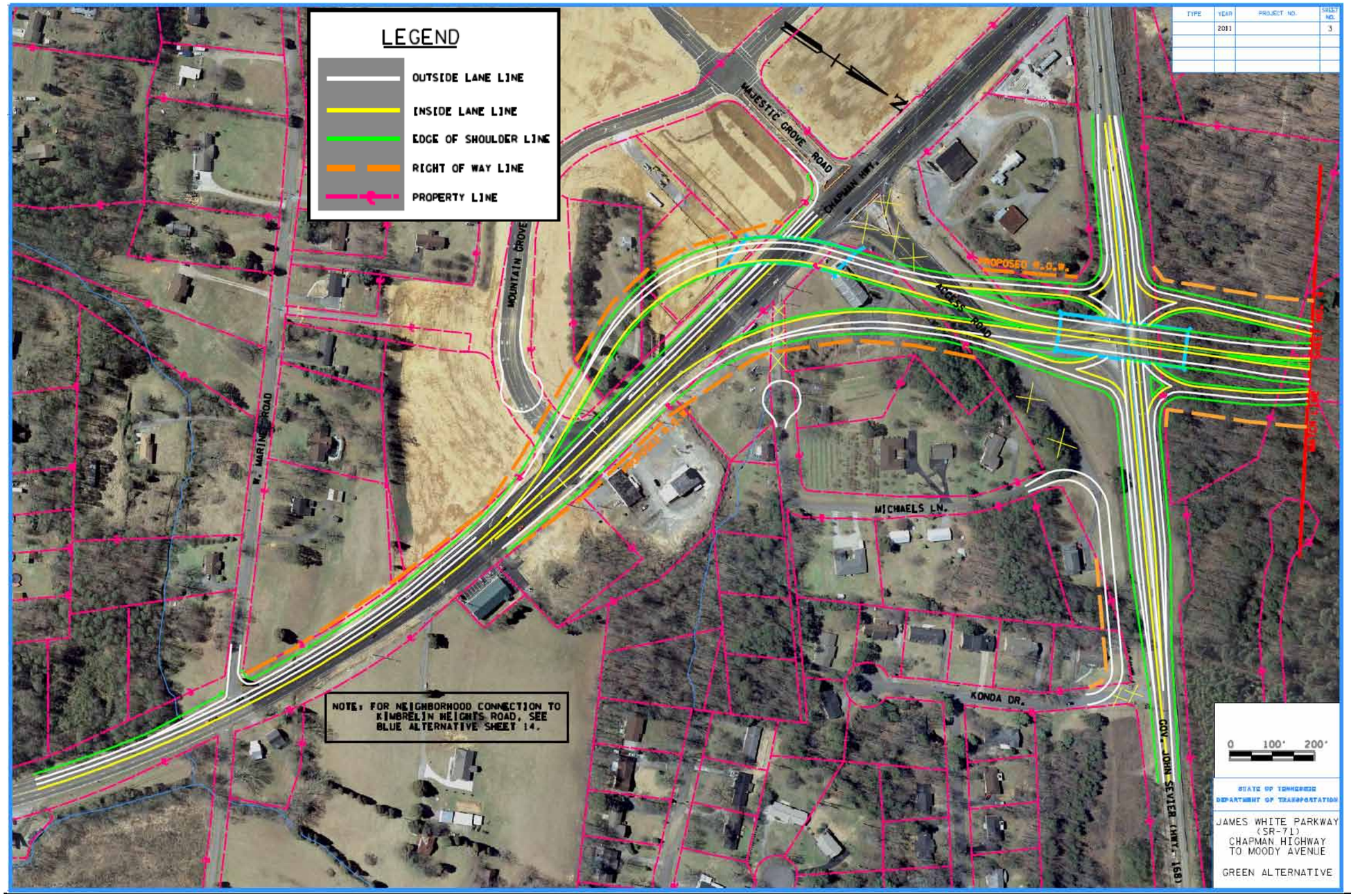

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Figure 2.5. Conceptual Layout of the Chapman Highway/Governor John Sevier Highway Connector for the Green Alternative.

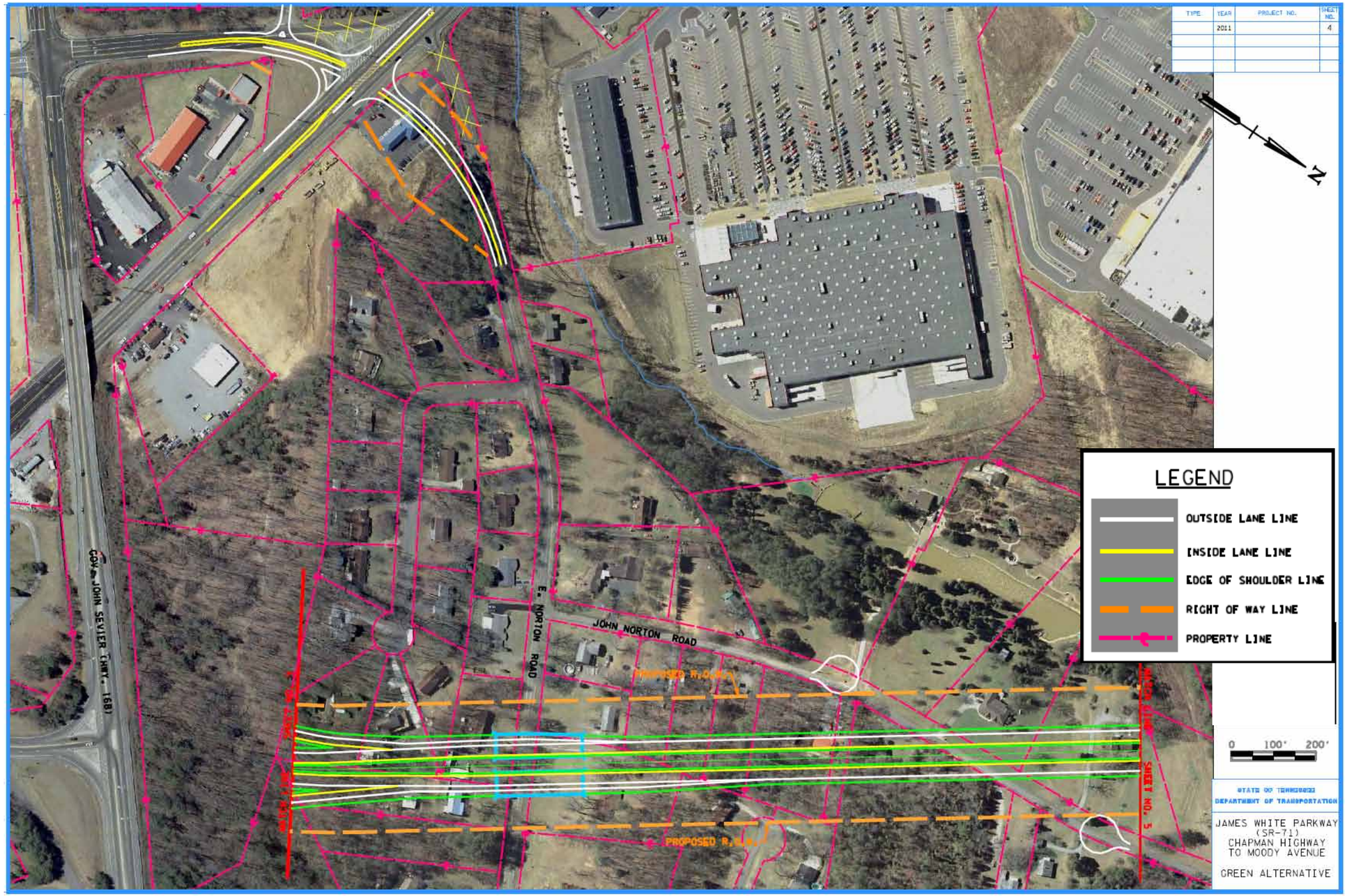

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Figure 2.6. Conceptual Layout of the James White Parkway/Governor John Sevier Highway Interchange for the Blue Alternative.

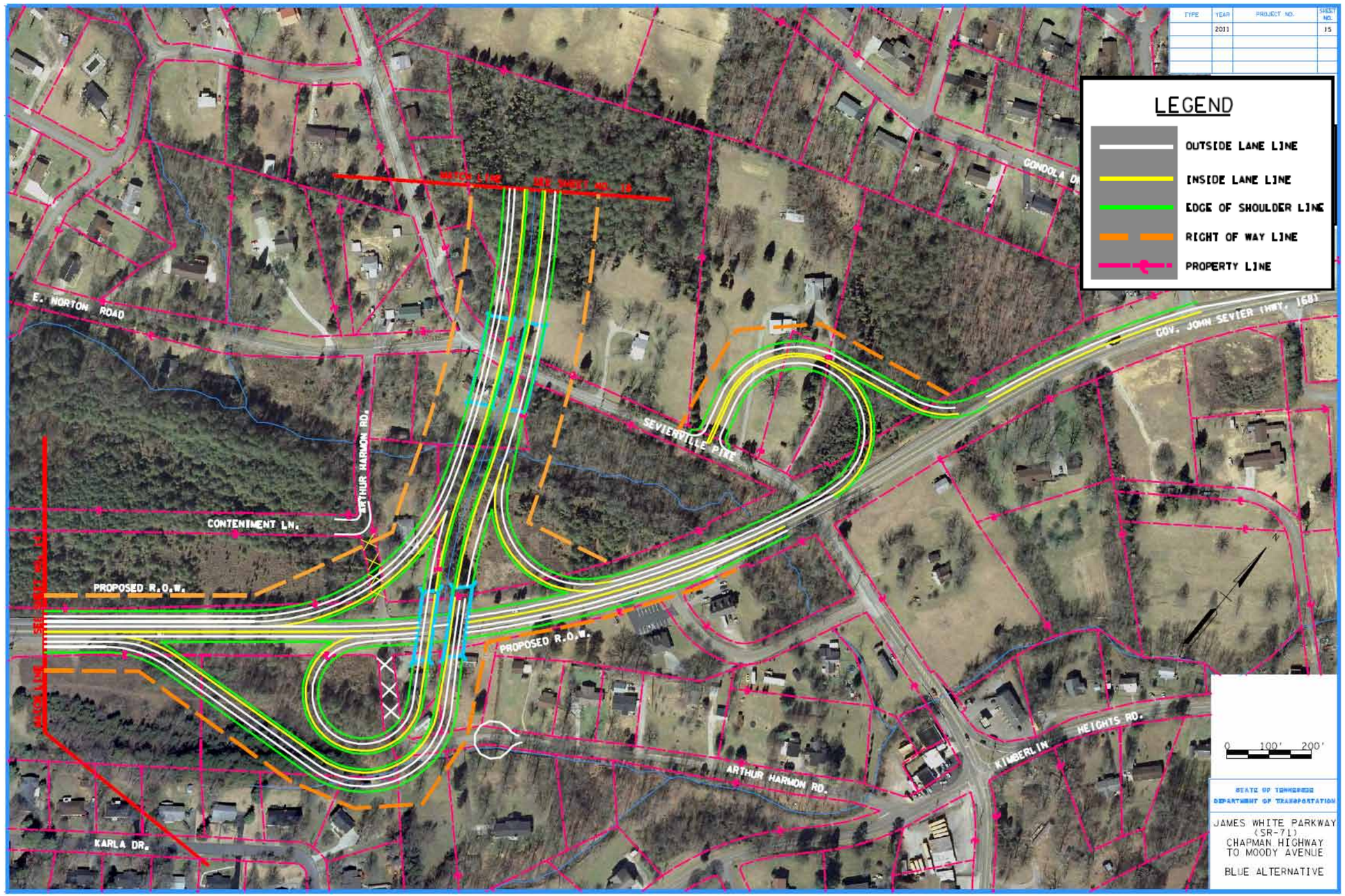

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Figure 2.7. Conceptual Layout of the James White Parkway/Governor John Sevier Highway Interchange for the Red Alternative.

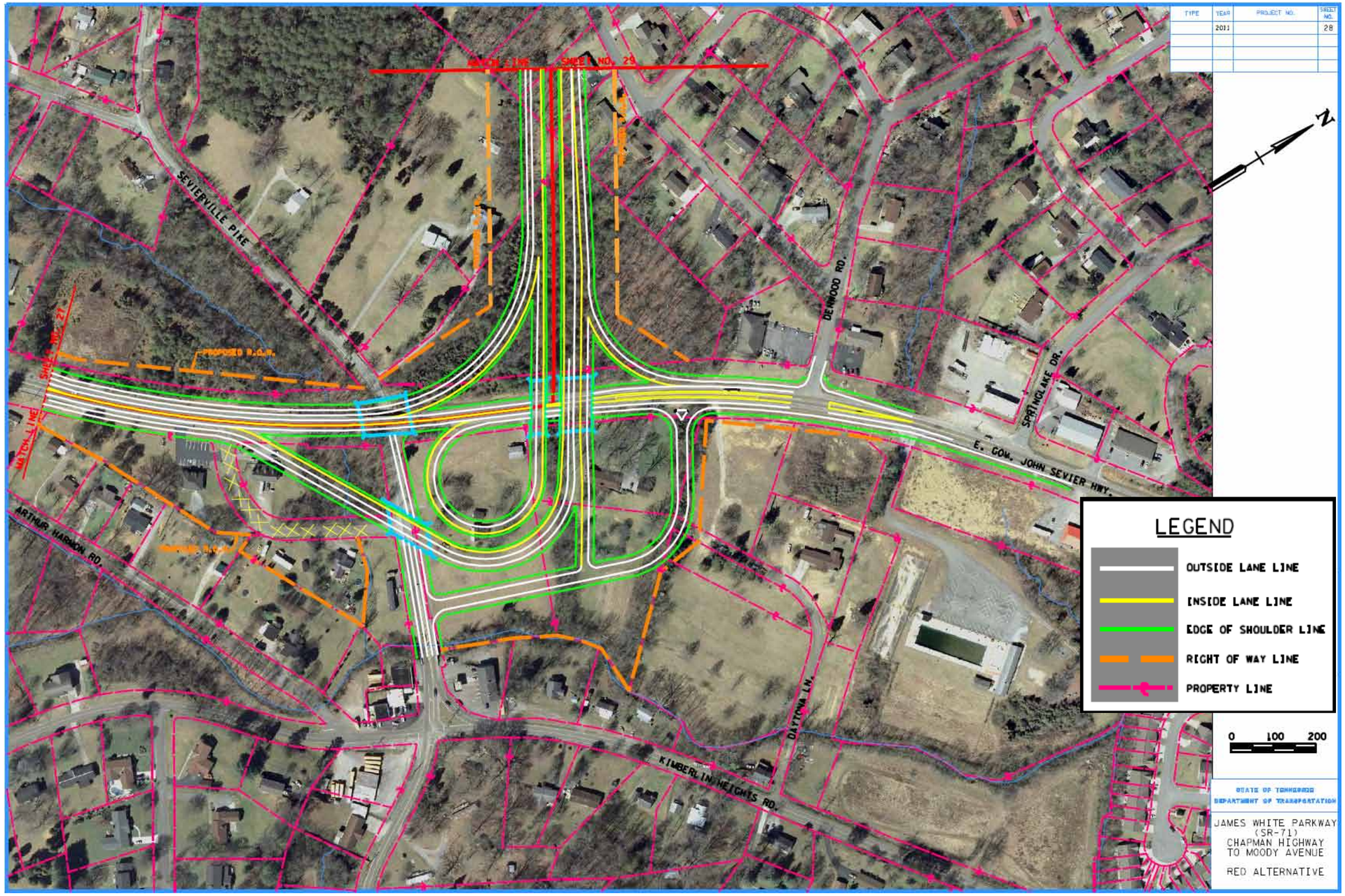

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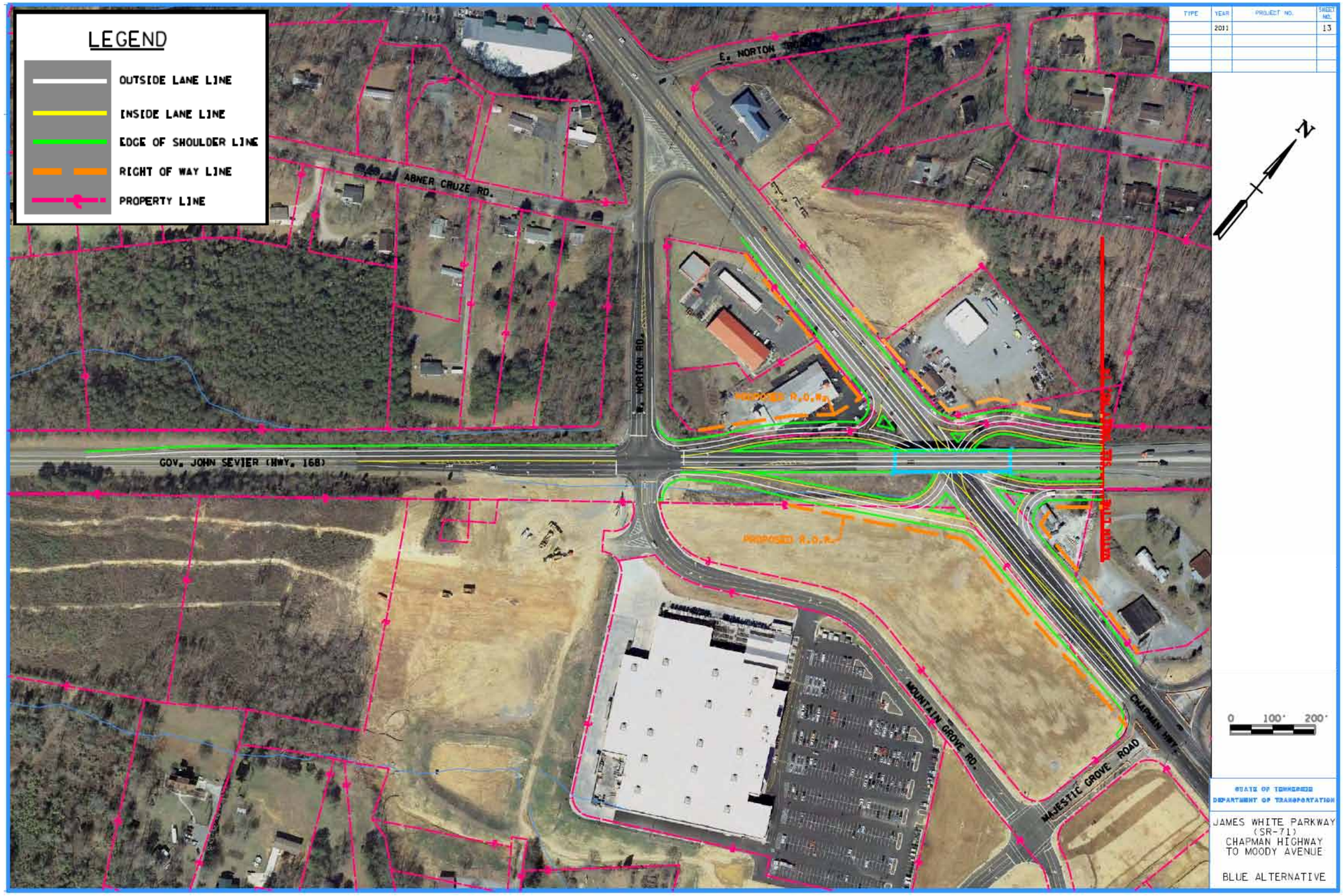
Figure 2.8. Conceptual Layout of the Proposed Chapman Highway/Governor John Sevier Highway Interchange for the Blue Alternative and Red Alternative.



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The following are more detailed descriptions of each of the potential build alternative studied in this DEIS. A summary note is contained at the end of each alternative description.

2.3.2.1 Green Alternative

The Green Alternative was developed using the Quantm system. The Green Alternative was previously referred to as Alternative 2 at the February 17, 2009 public meeting for this project. The approximate centerline of the Green Alternative is shown on Figure 2.1. This alignment, which begins near the existing intersection of Governor John Sevier Highway and Chapman Highway, extends 4.7 miles in a generally northwestern direction, on new alignment paralleling Chapman Highway to the east, and eventually terminating at the existing interchange of James White Parkway and Moody Avenue. The Green Alternative would not require any substantial improvements along Governor John Sevier Highway beyond the proposed new interchange with the new alignment. Figure 2.1 shows the proposed corridor for the Green Alternative.

A new grade-separated interchange would be constructed at the southern terminus of the James White Parkway at Chapman Highway just southeast of the existing Governor John Sevier/Chapman Highway intersection. Figure 2.4 depicts the conceptual layout of this interchange. In addition, improvements would be made to the existing Governor John Sevier Highway/Chapman Highway Interchange to provide connections for traffic moving between those two routes. Figure 2.5 depicts the proposed improvements to this interchange under the Green Alternative. The new at-grade intersection would utilize a portion of the existing connector road between Governor John Sevier Highway and Chapman Highway located in the northwest quadrant of the existing intersection. Additional turn lanes would be provided on the connector road so that all turning movements are provided at one intersection allowing travel in each direction on both Governor John Sevier Highway (via the short connector road) and Chapman Highway. On the east side of Chapman Highway, across from the Governor John Sevier Highway connector road, the west termini of East Norton Road would be realigned to complete the new intersection configuration. Since the amount of traffic on Chapman Highway will be reduced by approximately 45 percent under the Green Alternative (see Table 1.1 in Chapter 1), this at-grade intersection is expected to function well.

This alternative would improve traffic congestion on Chapman Highway and meet the overall project purpose and need. Section 2.3.3 contains a discussion of traffic analyses conducted for each of the build alternatives and how each would affect traffic on existing Chapman Highway.

The Green Alternative has fewer environmental impacts when compared to the previously considered Task Force alignment, because it avoids more of the known environmental constraints in the project study area, including the Meades Quarry Cave system. It would also be less expensive to construct due to the consideration of both horizontal and vertical aspects of the alignment as determined in the Quantm analysis. Section 2.4.1 below contains more information regarding the Task Force alignment. The Green Alternative has the lowest estimated costs compared to other build alternatives being considered. Consideration of the vertical aspect of an alignment in rolling to steep terrain, such as that in the project area, can result in substantial cost savings and reduce the need for cut and fill activities. Preliminary cost estimates associated with the proposed build alternatives are summarized on Table 2.2. A more detailed discussion of anticipated environmental impacts is provided in Chapter 3 of this document.

The Green Alternative was carried forward for further analysis in this DEIS, because this alternative would meet the purpose and need of the project and would provide an alignment with fewer environmental impacts when compared with other similar alternatives.

2.3.2.2 Blue Alternative

The Blue Alternative was developed using the Quantm system. The Blue Alternative was previously referred to as Alternative 3 at the February 17, 2009 public meeting for this project. The approximate centerline of the Blue Alternative is shown on Figure 2.1. This alignment begins near the existing intersection of Governor John Sevier Highway and Chapman Highway and extends 0.62 mile to the northeast along the existing Governor John Sevier Highway. It then continues another 4.34 miles in a generally northwestern direction on new alignment paralleling Chapman Highway to the east, and eventually terminates at the existing interchange of James White Parkway and Moody Avenue. The Blue Alternative is a total of 5.0 miles long. The Blue Alternative would require improvements along 0.62 miles of existing Governor John Sevier Highway involving widening the existing roadway to four traffic lanes to support the additional traffic that would be diverted from Chapman Highway and onto the new alignment portion of James White Parkway.

This alternative shares a similar alignment with the Green Alternative for the northern half of the alignment but separates and eventually terminates at Governor John Sevier Highway northeast of the Green Alternative. The Blue Alternative would locate the connection of James White Parkway and Governor John Sevier Highway away from the traffic congested areas near the existing Chapman Highway/Governor John Sevier Highway intersection.

A new grade-separated interchange would be constructed at the southern terminus of James White Parkway at Governor John Sevier Highway. Figure 2.6 depicts the conceptual layout of this interchange.

In addition, improvements would be made to the existing Governor John Sevier Highway/Chapman Highway Interchange to accommodate the James White Parkway traffic traveling to and from Chapman Highway via the improved Governor John Sevier Highway. The new interchange would consist of a new grade-separated, single point diamond interchange. Figure 2.8 depicts the proposed improvements to this interchange that would occur under both the Blue and Red Alternatives. This new interchange would consolidate left-turn movements to and from entrance and exit ramps at a single intersection as illustrated in Figure 2.8. The primary features of this type of interchange are that all four left-turning moves are controlled by a single multi-phase traffic signal system and opposing left turns operate to the left of each other. This is opposed to typical conventional diamond interchanges that have two intersections, one at each exit ramp termini. In addition, the right-turn movements of the proposed single point diamond interchange are typically free-flow movements and only the left turns must pass through the one signalized intersection. This operation eliminates a major source of traffic conflict, thereby increasing overall intersection efficiency and capacity. The configuration can help to reduce left-turn lane storage problems.

The Blue Alternative would provide benefits similar to the Green Alternative in terms of improving traffic congestion on Chapman Highway and meeting the overall project purpose and need. It would also have similar environmental impacts. A more detailed discussion of anticipated environmental impacts is contained in Chapter 3 of this document.

The Blue Alternative was carried forward for further analysis in the DEIS, because the alternative would meet the purpose and need of the project and would provide an alignment with reduced environmental impacts when compared with similar alternatives.

2.3.2.3 Red Alternative

The Red Alternative was developed using the Quantm system. The Red Alternative was previously referred to as Alternative 4 at the February 17, 2009 public meeting for this project. The approximate centerline of the Red Alternative is shown on Figure 2.1. This alignment, which begins near the existing intersection of Governor John Sevier Highway and Chapman Highway, extends 0.87 miles to the northeast along existing Governor John Sevier Highway, then continues another 4.29 miles in a generally northwestern direction, on new alignment paralleling Chapman Highway to the east, and eventually terminates at the existing interchange of James White Parkway and Moody Avenue. The Red Alternative is a total of 5.2 miles long. The Red Alternative would require improvements along 0.87 miles of existing Governor John Sevier Highway involving widening the existing roadway to four traffic lanes to support the additional traffic that would be diverted from Chapman Highway and onto to the new alignment portion of James White Parkway.

This alternative shares a similar alignment with the Green and Blue Alternatives for the northern half of the alignment but is separate from them at the start of the alignment at Governor John Sevier Highway northeast of the start of the Blue Alternative alignment. As with the Blue Alternative, the Red Alternative would remove the connection of James White Parkway and Governor John Sevier Highway away from the traffic congested areas near the existing Chapman Highway/Governor John Sevier Highway intersection.

A new grade-separated interchange would be constructed at the southern terminus of James White Parkway at Governor John Sevier Highway. Figure 2.7 depicts the conceptual layout of this interchange. In addition, improvements would be made to the existing Governor John Sevier Highway/Chapman Highway Interchange to accommodate the James White Parkway traffic traveling to and from Chapman Highway. The Red Alternative would result in the same grade-separated, single point diamond interchange configuration as the Blue Alternative at this location. Figure 2.8 depicts the proposed improvements to this interchange under both the Red and Blue Alternatives.

This alternative would provide similar benefits as the Green and Blue Alternatives in terms of improving traffic congestion on Chapman Highway and meeting the overall project purpose and need. A detailed discussion of anticipated environmental impacts of this alternative is contained in Chapter 3 of this document.

The Red Alternative was carried forward for further analysis in this DEIS because the alternative would meet the purpose and need of the project and would provide an alignment with fewer environmental impacts when compared with other similar alternatives.

Table 2.2. Preliminary Cost Estimates for Build Alternatives considered in this EIS.

Alternative	Green	Blue	Red
Total Length (miles)	4.7	5.0	5.2
Quantm Cost*(Millions - 2009)	$74.2	$76.5	$76.4
ROW Property Costs**	$6.2	$5.1	$5.3
Interchange Cost	$23.5	$18.5	$18.5
Widen/Improve Governor John Sevier Highway	$0.0	$4.0	$6.7
Total Costs (millions - 2009)	**$103.9**	**$104.1**	**$106.9**

* Quantm costs include costs for earthwork, bridges, retaining walls, and drainage.

** Assumed a needed ROW width of 300 feet used for estimating impacts, so this cost is for ROW plus any additional estimated ROW that fell within the Quantm earthwork footprint that extended outside the minimal 300-foot width. No relocation costs are included in these estimates at this time, only property costs.

Source: Parsons, 2010

2.3.3 Traffic Forecasts and Capacity Analysis for Build Alternatives

Congestion on Chapman Highway would be relieved by any of the build alternatives. Projected average daily traffic volumes (ADT) and LOS for Chapman Highway under both the No-Build Alternative and build alternatives are presented in Chapter 1 of this DEIS (see Table 1.1). Since all of the build alternatives are projected to divert traffic away from Chapman Highway, all of the LOS estimates reflect an improvement when compared to No-Build conditions.

James White Parkway, under each of the build alternative alignments, is anticipated to have good LOS with little congestion through the design year of 2035. Projected volumes and related LOS for the build alternatives are presented in Table 2.3.

Traffic projections of design hourly volumes (DHVs) for the three build alternatives are depicted on Figure 2.9, Figure 2.10, and Figure 2.11. Because the Green Alternative is closer to Chapman Highway at the south end and easier to access, it would divert a greater amount of traffic off of Chapman Highway. Both the Blue Alternative and the Red Alternative require travel on Governor John Sevier Highway, which introduces additional travel distance for motorists who wish to divert away from Chapman Highway. Because the Red Alternative requires travelling a further distance away from Chapman Highway, it would divert less traffic from that roadway than the other build alternatives, resulting in less relief for Chapman Highway.

Design Hourly Volumes (DHV)

The DHV is normally estimated as the 30th highest (K Factor) hour two-way traffic volume for the design year selected. The DHV is given in units of vehicles per hour.

K Factor is the percentage of ADT representing the 30th highest hourly volume in the design year. For typical main rural highways, K-factors generally range from 12 to 18 percent. For urban facilities, K- factors are typically somewhat lower, ranging from 8 to 12 percent.

D is the directional distribution of traffic during the design hour. It is the one-way volume in the predominant direction of travel expressed as a percentage of DHV (D is reported on Figures 2.7 through 2.9.

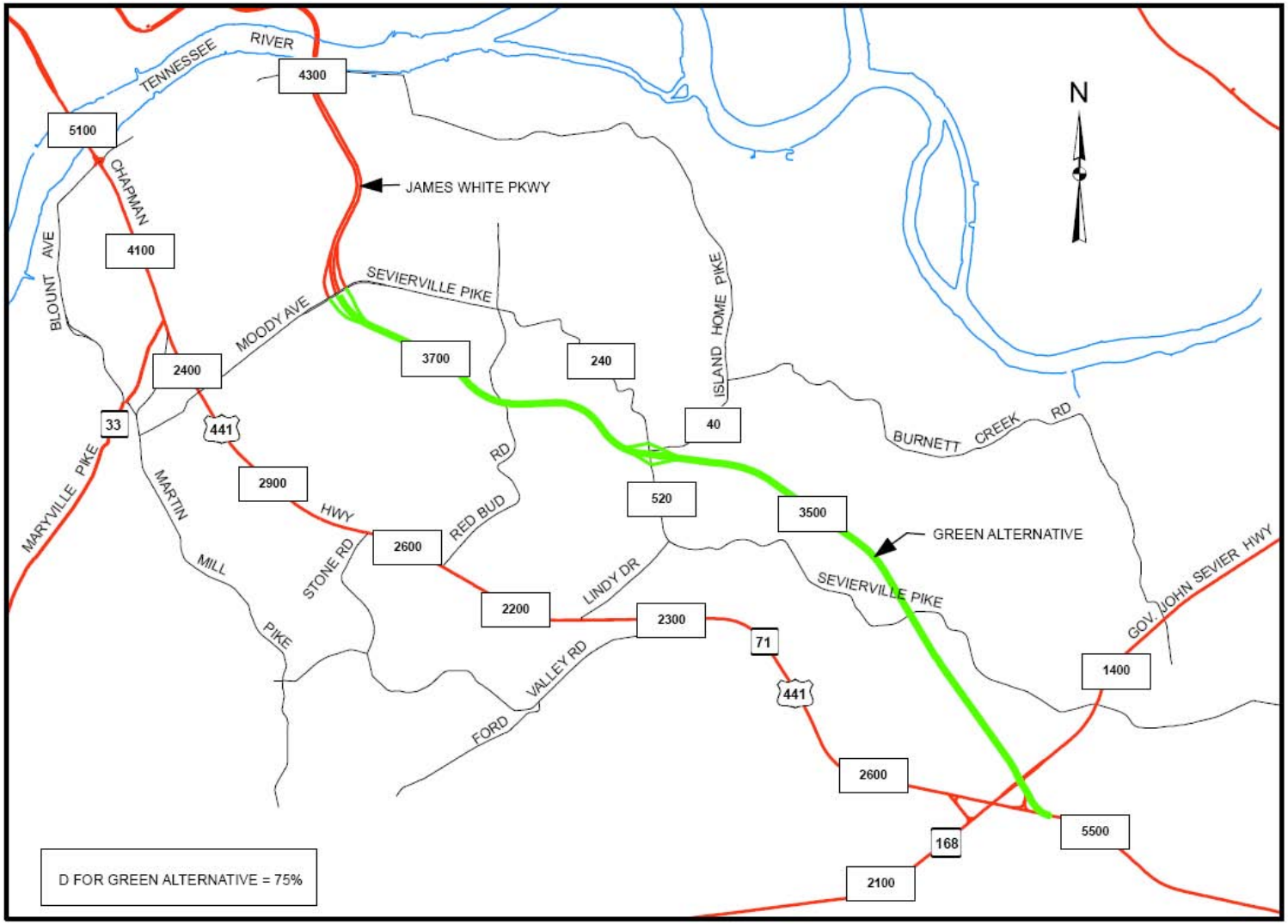
Table 2.3. Base Year 2015 and Design Year 2035 Traffic Forecasts and LOS for James White Parkway under each of the Build Alternatives.

	Green Alternative		**Blue Alternative**		**Red Alternative**	
Highway Segment	**2015 ADT/LOS**	**2035 ADT/LOS**	**2015 ADT/LOS**	**2015 ADT/LOS**	**2035 ADT/LOS**	**2015 ADT/LOS**
Tennessee River to Moody Avenue	29,000/C	43,000/D	27,000/C	40,000/D	25,000/C	38,000/D
Moody Avenue to Sevierville Pike	25,000/C	37,000/D	23,000/B	34,000/C	21,000/B	32,000/C
Sevierville Pike to Governor John Sevier Highway	23,000/B	35,000/D	22,000/B	32,000/C	20,000/B	30,000/C
* On Governor John Sevier Highway	NA	NA	26,000/D	35,000/D	24,000/D	33,000/D

Source: Tennessee Department of Transportation, 2010

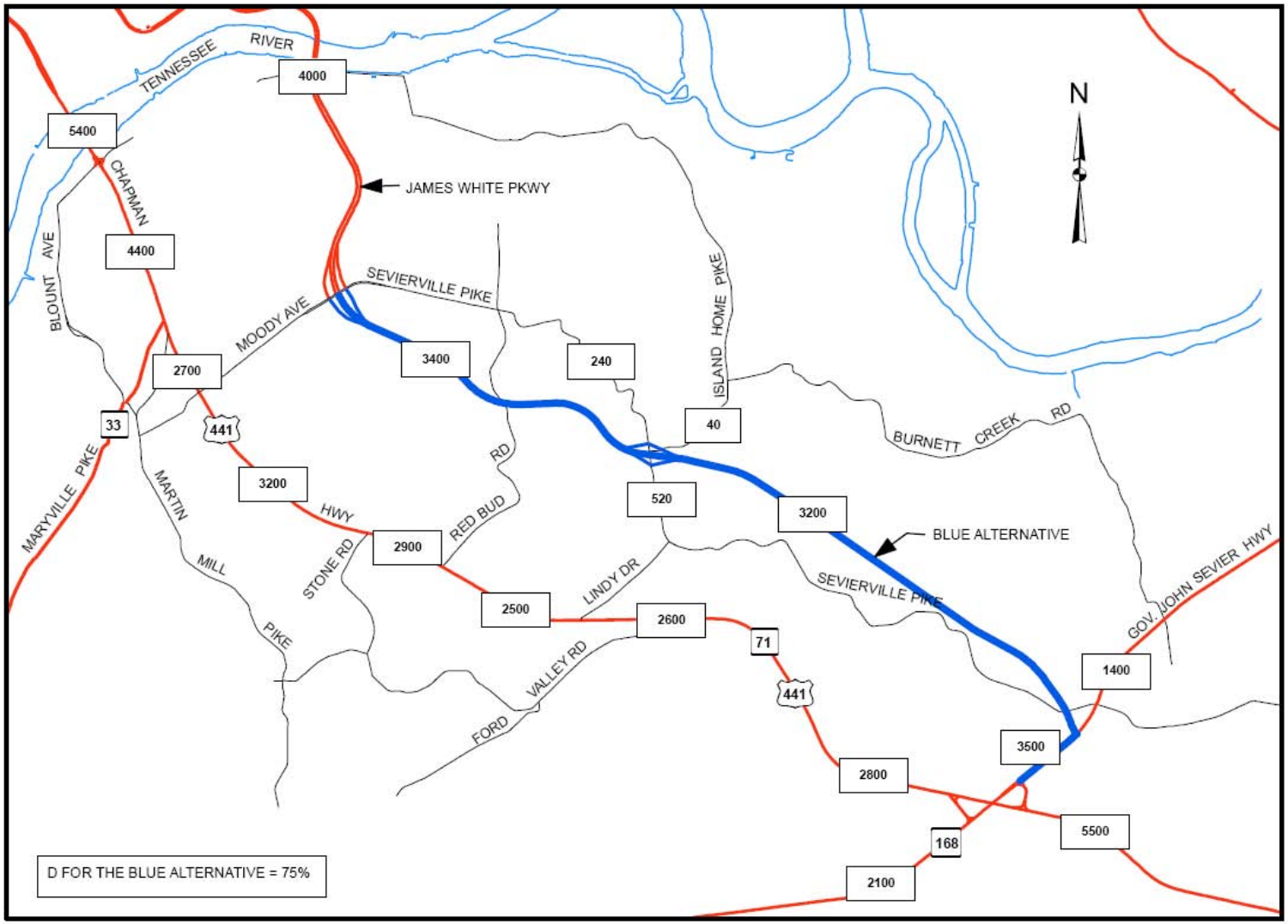
* Note: Under the Blue and Red Alternatives, Governor John Sevier Highway will be improved from near its existing intersection with Chapman Highway eastward to the proposed new Governor John Sevier Highway/James White Parkway Interchange in order to accommodate the additional James White Parkway traffic.

Figure 2.9. Design Year 2035 Design Hourly Traffic Volumes (DHV) for the James White Parkway Green Alternative.



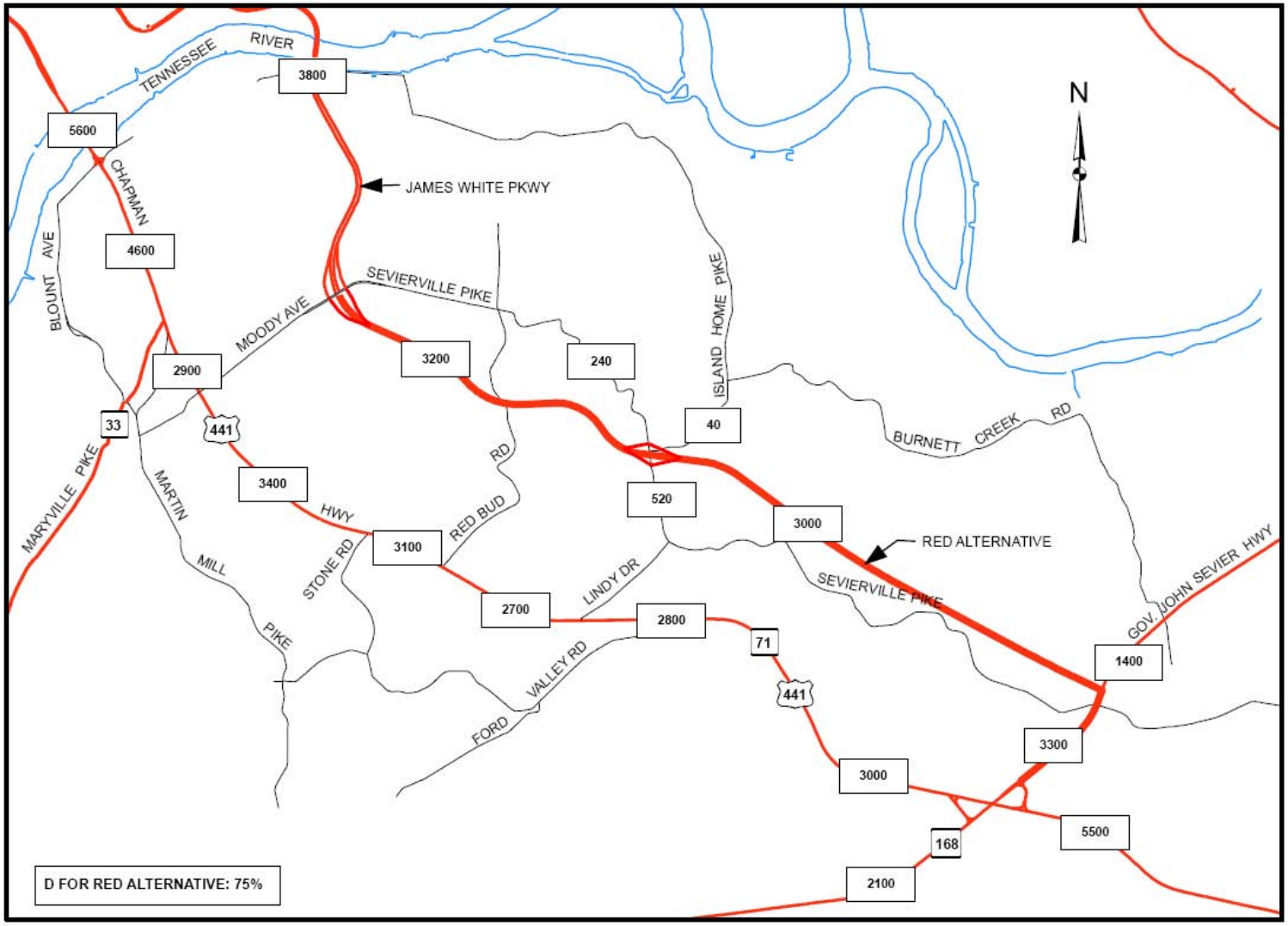
GREEN ALTERNATIVE - 2035 DHVS

Figure 2.10. Design Year 2035 Design Hourly Traffic Volumes (DHV) for the James White Parkway Blue Alternative.



BLUE ALTERNATIVE - 2035 DHVS

Figure 2.11. Design Year 2035 Design Hourly Traffic Volumes (DHV) for the James White Parkway Red Alternative.



RED ALTERNATIVE - 2035 DHVS

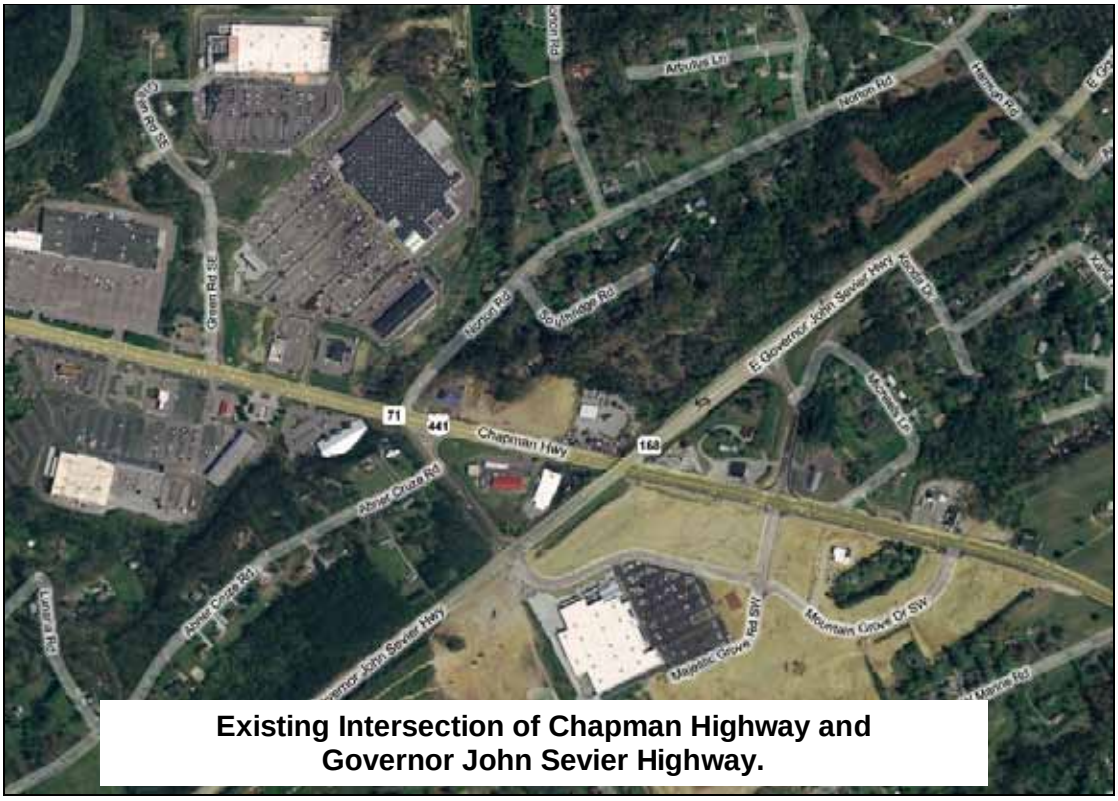
2.4 Alternatives Previously Considered and Eliminated from Further Consideration

In addition to the build alternatives discussed above, several additional alternatives were previously considered but were determined to not be reasonable alternatives for the current study. The primary reason for eliminating those alternatives from further study was because of their inability to meet the purpose and need for the project. They were not able to improve traffic flow between downtown Knoxville and areas to the south, alleviate traffic congestion and improve safety on Chapman Highway, or provide overall improved regional connectivity. Input from local officials, the Task Force, TESA agencies, and the public were also considered when determining which alternatives should be recommended to be carried forward for further study in this DEIS. Figure 2.12 depicts the previously considered build alternative alignments.

2.4.1 Alternative 1 (Task Force Alignment)

The Task Force Alignment referred to as Alternative 1 at the February 17, 2009 public meeting was developed based on a potential general alternative alignment recommended by the Task Force. The approximate centerline of Alternative 1 (Task Force Alignment) is shown in purple on Figure 2.12. It should be noted that the southern terminus at Governor John Sevier Highway was not fully defined in the Task Force report.

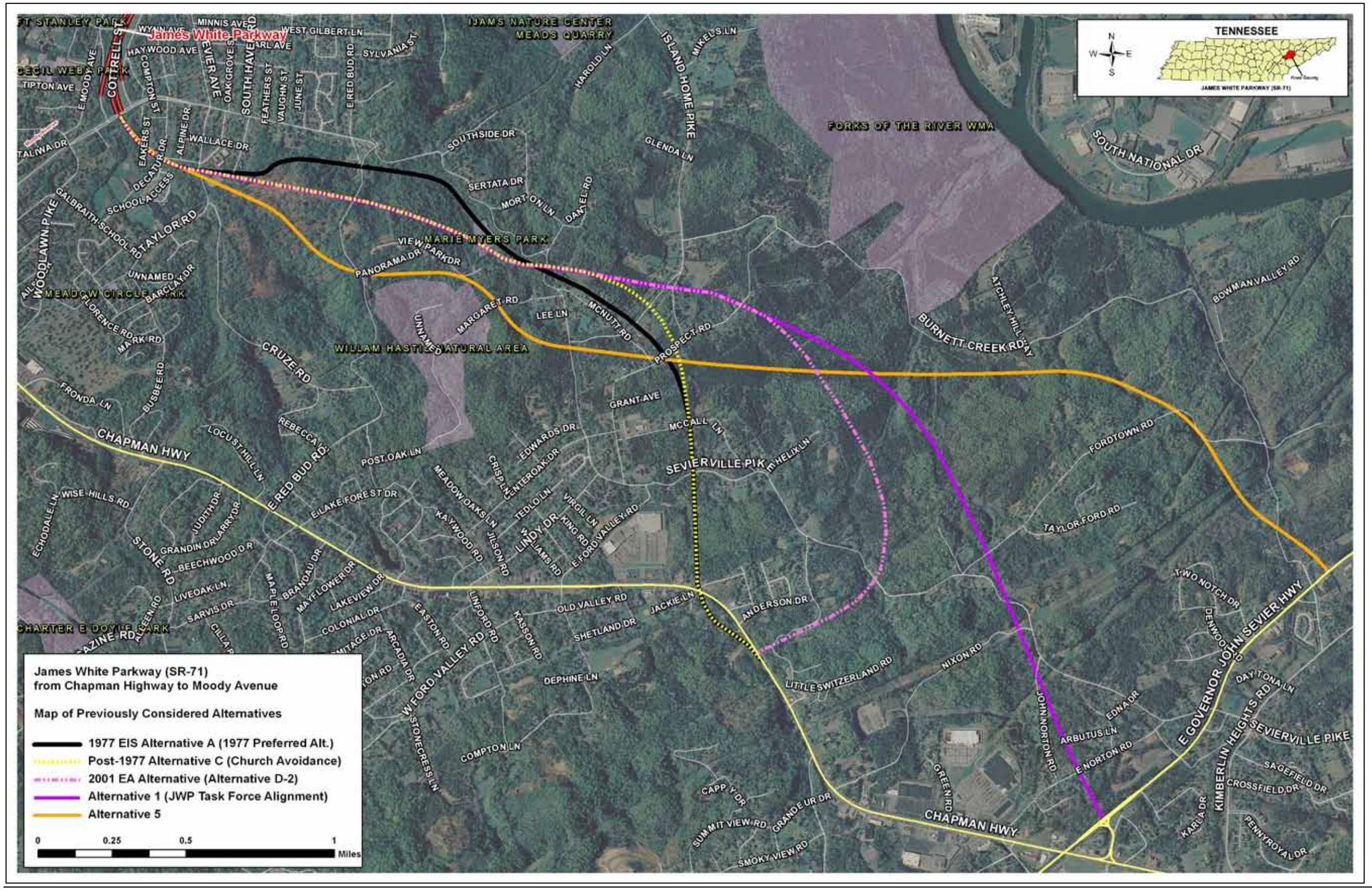
This alignment, which began near the existing intersection of Governor John Sevier Highway and Chapman Highway, extended 4.87 miles generally northwest on new alignment paralleling Chapman Highway to the east, and eventually terminated at the existing interchange of James White Parkway and Moody Avenue. Alternative 1 (Task Force Alignment) would not have required any substantial improvements along Governor John Sevier Highway beyond the proposed new interchange with the new alignment.



Existing Intersection of Chapman Highway and Governor John Sevier Highway.

A new grade-separated interchange would have been constructed at the southern terminus of James White Parkway at Governor John Sevier Highway. In addition, improvements would have been made to the existing Governor John Sevier Highway/ Chapman Highway Interchange to accommodate the James White Parkway traffic traveling to and from Chapman Highway.

Figure 2.12. Map of Previously Considered Alternatives for the James White Parkway Project in Knox County, Tennessee.



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The Task Force alternative would have met the purpose and need of the project. However, the development of this alignment did not have the benefits associated with using the Quantm system. It would impact several more known environmental constraints, such as karst topography, the Berry cave salamander, and Marie Myers Park, than the similar Green Alternative. Impacts to Marie Myers Park would have been substantial and the park would have been considered a Section 4(f) resource (see Section 3.22 for Section 4(f) information).

Since Alternative 1 (Task Force Alignment) would involve more substantial environmental impacts and more impacts to Section 4(f) resources than the Green Red, and Blue Alternatives, it was eliminated from further consideration in the DEIS.

2.4.2 Alternative 5

Alternative 5 was developed using the Quantm system. The approximate centerline of Alternative 5 is shown in orange on Figure 2.12. The alternative would have started on new alignment approximately 1.0 mile northeast of the existing intersection of Governor John Sevier Highway and Chapman Highway and would have extended 6.04 miles in a generally northwestern direction paralleling Chapman Highway to the east, and eventually terminating at the existing interchange of James White Parkway and Moody Avenue. Approximately 1.15 miles of improvements would have been required along the existing Governor John Sevier Highway under Alternative 5. These improvements would have consisted of widening the existing roadway to four traffic lanes. The cost of Alternative 5 was estimated to be $106,500,000 which is more than the Green and Blue Alternatives and slightly less than the Red Alternative.

This alternative shared a similar alignment with the Green, Blue, and Red Alternatives for the northern half of the alignment but was separated from them at the start of the alignment at Governor John Sevier Highway northeast of the start of the Red Alternative alignment. As with the Blue and Red Alternatives, Alternative 5 would have located the connection of James White Parkway and Governor John Sevier Highway away from the traffic congested areas near the existing Chapman Highway/Governor John Sevier Highway intersection.

A new grade-separated interchange would have been constructed at the southern terminus of James White Parkway at Governor John Sevier Highway. In addition, improvements would have been made to the existing Governor John Sevier Highway/Chapman Highway Interchange to accommodate the James White Parkway traffic traveling to and from Chapman Highway.

This alternative would have provided similar benefits as the Green, Blue, and Red Alternatives in terms of improving traffic congestion on Chapman Highway and meeting the overall project purpose and need. The amount of traffic expected to be removed from Chapman Highway under this alternative would have been lower. This alternative was expected to have more environmental impacts due to additional stream impacts and additional improvements that would have been required along Governor John Sevier Highway between Chapman Highway and the proposed Alternative 5 connection with Governor John Sevier Highway.

During an agency field review, the Environmental Protection Agency (EPA) expressed concerns over impacts to Burnett Creek. They indicated that they thought the impacts to the creek from the roadway and the new interchange with Governor John Sevier Highway would be too great to consider this a reasonable alternative. The U.S. Fish and Wildlife Service (USFWS) and several other agencies involved in the early project development process concurred with the EPA that this alternative should be dropped from further consideration.

Since Alternative 5 would not remove as much traffic from Chapman Highway, would involve more substantial environmental impacts than other similar reasonable alternatives, and was opposed by the resource agencies, it was recommended that this alternative be eliminated from further consideration in this DEIS.

2.4.3 2001 EA Build Alternative

One alternative that was previously considered, but has since been eliminated, was a build alternative studied during development of the 2001 EA. The 2001 EA Build Alternative was similar to the original 1977 EIS build alternatives, except the southern terminus of the alternative was changed near Chapman Highway and East Dick Ford Road. The approximate centerline of the 2001 EA Build Alternative is shown in pink on Figure 2.12.

The 2001 EA Build Alternative was dropped from further consideration based on public input following the public hearing held at that time, subsequent Chapman Highway Corridor studies, and recommendations by the Task Force that all suggested that extending the proposed James White Parkway all the way to Governor John Sevier Highway was the best option to meet the project purpose and need.

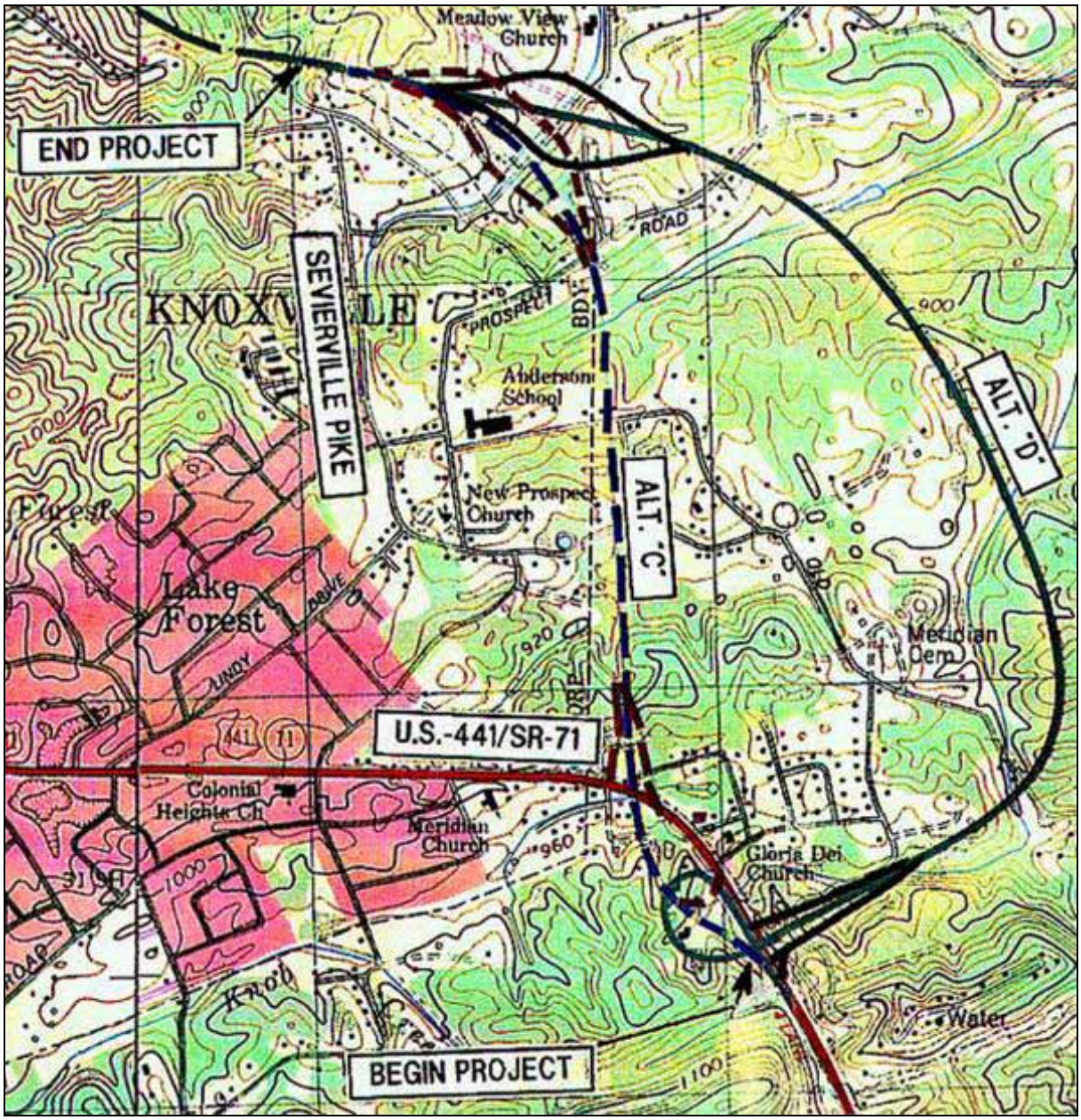
The primary concerns were that connecting James White Parkway to Chapman Highway north of Governor John Sevier Highway would not alleviate enough of the congestion issues that occur on Chapman Highway south of that point and would therefore not provide a roadway that could achieve the potential benefits to travel times and safety that could be achieved by extending the new roadway further south. New business developments along Chapman Highway just north of Governor John Sevier Highway and additional residential and business growth south of that area has resulted in additional traffic along much of Chapman Highway, including portions located south of East Dick Ford Road. It is expected that these trends will continue and will result in additional traffic congestion issues and safety issues along much of Chapman Highway all the way southward to Governor John Sevier Highway, especially during peak travel times.

2.4.4 Pre-2001 Build Alternatives

The 2001 EA Build Alternative (Alternative D-2) was a derivative of previous alternatives considered but later eliminated, beginning with two alternatives studied in a 1977 South Knoxville Boulevard (James White Parkway) EIS. In the 1977 South Knoxville Boulevard FEIS, the Alternatives A and B were discussed. Alternative A was selected as the preferred alternative at that time. However, during the design phase for Alternative A, changes to the original alignment were made to avoid a historic church and residences near Redbud Drive. The revised alignment was labeled as Alternative C, which replaced Alternative A.

Alternative C was eventually constructed between State Route 158 (CBD Loop) and Moody Avenue resulting in the existing James White Parkway (refer to Figure 1.3 in Chapter 1 to see the location of existing James White Parkway). However, a portion of Alternative C between Old Sevierville Pike and Chapman Highway had engineering constraints due to numerous sinkholes along the proposed alignment. Those engineering constraints led to the development of a new alternative running between Chapman Highway and Old Sevierville Pike, known as Alternative D. Alternative D was located east of the previous Alternative C alignment. Alternative D was later replaced by Alternative D-2 (the 2001 EA Build Alternative discussed above). Alternative D-2 was identical to Alternative D, except changes were made to the design of the intersection of the proposed alignment and Chapman Highway. Figure 2.12 and Figure 2.13 show the locations of the previously studied alignments of Alternative C and Alternative D.

Figure 2.13 Previously Considered (Pre-2001 Alternatives) Alternative C and Alternative D for James White Parkway.



2.4.5 Other Suggested Build Alternative Configurations

TDOT received several suggestions to look at additional alternative configurations following the February 17 public meeting in South Knoxville. Based on that public input, TDOT looked at all of the additional alternative alignments suggested.

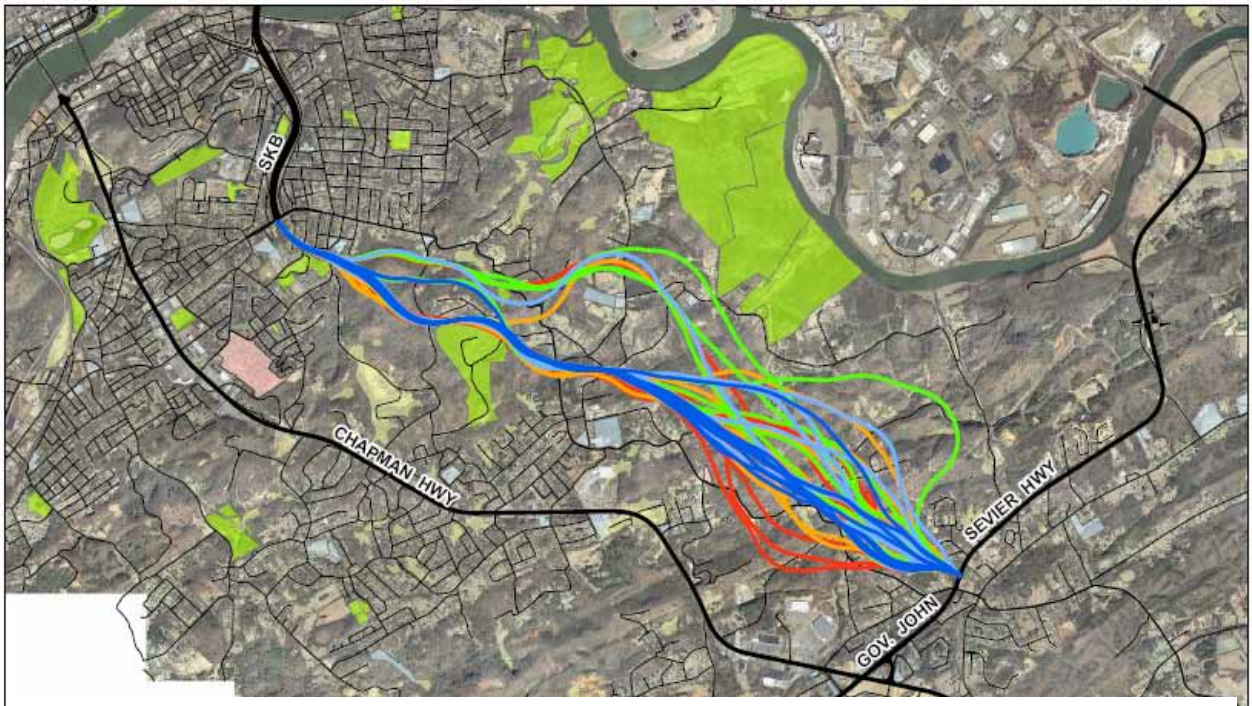
One of the alignments would have required the northern terminus of the project to begin in downtown Knoxville and extend eastward following a railroad ROW and then require two new crossings of the Tennessee River before eventually connecting to Governor John Sevier Highway near Marbledale. Upon further investigation, TDOT determined this is not a reasonable alternative and would not meet the purpose and need of the project. It would result in much higher costs due to the two new Tennessee River structures and additional environmental impacts when compared to the proposed build alternatives recommended to be carried forward for further study in this DEIS. It would also not attract as many commuters from the Chapman Highway corridor due to its southern terminus being located too far east.

Other alignments suggested by the public included other options to tie James White Parkway back into Chapman Highway at various points north of Governor John Sevier Highway. Similar to the 2001 EA Build Alternative discussed above, these alternatives were also not considered reasonable, because they would not fully meet the purpose and need for the project. Although these alignments would provide an improved connection between South Knoxville and downtown Knoxville and may improve northern portions of Chapman Highway, they would not adequately resolve traffic and safety issues on Chapman Highway all the way south to Governor John Sevier Highway. The recent retail business developments along Chapman Highway just north of Governor John Sevier Highway has resulted in additional traffic congestion and safety issues in that area. Therefore, it is necessary to provide an alternative that would relieve traffic along that portion of Chapman Highway. The three Build Alternatives being considered in this environmental document would relieve traffic along Chapman Highway from Governor John Sevier Highway all the way north into downtown Knoxville.

Retail Business Development along Chapman Highway just North of Governor John Sevier Highway.

A final alternative suggested by the public involved a crossover between Build Alternative 1 and Alternative 5. Although this Alternative would be feasible, it would result in more environmental impacts when compared with the other similar build alternatives including the Green, Blue, and Red Alternatives. Because those alignments were developed using the Quantm system, they are inherently the options that are expected to provide the fewest environmental impacts while reducing overall construction costs.

As part of the Quantm system analyses, hundreds of additional alternative alignments were evaluated and gradually narrowed down to the alignments presented in this DEIS. Although other Quantm system alignments may have been considered feasible, they were eliminated due to their similarity to one or more of the build alternative alignments presented in this document.



Example of one of the "50 Best" Alternative Alignments Produced by Quantm for one of the Program Runs Completed during the Alternative Analyses Process.

2.4.6 Transportation System Management (TSM) Alternatives

2.4.6.1 Improvements to Existing Chapman Highway

TSM Alternatives, such as improvements to existing Chapman Highway, were considered as stand-alone alternatives to constructing the proposed extension of James White Parkway on new alignment. Based on traffic data and numerous constraints along Chapman Highway that would make widening portions of the roadway difficult to implement, it was determined that improvements to Chapman Highway alone would not be considered a reasonable alternative for this project. Improving Chapman Highway without extending James White Parkway would not meet the overall purpose and need of the project.

As mentioned under the description of the No-Build Alternative, some TSM related improvements to Chapman Highway would still be considered for implementation under the

No-Build and the build alternatives studied under this project. Those improvements would include adding turn lanes at various locations, working on signal timing and operation, and implementing other minor improvements to improve the operation and safety of the existing route. Additional efforts to add sidewalks and/or bicycle lanes could also be considered along existing Chapman Highway under the No-Build and Build Alternatives. However, under the No-Build Alternative, it is not expected that those improvements would be enough to meet the purpose and need of this project.

While the build alternatives for extending James White Parkway to Governor John Sevier Highway raise questions about environmental impacts, other projects aimed at improving traffic capacity of Chapman Highway and other existing roads to handle the anticipated traffic volumes would be costly, have their own set of environmental impacts, and make it more difficult to realize the local visions of a pedestrian-friendly Chapman Highway. Preliminary estimates indicate that relocating businesses and utilities along Chapman Highway, along with improving other nearby roads, would not be substantially cheaper than constructing James White Parkway on new alignment. The option of just implementing improvements to Chapman Highway and other local roadways could also result in increased traffic on residential streets, as drivers seek other routes to avoid congestion. With traffic volume projections as they are, increasing capacity on Chapman Highway may necessitate addition of travel lanes in some areas. Widening could create a larger barrier to pedestrians and other alternative transportation, as well as local neighborhood traffic.

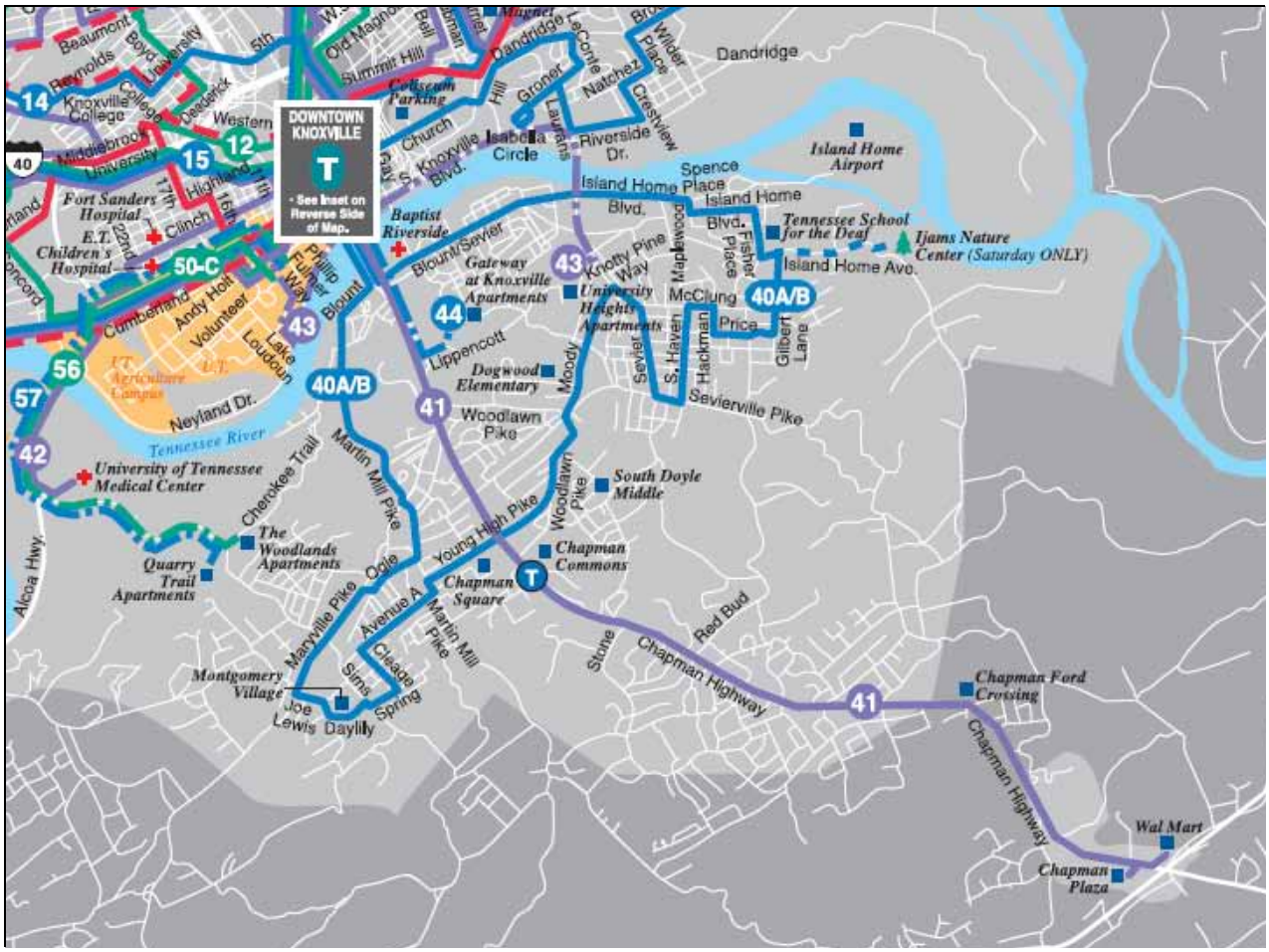
Existing Chapman Highway near Lake Shore Drive.

2.4.6.2 Transit Alternatives

Transit alternatives, such as improving or expanding local bus systems or construction of other public transit systems in the area were considered as standalone alternatives to take the place of extending James White Parkway. According to the Knoxville Regional TPO's 2009-2034 Knoxville Regional Mobility Plan, with the volatility of gas prices, unease over the economy, and concerns about the environment, there has been increased interest in public transportation in the Knoxville region. This interest has come from a cross-section of the community, including persons at different income levels; from those who live in suburbia, urban areas or downtown; and from college students, workers, and retirees. Transit ridership has reached levels not seen in over 25 years, and the public is demanding more service.

There are presently two Knoxville Area Transit (KAT) bus routes that extend southward into the general Chapman Highway Corridor within the study area. One of those routes runs along Chapman Highway south to near Governor John Sevier Highway. The other route remains further north and provides access to local residents living south of the Tennessee River and south to near the Young High Pike/Chapman Road vicinity. There is currently no commuter rail service in the study area. Figure 2.14 shows the existing KAT's routes in the general project vicinity.

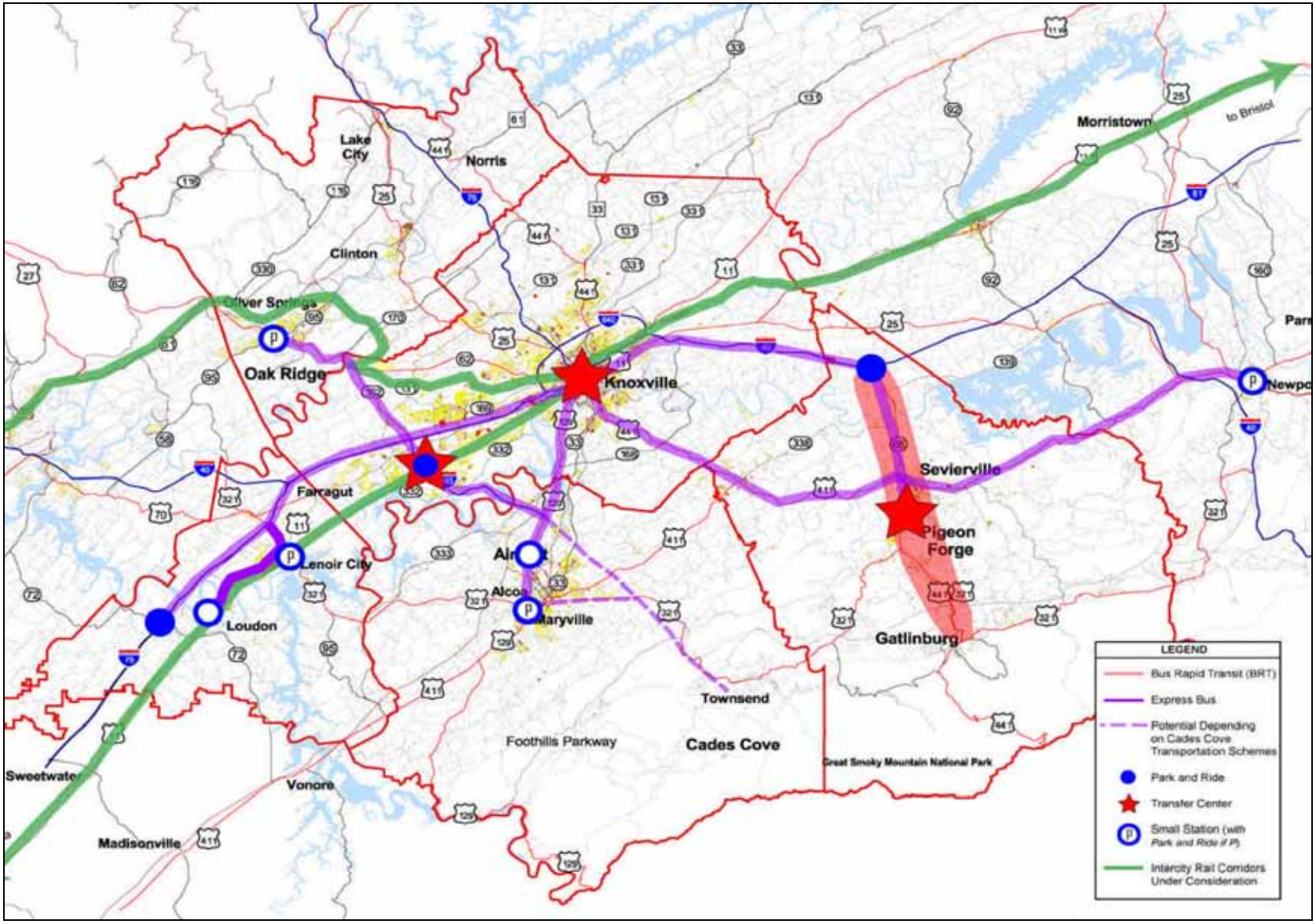
Figure 2.14. Knoxville Area Transit routes in the South Knoxville vicinity.



The TPO's 2002 Regional Transportation Alternatives Plan (RTAP) identified corridors throughout the region that would support alternative transportation modes. According to the RTAP, developing an efficient regional public transportation system or mass transit system requires a mass of either people or jobs along a corridor. In plotting the region's projected population for 2030, it was evident that population density did not meet this threshold. However, some pockets of population density exist in the central city of Knoxville and in clusters around Alcoa, Maryville, Oak Ridge, and Lenoir City. While Sevier County does not have a high population density, it does contain a high density of hotel rooms that house tourists and an abundance of employment generated by the tourist industry.

The proposed transit concept starts with a series of express buses connecting the region. Figure 2.15 shows a transit concept as shown in the 2002 RTAP. According to the RTAP, some of the key areas where the express buses will originate and end are Oak Ridge, Maryville/Alcoa, Lenoir City, Knoxville, Sevierville, and Pigeon Forge. A series of transfer centers will be strategically placed where express buses will meet and where passengers can transfer to different routes or to other local services. An important part of the regional concept is a proposed bus rapid transit (BRT) system that would stretch from I-40 to Sevierville, Pigeon Forge, and Gatlinburg.

Figure 2.15. Transit concept from the TPO's RTAP developed in 2002.



BRT is similar to light rail in that vehicles are separated from traffic but instead are rubber-wheeled vehicles. The key to this service is the separation from the rest of the traffic allowing the BRT vehicle to keep moving when congestion occurs. The RTAP study concluded that passenger rail is unlikely in the Knoxville area in the near future, but efforts should be taken to continue to assess potential opportunities due to some unique characteristics of the region in regards to tourism, economic development, and poor air quality.

Although improvements or additions to the local transit system would complement the James White Parkway project in creating a better overall regional transportation network, it is not expected that transit options alone would provide enough of a reduction in vehicular traffic to meet the purpose and need of this project, especially in terms of reducing enough traffic from Chapman Highway to improve the existing and predicted congestion and safety issues.

Daily traffic utilizing Chapman Highway consists of a combination of local drivers, daily commuters traveling to and from downtown Knoxville from areas to the south, such as Seymour, and through-traffic from outside of the region traveling between various points outside of Knoxville. Although there have been recent increases in the use of public transit in the area, it is expected that a large number of daily commuters from suburbs south of Knoxville are expected to continue to use personal vehicles even if additional mass transit options are made available.

In general, transit options will likely continue to be utilized more heavily by residents living closer to the downtown Knoxville area that would have easier access to the system in general or by visitors to the area. Although additional use of transit systems by those residents would help reduce some traffic on Chapman Highway closer to downtown, it is expected that there would still be traffic issues remaining for southern portions of the route due to the number of commuters coming from that region that would be less likely to utilize transit systems on a daily basis. Therefore, improvements to area highways, including primary corridors such as Chapman Highway, will continue to be essential to keep up with the overall transportation needs of the area. The potential impacts of future transit options being considered by the City of Knoxville will be incorporated into the cumulative impacts analysis of this DEIS. At this time it is not anticipated that the James White Parkway project would adversely affect any plans to develop additional transit options in the South Knoxville area. Instead, it is more likely that the new roadway corridor would complement expansion of transit options in the region.

2.5 Conclusion

This section provides a summary of the alternatives analyses conducted for this project. Based on all available information, TDOT is carrying three build alternatives, as described in this chapter, and the No-Build Alternative into this DEIS for further detailed environmental analyses. Table 2.4 contains basic summary information for the alternatives considered for the James White Parkway project. This table is meant to show how each of the alternatives considered would or would not support the purpose and need of the project and what the anticipated environmental consequences of selecting each alternative would be based on available information and technical studies conducted for this project.

Table 2.4. Summary of Alternatives Discussed in the James White Parkway EIS.				
	Components of Stated Purpose and Need			
Alternative Considered	**Provides Improved Transportation Efficiency for the Region in Terms of Travel Times**	**Reduces Traffic Congestion along Chapman Highway from Governor John Sevier Highway and downtown Knoxville**	**Capable of Accommodating Anticipated Increases in Design Year Traffic Demands (i.e., Maintains Acceptable LOS in Design Year)**	**Potential to Substantially Improve Safety on Existing Roads used by Daily Commuters, Including Chapman Highway**
No-Build Alternative	No	No	No - The anticipated increases in traffic volumes would not be accommodated by the minor TSM improvements along Chapman Highway that would occur under the No-Build Alternative.	No – Although some safety improvements may occur with TSM projects, overall traffic congestion issues along Chapman Highway will not allow for substantial improvements to safety.
Green Alternative	Yes	Yes	Yes – James White Parkway is expected to maintain an acceptable LOS in the design year while improving LOS on Chapman Highway between Governor John Sevier Highway and downtown Knoxville.	Yes
Blue Alternative	Yes	Yes	Yes – James White Parkway would maintain an acceptable LOS in the design year while improving LOS on Chapman Highway between Governor John Sevier Highway and downtown Knoxville.	Yes
Red Alternative	Yes	Yes	Yes – James White Parkway is expected to maintain an acceptable LOS in the design year while improving LOS on Chapman Highway between Governor John Sevier Highway and downtown Knoxville.	Yes
Source: Parsons, 2010				

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CHAPTER 3

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter of the James White Parkway Draft EIS will describe the social, economic, cultural, and natural resources in the project vicinity (affected environment), followed by a discussion of the potential impacts (environmental consequences) that this project may have on those resources. Following the discussion of environmental consequences, mitigation measures are discussed to explain what efforts have been or would be taken to avoid, minimize, and/or mitigate for adverse environmental consequences resulting from this project.

Direct, indirect, and cumulative impacts anticipated to occur with implementation of this project are discussed by alternative under each resource category. In addition, a summary matrix is provided at the end of the chapter to allow for side-by-side comparison of the primary impacts associated with each alternative being considered.

In some cases the information supplied in Chapter 3 includes summaries of more detailed information provided in technical study reports prepared for the EIS. The technical study reports are on file with the TDOT Environmental Division. The technical study reports are also available on the project website at: http://www.tdot.state.tn.us/sr71/ . Due to the sensitive nature of some resources, e.g. cultural sites or cave locations, certain sensitive portions of those reports cannot be made available to the general public. Should such information be desired for scientific or other research purposes, please contact the TDOT Environmental Division. Other technical documents, studies, plans, or references that are not available on the project website are listed in Chapter 6 (References).

3.1 Affected Environment

The affected environment portion of this chapter describes the existing natural, cultural, social, and economic environments occurring within the proposed project area. The affected environment results from all past and present actions in the project area. The affected environment descriptions serve to establish baseline conditions of each resource against which to evaluate anticipated environmental consequences that could result from the proposed project. The affected environment is described by resource category either in general or by subcategory where appropriate.

The following resource categories were determined to be appropriate for this study and are consistent with the general guidelines set forth by the FHWA (FHWA 1987):

- Social/Community and Economic Resources, including:
  - Land Use and Infrastructure;
  - Social Environment and Community Resources, including:
    - Environmental Justice and Non-discrimination,
    - Displacements and Relocations,
    - Neighborhood and Community Cohesion,
    - Travel Efficiency, and
    - Public Services,
  - Considerations Related to Pedestrians and Bicyclists;

- Visual Quality;
- Economic Environment; and
- Farmland.

- Ecological Resources including:
  - Aquatic Resources (Streams, Waterbodies, and Water Quality);
  - Wetlands;
  - Floodplains;
  - Threatened and Endangered Species; and
  - Fish and Wildlife/Habitats.
- Cultural Resources impacts including:
  - Historical/Architectural Resources; and
  - Archaeological Resources;
- Air Quality;
- Noise;
- Hazardous Materials;
- Energy;
- Section 4(f) Properties; and
- Construction.

As discussed in Chapter 2, potential implementation alternatives being considered in the environmental consequences section of this Draft EIS include the following:

- No-Build Alternative.
- Green Alternative – The Green Alternative would begin near the existing intersection of Governor John Sevier Highway and Chapman Highway, extend 4.7 miles in a general northwestern direction on new alignment paralleling Chapman Highway to the east, and eventually terminate at the existing interchange of James White Parkway and Moody Avenue. The Green Alternative would not require any substantial improvements along Governor John Sevier Highway beyond the proposed new interchange with the new alignment.
- Blue Alternative – The Blue Alternative alignment would begin near the existing intersection of Governor John Sevier Highway and Chapman Highway, extend 0.62 miles to the northeast along the existing Governor John Sevier Highway, continue another 4.34 miles in a general northwestern direction on new alignment paralleling Chapman Highway to the east, and eventually terminate at the existing interchange of James White Parkway and Moody Avenue. The Blue Alternative is a total of 5.0 miles long. The Blue Alternative would require improvements along 0.62 miles of existing Governor John Sevier Highway involving widening the existing roadway to four traffic lanes to support the additional traffic that would be diverted from Chapman Highway and onto to the new alignment portion of James White Parkway.
- Red Alternative – The Red Alternative alignment would begin near the existing intersection of Governor John Sevier Highway and Chapman Highway, extend 0.87

miles to the northeast along existing Governor John Sevier Highway, continue another 4.29 miles in a general northwestern direction on new alignment paralleling Chapman Highway to the east, and eventually terminate at the existing interchange of James White Parkway and Moody Avenue. The Red Alternative is a total of 5.2 miles long. The Red Alternative would require improvements along 0.87 miles of existing Governor John Sevier Highway involving widening the existing roadway to four traffic lanes to support the additional traffic that would be diverted from Chapman Highway and onto the new alignment portion of James White Parkway.

3.2 Study Methodologies, Study Areas, and Impacts Analysis

The alternatives studied in this Draft EIS have been developed and conducted in accordance with established procedures documented in TDOT"s latest edition of the Tennessee Environmental Procedures Manual (TEPM); with TDOT Environmental Division's scopes of work for performing specific types of studies, such as ecology, historic architecture and archaeology, hazardous materials, air quality, noise, and permits; and with other federal and state regulations and requirements.

The TEPM contains technical guidance as well as background information on federal and state environmental regulations, FHWA guidance and policies, interagency agreements, and TDOT policies. The TEPM provides guidance for the preparation of environmental analysis and documentation for federally funded and state-funded transportation projects. Projects that are funded in whole or in part with federal funds or have major federal actions must follow the requirements of NEPA, as well as related federal and state environmental regulations. The TEPM helps ensure that TDOT adheres to the requirements set forth in those regulations.

As mentioned above, the environmental consequences (here forth referred to as impacts) associated with this project will be described immediately following the affected environment descriptions for each resource category. Three types of impacts will be considered, including direct, indirect, and cumulative impacts. The various types of impacts are defined in more detail in the following sections.

Types of Impacts Assessed in this EIS

Direct Impacts are caused by the project at the time and place the project is constructed.

Indirect Impacts may be caused by a project, but would occur in the future or outside of the project area and are reasonably foreseeable.

Cumulative Impacts are the combined effects of all projects (not just the current project and not just highway projects) on a given resource, regardless of who builds the project (private developers, municipalities, etc., not just state departments of transportation or federal agencies). They are based on past, present, and reasonably foreseeable future actions.

The study area for direct impacts for most natural resources, noise, and physical environment studied in the Draft EIS included the 500-foot study corridor surrounding the centerlines of the proposed alternatives and surrounding the overall footprint of the proposed ramps associated with each proposed interchange. For certain resources, a larger area surrounding the proposed roadway was studied. For instance, impacts to social and economic environments was studied at the county level or using other appropriate administrative boundaries. Figure 3.1 illustrates the project vicinity.

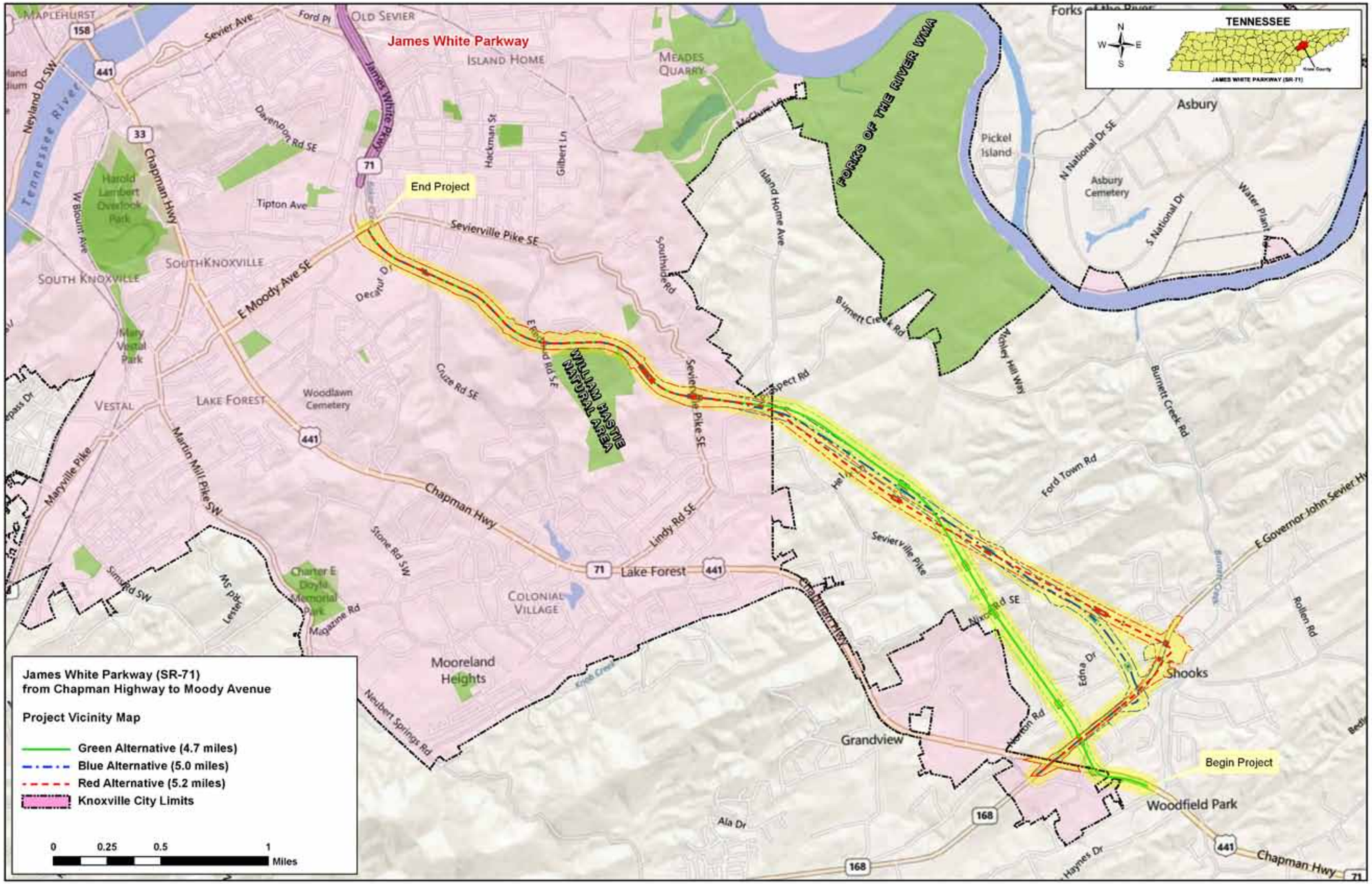
The size of the study area for the indirect and cumulative impacts analyses also extended beyond the 500-foot study corridor and varied by resource category depending on the resources identified in the project vicinity that may be impacted. For instance, the impact analyses for water resources was done on a watershed level so that potential impacts to existing water resources downstream of the project area were thoroughly considered. Impacts to social and economic environments were studied at the county level or other appropriate level based on local planning boundaries.

The study area for indirect impacts included areas most likely to be impacted by secondary developments induced by construction of the project, such as highway-oriented commercial/retail developments like gas stations, hotels, and fast-food restaurants that could be promoted at proposed interchange locations. Land use zoning restrictions and availability of developable land were considered in determining the potential for such developments and the associated impacts.

3.2.1 Short-Term versus Long-Term Impacts

Impacts are expressed in terms of duration. The duration of short-term impacts typically is considered to be one year or less. However, specific site conditions may alter the duration of what is considered short-term. For example, the construction of a building on a generally level piece of ground would expose soil in the immediate area of construction. This effect would be considered short-term, because it is expected that vegetation to stabilize the soil would re-establish on the disturbed area within a year of the disturbance. Long-term impacts last beyond one year. Long-term impacts can potentially continue indefinitely, in which case they would also be described as permanent.

Figure 3.1. Vicinity of the James White Parkway in South Knoxville, Tennessee.



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3.2.2 Impact Characterization

Impacts are characterized by their relative magnitude. Adverse or beneficial impacts that are substantial are the highest level of impacts. Conversely, negligible adverse or beneficial impacts are the lowest level of impacts. In this document, five descriptors are used to characterize the level of impacts. In order of degree of impact, the descriptors are as follows:

- No Impact;
- Negligible Impact;
- Minor Impact;
- Moderate Impact; and
- Substantial Impact.

The following graphically represents this hierarchy of impacts.

< IMPACT SCALE >								
Substantial Adverse Impact	Moderate Adverse Impact	Minor Adverse Impact	Negligible Adverse Impact	No Impact	Negligible Beneficial Impact	Minor Beneficial Impact	Moderate Beneficial Impact	Substantial Beneficial Impact

In many instances there is inadequate information or data available to assess the magnitude of the potential impacts, even though the type of impact (adverse or beneficial) can be presumed based on past trends or impacts previously observed for similar projects or actions. In those cases, no modifier for the magnitude of the impact is provided.

3.2.3 Direct Impacts

A direct impact is caused by the proposed action and occurs at the same time and place. A resource must be present in a particular area for a direct impact to occur. For example, construction of a new roadway may result in displacement of an existing residence located in the construction zone that could not be avoided. The occupants of the residence would be forced to relocate to another residence. This would be considered a direct impact to those residents.

3.2.4 Indirect Impacts

The basic concepts discussed in the National Cooperative Highway Research Program (NCHRP) Report 466 “Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects” were used during the indirect impacts analyses. An indirect impact is caused by the proposed action and occurs later in time or is farther removed in distance but is still reasonably foreseeable. For example, the occupants of the residence described under the direct impacts discussion above would need to be relocated. The new residence may be a comparable home that may be for sale in the project vicinity or a new home may be constructed on available property within the vicinity. If an existing home in the market is suitable, there would likely be minimal potential for additional impacts to the environment to occur due to the residence relocating. However, if a new home is required to be built to provide comparable or suitable housing for the displaced resident, construction of the home may result in additional, reasonably foreseeable impacts. For example, the new home may be constructed near an existing stream in the project vicinity that was avoided by the construction of the new roadway. Construction of the new home may result in sediment laden runoff from the home construction site entering the stream, reducing water quality and

adversely impacting aquatic habitats. The impacts caused by construction of the new home would be considered indirect impacts of the roadway project, because if it were not for the roadway forcing the residents to relocate, the impacts to the stream would not have occurred. Even though the stream was not directly impacted by the roadway construction activities, the adverse impacts to the stream were ultimately due to the roadway.

3.2.5 Cumulative Impacts

The cumulative impact analysis evaluates the direct and the indirect effects of implementing any of the study alternatives in association with past, present, and reasonably foreseeable future actions of other parties in the surrounding area (where applicable). The cumulative impacts analysis considers all potential impacts to various resources as a whole. The past, present, and reasonably foreseeable future projects considered in the cumulative impacts analyses may or may not be related to the proposed action.

The Council on Environmental Quality (CEQ) has outlined a framework for incorporating cumulative effects analyses into the environmental impact statement process. The framework includes the following points:

1) **Cumulative effects are caused by the aggregate of past, present, and reasonably foreseeable future actions.** The effects of a proposed action on a given resource, ecosystem, and human community include the present and future effects added to the effects that have taken place in the past. Such cumulative effects must also be added to effects (past, present, and future) caused by all other actions that affect the same resource.

2) **Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (Federal, non-Federal, or private) has taken the actions.** Individual effects from disparate activities may add up or interact to cause additional effects not apparent when looking at the individual effects one at a time. The additional effects contributed by actions unrelated to the proposed action must be included in the analysis of cumulative effects. However, if the proposed action has no direct or indirect effects on a given resource then there would be no potential for cumulative effects associated with the action. For instance, if a build alternative is selected but no impacts to wetlands occur, then the project would not contribute to cumulative impacts to wetlands that may be caused by other unrelated projects in the area. Although the cumulative impacts of those other unrelated projects should still be mentioned under the No-Build Alternative, because those impacts would occur even if the proposed action is not implemented.

3) **Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.** Environmental effects are often evaluated from the perspective of the proposed action. Analyzing cumulative effects requires focusing on the resource, ecosystem, and human community that may be affected and developing an adequate understanding of how the resources are susceptible to effects.

4) **It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.** For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded

to the point at which the resource is no longer affected significantly or the effects are no longer of interest to affected parties.

5) **Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.** Resources typically are demarcated according to agency responsibilities, watershed boundaries, county lines, or other administrative boundaries. Because natural and socio-cultural resources are not usually so aligned, each political entity actually manages only a piece of the affected resource or ecosystem. Cumulative effects analysis on natural systems must use natural ecological boundaries and analysis of human communities must use actual socio-cultural boundaries to ensure including all effects.

6) **Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.** Repeated actions may cause effects to build up through simple addition (more and more of the same type of effect), and the same or different actions may produce effects that interact to produce cumulative effects greater than the sum of the effects.

7) **Cumulative effects may last for many years beyond the life of the action that caused the effects.** Some actions cause damage lasting far longer than the life of the action itself (e.g., acid mine drainage, radioactive waste contamination, species extinctions). Cumulative effects analysis needs to apply the best science and forecasting techniques to assess potential catastrophic consequences in the future.

8) **Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters.** Analysts tend to think in terms of how the resource, ecosystem, and human community will be modified given the action's development needs. The most effective cumulative effects analysis focuses on what is needed to ensure long-term productivity or sustainability of the resource (CEQ 1997).

The cumulative impact analysis has been prepared at a level of detail that is reasonable and appropriate to support an informed decision in selecting a preferred alternative. The cumulative impact discussion is presented according to each of the alternatives listed.

Council on Environmental Quality

The Council on Environmental Quality (CEQ) coordinates Federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives. CEQ was established within the Executive Office of the President by Congress as part of the National Environmental Policy Act of 1969 (NEPA) and additional responsibilities were provided by the Environmental Quality Improvement Act of 1970.

3.2.5.1 Definitions Used in Cumulative Analysis

This Section defines several key terms used in the cumulative impact analysis.

Cumulative Impact Analysis Area

The cumulative impact analysis area includes that area that has the potential to be affected by implementation of any of the alternatives. The indirect impact analysis area was the same as the cumulative impacts analysis area for this project. The boundaries of the

indirect impact and cumulative impact study areas varied according to the resource being considered. For most resource categories, the indirect and cumulative impacts analyses extended beyond the 500-foot study corridor used to determine direct impacts for several resources. For those categories, the cumulative and indirect impact analysis area was set based on the context of the resource. In general, the potential for the James White Parkway project to influence those resources, either through induced development or by affecting the same resources as other past, present, or reasonably foreseeable projects or actions in the area, was considered based on the best available information prior to initiating the study. The boundaries of the cumulative and indirect impact analysis area are described for each resource category are identified on Table 3.1.

Table 3.1. Study area for each resource category considered in the indirect and cumulative impacts analysis for the James White Parkway EIS in South Knoxville, Knox County, Tennessee.	
Resource Category	**Analysis Area**
Land Use and Infrastructure	Land bounded by Chapman Highway to the west/southwest, East Moody Avenue and Sevierville Pike to the north, Sevierville Pike to McNutt Avenue to Burnett Creek Road to the east/southeast, and Governor John Sevier Highway to the south/southeast.
Farmland, Soils, and Physical Environment	Land bounded by Chapman Highway to the west/southwest, East Moody Avenue and Sevierville Pike to the north, Sevierville Pike to McNutt Avenue to Burnett Creek Road to the east/southeast, and Governor John Sevier Highway to the south/southeast.
Social Environment	Census Block Group 1 in Tracts 43, 51, and 52.
Relocation	South Knoxville Community.
Economics	Knox and Sevier Counties, Tennessee
Air Quality	Knox and Sevier Counties, Tennessee
Noise	Land bounded by Chapman Highway to the west/southwest, East Moody Avenue and Sevierville Pike to the north, Sevierville Pike to McNutt Avenue to Burnett Creek Road to the east/southeast, and Governor John Sevier Highway to the south/southeast.
Water Quality	All watersheds or waterbodies present in the area bounded by, and including, the Tennessee River (Ft. Loudon Lake) to the north/northeast, the French Broad River, Burnett Creek watershed, and other small tributaries that empty into the Tennessee River or the French Broad River. This would include any watercourses where stormwater runoff from the project area is discharged.
Wetlands	Land bounded by Chapman Highway to the west/southwest, East Moody Avenue and Sevierville Pike to the north, Sevierville Pike to McNutt Avenue to Burnett Creek Road to the east/southeast, and Governor John Sevier Highway to the south/southeast.
Water Body Modifications and Wildlife	Land bounded by Chapman Highway to the west/southwest, East Moody Avenue and Sevierville Pike to the north, Sevierville Pike to McNutt Avenue to Burnett Creek Road to the east/southeast, and Governor John Sevier Highway to the

Table 3.1. Study area for each resource category considered in the indirect and cumulative impacts analysis for the James White Parkway EIS in South Knoxville, Knox County, Tennessee.	
Resource Category	**Analysis Area**
	south/southeast.
Floodplains	The entire Burnett Creek floodplain from near Chapman Highway to Fort Loudon Lake/French Broad River.
Threatened and Endangered Species	All potential threatened and endangered species and any terrestrial habitats within a 1-mile radius and aquatic habitats within 4 miles downstream of the proposed construction zone that are considered potential habitat for those species.
Cultural Resources	The combined areas of the Green, Blue, and Red Alternatives [the Area of Potential Effect (APE)], including vacant properties proposed to be used for relocating displaced residences. The view shed analysis was made from areas within a one-mile radius of the APE.
Hazardous Waste Sites	All hazardous materials within one mile of the Green, Blue, and Red Alternatives.
Visual	The view shed analysis was made from areas within a one-mile radius of the Green, Blue, and Red Alternatives.
Energy	Knox and Sevier Counties, Tennessee
Source: Parsons 2011	

Impact Evaluation Criteria

Impact evaluation criteria are used to define or identify the level of effect that could result in an impact to the resource being considered. Impact evaluation criteria vary by resource category. Therefore, the introductory section for each resource category defines evaluation criteria that were considered, where applicable. Both the context and severity of potential impacts were evaluated. Impacts were considered in both short-term and long-term timeframes since the proposed action would have potential to have immediate impacts due to construction activities and other impacts that may be evident well into the future.

Past Actions

Past actions are defined as actions within the cumulative impact analysis area that occurred before the Draft EIS was initiated. These include past actions in the project area, and past demographic, land use, and development trends in the areas that surround the project area. In most cases, the characteristics and results of these past actions comprise the existing conditions that are included in the discussions of each of the resource categories.

Present Actions

Present actions include all existing or current activities, resource management programs, land uses, and development projects that are being implemented by local, state, or Federal governments, and/or the private sector (where they can be identified) within the cumulative impact analysis areas.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions may include those actions in the planning, budgeting, or execution phases. Actions may be those of the federal government, state or local government, or private organizations or individuals. Secondary or induced developments associated with projects such as new or improved roadways or interchanges that provide access to otherwise less accessible areas can also be considered reasonably foreseeable even though no plans or budgets have been created. Such developments would be reasonably foreseeable in those instances primarily based on past trends associated with similar transportation projects. Reasonably foreseeable developments often associated with new or improved access points may include highway-oriented businesses, such as gas stations, fast-food restaurants, and hotels and sometimes industrial or commercial/retail developments. Local zoning ordinances, land use plans, interviews with local officials, and other references are used to help determine what reasonably foreseeable developments are anticipated in the general project area.

3.2.5.2 Past, Present, and Reasonably Foreseeable Future Actions in the James White Parkway Project Area

The primary past and present actions that have occurred both within and adjacent to the project area that have been considered in the analysis of cumulative impacts are identified below. These actions are grouped in one discussion, as together they have resulted in the existing conditions of the surrounding area. A summary list of past and present actions within and around the project area that have the potential to impact the wide range of resource issues being considered in this cumulative impact analysis is provided in the following section. Existing conditions are discussed in the affected environment description for each of the resources assessed in this document.

Past and present actions that have resulted in the existing conditions of the project vicinity include the following:

- Construction of the existing transportation infrastructure, including the existing James White Parkway, Chapman Highway, Governor John Sevier Highway, and Sevierville Pike;
- Construction of existing local neighborhoods and associated local access roads within the project area limits;
- Construction and operation of existing commercial and industrial businesses and associated access roads and parking lots within the project area;
- Ongoing projects in retail development in south Knox County around Chapman Highway and its intersection with Governor John Sevier Highway. Retail development in this area includes the South Grove commercial development, including Lowe's Home Improvement Center, Food City, other retail shopping and adjacent restaurants, and The Home Depot, Wal-Mart Supercenter, and nearby restaurants;

- Ü Ongoing implementation of the Knoxville Regional Transportation Planning Organization, Transportation Improvement Program (TIP) 2011-2014. The TIP documents how federal funds will be expended on highway and public transportation improvements within an urban area. The TIP contains all federally funded and regionally significant locally funded projects. The TIP is cooperatively developed at least every four years (KRTPO, 2011).
- Ü The opening of Knoxville Area Transit (KAT) Knoxville Station in August 2010, its new off-street transit center in downtown Knoxville. The move to the new station involved the re-routing and scheduling of more than 20 routes. Concurrently, the KAT Transit Development Plan service recommendations, including regular service, neighborhood service, and trolley service routes, were also implemented. New trolley routes started operating on August 15, 2011. The new routes are: Downtown Loop, Gay Street Line, and Vol Line (KRTPO, 2011);
- Ü Rehabilitation of the State Route 33 (Henley Street Bridge) over Tennessee River and SR-158. Construction of this project is currently underway and is estimated to be complete in June 2013 (TDOT, 2011);
- Ü The SmartFIX40 project to improve I-40 through Knoxville; and
- Ü Continued expansion and upgrade of the TDOT SmartWay (intelligent transportation system) advanced information technologies including efforts to include:
    - Roadway Traffic Sensors to report traffic counts, speed, and travel time;
    - Camera Video Surveillance to monitor congested freeways and provide improved incident management capabilities;
    - Dynamic Message Signs to provide traffic and construction information to motorists, as well as provide information on Amber Alerts;
    - HELP Freeway Service Patrols to reduce congestion by removing minor incidents in a timely fashion;
    - Transportation Management Centers (TMC) which serve as a focal point for traffic management operations and communications;
    - Incident Management to detect, verify, and respond to incidents in an efficient manner and manage traffic conditions around the incident site;
    - Construction Information that is provided to advise motorists traveling through construction sites;
    - TDOT SmartWay Information System (TSIS) is a system communicating data from TDOT SmartWay devices to a central location and distributing that transportation information to motorists and other interested parties before and while making trips. Information is distributed via TDOT's website and through the media. TDOT also launched the Tennessee 511 component of this system; and
    - Information on Weather-Related Road Conditions, a new component of SmartWay, was introduced in December 2005. This feature allows TDOT to show travelers where problems may exist on any state road due to weather conditions, such as snow, ice, and flooding. This highlights any areas to be avoided due to hazardous road conditions.

The primary reasonably foreseeable future actions that have been considered for cumulative impacts are listed in Table 3.2. The listing includes relevant foreseeable actions within and adjacent to the project area, including other federal government agencies, state and local agencies, as well as private and commercial entities where information was known.

Table 3.2 Primary reasonably foreseeable future projects considered as part of the Cumulative Impacts Analysis for the James White Parkway Project.		
Reasonably Foreseeable Future Project	**Location**	**Resource(s) potentially impacted***
Blount Avenue / Sevier Avenue Corridor Improvements. South Knoxville Waterfront roadway improvements. Blount Avenue / Sevier Avenue will be improved from Scottish Park to James White Parkway with turn lanes where needed as well as pedestrian and bicycle accommodations where feasible. This project is planned under the 2011-2014 Transportation Improvement Program (KRTPO 2010). It has not been obligated for funding;	South Knoxville Waterfront.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
South Waterfront Riverwalk. Shoals Promenade phase I will begin near the railroad bridge over Blount Avenue and continue along the river to the Gay St. Bridge for 2,450 feet. This project is planned under the 2011-2014 Transportation Improvement Program (KRTPO 2010). It has not been obligated for funding.	South Knoxville Waterfront.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Chapman Highway (SR-71) Improvements. State Route-35/338 to Macon Lane. Widen 4-lane to 5-lane with curb and gutter. Engineering for this project is currently underway (TDOT 2011a).	Sevier County, just south of project area.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; wildlife; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.

Table 3.2 Primary reasonably foreseeable future projects considered as part of the Cumulative Impacts Analysis for the James White Parkway Project.		
Reasonably Foreseeable Future Project	**Location**	**Resource(s) potentially impacted***
Implementation of additional phases of TDOT SmartWay (intelligent transportation system) advanced information technologies in the Knoxville area.	Along major roadways within and surrounding downtown Knoxville including within the project area.	Infrastructure; social environment; economics; air quality; noise; cultural resources; visual impacts; and energy.
Continued implementation of the Knoxville Regional Transportation Planning Organization, TIP 2011-2014. The TIP documents how federal funds will be expended on highway and public transportation improvements within an urban area. The TIP contains all federally funded and regionally significant locally funded projects (KRTPO 2011).	Existing and new roadways within and surrounding Knoxville including within the project area.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
** A resource "potentially impacted" does not imply that this resource exists or would be directly or indirectly impacted by the project. Please refer to the various resource categories for the specific Cumulative Impacts Analysis.* *Source: Parsons, 2011*		

3.3 Land Use and Infrastructure

3.3.1 Affected Environment

3.3.1.1 Existing Conditions and Trends

Land use in the project area is primarily a combination of urban, suburban, and rural land uses. Development consists of business developments along Chapman Highway and Governor John Sevier Highway. The remainder of the project area consists of residential development, with some areas of dense residential development and some areas with less dense development intertwined with pockets of forests and other undeveloped lands. Schools and churches are also located in the project vicinity. Some of the undeveloped forested land is contained within local and county park systems.

Much of the land in the project vicinity is undeveloped due to the steep terrain and karst topography. Much of the steeper terrain is undeveloped and is covered by forest land, or dissected by local roadways primarily located in the less steep valleys or passes or along ridge tops. These areas would likely remain undeveloped even if James White Parkway is extended and improved access is provided.

At the time of this DEIS the Metropolitan Planning Commission (MPC) recently published updated sector plans for the north county, south county, and south city sector areas within the MPC service area. A sector is a geographical area of Knox County defined by the MPC for planning purposes. The Knoxville and Knox County area is divided into twelve sectors. The updated South County Sector Plan (MPC 2011a) and the South City Sector Plan (MPC 2011b) pertain to the James White Parkway study area (http://archive.knoxmpc.org/plans/sectorpl.htm). These plans are prepared by MPC staff and include basic planning information about environmental resources, land use, population, transportation, community facilities, and utilities as they pertain to each sector.

The MPC adopted the South City Sector Plan on August 5, 2011. The South City Sector Plan analyzes approximately 12 square miles in Knox County. For purposes of analyses in this DEIS, a portion of the South City Sector Plan was reviewed, this area includes the northern half of the study area, Sevierville Pike from East Moody Avenue to Helix Lane.

The primary land use categories in the northern half of the study area, as illustrated in the South City Sector Plan, include residential and agricultural/forest/vacant (MPC 2011b). Detached, single-family dwellings comprise the largest share of residential types within this area. Several areas of public/quasi-public land uses are located in proximity to the northern half of the study area; however, these areas are mostly avoided by the current build alternatives. There are no major office, industrial, or commercial development areas within the northern half of the study area, per the South City Sector Plan. The majority of this half of the study area is contained within the existing Knoxville city limits. Knoxville's urban growth boundary extends from the intersection of Sevierville Pike and Helix Lane to the south of the south city sector area.

The South County Sector Plan was last updated on April 19, 2011. The geographic area of the South County Sector Plan is 65 square miles; however, for planning purposes a small portion of this area was used in the analysis for this DEIS (MPC 2011a). The area of analysis in the South County Sector Plan as it relates to this DEIS includes from Helix Lane in the middle of the study area to the southern terminus of the build alternatives.

The South County Sector Plan illustrates the predominant existing land uses in the southern half of the study area is primarily composed of residential and agriculture/forest/vacant land uses. Existing residential development data, as well as residential trend data, suggests the majority of homes are low density, detached, single-family units. A new subdivision development is located along East John Sevier Highway; however, none of the actual lots within the subdivision were developed at the time this DEIS was drafted. Commercial land uses, which include a dentist's office and real estate offices, are represented at the southern terminus along East Governor John Sevier Highway. A substantial point for retail activities, located west of the southern terminus of the build alternatives, is the intersection of Chapman Highway and Governor John Sevier Highway. Retail stores in this area include a Lowe's, Food City, and other retail shopping and adjacent restaurants. There are no major office or industrial developments within this portion of the study area, according to the South County Sector Plan. The South County Sector Plan indicates a portion of the southern half of the study area is identified as a planned growth area in an effort to foster low and moderate forms of development in the future.

3.3.1.2 Regional Initiatives

Recent development trends in the larger area surrounding the study area are predominantly residential and commercial growth; however, the majority of this growth has occurred outside the James White Parkway EIS study area. The trend for this development has been

adjacent to Chapman Highway, west of the study area, with a focus near the core of the South City Sector area.

To create more desirable regional land use development, the Knoxville-Knox County General Plan 2033 developed several regional initiatives (MPC 2003, http://www.knoxmpc.org/generalplan/index.htm). For purposes of this DEIS, the most applicable initiative states that road improvements should effectively connect all parts of the region, and be of adequate capacity to handle reasonable traffic demands without creating unnecessary new demand. Furthermore, the regional transportation system should be designed in a manner to avoid conflict with core principles of building sustainable, viable, multi-use communities.

Evidence of this initiative in Knox County is the Chapman Highway Corridor Study (adopted 2006), which outlined regional concepts for short-term and long-range improvements for Chapman Highway (MPC. 2006). The plan included suggested land use changes and general rezoning to improve the mix of land use along the corridor. The land use in the Chapman Highway Corridor Study is substantially different from the James White Parkway DEIS study area; however, the concept to comply with existing land use and zoning while implementing fundamental improvements is essential. As such, the James White Parkway also anticipates improving the mix of land use in the corridor with minimal zoning changes. Any zoning changes in the study area will likely be the result of changes in land use to highway and associated right-of-way.

3.3.1.3 Land Use Controls

There are known concerns stated by local residents that the extension of James White Parkway may promote additional development and loss of undeveloped lands adjacent to the roadway. Although these concerns may be valid, many of the issues that concern development in the community relate to zoning decisions that TDOT does not have control over, such as prohibiting commercial development. The MPC would need to work with local residents, property owners, and elected officials to determine what types of land uses are desirable for lands along the proposed James White Parkway corridors, should a build alternative be constructed.

The majority of the project area is identified as an urban growth or planned growth area, per the Knoxville-Knox County-Farragut Growth Policy Plan (Growth Policy Plan), adopted by the Growth Policy Coordinating Committee in January 2001 (MPC 2003). A provision of this designation suggests the study area is primarily identified for low density residential and commercial land uses. The steeper areas in slope protection areas are where development would be more restricted due to terrain and potential erosion issues. Furthermore, since this area is identified as a planned growth area, it is assumed additional development is expected in the area, which would inherently lead to additional generated traffic.

3.3.1.4 Land Use Plans and Policies

Although land use in the study area is discussed in the MPC's South County Sector Plan (revised 2011) and South City Sector Plan (adopted 2011), an overall land use plan, which includes future land use, is contained in the Knoxville-Knox County General Plan 2033 (adopted 2003). An important concept of the General Plan, as related to land use, was to provide transportation choices for all citizens. The plan further stated that transportation and land use planning should promote business expansion, community development, and environmental protection. Combined, these plans provide planners with specific land use recommendations.

Tennessee State Law (public chapter 1101) requires that local land use must abide with any growth policy plans; therefore, the Knoxville-Knox County General Plan 2033 (General Plan) is closely connected to the Growth Policy Plan in a two-part approach. First, the planning framework is compatible with the three major designations of the Growth Policy Plan; however, the land use plan divides these categories into seven more detailed categories. Second, the Growth Policy Plan, coupled with the Knoxville City charter and the Knoxville and Knox County Zoning Ordinances, require land use decisions be compatible with the sector plans.

The planning framework map in the General Plan identified preferred areas for development, revitalization, and conservation in Knoxville and Knox County. The three major categories include rural conservation areas, areas for future development, and substantially developed areas. The study area for the James White Parkway is predominantly categorized rural conservation and future development. The General Plan further breaks down future development into five categories, of which the James White Parkway would likely be categorized a resource corridor, which is primarily open space along rivers, streams, ridgelines or rural roads. The future land use map in the General Plan outlines no major changes for the study area. The map indicates the study area will be a combination of agricultural/rural residential and low density residential. The future land use map further illustrates commercial development will be predominant along transportation corridors, such as Chapman Highway west of the study area; therefore, it is assumed commercial development may be anticipated in proximity to James White Parkway once it is completed.

3.3.2 Potential Land Use and Infrastructure Impacts of the No-Build Alternative

3.3.2.1 Direct Impacts (Land Use and Infrastructure – No-Build Alternative)

Under the No-Build Alternative, not improving James White Parkway would have several adverse long-term direct impacts to land use and infrastructure. Additional new residential or commercial development along the corridor would be expected to be limited. As such, the No-Build Alternative would likely result in continued transition of land uses from more rural low density residential areas to more urbanized, higher density residential areas, especially in areas south of the project study area. Development of some areas may occur more slowly than would occur if the James White Parkway project is constructed. Without the improved corridor, the current local and regional transportation network would continue to inhibit growth and development in south Knoxville and south Knox County. The potential for commercial development at the intersection of Governor John Sevier Highway and Chapman Highway would also continue to be limited and is not fully realized under this alternative. Current traffic congestion conditions on Chapman Highway would also increase over time as traffic demand continues to increase, while LOS continues to decrease.

3.3.2.2 Indirect Impacts (Land Use and Infrastructure – No-Build Alternative)

Since no activities related to the proposed James White Parkway project would occur under the No-Build Alternative, there would be no indirect impacts to land use and infrastructure.

3.3.2.3 Cumulative Impacts (Land Use and Infrastructure – No-Build Alternative)

Land use and infrastructure under the No-Build Alternative would likely remain similar to current conditions; therefore, there would be no cumulative impacts to land use and infrastructure. There would be new developments in the area, especially south and southwest of the project area, but no dramatic changes in land use would occur as those areas were previously developed and used for commercial uses. There are no other proposed developments that would noticeably change land use within the project area.

3.3.3 Potential Land Use and Infrastructure Impacts of the Green Alternative

3.3.3.1 Direct Impacts (Land Use and Infrastructure – Green Alternative)

Implementation of the proposed project will result in both adverse short- and long-term direct impacts, as well as beneficial long-term direct impacts to existing and future land use and infrastructure within the project area.

Short-term adverse impacts include the utility relocations required under the Green Alternative. This would involve relocating power lines, natural gas, water and sewer lines in areas where they currently run parallel to or within the proposed ROW limits of the project.

The primary adverse long-term impact will be the conversion of currently developed residential and commercial areas to highway and associated ROW uses, and the displacement of residences and businesses within the proposed ROW. Under the Green Alternative, 47 single-family residences, one multi-family residential complex containing 18 units, two businesses, and one non-profit organization will be displaced. ROW acquisition may also result in the fragmentation of larger parcels along the James White Parkway corridor, which may no longer support existing land uses.

The Green Alternative may also result in increased adverse impacts to land use due to continued transition to more urbanized land uses with growing populations, especially areas south of Governor John Sevier Highway. This transition is expected to occur regardless of James White Parkway being extended. However, the new roadway would likely lead to more rapid changes in land use in some areas due to improved travel times to and from downtown Knoxville.

Beneficial long-term land use impacts are expected to occur as a result of project implementation. A more efficient and safer transportation facility would be completed, yielding greater user benefits in respect to vehicle operating costs and travel time. Improved accessibility under the Green Alternative will also benefit the remaining residences and businesses. As a result of this improvement and recurring benefits, development would be expected to increase along or near the James White Parkway corridor. Enhanced development opportunities would occur in strategic areas, such as the Governor John Sevier Highway/James White Parkway intersection and at other easily accessible areas along the route.

3.3.3.2 Indirect Impacts (Land Use and Infrastructure – Green Alternative)

Construction of James White Parkway under the Green Alternative would have some short-term adverse indirect impacts, and several beneficial long-term indirect impacts in terms of land use and infrastructure. Relocation of the displaced residences may result in loss of existing open space as replacement homes may be constructed on existing vacant lands. The majority of this land is currently zoned for residential land uses; therefore, this would not result in major changes to anticipated land uses in the study area.

Short-term adverse indirect impacts include real property tax revenues being decreased as a result of displacements and public acquisition of private property for additional rights-of-way. Furthermore, property values in certain areas immediately adjacent to James White Parkway may decline owing to adverse noise/visual effects of the proposed improvements under the Green Alternative.

In contrast, long-term beneficial indirect impacts would also occur. Property values and land use intensities would be expected to increase at strategic locations because of improved traffic flow, particularly on property suitable for highway-oriented commercial and residential uses. However, due to existing zoning and topography constraints in the immediate project

vicinity, it is not likely that substantial development would result. Land development in the project area would also be expected to increase through conversion of low density residential zoned rural land to more intensive uses, such as higher density residential and commercial uses. As a result of the change in the intensity of the land use, employment opportunities, earnings, and tax collection would also increase.

Other development and revitalization projects anticipated to occur in the more general project vicinity, especially those areas north, west, and south of the project, would likely occur whether the James White Parkway project is completed. Therefore, the impacts of those developments would not be considered indirect impacts of this project.

3.3.3.3 Cumulative Impacts (Land Use and Infrastructure – Green Alternative)

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 and freight movement through the region, and a general revitalization of the southern areas of Knoxville and Knox County. It is anticipated that most of the commercial land use increases would occur in areas south or southwest of the project area, such as in proximity to Governor John Sevier Highway. 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. In general, most areas where new developments are expected to occur would be located in previously developed areas with much of the infrastructure, such as access roads, utilities, and other essential items already in place. Therefore, it is anticipated that only a small number of measurable infrastructure expansion or improvement projects would be needed in the reasonably foreseeable future in the project vicinity. Overall, the general land uses in the project vicinity would not change substantially and would continue to be a combination of residential and agriculture/forest/vacant land uses. The James White Parkway Green Alternative is not expected to contribute to any major land uses changes. The project will help provide needed transportation support for the majority of any future project.

3.3.4 Potential Land Use and Infrastructure Impacts of the Blue Alternative

Land use and infrastructure impacts of the Blue Alternative would be similar to those listed under the Green Alternative above. However, adverse impacts under the Blue Alternative would be expected to be slightly higher due to additional impacts associated with improvements along Governor John Sevier Highway, which is required to move additional traffic between Chapman Highway and the James White Parkway southern terminus at Governor John Sevier Highway. Displacements for this alternative include 44 single-family residences, two mobile homes, one multi-family residential complex with 18 units, and three businesses.

3.3.5 Potential Land Use and Infrastructure Impacts of the Red Alternative

Land use and infrastructure impacts of the Red Alternative would be similar to those listed under the Green Alternative above. The adverse impacts under Red Alternative would be expected to be slightly higher than the Green and Blue Alternatives due to additional length of improvements along Governor John Sevier Highway that would be required to move additional traffic between Chapman Highway and the South Knoxville Boulevard southern

terminus at Governor John Sevier Highway. Displacements for this alternative include 42 single-family residences, two mobile homes, one multi-family residential complex with 18 units, and five businesses.

3.3.6 Mitigation

Mitigation measures, as defined by the Council on Environmental Quality (40 CFR 1508.20), include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating the impact over time, and compensating for the impact. Knox County has mechanisms in effect to minimize, mitigate, or avoid adverse impacts to land use that could potentially result from project implementation. Potential changes to land use that may result from indirect and cumulative impacts can be addressed through implementation and application of applicable Knox County growth policy plans, zoning and subdivision ordinances, design guidelines, and other special ordinances and/or policies. In some cases, there is potential that the ROW boundaries could be shifted to avoid a small portion of a parcel. However, changes in the ROW boundary would be on a case-by-case basis and would not be considered if the change would compromise the overall integrity of the design.

All land acquisitions and relocation of displaced households, businesses, and any other affected parties would be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972 and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646).

3.4 Soils and Farmland

3.4.1 Affected Environment

3.4.1.1 Farmland

The Farmland Protection Policy Act of 1981 (FPPA) seeks to "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses, and to insure that federal programs are administered in a manner that, to the extent practicable, will be compatible with State and local government, and private programs and policies to protect farmland."

Prime, Unique, or Statewide or Locally Important Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, or oil-seed and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor without intolerable soil erosion. Prime farmland includes land that possesses the above characteristics and may include land currently used as cropland, pastureland, rangeland or forestland. Prime farmland does not include land already in or committed to urban development or water storage. (Land within the City Limits of Knoxville was excluded from the Prime Farmland analysis area.)

Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to economically produce high quality or high yields of specific crops when treated and managed according to acceptable farming methods.

Statewide or locally important farmland is land that has been designated of state or local importance for the production of food, feed, fiber, forage or oil-seed crops but is not of national importance.

The USDA, Natural Resources Conservation Service (NRCS) characterizes eligible farmlands as prime, unique, or of statewide or local significance. The designations, defined below, are based on NRCS soil type and are protected by federal legislation.

In accordance with the FPPA, a Farmland Conversion Impact Rating Form was submitted to the NRCS for Knox County, and an assessment score was determined for each alternative. This score is determined by numerous factors, including the agricultural value of the land. The score is used to determine which areas should receive the highest level of protection from conversion to nonagricultural uses. The higher the numerical score given to a proposed alternative, the more protection the farmland affected by it would receive. The highest rating possible is 260. Sites receiving a total score of 160 points or less typically do not require further evaluation. If the site receives a score higher than 160 points, alternatives should be developed that would avoid or minimize impacts to farmland.

All of the build alternative ROWs were evaluated in accordance with the FFPA. Some soils classified as prime or unique farmland are found within the project area outside of the city limits of Knoxville. Most of the farmland soils in the southern portions of Knox County are located along the larger streams, such as Burnett Creek, and their associated valleys. None of land appeared to be used for row crops, but some land may have been used to produce hay and/or provide pasture for livestock. The approximate amount of prime and unique farmland as identified by the NRCS for each of the proposed build alternatives is shown on Table 3.3. The NRCS correspondence and Farmland Conversion Rating Forms are included in Appendix C.

Table 3.3. Prime and unique farmland taken by each James White Parkway Build Alternative located in Knox County, Tennessee.

Alternative	Acres of Prime and Unique Farmland Taken	Overall Farmland Conversion Impact Rating Assessment Score[1]
Green Alternative	11	81
Blue Alternative	16.5	88
Red Alternative	20	89

[1] The highest possible overall score is 260. Scores over 160 points may require further evaluation and additional efforts to avoid or reduce impacts.

Source: USDA, 2011 and Parsons, 2011.

3.4.1.2 Soils

Much of the land in the study area is rolling to steep, contains shallow soils and numerous rock outcrops, is poorly suited for use as cropland, and has limited use as pasture land. Small areas of more fertile, deeper, and less rocky soils are found near a few of the drainageways and streams. Much of the area is forested due primarily to the limits of the terrain for other uses.

Mapped soils in the area are primarily of the following types described on the Knox County Soil Survey (NRCS, 2011): Loyston-Talbott Rock Outcrop Complex (15-50% Slopes);

Coghill-Corryton Complex (25-65% Slopes, Rocky); Nonaburg Channery Silt Loam (12-25% Slopes, Severely Eroded, Rocky), and Heiskell Silt Loam (2-5% Slopes). The Loyston Talbott Rock Outcrop Complex and Coghill-Corryton Complex contain parent material consisting of clayey residuum weathered from limestone, sandstone, and/or shale. The natural drainage class of these soils is well drained and water movement in the most restrictive layer is moderately high. The Nonaburg Channery Silt Loam occurs on ridges within river valleys and has parent material consisting of clayey residuum weathered from calcareous shale. The Heiskell Silt Loam occurs within drainageways of stream and river valleys and has parent material consisting of loamy alluvium derived from limestone and shale. The natural drainage class of both types of silt loam is well drained with water movement in the most restrictive layer is moderately high.

3.4.2 Potential Soils and Farmland Impacts of the No-Build Alternative

3.4.2.1 Direct Impacts (Soils and Farmland – No-Build Alternative)

No direct impacts to soils and farmland resources would be anticipated under the No-Build Alternative. Without construction of the James White Parkway, current land uses and development trends would continue in the project area.

3.4.2.2 Indirect Impacts (Soils and Farmland – No-Build Alternative)

Under the No-Build Alternative, no indirect impacts to soils and farmland resources would be anticipated. The surrounding area may become less attractive for continued residential and commercial developments, and therefore the potential for additional impacts to farmland may be somewhat reduced in the long term, but this reduction is considered negligible.

3.4.2.3 Cumulative Impacts (Soils and Farmland – No-Build Alternative)

Under the No-Build Alternative, no cumulative impacts to soils and farmland resources would be anticipated. Without construction of the James White Parkway, current land uses and development trends would continue in the project area.

3.4.3 Potential Soils and Farmland Impacts of the Green Alternative

3.4.3.1 Direct Impacts (Soils and Farmland – Green Alternative)

The farmland impact rating score for the Green Alternative (81 points) was well below the 160-point threshold discussed above. Although impacts to farmland are lowest under the Green Alternative, there would be some unavoidable farmland impacts. Portions of the proposed James White Parkway ROW would cross existing farmland and result in direct conversion of that land to non-farm uses. None of the farmland in the project area is in production at this time. The conversion of farmland would have a long-term impact on crop and/or timber production depending on the future use of the land.

Soils in the project area would be disturbed during construction of the project as earth-moving equipment would be used to grade the area. Grading of the project area would require a combination of cutting or leveling hills and filling of small valleys or low areas along the length of the project. Some erosion of soils is expected to occur during the construction phase of the project as exposed soils are unavoidable. Best management techniques would be utilized to control erosion and subsequent sedimentation in and adjacent to the project area. The mitigation section below provides more detail regarding the general actions that would be taken to control soil erosion during and following construction.

3.4.3.2 Indirect Impacts (Soils and Farmland – Green Alternative)

Farmland, soils, and karst geology adjacent to the Green Alternative ROW could be indirectly impacted through secondary development. The project is expected to encourage

some new development, especially near the proposed interchanges with other local roadways. It is likely, given the rural nature of the area, that some of this new development could occur on farmland. It is also likely, given the large areas of karst geology in the area, that some of this new development would occur on land with sinkholes and caves.

3.4.3.3 Cumulative Impacts (Soils and Farmland – Green Alternative)

Any impacts to soils and farmland resulting from this project would be cumulative to similar impacts associated with other past, present, and reasonably foreseeable future projects. However, it is not anticipated that substantial new impacts would occur as both this project and many of the developments would occur in previously developed urban areas. Therefore, no substantial cumulative impacts to soils and farmland resources are anticipated.

3.4.4 Potential Soils and Farmland Impacts of the Blue Alternative

Types of impacts to farmland associated with the Blue Alternative would be similar to those discussed under the Green Alternative, except the impacts would be somewhat higher (88 points) due to the additional amount of prime farmland soils that would be utilized under the Blue Alternative.

3.4.5 Potential Soils and Farmland Impacts of the Red Alternative

Impacts to farmland associated with the Red Alternative would be similar to those discussed under the Green and Blue Alternatives, except the impacts would be slightly higher (89 points) due to the additional amount of prime farmland soils that would be utilized under the Red Alternative.

3.4.6 Mitigation

Impacts to farmland will be minimal under each of the build alternatives. Although only short-term adverse impacts to soils are anticipated, all reasonable precautions will be taken to ensure that any potential adverse impacts to soils are minimized. Soil protection measures are described in the following documents:

- Tennessee Erosion and Sediment Control Handbook (TDEC, 2002).
- Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot, 1992).
- Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction (TDOT, 2006).

Examples of mitigation measures include:

- The unnecessary removal of existing vegetation would be avoided. Canopy removal along all working or staging areas would be limited to the extent practicable.
- Where removal of vegetation is necessary, sediment control measures would be employed immediately at the start of construction.
- Areas disturbed during construction will be revegetated as soon as possible.
- Control structures would be inspected and properly maintained throughout the life of the project.

3.5 Geology

3.5.1 Geology Affected Environment

Knox County is in the eastern part of Tennessee and covers 336,600 acres (526 square miles). Knox County lies entirely within the Southern Appalachian Ridges and Valleys major land resource area. The soils range from shallow to very deep over limestone, dolomite, shale, siltstone, or sandstone bedrock. The county consists of a series of southwest- to northeast-trending ridges and intervening valleys. The ridges and valleys were formed by thrust faulting of the underlying bedrock early in the development of the landscape. The geologic ages of the bedrock are Cambrian, Ordovician, and Silurian. Six major faults and numerous minor faults occur in the county. Major faults are the Copper Creek, Beaver Valley, Saltville, Knoxville, Rocky Valley, and Dumplin Valley Faults. Each fault extends from southwest to northeast and represents a separation between distinct physiographic units. The relief is mainly rolling to hilly, but numerous steep, fairly rugged ridges extend throughout the county. Elevations range from about 740 feet, on the Clinch River where it leaves the county, to about 2,128 feet on House Mountain (USDA, 2006).

The Geotechnical and Geohazards Report (TDOT 2007b), Hydrological and Dye Trace Study (TDOT 2009a), and the Geologic Brief on Karst and Caves (TDOT 2009b) describe the local geology of the James White Parkway project corridor. The proposed James White Parkway corridor is situated in the rolling to hilly topography of the Valley and Ridge Province of East Tennessee. The corridor is underlain by folded and faulted sedimentary strata that consist of shale, limestone, siltstone, and sandstone units. The rocks are of Ordovician age belonging to the Chickamauga Group of geologic formations. Subdivisions of this major rock group include:

- Ol – Lenoir Formation; argillaceaous limestone, some sinkholes and caves; moderately common karst association.
- Oh – Holston Formation; crystalline limestone; numerous sinkholes and caves; major karst association.
- Ocr – Chapman Ridge Formation; sandstone; high knobs and ridges.
- Oo – Ottosee Formation; calcareous shale; valley floors and low rolling hills; minor karst association.

Large areas (up to 50 or 60 percent) of East Tennessee are underlain by carbonate rocks, such as limestone and dolostone. As a result, these areas are subject to chemical weathering and karst landform development, such as sinkholes and cave systems. Karst areas may experience a sudden sinkhole collapse or flooding. This is of considerable importance to the design and construction of the proposed highway infrastructure. A total of eight caves as well as numerous sinkholes were located within the study area used to identify potential reasonable alternatives during the alternatives analysis phase of this EIS. The karst features identified in the project vicinity are concentrated near Cruze Road/Red Bud Drive/Old Sevierville Pike, Ijams Nature Center/Meades Quarry, and an area just north of the Governor John Sevier Highway.

Of the eight caves identified during the alternatives analysis phase, two were determined by TDOT Geotechnical Section to be substantial enough to require more in-depth study and analysis (Meades Quarry Cave and Cruze Cave). In addition to the geotechnical studies listed above, the James White Parkway Biological Assessment (BA) (TDOT 2011b) and Ecology Study Technical Report, both on file with the TDOT Environmental Division, contain

additional information regarding these resources. Figures showing the location of the caves and sinkholes within or adjacent to the project corridor are in the Ecology Report and geotechnical reports.

After the current build alternatives were developed, additional on-site field investigations were conducted to determine the presence of individual sinkholes and caves within the proposed ROWs. Table 3.4 shows the caves and sinkholes that have been recorded within the proposed build alternative ROWs.

The primary areas within the ROW containing karst features visible from the surface included an area near Margaret Lane and the William Hastie Natural Area, an area from near Helix Lane southeastward to near Johnson Creek, and a third area near the intersections of Sevierville Pike and Old Sevierville Pike, and finally an area northeast of Sevierville Pike and just west of Gondola Drive.

Most of the individual sinkholes impacted are relatively small sinkholes with little to no opening. However, a few of the sinkholes had small openings and showed evidence of recent subsidence. One large sinkhole with multiple sub-sinkhole areas contained within it is located in the southern portion of the Blue Alternative and Red Alternative northeast of Sevierville Pike and west of Gondola Drive. This area will require additional detailed geotechnical studies to ensure there are no caves underlying this area should one of those two build alternatives be selected.

Table 3.4. Caves and sinkholes impacted by each James White Parkway Build Alternative located in Knox County, Tennessee.

Alternative	Number of Caves Present in ROW	Number of Sinkholes Present in ROW	Estimated Area of Sinkholes within ROW (acres)
Green Alternative	2	6	0.77
Blue Alternative	1	7	3.20
Red Alternative	1	9	2.99

Sources: Parsons, 2011 TDOT 2009, and TDOT 2007.

The known caves impacted by the project include Margaret Cave, which is located within the proposed ROW of all three build alternatives, and Johnson Cave, which is located within the ROW of the Green Alternative and just northeast of the Blue Alternative. Due to the relatively small size of these caves and because they lie near the edge of the proposed ROWs, it is possible that minor shifting of the alignments near each cave could avoid or minimize impacts to them.

The Geotechnical and Geohazards Report prepared for the project determined that acid-producing (pyritic) material is not expected to be encountered in the study area (TDOT 2007b). However, additional geotechnical investigations will be conducted during the design phase, should a build alternative be selected, and if some possibility of encountering acid-producing material is disclosed during that study, then an assessment and mitigation plan will be developed at that time.

3.5.2 Potential Geology Impacts of the No-Build Alternative

3.5.2.1 Direct Impacts (Geology – No-Build Alternative)

No direct impacts to the geology or physical resources of the area would be anticipated under the No-Build Alternative. Without construction of the James White Parkway, current land uses and development trends would continue in the project area.

3.5.2.2 Indirect Impacts (Geology – No-Build Alternative)

Under the No-Build Alternative, no indirect impacts to geology or physical resources would be anticipated. The surrounding area may become less attractive for continued residential and commercial developments, and therefore the potential for additional impacts to karst features may be somewhat reduced in the long term, but this reduction is considered negligible.

3.5.2.3 Cumulative Impacts (Geology – No-Build Alternative)

Under the No-Build Alternative, no cumulative impacts to geology or physical resources would be anticipated. Without construction of the James White Parkway, current land uses and development trends would continue in the project area.

3.5.3 Potential Geology Impacts of the Green Alternative

3.5.3.1 Direct Impacts (Farmland, Soils, and Geology – Green Alternative)

The Green Alternative would impact two caves (Margaret Cave and Johnson Cave), which is one more than both the Blue Alternative and Red Alternative. However, it is expected that minor alignment shifts could fully avoid or minimize impacts to these caves. The Green Alternative would affect six sinkholes, which is less than the other two build alternatives. The total area of sinkholes impacted by the Green Alternative is approximately 0.77 acre, which is also less than both the Blue Alternative and Red Alternative. Karst geology would be impacted during construction of the project where caves and sinkholes are exhumed and/or filled in with the embankment material, and where surface drainage is directed into sinkholes that empty into caves and groundwater systems. The TDOT Hydrologic and Dye Trace Study (2009) suggested that flows from sinkholes within the current proposed ROW of the build alternative alignments would <u>not</u> enter the Meades Quarry or Cruze Cave systems. These impacts can be lessened by appropriate and judicious mitigation during the design and construction phase of the project as described in the mitigation section below.

3.5.3.2 Indirect Impacts (Farmland, Soils, and Geology – Green Alternative)

The karst geology adjacent to the Green Alternative ROW could be indirectly impacted through secondary development. The project is expected to encourage some new development, especially near the proposed interchanges with other local roadways. Given the large areas of karst geology in the area, some of this new development would occur on land with sinkholes and caves.

3.5.3.3 Cumulative Impacts (Farmland, Soils, and Geology – Green Alternative)

Any impacts to geological features resulting from this project would be cumulative to similar impacts associated with other past, present, and reasonably foreseeable future projects. However, it is not anticipated that substantial new impacts would occur as many of the new developments would occur in areas most suitable for development, which do not contain substantial karst features. Therefore, no substantial cumulative impacts to geology are anticipated.

3.5.4 Potential Farmland, Soils, and Geology Impacts of the Blue Alternative

Impacts to geology associated with the Blue Alternative would be similar to those discussed under the Green Alternative, except slightly higher, because the Blue Alternative would impact an additional area of intense karsts and sinkholes near the southeastern portion of the study corridor just north of the Governor John Sevier Highway that the Green Alternative avoids. The Blue Alternative would impact one cave (Margaret Cave) and seven sinkholes. The total area of sinkholes impacted is approximately 3.20 acres representing the largest area of sinkholes impacted by any of the build alternatives.

3.5.5 Potential Farmland, Soils, and Geology Impacts of the Red Alternative

The impacts to geology associated with the Red Alternative would be similar to those discussed under the Blue Alternative in that it would affect only one cave (Margaret Cave). The Red Alternative would affect nine sinkholes, the most of all of the build alternatives. However, the total area of sinkholes impacted is approximately 2.99 acres, slightly less than the Blue Alternative, but more than the Green Alternative.

3.5.6 Mitigation

Impacts to geology, including karst features, will be avoided or minimized to the extent possible for each of the build alternatives. Measures used to protect soils discussed in Section 3.4.6 above will also help to protect karst features to some extent by reducing the potential for erosion and subsequent sedimentation into sinkholes and caves.

Due to the nature of karst topography and the number of features observed in the area, it is possible that additional caves may be present that do not have openings within the study area or do not have entrances large enough for humans. Further geotechnical studies will be conducted once a preferred alternative has been selected during the design phase of the project. Should additional caves be located, additional studies will be conducted to determine the size of such features, the hazards they might present, and whether avoidance or changes in the overall design of the roadway will be required. If entrances are available, additional biological surveys will be conducted to determine if any threatened or endangered species are present.

Impact minimization of construction on the sinkhole and cave environments include the following measures to be considered and/or employed during the roadway design phase:

- Design measures, such as minimizing cut and fill to the extent possible during design and construction with minimal alterations in the drainage of an area (both surface and subsurface).
- Proactive measures, such as
  - surface drainage filtration systems for existing sinkholes, including grass-lined stormwater channels in place of concrete ditches;
  - impermeable lining for ditch lines in non-sinkhole areas (to prevent new sinkholes from forming);
  - the use of graded rock embankments (for stability and groundwater impacts);
  - where feasible, directing surface highway runoff directly through stormwater pipes and/or ditches into nearby surface streams that remain above the surface until entering larger waterbodies downstream (to reduce roadway contaminants entering groundwater and/or sinkhole/cave systems); and

- the use of structural bridges over sensitive sinkholes to maintain more natural drainage/biological integrity of those systems.

3.6 Social Environment

3.6.1 Affected Environment

The geographic area considered for the social environment includes Knox County as well as Knoxville, Seymour, and Sevier Counties. The geographic area for environmental justice analysis also includes census tracts and block groups.

3.6.1.1 Population and Housing Trends

Population trends for the census geography areas are shown on Table 3.5. Between 2000 and 2010, the population increased in both Sevier and Knox County. Knox County's population grew approximately 13 percent in the decade. Growth in Knox County led the "big-four" metropolitan counties (Shelby [3.4 percent], Hamilton [9.3 percent], and Davidson [10.0 percent]) in the state (Knox County 2011). Population growth has been steady and increasing in the area. Knoxville's strong economy with the lowest metropolitan jobless rate in the state and third lowest rate out of all 95 counties make it a good place for jobs (Knox County 2011).

Sevier County saw the greatest population increase with approximately 26 percent (SCEDC, 2011). It is one of the fastest growing counties in Tennessee. The area has a low cost of living, low crime rate, and a variety of housing options. Tourism drives the economy with nearly 50 percent of the county is employed in the tourism and hospitality industry (SCEDC 2011). The county is known as the "Gateway to the Great Smoky Mountains," which is the most visited national park in the country with nearly 9.5 million visitors in 2010 (NPCA 2010).

The Seymour/South Knox County corridor consists of approximately 19,631 residents. Seymour, an unincorporated town in the northern portion of Sevier County, had a population of 10,919 according to the Census. However, the Seymour Chamber of Commerce indicates that many of the surrounding unincorporated areas of Sevier County approximately 55,000 people are served by Seymour businesses.

Table 3.5. Population Trends, 1990-2020.				
Geographic Area	**2020 Projected Population[1]**	**Percent Population Change (2000-2010)**	**2010 Population**	**2000 Population**
City of Knoxville, TN	NA	3.0	178,874	173,890
Seymour CDP, TN	NA	23.4	10,919	8,850
Knox County	482,498	13.1	432,226	382,032
Sevier County	103,323	26.3	89,889	71,170
Tennessee	3,327,660	11.5	6,346,105	5,689,283

[1] Tennessee Advisory Commission on Intergovernmental Relations, 2011
NA = data are not available.
Source(s): U.S. Census Bureau, 2000 and 2010a and Tennessee Advisory Commission on Intergovernmental Relations, 2011.

Population distribution by age cohort for the census geography areas is shown on Table 3.6. The median age for Knox County, 37.2, was slightly younger than Sevier County, 40.9. The age distribution of the population reflects a typical population age pyramid with a greater share of the population being at the young (under 19) and young/middle-age categories (25 to 54). There are no substantial differences in age distribution of the population within the project area.

Table 3.6. Population Distribution by Age Cohort within the Project Area, 2010 (percent).					
Age Cohort (Years)	**State of Tennessee**	**Knox County**	**Sevier County**	**City of Knoxville**	**Seymour CDP**
Under 19	26	25	25	24	25
20-24	7	9	6	13	5
25-34	13	14	12	16	11
35-44	14	13	14	12	15
45-54	15	14	15	12	15
55-64	12	12	14	11	13
65-74	8	7	10	6	10
75 & Over	6	6	6	7	6

Source: U.S. Census Bureau, 2010a.

Selected housing characteristics related to occupancy status, median value, vacancy rate, and size of household are shown on Table 3.7. In 2009, there were 250,867 housing units within the two-county project area according to the 2000 U.S. Census. Approximately 78 percent of the total housing units within the project area are in Knox County. The number of housing units increased by approximately 7 percent during the 2000-2010 period. Sevier County added 13,249 houses during this period while Knox County added 2,220. Single family residential on large rural lots is the dominant housing type along the proposed ROW. The rural nature of the area partially explains the greater predominance of single family dwellings. Multi-family housing occurs more commonly with the more developed or densely populated portions of Knoxville.

Table 3.7. Housing Characteristics within the James White Parkway Project Area, 2010.

County	Total Housing Units, 2010	Percent Vacant, 2010	Percent Owner Occupied, 2010	Median Housing Value, 2008[1]	Average Household Size, 2010
Knox County	194,949	9.1	66.2	$172,200	2.4
Sevier County	55,918	36.8	68.7	$164,900	2.5
City of Knoxville	88,009	11.3	49.2	NA	2.2
Seymour CDP	4,527	5.8	72.3	NA	2.6
Total/ Average (County)	250,867	23.0	67.5	$168,550	2.5

[1] Tennessee Department of Economic and Community Development, 2010

NA = Not Available

Source: USCB 2000 and TDECD 2010

3.6.1.2 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.* This EO was issued to provide that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

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

The initial step in this process is the identification of minority and low-income populations that might be affected by implementing the proposed action. FHWA Order 6640.23 defines

minority as a person who is Black, Hispanic, Asian American, or American Indian/Alaskan Native and low-income means a household income at or below the U.S. Department of Health and Human Services Poverty Guidelines. For environmental justice considerations, these populations are defined as individuals or groups of individuals that are subject to an actual or potential health, economic, or environmental threat arising from existing or proposed federal actions and policies.

Minority and low-income population data were collected for the State of Tennessee, Knox County, the City of Knoxville, Census tracts, Census block groups, and Census blocks in the project area as shown on Figure 3.2. Table 3.8 contains a summary of the minority and low-income population data. The percentage of minority populations within the census tracts averages approximately 4 percent, which is lower than both the county (12%) and city (20%) average. The weighted average poverty threshold for a family of four in 2009 in the United States was $21,954. The three Census tracts within the project area had a wide range of the population below the poverty level ranging from 5 percent in Tract 56.01 to 22 percent in Tract 23.

Although Census Tract 23 Block Group 1 contains a substantially higher percentage of minorities than the respective city average, this block group is located near the intersection of Moody Avenue and James White Parkway and lies adjacent to the project area. However, no residents would be displaced in this block group and the group would not be disproportionately affected. The remaining block groups have low-income population percentages that are lower than the average for the City of Knoxville.

This environmental document was sent to TDOT Civil Rights Staff for review to ensure that the studies conducted to date have been conducted in accordance with Title VI of the Civil Rights Act of 1964, Executive Order 12898 (Environmental Justice), and NEPA. In a response letter dated December 23, 2011, TDOT Civil Rights Staff found that the assessment and methodology used was in compliance with the laws that govern programs/projects that are federally funded. TDOT Civil Rights staff will continue to be involved with this project in subsequent phases of the project.

Figure 3.2. Map of Census Tracts for the James White Parkway project area.

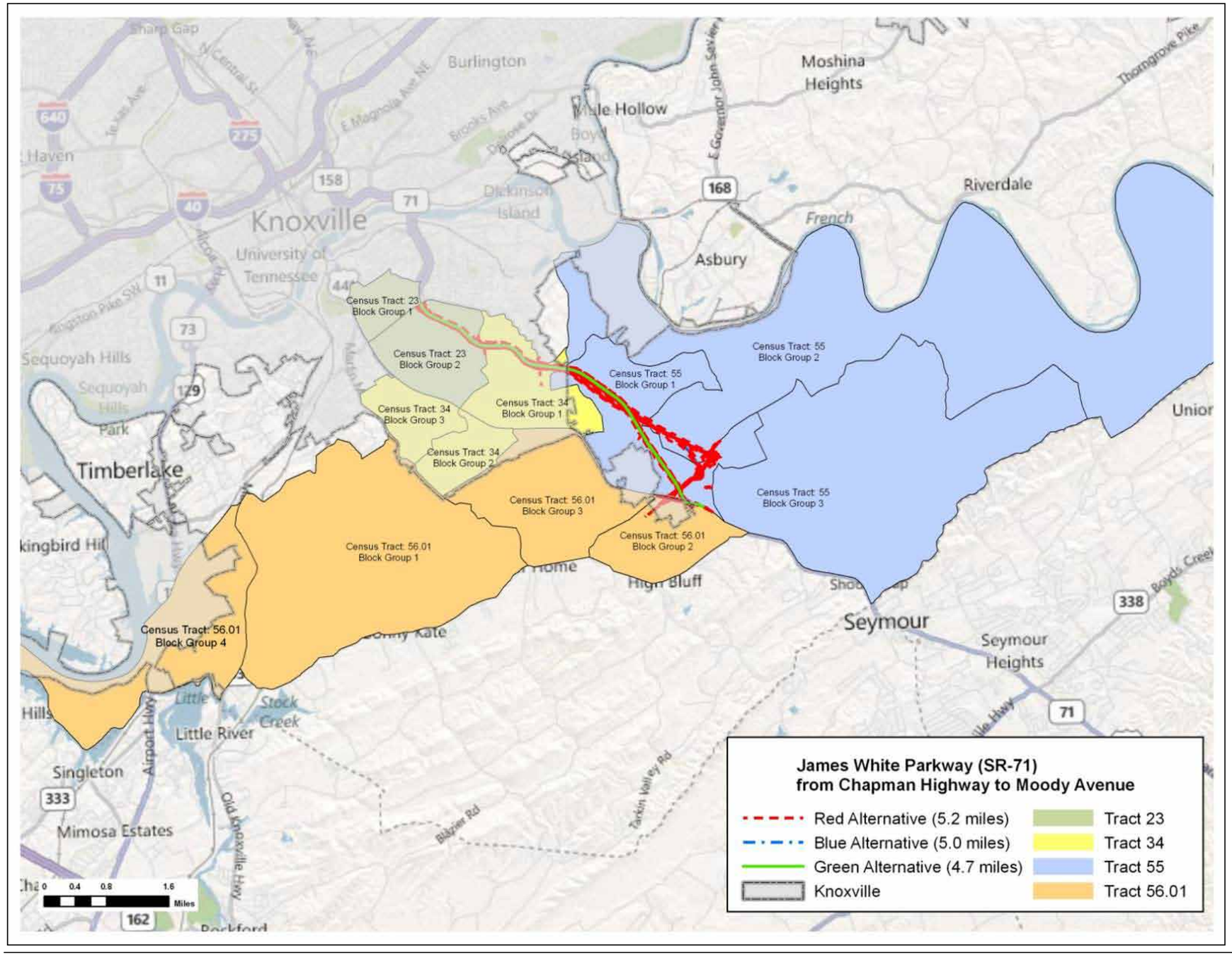

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Table 3.8. Summary of Minority and Income Data for the James White Parkway Project Area.				
Geographic Area	**Population 2000**	**Percent Minority 2000**	**Median Household Income**	**Percent Below Poverty Level 2000**
Tennessee	5,689,283	20	$36,360	13
Knox County, TN	382,032	12	$37,454	13
Knoxville, TN	173,680	20	$27,492	21
Census Tract 23	3,207	7	$24,856	22
Block Group 1	1,593	9	$20,827	30
Block Group 2	1,614	5	$27,782	14
Census Tract 34	3,869	5	$32,179	7
Block Group 1	1,527	5	$29,146	9
Block Group 2	1,419	3	$35,764	6
Block Group 3	923	7	$31,484	4
Census Tract 55	6,089	2	$31,748	13
Block Group 1	1,110	1	$38,229	6
Block Group 2	2,610	2	$27,300	14
Block Group 3	2,369	2	$31,128	15
Census Tract 56.01	5,577	2	$45,428	6
Block Group 1	2,462	2	$46,750	2
Block Group 2	693	5	$33,625	16
Block Group 3	1,588	3	$43,125	4
Block Group 4	834	0	$73,750	9
Source(s): USCB 2000				

3.6.1.3 Displacements and Relocations

A field survey was conducted along the proposed ROW for each build alternative of the James White Parkway Expansion to determine residential, business, and public/not-for-profit displacements that would potentially occur because of the proposed project. A Conceptual Stage Relocation Plan (CSRP) was prepared for this project. The CSRP is available on the project website at: http://www.tdot.state.tn.us/sr71/ and is on file with the TDOT Environmental Division. Table 3.9 summarizes the displacement data by alternative. These numbers may change slightly during the final design and acquisition phases of the project as minor shifts in the ROW boundary could occur.

Table 3.9. Type and Estimated Number of Displacements out of the Total Number of Structures Located in the Study Area of each James White Parkway Build Alternative.

Type of Displacement	Build Alternatives		
	Green Alternative	**Blue Alternative**	**Red Alternative**
Single Family Residence	47	44	42
Multi-Family Complex/# of Units	1/with 18 units	1/with 18 units	1/with 18 units
Mobile Home	0	2	2
Total Number of Residential/ Household Units Displaced	65	64	62
Businesses	2	3	5
Farms	0	0	0
Non-Profit (Churches, etc.)	1	0	0

Source: Conceptual State Relocation Plan (PIN 101420.00).

Although there is the potential for approximately 65 displacements, a study of the real estate market in the project area indicates an active market with sufficient housing both for sale and for rent to accommodate those displaced by this project. A survey of the Knox County residential real estate market using the Knoxville Area Association of Realtors website revealed a total of 141 active listings in the immediate project area ranging in price from $50,000 to $250,000 and in size from 720 to 3,300 square feet. The variation of home prices is due to the broad range of potentially displaced residences, which typically include either manufactured homes or older and smaller frame homes on the lower end of the cost spectrum to newer and larger homes that are typically in newer subdivisions. The study of the Knox County real estate market reveals that there is an adequate supply of housing at a variety of price points and sizes in the project area to accommodate the displaced persons. The available commercial properties for displaced businesses are shown on Table 3.10.

Table 3.10. Availability of Commercial Real Estate for Sale and/or Lease	
Property Type	**Number Available (For Sale and/or Lease)**
Office Spaces	13
Shopping Center Spaces	3
Commercial/Retail Buildings	21
Vacant Land	21
Source: Conceptual State Relocation Plan (PIN 101420.00).	

3.6.1.4 Neighborhood and Community Cohesion

The primary communities that would be impacted by this project include the City of Knoxville and the Seymour portion of Sevier County. Most of the subdivisions that would be impacted within the immediate project area are located around the proposed connection of James White Parkway with Moody Avenue and Governor John Sevier Highway. Subdivisions near Panorama/View Park Drive, Prospect/Mission Road, and Norton Road would also be impacted under at least one of the build alternatives. The remaining residences are clustered in small groups or small neighborhoods along the north side of Sevierville Pike Road. Due to the relatively small size of the neighborhoods in the area, displacement of a small portion of residences may be meaningful in terms of neighborhood cohesion.

3.6.1.5 Travel Efficiency

Chapman Highway is the only north-south route connecting Knoxville's CBD loop, Southern Knox County, and the Seymour Portion of Sevier County. The SR-66 connector from Sevierville to I-40 reroutes much of the non-local traffic.

As discussed in Section 3.6.1.1, southern Knox County and Sevier County are fast–growing areas. Traffic volumes are projected to increase along the existing Chapman Highway, which will result in reduced travel efficiency in the long-term. The Chapman Highway Corridor Study adopted in 2006 includes traffic analyses on a highway segment basis for a future year of 2030 and indicates LOS E (extremely unstable operations) in two of six segments. Some signs of travel efficiency problems have already begun to develop along portions of the existing route. For example, crash rates along portions of Chapman Highway are higher than statewide averages for similar roadway types. Such problems would only be expected to worsen as traffic volumes in the area continue to increase.

Reduced travel efficiencies can result in both social and economic consequences, including increased commuting times, increased response time for emergency vehicles, increased congestion-related crashes, lower fuel efficiency, and potential impacts on property values as the area could become less desirable to new residents due to traffic issues.

3.6.1.6 Community Resources

Community facilities provide basic needs and services to communities and neighborhoods in the area. Transportation projects may affect the safety and efficiency of travel and thus changing access to public facilities and services including fire, police, and ambulance responsiveness and access of residents to the use of local schools, churches, hospitals, parks, post offices, and libraries.

Community facilities that were identified in the project study area and discussed below include places of worship, public parks and recreational facilities, educational facilities, social service and healthcare facilities, public service facilities (post offices and libraries), and public safety facilities (police, fire, and rescue).

Places of Worship. There are eleven churches and three known cemeteries located within one mile of the proposed James White Parkway.

Public Parks and Recreational Facilities. There are five public city parks located within one mile of the proposed James White Parkway. The Cecil Webb Recreational Facility is located just north of the project terminus near East Moody Avenue. William Hastie Natural Area, Forks of the River Wildlife Management Area, and Marie Myers Park are also within one mile of the proposed project.

Schools and Colleges. There are five educational facilities located within one mile of the project study area. Three schools are located within or immediately adjacent to the James White Parkway corridor: South Doyle Middle School; South Young High School; and Head Start Anderson Elementary School. The University of Tennessee is located near downtown Knoxville, across the Tennessee River.

Social Service and Healthcare Facilities. The main regional hospitals in the area are the University of Tennessee Medical Center and Fort Sanders Regional Medical Center. University of Tennessee Medical Center is a general medical and surgical hospital as well as offering care as the area's only Level I Trauma Center. The 503-bed hospital is a tertiary facility, offering general, specialty and sub-specialty care in a full range of medical fields. Fort Sanders Regional Medical Center is located near downtown Knoxville and has 415 beds. Fort Sanders Regional Medical Center is a regional referral center for neurology, neurosurgery, orthopedics, oncology, cardiology, obstetrics and rehabilitation medicine. The hospital offers a variety of specialized services, such as one-day surgery, electro-diagnostics, a sleep disorders center, a diabetes management center, prenatal education, and sports medicine.

Public Service Facilities. There are no post offices or libraries located within or adjacent to the James White Parkway study corridor. The closest post office and library is located near the East Moody Avenue / Chapman Highway intersection.

Public Safety Facilities. Public safety facilities located within or adjacent to the James White Parkway study corridor include Police and Fire. The Knoxville Police Department is located in downtown Knoxville. The Knoxville Fire Department, which also provides Emergency Medical Services, has several fire stations in the vicinity of the project area (#10, #13, and #19).

3.6.2 Potential Social Environment Impacts of the No-Build Alternative

3.6.2.1 Direct Impacts (Social Environment – No-Build Alternative)

No direct impacts to the social environment would be anticipated under the No-Build Alternative as no substantial changes from the baseline conditions would occur. Existing social conditions and trends would be expected to continue in the project area.

3.6.2.2 Indirect Impacts (Social Environment – No-Build Alternative)

Because the James White Parkway extension would not be constructed, local roads would continue to become more crowded if population levels increased. This would result in decreased LOS on local roadways specifically Chapman Highway. Increased traffic congestion would also place drivers at a higher risk for congestion-related crashes.

Reduction in travel efficiency along Chapman Highway can result in potential social impacts especially on local communities. Some of the potential social impacts would be due to increased travel times required for commuters to go to and from work, school, and other travel destinations. In addition, response time for emergency vehicles can be adversely impacted. It is likely that more traffic may attempt to use the local neighborhood roadways to avoid traffic jams on Chapman Highway.

3.6.2.3 Cumulative Impacts (Social Environment – No-Build Alternative)

Some adverse cumulative impacts to the social environment would be expected due to increased industrial, residential, and commercial developments expected to occur in the general project vicinity regardless of whether the James White Parkway is expanded or not. With no major improvements like extending James White Parkway, it would be expected that the additional traffic generated by other non-related projects would result in further decreases in LOS on local roadways. This would result in adverse impacts to the social environment due to increases in traffic congestion and noise and decreases in air quality and safety in and around the local neighborhoods. It is likely that more traffic may attempt to use the local neighborhood roadways to avoid traffic jams on Chapman Highway.

3.6.3 Potential Social Environment Impacts of the Green Alternative

3.6.3.1 Direct Impacts (Social Environment – Green Alternative)

Direct short-term adverse minor impacts to populations would occur as a result of population loss from the displacement and relocation of residences. The potential estimated population loss is approximately 156 people based on an average household size of 2.4 persons per household (Census 2010). The project will not separate entire neighborhoods or deny them access to community centers, schools, hospitals, or emergency services. There would be long-term negligible adverse impacts on neighborhood cohesion. Most of the existing housing along the proposed project area is small clusters of houses in rural settings. The larger neighborhoods in the area were avoided during the alternative development process to reduce displacements and associated impacts to neighborhoods. The displacement of 1 or 2 households in the small rural neighborhoods could be meaningful to the residents. However, it is anticipated that, when possible, many of the displaced families would prefer and attempt to relocate in the same general area.

The adverse impacts of the proposed project would not be primarily or disproportionately borne by minority or low income populations. Based on the census data gathered, the potential residential displacements are comprised of a mixture of income levels and are located within block groups with both minority and non-minority populations. Therefore, the project would not have a disproportionate adverse impact on minority or low income populations. There are no concentrations of minority populations within, adjacent, or near the proposed James White Parkway ROW. The census block groups traversed by the Green Alternative all have minority population percentages that are smaller than the respective county-wide relative share of minority populations. Block Group 1 within Census Tract 23 has a higher percentage of low-income populations than Knox County. However, this block group is located adjacent to the ROW near the intersection of the existing James White Parkway and Moody Avenue. It is not anticipated that disproportionate impacts would

occur to any low-income populations because the impacts of the new roadway would not be more severe or greater in magnitude than the impacts that will be imposed by the non-low-income populations along the proposed route.

Direct long-term minor adverse social impacts would occur from the displacement and relocation of 47 single family units, one 18-unit multi-family building, two businesses (a restaurant and apartment building), and one non-profit (Chapman Highway Church of Christ). The potential displacement of 65 residential units would place an additional demand on the existing housing market. The study of the Knox County real estate market reveals that there is an adequate supply of housing at a variety of price points and sizes in the project area to accommodate the displaced persons. The Tennessee Department of Transportation will make relocation assistance available to all eligible persons impacted by this project. The TDOT 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, implementing federal regulations, TCA 13-11-101 through 119, The State of Tennessee Relocation Assistance Brochure, and Chapter IX of the TDOT Right-of-Way Manual. TDOT's relocation program is practical and will allow for the efficient relocation of all eligible displaced persons in accordance with state and federal guidelines.

Direct short-term minor impacts associated with the displacements include temporary disruption of business and employment for the apartment complex and IHOP restaurant. Church-related employment, services, and functions may also experience a temporary disruption during relocation.

Direct short-term negligible adverse impacts would affect travel efficiency and community resources during the construction phase. Construction activity would create a temporary increase in traffic congestion and disruption of traffic patterns and accessibility. Other direct short-term negligible adverse impacts would be anticipated during the construction phase relative to posing potential temporary inconveniences for parishioners, customers, and students at the various churches, businesses, and schools in the area. Additional traffic and noise from construction may also temporarily diminish quality of life for nearby residents.

3.6.3.2 Indirect Impacts (Social Environment – Green Alternative)

Highway and traffic safety would be beneficially impacted in the long term under this alternative. Current traffic and future traffic demand would be served in a more efficient and safe manner. Relieving some of the congestion and improving access in the area would improve response times for emergency vehicles attempting to reach the project vicinity.

It is anticipated that the new expansion would bring new residential and commercial developments into the area. The associated population increase and associated construction would eventually demand additional public services and expenditures. However, the increased tax base resulting from the new development would contribute to financing the costs of these additional services.

Indirect long-term minor beneficial impacts would occur in respect to community cohesion. The expansion would provide another needed north-south connector between the growing areas of Sevier County and downtown Knoxville. The improved traffic circulation and enhanced accessibility will indirectly benefit the project area by enhancing community cohesion, reducing commute times, and providing connections between adjacent areas.

There is a potential for indirect beneficial long-term impacts in respect to provision of suitable or comparable replacement housing. Current vacant housing in the area could be

used for this purpose. In addition, some displaced households may be relocated into housing of higher quality and value than their existing residence.

There is potential for impacts to community resources. There would be a change in residents' day-to-day routine and behavior and travel patterns from the relocation of residences, nearby businesses, and the church. These changes may be perceived as negative and/or positive depending on the perspective of the person impacted.

Some residents and businesses may choose to construct new residences or businesses within the area during relocation, which may result in additional loss of open space and impacts to natural resources. It is anticipated that these impacts would be negligible and isolated.

3.6.3.3 Cumulative Impacts (Social Environment – Green Alternative)

Opportunities for potential social and economic growth of the region would be improved as the infrastructure is modernized, which would facilitate connections between adjacent areas. The expansion of James White Parkway would combine with all other transportation improvements in and around the City of Knoxville to help relieve some existing traffic issues, improving commute times and interconnectivity of the entire area.

The project would combine with other new developments in the project vicinity, particularly the mixed-use developments anticipated for areas to the north and east of the project area and provide potential increases in quality of life and new opportunities for some of the residents within and adjacent to those areas.

3.6.4 Potential Social Environment Impacts of the Blue Alternative

3.6.4.1 Direct Impacts (Social Environment – Blue Alternative)

Impacts associated with the Blue Alternative would be similar to those discussed under the Green Alternative. There would be three less residential displacements with 44 residential displacements, one 18-unit multi-family building, two mobile homes, and three businesses displacements. There would be an estimated population loss of 154 people. The Church would be able to remain in place and function at its current capacity, but three businesses (a carwash, apartment building, and retail store) would be displaced versus the two impacted under the Green Alternative.

3.6.4.2 Indirect Impacts (Social Environment – Blue Alternative)

Indirect impacts associated with the Blue Alternative would be essentially the same as those discussed under the Green Alternative.

3.6.4.3 Cumulative Impacts (Social Environment – Blue Alternative)

Cumulative impacts associated with the Blue Alternative would be essentially the same as those discussed under Green Alternative.

3.6.5 Potential Social Environment Impacts of the Red Alternative

3.6.5.1 Direct Impacts (Social Environment – Red Alternative)

Impacts associated with the Red Alternative would be similar to those discussed under the Green Alternative. There would be five less residential displacements with 42 residential displacements, one 18-unit multi-family building, two mobile homes, and five businesses displacements. There would be an estimated population loss of 149 people. Also, there is a possibility that five businesses (a carwash, retail store, dentist office, real estate office, and apartment building) would be impacted versus the two impacted under the Green Alternative. If the three additional businesses are unable to remain in place and function at

their current capacity, then the social impacts of the Red Alternative would be slightly greater in magnitude compared to the Green Alternative. The Church impacted by the Green Alternative would be avoided by the Red Alternative.

3.6.5.2 Indirect Impacts (Social Environment – Red Alternative)

Indirect impacts associated with the Red Alternative would be essentially the same as those discussed under the Green Alternative. However, if three additional businesses are displaced then the potential social impacts would be greater.

3.6.5.3 Cumulative Impacts (Social Environment – Red Alternative)

Cumulative impacts associated with the Red Alternative would be essentially the same as those discussed under the Green Alternative.

3.6.6 Mitigation

Parcels that would become fragmented and consequently lose their previous access would need to be addressed through modification of existing or provision of alternative access. Measures would be taken to avoid disruption in accessibility and subsequent delivery of public services, such as police, fire, EMS, and school bus routing during project construction.

The relocation of displaced households, businesses, and any other affected parties would be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646), as amended by the Surface Transportation and Uniform Relocation Act of 1987. These relocation assistance programs are offered to all individuals, families, businesses, farm operators, and nonprofit organizations that are partially or totally displaced by a federal or state highway project. Relocation assistance under these programs would be available to all relocated persons without regard to race, color, religion, or national origin. Relocation payments and financial assistance would be in accordance with the above laws. A relocation office would be established within the general project area at the initiation of negotiations for property acquisition.

Comparable replacement housing would be provided for all displaced households under the provisions of the above laws. Comparable replacement housing means a decent, safe, and sanitary dwelling; functionally equivalent to the existing displaced dwelling; adequate in size to accommodate the displaced person(s); in a location not less desirable than the existing displaced dwelling; located on a typical residential site; accessible to the displaced person's place of employment; currently available on the private market; and within the financial means of the displaced person. If any situation should exist where suitable housing is not available, such housing would be made available under the provisions of "Last Resort" housing when replacement housing is not available.

Relocation payments and financial assistance would be in accordance with the above laws. All persons and businesses to be displaced are given assurances that they would not have to move from their dwelling or place of business without at least a 90-day written notice given after the subject property has been purchased by TDOT and at least one comparable replacement dwelling has been made available to the displaced occupant.

To ensure that the proposed project is conducted in accordance with Title VI of the Civil Rights Act of 1964, Executive Order 12898 "Environmental Justice," and the National Environmental Policy Act this document was reviewed by the TDOT Civil Rights Staff. The TDOT Civil Rights Staff found the assessment and methodology used to be in keeping with

the spirit of the laws that govern programs/projects that are federally funded, specifically, Title VI of the Civil Rights Act of 1964, Executive Order 12898, and the National Environmental Policy Act. The project does not disproportionately affect the health or environmental effects on minority and low-income populations.

3.7 Economics

3.7.1 Affected Environment

There are various key indicators of economic conditions and growth within an area, including changes in labor force, employment, development trends, and property values. These economic variables are discussed in the context of Knox and Sevier County. The Knoxville-Knox County Metropolitan Planning Commission divides the region into 12 sectors for planning purposes. The project area falls mainly in the South City Sector; however, a small portion of the expansion is in the South County Sector. Economic conditions are discussed in the context of South City and South County Sector, when possible.

3.7.1.1 Economic Conditions and Trends

Knoxville has a strong, diverse economy. It is home to the Tennessee Valley Authority (TVA) Headquarters, University of Tennessee (UT) Knoxville, and Oak Ridge National laboratory (ORNL), a major U.S. Department of Energy facility in nearby Oak Ridge. The city is very technology-forward and has thus been able to attract many telemarketing divisions of large corporations (City Data 2011). Knoxville is part of an economic development initiative called Innovation Valley, Inc. This partnership was created to implement a five-year regional economic development initiative that centers on a 25-mile technology corridor in the Knoxville-Oak Ridge Area (Knoxville Chamber 2011).

Knoxville's location is a reason why many manufacturing companies have relocated or expanded in the area. It is located in the center of the eastern half of the United States with a major regional airport, junctions for a variety of highways, and a barge and rail service. Mining of zinc and coal occurs in nearby Cumberland Range, and livestock, dairy, and a variety of food crops are farmed outside the city. Knoxville serves as an urban center for all those activities. There is also a large tourism industry specifically in nearby Sevier county from visitors at Great Smoky Mountains National Park.

Employment

The annual labor force in Knox and Sevier County was approximately 281,482 in 2010 with total employment of the labor force estimated at 258,940 (BLS, 2005; BLS 2010). Approximately 83 percent of the labor force is located in Knox County. The 2010 labor force represented a 7- percent increase from 2005. The State of Tennessee's labor force also increased 7-percent between 2005 and 2010. The annual unemployment in the two-county project area in 2010 was 9.0 percent compared to a statewide unemployment rate of 9.7 percent.

Total non-farm employment within Knox and Sevier County increased by approximately 10 percent and 15 percent, respectively, between 2001 and 2009, more than the statewide increase of 3 percent during this same period. Employment by major industry sectors in 2009, including the government sector, is shown on Table 3.11. The services and retail trade sectors account for approximately 37 percent of the employment in two-county area with government another major employment sector. The major employers in Knox and Sevier County, which are listed in Table 3.12, reflect the predominance of service and government sector employment.

Table 3.11. Full and Part-Time Employment by Major Industry Sector by Place of Work in the Two-County James White Parkway Project Area, 2009 (North American Industrial Classification System).

Industry Sector	Knox County		Sevier County	
	Total Employment	Percent	Total Employment	Percent
Total Employment	216,737	100	36,751	100
Natural Resources and Mining	628	<1	(D)	(D)
Construction	10,255	4.7	1,472	4.0
Manufacturing	11,896	5.5	1,046	2.9
Wholesale Trade	12,214	5.6	313	<1
Retail Trade	28,922	13.3	7,022	19.1
Transportation and Warehousing	6,664	3.1	(D)	(D)
Information	4,791	2.2	258	1.0
Financial Activities	12,204	5.6	1,913	5.2
Professional and Business Services	30,179	13.9	1,862	5.1
Educational and Health Services	33,746	15.6	1,730	4.7
Leisure/Hospitality	25,779	11.9	15,485	42.1

(D) Not shown to avoid disclosure of confidential information, but estimates for these items are included in the total non-farm employment.

Note: Sum of sector employment does not equal total employment because of non-disclosure of information for some industry sectors and service sub-sectors.

Source: TDECD, 2010.

Table 3.12. Major Employers within the James White Parkway Project Area.	
Employer	**Number Employees**
Covenant Health	8,664
University of Tennessee	8,447
Knox County Schools	7,860
St. Mary's Health System	3,529
K-VA-T Food Stores	3,416
University Health System	3,367
Knox County Government	2974
Sevier County Schools	2,213
The Kroger Co.	2,220
Baptist Health Systems	2,090
Source: Knoxville Chamber, 2006.	

Development Trends

Housing

Since 2005, there has been a steady decline in new residential permits for privately owned housing within the two-county area although the City of Knoxville and Sevier County have seen a modest increase within the last year. The overall decrease likely reflects declines in the national housing market as well as impacts from the recent recession. The National Bureau of Economic Research declared that the recession began in December 2007, and the sharpest decline in new residential permits occurred between 2007 and 2008. In 2008, Knox and Sevier County issued nearly 48 percent fewer permits than the previous year.

Within Knox County, there are 12 sectors that divide the county for detailed planning analysis. The majority of recent new residential development has occurred in the Central City Sector, northwest of the study area, which is home to the University of Tennessee. There has been a need for more on- and off- campus apartment complexes for students. The Central City Sector also has several public housing developments. Multi-dwellings comprised an 87 percent share of all net residential building activity in the Central City Sector from 2000 to 2007, the largest of any planning sector. The South City Sector, which includes the majority of the study area, was second with multi-dwellings comprising a 51-percent share.

Sevier County, southeast of the study area, had a small increase in new residential permits in the last year. The area is growing; between 2000 and 2010 the county had a 26.3 percent increase in population. Table 3.13 provides a summary of residential building activity during the 2005-2010 period within the two-county study area.

Building permits were issued for 13,710 housing units during this six-year period (2005-2010), or an average of 2,285 permits annually for the two-county study area. Single family detached dwellings account for the majority of the permits issued (13,301 units). Over 90 percent of the residential units authorized by building permit in the two-county area were in Knox County, with the City of Knoxville accounting for 22 percent of the total permits issued in Knox County.

Table 3.13. Estimated Number of Construction Permits Issued for New Privately-Owned Housing Units within the James White Parkway Study Area, 2005-2010.

County/ City	Total	2010	2009	2008	2007	2006	2005
Knox County	12,407	910	929	1,316	2,511	3,220	3,521
Sevier County	1,303	68	56	135	260	295	489
City of Knoxville	2,676	218	204	202	488	727	837
Total*	13,710	978	985	1,451	2,771	3,515	4,010

**Total number of permits includes Knox and Sevier Counties only, because the City of Knoxville permits are included in the Knox County totals.*

Source: U.S. Bureau of the Census, 2010
http://censtats.census.gov/bldg/bldgprmt.shtml

Industry

Most of the south Knoxville city/south Knox County industrial spaces pre-date 1960. They represent relatively small operations. One space is along the rail lines and Maryville Pike. Metal recycling, machinery parts distribution, construction materials, and structural steel account for some of the industrial uses found in south city/south county. The vacancy rate in this area was over 25 percent in 2007, suggesting needs for renovation and redevelopment. The South City Waterfront has 46 industrial establishments with over 900 employees in the manufacturing and wholesale trades. There is also a small aging industrial operation north of Chapman Highway near the Sevier County line. This includes the old Camel plant, which has access from Valgro Road and Chapman Highway (MPC 2011a; MPC 2011b). Many of these aging industrial areas are slated for redevelopment into mixed-use areas, while modern industrial parks have been developing on the outskirts of Knoxville. Knox County has six industry/business parks and a technology corridor to meet a wide range of corporate facility needs. In 2010, nearly 1,200 new jobs were created in Knox County and over 2,700 jobs across the metro area (TDC 2011).

Retail/Businesses

Retail sales and establishment grew within Knox and Sevier Counties for the 2005-2010 period. Overall retail sales in Knox County grew 4.4 percent from 2009 to 2010 but fell 2.9 percent from 2005 to 2010. The average number of retail establishments grew 7.7 percent from 2005 to 2009 (TDECD 2011; LWD 2011). Most of retail development in south Knox County has been occurring around Chapman Highway and its intersection with Governor John Sevier Highway in the form of retail stores. This has become a significant node for retail activities, serving residents of the South Knox County, South Knoxville, Seymour, and East Knox County. Retail development in this area includes:

- South Grove commercial subdivision (63.6 acres), including Lowe's Home Improvement Center, Food City, other retail shopping and adjacent restaurants; and
- The Home Depot, Wal-Mart Supercenter, and nearby restaurants.

The south Knox County sector as a whole has approximately 500,000 square feet in shopping center and related retail and restaurant space (MPC 2011a).

Retail sales in Sevier County grew by approximately 2.7 percent between 2005 and 2010. The average number of retail establishments grew 7.7 percent from 2005 to 2009 (ECD 2011; LWD 2011). Many of the retail establishments within Sevier County are related to tourism. The tourism industry now employs 45.5 percent of Sevier County's local workforce and captures 30.7 percent of total industry earnings in Sevier County. Existing retail businesses in Sevier County that are near the James White Parkway Study area are concentrated along Chapman Highway and near Seymour, Tennessee.

3.7.1.2 Property Values

Property value trends for the 2000-2006 time period are shown in Table 3.14. Knox County had a 32 percent increase in total property value during this five-year period. Property value increases reflect primarily real property and improvements through new construction of buildings and facilities that are added to the tax rolls. However, some of the increases in property valuations during this time period were due to reassessments. Nonetheless, property valuation trends are a good indicator of economic growth and construction activity within a region or political jurisdiction.

Table 3.14. Estimated Property Values[1], 2004-2009 (in Billions).							
Region	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**Percent Change, 2005-2010**
Knox County	35.6	35.3	33.2	31.9	27.8	26.8	32.8
Sevier County	14.1	14.7	14.3	11.9	11.1	9.9	42.4

[1] Appraised values. Includes real, personal, and public utility property.

Source: State of Tennessee, Tennessee Comptroller of the Treasury, Division of Property Assessments, Tax Aggregate Report, 2005-2010.

3.7.2 Potential Economic Impacts of the No-Build Alternative

3.7.2.1 Direct Impacts (Economic – No-Build Alternative)

Most of the existing economic conditions and trends would likely continue into the foreseeable future under the No-Build Alternative. Movements of goods and people as well as accessibility to the regional transportation network would not be enhanced. As traffic volumes continue to increase along Chapman Highway, the already poor LOS will continue to decline, if no major changes are made. This would make the areas much less attractive for development.

3.7.2.2 Indirect Impacts (Economic – No-Build Alternative)

Reduction in travel efficiency would result in adverse economic impacts especially to local communities. Economic impacts can result from increased travel expenses due to longer commute times. The impacts would ultimately result in fewer new job openings in the region and ultimately adversely impact unemployment rates, income, and other economic factors. It is not possible to quantify or determine exactly what those impacts would be at this time, but some adverse impacts would be anticipated.

Continued decreases in the already poor LOS of Chapman Highway would have potential secondary impacts on other local roadways as drivers attempt to find alternative routes to avoid the highly congested highway. This would ultimately decrease LOS in other areas that would otherwise function at better LOS. Decreasing LOS in other areas would result in further potential adverse impacts to the local and regional economies.

3.7.2.3 Cumulative Impacts (Economic – No-Build Alternative)

Manufacturers, business vendors, and suppliers dependent upon product transport would not have optimum transportation infrastructure available under the No-Build Alternative. The lack of optimum transportation infrastructure could curtail business potential for increased production, thereby adversely affecting employment opportunities and associated personal income in the region. Any adverse economic impacts would likely result in long-term impacts that would be difficult to mitigate or counteract. This would be especially true if a large business/employer were to choose not to locate, or expand operations, in South

Knoxville due to the poor LOS along Chapman Highway. If such an employer were to choose another city outside of the region, it would adversely affect the local economy.

Even when combining the benefits of other past, present, and reasonably foreseeable transportation improvements in the region, it would be expected that not implementing the James White Parkway improvement project would be capable of resulting in adverse impacts to the local and regional economies. This is primarily due to Chapman Highway being an important route to, from, and through the area.

Decreases in LOS on Chapman Highway would have potential secondary impacts on other local roadways as drivers attempt to find alternative routes to avoid the highly congested Chapman Highway. This increased traffic using local roadways would combine with any new traffic generated by other reasonably foreseeable developments in the project vicinity that may also require the use of local roadways for access. Overall decreases in LOS of local roadways could have adverse impacts to the local economy if it deters future development in an area. It is not possible to determine the extent of those impacts at this time, but it is anticipated that at least some adverse economic impacts would result under such conditions.

3.7.3 Potential Economic Impacts of the Green Alternative

3.7.3.1 Direct Impacts (Economic – Green Alternative)

Both short-term and long-term beneficial and adverse economic impacts would occur under the Green Alternative. Short-term adverse impacts will occur due to a decrease in the real property tax base and real property tax revenues as a result of the displacement of 47 single family units, one 18-unit multi-family residential, two businesses, and one non-profit organization. Short-term adverse economic impacts would consist primarily in the reduction of the real property tax base and tax revenues as a result of ROW acquisition and displacement of residences and businesses. Based upon a sample of 2010 property tax records of the respective County Assessor offices, the average appraisal value for houses in the project area ranged from $22,000 to $470,000 and paid between $100 and $1,600 in property taxes. The average appraised value was $109,969 and average property tax was $654. This represents a decrease of approximately $4.9 million in real property appraised value and an estimated associated annual loss of $29,000 in real property tax revenues (2010). However, the above numbers reflect only those parcels classified as single family. Additional property tax revenue loss resulting from public acquisition of other agricultural and vacant land parcels for necessary ROW is not included.

Additional tax revenue losses could also occur due to losses of business-related taxes (e.g., sales, utility, inventory taxes, etc.). However, the tax revenue losses may only be temporary (i.e., limited to the construction phase of the project), if the displaced businesses relocate within the project vicinity. Other short-term adverse economic impacts would include relocation expenses and the temporary loss of business income during the relocation period. Employees of the displaced businesses may become temporarily unemployed during the relocation period, unless the displaced businesses can utilize them or place them at a temporary location during that period. It is expected that the businesses would be able to locate within the general project vicinity, but if they choose not to reestablish the business, the employees would become unemployed.

Short-term beneficial impacts would be realized by employment associated with the construction of the roadway. This new construction-related employment would also create additional personal income for the local and regional purchase of consumer goods and services during the construction period, which would most likely occur intermittently over a period of several years.

There is the potential for long-term adverse impacts to some existing businesses, especially those along Chapman Highway. Those businesses could be potentially impacted by construction of a new roadway that could result in shifting traffic to new areas and possibly result in loss of some existing business. However, the region as a whole could benefit economically due to the improved transportation options and access that would be provided.

Long-term beneficial economic benefits may be realized by implementation of the Green Alternative. Improved accessibility and travel efficiency would enhance the potential for new highway-oriented and community-based development. Business growth can occur in the manufacturing, service, wholesale and retail sectors of the economy through the expansion of existing businesses; attraction of new businesses to the area; reduction in the cost of moving goods and raw materials; and the servicing of inter-regional traffic flows, which can encourage development of travel-related businesses. The impacts on business are reflected in increases in sales, income, employment, and other economic indicators.

Property values within the vicinity of the James White Parkway expansion project area may appreciate due to better access and improved transportation efficiency making the area more attractive for residential, retail, and industrial uses. The specific impacts on property values would depend on the proximity of a property in relation to the improvements. Some properties may be subjected to slight decrease in value due to increased noise or visual impacts as the new roadway may encroach closer to the existing residence. In general, the further away from the proposed expansion a property is, the lower the chance of experiencing changes to property values, either positive or negative.

Increased development would result in enhanced tax revenues. Thus, any short-term tax revenue losses from project implementation (e.g., displacement, ROW acquisition) would be offset by the potential long-term tax revenue increases directly and indirectly resulting from project implementation as a result of increased property valuations and growth.

3.7.3.3 Indirect Impacts (Economic – Green Alternative)

Indirect short-term 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 region.

It is possible that the improvements may promote additional commercial, industrial, and/or residential development, especially in southern Knox County and possibly in the northern portions of Sevier County. New development would likely result in long-term economic benefits for the local and regional economies.

As new development occurs in the project vicinity, property values may increase. Some of the vacant areas around the project area may become more attractive, if access to the area is improved. This would make these areas more valuable. Areas once perceived as too far from downtown Knoxville may become more attractive as commuters may be able to drive the extra distances while maintaining similar commuting times as they currently encounter due to congestion.

Minor indirect impacts to local businesses and the local economy may occur in the short term due to loss of secondary business that may be generated by the two businesses being displaced that may use local businesses for their supplies and repairs. Assuming the displaced businesses are able and/or willing to relocate in the area, the impacts to the secondary businesses would be short term, as well.

3.7.3.4 Cumulative Impacts (Economic – Green Alternative)

The proposed James White Parkway Expansion would create improved and expanded transportation services in the region by providing for a more efficient and safe route to travel. Optimum transportation infrastructure could increase business potential, thereby positively affecting employment opportunities and associated personal income in the region. The combination of all of the past, present, and future transportation improvements, and other new residential, industrial, and commercial developments would result in continued economic growth in the region. Although some of this development would likely occur without the proposed project, it is likely that the project would increase the rate at which some of the development happens and may result in some development that otherwise would not have occurred.

3.7.4 Potential Economic Impacts of the Blue Alternative

3.7.4.1 Direct Impacts (Economic – Blue Alternative)

Direct economic impacts of the Blue Alternative would be essentially the same as those of the Green Alternative, except the displacement of single-family units had slightly different appraisal values. The average appraisal value for houses in the project area ranged from $22,000 to $291,000 and paid between $100 and $1,700 in property taxes. The average appraised value was $87,000 and average property tax was $739. This represents a decrease of approximately $4.0 million in real property appraised value and an estimated associated annual loss of $33,000 in real property tax revenues (2010). There would be a negligible increase in the amount of real property tax base and real property tax revenues that could be lost as a result of the business displacements since one additional business would be displaced.

3.6.4.2 Indirect Impacts (Economic – Blue Alternative)

Indirect economic impacts of the Blue Alternative would be the same as the Green Alternative A, except one more business may be impacted. There would be slightly more short-term indirect impacts associated with loss of business during construction.

3.7.4.3 Cumulative Impacts (Economic – Blue Alternative)

Cumulative Impacts associated with The Green Alternative would be the same as those discussed under the Green Alternative.

3.7.5 Potential Economic Impacts of the Red Alternative

3.7.5.1 Direct Impacts (Economic – Red Alternative)

Direct economic impacts of the Red Alternative would be essentially the same as those of the Green Alternative, except the displacement of single family units had slightly different appraisal values. The average appraisal value for houses in the project area ranged from $22,000 to $291,000 and paid between $100 and $1,700 in property taxes. The average appraised value was $93,260 and average property tax was $739. This represents a decrease of approximately $4.1 million in real property appraised value and an estimated associated annual loss of $33,000 in real property tax revenues (2010). There would be a minor increase in the amount of real property tax base and real property tax revenues that could be lost as a result of the business displacements since three additional businesses would be displaced.

3.7.5.2 Indirect Impacts (Economic – Red Alternative)

Indirect economic impacts of the Red Alternative would be the same as the Green Alternative A, except three more business may be impacted. There would be slightly more

short-term indirect impacts associated with loss of business during construction since three additional businesses would be displaced. Therefore, the potential for adverse economic impacts would be slightly increased compared to the Green Alternative.

3.7.5.3 Cumulative Impacts (Economic – Red Alternative)

Cumulative Impacts associated with the Red Alternative would be the same as those discussed under the Green Alternative.

3.7.6 Mitigation

The overall economic benefits of the James White Parkway would provide to the local and regional economy in the long term would mitigate potential short-term adverse impacts. The improvements would provide for better connections between downtown Knoxville and southern Knox County and Sevier County that are currently limited due to traffic congestion issues on Chapman Highway. This improved access and traffic flow may promote additional development and economic growth in the immediate project area and for the region in general.

The State's Relocation Assistance Program will be utilized to ensure to the maximum extent possible the prompt and equitable relocation and reestablishment of businesses displaced as a result of this project. The Relocation Assistance Program helps to ensure that displaced parties do not suffer disproportionate harm as a result of programs designed to benefit the public as a whole.

The relocation of displaced businesses will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646).

3.8 Pedestrians and Bicyclists Considerations

3.8.1 Affected Environment

The James White Parkway would be designed with consideration given to the TDOT's Bicycle and Pedestrian Plan (2005). TDOT's policy is to integrate bicycling and walking options into the transportation system as a means to improve mobility and safety of non-motorized traffic. This policy pertains to both bicycle and pedestrian facilities. The Tennessee LRTP contains information regarding pedestrian and bicycle considerations in transportation planning. The Bicycle and Pedestrian Element of the LRTP can be found at: http://www.tdot.state.tn.us/plango/pdfs/plan/BicyclePed.pdf (TDOT, 2005).

The James White Parkway was designed with consideration given to the TDOT Bicycle and Pedestrian Policy, which became effective on December 1, 2010. It can be found at: http://www.tdot.state.tn.us/bikeped/pdfs/policy.pdf (TDOT, 2010).

The December 2009 Draft Knoxville, Knox County Comprehensive Park, Recreation, and Greenways Plan (MPC, 2009) and the 2011 South City Sector Plan (MPC, 2011b) contains details for all existing and proposed Knox County greenways and trails. These plans can be viewed on the Metropolitan Planning Commission's website at: http://archive.knoxmpc.org/plans/parks/park_plan_adopted_2010.pdf and http://knoxmpc.org/southcity/index.htm, respectively.

Greenways have been defined in the Tennessee Department of Environment and Conservation's (TDEC) Greenways and Trails Plan (2008) as linear open spaces established along either a natural corridor, such as a riverfront, stream valley or ridgeline, or

overland along a railroad ROW converted to recreational use, a canal, scenic road, or other route.

The December 2009 Knoxville, Knox County Comprehensive Park, Recreation, and Greenways Plan and the 2011 South City Sector Plan were reviewed to determine the location of existing and planned pedestrian, bicycle, or other trails that could be impacted or enhanced as part of the James White Parkway project. The proposed James White Parkway crosses several small pedestrian/bicycle trails on privately-owned properties. Some of these trails occur in locations that are identified as proposed greenway corridors in the above planning documents. At present, these properties are privately owned. The proposed facilities that would be crossed by the James White Parkway are the northward extension of the William Hastie Natural Area Trail that will connect the William Hastie Natural Area with Marie Myers Park, the proposed greenway that will connect the Smoky Mountain Railway Greenway to Forks of the Rivers Wildlife Management Area, and the proposed Burnett Creek Greenway that extends northward from Chapman Highway, across East John Sevier Highway. TDOT will also work with the City of Knoxville and Knox County to determine how the proposed James White Greenway can be incorporated into the design of James White Parkway to provide additional connections between the existing and proposed trail systems.

Existing trail along Johnson Creek southeast of Helix Lane.

It has also been recognized that through a unique partnership among the Legacy Parks Foundation, Appalachian Mountain Bike Club (AMBC), TWRA, Ijams Nature Center, City of Knoxville, Knox County, private donors and private land owners the “South Loop Trail” is being finalized. Legacy Parks Foundation announced the property acquisitions and private

property easements, which will allow for 30 miles of natural surface trail connecting five parks and natural areas has been secured. The new South Loop Trail will connect Ijams Nature Center, Forks of the River Wildlife Management Area, William Hastie Natural Area and Marie Myers Park with trailheads and parking along the route. The South Loop is being designed for bikers, hikers and runners of all levels of experience. Narrower trails within each of the parks will add an additional 15 miles of trails of varying terrain.

The primary South Loop Trail is crossed in two locations by each of the proposed James White Parkway build alternatives. The first crossing appears to be at the same location as the proposed greenway connection between William Hastie Natural Area and Marie Myers Park near the southeast end of View Park Drive. The second crossing of the main South Loop Trail will be just southeast of Prospect Road. The Legacy Parks Foundation website, http://www.legacyparks.org/, contains a map of the South Loop Trail along with the smaller internal trails. Appendix D of this EIS also contains additional information and maps showing the trails.

In addition to the crossing of the main South Loop Trail, the project will cross several of the smaller internal trails located on private property in the Helix Lane and Johnson Creek vicinity to the southeast. The existing trails in these areas consist primarily of narrow unpaved paths constructed through the urban forests and other habitats within the study area.

3.8.2 Potential Pedestrians and Bicyclists Impacts of the No-Build Alternative

3.8.2.1 Direct Impacts (Pedestrians and Bicyclists – No-Build Alternative)

There would be no impacts to existing pedestrian or bicycle facilities along the proposed study area if James White Parkway is not constructed. Noise and aesthetic consequences of the James White Parkway and ROW would not occur and would therefore not impact existing greenway trails or other bicycle or pedestrian routes. It is likely under the No-Build Alternative that the Chapman Highway corridor would be improved in terms of the pedestrian and bicycle accommodations. These improvements would be conducted as separate projects and not as part of the James White Parkway project.

3.8.2.2 Indirect Impacts (Pedestrians and Bicyclists – No-Build Alternative)

If James White Parkway is not constructed, the James White Greenway would not be constructed. This would result in long-term adverse impacts associated with fewer recreational opportunities and less connectivity between various other greenway trails in the South Knoxville vicinity.

3.8.2.3 Cumulative Impacts (Pedestrians and Bicyclists – No-Build Alternative)

Although there would be no direct adverse impacts to existing pedestrian and bicycle facilities if James White Parkway was not constructed, there would also be no potential benefits. The proposed James White Greenway would not be constructed and would not be available to provide additional recreational opportunities or important connectivity between other existing and proposed facilities.

3.8.3 Potential Pedestrians and Bicyclists Impacts of the Green Alternative

3.8.3.1 Direct Impacts (Pedestrians and Bicyclists – Green Alternative)

Construction of James White Parkway is not expected to sever any existing or proposed bicycle or pedestrian routes or proposed greenways. Any existing routes designated for pedestrian and bicycles that are crossed by James White Parkway would be provided access across James White Parkway via bridges or underpasses at local roadway crossings

that would be built to provide wide enough shoulders, bicycle lanes, and/ or sidewalks to allow for continued use of those facilities.

Increased noise, along with potential aesthetic impacts, would result in minor long-term adverse impacts to users of portions of existing trails or other bicycle and pedestrian facilities located in proximity to the new roadway. In most instances, James White Parkway would run relatively perpendicular to existing and proposed facilities and would therefore not impact large portions of any one facility. The trails within the William Hastie Natural Area would not be directly impacted by the proposed James White Parkway project, but portions may experience minor increases in noise and/or aesthetic impacts.

Several of the smaller internal Legacy Parks Foundation/AMBC trails located on private lands in the study area, in the vicinity of Helix Lane, would be crossed causing moderate long-term adverse impacts. Portions of these trails would be severed and would no longer be available for use. Those trails consist primarily of narrow unpaved paths constructed through the urban forests and other habitats within the study area. It is likely that these groups may construct additional trails on remaining portions of the adjacent property not required to be purchased for ROW or it may be possible that their trails could be constructed along the outside edge of the ROW to reconnect with other portions of the existing trails that would not be impacted.

Because James White Parkway is proposed to be constructed as a freeway-type facility, it would not be conducive to safely providing bicycle lanes along the main roadway. However, the proposed James White Greenway would provide connections with and between many of the existing and proposed greenways and associated trails resulting in long-term beneficial impacts. The James White Greenway could provide a useful alternative transportation and recreational route that could benefit communities along its length. Although traffic noise will be inherent along the James White Greenway, the presence of trees and proper placement of the proposed trails within the ROW or adjacent areas would provide some barrier and allow the greenway to provide plenty of benefits for users.

3.8.3.2 Indirect Impacts (Pedestrians and Bicyclists – Green Alternative)

The James White Parkway would result in indirect adverse impacts to bicycle and pedestrian facilities due to potential developments that could be promoted by the new roadway, especially near the proposed interchange at Sevierville Pike. Those developments may reduce the amount of green space and other buffers that currently occur along the existing and proposed greenway trails. It is expected that most areas where development is promoted by James White Parkway would eventually happen, because many of those areas are in planned growth areas for the City of Knoxville and other portions of Knox County. The James White Parkway may increase the rate at which some of the development occurs.

A substantial amount of traffic, especially through-traffic, is expected to be removed from Chapman Highway due to the presence of the more efficient James White Parkway. This would allow for Chapman Highway to more safely handle pedestrian and bicycle traffic. The Chapman Highway corridor could be made a safer route for pedestrians and bicycles through implementation of transportation system management (TSM) improvements. These improvements would provide additional bicycle and pedestrian connectivity and continuity in the region. Such improvements would be conducted as separate projects and not as part of the James White Parkway project.

Construction of the James White Greenway within or adjacent to the James White Parkway ROW would result in long-term beneficial impacts to local communities and residents. The

presence of the greenway may increase property values in some areas, especially those properties with easy access to the proposed trails. Communities with well-developed trails and recreational opportunities are often better at attracting residents and/or businesses. The James White Greenway would also provide better connection between local neighborhoods and communities and other pedestrian and bicycle facilities. Finally, the Greenway would promote exercise and recreational activities that may not otherwise occur if a trail is not located nearby.

3.8.3.3 Cumulative Impacts (Pedestrians and Bicyclists – Green Alternative)

Construction of James White Parkway would result in potential adverse impacts to pedestrian and bicycle facilities due to noise and aesthetic consequences for nearby trails. The loss of green space and increased traffic noise would combine with similar types of impacts from other past, present, and reasonably foreseeable projects. The James White Parkway would cross most of the existing and proposed trails at relatively perpendicular angles and would therefore reduce the overall impacts to individual trails.

The James White Greenway, if constructed, would provide cumulative benefits by providing better connectivity and additional trails for bicyclists and pedestrians in addition to other existing and proposed greenways and associated trails.

3.8.4 Potential Pedestrians and Bicyclists Impacts of the Blue Alternative

3.8.4.1 Direct, Indirect, and Cumulative Impacts (Pedestrians and Bicyclists – Blue Alternative)

Pedestrian and bicyclist impacts of the Blue Alternative would be similar to those listed under the Green Alternative above.

3.8.5 Potential Pedestrians and Bicyclists Impacts of the Red Alternative

3.8.5.1 Direct, Indirect, and Cumulative Impacts (Pedestrians and Bicyclists – Red Alternative)

Pedestrian and bicyclist impacts of the Red Alternative would be similar to those listed under the Green Alternative above.

3.8.6 Mitigation

TDOT will provide existing and proposed bicycle and pedestrian facilities access over or under the new roadway so that the project does not divide neighborhoods or cut off access to important recreational areas, such as local parks, natural areas, etc.

This type of roadway also requires a slightly wider right-of-way than other roadway designs considered in the past. Thus the ROW would be wide enough that separate bicycle or pedestrian paths could potentially be incorporated within the corridor at some time in the future.

TDOT would continue to work with local planners, local residents, and other stakeholder groups during the design phase of the project to determine how this project may affect existing or planned bicycle or pedestrian facilities and/or what opportunities may exist for improving those facilities as part of this project. Plans including, but not limited to the 2009 Knoxville Regional Bicycle Plan (http://www.knoxtrans.org/plans/bikeplan/index.htm); Knoxville, Knox County Comprehensive Park, Recreation, and Greenways Plan; Knoxville-Knox County General Plan (http://www.knoxmpc.org/generalplan/); South City Sector Plan; Tennessee Greenways and Trails Plan: Tennessee 2020 (http://www.tn.gov/environment/recreation/pdf/2020_full_version.pdf); AMBC's Legacy Parks South Knoxville Master Plan (http://www.ambc-sorba.org/; and Legacy Parks Foundation's

South Loop Trail (http://www.legacyparks.org/) ; and other available information would be reviewed to determine where proposed bicycle and pedestrian facility improvements may occur. Such features would be incorporated into the design of the roadway as appropriate and feasible while maintaining the design integrity of the roadway itself.

3.9 Air Quality

3.9.1 Affected Environment

3.9.1.1 Regulations

The Clean Air Act (CAA), which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of sensitive populations, such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants as shown in Table 3.15. These six are called criteria pollutants. Areas in which air pollution levels persistently exceed the NAAQS may be designated as “nonattainment.” States in which a nonattainment area is located must develop and implement a State Implementation Plan (SIP) containing policies and regulations that will bring about attainment of the NAAQS.

3.9.1.2 Existing Air Quality

Knox County has been designated as nonattainment for two of the criteria pollutants – ozone and particulate matter. Ozone is measured as exposure for an 8-hour period, known as the 8-hour ozone standard. Particulate matter is measured as exposure over both a daily and annual basis for different sizes of particles. Knox County is currently nonattainment for both the daily and annual maximum standard for particulate matter measuring 2.5 microns or less in diameter, also known as $PM_{2.5}$. The designation of ozone nonattainment area (under the 1997 8-hour ozone standard) was made effective on June 15, 2004, while the designation of the $PM_{2.5}$ nonattainment area was made effective on April 5, 2005, for the annual standard and on December 14, 2009, for the daily standard by EPA (*Knoxville Regional Transportation Planning Organization Air Quality Conformity Determination, September 2010*). On March 8, 2011, the EPA redesignated the ozone nonattainment area to maintenance. However, on April 30, 2012, EPA redesignated all of Knox and Blount Counties, as well as a small portion of Anderson County near the TVA Bull Run Steam Plant, as nonattainment based on the more stringent 2008 8-hour ozone standard.

Table 3.15. National Ambient Air Quality Standards (NAAQS).			
Pollutant	**Primary Standard**	**Averaging Time**	**Secondary Standard**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour[1]	None
	35 ppm (40 mg/m^3)	1-hour[1]	None
Lead	0.15 µg/m^3[2]	Rolling 3-Month Average	Same as Primary
	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	53 ppb	Annual (Arithmetic Mean)	Same as Primary
	100 ppb	1-hour[4]	None
Particulate Matter (PM_{10})[4]	150 µg/m^3	24-hour[5]	Same as Primary
Particulate Matter ($PM_{2.5}$)	15 µg/m^3	Annual[6] (Arithmetic Mean)	Same as Primary
	35 µg/m^3	24-hour[7]	
Ozone	0.075 ppm (2008 std)	8-hour[8]	Same as Primary
	0.08 ppm (1997 std)	8-hour[9]	Same as Primary
	0.12 ppm	1-hour[10]	Same as Primary
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (3-hour[1])
	0.14 ppm	24-hour[1]	
	75 ppb[11]	1-hour	None

[1] Not to be exceeded more than once per year.

[2] Final rule signed October 15, 2008.

[3] The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

[4] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).

[5] Not to be exceeded more than once per year on average over 3 years.

[6] To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

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

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

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

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

(c) EPA is in the process of reconsidering these standards (set in March 2008).

[10] (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.

[11] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Source: USEPA, 2011

3.9.1.3 Conformity

Transportation conformity is a process required of Metropolitan Planning Organizations (MPOs) pursuant to the CAA amendments (CAAA) of 1990. CAAA require that transportation plans, programs, and projects in nonattainment or maintenance areas that are funded or approved by the FHWA be in conformity with the SIP, which represents the State's plan to either achieve or maintain the NAAQS for a particular pollutant. The project is located in the Knoxville 8-hour ozone nonattainment area and $PM_{2.5}$ nonattainment area.

Projects conform to the SIP if they are included in a fiscally constrained and conforming Long Range Transportation Plan (LRTP) or Transportation Improvement Program (TIP). This project is included in the 2009-2034 KRMP, the Knoxville Regional TPO's FY 2011-2014 TIP, and is endorsed by the MPO for the region in which the project is located. The KRMP number for this project is 666. The TIP number for this project is 2011-022. The project is described in the KRMP and TIP as the construction of a new four-lane facility between Chapman Highway and Moody Avenue. This project description and termini are consistent with the proposed project. Therefore, the project is in conformity with the SIP.

Carbon Monoxide Hot-Spot Analysis

Based on the screening procedure in the Tennessee Environmental Procedures Manual, this project does not meet the criteria requiring a CO project level hot-spot analysis and will not produce a projected violation of the CO National Ambient Air Quality Standards (NAAQS).

Qualitative PM2.5 Hot-Spot Analysis

TDOT completed a $PM_{2.5}$ Hot-Spot Determination for the project that concluded that the project was "not a project of air quality concern." TDOT submitted this determination to the Knoxville Area Interagency Consultation (IAC) group on September 14, 2011. The IAC members concurred with TDOT's determination on the following dates: FHWA September, 26, 2011, EPA September 19, 2011, and TDEC September 19, 2011.

3.9.1.4 Mobile Source Air Toxics

On February 3, 2006, the FHWA released "Interim Guidance on Air Toxic Analysis in NEPA Documents" (FHWA 2006b). This guidance was superseded on September 30, 2009, by FHWA's "Interim Guidance Update on Air Toxic Analysis in NEPA Documents" (FHWA 2009). 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 considered interim, because MSAT science is still evolving. As the science progresses, FHWA will update the guidance.

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions. The qualitative assessment presented below has been prepared in accordance with FHWA's Interim Guidance derived in part from a study conducted by the FHWA entitled "A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives" (Claggett and Miller 2006). The Air Quality Technical Study Report, which contains additional information regarding MSATs, is provided in on the project website at: http://www.tdot.state.tn.us/sr71/ and is available through the TDOT Environmental Division.

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

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

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

As described previously, the build alternatives include extending James White Parkway, by constructing a new four-lane facility between Moody Avenue and Governor John Sevier Highway. Design year traffic projections on James White Parkway range from 30,000 to 43,000 vehicles per day. These volumes are lower than the FHWA criterion. As a result, the project is considered to be a "Project with Low Potential MSAT Effects."

For both the Build and No-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. The VMT for the No-Build and Build Alternatives was determined for the affected roadway network as shown in Table 3.16. As shown, the projected VMT for the No-Build Alternative is 429,900 miles. The projected VMT for the build alternatives ranges from 430,300 miles to 437,000 miles. Therefore, it is expected that construction of the project would slightly increase MSAT emissions by 400 miles for the Green Alternative, 3,700 miles for the Blue Alternative, and up to 7,100 for the Red Alternative.

Table 3.16. Design Year (2035) Daily VMT Projections on Affected Roadway Network.	
Alternative	**Design Year VMT (miles)**
No-Build	429,900
Green Alternative	430,300
Blue Alternative	433,600
Red Alternative	437,000

* If the project were built, it would attract trips that would divert into the area from other routes outside of the primary study area. Those diverted trips are captured in the VMT estimates for Chapman Highway, James White Parkway, and/or Governor John Sevier Highway under each of the Build Alternatives. Alternatively, under the No-Build Alternative, some trips that could utilize sections of Chapman Highway, James White Parkway, and/or Governor John Sevier Highway within the study area are expected to divert away from these roadways and onto other routes outside of the study area. These are trips that are made by residents within the study area, and those traveling from areas primarily south and/or east of the study area, that purposely use alternative facilities such as Alcoa Highway, Maryville Pike, Neubert Springs Road, Governor John Sevier Highway, and I-40 in order to reach destinations in Knoxville and avoid travel delays due to traffic congestion on Chapman Highway. These trips were included in the No-Build Alternative VMT analysis since they are already being captured under the Build Alternatives as trips that are anticipated to divert into the study area from other portions of the metropolitan Knoxville area and do not represent new trips. In other words, these trips would still occur under the No-Build Alternative if the Build Alternatives were not constructed, but they would utilize other roadways in the region and not the roadways available in the immediate study area. The estimated ADT and related VMT for those trips expected to divert to other roadways outside the main study area under the No-Build Alternative are included for more accurate meaningful comparisons with the Build Alternatives. Not including those diverted trips and associated VMT would underestimate the potential impacts to air quality associated with those trips.

Source: TDOT 2011

Construction of the project would lead to higher MSAT emissions for the build alternatives along the segments of James White Parkway that will be constructed on new alignment. MSAT emissions will also be greater along existing James White Parkway and Governor John Sevier Highway where traffic volumes are projected to increase compared to the No-Build Alternative. There will also be a corresponding decrease in VMTs and MSAT emissions along currently traveled routes, including Chapman Highway. Emissions increases may be offset somewhat by lower MSAT emission rates due to increased travel speeds for the build alternatives. Travel speeds in the build alternatives are expected to be higher than for the No-Build Alternative. According to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 72 percent between 1999 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 MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The construction of James White Parkway will have the effect of moving some traffic closer to nearby homes, schools, and churches; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under the build alternatives than the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced at locations near the segments of James White Parkway that will be constructed on new alignment. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models.

In summary, under the build alternatives in the design year it is expected there would be slightly higher MSAT emissions in some areas, relative to the No-Build Alternative, due to slightly increased VMT. There could be slightly elevated but unquantifiable changes in MSATs to residents and others in localized areas where VMT increases, which may be important particularly to any members of sensitive populations. Conversely, lower MSAT emissions would be expected along the existing roadway network including Chapman Highway due to reduced VMT.

However, on a regional basis, EPA's vehicle and fuel regulations coupled with fleet turnover will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Substantial construction-related MSAT emissions are not anticipated for this project as construction is not planned to occur over an extended building period. However, construction activity may generate temporary increases in MSAT emissions in the project area.

3.9.1.5 Climate Change

Climate change, also referred to as global warming, is an increase in the overall average atmospheric temperature of the earth due to the trapping of heat in the atmosphere by greenhouse gases. The primary greenhouse gas emitted by human activities in the United States is carbon dioxide (CO_2), which represents approximately 85 percent of total greenhouse gas emissions.

Transportation sources contribute to global warming through the burning of petroleum-based fuel. According to FHWA, transportation sources are responsible for approximately one-quarter of the greenhouse gas emissions for the United States. Automobiles and light-duty trucks account for almost two-thirds of emissions from the transportation sector and emissions have steadily grown since 1990.

Emissions from transportation sources depend on the number of trips or miles traveled by each type of vehicle each year, which are in turn influenced by larger economic trends and consumer behavior. Over the long term, changes in vehicle fuel efficiency, driving behavior, and fuel type will influence the level of emissions.

Under the CAA, the EPA has the authority to establish motor vehicle emissions standards for CO_2 and other greenhouse gases although such standards have not yet been established.

FHWA is actively involved in efforts to initiate, collect, and disseminate climate-change-related research and to provide technical assistance to stakeholders. FHWA is also involved in climate change initiatives with the U.S. DOT Center for Climate Change and Environmental Forecasting.

Climate change and related effects are complex and global in nature. As a result, the impacts of any single transportation project cannot be effectively estimated in terms of global warming effect. However, the emissions changes due to individual projects are very small compared to global emissions.

Once standards are established and guidance for assessing the potential greenhouse gas effects of transportation projects becomes available, a more in-depth assessment may be possible.

3.9.2 Potential Air Quality Impacts of the No-Build Alternative

3.9.2.1 Direct Impacts (Air Quality – No-Build Alternative)

Under the No-Build Alternative, it is anticipated that local air quality may be adversely impacted as LOS would continue to decline and traffic congestion would continue to increase. Increased emissions from vehicles forced to idle in the area would result in potential health risks for adjacent residents. However, the full extent of those risks cannot be predicted at this time.

It is likely that in the long term, there would be some reduction in MSAT levels due to new EPA regulations and eventual fleet turnover that would provide for cleaner engines and fewer MSAT emissions. However, without additional capacity in the area, it is likely that at least some potential adverse air quality impacts would occur throughout the reasonably foreseeable future.

3.9.2.2 Indirect Impacts (Air Quality – No-Build Alternative)

If no improvements were made to help reduce traffic congestion in the project area, it is likely that some long-term adverse air quality impacts would occur at least locally and possibly regionally. Continued decreases in LOS on project area roadways would eventually result in more traffic being forced to utilize other routes in the area resulting in potential decreased LOS on those alternative routes as well as increased VMT. Decreased LOS on other routes would likely eventually result in increased traffic congestion in those other areas. This could result in additional areas being exposed to increased vehicle emissions due to congestion. Also, use of alternative routes would result in additional VMT than would otherwise be necessary if improvements were made to help reduce congestion. Increased VMT would result in potential increases in air quality impacts.

3.9.2.3 Cumulative Impacts (Air Quality – No-Build Alternative)

It is anticipated that adverse impacts to air quality would occur if no improvements were made in the project area, because traffic conditions would continue to deteriorate. Reduced LOS on the existing roadways would combine with potential increased traffic volumes generated by continued regional urban growth and increases in truck traffic. Even if other planned transportation improvements are implemented as planned around the region, potential adverse regional air quality impacts would be anticipated if the James White Parkway were not constructed.

3.9.3 Potential Air Quality Impacts of the Green Alternative

3.9.3.1 Direct Impacts (Air Quality – Green Alternative)

This project is not expected to cause or contribute to any violation of the NAAQS. Carbon monoxide and $PM_{2.5}$ hot-spot analyses are not required for this project.

The Green Alternative will result in the temporary generation of construction-related pollutant emissions and dust that could result in short-term air quality impacts.

As documented in the MSAT qualitative assessment above, the Green Alternative may result in slightly higher MSAT emissions when compared to the No-Build Alternative. Increases in MSATs attributable to higher VMT could be completely offset due to increases in speeds and reductions in congestion. Additionally, MSAT emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050.

Overall, this project alone is not expected to result in any substantial impacts to air quality.

3.9.3.2 Indirect Impacts (Air Quality – Green Alternative)

Implementation of the Green Alternative may result in minor secondary impacts to air quality in terms of relieving traffic congestion on parallel roads, such as Chapman Highway. Providing this new roadway could promote secondary developments in and around the project area which could result in additional impacts to air quality. Most of those impacts would likely be considered short term due to construction equipment exhaust, dust, and other construction related activities. Secondary developments may increase the amount of traffic in the area which could eventually influence air quality if new areas of traffic congestion result. Such impacts cannot be predicted accurately at this time. However, due to the EPA vehicle and fuel regulations, coupled with fleet turnover, it is likely that air quality impacts would be minor.

3.9.3.3 Cumulative Impacts (Air Quality – Green Alternative)

The improvements to traffic flow resulting from construction of the James White Parkway would likely result in overall improvements to air quality when combined with other past, present, and reasonably foreseeable transportation projects and changes in EPA vehicle and fuel regulations. Overall regional air quality is expected to improve into the future even with additional development expected in the area.

3.9.4 Potential Air Quality Impacts from the Blue Alternative

3.9.4.1 Direct Impacts (Air Quality – Blue Alternative)

Air quality impacts associated with the Blue Alternative would be essentially the same as those discussed for the Green Alternative. However, the MSAT emissions would increase due to an increase in VMT of 3,300 miles under the Blue Alternative compared to the Green Alternative.

3.9.4.2 Indirect Impacts (Air Quality – Blue Alternative)

Indirect air quality impacts associated with the Blue Alternative would be essentially the same as those discussed for the Green Alternative.

3.9.4.3 Cumulative Impacts (Air Quality – Blue Alternative)

Cumulative impacts to air quality associated with the Blue Alternative would be essentially the same as those discussed for the Green Alternative.

3.9.5 Potential Air Quality Impacts from the Red Alternative

3.9.5.1 Direct Impacts (Air Quality – Red Alternative)

Air quality impacts associated with the Red Alternative would be essentially the same as those discussed for the Green Alternative. However, VMT and associated MSAT emissions would increase an additional 6,700 miles over the Green Alternative and 3,400 miles over the Blue Alternative.

3.9.5.2 Indirect Impacts (Air Quality – Red Alternative)

Indirect air quality impacts associated with the Red Alternative would be essentially the same as those discussed for the Green Alternative.

3.9.5.3 Cumulative Impacts (Air Quality – Red Alternative)

Cumulative impacts to air quality associated with the Red Alternative would be essentially the same as those discussed for the Green Alternative.

3.9.6 Mitigation

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

This project will result in the temporary generation of construction-related pollutant emissions and dust that could result in short-term air quality impacts. These construction-related impacts will be mitigated through the implementation of Best Management Practices, which are included in *TDOT's Standard Specifications for Road and Bridge Construction*. All construction equipment shall be maintained, repaired and adjusted to keep it in full satisfactory condition to minimize pollutant emissions.

3.10 Noise

3.10.1 Affected Environment

3.10.1.1 Regulations

The Federal Aid Highway Act of 1970 established the requirement that noise control be a part of the planning and design of all federally-aided roadways. The FHWA has developed guidelines for conducting noise studies and has established noise abatement criteria for different land use activity categories. FHWA guidelines are set forth in Code of Federal Regulations, Title 23, Part 772 (23 CFR 772). Noise impacts for this project were evaluated in accordance with FHWA noise assessment guidelines.

3.10.1.2 Criteria for Determining Impacts

<u>Traffic Noise Terminology</u>

Traffic noise levels are expressed in terms of the hourly, A-weighted equivalent sound level in decibels (dBA). A sound level represents the level of the rapid air pressure fluctuations caused by sources such as traffic that are heard as noise. A decibel is a unit that relates the sound pressure of a noise to the faintest sound the young human ear can hear.

The A-weighting refers to the amplification or attenuation of the different frequencies of the sound (subjectively, the pitch) to correspond to the way the human ear "hears" these frequencies. Generally, when the sound level exceeds the mid-60 dBA range, outdoor conversation in normal tones at a distance of three feet becomes difficult. Figure 3.3 depicts shows several typical outdoor and indoor sound levels.

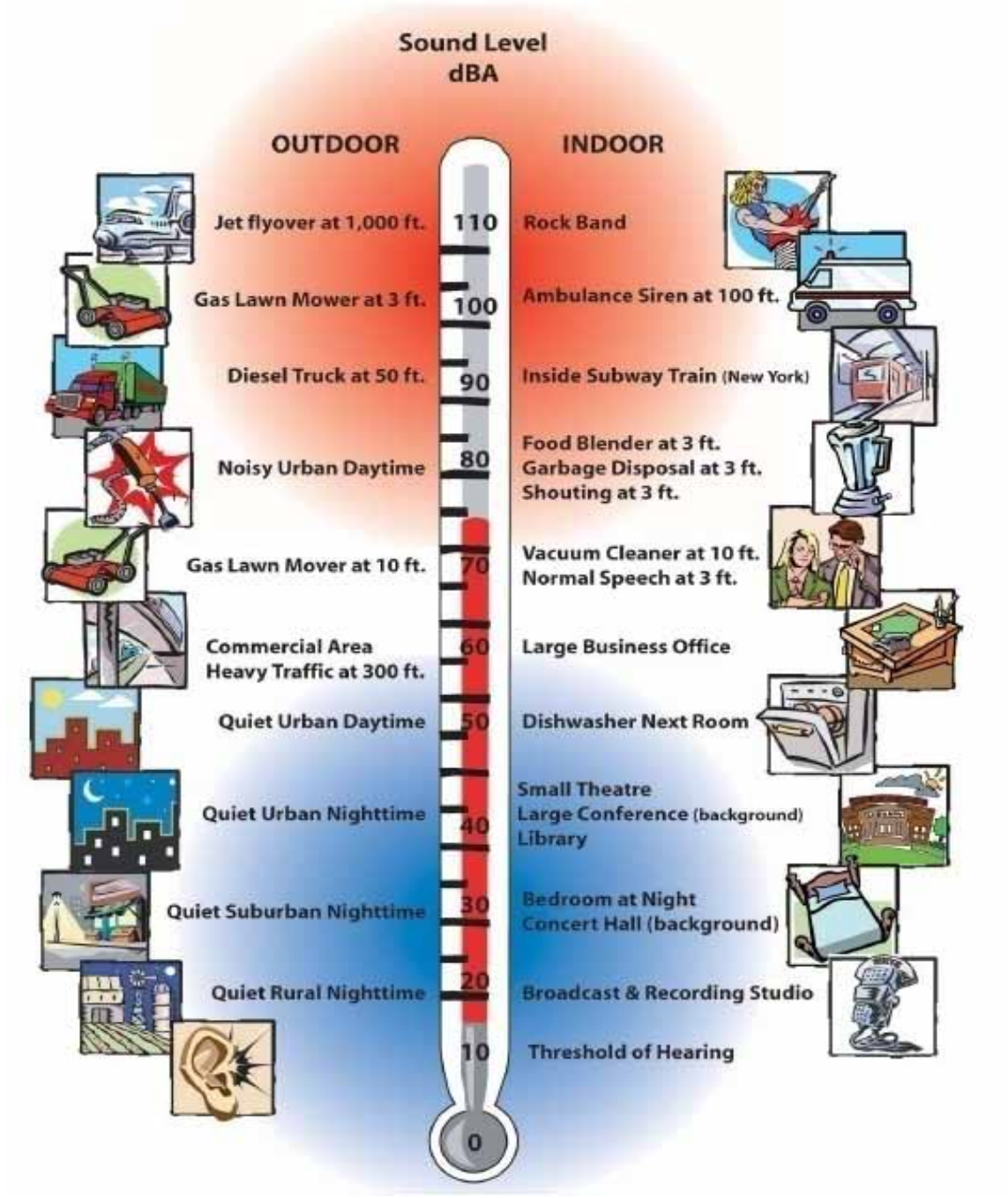
A 9-10 dB increase in sound level is typically judged by the listener to be twice as loud as the original sound while a 9-10 dB reduction is judged to be half as loud. Doubling the number of sources (i.e. vehicles) will increase the hourly equivalent sound level by approximately 3 dB, which is usually the smallest change in hourly equivalent A-weighted traffic noise levels that people can detect without specifically listening for the change.

Because most environmental noise fluctuates from moment to moment, it is standard practice to condense data into a single level called the equivalent sound level (L_{eq}). The Leq is a steady sound level that would contain the same amount of sound energy as the actual time-varying sound evaluated over the same time-period. The L_{eq} averages the louder and quieter moments, but gives much more weight to the louder moments in the averaging. For traffic noise assessment purposes, L_{eq} is typically evaluated over the worst one-hour period and is defined as L_{eq} (1h).

The term insertion loss (IL) is generally used to describe the reduction in L_{eq} (1h) at a location after a noise barrier is constructed. For example, if the Leq (1h) at a residence before a barrier is constructed is 75 dBA and the L_{eq} (1h) after a barrier constructed is 65 dBA, then the insertion loss would be 10 dB.

Within the urban and rural environment, noise generated by vehicular traffic is one of the most substantial of the common noises because of its prevalence and its intensity or loudness. The increase in noise levels that accompany the routing of high volumes of automobiles and truck traffic onto expressway facilities, which are located in areas of diversified land use, necessitates that a quantitative environmental noise impact analysis be conducted during the planning and design stages.

Figure 3.3. Typical sound levels for various outdoor and indoor noise sources.



Noise Abatement Criteria

Noise impact is determined by comparing future project sound levels: (1) to a set of Noise Abatement Criteria (NAC) for a particular land use category; and (2) to existing sound levels.

The FHWA noise standards (contained in 23 CFR 772) and TDOT's noise policy state that traffic noise impacts require consideration of abatement when worst-hour sound levels approach or exceed the NAC listed in Table 3.17. TDOT considers "approach" to be within one decibel of the NAC.

Table 3.17. Noise Abatement Criteria.

Activity Category	LAeq(h)	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.

(1) Includes undeveloped lands permitted for this activity category.

Source: 23 Code of Federal Regulations Part 772and TDOT Policy on Highway Traffic Noise Abatement

The FHWA noise standards and TDOT's noise policy also define impacts to occur if there is a substantial increase in design year sound levels. Table 3.18 presents TDOT's criteria to define substantial noise increase.

Table 3.18. Noise Level Impacts.

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.

Source: TDOT Policy on Highway Traffic Noise Abatement

3.10.1.3 Determination of Existing Sound Levels

A noise study was conducted for the proposed action in accordance with the TDOT *Policy on Highway Traffic Noise Abatement* effective July 13, 2011 (TDOT 2011b). Noise analysis areas were identified and are discussed in more detail in that study. The Noise Technical Study Report is provided in on the project website at: http://www.tdot.state.tn.us/sr71/ and is available through the TDOT Environmental Division.

Two methods were used to determine existing sound levels: 1) noise measurement; and 2) Traffic Noise Prediction Modeling (TNM) along Governor John Sevier Highway.

Noise Measurements

Noise measurements were conducted at several noise-sensitive land uses in the project area on December 28, 2010 (Figure 3.4). Table 3.19 summarizes the existing sound levels at the measurement locations.

Table 3.19. Existing Noise Levels.

Noise Reading Location ID	Nearest Address	Distance to James White Parkway (feet)(1)	Date	Period	Noise Level (dBA)
1	825 Gondola Drive	150 (Red)	12/28/2010	20 minutes	46.2
2	301 Norton Road	140 (Green)	12/28/2010	20 minutes	59.2
3	440 Norton Road	285 (Blue)	12/28/2010	20 minutes	64
4	715 Decatur Drive	290 (All Alternatives)	12/28/2010	1 hour	51.7
5	500 Red Bud Road	175 (All Alternatives)	12/28/2010	1 hour	55.2
6	612 View Park Drive	135 (All Alternatives)	12/28/2010	20 minutes	48.2
7	4621 Prospect Road	35 (Blue) 85 (Red/Green)	12/28/2010	20 minutes	55.6
8	6804 Sevierville Pike	235 (Green) 285 (Red) 340 (Green)	12/28/2010	1 hour	56.3

(1) From proposed edge-of-pavement.

Source: TDOT 2011c.

Sound levels vary throughout the day depending on the proximity of noise-sensitive land uses to local roads and to other noise sources. Sound levels can also vary with environmental changes, including shifts in wind speed and direction and changes in the vertical temperature profile. As a result, the short-term measurement data provides only a snapshot of the existing noise environment at each measurement location. Based on the noise measurements, existing sound levels ranged from 46 to 64 dBA depending on location.

TNM Modeling

Existing sound levels for Governor John Sevier Highway were determined using TNM 2.5 utilizing existing roadway geometry and existing traffic volumes. Existing worst hour sound levels for Governor John Sevier Highway ranged from 46 to 63 dBA depending on location.

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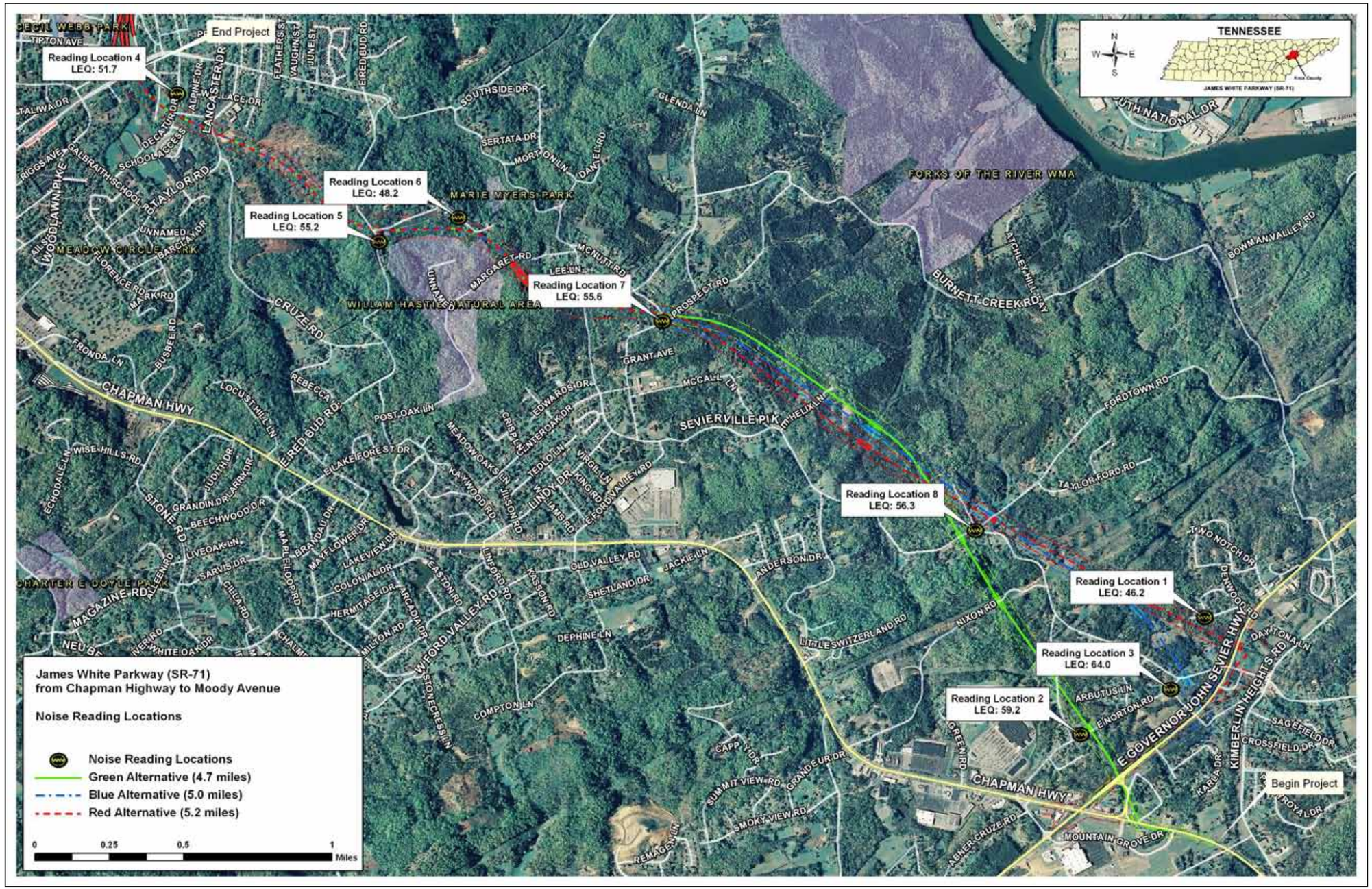
Figure 3.4. Noise Reading Locations used for Noise Analyses for the James White Parkway Project in Knoxville, Tennessee.



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3.10.1.4 Determination of Future Sound Levels

Traffic projections were developed for each project alternative for the design year 2035. These projections include traffic volumes for the "design hour", which represents a theoretical worst traffic condition. These design hour traffic projections were used for the noise analysis, since they represent the highest number of vehicles expected to travel on James White Parkway in a given hour and would, therefore, represent the worst noise hour (TDOT 2011c). Table 3.20 shows the predicted design year sound levels for the build alternatives. Predicted noise impacts are discussed in more detail below in the impacts section for each alternative.

Table 3.20. Predicted design year 2035 noise levels for the James White Parkway Build Alternatives.

Build Alternative	Maximum Increase over Existing Sound Levels (dB)	Design Year Sound Levels (dBA)	Impacts based on Substantial Increase	Impacts based on NAC	Number of Impacts
Green Alternative	18	48 to 70	22	13	35
Blue Alternative	18	47 to 68	16	8	24
Red Alternative	19	46 to 67	19	7	26

Source: TDOT 2011c.

3.10.1.5 Noise Abatement

Abatement is generally evaluated when impacts are predicted to occur. Noise barriers were evaluated to reduce sound levels for the impacted areas.

TDOT's noise policy also states that noise abatement will generally not be considered reasonable for isolated residences due to the cost of abatement verses the benefits provided. As a result, noise abatement was not evaluated for a single noise impact. As mentioned earlier, the project area consists of rolling to steep terrain dissected with scattered areas of low to medium density residential land uses. While impacts may occur along the project corridor, much of the impacts occur in areas that are isolated or rural.

As a result, noise abatement measures were evaluated in areas where residential land use was more developed. In order for noise barriers to be included in the project plans for the impacted areas, they must be determined to be both feasible and reasonable in accordance with TDOT's noise policy. Details of noise abatement measures are described in the mitigation section.

3.10.2 Potential Noise Impacts of the No-Build Alternative

3.10.2.1 Direct Impacts (Noise – No-Build Alternative)

Sound levels for the No-Build Alternative can be reasonably estimated by evaluating existing and future traffic volumes on Governor John Sevier Highway.

Doubling the traffic on a roadway would result in a 3 dB increase in the sound level at a given receiver assuming all other conditions remain the same. Design year 2035 traffic volumes on John Sevier Highway are predicted to be approximately 7% higher than existing volumes. This increase in traffic would increase sound levels at nearby residences by 0.3 dB. Noise receptors along the proposed James White Parkway would remain unchanged.

Existing sound levels along Governor John Sevier Highway were increased by 0.3 dB to arrive at design year 2035 sound levels for the No-Build Alternative at the measurement locations shown in Figure 3.4. This increase is defined as "minor" in accordance with TDOT noise policy. No residences would experience a substantial increase in sound levels under the No-Build Alternative.

Sound levels at receivers along the proposed James White Parkway are a significant distance from Governor John Sevier Highway and would not be affected by the 0.3 dB increase. The future No-Build sound levels at these locations are assumed to be the same as existing sound levels.

Similar to Governor John Sevier Highway, noise levels along Chapman Highway will continue to increase as traffic volumes increase.

3.10.2.2 Indirect Impacts (Noise – No-Build Alternative)

If proposed action is not constructed, there could be potential noise impacts for receptors along secondary roadways or other routes that may be used by commuters to bypass congestion on Chapman Highway. As traffic volumes increase and LOS of Chapman Highway continue to decline, it is likely that other roadways in the area would be more heavily used than would occur if James White Parkway is constructed. This would primarily be a problem in large trucks started using alternative routes to bypass Chapman Highway by cutting through local neighborhoods or other roadways not normally traveled heavily by trucks.

3.10.2.3 Cumulative Impacts (Noise – No-Build Alternative)

There would be potential cumulative noise impacts under the No-Build Alternative. Cumulative noise impacts would primarily occur along secondary roadways and other routes that may be used by motorists trying to avoid congestion on Chapman Highway. Additional traffic volumes that are likely to occur due to other unrelated, but reasonably foreseeable projects (Table 3.2) would combine with increased traffic on secondary roadways due to motorists trying to bypass Chapman Highway. This would result in potential increases in noise levels and lower LOS on the secondary routes. If LOS declines on secondary routes, noise levels would likely increase due to additional acceleration and deceleration that would be required, especially in congested areas. Also, additional trucks moving through the alternative routes would add to the noise levels in those areas.

3.10.3 Potential Noise Impacts of the Green Alternative

3.10.3.1 Direct Impacts (Noise – Green Alternative)

Long-term noise impacts are expected under the Green Alternative. The maximum design year sound level for the Green Alternative is predicted to be 18 dB higher than existing sound levels. This increase is substantial in accordance with TDOT's Noise Policy. Of the 178 receivers modeled, approximately 22 are predicted to be impacted by a substantial increase in sound level and 13 impacted based on NAC resulting in a total of 35 receivers predicted to be impacted by the Green Alternative.

The Green Alternative alignment runs along the northern border of the William Hastie Natural Area. The predicted worst hour noise level for the area did not meet or exceed the

NAC, nor was there a substantial increase in design year noise levels above the existing noise levels of the area. Receivers were modeled at distances 300, 400, and 500 feet from the edge of the proposed James White Parkway. Design year sound levels measured 56, 54, and 53, respectively. As a result, it is not anticipated the William Hastie Natural Area would be impacted by noise.

Trucks and machinery used for construction produce noise and vibration, which may affect some land uses and activities during the construction period. Individuals inhabiting homes along the project area may at some time experience perceptible construction noise and vibration from the implementation of this project. Occupants of buildings within a radius of approximately 200 feet from very specific construction equipment may perceive ground vibration effects during the operation of that equipment. Although these effects are of a temporary nature and will vary from day to day based on specific construction operations, even minor cosmetic damage is unlikely to occur to buildings situated beyond approximately 100 feet from the heaviest vibration generators.

3.10.3.2 Indirect Impacts (Noise – Green Alternative)

Negligible, indirect noise impacts associated with the Green Alternative are expected. Other than the termini, only one intersection would be constructed along the proposed James White Parkway. This limits the amount of development that would occur associated with the new roadway. Areas where new developments occurs would likely increase traffic volumes resulting in potential increased noise levels in some areas.

3.10.3.3 Cumulative Impacts (Noise – Green Alternative)

Implementation of Green Alternative would result in potential cumulative noise impacts when combined with other potential development projects expected to occur in the reasonably foreseeable project. It is probable that the projects listed in Table 3.2 would result in increased construction noise levels and long-term noise levels. Noise abatement measures would likely help reduce the potential for cumulative noise impacts in the project area.

3.10.4 Potential Noise Impacts of the Blue Alternative

3.10.4.1 Direct Impacts (Noise – Blue Alternative)

Noise impacts for the Blue Alternative are expected to be similar to those of the Green Alternative, except there would be 11 less receivers impacted. Of the 196 receivers modeled for the Blue Alternative, approximately 16 are predicted to be impacted by a substantial increase in sound level and eight impacted based on NAC, resulting in a total of 26 receivers predicted to be impacted.

As discussed for the Green Alternative, it is not anticipated the William Hastie Natural Area would be impacted by noise.

3.10.4.2 Indirect Impacts (Noise – Blue Alternative)

Indirect noise impacts associated with Blue Alternative would be similar as those discussed under the Green Alternative.

3.10.4.3 Cumulative Impacts (Noise – Blue Alternative)

Cumulative noise impacts associated with Blue Alternative would be similar as those discussed under the Green Alternative.

3.10.5 Potential Noise Impacts of the Red Alternative

3.10.5.1 Direct Impacts (Noise – Red Alternative)

Noise impacts for the Red Alternative are expected to be similar to those of the Green Alternative and Blue Alternative. However, the Red Alternative will impact a total of 26 receivers. Of the 209 receivers modeled for the Red Alternative, approximately 19 are predicted to be impacted by a substantial increase in sound level and seven impacted based on NAC, resulting in a total of 46 receivers predicted to be impacted.

As discussed for the Green Alternative, it is not anticipated the William Hastie Natural Area would be impacted by noise.

3.10.5.2 Indirect Impacts (Noise – Red Alternative)

Indirect noise impacts associated with Red Alternative would be similar as those discussed under the Green Alternative.

3.10.5.3 Cumulative Impacts (Noise – Red Alternative)

Cumulative noise impacts associated with Red Alternative would be similar as those discussed under the Green Alternative.

3.10.6 Mitigation

The Noise Technical Report (TDOT 2011c) found that a noise barrier would be both feasible and reasonable for each alternative, and would therefore likely be constructed as part of the project. This barrier would be located along westbound James White Parkway off-ramp at Moody Avenue. This barrier, if constructed, would cover all impacted properties that qualify for abatement along that section of the proposed roadway. However, per TDOT's Noise Policy, the views of benefited property owners and residents will be considered in making final noise abatement decisions and final placement/length of noise barriers. This input will be gathered at the Corridor Public Hearing for the Draft EIS and/or at subsequent public involvement meetings held during the design phase of the project. With the noise barrier, a 5-dB IL could be achieved at the majority of the impacted first-row residences. The term *insertion loss* is generally used to describe the reduction in Leq (1h) at a location after a noise barrier is constructed. For example, if the Leq (1h) at a residence before a barrier is constructed is 75 dBA and the Leq (1h) after a barrier constructed is 65 dBA, then the insertion loss would be 10 dB. Final decisions regarding the construction of barriers will be made during the final design process for the project.

To minimize or eliminate the effects of construction noise on adjacent sensitive receptors, mitigation measures have been incorporated into the TDOT *Standard Specifications for Road and Bridge Construction*. 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.

3.10.6.1 Information for Local Officials

There are tracts of undeveloped land adjacent to James White Parkway. 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 3.21 presents the design year sound levels for areas along James White Parkway where vacant and possibly developable lands exist. Noise predictions were made at distances between 100 and 500 feet from the centerline of the near lane of the Green Alternative design year 2035 traffic volumes. As indicated, sound levels along James White Parkway within approximately 150 feet of the centerline of the near lane may 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.

Keep in mind that the predicted levels in Table 3.21 do not represent levels at every location at a particular distance back from the roadway. Sound levels will vary with changes in terrain and will be affected by the shielding of objects such as buildings. This information is being included to make local officials and planners aware of anticipated highway noise levels so that future development will be compatible with these levels.

Table 3.21. Design year 2035 noise levels for undeveloped lands along the James White Parkway Build Alternatives.

Distance from James White Parkway(1)	Leq (1h) (dBA)(2)
100 feet	67
200 feet	60
300 feet	57
400 feet	54
500 feet	52

Source: TDOT 2011c.

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

- The neighborhood must be located along a limited-access roadway;
- The neighborhood must be primarily residential;
- The majority (more than 50%) of residences in the neighborhood near the highway pre-dated the initial highway construction;
- A noise barrier for the neighborhood must not have been previously determined to be not reasonable or not feasible as part of a new highway construction or through-lane widening study (Type I project);
- Existing noise levels measured in the neighborhood must be above the Noise Abatement Criteria (NAC) of 66 dBA;
- A barrier must be feasible to construct and will provide substantial noise reduction; and

- A barrier must be reasonable (barrier cost per benefitted residence) in accordance with TDOT's noise policy. A residence is considered "benefitted" if the noise barrier will reduce the traffic noise by at least 5 dB.

3.11 Aquatic Resources

3.11.1 Affected Environment

3.11.1.1 Water Quality

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

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

The following designated uses are listed along with the pollutants or factors that impair or limit the capability:

- Aquatic Life Use – dissolved oxygen, pH, temperature, turbidity, toxics, or any non-toxic compound that alters the aquatic life community structure beyond that expected;
- Drinking Water – compounds that are not easily removed by drinking water treatment facilities; compounds with established secondary maximum contaminant levels (MCL), e.g., chlorines, sulfates, nitrates, and total dissolved solids (TDS);
- Primary and Secondary Contact – fecal coliform; and
- Agricultural or Industrial Uses – Compounds that would interfere with industrial uses such as cooling water or the water used in certain manufacturing processes; or waters unsuitable for livestock watering or crop irrigation; most often includes chlorine, sulfates, and TDS.

Water quality standards published by TDEC, Division of Water Pollution Control classifies most streams in the project area as having the capability to support fish and aquatic life; recreation; irrigation; and livestock and wildlife watering.

Pursuant to Section 303(d) of the Clean Water Act, TDEC has compiled a list of streams in the state that are "water quality limited" (TDEC, 2010). McCall Branch, located in the southern portion of the project area, and Baker Creek, located in the northern portion of the project area, are both listed on the 303(d) list. McCall Branch was listed due to loss of biological integrity due to siltation. This stream was still experiencing substantial sedimentation during the December 2010 field study due to substantial land disturbance and clear-cutting activities along the upper portions of the stream channel. Baker Creek was listed due to nitrate+nitrite, other anthropogenic habitat alterations, and pathogens (*Escherichia coli*), most likely from sewer drainage and livestock. Figure 3.5 (Maps 1 through 4) depicts the locations of the 303d-listed streams.

3.11.1.2 Streams, Waterbodies, Springs, and Seeps

Streams and Other Watercourses

The slope of most of the study area tends to be to the north or northeast toward the two primary watersheds in the vicinity, the Tennessee River (HUC-12 ID = 060102010201) and

the French Broad River (HUC-12 ID = 060101070204). Areas northwest of Prospect Road tend to drain into the Tennessee River watershed, whereas areas southeast of Prospect Road drain into the French Broad River watershed. A small area at the southern end of the project area drains to the southwest into the Stock Creek Watershed (HUC-12 ID = 060102010108). Based on a dye trace study conducted for the project, the general trend for groundwater flow is to the north/northeast similar to the surface water flows. However, there are some areas that drain other directions, but eventually enter into surface drainages that enter the Tennessee River or French Broad River watersheds.

Drainage in the study area is primarily via sixteen separate surface streams. Of those, a total of six perennial streams, three intermittent streams, and five ephemeral streams are impacted by at least one build alternative. Several of the streams drain directly into sinkholes or into subsurface flows as disappearing streams that later emerge as springs located downstream of the project area. A few of the larger perennial streams continue to flow on the surface and into larger waterbodies including the French Broad River and Tennessee River (Fort Loudon Lake). There are several wet weather conveyances in the study area that drain into the larger streams and/or sinkholes in the vicinity. The Ecology Study Technical Report is on file with TDOT Environmental Division, and it contains more detailed information regarding the individual streams that exist in the project study area.

Some of the larger named streams potentially affected by the various build alternative alignments include Baker Creek, Toll Creek, Johnson Creek, McCall Branch, and Burnett Creek. A map showing the watercourses potentially impacted by the James White Parkway project is contained on Figure 3.5 (Maps 1 through 4). Table 3.22 shows a comparison of stream information for each of the proposed build alternatives. The Ecology Study Technical Report contains more detailed descriptions of each of the watercourses potentially impacted by this project and is available on the project website at: http://www.tdot.state.tn.us/sr71/ and upon request through the TDOT Environmental Division.

Stream Channelization

Stream crossing points were assessed to determine if any channelization would be required. It was assumed that channelization would be necessary if the angle of the stream crossing to the highway was less than 45 degrees. Stream crossings at angles greater than 45 degrees would be accommodated by culverts or bridges and would require only minimal channelization. At locations where the stream would be spanned by a bridge, it was assumed that any minimal channelization would be corrected as part of the bridge construction. In addition, stream segments not crossed by the road could still be impacted, if the build alternative were to be constructed adjacent to the stream, depending on the limits of fill. In these cases, channelization could be necessary, as well. Stormwater drainage ditches were not considered channelizations when culverts could be used to carry future stormwater flow. A summary of the number of streams likely requiring substantial channel modification or stream channelization is provided on Table 3.22.

Springs, Seeps, and Other Waterbodies

Several springs, seeps, and man-made ponds would also be potentially affected by the various build alternative alignments. A total of 14 springs/seeps and six ponds were located within the 500-foot study area surrounding all of the build alternatives. The locations of these features are shown on Figures 3.5 (Maps 1 through 4). More details for each of these features are contained in the Ecology Study Technical Report located on the project website and on file with the TDOT Environmental Division.

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Figure 3.5 (Map 1 of 4). Map of Ecological Resources Present within the James White Parkway Study Area in Knox County, Tennessee.

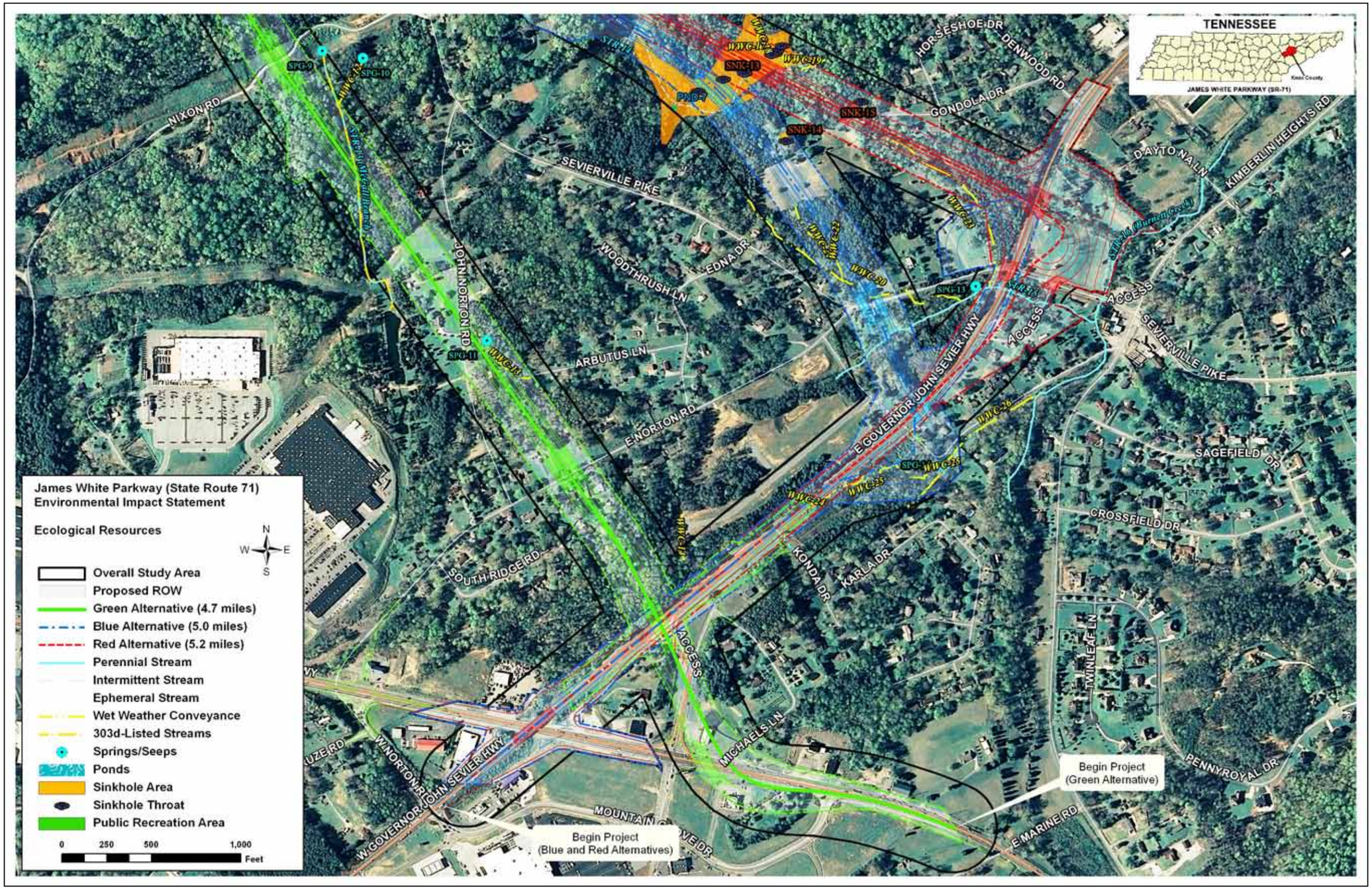

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Figure 3.5 (Map 2 of 4). Map of Ecological Resources Present within the James White Parkway Study Area in Knox County, Tennessee.

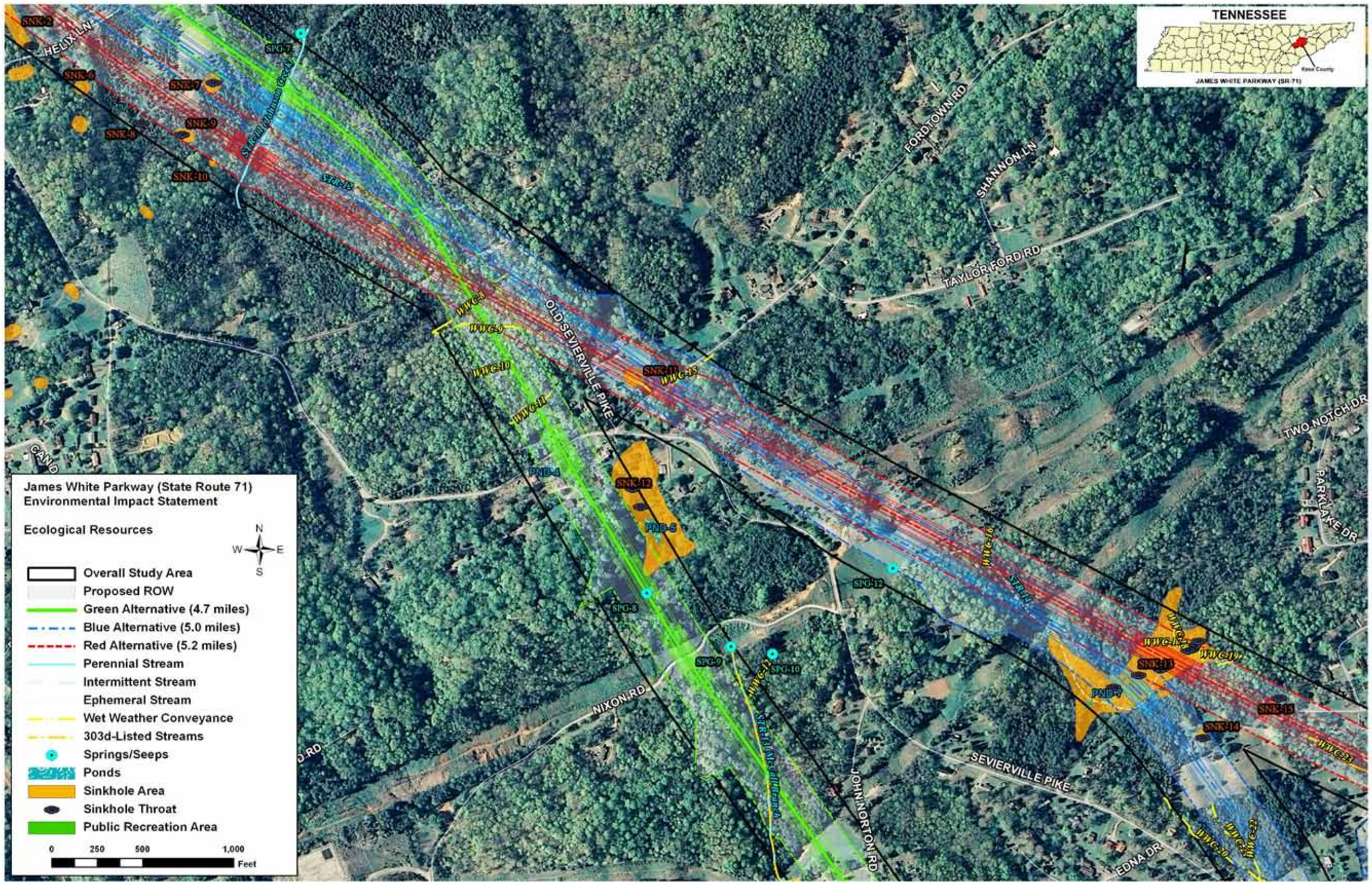

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Figure 3.5 (Map 3 of 4). Map of Ecological Resources Present within the James White Parkway Study Area in Knox County, Tennessee.

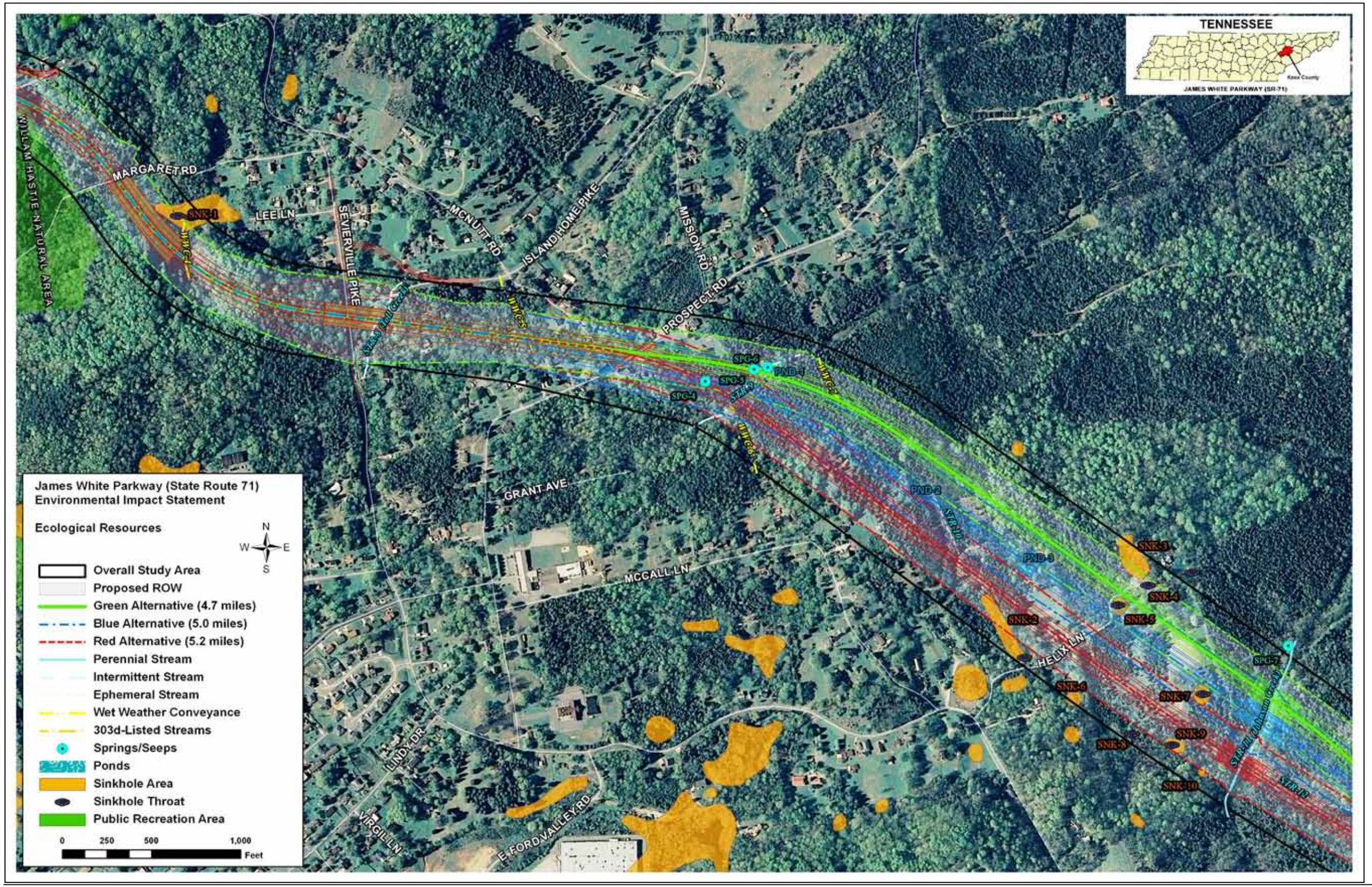

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Figure 3.5 (Map 4 of 4). Map of Ecological Resources Present within the James White Parkway Study Area in Knox County, Tennessee.

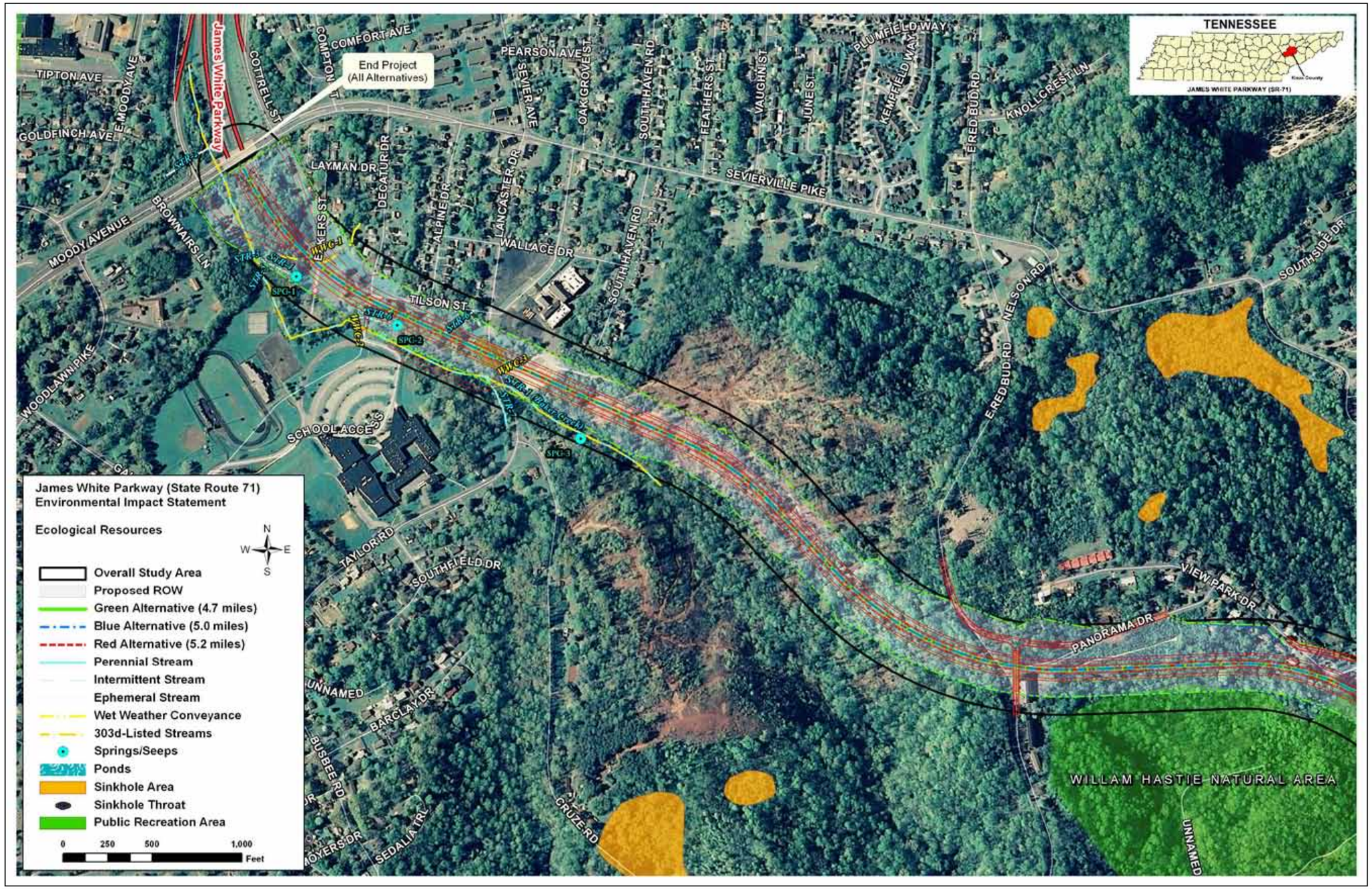

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Table 3.22. Streams Present and Potentially Impacted by each Build Alternative for the James White Parkway Project.					
Alternative	**Number of Streams within 500-foot Study Area**	**Number of Streams Impacted within ROW**	**Length of Stream Channel in the proposed ROW (feet)**	**Number of Stream Direct Crossings**	**Number of Streams Requiring Channelization**
Green Alternative	13	10	4098.64	7	4
Blue Alternative	14	12	6071.25	9	4
Red Alternative	15	13	5884.80	9	5

Note: The number of streams impacted represents all streams that fell within the 500-foot study area of each alternative, even though some streams may only be impacted by runoff. For more accurate estimates of actual direct impacts, the detailed comparison of alternatives for length of stream channel, number of direct crossings, and number of streams requiring channelization are reported only for those features or the segments of those features that fell within the proposed ROW boundaries shown on Figure 3.5 above. Three streams under each alternative require both crossing and substantial channelization due to the angle of the crossing. The remaining stream(s) under those alternatives were located near the edge of the proposed ROW, but may require channelization. Streams that were crossed more than one time were counted only once in this table, because it has not been determined if those streams will actually be crossed more than once or if the channel will be realigned to parallel the new roadway and then require fewer actual crossings.

Source: Parsons, 2011

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

3.11.2.1 Direct Impacts to Aquatic Resources (No-Build Alternative)

Because no new construction activities would occur under the No-Build Alternative, no changes from the baseline conditions of aquatic resources would occur.

3.11.2.2 Indirect Impacts to Aquatic Resources (No-Build Alternative)

Because no new construction activities would occur under the No-Build Alternative, no changes from the baseline conditions of aquatic resources would occur.

3.11.2.3 Cumulative Impacts to Aquatic Resources (No-Build Alternative)

The No-Build Alternative would not result in any major changes to baseline conditions of aquatic resources and would therefore not result in any cumulative impacts. Other non-related projects, such as local roadway and bridge repair projects, commercial and residential developments, agricultural practices, and private landowner activities would continue to influence water quality in local watersheds due to the increased potential for

erosion and sedimentation and use of chemicals or fertilizers near watercourses. However, there would be no substantial changes from baseline conditions in the reasonably foreseeable future.

3.11.3 Potential Impacts to Aquatic Resources Associated with the Green Alternative

3.11.3.1 Direct Impacts to Aquatic Resources (Green Alternative)

The Green Alternative may directly affect up to 10 streams, 13 wet weather conveyances, seven springs/seeps, and four ponds. It appears that seven streams will be crossed, and four may be rechanneled under the Green Alternative (see following mitigation section on channelization details). It is not possible to determine the exact impact based on the conceptual design plans available at this time; therefore the information regarding stream impacts, including those shown in Table 3.22 represent the worst-case impact, with the assumption that these impacts will be reduced, where possible, during final project design.

Long-term adverse impacts to streams would occur due to changes in stream flow caused by necessary channel modifications at crossings. Additional minor long-term adverse impacts would occur due to highway runoff containing oils and other roadway contaminants entering the streams.

Long-term impacts to water quality would be anticipated for streams along the Green Alternative alignment. Construction of James White Parkway would increase the amount of paved or impervious surfaces resulting in increased runoff. Pollutants usually contained in highway runoff include de-icing salts, pesticides, and herbicides used for the control of roadside vegetation. De-icing salts are used relatively sparingly in this area and would not likely impact water quality, and pesticides and herbicides can be applied in a manner designed to minimize introduction of these chemicals into the surrounding waterbodies. Runoff from bridge surfaces could impact water quality in the immediate area. Also, aquatic benthic habitats may be altered near the piers of bridges due to changes in bathymetry associated with the piers. McCall Branch and Baker Creek, both 303d-listed streams, would be impacted by the Green Alternative. However, it is not anticipated that impacts will be substantial due to use of best management practices (BMPs) and proper mitigation efforts that will be conducted as part of this project.

Long-term adverse impacts would be expected as a result of stream channelization. Straightening of the watercourse and modification of natural streambank would likely lead to permanent loss or degradation of habitat for aquatic and riparian species. For example, streams that have been channelized often exhibit less aquatic habitat complexity as compared to non-channelized streams.

Short-term adverse impacts would include interruption or modification of stream flow during construction and water quality impacts associated with site preparation, grading, and construction activities. Other short-term adverse impacts would include increased sediment loading, disruption of bottom substrates and associated macroinvertebrate communities, and removal of tree cover and riparian vegetation resulting in increased erosion and habitat loss. Removal of canopy cover increases sun exposure to the water surface, which can raise stream water temperature. Increased water temperature can alter species composition in the stream. Contaminant runoff from construction equipment and materials may also adversely affect water quality. Construction-related impacts would be temporary and any affected aquatic communities would be expected to recover after construction has ceased. The degree of impact would vary depending on the width and depth of the stream, the distance of the stream to the final alignment, the steepness of the newly established streambanks, and the typical level of flow within the stream.

Impacts to springs/seeps would directly impact associated streams to which they supply hydrology. Efforts would be made during the design phase to avoid or minimize impacts to these features or design the roadway in a manner that would allow them to continue to provide hydrological connection to streams and wetlands.

The Green Alternative would impact four ponds. Some of the ponds impacted would need to be completely drained and filled. Impacts to ponds and lakes would be avoided or minimized to the extent practical during the final design phase of the project. Draining of ponds may have short-term impacts to downstream watercourses.

3.11.3.2 Indirect Impacts to Aquatic Resources (Green Alternative)

Channelization of streams within the project area could result in long-term adverse impacts to aquatic habitats and species living in downstream habitats. These long-term adverse impacts would primarily result from potential changes in aquatic habitat conditions associated with changes in hydrology and water quality over time. Changes in hydrology may impact microhabitat conditions, such as substrate type, stream channel depth and width, and vegetation in portions of these streams. These changes could result in changes in species composition in certain areas. These adverse impacts have potential to affect spawning and larval fish due primarily to the decreased water quality and subsequent decrease in benthic invertebrates.

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

The 303d-listed streams, Baker Creek and McCall Branch, could receive short-term impacts 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. In fact, due to the present conditions surrounding McCall Branch, any erosion and sediment control features established on the site for this project would be considered an improvement. This is because during the December 2010 site visits, a large area at the upper end of this streams watershed was severely disturbed due to tree clearing and grading of the land, which was resulting in severe erosion and sedimentation in McCall Branch. No substantial erosion or sediment control structures were being utilized at that time to protect the stream. TDOT will continue to work with regulatory agencies throughout the design, permit acquisition, and construction phases to ensure that appropriate measures are taken to prevent further degradation to this stream, and other non-303(d) listed streams in the vicinity.

Impacts to springs and seeps may indirectly impact streams and wetlands that rely on the hydrology provided by those features. Loss or alteration of the hydrology of adjacent streams would likely result in eventual loss of function of those features. Efforts would be made during the design phase to maintain hydrology to all streams located downstream of the project area to reduce the potential for long-term impacts extending beyond the project limits.

Construction of James White Parkway could indirectly impact springs located outside of the immediate ROW due to disruption of hydrology in the vicinity of the project area. This disruption of hydrology would change the existing groundwater flow rates in some areas.

3.11.3.3 Cumulative Impacts to Aquatic Resources (Green Alternative)

Culverting, stream channelization and modifications, sediment impacts, and the addition of impervious surfaces in a geographic area all tend to degrade overall quality of aquatic habitats and water quality. The placement of lengths of streams in culverts is considered by TDEC to be a permanent impact. While the water quality impacts of culverts over 200 feet in length are mitigated by off-site programs, increases in numbers of culverts associated with public highways and other roadways or driveways associated with private residential, industrial, and commercial developments may cumulatively reduce available habitats over time. TDOT would make every effort to minimize water quality impacts associated with James White Parkway. Use of appropriate BMPs and continued coordination with regulatory agencies during project design and permitting would be implemented to help reduce the overall cumulative impacts to aquatic resources caused by the James White Parkway project.

The Green Alternative would impact both 303-d listed streams in the project vicinity, Baker Creek and McCall Branch. However, with use of BMPs and approved mitigation techniques, it is not anticipated that impacts to these streams would substantially alter the streams from baseline conditions. It is possible that the impacts to McCall Branch could actually benefit this stream based on the severely degraded conditions observed during the site visits conducted for this project. Any efforts to improve the erosion and sedimentation issues near the upper reaches of this stream's subwatershed would benefit this stream. Such efforts would be implemented in association with construction of the James White Parkway.

It is anticipated that James White Parkway 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 James White Parkway have potential to add to the adverse impacts to water quality associated with construction and operation of James White Parkway 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.

3.11.4 Potential Impacts to Aquatic Resources Associated with the Blue Alternative

3.11.4.1 Direct Impacts to Aquatic Resources (Blue Alternative)

The Blue Alternative will affect 12 streams, 15 wet weather conveyances, seven springs/seeps, and four ponds. It appears that nine streams will be crossed, and four may be rechanneled under the Blue Alternative. The Blue Alternative would avoid the 303d-listed McCall Branch. The other general aquatic resources impacts associated with the Blue Alternative would be similar to those discussed under the Green Alternative.

3.11.4.2 Indirect Impacts to Aquatic Resources (Blue Alternative)

Indirect impacts to aquatic resources associated with the Blue Alternative would be similar to those discussed for the Green Alternative.

3.11.4.3 Cumulative Impacts to Aquatic Resources (Blue Alternative)

Cumulative impacts to aquatic resources associated with the Blue Alternative would be similar to those discussed for the Green Alternative. However, cumulative impacts to McCall Branch would not occur under the Blue Alternative because it avoids that stream.

3.11.5 Potential Impacts to Aquatic Resources Associated with the Red Alternative

3.11.5.1 Direct Impacts to Aquatic Resources (Red Alternative)

The Red Alternative will affect 13 streams, 15 wet weather conveyances, three springs/seeps, and no ponds. It appears that nine streams will be crossed, and five may be rechanneled under the Red Alternative. The Red Alternative would avoid the 303d-listed McCall Branch. However, it would encroach upon Burnett Creek and its associated floodplain located at the proposed interchange of James White Parkway and Governor John Sevier Highway near Sevierville Pike. The other impacts associated with Red Alternative would be similar to those discussed under the Green Alternative.

3.11.5.2 Indirect Impacts to Aquatic Resources (Red Alternative)

Indirect impacts to aquatic resources associated with the Red Alternative would be similar to those discussed for the Green Alternative.

3.11.5.3 Cumulative Impacts to Aquatic Resources (Red Alternative)

Cumulative impacts to aquatic resources associated with the Red Alternative would be similar to those discussed for the Green Alternative. However, cumulative impacts to McCall Branch would not occur under the Blue Alternative, because it avoids that stream. The Red Alternative would impact Burnett Creek, but it is not expected to have substantial impacts to this stream due to little or no channel modification being required for this stream as part of this project.

3.11.6 Mitigation of Aquatic Resources Impacts

Impacts to aquatic resources and water quality can be minimized by using best management practices and appropriate techniques during the construction and/or placement of metal pipes, concrete culverts, and bridges. Contractors will utilize erosion controls and minimize the removal of existing vegetation to the extent possible to reduce soil erosion. Employing bank stabilization measures, such as seeding, placing of rip-rap, and/or installing a silt fence would also minimize short-term adverse impacts to water quality during stream-side and in-stream construction.

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

Although only short-term indirect adverse impacts to water quality are anticipated, all reasonable precautions will be taken to ensure that any potential adverse impacts are minimized. Water quality protection measures are described in the following documents:

- Tennessee Erosion and Sediment Control Handbook (TDEC, 2001c);
- Riparian Restoration and Streamside Erosion Control Handbook (TDEC, 1998b);
- Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot, 1992); and
- Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction (TDOT, 2006).

Examples of mitigation measures may include:

- The unnecessary removal of existing vegetation would be avoided. Canopy removal along all working or staging areas would be limited to the extent practicable.
- Where removal of vegetation is necessary, sediment control measures would be employed immediately at the start of construction.
- Control structures would be inspected and properly maintained throughout the life of the project.
- Permits - The acquisition of permits will occur prior to initiation of construction activities, pursuant to Section 69-3-108(a) of the Tennessee Water Quality Control Act of 1977 and other state and Federal laws and regulations. These permits could include:
    - CWA Section 404 Permit – required for construction that involves the placement of dredge and fill material in Waters of the U.S. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. The U.S. Army Corps of Engineers (USACE) would require Section 404 permits prior to construction.
    - Aquatic Resource Alteration Permit (ARAP) – required for any alterations of state waters, including wetlands, which do not require a federal (Section 404) permit. ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; perennial streams; intermittent streams; or any stream that supports any form of aquatic life or is in the vicinity of a State-listed endangered species. TDEC Division of Water Pollution Control issues ARAP permits.
    - National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit – required for grubbing, clearing, grading, or excavation of one or more acres of land. TDEC's Division of Water Pollution Control issues NPDES permits.
    - Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP) – required by operators of construction sites in Tennessee.

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

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

A spill prevention, control, and counter measures (SPCC) plan would be developed for both the construction process and for operations after construction. This plan would define the emergency response plan in cases where accidental releases of hazardous substances occurred, including potential spills or releases adjacent to stormwater systems. A Stormwater Pollution Prevention Plan (SWPPP) will also be developed for the project.

3.12 Wetlands

3.12.1 Affected Environment

Section 404 of the CWA extends authorization to the USACE to regulate activities that affect waters of the United States, including wetlands, and to issue permits for the discharge of dredged or fill material into wetlands and other water of the U.S. Activities that impact wetlands or waters of the U.S. require Section 404 permitting and mitigation may be required.

The USACE defines wetlands as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR Part 328.3b). In general, to be considered jurisdictional, a wetland area must satisfy criteria for hydrology, hydric soils, and hydrophytic vegetation. Wetland hydrology means that water permanently or periodically inundates soils or that the soil is saturated to the surface for a given duration during the growing season. Hydric soils show signs of reduced rather than oxidized soil conditions. Hydrophytic plants have adapted to areas having hydric soils or to areas that have inundated or saturated soils, which create anaerobic/anoxic conditions.

Wetland areas may perform a variety of functions and provide many values for society. Functions are ecological roles that the wetland system performs within the greater landscape, such as water storage, carbon fixation, nutrient transformation, and species habitat. Values are attributed to wetlands based on their worth to humans. Examples of wetland values include flood control, hunting/recreation, timber production, and waste water treatment. Some wetlands are better at performing certain functions or providing certain values than others.

Prior to field investigations, USFWS National Wetland Inventory (NWI) maps and USGS topographic maps were analyzed to determine potential locations of jurisdictional wetland areas in the proposed project area. The NWI program identifies potential wetland areas through stereoscopic analysis of high altitude aerial photographs. Potential wetland areas are classified in accordance with Cowardin (1979) based on interpretation of vegetation, visible hydrology, and geography observed on the photographs. The NWI map was used as an initial screen to determine likely locations of potential wetland areas within the project area.

Following the preliminary review of potential wetlands, on-site field investigations were conducted to identify potential jurisdictional wetlands occurring within and immediately adjacent to the build alternative ROWs. Wetland determinations were made utilizing the technique as described in the USACE Wetlands Delineation Manual (USACE, 1987). The USACE three-parameter approach (hydrology, soils, and vegetation) was applied to make routine wetlands determinations in the field. This approach requires an on-site inspection of the vegetative composition, soils, and hydrology of an area to make wetland determinations. At least one positive wetland indicator for each parameter must be evident for a positive wetland determination.

Vegetation and hydrology determinations were based on field observations. Dominant plant species were identified for each vegetative stratum (i.e., tree, shrub/sapling, herb, vine), and their wetland indicator status documented on the data sheets. Soil determinations were based on soil core samples. Soil core samples were taken and observations of hue, value, and chroma using a Munsell Soil Color Chart were made.

After evaluating all of these parameters at locations identified during pre-field map reviews and for additional areas identified during the on-site field investigations, no jurisdictional wetlands were identified within the 500-foot study area of any of the build alternatives. Most of the project area remains in upland areas and within karst terrain. Most of the areas encountered were considered well-drained due to the many solution cavities, sinkholes, or joint cracks in the underlying limestone. This type of drainage does not promote the formation of wetlands. The following two paragraphs describe a few of the locations that were evaluated to determine their wetland status.

The first area was a small forested area located near the northern terminus of the project, just south of Moody Avenue and adjacent to the east side of Baker Creek. This area contained bottomland hardwood forest that had a few small pockets of temporarily saturated soils and inundated areas. However, these saturated conditions at the time appeared to be due to recent precipitation and semi-frozen surface layers that were holding water near or above the surface. Based on soil cores studied at several locations within this area, it did not appear the area maintained saturated conditions for long enough periods to promote hydric soil conditions. A series of deeply cut surface drainages running through the area appeared to allow the soils to readily drain into Bakers Creek.

Other areas evaluated included several small ponds in the project area. Pond 1 located within the channel of STR-09 contained water that was too deep to support wetland vegetation. Pond 6 (0.02 acres) and Pond 7 (0.05 acres) located adjacent to STR-14 within SNK-13 were investigated at the time of the site visit due to potential wetland hydrology. However, the soils did not exhibit hydric soil indicators to allow the areas to be considered wetlands. It appeared these two areas were holding water due to a layer of ice that had formed within the depressions, which was likely keeping the surface water runoff from recent rains from draining into the underlying sinkhole area. Should the Blue Alternative be selected, these areas should be re-investigated to make a final wetland determination. A map showing the location of ponds potentially impacted by the project is contained on Figure 3.5 in Section 3.11. More details are provided in the Ecology Study Technical Report on the project website at: http://www.tdot.state.tn.us/sr71/ and upon request through the Environmental Division.

3.12.2 Potential Impacts to Wetlands Associated with the No-Build Alternative

3.12.2.1 Direct Impacts to Wetlands (No-Build Alternative)

Because no new construction activities would occur under the No-Build Alternative, no changes from the baseline conditions of wetlands would occur.

3.12.2.2 Indirect Impacts to Wetlands (No-Build Alternative)

Because no new construction activities would occur under the No-Build Alternative, no changes from the baseline conditions of wetlands would occur.

3.12.2.3 Cumulative Impacts to Wetlands (No-Build Alternative)

The No-Build Alternative would not result in any major changes to baseline conditions of wetlands and would therefore not result in any cumulative impacts. Other non-related projects, such as local roadway and bridge repair projects, commercial and residential developments, agricultural practices, and private landowner activities would continue to have the potential to affect any wetland resources in the area. However, there would be no substantial changes from baseline conditions in the reasonably foreseeable future.

3.12.3 Potential Impacts to Wetlands Associated with the Build Alternatives

3.12.3.1 Direct Impacts to Wetlands (Green Alternative, Blue Alternative, and Red Alternative)

No direct impacts to wetlands are anticipated under any of the build alternatives.

3.12.3.2 Indirect Impacts to Wetlands (Green Alternative, Blue Alternative, and Red Alternative)

Increased sediment loading due to increased runoff from the proposed project could adversely affect any wetlands located downstream of the study area. However, there are no known wetlands located immediately downstream of the project area, so this type of impact is considered unlikely. Indirect impacts due to secondary developments promoted by construction of James White Parkway are also considered unlikely due to most of the surrounding area, especially near the proposed interchanges being considered upland areas and within well drained karst topography. It is not possible to quantify such impacts at this time. All new developments in the area, whether promoted by this project or unrelated to it, would be subject to all local, state, and federal regulations regarding environmental impacts, including wetlands. It is likely that impacts to wetlands would be avoided, minimized, and/or mitigated for as part of the permit phase of those projects.

3.12.3.3 Cumulative Impacts to Wetlands (Green Alternative, Blue Alternative, and Red Alternative)

No cumulative impacts to wetlands are anticipated under any of the build alternatives, because the build alternatives would not impact any known wetlands, and there are few wetlands present in the vicinity of the project.

3.12.4 Mitigation

Because no known wetland impacts would occur as a direct result of this project, it is not likely that any mitigation efforts would be necessary or required. If any wetlands were discovered during any phase of this project, and it was determined that the project would impact them, TDOT would attempt to avoid them or would obtain the appropriate permits to fill or drain the wetlands, as necessary. As part of the permit process, TDOT would work with the appropriate regulatory agencies to determine what mitigation measures may be required. Similarly, if any wetlands were impacted by secondary developments and/or other unrelated development projects; they would require permits and appropriate mitigation as determined by the appropriate regulatory agencies.

3.13 Water Bodies and Wildlife Resources

3.13.1 Affected Environment

3.13.1.1 Aquatic Habitats and Wildlife

Aquatic habitats within the project area consists of a mixture of intermittent streams, perennial streams, subsurface streams, springs, and small ponds. Most of the streams in the project area contain relatively limited amounts of aquatic habitats due to their small sizes. However, some of the larger streams, such as Baker Creek, Johnson Creek, and Burnett Creek, provide habitats for a variety of species. Characteristics of the habitats within the James White Parkway study area are described in more detail in the Ecology Study Technical Report prepared for this project.

Several small fish species, reptiles, amphibians, mammals, and various invertebrates rely on the aquatic habitats within the project area. Several otherwise terrestrial species also utilize the aquatic habitats for drinking and foraging. In addition, several streams and wet weather conveyances in the area provide necessary hydrology and food sources for subterranean species, such as salamanders and other cave species. Most of the existing aquatic habitats are of somewhat reduced quality due to past and present human disturbances including: residential developments; associated infrastructure, such as roadways, driveways, and utilities timber harvesting and mining; and other land uses. These disturbances have resulted in a combination of impacts to local aquatic habitats and water quality resulting from removal of riparian vegetation, substantial channel modifications, increased erosion, changes in hydrology, and use of pesticides, herbicides, and fertilizers in the watershed.

3.13.1.2 Terrestrial Habitats and Wildlife

Some of the land in the project corridor has been developed in the past due to residential and business development and associated local access roadways. However, a majority of the study corridor remains forested due primarily to the relatively steep terrain and sinkholes in the area, which make the land less desirable for several land uses.

Plant communities in the area are characteristic of communities formed over limestone, sandstone, and shale. The various elevations, slopes, and directional orientations have influenced the species composition within the plant communities. Most of the upland forested communities in the area are dominated by oaks and hickories accompanied by maples, tulip poplars, pines, cedars, and a variety of other species. A few areas were dominated by pines and/or cedars with a mixture of oaks and hickories scattered within the stands. However, it appeared that several areas formerly dominated by pines, based on aerial photography, had either succumb to diseases in the past few years, or were clearcut and sold. Some of those areas appeared to be naturally regenerating with a mixture of pine seedlings and seedlings of a variety of deciduous trees. The lower lying areas along streams were dominated by sycamores, box elder, and thick stands of privet.

The mature forest habitats provide food, cover, and nesting opportunities for numerous mammals, including deer, raccoons, squirrels, and rodents; resident or quasi-resident birds, such as northern cardinals, woodpeckers, and owls; and migratory birds, including a variety of thrushes, warblers, vireos, and other species; reptiles and amphibians; and a variety of insects. Much of the forest in the area contains relatively diverse stands of trees with a good mixture of large and small trees, and several hollow snags. This range of habitats promotes a more diverse suite of species.

The old field and shrub/scrub habitats in various stages of succession are also beneficial to many types of wildlife, especially deer, birds, reptiles, and insects. These areas are most

often dominated by grasses and legumes, blackberries, young cedars, and other clumps of small woody vegetation, such as sumac and wild plum.

The grassland/pasture areas offer more limited wildlife habitat but are used by some species including deer and rodents primarily for food. Depending on the amount and timing of disturbance, grasslands offer nesting habitat for grassland nesting birds. However, heavily grazed or fields that are hayed early in the season are not suitable for most species. A couple of small food plots were observed in the project area that were assumed to be used to provide food for deer.

The developed and disturbed areas within the project area offer very limited habitat for most species, except for species that have adapted well to living with human disturbance. The primary species found in these areas include birds, such as American robins and northern cardinals and nuisance species, such as starlings and house sparrows. Squirrels, rabbits, and deer also utilize these areas if adequate food and cover is available nearby.

Characteristics of these habitat types are described in detail in the Ecology Study Technical Report prepared for this project. The acreage of each habitat type within each of the build alternative ROWs is summarized on Table 3.23.

Table 3.23. Total Habitat (Acres) Potentially Affected by Each Build Alternative.

Alternative	Forest	Shrub/Scrub	Old Field	Grassland/ Pasture	Developed/ Disturbed	Total
Green Alternative	122.12	4.27	2.79	0.69	58.09	187.96
Blue Alternative	123.09	8.76	5.66	6.02	59.82	203.36
Red Alternative	123.12	6.96	5.63	4.40	65.57	205.68

*Note: These acreage amounts were calculated based on anticipated ROW boundaries shown on aerial photographs and are given for impact estimation/comparison purposes. They include all areas within the proposed new ROW and the areas within existing ROWs that are already owned by the state, portions of which are likely to be used for project construction. For instance, existing ROWs along Governor John Sevier Highway near the southern terminus of each alternative are included in the habitat calculations, but are not included in the new ROW acquisition amounts shown elsewhere in the environmental document. Not all of the acreages shown in this table will actually be disturbed, since lands outside of those needed for actual construction, slope easements, or work zones may not need to be cleared.

Source: Parsons, 2011

3.13.1.3 Invasive Species

In accordance with EO 13112 *Invasive Species*, field surveys in the project area included visual observations for invasive species populations. The EO directs federal agencies to expand and coordinate their efforts to combat the introduction and spread of plants and animals not native to the United States. Roadways can provide opportunities for the spread of invasive species in several ways, including: the introduction by automobile traffic;

mowing and spraying operations; the importing of dirt, gravel, or sod; or through the use of nonnative plants for erosion control, landscape, or wildflower projects.

Past development, including residential areas and roads bisecting the project area, has permanently altered the natural landscape and has helped introduce or spread non-native species. Some of the most common non-native plant species observed in the proposed project corridor include Japanese honeysuckle (*Lonicera japonica*), sericea lespedeza (*Lespedeza cuneata*), multiflora rose (*Rosa multiflora*), and privet (*Ligustrum spp.*). Of those, privet appears to be the most invasive of the non-native plants observed in the James White Parkway project area. Several dense stands of privet were observed lining many of the streams throughout the area. Isolated populations of other invasive plants are possibly present within the project area as well, but no evidence of widespread infestations of such plants was observed during the field surveys.

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

3.13.2.1 Direct Impacts to Fish and Wildlife Resources (No-Build Alternative)

The No-Build Alternative would not change the baseline conditions in the project area. Therefore, no substantial changes to existing levels of impacts to fish and wildlife resources would be expected.

3.13.2.2 Indirect Impacts to Fish and Wildlife Resources (No-Build Alternative)

The No-Build Alternative would not change the baseline conditions in the project area. Therefore, no substantial changes to existing levels of impacts to fish and wildlife resources would be expected.

3.13.2.3 Cumulative Impacts to Fish and Wildlife Resources (No-Build Alternative)

The No-Build Alternative would not result in any major changes to baseline conditions of fish and wildlife resources and would not result in any cumulative impacts. Other non-related projects, such as local roadway and bridge repair projects, commercial and residential developments, agricultural practices, and private landowner activities would continue to have potential to affect fish and wildlife resources in the area. However, there would be no substantial changes from baseline conditions in the reasonably foreseeable future.

3.13.3 Potential Impacts to Fish and Wildlife Resources Associated with the Build Alternatives

3.13.3.1 Direct Impacts to Fish and Wildlife Resources (Green Alternative, Blue Alternative, and Red Alternative)

There would be long-term adverse impacts to vegetation and terrestrial habitats associated with each build alternative due to the necessary clearing of forests, old field, and other undeveloped land. Loss of forest and other wildlife habitat is one of the main potential adverse impacts of the project. Table 3.23 above shows the amount of each habitat type expected to be impacted by each alternative. Impacts are relatively similar between alternatives, except that the Blue and Red Alternatives would result in 15.40 and 17.72 acres, respectively, of additional habitat potentially being cleared when compared to the Green Alternative. The extra clearing is due primarily to the extra overall length associated with each of those alternatives due to widening of Governor John Sevier Highway before heading to the northwest on new alignment. Although a substantial amount of clearing of forests will be required for the project, the area surrounding the project area still contains an abundance of forest and other wildlife habitats that are expected to remain mostly intact in the foreseeable future primarily due to the steepness of the terrain and presence of karst

features, which make those areas less desirable for other types of development. Also, portions of the forests in the project vicinity are currently publicly-owned parks and/or natural areas, which would remain in their natural state to provide recreational uses, such as wildlife viewing and nature trails.

Highway noise can affect the utilization of habitats by wildlife in both the short and long term. Most of the project area, except areas near the southern and northern termini, is relatively rural and currently experiences little traffic noise. Construction noise would likely disturb wildlife in the short term. Vehicle noise from operation of the constructed James White Parkway would be a sustained long term impact. However, most of the species inhabiting the area are tolerant of the levels of traffic noise anticipated for this project and would not be substantially impacted. Areas immediately adjacent to the traffic lanes would experience higher levels of noise than areas at the outside edge of the ROW and beyond.

Mortality of individual animals may occur during construction and afterward during highway operation. Although roadway mortality is generally not believed to affect animal populations under normal conditions, if the population is experiencing other sources of stress, then traffic-related mortality can contribute to the cumulative reduction of the population. After project construction, areas that remain undisturbed within highway ROW, will, over time, provide some degree of useful habitat for local wildlife, especially for species tolerant of some human activity and traffic noise. For instance species like red-tailed hawks, northern cardinals, and other songbirds; deer; and small mammals are often found utilizing habitats within or near the edges of highway ROWs for food, cover, and nesting habitat. These undisturbed areas sometimes provide travel corridors between habitats where surrounding areas are more developed.

Short-term adverse impacts would include interruption or modification of stream flow during construction and water quality impacts associated with site preparation, grading, and construction activities. Other short-term adverse impacts would include increased sediment loading, disruption of bottom substrates and associated macroinvertebrate communities, and removal of tree cover and riparian vegetation resulting in increased erosion and habitat loss. Contaminant runoff from construction equipment and materials may also adversely affect water quality. Construction-related impacts would be temporary and any affected aquatic communities would be expected to recover after construction had ceased. The degree of impact would vary depending on the width and depth of the stream, the distance of the stream to the final alignment, the steepness of the newly established streambanks, and the typical level of flow within the stream.

Transportation systems can facilitate the spread of plant and animal species outside their natural range. Those species that are likely to harm the environment, human health, or economy are of particular concern. Nonnative flora and fauna can cause major changes to ecosystems, upset the ecological balance, and cause economic harm to agriculture and recreation sectors. It is not anticipated that the James White Parkway project will substantially change the baseline conditions related to invasive species. Construction activities associated with any of the build alternatives would potentially increase the chance of spreading invasive plant species in the project area, due primarily to soil disturbance and removal of native vegetation. Many invasive species thrive in newly disturbed areas and effectively out-compete native vegetation before it can become reestablished. Areas that already contain a population of invasive species would be the most likely areas to be affected. Although even if no identifiable population of invasive species occurs in an area, it is possible for seeds from nearby populations to lie idle on the surface awaiting disturbances, such as removal of native vegetation, to allow them to germinate. Prompt reseeding of disturbed areas with native plants that are easily established would help reduce

the risk of invasive species spreading along the disturbed areas created during construction. Other BMPs and control methods would be utilized to help control the spread of invasive species as described in the Mitigation section below.

3.13.3.2 Indirect Impacts to Fish and Wildlife Resources (Green Alternative, Blue Alternative, and Red Alternative)

The habitats found within the proposed project ROWs serve as shelter, nesting, and foraging areas for numerous species of wildlife. Loss of habitat due to the proposed action would displace animals from the project area forcing them to concentrate into a smaller area. This can cause over-utilization of the remaining habitats.

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

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

Construction of the new roadway may promote increased development in the project vicinity due to the improved transportation efficiency. These secondary developments would likely result in additional loss of wildlife habitats. The exact location and amount of loss cannot be determined at this time. Also, for projects adjacent to large urban centers, such as this, it is difficult to determine whether new developments are a direct result of the new roadway or if developments would have occurred regardless of the new roadway due to the proximity of the property to the urban or suburban area. In areas where new interchanges are constructed, it is typically expected that at least some new development will occur that is attributable to the new access point unless local zoning prohibits such developments.

Much of the habitat along the existing James White Parkway corridor has been altered or is adjacent to residential areas or other areas prone to frequent human disturbances. Therefore, most species existing in the project area can tolerate moderate levels of human disturbance that would be anticipated with the new roadway and any associated secondary developments. Species requiring large home ranges or large intact blocks of high quality habitats have likely already been lost from the area due to habitat fragmentations and other past changes in the landscape. Impacts to existing habitats could result in additional changes in species composition as species less adapted to human disturbances or habitat fragmentation may not persist in the area. In addition, increase development could result in decreased water quality for aquatic habitats resulting in a change in species composition from water quality sensitive species to more tolerant species.

Secondary developments associated with James White Parkway would result in additional land disturbances that could result in the spread of invasive plant species due to additional land disturbances.

3.13.3.3 Cumulative Impacts to Fish and Wildlife Resources (Green Alternative, Blue Alternative, and Red Alternative)

In rural and suburban areas adjacent to large urban areas like the City of Knoxville, the pressure to develop habitat into commercial and residential areas can be high. Within a two-mile radius of the project area, there has been an increase in commercial and residential developments over the past 10 years, primarily in areas west and south of the proposed project. However, areas in the immediate project vicinity have not been developed as rapidly because of the relatively steep terrain and karst topography in the area. Undeveloped forest and other habitats are gradually decreasing in Knox County. The quality of remaining forests is also declining due to continued spread of invasive species in the area due to land disturbances and introduction of some species in landscape plantings that escape or spread into the adjacent native habitats. It is likely that this trend will continue to occur regardless of James White Parkway being constructed. However, if the new roadway is constructed, it is likely that development in adjacent areas and areas to the south will occur sooner than it would occur without the new roadway and associated improved travel efficiency it will provide. Local zoning, conservation buffers, and other land management tools can be used to control the amount and type of development that occurs, as well as the associated impacts to fish and wildlife resources.

3.13.4 Mitigation of Fish and Wildlife Resources Impacts

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

It is expected that the combined use of water quality protection measures during construction and appropriate mitigation measures would result in a reduction in potential impacts to fish and wildlife. Although short-term and long-term adverse impacts would be anticipated, BMPs would be followed to minimize or mitigate for the overall impact to fish and wildlife. When possible, streamside and in-stream construction activities would be performed during dry periods, when stream flow is at a minimum. The unnecessary removal of existing vegetation would be avoided as much as possible. Canopy removal along all working or staging areas would be limited to the extent practicable. Where removal of vegetation is necessary, bank stabilization and sediment control measures would be employed immediately before the start of construction. Bank stabilization measures would include seeding with native species and placing of silt fences or riprap. Control structures would be inspected and properly maintained throughout the life of the project. A spill prevention control and countermeasures (SPCC) plan would be developed for both the construction process and for operations of James White Parkway after construction.

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

application of herbicides, and use of selected mowing to maintain ecotone and habitat diversity.

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

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

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

TDOT will work closely with TDEC and the USACE during the permit stage of the project to determine exact impacts to existing watercourses and what mitigation is required for impacts to those resources. TDOT will continue to work closely with regulatory agencies and other stakeholders to ensure that impacts to important resources are kept to the minimum practical.

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

The Tennessee Exotic Pest Plant Council (TN-EPPC) has produced a detailed manual, Tennessee Exotic Plant Management Manual (TN-EPPC 1997), aimed at providing information to help control and manage 20 of Tennessee's worst exotic pest plant problems. This manual provides the entire list of invasive exotic pest plants in Tennessee, detailed

species descriptions, and recommended herbicide application methods for controlling these species. This resource will be used as an additional tool to control the spread of invasive species with construction of any of the build alternatives.

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

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

3.14 Floodplains

3.14.1 Affected Environment

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

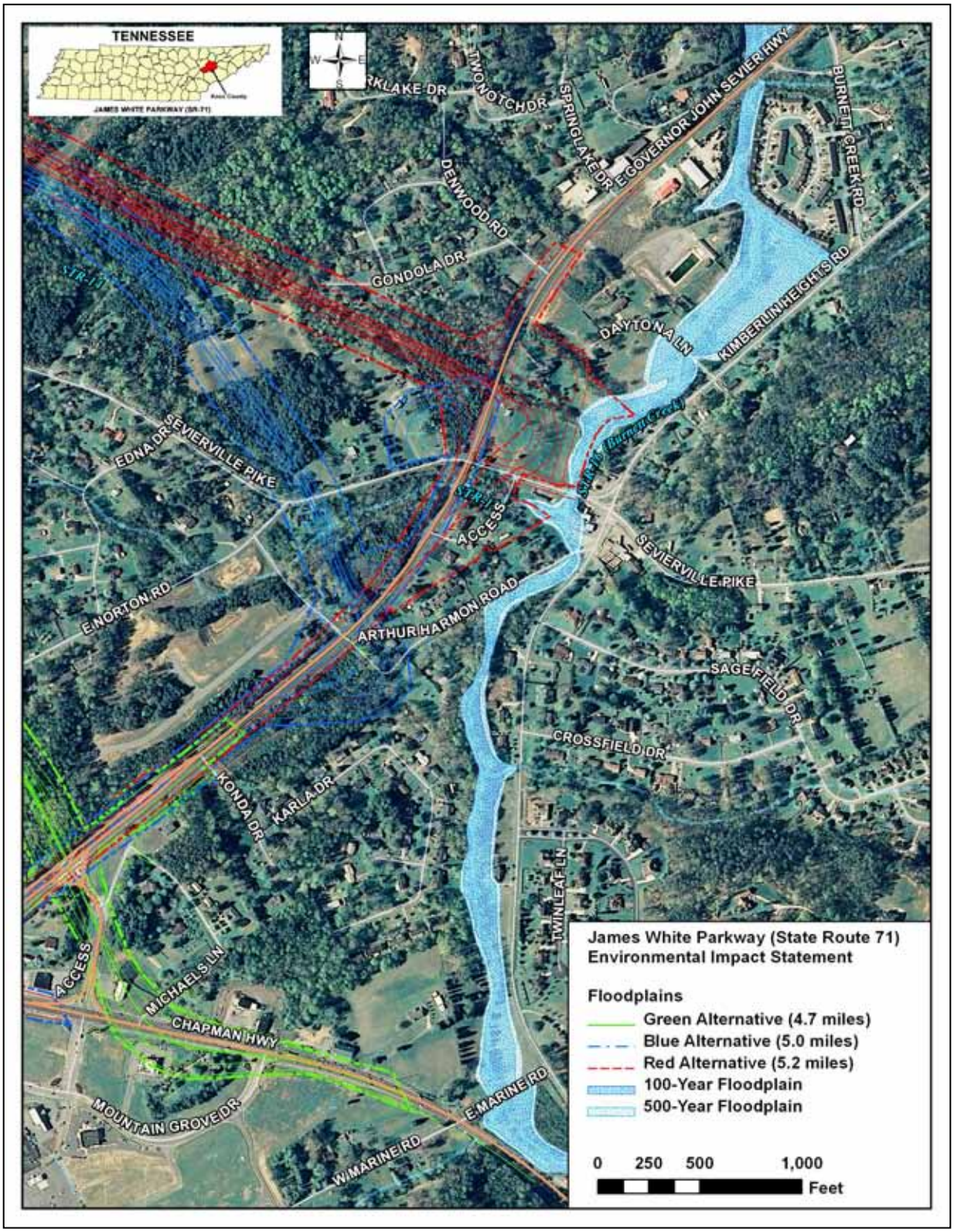
Encroachment according to 23CFR650.105(q) refers to a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction-related or flood-related impacts: (1) a substantial potential for interruption or termination of a transportation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

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

Based on the current flood insurance rate maps (FIRM) for the study area (Map #47093C0312F), a small amount (1.08 acres) of 100-year floodplain associated with Burnett Creek (STR-16) may be impacted by the proposed Governor John Sevier Highway interchange and Sevierville Pike connector roads associated with the Red Alternative. Figure 3.6 shows the location of the floodplain area in relation to the James White Parkway alternatives.

As discussed in the analysis below, there will be no substantial encroachment or impacts on floodplains from any of the potential build alternatives.

Figure 3.6. Map of Burnett Creek Floodplain in the James White Parkway Project Area.



3.14.2 Potential Impacts to Floodplains (No-Build Alternative)

The No-Build Alternative would not result in any changes to the baseline conditions relative to floodplains in the project vicinity.

3.14.3 Potential Impacts to Floodplains (Green Alternative)

3.14.3.1 Direct Impacts to Floodplains (Green Alternative)

The Green Alternative is not expected to result in any direct impacts to regulatory floodplains.

3.14.3.2 Indirect Impacts to Floodplains (Green Alternative)

There is a chance that the Green Alternative could spur some secondary developments in the southern portion of the project area near the Burnett Creek floodplain. Some of this development could impact existing floodplain areas. However, it is anticipated that most new developments that may be spurred by the project would occur on upland areas that are outside of floodplains. There are still developable upland areas near the southern portion of the project area and points to the south that would likely be utilized prior to land that would be prone to flooding.

Increased runoff from newly developed areas in addition to the addition of impermeable areas resulting from the proposed roadway could result in additional runoff into the nearby streams causing slight increases in water levels downstream of the area during heavy precipitation events. However, the amount of impermeable area from the new roadway would be minimal and is not expected to contribute substantially to increased water levels in the nearby streams. TDOT will continue to work with regulatory agencies to determine the need for stormwater retention basins or other measures to ensure flood levels are not impacted by the project. Other developments in the area beyond TDOT's control will need to be approved on a case-by-case basis by local planning agencies, which also take floodplain impacts into consideration.

3.14.3.3 Cumulative Impacts to Floodplains (Green Alternative)

Because no floodplains would be adversely impacted by the Green Alternative, it is anticipated that it would not result in measurable impacts to floodplains even when combined with other past, present, and reasonably foreseeable future projects. The only way that the Green Alternative would impact floodplains would be due to impacts due to secondary developments that may be induced by the roadway improvements. However, it is likely that most projects induced by the roadway improvements would occur on adjacent upland areas and would not impact floodplains. Therefore the likelihood of cumulative impacts to floodplains is minimal as a result of the Green Alternative.

3.14.4 Potential Impacts to Floodplains (Blue Alternative)

3.14.4.1 Direct Impacts to Floodplains (Blue Alternative)

The Blue Alternative is not expected to result in any direct impacts to regulatory floodplains.

3.14.4.2 Indirect Impacts to Floodplains (Blue Alternative)

Indirect impacts to floodplains under the Blue Alternative will be similar to those discussed under the Green Alternative. However, there will be an increased chance that secondary developments associated with the Blue Alternative could impact floodplains due to the proximity of the proposed interchange with Governor John Sevier Highway being located near the Burnett Creek floodplain area. Land surrounding new interchanges is often developed more quickly than other lands due to the improved access. However, it is

anticipated that most new developments that may be spurred by the project would occur on upland areas that are outside of floodplains. This is because there are still developable upland areas near the southern portion of the project area and points to the south that would likely be utilized prior to land that would be prone to flooding.

3.14.4.3 Cumulative Impacts to Floodplains (Blue Alternative)

Cumulative impacts to floodplains under the Blue Alternative will be similar to those discussed under the Green Alternative. However, there will be a slightly increased chance that secondary developments associated with the Blue Alternative could impact floodplains due to the proximity of the proposed interchange with Governor John Sevier Highway being located near the Burnett Creek floodplain area. Therefore, there would be a slightly increased chance for cumulative impacts to floodplains when such impacts are added to impacts of other past, present, and reasonably foreseeable projects that have or will also affect floodplains. However, no substantial floodplain impacts are anticipated as a result of this project due to the small area of the floodplain it is expected to encounter.

3.14.5 Potential Impacts to Floodplains (Red Alternative)

3.14.5.1 Direct Impacts to Floodplains (Red Alternative)

The Red Alternative ROW contains approximately 1.08 acres of regulatory floodplain that could be impacted by the project. However, it is anticipated that floodplain impacts will be minor, because the affected floodplain area lies at the very southern edge of the proposed ROW boundary. Therefore, it may be possible to slightly alter the design in that area to limit the amount of fill that occurs within the floodplain area to avoid the floodplain all together or reduce the amount of floodplain impacts. If avoidance is not possible, mitigation will be implemented to insure no net rise in base flood elevations will occur due to this project under the Red Alternative.

3.14.5.2 Indirect Impacts to Floodplains (Red Alternative)

Indirect impacts to floodplains under the Red Alternative will be similar to those discussed under the Blue Alternative. However, there will be an increased chance that secondary developments associated with the Red Alternative could impact floodplains due to the proximity of the proposed interchange with Governor John Sevier Highway being located within a portion of the Burnett Creek floodplain area. The proposed interchange may spur new development on lands in that immediate area. However, because the floodplain is relatively narrow in this area and there are developable upland areas adjacent to it, it is likely that impacts to the floodplain will be minor.

3.14.5.3 Cumulative Impacts to Floodplains (Red Alternative)

Cumulative impacts to floodplains under the Red Alternative will be similar to those discussed under the Green Alternative. However, there will be a slightly increased chance that secondary developments associated with the Red Alternative could impact floodplains due to the proximity of the proposed interchange with Governor John Sevier Highway being located near the Burnett Creek floodplain area. Therefore, there would be a slightly increased chance for cumulative impacts to floodplains when such impacts are added to impacts of other past, present, and reasonably foreseeable projects that have or will also affect floodplains. However, no substantial floodplain impacts are anticipated as a result of this project. Floodplain impacts will be regulated by local, state, and federal planning and regulatory agencies to ensure individual projects do not result in increased flooding for areas upstream or downstream.

3.14.6 Mitigation of Floodplain Impacts

Any build alternative selected for construction would be designed to minimize impacts to current drainage patterns and would not increase the base flood elevations upstream or downstream from the floodplain crossing or encroachment area. Where feasible, precautions would be taken during construction to minimize in-stream work and other stream disturbances that could alter flood flow on a temporary basis. Stormwater control features will continue to be implemented as necessary for new developments in the area. All stream work and mitigation measures would be in compliance with EO 11988, *Floodplain Management*.

All regulatory floodplain encroachments would be coordinated with FEMA, and no revisions to the regulatory floodplain limits are anticipated. There would be no significant encroachment [as defined in 23CFR650.105(q)] on floodplains with any of the alternatives.

3.15 Threatened and Endangered Species

3.15.1 Affected Environment

3.15.1.1 Federal-Listed Threatened and Endangered Species

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

Section 7 of the ESA will be completed prior to submission of the Final Environmental Impact Statement. FHWA and TDOT have continued to coordinate with the USFWS throughout the development of this environmental document. Coordination letters received to date from the USFWS are included in Appendix C.

Information from several sources, as well as prior experience with habitats in the area, was used to prepare for field surveys to locate protected species and/or habitats. These sources included database information provided by the USFWS and TDEC Natural Heritage Inventory Program (TDEC-NHIP). Table 3.24 lists the federally-listed T&E species for Knox County.

Table 3.24. Federal Threatened and Endangered Species in Knox County, Tennessee.			
Group	**Common Name**	**Scientific Name**	**Federal Status**
Amphibian	Berry Cave salamander	*Gyrinophilus gulolineatus*	Candidate Species
Fishes	Snail darter	*Percina tanasi*	LT
Fishes	Yellowfin madtom	*Noturus flavipinnis*	LT
Mammal	Gray bat	*Myotis grisescens*	LE
Mammal	Indiana bat	*Myotis sodalis*	LE*
Mussel	Turgid-blossom	*Epioblasma turgidula*	LE
Mussel	Pink mucket	*Lampsilis abrupta*	LE
Mussel	Dromedary pearlymussel	*Dromus dromas*	LE
Mussel	Finerayed pigtoe	*Fusconaia cuneolus*	LE
Mussel	Shiny pigtoe	*Fusconaia cor*	LE

*The Indiana bat is not listed for Knox County, but is listed for adjacent Blount County. The USFWS has requested that this species be taken into consideration in the Environmental Impact Statement and the associated Biological Assessment.

Status key: LE-Listed Endangered

LT-Listed Threatened

Source: USFWS, 2011b

3.15.1.2 Tennessee State-listed Species

The TDEC-NHIP maintains a GIS database with information on the distribution and ecology of rare plants, animals, and ecological communities across Tennessee. Table 3.25 lists all of the rare species known to occur in Knox County, Tennessee. According to the TDEC-NHIP there are 58 species of special concern in Knox County, and of these 58, there are four rare and/or state-protected species that have been previously observed within one mile of the ROW in Knox County and 25 additional species within a four-mile radius of the project area.

Table 3.25. Elements of Special Concern Identified by Tennessee Natural Heritage Program for Knox County, Tennessee		
Group	**Common Name**	**Scientific Name**
Invertebrate	Anthony Riversnail	*Athearnia anthonyi**
Invertebrate	Dromedary Pearlymussel	*Dromus dromas**
Invertebrate	Shiny Pigtoe	*Fusconaia cor**
Invertebrate	Finerayed Pigtoe	*Fusconaia cuneolus*
Invertebrate	Spiny Riversnail	*Io fluvialis**
Invertebrate	Pink Mucket	*Lampsilis abrupta*
Invertebrate	Birdwing Pearlymussel	*Lemiox rimosus*
Invertebrate	A Cave Spider	*Nesticus paynei*
Invertebrate	Orangefoot Pimpleback	*Plethobasus cooperianus**
Invertebrate	Cumberland Monkeyface	*Quadrula intermedia**
Plant		*Archidium alternifolium*
Plant		*Funaria americana**
Plant	Sharp's Homaliadelphus	*Homaliadelphus sharpie**
Plant	A Liverwort	*Radula volute**
Plant	Budding Tortula	*Rhachithecium perpusillum**
Plant	Spreading Rockcress	*Arabis patens**
Plant	Spreading False-foxglove	*Aureolaria patula**
Plant	Running Bittercress	*Cardamine flagellifera**
Plant	Foxtail Sedge	*Carex alopecoidea*
Plant	Heavy Sedge	*Carex gravida*
Plant	Appalachian Bugbane	*Cimicifuga rubifolia**
Plant	Pink Lady's-slipper	*Cypripedium acaule*

Table 3.25. Elements of Special Concern Identified by Tennessee Natural Heritage Program for Knox County, Tennessee		
Group	**Common Name**	**Scientific Name**
Plant	Tall Larkspur	*Delphinium exaltatum*
Plant	Naked-stem Sunflower	*Helianthus occidentalis***
Plant	Goldenseal	*Hydrastis canadensis*
Plant	Butternut	*Juglans cinerea*
Plant	Marsh Pea	*Lathyrus palustris*
Plant	Canada Lily	*Lilium canadense*
Plant	Michigan Lily	*Lilium michiganense*
Plant	Mountain Honeysuckle	*Lonicera dioica*
Plant	Sweet Pinesap	*Monotropsis odorata*
Plant	Shaggy False Gromwell	*Onosmodium hispidissimum**
Plant	Western False Gromwell	*Onosmodium molle ssp. occidentale***
Plant	American Ginseng	*Panax quinquefolius**
Plant	Yellow Water-crowfoot	*Ranunculus flabellaris*
Plant	Pursh's Wild-petunia	*Ruellia purshiana*
Plant	Royal Catchfly	*Silene regia**
Plant	Sweetscent Ladies'-tresses	*Spiranthes odorata*
Plant	Pineland Squarehead	*Tetragonotheca helianthoides**
Vertebrate	Sharp-shinned Hawk	*Accipiter striatus***
Vertebrate	Lake Sturgeon	*Acipenser fulvescens*
Vertebrate	Highfin Carpsucker	*Carpiodes velifer**
Vertebrate	Hellbender	*Cryptobranchus alleganiensis*
Vertebrate	Blue Sucker	*Cycleptus elongatus*
Vertebrate	Peregrine Falcon	*Falco peregrinus*

Table 3.25. Elements of Special Concern Identified by Tennessee Natural Heritage Program for Knox County, Tennessee		
Group	**Common Name**	**Scientific Name**
Vertebrate	Common Moorhen	*Gallinula chloropus*
Vertebrate	Berry Cave Salamander	*Gyrinophilus gulolineatus***
Vertebrate	Flame Chub	*Hemitremia flammea*
Vertebrate	Least Bittern	*Ixobrychus exilis**
Vertebrate	Gray Bat	*Myotis grisescens**
Vertebrate	Yellowfin Madtom	*Noturus flavipinnis*
Vertebrate	Snail Darter	*Percina tanasi*
Vertebrate	Tennessee Dace	*Phoxinus tennesseensis**
Vertebrate	Northern Pinesnake	*Pituophis melanoleucus melanoleucus*
Vertebrate	Southeastern Shrew	*Sorex longirostris*
Vertebrate	Southern Bog Lemming	*Synaptomys cooperi*
Vertebrate	Barn Owl	*Tyto alba**
Other	Heron Rookery	
** Species reported within 1-mile radius of project. *Species reported within 1-mile to 4-mile radius of project. *Source: TNHP, 2011*		

3.15.1.3 Threatened and Endangered Species Habitat/Population Assessment

Following the compilation of the list of threatened and endangered species potentially occurring in the project area, a detailed literature search was completed for the species. Published recovery plans and species accounts from the USFWS were collected and analyzed. The potential for species to occur in the project area was estimated using available life history information coupled with recorded observations of known threatened and endangered species occurrences provided by TDEC. The Ecology Study Technical Report prepared for this study contains a detailed discussion of all species previously documented within the project vicinity, including all federally-and state-listed species of concern. The Ecology Study Technical Report is available on the project website at: http://www.tdot.state.tn.us/sr71/ and upon request through the Environmental Division. Although habitat exists within the project area for several species, it is anticipated that best management practices will minimize impacts to any populations of these species that may be present.

The USFWS requested that a Biological Assessment (BA) be prepared for the Indiana bat (*Myotis sodalis*) and Berry Cave salamander (*Gyrinophilus gulolineatus*). The findings of the BA for both species were that the project "may affect, but is not likely to adversely affect" populations of either species. The USFWS agreed with the findings of the BA in a letter dated November 17, 2011. However, the agency did have additional requirements and suggestions to ensure protection of both species. Additional surveys will be required to determine the presence of Indiana bats prior to construction should any of the build alternatives be selected as the preferred alternative. In addition, if any new caves are discovered in the project area, additional surveys for Berry Cave salamanders will be conducted to determine if any populations are present. The mitigation discussion below describes additional measures that will be implemented to protect threatened and endangered species.

Indiana Bat

Although it is not currently listed for Knox County, in a letter dated November 5, 2010, the USFWS requested that the forests in the study area be studied to determine their general suitability to provide potential summer roost habitat for Indiana bats. They requested that potential Indiana bat impacts be factored into the decision-making process at the NEPA level when choosing a preferred alternative for this project. According to the USFWS, there is currently not enough data available to determine if Indiana bats utilize the project area.

Indiana bats are typically associated with stands of mature hardwood forests, mainly along streams. In the summer months, females, solitary or in small maternity colonies, bear their offspring in hollow trunks or under exfoliating bark of living or dead trees. Maternity sites have often been reported as occurring in riparian areas, floodplain forests, and upland habitats. Typically trees in sunny openings are attractive roost sites to the bats due to the warmer air spaces and crevices under the bark.

In late summer and early fall, males and females begin to assemble at cave entrances at dusk and dawn for mating. Mating occurs from late August to early October, prior to hibernation (Humphrey and Cope 1977). Limestone caves with pools are preferred for hibernacula. Preferred caves are of medium size with large, shallow passageways. Roosts usually are in the coldest part of the cave. Preferred sites have an average air temperature of 4-8 degrees Celsius, although a broader range is tolerated (Hall 1962; Henshaw and Folk 1966). Relative humidity in occupied caves ranges from 66 to 95 percent and averages 87 percent throughout the year (Barbour and Davis 1969; Clawson et al. 1980). Because of these requirements, the Indiana bat is highly selective of hibernacula and suitable sites are not readily abundant.

In fulfillment of the USFWS requests, forests within the study area were characterized by the general qualities they exhibited in terms of potential to provide suitable Indiana bat summer/maternity roost sites. Forests with an abundance of mature (>6 inch DBH) trees with exfoliating bark, crevices, cavities, and/or deep furrows, including dead and/or dying trees/snags were considered to have "good" potential to be utilized by bats. These forests typically included an abundance of mature shagbark hickory, a variety of oaks, and maples, along with scattered sycamores. Forests that contained fewer more scattered roost trees were considered "marginal". Forests that appeared to lack suitable roost sites due to species composition and overall characteristics of the trees, such as small size, smooth bark, and lack of standing snags were considered "poor" in terms of potential to support bat maternity colonies. Forests that were recently clearcut were not considered in the habitat suitability analysis for bats since at the present time those areas resembled more of an old

field type habitat without mature trees. Table 3.26 shows the amount of potential maternity roost habitat within each of the build alternative ROWs.

Based on the November 5, 2010 USFWS letter, additional detailed Indiana bat habitat surveys will be performed once a preferred alternative has been selected in order to receive Section 7 clearance under the Endangered Species Act. Because there is a large amount of potential Indiana bat summer roost habitat in the proposed ROW of each of the alternatives, and therefore it is possible bats may be present during summer months, mitigation options will likely need to be developed in coordination with the USFWS as part of the NEPA process. Due to the number of potential roost trees present in several forests, the primary option will likely be to limit clearing of forested habitats thought to be possible Indiana bat roost habitats during winter months, when bats are known to be in winter cave hibernacula.

The Indiana bat is discussed in much greater detail in the James White Parkway BA(TDOT, 2011) and the Ecology Study Technical Report on file with the TDOT Environmental Division. Due to the sensitive nature of karst habitats mapped in the BA, copies of this report will not be made available to the general public.

Table 3.26. Amount of Potential Bat Summer Roost Habitat by Suitability Category Potentially Affected by Each Build Alternative.

Alternative	Good [acres (% of forest in ROW)]	Marginal [acres (% of forest in ROW)]	Poor [acres (% of forest in ROW)]	Total Forest in ROW** (acres)
Green Alternative	59.21 (54%)	19.58 (18%)	29.88 (28%)	108.67
Blue Alternative	60.82 (54%)	16.58 (15%)	34.46 (31%)	111.86
Red Alternative	72.67 (64%)	12.92 (11%)	27.74 (25%)	113.33

* Note: These acreage amounts were calculated based on anticipated ROW boundaries shown on aerial photographs, and are given for impact estimation/comparison purposes. They include all areas within the proposed new ROW and the areas within existing ROWs that are already owned by the state, portions of which are likely to be used for project construction. For instance, existing ROWs along Governor John Sevier Highway near the southern terminus of each alternative are included in the habitat calculations. Not all of the acreages shown in this table will actually be disturbed, since lands outside of those needed for actual construction, slope easements, or work zones may not need to be cleared.

** Total forest for this analysis excludes forests that have been recently clear-cut due to lack of standing mature timber to be used by bats. These areas were considered forest earlier in this document, because they were regenerating back into forests, but only contained seedlings at the time of study and would not be mature enough to provide bat habitat by the time this project is anticipated to be constructed.

Source: Parsons, 2011

Berry Cave Salamander

The Berry Cave salamander is currently considered a candidate species and is under review to determine if it should be listed as an endangered species under the federal endangered species list. This species is already protected by the State of Tennessee.

The Berry Cave salamander is an aquatic cave specialist restricted to a small number of cave systems in east Tennessee. The nearest Berry Cave salamander population to the project area is Meades Quarry Cave system located approximately one mile east of the project terminus at the existing James White Parkway. Historically, Berry Cave salamanders were reported from Cruze Cave in Knox County. However, recent morphological and genetic evidence indicate that the salamanders currently in Cruze Cave are an unusual population of spring salamanders (*Gyrinophilus porphyriticus*) that reach extremely large sizes before metamorphosing (Niemiller and Miller 2010; Niemiller pers. Comm. 2011).

In a letter dated May 30, 2008, the USFWS discussed concerns over the project's potential impacts to the Berry Cave salamander population known to exist in the Meades Quarry Cave system located to the northeast of the immediate project area. They also requested that a dye-trace study be conducted to determine if the proposed project alignments would impact the potential surface recharge zone that is hydrologically connected to the Meades Quarry Cave system. In fulfillment of that request, a dye trace study was conducted from April through June 2009 on behalf of TDOT to determine which sinkholes within the Toll Subwatershed likely drained stormwater into the Meades Quarry Cave system. A copy of the USFWS letter is contained in Appendix C of this DEIS. A copy of the dye trace study is on file with the TDOT Environmental Division.

Based on field surveys of the surface drainages and the dye trace study conducted for the project to determine subsurface hydrogeology flows in the area, it is not expected that this project will impact the known populations of Berry Cave salamander. Information obtained through the dye trace study resulted in the current alignments being shifted as far to the southwest and away from Meades Quarry Cave as possible to reduce the chance of impacting the known salamander population in that cave, which is the most robust population of the species currently known. A previous alignment suggested by the James White Parkway Task Force would have resulted in surface flows entering sinkholes directly connected to the Meades Quarry Cave system. Therefore, that alternative was not carried forward for consideration in this James White Parkway EIS.

Based on preliminary water budget calculations calculated as part of the dye trace study, approximately 44 percent of the water falling on the Toll Subwatershed as precipitation may infiltrate into the karst aquifer via runoff into sinkholes and seepage out of surface water bodies during an average precipitation year. Much of this subsurface flow appears to be handled by the Meades Quarry Cave system and the No-Name Cave System to its south.

The dye trace study suggested that flows from sinkholes within the current proposed ROW of the build alternative alignments would not enter the Meades Quarry or Cruze Cave systems. Flow entering other known sinkholes within the project impact area in the northern portion of the alignments, including those located near William Hastie Natural Area, would remain southeast of the Meades Quarry Cave system and flow northeastward within the No-Name Cave System, eventually emptying into Toll Creek and the French Broad River via a spring named Big Spring. Other sinkholes to the south are expected to flow north-northeast through separate systems.

None of the surface connections from within the project impact areas are expected to flow toward Cruze Cave or any sinkholes believed to filter water in that direction. Most of the surface water from the northwestern one-fourth of the build alternatives will drain into Bakers Creek via surface and subsurface connections, and is then transported northwestward/northward into the Tennessee River/Fort Loudon Lake. No sinkholes were documented within or downstream of the project ROW in the area northwest of Redbud Road. The remaining southern three-fourths of the proposed ROW areas are drained by a series of surface and subsurface drainages, some of which involve sinkholes, that eventually flow northward and/or northeastward into the French Broad River/Fort Loudon Lake.

A previous dye trace study was conducted in 2002 for the TDEC Division of Superfund within the French Broad Watershed located in the southern portions of the proposed ROW boundaries. That study was conducted to evaluate potential groundwater impacts associated with the dumping of debris from the former Coster Shop into a sinkhole located at a residence located along Sevierville Pike. That dye trace study confirmed the trend for groundwater from the sinkholes in the area to flow in the general north/northeastward direction and eventually into Fort Loudon Lake with no known connection to the Meades Quarry Cave system to the north.

No other known populations of Berry Cave salamanders occur within the proposed ROW of any of the build alternatives. However, several sinkholes in the southern three-fourths of the study area will be impacted. Most of the larger sinkholes in the ROW will be bridged and will therefore continue to provide hydrology for subsurface streams that may flow through any unknown cave systems under this area or downstream areas.

The Berry Cave Salamander is discussed in greater detail in the James White Parkway BA (TDOT, 2011), which is on file with the TDOT Environmental Division.

3.15.2 Potential Impacts to Threatened and Endangered Species from the No-Build Alternative

3.15.2.1 Direct Impacts to Threatened and Endangered Species (No-Build Alternative)

No substantial changes in the baseline conditions are anticipated under the No-Build Alternative. Continued urban growth and development, along with existing land use practices will continue to affect potential habitats for threatened and endangered species in the region. These items include land disturbance and grading, clear-cutting of forests, depositing trash and other household items into sinkholes, and use of chemicals and fertilizers for lawn care that enter into surface and groundwater resources.

3.15.2.2 Indirect Impacts to Threatened and Endangered Species (No-Build Alternative)

No substantial changes in the baseline conditions are anticipated under the No-Build Alternative. However, not constructing James White Parkway could slow some of the urban growth and economic development in the South Knoxville region due to continued increases in traffic congestion, especially along Chapman Highway. This reduced development may limit the amount of potential fish and wildlife habitat being removed or degraded, thereby potentially protecting threatened and endangered species habitats.

Alternatively, in specific instances, some of the more degrading or destructive land uses currently being conducted within private lands within the build alternative alignments will continue to be conducted without regard to environmental impacts causing continued habitat degradation and loss, including impacts to potential threatened and endangered species habitats. Should a build alternative affect these same areas, it is likely that the mitigation

efforts provided as part of the project would actually result in improvements to those areas and could result in some improvement from baseline conditions that would not occur under the No-Build Alternative. However, in general it is anticipated that the No-Build Alternative would still result in fewer indirect impacts than the build alternatives that will have some inherent/unavoidable impacts to natural resources.

3.15.2.3 Cumulative Impacts to Threatened and Endangered Species (No-Build Alternative)

No substantial changes in the baseline conditions are anticipated under the No-Build Alternative. Continued urban growth and development, along with existing land use practices will continue to affect potential habitats for threatened and endangered species in the region. These items include land disturbance and grading, clear-cutting of forests, depositing trash and other household items into sinkholes, and use of chemicals and fertilizers for lawn care that enter into surface and groundwater resources. All of these continued impacts will cumulatively affect threatened and endangered species and/or their habitats unless further studies are conducted to identify populations of such species, protect the sensitive habitats, and educate the private landowners about the impacts their land use practices or development activities might be having on those species.

3.15.3 Potential Impacts to Threatened and Endangered Species from the Green Alternative

3.15.3.1 Direct Impacts to Threatened and Endangered Species (Green Alternative)

According to the USFWS, there is currently not enough data available to determine if Indiana bats utilize the project area. Field surveys for potential habitat along each alternative were conducted to characterize forests in the project area for the general qualities they exhibit in terms of suitable summer/maternity roost sites. Table 3.26 above shows the amount of potential maternity roost habitat within each of the build alternative ROWs. There is approximately 79 acres of forest in the proposed Green Alternative ROW that was considered “good” or “marginal” habitat for Indiana bats. Though potential habitat is available, a maternity colony has not been documented in Knox County. Therefore, the likelihood of this project impacting the Indiana bat is small. Regardless, more detailed studies including an ANABAT and mist net survey will be conducted within the selected alignment ROW after the selection of a preferred alternative, should that be one of the build alternatives instead of the No-Build Alternative. The results of those surveys will help to verify whether any maternity colonies may occur in the vicinity of the project. This will provide information for the USFWS and TDEC to determine what reasonable and prudent measures may be appropriate to reduce effects to the potential summer habitat in the project area should any Indiana bats be detected during the summer months in the area.

Based on field surveys of the surface drainages and the dye-trace study conducted for the project to determine subsurface hydrogeology flows in the area, it is not expected that this project would affect any known populations of Berry Cave salamander. Alternative alignments have been shifted as far to the southwest and away from Meades Quarry Cave as possible to reduce the chance of affecting the known salamander population in that cave system based on information obtained through the dye-trace study. Although the Berry Cave salamander is not known to occur within the proposed ROW of any of the build alternatives, the James White Parkway project would affect several sinkholes in the southern three-fourths of the project area. Since there is potential that drainage entering some of the affected sinkholes could enter unknown/undiscovered cave systems, which could potentially support populations of Berry Cave salamanders, potential effects could be realized. Therefore, TDOT will work with the USFWS and TDEC to determine the

appropriate reasonable and prudent measures to reduce contaminants from entering into the affected sinkholes. Should new caves be discovered, additional surveys will be conducted to determine the presence of Berry Cave salamanders and/or other species of concern.

Other federally-listed species, such as gray bats (*Myotis grisescens*) and several mussel species were listed in the vicinity, but are not anticipated to be impacted by this project due to lack of habitat in the immediate project area. Use of BMPs are anticipated to sufficiently protect those species, including the several listed mussel species, that are known to occur, or occurred historically, downstream in the Tennessee River and French Broad River.

Several state-listed species are known to occur in the immediate project area (within a one-mile radius) or have suitable habitat present. Although this project will require removal of some of the suitable habitats for these species, it is not anticipated to have any substantial impacts on populations of those species due to the amount of suitable habitat available in the adjacent properties, some of which is protected by local governments as parks and/or natural areas. Use of BMPs is anticipated to minimize impacts to aquatic species impacted by the project.

3.15.3.2 Indirect Impacts to Threatened and Endangered Species (Green Alternative)

There is a potential that suitable threatened or endangered species habitats could be adversely impacted due to secondary commercial, industrial, and/or residential developments that could be promoted by the James White Parkway project. Such developments may result in additional clearing of habitats, potential increases in erosion and sedimentation into adjacent watercourses, and additional human disturbances in areas that may be further removed from human activities at the present time. However, the amount and/or magnitude of these impacts attributable to this project cannot be fully determined at this time because the long-term trends in this region suggest that urban growth will occur in much of the immediate project area with or without the James White Parkway project. Although the development trend may increase immediately after construction of James White Parkway resulting in faster use of developable lands in the area due to improved access and transportation efficiency, the end result is expected to be the same in the long term due to much of the area being within the designated urban growth or planned growth boundaries of Knoxville and/or Knox County. Local planning and regulatory agencies can continue to identify sensitive natural resources in the area in advance of further development and attempt to protect those resources to the extent possible. For example, information from studies such as the dye trace study and Indiana bat habitat and future ANABAT and mist net surveys conducted for this particular project can be used to help identify those areas that could be protected from future development. The James White Parkway project alternatives studied in this EIS were shifted away from Meades Quarry Cave based on the results of the dye trace study. Similar efforts could be made for other proposed private and/or public developments in the area.

3.15.3.3 Cumulative Impacts to Threatened and Endangered Species (Green Alternative)

Because the James White Parkway project is not expected to have any substantial direct or indirect impacts to threatened and endangered species, it would not substantially contribute to cumulative impacts caused by other development trends or land uses in the surrounding area. No specific future state or local actions have been identified in the immediate project vicinity that would cause substantial cumulative effects to threatened and endangered species. However, continued urban growth in the South Knoxville region, including any

developments promoted by the James White Parkway project, poses some threat to these species and/or their habitats. Therefore, a continued effort by local agencies to identify and protect sensitive natural resources is important. It is expected that development of commercial and residential property would continue near the Chapman Highway/Governor John Sevier Highway intersection due to the developable land in that area adjacent to major roadways. This development could lead to a reduction in potential summer habitat for the Indiana bat, but would not change the affect determination for this species due to the amount of suitable habitat in the surrounding areas that are not expected to be developed due to slope and karst features prohibiting such development in several areas.

Presently, TDOT has no other plans to construct any additional roads or highways in the general vicinity of the project area. General maintenance of existing highways within existing ROWs is not anticipated to result in any substantial impacts to natural resources.

3.15.4 Potential Impacts to Threatened and Endangered Species from the Blue Alternative

3.15.4.1 Direct Impacts to Threatened and Endangered Species (Blue Alternative)

Impacts to threatened and endangered species from the Blue Alternative would be similar to those discussed for the Green Alternative. However, as discussed in Section 3.5, the Blue Alternative would impact more sinkholes and sinkhole area than the Green Alternative, which could potentially result in a higher risk of impacting unknown populations of threatened and endangered species, such as Berry Cave salamanders, if those sinkholes feed into any previously undiscovered caves that provide suitable habitat for any of those species. The Blue Alternative contains a similar amount of suitable Indiana bat habitat as the Green Alternative. There is approximately 78 acres of forest in the proposed Blue Alternative ROW that was considered “good” or “marginal” habitat for Indiana bats compared to 79 acres for the Green Alternative.

3.15.4.2 Indirect Impacts to Threatened and Endangered Species (Blue Alternative)

Indirect impacts to threatened and endangered species from the Blue Alternative would be similar to those discussed for the Green Alternative.

3.15.4.3 Cumulative Impacts to Threatened and Endangered Species (Blue Alternative)

Cumulative impacts to threatened and endangered species from the Blue Alternative would be similar to those discussed for the Green Alternative.

3.15.5 Potential Impacts to Threatened and Endangered Species from the Red Alternative

3.15.5.1 Direct Impacts to Threatened and Endangered Species (Red Alternative)

Impacts to threatened and endangered species from the Blue Alternative would be similar to those discussed for the Green Alternative. However, similar to the Blue Alternative, the Red Alternative would impact more sinkholes and sinkhole area than the Green Alternative, which could potentially result in a higher risk of impacting unknown populations of threatened and endangered species, such as Berry Cave salamanders, if those sinkholes feed into any previously undiscovered caves that provide suitable habitat for any of those species. The Red Alternative contains slightly more suitable Indiana bat habitat compared to both the Green and Blue Alternatives. There is approximately 86 acres of forest in the proposed Red Alternative ROW that was considered “good” or “marginal” habitat for Indiana bats compared to 79 acres for the Green Alternative and 78 acres for the Blue Alternative.

This is primarily a result of the additional length of the Red Alternative resulting in more forested areas being included in the ROW.

3.15.5.2 Indirect Impacts to Threatened and Endangered Species (Red Alternative)

Indirect impacts to threatened and endangered species from the Red Alternative would be similar to those discussed for the Green Alternative.

3.15.5.3 Cumulative Impacts to Threatened and Endangered Species (Red Alternative)

Cumulative impacts to threatened and endangered species from the Red Alternative would be similar to those discussed for the Green Alternative.

3.15.6 Mitigation

TDOT will continue to work closely with the USFWS, TWRA, and TDEC throughout the planning, design, and construction of this project to ensure any potential impacts to threatened and endangered species are avoided or minimized to the extent practical. Where impacts are unavoidable, TDOT will work closely with these agencies to ensure proper mitigation is included for impacts to those resources.

Several potential conservation commitments were developed as part of the BA prepared for this project. These commitments are provided below to show that efforts will be made to protect species to the extent practical, while providing adequate transportation options in the Knoxville region. Section 7 of the Endangered Species Act of 1973, as amended, will be completed prior to submission of the Final EIS. Prior to that time more detailed mitigation and/or conservation measures will be developed in coordination with the USFWS.

3.15.6.1 Indiana Bat Commitments

- ANABAT and mist net surveys will be conducted along the preferred alternative, should a build alternative be selected, to help fully determine the potential impacts of the selected alignment (summer 2012).
- ANABAT and mist net surveys will also be conducted immediately before construction is let.
- Alternative selection will take into consideration the amount and quality of potential summer habitat in each alternative.
- Timber providing good or marginal summer habitat would be removed during hibernation between October 15 and March 15.
- During construction, if additional caves or potential winter habitat is found, TDOT will have the caves surveyed for Indiana bats and coordinate with the USFWS on appropriate actions to reduce effects to this species.

Information collected from ANABAT and mist-net surveys will be documented and shared with regulatory and planning agencies so that the information can be used to help protect any populations of Indiana bats discovered, or to add to the overall information available about this species because little is known about Indiana bat maternity colony presence in Knox County. Such information will assist the USFWS with on-going efforts to protect this species.

3.15.6.2 Berry Cave Salamander Commitments

- Measures will be taken to reduce and treat stormwater runoff during construction and operation of the proposed action. These measures include, but are not limited to,

curb elimination, litter control, and establishment and maintenance of vegetation, including grassed channels. Because organic material entering cave systems via sinkholes is important to the Berry Cave salamander and their prey (i.e. invertebrates), these measures will allow for the transport of organic material into sinkholes while helping to reduce or filter pollutants.

- To the extent possible, surface water runoff from the roadway would be directed through stormwater drainage system and into nearby surface streams that remain above the surface until entering the French Broad River/Fort Loudon Lake.
- During construction, if additional caves or potential habitat is found, TDOT will have the caves surveyed for Berry Cave salamanders and coordinate with the USFWS on appropriate actions to reduce effects to this species.

Since there is potential that some of the affected sinkholes could enter unknown/undiscovered cave systems, which could potentially support populations of Berry Cave salamanders, TDOT will work with the USFWS and TDEC to determine what BMPs may be appropriate to reduce contaminants from entering into the affected sinkholes. Use of peat filtration systems was an option previously considered, but concerns have been raised by the USFWS that such filtration systems could reduce the amount of food (detritus) entering into the cave systems for salamanders.

In a letter dated December 9, 2011, the USFWS stated that with TDOT's commitments to construct James White Parkway as a fully access controlled facility and to continue to work with the USFWS and TDEC to explore means of reducing contaminants into sinkholes, in addition to the result of the dye trace study indicating no groundwater connection between the project area and Meades Quarry Cave, that TDOT is adequately addressing their concerns for impacts to Berry Cave salamander. Copies of the December 9, 2011 letter and other USFWS letters received to date are included in Appendix C.

3.15.6.3 Avoidance, Minimization, and Mitigation Measures for Sensitive Species

Whenever possible, impacts to threatened and endangered species would be avoided and minimized. Although minor short-term and long-term adverse impacts would be anticipated due to habitat removal and impacts to streams, BMPs would be followed to minimize or mitigate for the overall impact to fish and wildlife, including any sensitive species that might inhabit the area. When possible, streamside and in-stream construction activities would not be performed directly after substantial rainfall. This will help protect water quality and limit the amount of sedimentation flowing into sinkholes and groundwater areas. The unnecessary removal of existing vegetation would be avoided as much as possible. Canopy removal along all working or staging areas would be limited to the extent practicable. Where removal of vegetation is necessary, bank stabilization and sediment control measures would be employed immediately before the start of construction. Bank stabilization measures would include seeding with native species and placing of silt fences or riprap. Control structures would be inspected and properly maintained throughout the life of the project.

A SPCC plan would be developed for both the construction process and for operations of James White Parkway after construction to help protect water sources and sensitive habitats. All reasonable precautions would be taken to minimize short-term and long-term impacts to both terrestrial and aquatic habitats. Some of the techniques that can be applied include strict adherence to state erosion and sedimentation controls, selective clearing and grubbing, selective seeding of native herb, shrub and tree species typical of the habitats impacted, restrictions in the time of use and application of herbicides, and use of selected mowing to maintain ecotone and habitat diversity.

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

3.16 Cultural Resources

3.16.1 Affected Environment

The two primary laws that apply to transportation projects and their impacts to cultural resources are Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the Department of Transportation Act of 1966. Cultural resources include prehistoric and historic archaeological sites, buildings, objects, districts, and historic bridges. The purpose of cultural resource investigations is to consider the impact of federally funded undertakings on such features that are listed in, or may be eligible for inclusion in the National Register of Historic Places (NRHP). The criteria of adverse effect, the standard by which effects to historic properties are measured, are included in 36 CFR 800.

Two types of cultural resources need to be identified to satisfy the requirements of Section 106 of the National Historic Preservation Act of 1966: architectural/historical resources (e.g., buildings and structures) and archaeological resources (e.g., sites).

An important part of the Section 106 process is consultation with the Tennessee State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), federally recognized Native American tribes that may attach cultural or religious significance to properties within the project study area, and local governments. Section 4 of this document contains a brief summary of the coordination and consultation efforts for this project and a summary of responses received from the various parties involved. Appendix E contains copies of all coordination letters related to cultural resources issues for this project.

3.16.1.1 Architectural/Historical Resources

A historic property, as defined in regulation 36 CFR Section 800.16(l)(1), is any cultural resource included in, or eligible for inclusion in, the NRHP. A cultural resource is eligible for listing in the NRHP if it meets one or more of the four NRHP Criteria and retains sufficient integrity to convey historic significance. The NRHP Criteria states that the quality of significance is present in cultural resources when resources:

- Are associated with events that have made a meaningful contribution to the broad patterns of our history; or
- Are associated with the lives of persons significant in our past; or
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or may be likely to yield information important in prehistory or history.

In addition to significance, a property must also have integrity of location, design, setting, materials, workmanship, and feeling to be eligible for inclusion in the NRHP. This means that not only must resource be old; it must also retain many of its original features and be significant under one or more of the four criteria listed above.

Pursuant to 36 CFR 800.4, which requires TDOT and FHWA to identify historic resources near its proposed projects, a historic architecture survey was conducted within the Area of Potential Effect (APE) for this proposed project in an effort to identify any National Register listed or eligible properties. The Architectural Survey Report is contained on the project website at http://www.tdot.state.tn.us/sr71/ and is on file with TDOT Environmental Division. The APE was defined as the area that the proposed project may directly or indirectly cause alterations in the character or use of historic properties, if any exist. This area includes properties that may be physically or visually affected by the project, as well as properties affected by changes in air quality, noise levels, setting, and land use. The APE included the existing and proposed ROW in which all construction activities would occur, and properties within one mile that may be directly or indirectly affected by the proposed construction.

The properties inventoried for this project are primarily single-family dwellings built between circa. 1890 and 1960. Some of these dwellings were built in vernacular designs of the period, such as pyramid square, gabled-ell and I-House forms while others reflect popular nationwide styles such as Bungalow/Craftsman and Tudor Revival. Most of these dwellings are of frame construction and have modest designs and detailing. This area contained a number of small farms in the early twentieth century but most were subdivided for residential development in the mid-twentieth century or are no longer working farms and do not possess historic agricultural uses or patterns of cultivation. No historically or architecturally significant churches, industrial buildings, schools or commercial buildings were inventoried in the APE. A number of subdivisions developed after World War II are located along the western edges of the APE and contain representative examples of house styles and forms from this period such as Ranch, Split-Level, and Minimal Traditional. Many of these properties have been altered over time with rebuilt porches and added siding materials and none of the subdivisions appear to possess architectural or historical distinction. Therefore, it was determined that none of the surveyed properties within the project area are potentially National Register-eligible and no historic above-ground resources would be affected by the proposed project. It was also determined that the project would not have a Section 4(f) "use" of any historic above-ground property within the project area. The Tennessee SHPO concurred with these findings in a letter dated September 8, 2011, and determined that "… the area of potential effects contains no architectural resources eligible for listing in the National Register of Historic Places affected by this undertaking." A copy of the SHPO letter is included in Appendix E of this DEIS.

3.16.1.2 Archaeological Resources

As part of the Section 106 consultation process TDOT consulted with the following federally recognized Native American tribes:

- Cherokee Nation;
- Shawnee Tribe;
- United Keetoowah Band of Cherokee Indians;
- Eastern Band of Cherokee Indians; and
- Eastern Shawnee Tribe of Oklahoma

No responses were received from these tribes.

A Phase I Cultural Resources survey was conducted for the proposed James White Parkway. The APE for the Phase 1 Cultural Resources survey consists of the footprint of all three alternative alignments. The entire area of potential effects encompasses an area of approximately 489 acres. More details regarding the APE are included in the 2011 Phase 1 Cultural Resources Survey Report located on the project website and on file with TDOT.

The archaeological field surveys were conducted from May 31 to June 21, 2011 and included the excavation of 1,684 shovel tests. The field investigations included pedestrian reconnaissance, systematic shovel testing, mapping, GPS point recording, and photographing sites and artifacts. Background research was also conducted, including information on chain-of-title for parcels containing historic archaeological sites or components. Records indicate that only one known archaeological resource is located within a 1-mile (1.6-kilometer) radius of the APE. Five previously unrecorded archaeological sites and three artifact locations (Location 1, Location 2, and Location 3) were identified during fieldwork. None of the sites are recommended as eligible for the National Register of Historic Places, and no additional archaeological work is recommended. Location 1 consists of a single prehistoric artifact, Location 2 consists of seven historic artifacts, and Location 3 consists of three historic artifacts. The locations do not constitute archaeological sites according to the Tennessee Division of Archaeology. The Tennessee SHPO has concurred with these findings in a letter dated September 29, 2011, and determined that "…the project area contains no archaeological resources eligible for listing in the National Register of Historic Places." A copy of this letter is included in Appendix E of this DEIS.

3.16.2 Potential Impacts to Cultural Resources from the No-Build Alternative

There would be no direct, indirect, or cumulative impacts to historical/architectural resources under the No-Build Alternative. There would be no direct, indirect, or cumulative impacts to archaeological resources from the No-Build Alternative.

3.16.3 Potential Impacts to Cultural Resources from the Green Alternative

There would be no direct, indirect, or cumulative impacts to historical/architectural resources under the Green Alternative. None of the surveyed properties within the project area are potentially National Register-eligible and no historic above-ground resources would be affected by the proposed project.

There would be no direct, indirect, or cumulative impacts to archaeological resources under the Green Alternative. None of the sites are recommended as eligible for the National Register of Historic Places, and the locations do not constitute archaeological sites according to the Tennessee Division of Archaeology.

3.16.4 Potential Impacts to Cultural Resources from the Blue Alternative

There would be no direct, indirect, or cumulative impacts to historical/architectural resources under the Blue Alternative. None of the surveyed properties within the project area are potentially National Register-eligible and no historic above-ground resources would be affected by the proposed project.

There would be no direct, indirect, or cumulative impacts to archaeological resources under the Blue Alternative. None of the sites are recommended as eligible for the National Register of Historic Places, and the locations do not constitute archaeological sites according to the Tennessee Division of Archaeology.

3.16.5 Potential Impacts to Cultural Resources from the Red Alternative

There would be no direct, indirect, or cumulative impacts to historical/architectural resources under the Red Alternative. None of the surveyed properties within the project area are

potentially National Register-eligible and no historic above-ground resources would be affected by the proposed project.

There would be no direct, indirect, or cumulative impacts to archaeological resources under the Red Alternative. None of the sites are recommended as eligible for the National Register of Historic Places, and the locations do not constitute archaeological sites according to the Tennessee Division of Archaeology.

3.16.6 Mitigation

Since there would be no impacts to historical/architectural resources from any of the alternatives (No-Build, Green Alternative, Blue Alternative, Red Alternative), mitigation for historical/architectural resources would not be necessary.

Since there would be no impacts to archaeological resources from any of the alternatives (No-Build, Green Alternative, Blue Alternative, Red Alternative), mitigation for archaeological resources would not be necessary. If a build alternative is selected and any potential cultural site is uncovered during construction, the construction operation would cease and TDOT cultural resources personnel would investigate the site, document their findings, and make recommendations to the SHPO.

If a build alternative is selected and historic human remains are discovered during construction, in compliance with the Native American Grave Protection and Repatriation Act (PL 101-601) of 1990 (NAGPRA), the construction operation would cease. TDOT cultural resources personnel, the SHPO, and tribal representatives would be contacted to assess the site to determine a path forward to repatriate the remains and insure compliance with NAGPRA.

3.17 Hazardous/Special Waste Sites

3.17.1 Affected Environment

A Hazardous Materials, Hazardous Waste, and Special Waste Technical Report was prepared for the James White Parkway project. A copy of the full report is available on the project website at http://www.tdot.state.tn.us/sr71/ and is on file with TDOT Environmental Division. The purpose of the study was to identify hazardous materials, hazardous waste, and special waste sites that may affect or be affected by construction of the proposed James White Parkway project. The presence of these sites within or adjacent to the proposed alignments was determined by conducting an environmental database search, by reviewing aerial photographs, and by conducting a field survey.

3.17.1.1 Database Search

A search of federal and state environmental databases was conducted to identify potential sites of concern within a one-mile radius of the project area with Environmental Data Resources, Inc. (EDR) (EDR 2011). A description of the databases searched is included in the Hazardous Materials, Hazardous Waste, and Special Waste Technical Report.

The database search returned a total of seven records for sites with known (mapped) locations within one mile of the proposed James White Parkway project area. Some records were for sites with more than one facility and some facilities were listed in more than one database. In addition, 52 unmapped, also known as “orphan” sites were identified. Orphan sites are identified by EDR as occurring in the project area vicinity, but precise locations are not known. Based on the information provided by the orphan site list, eight were

subsequently mapped within the one-mile buffer (one site was not located) and their information is reflected in the report (EDR 2011).

3.17.1.2 Aerial Photograph Review

Aerial photographs were reviewed to identify facilities within the study area that may warrant a site inspection. Facilities that were identified from the aerial photos were visually surveyed for their potential to handle or generate hazardous and/or special waste. Those facilities were compared to the environmental database list of sites in the area.

3.17.1.3 Site Reconnaissance

A field survey of the study area was conducted to locate any hazardous material or waste sites in the proposed 500-foot right-of-way. These sites were documented and included in the hazardous waste Technical Memorandum. As discussed above, EDR identified all known facilities located within one mile of the James White Parkway project area. Many of these facilities do not present a contamination risk due to the nature of the operations at the facility and its location in relation to the project area. The field survey was also used to eliminate facilities from the environmental database list that were erroneously reported to be located within the study area. In addition, existing facilities not identified on the database lists were noted, if they were considered to potentially handle or generate hazardous and/or special waste.

3.17.1.4 Identification and Rating of Sites

Parcels were evaluated based upon their current usage, past usage, and the location of the property relative to the proposed right-of-way for the James White Parkway project. As discussed above, the assessment consisted of an environmental database search, a review of aerial photographs, and field reconnaissance. Overall, a total of 16 hazardous waste, special waste, or other sites were identified that may potentially impact, or be impacted by, construction of the new highway alignment. Additionally, numerous small household waste dump sites were also observed in the proposed right-of-way. Table 3.27 summarizes all of the sites. Figure 3.7 shows all of the sites with respect to the proposed build alternatives.

Common acronyms used in the table below include: Underground Storage Tank (UST); Leaking Underground Storage Tank (LUST); Historical Underground Storage Tank Database (HIST UST); Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS); Federal Index System (FINDS); Leaking Underground Storage Tanks State Trust Fund Reimbursement Information (LUST TRUST); Resource Conservation and Recovery Act - Small Quality Generator (RCRA-SQG); Resource Conservation and Recovery Act – Non-Generator (RCRA-Non Gen); and Historical Leaking Underground Storage Tanks (HIST LUST_CO).

Table 3.27. Summary of Hazardous Waste and Special Waste Sites for Within One Mile of the James White Parkway in Knox County, Tennessee.				
Site ID	**Site Name**	**Site Address**	**Site Type**	**Distance from the Proposed 500-foot Right-of-Way**
1	Kenjo #12	3644 Sevierville Pike	UST, HIST UST	0.18 miles N
2	Doyle Middle School	3900 Decatur Road	HIST UST	0.10 miles W
3	Cruze Road Dump	Off Cruze Road, Knoxville, TN	CERCLIS, FINDS	0.33 miles W
4	Korner Market	7512 Old Sevierville Pike	LUST, UST, HIST UST	0.07 miles SE
5	Conoco #42030	7345 Chapman Highway	LUST, LUST TRUST	0.26 miles W
6, 7	Thoni Oil Co of Florida	7518 Chapman Highway	LUST	Within the Proposed 500-foot Right-of-Way
8	Resort Marketing, Inc.	Abner Cruze Lane	RCRA-Non Gen, FINDS	0.85 miles SW
9	Rule Amoco	8125 Chapman Highway	LUST, LUST TRUST, HIST_LUST CO	0.87 miles SE
10	Home Depot #0773	140 Green Lane	RCRA-SQG	0.20 miles SW
11	Murphy USA #7004	120 Green Road	LUST, UST, HIST UST	0.33 miles W
12	Food City Gas-N-Go #682	7608 Mountain Grove Drive	UST	0.18 miles S
13	AD-Graphics Incorporated	Rural Rt. 23	RCRA-Non Gen, FINDS	0.50 miles SW
14	Bell South Telecommunications 81253	131 Young High Pike	RCRA-Non Gen	0.73 miles SW

Table 3.27. Summary of Hazardous Waste and Special Waste Sites for Within One Mile of the James White Parkway in Knox County, Tennessee.				
Site ID	**Site Name**	**Site Address**	**Site Type**	**Distance from the Proposed 500-foot Right-of-Way**
15	South Central Bell KNVLTNYH	131 Young High Pike	RCRA-Non Gen, FINDS	0.73 miles SW
NA	Kmart #3360	Chapman Highway (orphan site)	LUST, HIST UST	NA-address unknown
16-21	Numerous small dump sites	Throughout the 500-foot project corridor	Observed during site reconnaissance	Within the proposed 500-foot Right-of-Way
Source: Parsons 2011.				

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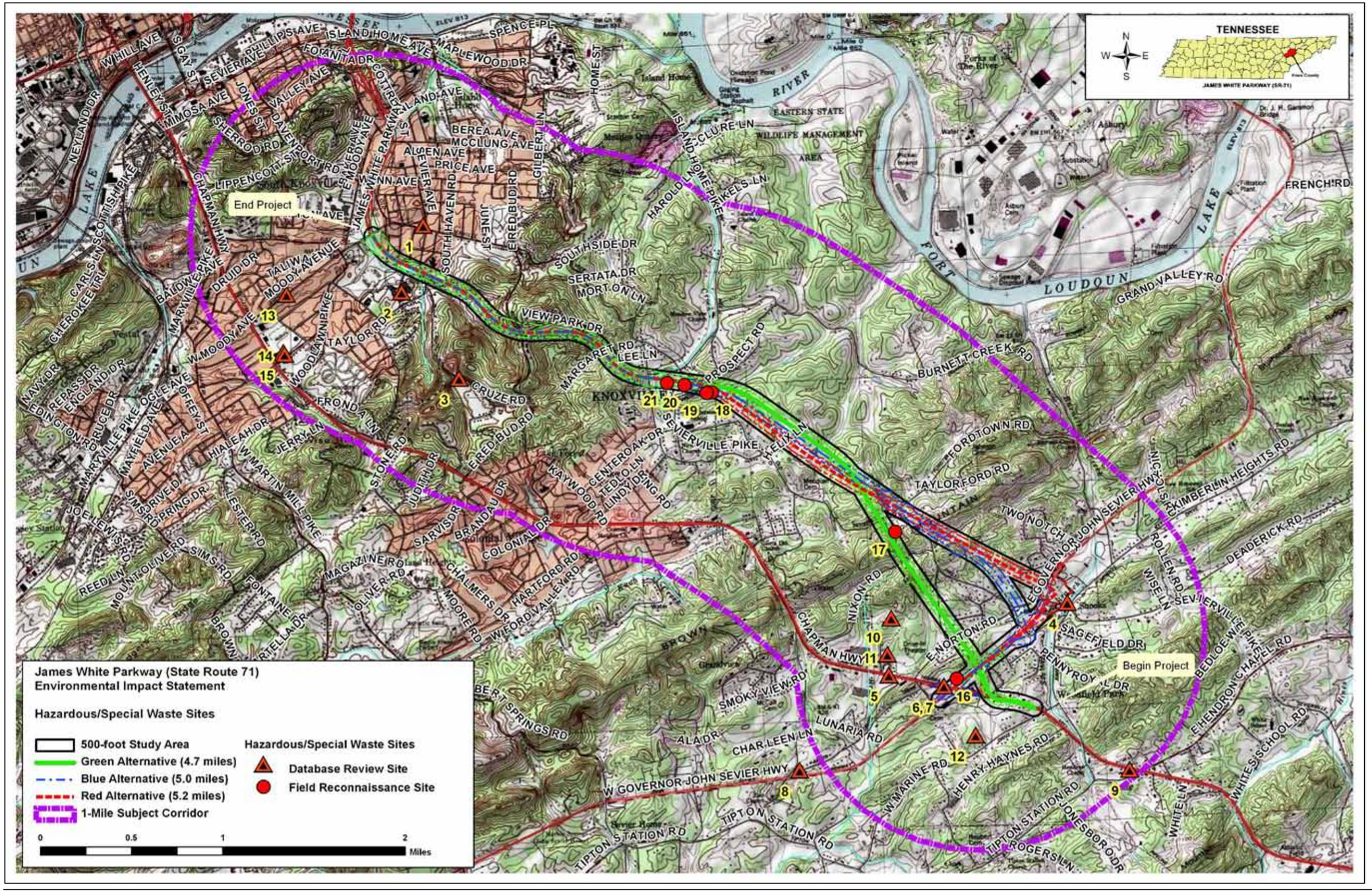
Figure 3.7. Map of Hazardous Waste and Special Waste Sites Within One Mile of the James White Parkway Build Alternatives in Knox County, Tennessee.



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Site Ratings

After the completion of the database search and the visual assessment of properties within the study area, the sites were assigned hazard ratings. As shown on Table 3.28, the hazard rating system is divided into three degrees of risk: “no indication,” “low,” and “high.” Parcels were evaluated based upon their current and past usage, and the location of the property relative to the project area. Professional judgment was used to determine the appropriate category for each site. Table 3.29 lists the hazard rating for each site.

Table 3.28. Hazard Rating System for Identified Hazardous Waste and Special Waste Sites for the James White Parkway Project.

Rating	Rationale
No Indication	There is no indication that hazardous waste/materials or special wastes would impact highway construction after a review of all available information and a visual survey of the site from the road. The site was identified by the database search at occurring at a specific location, however the facility could not be found during the field survey. This does not preclude the possibility that hazardous waste/materials or special wastes could have been handled at this address at one time or at a nearby location.
Low	Hazardous waste/materials or special wastes may have existed or may currently exist on the site, but there is limited likelihood that there would be any involvement with these wastes or materials during roadway construction. This type of site is too distant to the corridor to impact the project.
High	Hazardous waste/materials or special wastes were stored or handled on the site, or could currently exist at the site, and there is a possibility of soil or groundwater contamination that could impact roadway construction. These sites have had contamination problems in the past, would pose greater risk due to the type(s) of hazardous waste/materials or special wastes, and/or are relatively close to the project area. Sites that were found to be located within the proposed ROW (including sites not identified by the database report) that may be associated with hazardous waste/materials or special wastes were assumed to pose a high risk and given a “high” rating since they would likely be removed.

Source: Parsons 2011.

Table 3.29. Rating of Identified Hazardous Waste and Special Waste Sites for the James White Parkway (SR-71) Project.	
Site Name	**Site Rating**
Kenjo #12	No indication
Doyle Middle School	No indication
Cruze Road Dump	Low
Korner Market	No indication
Conoco #42030	No indication
Thoni Oil Co of Florida (two EDR listings)	High, High
Resort Marketing, Inc.	No indication
Rule Amoco	No indication
Home Depot #0773	No indication
Murphy USA #7004	No indication
Food City Gas-N-Go #682	No indication
AD-Graphics Incorporated	No indication
Bell South Telecommunications 81253	No indication
South Central Bell KNVLTNYH	No indication
Kmart #3360	No indication
Numerous Small Household Waste Dump Sites	Low
Source: Parsons 2011.	

3.17.1.5 Summary of Hazardous/Special Waste Sites in the James White Parkway Project Vicinity

The presence of hazardous and/or special waste with the proposed project vicinity was determined by reviewing federal and state environmental records, by reviewing aerial photographs, and by conducting a field survey. Each site was assigned a risk level of either "no indication," "low," or "high." Table 3.30 is a compilation of the risk ratings.

Table 3.30. Summary of Site Ratings: Likelihood of Hazardous Waste Impacts for James White Parkway Project.	
Risk Rating	**Number of Sites**
No Indication	13
Low	1 (plus numerous small household waste dump sites)
High	2
TOTAL	**16**
Source: Parsons, 2011	

The Thoni Oil Company of Florida site was assigned a "high" risk rating. A "high" risk rating is given to a site located within the proposed right-of-way or immediately adjacent to the project area, may be associated with hazardous waste/material or special waste, and would likely need to be removed during highway construction. This is a LUST site with both soil and groundwater contamination. Although contamination is limited to the site, it is located within the proposed 500-foot right-of-way for all three alternatives. A state purchased groundwater dual phase pump and treat system was installed to remediate on-site groundwater. The system became operational on October 4, 2010. The site is near closure and TDEC expects the concentrations in groundwater below regulatory levels within two to four years (Clifford pers. comm., 2011).

The Cruze Road Dump site was assigned a "low" risk rating. This Superfund site was identified on the CERCLIS and FINDS databases, but it was not listed on National Priorities List. The site is located approximately 0.33 mile from the 500-foot right-of-way. The site is a large sinkhole used by the City of Knoxville in the early 1970s as a dump where construction, demolition, and industrial wastes were disposed into a sinkhole. The site was discovered in 1997, and a preliminary assessment occurred in 1998. According to TDEC, no additional investigations since the preliminary assessment were performed to date. The EDR database report identifies that the potential for groundwater contamination is high. Although potential contamination may exist in the groundwater surrounding this site, there is limited likelihood that there would be any involvement of this potential contamination during roadway construction. This is due to the site's distance from the proposed right-of-way.

Two sites, including the numerous small household waste dump sites, were assigned a "low" risk rating. The numerous household waste dump sites were assigned a "low" risk rating. Since the contents of these dump sites appear to be household wastes (trash, appliances, empty paint cans, etc.), the probability of concentrated hazardous wastes is low. Although the trash will need to be removed during construction, the effort necessary is expected to be negligible.

Several of the existing sites or abandoned facilities are found in the EDR report, because the sites contain USTs. Only six of the sites are known to have LUSTs. Five of the LUST sites require no further action, and one has on-going remediation activities, as discussed above (Thoni Oil Company of Florida). Many of the identified sites are either current or former gasoline stations. These sites are not technically classified as hazardous waste sites

but are potential sources of petroleum products or special wastes. These special waste sites are regulated under different regulations and requirements for monitoring and cleanup than for hazardous materials and waste.

3.17.2 Potential Impacts to Hazardous/Special Waste Sites from the No-Build Alternative

3.17.2.1 Direct Impacts (Hazardous/Special Waste Sites –No-Build Alternative)

Because no activities related to the proposed James White Parkway project would occur under the No-Build Alternative, there would be no direct impacts to existing hazardous/special waste sites in the project vicinity. However, not improving the existing congestion issues on Chapman Highway may result in an increased potential for accidental spills of hazardous or special wastes in the area due to continued reduction in LOS on adjacent roadways. Continued, or worsening, traffic congestion problems could result in increased crash rates in the project area. It is possible that some of those crashes could involve vehicles transporting hazardous or special wastes through the area. Fuels and other liquids from vehicles damaged during a crash could leak onto the highway and be washed into stormwater sewers resulting in potential impacts to water quality where those sewers discharge. The Tennessee Emergency Management Agency (TEMA) has the responsibility and authority for coordination of all state and local agencies during accidents involving hazardous materials. The TEMA has demonstrated its ability to effectively manage such incidents.

3.17.2.2 Indirect Impacts (Hazardous/Special Waste Sites –No-Build Alternative)

If the proposed James White Parkway is not constructed, it is likely that traffic conditions would continue to deteriorate on the adjacent roadways including Chapman Highway. As traffic conditions and LOS decline, drivers, including drivers of large trucks, may choose to use alternative routes. This may increase the risk of crashes along those alternative routes. This would likely increase the risk of accidental spills of fuel, antifreeze, and engine oil in additional areas outside the immediate project area due to crashes. These contaminants could flow into stormwater sewers and eventually discharge into downstream watercourses or wetlands. In some cases, these contaminants may not reach downstream watercourses until enough precipitation occurs to transport the materials through the stormwater pipes.

There would be additional concerns that the poor LOS anticipated on Chapman Highway under the No-Build Alternative would result in increased congestion that would force vehicles to remain in the project area for longer periods. The longer individual vehicles remain in the area, the more chance there would be for potential hazardous and/or special wastes issues due to leaks from vehicles containing them, including leaks of fuels, oils, and other liquids used for vehicle operation. Over time, leakage from individual vehicles could accumulate on the roadway surface and then be washed into stormwater sewers and eventually be carried into downstream watercourses.

3.17.2.3 Cumulative Impacts (Hazardous/Special Waste Sites –No-Build Alternative)

Because no construction activities would occur under the No-Build Alternative, there would be a low potential for this project to result in cumulative impacts to hazardous or special waste sites. However, the No-Build Alternative could result in long-term adverse cumulative impacts due to increased potential for accidental spills or leaks of hazardous or special waste materials on local highways. The LOS on Chapman Highway and other adjacent roadways would continue to decline due continued urban growth in the region that is expected to continue to increase traffic volumes. The poor LOS expected on Chapman Highway within the project area would likely result in increased crash rates, which would in

turn increase the risk of accidental spills or leaks of contaminants. Also, additional traffic volumes and decreased LOS may force vehicles to move more slowly through a given stretch of roadway resulting in potential for accumulation of vehicle contaminants from vehicle leakage. All spills or leaks of any hazardous materials or special wastes could potentially result in adverse impacts to the local environment. In addition, if an accidental release of a hazardous material were to occur on the roadway, it could pose health and safety risks to nearby residents, especially those living near the roadways that could be exposed to toxic fumes or materials.

3.17.3 Potential Impacts to Hazardous/Special Waste Sites from the Green Alternative

3.17.3.1 Direct Impacts (Hazardous/Special Waste Sites – Green Alternative)

Minor short-term and no long-term adverse impacts to hazardous/special waste from construction activities are anticipated under the Green Alternative. The Thoni Oil Company LUST site is located at the northern corner of the intersection of Chapman Highway and East Governor John Sevier Highway. This is within the proposed 500-foot right-of-way. Due to contaminated soil and groundwater at this site, subsurface disturbance in this area would need to be completed with care. Any contaminated soil would need to be disposed of in accordance with TDEC regulations and could increase project costs. This would result in a minor short-term adverse impact during construction.

Numerous household waste dump sites within the proposed 500-foot right-of-way were identified as being a potential low risk to the James White Parkway project. Any hazardous materials or wastes within these dumps sites are likely to be in minor or insignificant quantities. These dumps are not expected to affect construction activities.

The Cruze Road dump site is outside the proposed 500-foot right-of-way. Soil contamination is not expected to be an issue due to the distance between the proposed construction zone and the location of the site. Although, groundwater has the potential to be impacted by this site, the karst topography makes it difficult to accurately determine the direction of the groundwater flow. Regardless, it is not expected that possible contamination from this site will impact the proposed right-of-way.

If any new hazardous or special waste sites or potentially contaminated soils are discovered during demolition of existing buildings or during construction, they will be handled in an appropriate manner to ensure contaminants are removed and disposed of properly.

There is a potential for minor, short-term adverse impacts during construction due to leaks or spills of contaminants from construction equipment. No construction activities would be conducted in any watercourses, sinkholes, or wetlands. Therefore, there is limited chance of introducing contaminants into waters. Use of BMPs and proper maintenance and cleaning of construction equipment and vehicles will reduce the potential for adverse impacts.

Construction of the James White Parkway would help to reduce traffic congestion in the area allowing vehicles to move through the area more efficiently and potentially reduce crash rates. These factors would reduce the chance for accidental spills and leaks of hazardous materials or special waste in the project area. Less congestion would also reduce the amount of time vehicles leaking fluids would spend at any one location along the roadway, thus reducing the chance for heavy accumulations of hazardous fluids from leaking vehicles.

3.17.3.2 Indirect Impacts (Hazardous/Special Waste Sites – Green Alternative)

Negligible, long-term beneficial impacts would result from improving traffic issues along the area under Green Alternative. This alternative would potentially remove some traffic from other local roadways that are currently used to bypass traffic congestion, or that would become more heavily used in the future for that purpose if the proposed James White Parkway was not constructed. This would help reduce the risk of accidental spills or leaks of hazardous materials along other roadways in the area, some of which may be local neighborhood streets or other roadways with more residences along them.

There is potential that the James White Parkway project could promote secondary development in the general project vicinity due to better traffic flow and accessibility. This new development could involve facilities that generate, store, or transport regulated hazardous materials and waste. Current laws and regulations for the handling of hazardous materials and wastes would reduce the risk of development in the project vicinity.

It is possible that the James White Parkway project could promote development of gas stations in the area as part of the secondary developments that could occur. Gas stations would bring with them the risk of contamination due to fuel stored in USTs and due to potential spills on the surface. However, the risks associated with modern gas stations containing new USTs are lower than in the past due to more stringent requirements for storing and handling fuels and other potentially harmful substances. Therefore, even if new gas stations were developed in the project vicinity, it is not likely that overall risks would increase substantially.

3.17.3.3 Cumulative Impacts (Hazardous/Special Waste Sites – Green Alternative)

No measureable adverse impacts are expected due to hazardous/special waste sites associated with Green Alternative and other past, present, and reasonably foreseeable projects in the project area. Continued urban growth in the region would generate additional traffic volumes on local roadways, including James White Parkway. This long-term increase in traffic volumes would eventually lead to declines in LOS on some roadways and increased crash rates. Those factors may contribute to more potential for accidental spills or leaks of hazardous materials on those roadways. At least in the reasonably foreseeable future through the design year of this project, the James White Parkway would be expected to handle the forecasted increases in traffic in the region. Therefore, in the long-term, the Green Alternative would result in improvements to traffic flow and therefore crash rates and associated spill potential.

More stringent environmental regulations placed on new developments, including new USTs installed at new gas stations, would also help to reduce potential adverse impacts from hazardous materials in the project vicinity. Therefore, even though continued development is expected, no substantial increases in risks associated with hazardous materials are anticipated.

3.17.4 Potential Impacts to Hazardous/Special Waste Sites from the Blue Alternative

Impacts to or from hazardous materials, hazardous waste, and special waste sites associated with the Blue Alternative would be essentially the same as those discussed under Green Alternative.

3.17.5 Potential Impacts to Hazardous/Special Waste Sites from the Red Alternative

Impacts to or from hazardous materials, hazardous waste, and special waste sites associated with Red Alternative would be essentially the same as those discussed under Green Alternative**.**

3.17.6 Mitigation

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

3.18 Visual Quality

3.18.1 Affected Environment

The general setting of the James White Parkway project area consists primarily of an urban and semi-rural setting with mixed views throughout the length of the project. Aesthetic quality within the proposed project area is currently moderately high due to a lack of major development and abundance of forests and open spaces. Most of the project area consists of rural or single family residential and agricultural, forestry, or public land areas with rolling to steep hills covered with forests and fields.

The TDEC Greenways and Trails Program encourages Tennessee communities to save their green spaces and promotes work to preserve and conserve the natural and cultural resources that make each community unique (TDEC 2008). This contributes positively to the overall visual quality of the City of Knoxville environment. The December 2009 Draft Knoxville, Knox County Comprehensive Park, Recreation, and Greenways Plan and the 2011 South City Sector Plan contains details for all existing and proposed Knox County parks, greenways, and trails (MPC 2009; MPC 2011b). Several laws and features positively contribute to the aesthetics and visual quality of the Knoxville area.

Scenic Highways. Under state law, several roads in Knox County are designated Scenic Highways, like portions of Sevierville Pike. The provisions of this 1971 act prohibit junkyards and billboards within 2,000 feet of the designated highway. With few exceptions, the act also limits building height to 35 feet within 1,000 feet of a designated route.

Tennessee Parkways. There is also a provision for Tennessee Parkways, which has the same restriction on junkyards and trash dumping as the Scenic Highway. However, billboards are not regulated in such areas as the South City Sector, which is comprehensively zoned. The Parkway designation, which does affect building height, is made by the TDOT Commissioner.

Greenways. Greenways have been defined in the Tennessee Greenways and Trails Plan as linear open spaces established along either a natural corridor, such as a riverfront, stream valley or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, scenic road, or other route (TDEC 2008). The proposed James White Parkway passes through several proposed greenways. The greenways that would be crossed by the James White Parkway project are the proposed northward extension of the

William Hastie Natural Area Trail that will connect the William Hastie Natural Area with Marie Myers Park, the proposed greenway that will connect the Smoky Mountain Railway Greenway to Forks of the Rivers Wildlife Management Area, and the proposed Burnett Creek Greenway that extends northward from Chapman Highway, across East John Sevier Highway.

Ridge Conservation Corridors. Knox County communities enjoy a naturally beautiful landscape, framed by forested ridges. Proposed ridge conservation corridors would be used to conserve natural settings for recreation, including wildlife observation and walking trails. These conservation corridors would be a combination of public and privately-owned land (MPC 2009). Some of the most striking views within the James White Parkway project area are from the top of Rodgers Ridge.

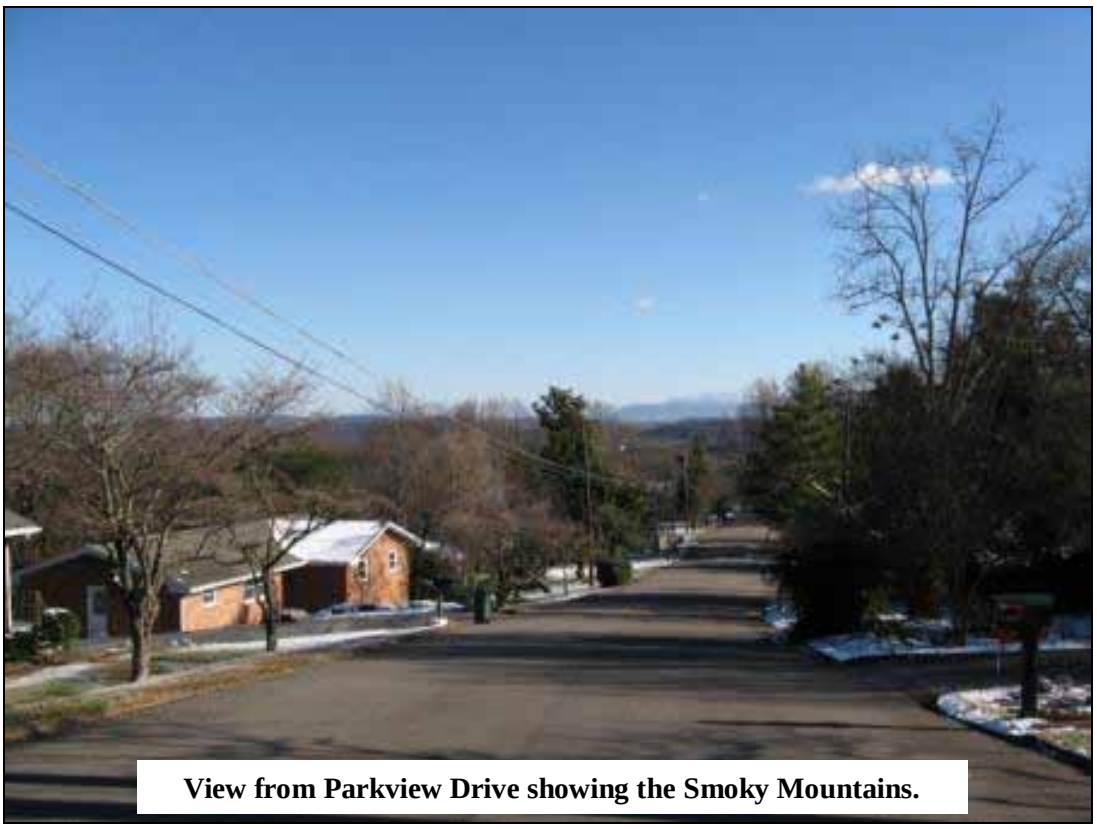
Natural Areas/Open Spaces. Knoxville and Knox County have several large reserves of natural and wildlife management areas. Natural Areas adjacent to or near the project area include Ijams Nature Center, William Hastie Natural Area, and Marie Myers Park.

3.18.1.1 Visual Quality of the Project Area

The first mile of the project area extending northwest from the intersection of John Sevier Highway and Chapman Highway is a mixture of developed areas, including commercial properties, highways, multifamily and single family residential properties, agricultural areas, and undeveloped forest areas. Many of the commercial properties are new or revitalized and a few, such as the used car lot at the corner of John Sevier Highway and Chapman Highway, are older and have reduced visual appeal. The residential areas are a mixture of newer and older homes. Most are well maintained and have good visual appeal. The ridge of Brown Mountain just south of Fordtown Road offers visually appealing views of forests, fields, and ridges.

The views along the project area between Fordtown Road and Prospect Road are dominated by a mixture of newer and older rural residential properties, agricultural land, and large tracts of forested areas. This section of the proposed alignment offers many appealing views of rolling hills and forests.

View from Brown Mountain.



View from Parkview Drive showing the Smoky Mountains.

From Prospect Road to Panorama Drive the views along the project corridor consist of newer and older residential neighborhoods. The View Park neighborhood at Panorama Drive and View Park Drive sits at the top of Rodgers Ridge and has many visually appealing views of hills, forests, and the Smoky Mountains in the distance. There are also views of the William Hastie Natural Area and Marie Myers Park from this section of the project corridor.

Views along the project corridor from Panorama Drive to the terminus at Moody Avenue consist of large tracts of vacant forest and fields, the South Doyle Middle School recreational grounds, roadways such as the existing James White Parkway and Moody Avenue, and single family residential neighborhoods.

3.18.2 Potential Impacts on Visual Quality from the No-Build Alternative

3.18.2.1 Direct Impacts (Visual Quality – No-Build Alternative)

There would be no direct impacts to existing visual quality along the proposed corridor if James White Parkway is not constructed. Aesthetic consequences from development of the James White Parkway and ROW would not occur and would therefore not impact existing undeveloped forested areas, agricultural areas, ridges, natural areas, or rural and low density family residential areas.

3.18.2.2 Indirect Impacts (Visual Quality – No-Build Alternative)

There would be no indirect impacts to existing visual quality along the proposed corridor if James White Parkway is not constructed. Development of other adjacent properties related to construction of the proposed parkway would not occur. Existing properties would remain in place, and there would be no additional reduction of visually appealing elements, such as undeveloped forest and agricultural fields, rural and low density family residential areas, and undeveloped ridgetops.

3.18.2.3 Cumulative Impacts (Visual Quality – No-Build Alternative)

There would be no cumulative impacts to existing visual quality along the proposed corridor if James White Parkway is not constructed. No additional reduction of visually appealing elements such as undeveloped forest and agricultural fields, rural and low density family residential areas, and undeveloped ridgetops would occur. Although some development would likely occur in the area, the current transportation network would not promote the amount of development otherwise anticipated.

3.18.3 Potential Impacts on Visual Resources from the Green Alternative

3.18.3.1 Direct Impacts (Visual Quality – Green Alternative)

Reductions in visual quality from the proposed construction of the James White Parkway may result in some adverse impacts to residents of several homes located along the edge of the proposed James White Parkway. These residents would be exposed to views of the new roadway and associated infrastructure and traffic. Additionally, portions of existing greenways or other bicycle and pedestrian facilities are located in proximity to the new roadway. In most instances, the proposed James White Parkway would run relatively perpendicular to existing and proposed facilities and would therefore not impact large portions of any one facility. Although views of traffic will be inherent along the James White Parkway, the presence of trees and proper placement of the proposed trails within the ROW or adjacent areas will provide some barrier and allow the greenway to provide plenty of benefits for users. TDOT will determine potential ways to help reduce impacts, such as planting vegetation screens or providing aesthetically pleasing features as part of the highway design.

Most of the adverse visual impact associated with the project will occur during the construction phase of the project. These short-term adverse impacts would be due to the presence of heavy equipment, construction materials, and non-vegetated areas that would be visible. Proper construction techniques would be utilized to help reduce short-term visual impacts and long-term lingering effects of construction.

3.18.3.2 Indirect Impacts (Visual Quality – Green Alternative)

Development of the proposed James White Parkway would result in indirect adverse impacts to visual quality due to potential developments that could be promoted by the new roadway, especially near proposed interchange at Sevierville Pike. Those developments may reduce the amount of green space and other buffers that currently occur along the existing and proposed greenway trails. It is expected that most areas where development is promoted by James White Parkway would eventually happen because many of those areas are in planned growth areas for local communities and/or counties, however, the James White Parkway may increase the rate at which some of the development occurs.

3.18.3.3 Cumulative Impacts (Visual Quality – Green Alternative)

Construction of proposed James White Parkway would result in cumulative adverse visual impacts due to a reduction in the aesthetics of nearby trails and residential properties. The loss of green space and increased traffic would combine with similar types of impacts from other past, present, and reasonably foreseeable projects. James White Parkway would, however, cross most of the existing and proposed trails at relatively perpendicular angles, and therefore, would reduce the overall impacts to individual trails.

3.18.4 Potential Impacts on Visual Resources from the Blue Alternative

Visual quality impacts of the Blue Alternative would be similar to those listed under the Green Alternative above.

3.18.5 Potential Impacts on Visual Resources from the Red Alternative

Visual quality impacts of the Red Alternative would be similar to those listed under the Green Alternative above.

3.18.6 Mitigation

Short-term visual impacts are expected with any construction project due to construction equipment, grading, and storage of materials on site. Most visual impacts due to construction typically end once a project is complete. However, careless construction techniques can have long-term aesthetic consequences. Examples of careless construction techniques include inappropriately located disposal sites, unnecessary damage to trees that should remain on the site, and poorly located access and haul roads that cause unnecessary removal of vegetation or other impacts. Also, improper grading, revegetating, or landscaping of construction sites can result in visual impacts. If proper vegetation, such as grass or other groundcover, is not established on disturbed areas following construction, the area would likely be perceived negatively by most individuals. Non-vegetated areas also tend to have erosion issues, which usually lead to further visible issues. All of these types of construction impacts can remain visible for long periods following construction.

One of the goals of most modern construction projects, including TDOT roadway projects, is typically to provide structures or facilities that fit into the surrounding setting as well as possible so the visual affect is an improvement over existing conditions. If not perceived as an improvement, the goal would be to maintain the general visual quality in an area to the extent practical.

Mitigation measures, as defined by the CEQ (40 CFR 1508.20), include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating the impact over time, and compensating for the impact. Potential mitigation measures for visual impacts should include, but not be limited to:

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

TDOT will involve the public during the design phase of the project in accordance with TDOT's Public Involvement Plan. This will provide the public and local communities additional opportunities to provide input related to the design of the project and to help identify features that will help the project fit into the context of the area to the extent possible.

3.19 Energy

3.19.1 Affected Environment

The current commitment of energy resources (mainly gasoline and diesel fuels) in the project area is influenced by traffic flow patterns. When traffic flow is congested, which often occurs on the existing Chapman Highway, higher consumption of fuel is required than when traffic flow is flowing more freely.

Construction equipment used for roadway projects requires the use of additional energy. However, the short-term uses of extra energy during construction are typically offset by the energy resources saved due to improved traffic flows in the long-term.

There are no energy sources in the James White Parkway project area that would be potentially impacted. Any electrical lines and gas pipelines impacted in the project construction zone will be relocated as part of the project.

3.19.2 Potential Impacts on Energy from the No-Build Alternative

3.19.2.1 Direct Impacts (Energy – No-Build Alternative)

Not extending James White Parkway to Governor John Sevier Highway would result in potential long-term adverse impacts to energy resources. Traffic congestion would continue to worsen on Chapman Highway and would likely eventually cause additional roadways to have reduced LOS as people look for alternative routes to avoid the congested areas. The poor traffic flow would continue to result in extra commitment of energy resources (diesel fuel and gasoline) than would be needed if traffic flowed more freely and efficiently.

3.19.2.2 Indirect Impacts (Energy – No-Build Alternative)

Not extending James White Parkway would likely result in more congestion on other roadways in the region as people attempt to use other routes to avoid the congested areas. This would likely result in reduced LOS on those alternative routes and would cause increases in VMT and travel times. These impacts are not measurable at this time. Regardless, all of those factors would result in increased fuel consumption in the region, which would cause adverse impacts to energy resources. This extra fuel would also have secondary economic impacts for local residents and businesses due to the extra fuel that

would need to be purchased for commuting to and from work or for shipping items in and out of the area.

The No-Build Alternative would not promote new development in the general project vicinity or points to the south, because the traffic congestion problems could dissuade developers and potential tenants from locating in the area. This may have some potential benefits in terms of energy, because less construction would occur and less long-term energy consumption would be needed if fewer developments occurred. However, it is likely that those developments would just shift to other portions of the Knoxville area or other cities putting additional energy demands on those areas. Also, if the developable areas near the project area are not utilized to their full potential because of traffic issues, it may result in additional energy impacts. This is because those developments, including residential, commercial, and/or industrial developments, would likely be located farther away from the downtown Knoxville area and may result in longer commutes requiring additional fuel consumption. If the areas closer to downtown can be utilized, less fuel would be required, especially for residents and businesses that require travel into the downtown Knoxville area on a daily or regular basis.

3.19.2.3 Cumulative Impacts (Energy – No-Build Alternative)

Reduced LOS and increased congestion on Chapman Highway, and other secondary roadways used as alternatives to avoid congestion, would have adverse impacts to energy resources, primarily fuel. When viewed cumulatively with other past, present, and reasonably foreseeable projects and trends, the impacts to energy would be even more adverse. It is anticipated that traffic volumes will continue to increase in the region due to continued urban development and economic growth in the area. Extra vehicles generated by new developments would result in worsening traffic congestion on Chapman Highway and other local roadways, if no major improvements were made. This could result in increases in fuel consumption.

A minor amount of relief to the potential extra fuel consumption may result from more efficient vehicles due to more stringent regulations by the government promoting auto makers to produce more fuel efficient vehicles. However, the benefits of those efforts would not be as noticeable if traffic flow issues remain due to the poor LOS on Chapman Highway. Continued improvements to existing roadways in the region may also help alleviate some of the traffic problems in the region as a whole. However, because Chapman Highway is a busy route and handles a substantial amount of traffic, not improving the traffic capacity of the local network would have noticeable adverse impacts due to increased energy consumption.

3.19.3 Potential Impacts on Energy from the Green Alternative

3.19.3.1 Direct Impacts (Energy – Green Alternative)

The improved traffic flow and reduction in commuting times would decrease the amount of fuel consumption in the region. The improved LOS would allow both local commuters and through traffic to move through the area more efficiently and without having to find other, less-efficient alternative routes to avoid congestion on Chapman Highway.

Short-term adverse impacts would occur due to extra fuel consumption during construction of the project. However, those short-term impacts would be more than offset by the long-term benefits of the new roadway in terms of providing more efficient travel through the area.

There could be temporary disruption of electric and gas service in the area while powerlines and/or gas pipelines are relocated (if necessary). These impacts would be short term and would likely not cause measureable impacts.

3.19.3.2 Indirect Impacts (Energy – Green Alternative)

James White Parkway would help to improve LOS on other local roadways making them more efficient. This improved LOS would be due to removing some of the traffic from those other roadways that drivers currently use to avoid congestion on Chapman Highway.

Providing faster access to developable land adjacent to the project area, especially areas near the southern terminus of the Green Alternative would promote faster development in the area. In terms of energy, this would likely be beneficial in the long-term, because it would take advantage of developable land relatively close to the Downtown Knoxville area compared to other developable land that occurs further away from the planned growth boundaries. This in turn would provide for shorter commuting distances to and from residences, businesses, and/or industries choosing to locate in the area and would require less energy to get people and goods to and from those areas from Downtown Knoxville. The benefits of providing better access and more efficient travel to areas located adjacent to the project would result in overall positive impacts to energy.

Secondary developments promoted by the transportation improvements may put more demands on some sources of energy like electric and natural gas. However, it is likely that much of this area will be developed in the future regardless of this project due to its proximity to Knoxville. Therefore, the long-term impacts to energy from secondary developments are not anticipated to differ substantially from the No-Build Alternative conditions.

3.19.3.3 Cumulative Impacts (Energy – Green Alternative)

The extension of James White Parkway would provide for more efficient travel through the area resulting in increased fuel efficiency and beneficial impacts to energy. Those benefits would combine with benefits of other past, present, and reasonable foreseeable transportation improvement projects in the Knoxville area. Also, continued improvements by automakers in providing more fuel-efficient vehicles would also add to the overall positive impacts to energy.

Secondary developments near the project area would also ultimately help to reduce commuting distances and travel times for many residents and businesses that choose to locate there instead of areas located further from downtown. This would also help offset some of the increased energy demands expected throughout the Knoxville region due to continued urban development and economic growth. Continued growth in the Knoxville area would occur with or without the James White Parkway project. Therefore, this project would not necessarily add to any increased energy demands in the long-term. Instead, it would help to compensate for some of the increased demands by providing for more efficient travel through the area when compared to existing conditions that would continue to worsen under the No-Build Alternative.

3.19.4 Potential Impacts on Energy from the Blue Alternative

3.19.4.1 Direct Impacts (Energy – Blue Alternative)

Impacts to energy under the Blue Alternative would be similar to those discussed under the Green Alternative. However, there would be slightly less improvement on energy demand due to the increased length of this alternative, and because it would relieve slightly less

traffic from Chapman Highway. Therefore the Blue Alternative would not provide quite as much benefit to energy as the Green Alternative.

3.19.4.2 Indirect Impacts (Energy – Blue Alternative)

Indirect impacts associated with the Blue Alternative would be similar to the Green Alternative, except there would be slightly less of a reduction in traffic volumes on Chapman Highway and the other local roadways used as alternative routes.

3.19.4.3 Cumulative Impacts (Energy – Blue Alternative)

Cumulative impacts to energy under the Blue Alternative would be similar to the Green Alternative except there would be a slight reduction in the amount of benefits due to the slight reduction in traffic it would relieve from Chapman Highway and other routes.

3.19.5 Potential Impacts on Energy from the Red Alternative

3.19.5.1 Direct Impacts (Energy – Red Alternative)

Impacts to energy under the Red Alternative would be similar to those discussed under the Green Alternative and Blue Alternative. However, the Red Alternative would have the least improvement on energy demand due to the increased length of this alternative, and because it would relieve less traffic from Chapman Highway due to its less direct route. Therefore the Blue Alternative would not provide as much benefit to energy as the other build alternative options.

3.19.5.2 Indirect Impacts (Energy – Red Alternative)

Indirect impacts associated with the Red Alternative would be similar to the Green Alternative and Blue Alternative. However, since the Red Alternative would have the least reduction in traffic volumes on Chapman Highway and the other local roadways used as alternative routes, it would provide the least potential benefit in terms of energy demands.

3.19.5.3 Cumulative Impacts (Energy – Red Alternative)

Cumulative impacts associated with the Red Alternative would be similar to the Green Alternative and Blue Alternative. However, since the Red Alternative would have the least reduction in traffic volumes on Chapman Highway and the other local roadways used as alternative routes, it would provide the least potential benefit in terms of energy demands. Even when considered with other past, present, and reasonably foreseeable projects that help to reduce energy demands, the Red Alternative would provide the least potential benefit of all three of the build alternative options.

3.19.6 Mitigation

Construction of James White Parkway would be conducted in an efficient manner to avoid unnecessary consumption of energy. Construction equipment will be maintained regularly to allow for efficient operation and fuel efficiency.

The James White Parkway project will improve traffic flow conditions in the Knoxville region. Meeting that goal would result in improved fuel efficiency for some vehicles traveling in the area.

3.20 Construction Impacts

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

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

Contractors would be required to conduct and schedule operations according to these provisions. For example, the contractor would be bound by Section 107.01 of the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic would be routed during construction in a manner that has the least noise impact practicable upon residential and noise sensitive areas. In addition, coordination with affected utility companies would minimize disruption to utility services. Furthermore, TDOT would coordinate with local governments during the construction phase to minimize disruption to communities accepting detoured traffic.

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

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

Proper sediment control measures, such as silt fences, would be used as outlined in the Tennessee Erosion and Sediment Control Handbook (TDEC 2001b) and Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992).

3.21 Required Permits

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

- **Clean Water Act - Section 404 Permit** – required for construction that involves placement of dredge and fill material in Waters of the U.S. and/or impacts to waters of the U.S. where federally-listed Threatened or Endangered species are present. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. Section 404 Permits are issued by the

USACE. Individual and/or Nationwide Section 404 permits (NWP) may be required depending on the types of impacts involved.

- **Section 401-** Section 401 Water Quality Certification Pursuant to Section 401 of the Clean Water Act, a certification must be obtained from the state before any activity that may result in a pollution discharge into waters of the U.S. can be permitted by a federal agency. This certification is issued by TDEC, Division of Water Pollution Control, and states that the discharge will comply with the applicable effluent limitations and water quality standards. For Nationwide Section 404 Permits, TDEC provides a blanket approval. For Individual Section 404 Permits, an application must be completed by the permit applicant and submitted to TDEC for review. If the project is acceptable, TDEC will issue the Section 401 Water Quality Certification that states that the discharge complies with the aquatic protection requirements of the State.
- **Aquatic Resource Alteration Permit (ARAP)** – Projects that alter state waters or wetlands and that do not require an individual Section 404 permit must obtain an ARAP from TDEC. The permit application identifies a project's potential impacts to water quality and ensures compliance with the aquatic protection requirements of the state. The ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; blueline streams; intermittent blueline streams on the United States Geologic Survey (USGS) 7.5 quadrangle map; any stream that supports any form of aquatic life; or is in the vicinity of a State-listed endangered species. TDEC, Division of Water Pollution Control issues ARAP permits.
- **Section 26(a) Permit** - Section 26a of the TVA Act of 1933 as amended (49 Stat. 1079, 16 U. S. C. sec. 831y1) prohibits the construction, operation or maintenance of any structure affecting navigation, flood control on public lands or reservations across, along or in the Tennessee River or any of its tributaries until plans for such activities have been reviewed and approved by TVA. This permit is obtained from TVA for construction of projects that are in or along the Tennessee River and its tributaries, i.e., the Tennessee River watershed. (See http://www.tva.gov/river/26apermits/howto.htm). The 26a Permit shares an application form with USACE Permits applied for under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, as described above.
- **National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit** – The responsibility for issuing permits under the NPDES has been delegated by the EPA to TDEC. The legal reference of the NPDES is Section 402 of the Federal Water Pollution Control Act of 1972, as amended by the Clean Water Act (1977 and 1987). The NPDES storm water permitting program is intended to improve the quality of the nation's rivers, lakes, and streams by reducing pollution from non-point sources. All TDOT construction activities disturbing one acre or more of land are required to obtain an NPDES permit. These permits establish pollution control and monitoring requirements. General permits for construction activities require development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) to help control erosion, sedimentation, and other project-generated waste. This permitting program is overseen by TDEC's Permit Section of the Division of Water Pollution Control. This division is responsible for the permitting process and also for administration of the Tennessee Water Quality Control Act of 1977.

- **Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP)** – required by operators of construction sites in Tennessee.
- **Underground Injection Control Permit** - This permit is required for any project that discharges industrial/commercial wastes into a subsurface system (other than city sewers) or stormwater into a sinkhole or cave. The permit is issued by TDEC, Division of Water Supply, Ground Water Management Section.

3.22 Section 4(f) Properties

3.22.1 Affected Environment

Section 4(f) was created when the U.S. Department of Transportation (USDOT) was formed in 1966. It was initially codified at Title 49 United States Code (U.S.C.) Section 1653(f) (Section 4(f) of the USDOT Act of 1966). In 1983, Section 1653(f) was reworded and recodified at Title 49 U.S.C. Section 303. These two statutes have no real practical distinction and are still commonly referred to as "Section 4(f)". Congress amended Section 4(f) in 2005 when it enacted SAFETEA-LU. Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) added a new subsection to Section 4(f), which authorizes the FHWA to approve a project that results in a de minimis impact to a Section 4(f) resource without the evaluation of avoidance alternatives typically required in a Section 4(f) Evaluation.

Section 6009 amended Title 23 U.S.C. Section 138 to state:

> "The Secretary shall not approve any program or project (other than any project for a park road or parkway under Section 204 of this title) which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge or national, state, or local significance as determined by the federal, state, or local officials having jurisdiction thereof, or any land from an historic site of national, state, or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use. The requirements of this section shall be considered to be satisfied and an alternatives analysis not required if the Secretary determines that a transportation program or project will have a de minimis impact on the historic site, parks, recreation areas, and wildlife or waterfowl refuges. In making any determination, the Secretary shall consider to be a part of a transportation program or project any avoidance, minimization, mitigation, or enhancement measures that are required to be implemented as a condition of approval of the transportation program or project. With respect to historic sites, the Secretary may make a finding of de minimis impact only if the Secretary has determined in accordance with the consultation process required under Section 106 of the National Historic Preservation Act that the transportation program or project will have no adverse effect on the historic site or there will be no historic properties affected by the transportation program or project; the finding has received written concurrence from the State Historic Preservation Officer (SHPO); and the finding was developed in consultation with the parties consulted under the Section 106 process."

All three James White Parkway build alternatives are anticipated to result in a minor impact to the William Hastie Natural Area. Based on current information and the conceptual layouts of the build alternatives, TDOT is considering requesting a de minimis impact finding for this

project as described below. Another nearby park, the Marie Myers Park located off of Sevierville Pike, was purposely avoided by the project alternatives due to its proximity to the Meades Quarry Cave system and known groundwater connections to that area that could impact the Berry Cave salamander population inhabiting the cave system. Some of the previously considered alternatives, including the Task Force recommended alternative, would have resulted in substantial impacts to the Marie Myers Park and Meades Quarry Cave system. Those impacts will be successfully avoided by all three of the current build alternatives.

As a public facility owned by the City of Knoxville and managed through the City's Parks and Recreation Department, and because it is used for recreation/park purposes, the William Hastie Natural Area is afforded special protections under Section 4(f) of the USDOT Act (recodified in 49 U.S.C. 303 and 23 U.S.C. 138). William Hastie Natural Area consists of approximately 77 acres (*estimated using James White Parkway GIS data*) of forested land located just a few miles south of Ijams Nature Center, adjacent to the Lake Forest Neighborhood. Primary access to the park is provided via Margaret Road. Like Ijams Nature Center, the terrain at William Hastie Natural Area is within a karst region and contains several sinkholes and caves. The center of the area contains a low or subsided area surrounded by a series of steep hills and ridges providing a somewhat enclosed setting. Figure 3.8 shows the location of William Hastie Natural Area in relation to the James White Parkway build alternative alignments and ROW.

The existing primary uses of William Hastie Natural Area are nature viewing, mountain biking, hiking, and trail running. Although the City of Knoxville did not initially develop a trail system on the property, the Appalachian Mountain Bike Club (AMBC) (http://www.ambc-sorba.org/) got involved and provided over 1,000 hours of volunteer work to develop a series of unpaved trails extending over four miles within the area boundaries. These trails now provide an urban getaway for hikers, mountain bikers, and trail runners. More details regarding the William Hastie Natural Area are included in the Preliminary Section 4(f) Summary Report located in Appendix D of this DEIS. Additional information is available on the City of Knoxville Parks and Recreation Division website at: (http://www.ci.knoxville.tn.us/parks/hastie.asp). Additional discussion regarding trails and greenways in the area are included above in the Pedestrian and Bicyclist Considerations subsection of this EIS and in Appendix D.

3.22.2 Considerations for a De Minimis Impact Finding

Section 6009(a) of SAFETEA-LU amended the existing Section 4(f) legislation to simplify the processing and approval of projects that have what is referred to as de minimis (minimal) impacts on lands protected by Section 4(f). De minimis impacts on publicly -owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not adversely affect the activities, features, and attributes of the Section 4(f) resource.

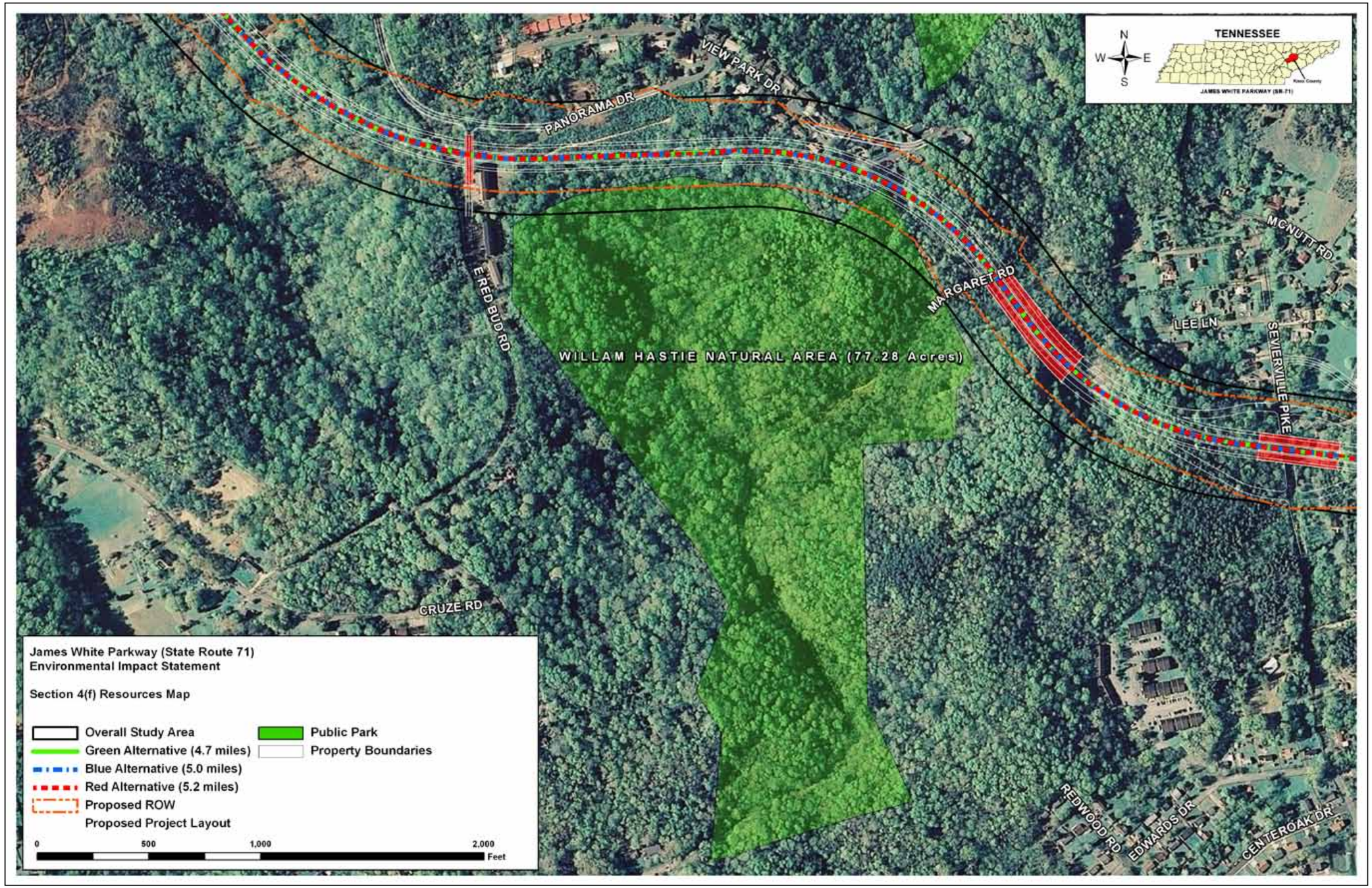
Based on the best available information and conceptual layouts of the build alternatives, the James White Parkway project will result in the initial take of 0.79 acres of the William Hastie Natural Area, but with proposed mitigation would increase the size of the park by a total of 0.43 acres. Appendix D contains a map showing the proposed mitigation areas. In addition, none of the parks existing functions, activities, features, or attributes are expected to be substantially impacted based on current information. The proposed roadway would provide improved access to the site from downtown Knoxville via the proposed Sevierville Pike Interchange. Noise, visual, and air quality impacts are not anticipated to be substantial and would not alter the current primary uses of the site, which include mountain biking, hiking, trail running, and nature viewing. It is possible that some of those impacts can be reduced

through additional mitigation measures and/or context sensitive solutions/design features, such as vegetation screens and/or other options.

Unless additional information provided by the public or local officials provide additional evidence that a de minimis finding is not appropriate, TDOT intends to request a de minimis impact finding for the James White Parkway impacts to William Hastie Natural Area. Should further studies or information indicate otherwise, FHWA will require that a full Section 4(f) Evaluation be conducted to determine if any other reasonable alternatives exist to fully avoid the William Hastie Natural Area.

TDOT has provided the local officials with jurisdiction over the William Hastie Natural Area with a letter describing the proposed project impacts and mitigation to make up for those impacts. This letter also notified the officials that TDOT was considering requesting a de minimis impact finding due to the net minor impacts expected. Following the Corridor Public Hearing, which includes the findings of the NEPA and Section 4(f) studies, all public comments regarding the Section 4(f) resource will be evaluated, summarized, and then provided to the local officials with jurisdiction. This will allow them to make an informed decision as to whether to concur with TDOT that a de minimis impact finding is appropriate. Should they concur, TDOT will present the information and local official concurrence letter to FHWA for their final review and determination on the finding.

Figure 3.8. Map of the William Hastie Natural Area in Relation to the James White Parkway Build Alternatives.



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3.22.3 Potential Section 4(f) Impacts of the No-Build Alternative

3.22.3.1 Direct Impacts (Section 4(f) – No-Build Alternative)

The No-Build Alternative would not result in any known direct impacts to Section 4(f) resources.

3.22.3.2 Indirect Impacts (Section 4(f) – No-Build Alternative)

If James White Parkway is not constructed, the proposed James White Greenway discussed above in Pedestrians and Bicyclists Consideration subsection would not be constructed. This would result in reduced recreational opportunities at William Hastie Natural Area due to less connectivity between various other greenway trails in the South Knoxville vicinity when compared to the build alternatives, which would provide a potential corridor for those increased trail connections to occur.

3.22.3.3 Cumulative Impacts (Section 4(f) – No-Build Alternative)

Although there would not be any direct adverse impacts to existing Section 4(f) properties if James White Parkway was not constructed, there would also be no potential benefits. The proposed James White Greenway would not be constructed and would not be available to provide additional recreational opportunities or important connectivity between other existing public parks and recreation areas around the region. Other proposed greenways and trails would likely be completed as proposed in local plans, and would not be substantially affected by selection of the No-Build Alternative for the James White Parkway.

3.22.4 Potential Section 4(f) Impacts of the Build Alternatives (Green Alternative, Blue Alternative, and Red Alternative)

3.22.4.1 Direct Impacts (Section 4(f) – Build Alternatives)

All three of the James White Parkway build alternatives will impact the William Hastie Natural Area along its northern border. Due to other constraints identified and considered throughout the alternative development process, including: threatened and endangered species habitats, karst features, dense residential developments, and other resources/existing developments; the location of the build alternative alignments were confined to the area abutting the northern boundary of the William Hastie Natural Area. Therefore, all three build alternatives share the same alignment at this location. Although it may be possible for additional minor revision of the proposed ROW lines in this area, it is anticipated that at least a small portion of the natural area will need to be acquired for use for the transportation project. Appendix D contains a map showing the anticipated “take areas” that will need to be acquired for the project. The total amount of land anticipated to be acquired includes 0.79 acre of the total 77.28 acres within the William Hastie Natural Area. This represents approximately one percent of the total area. The northern boundary of the Natural Area contains two areas that protrude into the proposed ROW of the alternatives. These small areas are not critical to the function or quality of the site and are proposed to be replaced by adjacent land with the same general characteristics as the take areas. The proposed greenway trail proposed to connect William Hastie Natural Area to Marie Myers Park to the north would be incorporated into the design plans for the James White Parkway project. The land for the proposed greenway trail at the proposed crossing is privately-owned at this time and would therefore not be considered a Section 4(f) resource. Only the land within the existing William Hastie Natural Area would qualify at this time. Regardless, the connections and recreational uses provided by the proposed trail would not be severed. The following section describes the proposed mitigation in more detail.

In addition to the direct take of the existing property, other potential impacts the build alternatives may have on the William Hastie Natural Area include noise and visual impacts. However, due to the position of the build alternative alignments in relation to the primarily utilized portions of the site, these impacts are not expected to be substantial and would not limit any of the existing uses or functions of the site. Most of the activity within the William Hastie Natural Area occurs on the AMBA trails, which are primarily located toward the core of the site and do not extend all of the way to the northern boundary where the proposed build alternatives are aligned. Although some occasional use of the northern boundary of the site may occur, there is no evidence that this portion of the site is currently frequented by park visitors. Therefore, any visual or noise impacts that do occur at the very northern boundary of the park would not impede the primary recreational uses of the area, which are primarily located to the south of this area. As distance from the proposed ROW increases, the probability for noise and visual impacts will quickly become reduced.

The predicted worst hour noise level for the area did not meet or exceed the NAC, nor was there a substantial increase in design year noise levels above the existing noise levels of the area. Receivers were modeled at distances 300, 400, and 500 feet from the edge of the proposed James White Parkway. Design year sound levels measured 56, 54, and 53, respectively. As a result, it is not anticipated the William Hastie Natural Area would be impacted by noise.

Substantial noise impacts are not anticipated for the William Hastie Natural Area, because the roadway will lie primarily above the elevation of the area allowing sound to travel over the area. In addition, the forested areas that will remain along the border of the ROW will provide an additional buffer that will help reduce noise levels inside the primarily used portions of the site, including the AMBA trail system.

Visual impacts from within the William Hastie Natural Area are also expected to be minimal due to the roadway being developed above the majority of the site in elevation, and due to the visual buffer that will be provided by the remaining forest separating the primarily used areas of the site from the project ROW. Shifting the alignment away from the park towards the adjacent ridgetop and residential area would create an adverse visual impact and adversely impact the Mountain View neighborhood.

The air quality study for the James White Parkway project did not identify measurable impacts in the vicinity of the Natural Area.

3.22.4.2 Indirect Impacts (Section 4(f) – Build Alternatives)

Each of the build alternatives for James White Parkway could result in indirect impacts to Section 4(f) properties due to potential developments that could be promoted by the new roadway, especially near the proposed interchange at Sevierville Pike. Those developments may increase noise, reduce visual quality, and/or reduce the amount of green space and other buffers that currently occur along the existing trails and proposed greenways connecting existing Section 4(f) parks and other recreation areas in the vicinity. However, due to the steep terrain and karst topography in the immediate vicinity of William Hastie Natural Area, it is not likely that any substantial developments would occur immediately adjacent to it. It is expected that most areas where development is promoted by James White Parkway would eventually happen, because many of those areas are in planned growth areas for the City of Knoxville and other portions of Knox County. The extension of James White Parkway may increase the rate at which some of the development occurs.

Construction of the proposed James White Greenway within or adjacent to the James White Parkway ROW would result in long-term beneficial impacts in terms of enhancing recreational activities by providing better connection between public parks and natural areas, local neighborhoods and communities, and other pedestrian and bicycle facilities. All new connections would be considered a beneficial impact to Section 4(f) resources, such as William Hastie Natural Area in terms of improved access and overall usage of the area for recreational purposes.

3.22.4.3 Cumulative Impacts (Section 4(f) – Build Alternatives)

Construction of each of the build alternatives of James White Parkway would result in potential adverse impacts to Section 4(f) facilities due primarily to aesthetic consequences due to additional loss of green space. Those impacts would be cumulative to other past developments, including construction and use of local roads and residential developments that have increased noise levels and resulted in loss of native vegetation or green space.

The James White Greenway, if constructed, would provide cumulative benefits to Section 4(f) resources by providing better connectivity and additional trails for bicyclists and pedestrians in addition to other existing trails and proposed greenways and associated trails. This beneficial impact would also be in addition to the proposed positive impacts provided by the minor increase in the size of the William Hastie Natural Area as part of the mitigation for the Section 4(f) land required for the project.

3.22.5 Proposed Measures to Minimize and Mitigate Impacts to Section 4(f) Property

TDOT proposes to mitigate the impacts of the direct take of the two small segments along the northern boundary of the William Hastie Natural Area by acquiring three small segments of land that will remain from other affected parcels that attach to the existing Natural Area. The total amount of area contained in the proposed mitigation areas is 1.22 acres. As mentioned above, approximately 0.79 acres of land would be required for the proposed James White Parkway ROW from within the existing William Hastie Natural Area. Therefore, with the transfer of the 1.22 acres of mitigation property, the total size of the William Hastie Natural Area would become 77.71 acres, for an overall increase in size of 0.43 acres from the existing 77.28 acres. In addition, the resulting northern boundary of the William Hastie Natural Area would become a more regular-shaped area that would line the edge of the proposed James White Parkway ROW boundary. Appendix D contains a map showing the proposed mitigation areas. The three segments would be purchased during the ROW acquisition phase of the project and immediately transferred to the City of Knoxville to become part of the William Hastie Natural Area.

James White Parkway would provide quicker access to the William Hastie Natural Area for downtown users via the proposed new Sevierville Pike/James White Parkway interchange. This interchange would provide excellent access with users only being required to make two quick left turns after leaving the proposed new roadway to gain access to the Natural Area via Margaret Lane. In addition, construction of the James White Greenway within the James White Parkway corridor would substantially improve access and connectivity between William Hastie Natural Area and several other areas by providing connections to other existing trails and proposed greenways in the area. This would add to the already increasing number of bicycle and pedestrian facilities in the South Knoxville vicinity and overall Knoxville region.

3.23 Relation of Short-Term Use of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The local short-term impacts of the proposed action and the use of resources for it are consistent with the maintenance and enhancement of long-term productivity for the region. Creation of the project would support growth and development of employment and population in the region. This project would support short-term and long-term goals by improving means of transport into and out of the region.

The level of development anticipated provides the basis for improved delivery of services and goods to and from the region. It should enhance the quality of life as access is improved and traffic travel times throughout the region are reduced. There would be no discernable difference between the build alternatives in terms of short term use of man's environment and the maintenance of long-term productivity.

3.24 Irreversible and Irretrievable Commitment of Resources

The proposed James White Parkway project would require the expenditure of human and fiscal resources and the potential modification of natural resources. Land and materials utilized in the construction of the project are considered an irreversible commitment.

Land used in the construction of the proposed facilities is considered an irreversible commitment during the period that the land is used for the highway purposes. However, if a greater need arises for the use of the land, or if the highway facilities are no longer needed, the land can be converted to another use. At present, there are no reasonably foreseeable reasons to believe such a conversion would ever be necessary or desirable. Some of the resources affected by construction of the project may be irreversibly altered.

Construction would require the expenditure of materials that are generally not retrievable. Considerable amounts of fossil fuels, labor, and construction materials, such as cement, aggregate, iron, gravel, and bituminous material would be expended and large amounts of labor and natural resources are necessary in the fabrication and preparation of construction materials. However, although these materials are generally not retrievable, they are not in short supply and their use for this project would not have an adverse effect upon continued availability of these resources. In addition, construction would also require large, one-time investment of both state and federal funds that are not retrievable.

The commitment of these resources is based on the concept that residents both within the project area, as well as the region, would benefit by improvements in the quality of the local and regional highway transportation system. The facilities would improve the highway capabilities of the region by substantially enhancing highway capacity, accessibility, and saving travel time. The facilities should provide a positive influence on the economy of the region and the livelihood of its citizens.

3.25 Summary of Environmental Consequences

This section was prepared to provide a summary of the potential impacts of each of the proposed alternatives for the project. The Executive Summary also contained a general summary of the environmental consequences associated with the project. Table 3.31 shows side-by-side comparisons of impacts associated with the No-Build Alternative, Green Alternative, Blue Alternative, and Red Alternative.

Table 3.31. Summary of Project Data for each of the James White Parkway Alternatives.

Item	No-Build		Green Alternative		Blue Alternative		Red Alternative	
Functional Classification	Urban Principal Arterial		Urban Principal Arterial		Urban Principal Arterial		Urban Principal Arterial	
System Class	Federal Aid Primary System		State Highway System		State Highway System		State Highway System	
Length - Miles	NA		4.7		5.0		5.2	
Average Daily Traffic/Level of Service (ADT/LOS)								
Chapman Highway	2015	2035	2015	2035	2015	2035	2015	2035
Tennessee River to Blount Avenue	41,000/D	66,000/F	34,000/D	51,000/E	36,000/D	54,000/E	37,000/D	56,000/F
Blount Avenue to Moody Avenue	36,000/E	58,000/F	28,000/D	41,000/E	30,000/D	44,000/E	31,000/D	46,000/E
Moody Avenue to Stone Road	34,000/C	54,000/E	19,000/B	32,000/C	20,000/B	35,000/C	23,000/C	38,000/D
Stone Road to Lindy Drive	31,000/C	49,000/E	17,000/B	27,000/C	19,000/B	30,000/C	20,000/B	32,000/C
Lindy Drive to West Dick Ford Lane	31,000/C	50,000/E	15,000/B	26,000/C	17,000/B	29,000/C	19,000/B	31,000/C
West Dick Ford Lane to Governor John Sevier Highway	33,000/C	52,000E	18,000/B	29,000/C	19,000/B	31,000/C	20,000/B	33,000/C
James White Parkway	2015	2035	2015	2035	2015	2035	2015	2035
Tennessee River to Moody Avenue	NA	NA	29,000/C	43,000/D	27,000/C	40,000/D	25,000/C	38,000/D
Moody Avenue to Sevierville Pike	NA	NA	25,000/C	37,000/D	23,000/B	34,000/C	21,000/B	32,000/C

Item	No-Build		Green Alternative		Blue Alternative		Red Alternative	
James White Parkway (cont.)	2015	2035	2015	2035	2015	2035	2015	2035
Sevierville Pike to Governor John Sevier Highway	NA	NA	23,000/B	35,000/D	22,000/B	32,000/C	20,000/B	30,000/C
On Governor John Sevier Highway	NA	NA	NA	NA	26,000/D	35,000/D	24,000/D	33,000/D
Estimated Right-of-Way Acquisition (Acres)	0		188		203		206	
Displacements								
Residential Household Units[1]	0		65		64		62	
Business	0		2		3		5	
Non-Profit	0		1		0		0	
Noise Receptors Impacted	0		35		24		26	
Cultural Resources								
Archaeological Sites Impacted	0		0		0		0	
Historic Sites Impacted (number)	0		0		0		0	
Section 4(f) Properties Impacted	0		1		1		1	
Land Cover/Terrestrial Habitat Impacted in ROW[2]								
Forest (acres)	0		122		123		123	
Shrub/Scrub (acres)	0		4		9		7	

Item	No-Build	Green Alternative	Blue Alternative	Red Alternative
Old Field (acres)	0	3	6	6
Grassland/Agriculture (acres)	0	1	6	4
Developed/Disturbed (acres)	0	58	60	66
Farmland Conversion Impact Rating Score (out of 260 points possible)	NA	81	88	89
Aquatic Resources Impacted[3]				
Streams Impacted in ROW	0	10	12	13
Stream Channel in ROW (feet)	0	4,099	6,071	5,885
Streams Crossed in ROW	0	7	9	9
Streams Channelized within ROW	0	4	4	5
WWCs Impacted in ROW	0	13	15	15
Springs/Seeps Impacted in ROW	0	7	7	3
Ponds Impacted in ROW	0	4	4	0
Wetlands Impacted in ROW	0	0	0	0
100-year Floodplains Impacted	0	0	0	1
Floodplain Area in ROW (acres)	0	0	0	1.08
Karst Features Impacted[4]	0			

Item	No-Build	Green Alternative	Blue Alternative	Red Alternative
Caves Impacted in ROW	0	2	1	1
Sinkholes Impacted in ROW	0	6	7	9
Sinkhole Area in ROW (acres)	0	0.77	3.20	2.99
Hazardous Materials Sites Impacted (no. of "High" impact potential sites)	0	1	1	1
Estimated Total Construction and Right-of-Way Costs (millions-2009)[5]	0	$103.9	$104.1	$106.9

[1] Includes total of individual single family homes + individual apartment units + mobile homes.

[2] Land cover/wildlife habitat data is provided for comparison purposes only. Acreages derived using GIS based on data collected during the December 2010 field surveys.

[3] Aquatic resources direct impact data is provided for comparison purposes only. Detailed data regarding stream impacts and mitigation will be provided following the final design phase as part of the permit acquisition process.

[4] Preliminary Cost Estimates are provided for general comparison only and include Quantm cost estimates for earthwork, bridges, retaining walls, and drainage and property costs for ROW acquisitions based on 2009 cost data. These cost estimates also include construction of interchanges and widening/improvements to Governor John Sevier Highway necessary for the Blue and Red Alternatives. These estimates do not include relocation costs for displacements, engineering costs, or utility relocation costs. More detailed cost estimates will be developed following selection of a preferred alternative.

[5] Karst features include all features observed on the surface during preliminary field investigations within the study area boundaries. There is potential that additional karst features, including caves could be identified during secondary geotechnical studies that will be conducted after a preferred alternative is selected.

Source: Parsons and TDOT, 2011

CHAPTER 4

4.0 COORDINATION, COMMENTS, and PUBLIC INVOLVEMENT

4.1 Agency Coordination

On May 1, 2007 a Notice of Intent was published in the Federal Register to advise the public that an EIS would be prepared for this project [Federal Register: May 1, 2007 (Volume 72, Number 83)]. A project-specific Coordination Plan was developed to define the process by which information about the project would be communicated to the cooperating, participating, and other agencies and project stakeholders. A project specific Public Involvement Plan was developed to define the process by which information would be communicated to the public and how the public could provide input on the project throughout the preparation of the environmental document.

4.1.1 Initial Coordination

On April 17, 2008, TDOT notified a total of 59 federal, state, and local planning/resource management agencies, private organizations, and other project stakeholders by letter about the proposed James White Parkway DEIS. As part of this coordination process, several agencies with jurisdiction or responsibilities in the area were invited to become participating and/or cooperating agencies. On August 25, 2011, TDOT mailed letters to five groups or tribes representing Native American interests and asked them if they wished to participate in the historic review process for this project as consulting parties.

Each party in the coordination efforts was invited to comment upon any possible environmental, economic, and/or social impacts within their special area(s) of expertise and/or concern. The coordination effort afforded concerned agencies, local officials, organizations, tribes, and citizens an opportunity to provide input into the project planning process during the early stages of project development. The coordination efforts helped ensure that all foreseeable impacts and concerns were considered in the environmental and location studies to date.

Table 4.1 shows a list of the agencies/organizations contacted. A total of 18 responses to the initial coordination letters was received. Copies of these responses are available in the Appendix C.

Cooperating and Participating Agencies

Cooperating Agencies are those governmental agencies specifically requested by the lead agencies (FHWA and TDOT) to participate during the environmental evaluation process for the project because of their jurisdictional authority, special expertise, and/or statewide interest. Agencies invited to become Cooperating agencies for this project are identified with (C) in Table 4.1. Those that accepted are identified with a (**C**).

Participating Agencies are federal, state and local governmental agencies that "may have an interest in the project." Agencies invited by FHWA and TDOT to participate in the project are identified with a (P) in Table 4.1. Those that accepted are identified with a (**P**).

Table 4.1. List of Agencies Involved in Coordination for the James White Parkway DEIS.

AGENCY TYPE[(1)]	NAME	RESPONSE RECEIVED
Federal(C and P)	Tennessee Valley Authority-Environmental Policy and Planning	
Federal (**C** and P)	U.S. Army Corps of Engineers, Nashville District-Regulatory Branch (CELRN-OP-F)	X
Federal (**P**)	U.S. Environmental Protection Agency	X
Federal (P)	U.S. Department of Agriculture-NRCS	X
Federal (P)	Appalachian Regional Commission	
Federal (P)	Federal Emergency Management Agency	
Federal (P)	U.S. Department of Housing and Urban Development	
Federal (P)	U.S. Department of the Interior-Office of Environmental Policy and Compliance	
Federal (P)	U.S. Department of the Interior-USGS	X
Federal (P)	U.S. Department of the Interior-USGS Water Resources Division	
Federal (**P**)	U.S. Department of the Interior-USFWS	X
Federal (P)	U.S. Department of the Interior-Office of Surface Mining	
Federal (P)	U.S. Department of the Interior-Great Smoky Mountain National Park	X
Federal (P)	U.S. Department of Agriculture-NRCS Wetland Reserve Program Coordinator	
Federal (P)	Federal Energy Regulatory Commission	
Federal (P)	Federal Aviation Administration	
Federal (P)	U.S. Department of Energy	
Federal (P)	Federal Railroad Administration	
Federal	National Oceanic and Atmospheric Administration	

Table 4.1. List of Agencies Involved in Coordination for the James White Parkway DEIS.

AGENCY TYPE[(1)]	NAME	RESPONSE RECEIVED
State (**P**)	Tennessee Department of Environment and Conservation-	X (6)
State (P)	Tennessee Department of Economic & Community Development-NEPA Contact	X
State (P)	Tennessee Department of Economic & Community Development-Local Planning Assistance Office, East Tennessee Section	
State (**P**)	Tennessee Wildlife Resources Agency	X
State (P)	State Historic Preservation Officer-Tennessee Historical Commission	X
State (**P**)	Tennessee Department of Agriculture-Deputy Commissioner's Office	X
State (P)	Tennessee Department of Education	
State (P)	East Tennessee Development District	
State (P)	Tennessee Housing Development Agency	
Local (P)	Knoxville Regional Transportation Planning Organization	X
Local (**P**)	Metropolitan Planning Commission of Knoxville and Knox County	X
Local (P)	City of Knoxville-Office of the Mayor	
Local (P)	Knox County-Office of the Mayor	
Local (P)	East Tennessee Human Resources Agency	
Local (P)	Knox County Housing Authority	
Local (P)	Knoxville's Community Development Corp	
Local (P)	Knoxville Area Transit	
Local	State Representative-District 15 Knox County	
Local	State Representative-District 19 Knox Count	
Local	State Senator-District 6 Knox County	

Table 4.1. List of Agencies Involved in Coordination for the James White Parkway DEIS.

AGENCY TYPE[(1)]	NAME	RESPONSE RECEIVED
Local	State Senator-District 7 Knox County	
Private	NAACP-Knoxville Chapter	
Private	NAACP-Region V Area Director	
Private	Tennessee Trails Association	
Private	Tennessee Conservation League	
Private	Sierra Club	
Private	Chickasaw Group-Sierra Club	
Private	The Nature Conservancy	
Private	Tennessee Wildlife Federation	
Private	Tennessee Environmental Council	
Private	World Wildlife Fund	
Private	Tennessee Chapter of the Sierra Club.	
Tribe/Group Representative	The Cherokee Nation	
Tribe/Group Representative	Shawnee Tribe	
Tribe/Group Representative	Eastern Band of Cherokee Indians	
Tribe/Group Representative	United Keetoowah Band of Cherokee Indians	
Tribe/Group Representative	Eastern Shawnee Tribe of Oklahoma	
	TOTAL	**18**
C-Invited to become a Cooperating Agency; **C**-Accepted Invitation P- Invited to become a Participating Agency; **P** – Accepted Invitation		

4.1.1.1 Summary and Disposition of Comments Received during Initial Coordination

Eighteen replies have been received from federal, state, and local planning/resource management agencies, Native American Nations/ Tribes, and private groups. Table 4.2 contains a brief summary of the initial coordination replies. Copies of the original response letters are attached in Appendix C.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
Tennessee Department of Economic and Community Development	May 27, 2008	Michael Atchison, Director of Special Projects, declined the invitation to become a participating agency with TDOT and FHWA in the development of the EIS for the subject project.	The comments regarding the Tennessee Department of Economic and Community Development jurisdiction over the project and their decline to become a participating agency are noted.
National Park Service – Great Smoky Mountain National Park	June 9, 2008	Great Smoky Mountains National Park has no jurisdiction or authority with respect to the project; therefore, we are declining this invitation to be a participating agency.	The comments regarding the National Park Service – Great Smoky Mountain National Park jurisdiction over the project and their decline to become a participating agency are noted.
U.S. Environmental Protection Agency	May 29, 2008	In accordance with this request, we accept your invitation to become a participating agency for this project and will endeavor to participate in project activities in the manner suggested in your letter, subject to resource limitations. EPA does not have any comments on the Project Coordination Plan.	The comments regarding the U.S. Environmental Protection Agency participation and their acceptance to become a participating agency are noted.
Natural Resources Conservation Service	August 16, 2011	NRCS attached a NRCS-CPA-106 form (Farmland Conversion Impact Rating for Corridor Type Projects) to response letter. NRCS identified areas of prime and unique farmland and assigned a land evaluation point	TDOT concurs with the NRCS-CPA-106 form that there would be minimal effects to farmland under their jurisdiction due to the small amount of farmable land in the area.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
		rating (0-100 points) of 24, 28, and 29 for the proposed Green, Blue and Red Alternatives, respectively. The form also had zeros for the site assessment evaluation, which is completed by the lead agencies after NRCS provides the initial land evaluation ratings.	A site assessment evaluation has been completed since NRCS's letter and a point value assigned for each alternative. A point value of 81, 88, and 80 were assigned for the proposed Green, Blue, and Red Alternatives, respectively.
Tennessee Wildlife Resources Agency	May 1, 2008	We accept the invitation to participate in this process and encourage continued consultation with our agency in future phases of this project to further reduce impacts to fish and wildlife resources. Our current concerns are potential environmental impacts associated with potential stream and wetland impacts, and impacts to federally and state listed species that may occur do to the construction of this project.	TDOT acknowledges the Tennessee Wildlife Resources Agency's acceptance to become a participating agency for the project and appreciates their input for this project. TDOT will continue to work with the USFWS and TWRA to determine ways to avoid and/or minimize impacts to streams, wetlands, and federally and state listed species that may occur in the study area. The proposed alternatives being carried forward in the Draft EIS should avoid or minimize direct impacts to these natural resources to the extent possible.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
U.S. Fish and Wildlife Service Comment 1 of 2	May 30, 2008	We accept the invitation to be a participating agency in the development of this project. A survey documented the Meades Quarry Cave Berry Cave salamander (*Gyrinophilus gulolineatus*) population as the most robust population of this species currently known, making urgent the protection of this population from threats that would lead to its decline. It was recommended that a dye-tracing study be conducted by TDOT to delineate the surface recharge zone that is hydrologically connected to Meades Quarry Cave. The Service believes that the EIS could not be considered complete without consideration of such data during the alternative analysis. Without this data, we do not believe the potential threats to the cave, the Berry Cave salamander, and the state-listed Tennessee Cave salamander (*Gyrinophilus palleucus*) population that reside there can be adequately analyzed during the ongoing NEPA process. Absent such data and assurances from TDOT that any road construction projects in the vicinity of Meades Quarry Cave would include measures to prevent impacts to the cave system, we would likely find that the potential for such a project poses a considerable threat to the species.	TDOT acknowledges the USFWS's acceptance to become a participating agency for the project and appreciates their input for this project. TDOT will continue to work with the USFWS to determine ways to avoid and/or minimize impacts to the Meades Quarry Cave system, the Berry Cave salamander, and the Tennessee Cave salamander. A dye-trace study was conducted in 2009 and based on the results of the groundwater movement analyses the proposed alternatives being carried forward in the Draft EIS should avoid direct impacts to the known Berry Cave salamander population in Meades Quarry Cave. Should any new evidence of suitable habitat be identified within the proposed alignments, TDOT will contact the USFWS to discuss the findings.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
TDEC Air Pollution Control Division Comment 1 of 2	April 22, 2008	The Division directly serves 91 counties within the state and oversees and assists in the actions of Davidson, Hamilton, Knox, and Shelby counties, which have their own local air pollution control programs. For Environmental Impact concerns with Air Quality in Knox County, contact the local air program.	TDOT appreciates TDEC's response. TDOT completed a $PM_{2.5}$ Hot-Spot Determination for the project and concluded that the project was "not a project of air quality concern. TDOT submitted this determination to the Knoxville Interagency Consultation (IAC) Group on 09/14/2011. The Knoxville IAC Group members concurred with this determination on the following dates: FHWA (09/26/2011), EPA (09/19/2011), and TDEC (09/19/2011). Therefore, a qualitative $PM_{2.5}$ hot-spot analysis is not required for this project. It has been noted that Knox County Department of Air Quality Management has jurisdiction for the project area. They will be provided an opportunity to review the EIS.
TDEC Air Pollution Control Division Comment 2 of 2	April 28, 2008	Knox County is designated as nonattainment for ozone and fine particulates (PM 2.5) under the Federal National Ambient Air Quality Standards (NAAQS). As per the Transportation Conformity rules in 1200-3-34, the project must ultimately demonstrate conformity in the latest Long Range Transportation Plan for the Knoxville Area, as indicated in the EIS. As Knox County is designated nonattainment for PM2.5, a hot-	The project is included in the latest approved Long Range Transportation Plan, and meets the Transportation Conformity requirements. TDOT completed a $PM_{2.5}$ Hot-Spot Determination for the project and concluded that the project was "not a project of air quality concern. TDOT submitted this determination to the Knoxville Interagency Consultation (IAC) Group on 09/14/2011. The Knoxville IAC

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
		spot analysis might also be required. There may be Mobile Source Air Toxic (MSAT) concerns. This agency's other concerns are the control of fugitive dust and equipment exhaust emissions during the construction phase. Additionally, our concerns include that any structures requiring demolition are asbestos free, as per the requirements of Chapter 1200-3-11, Hazardous Materials. Before the burning of any wood waste, please refer to Chapter 1200-3-3; Open Burning Certification Process. Knox County Department of Air Quality Management has jurisdiction, we request the local program also have the opportunity to review the EIS.	Group members concurred with this determination on the following dates: FHWA (09/26/2011), EPA (09/19/2011), and TDEC (09/19/2011). Therefore, a qualitative $PM_{2.5}$ hot-spot analysis is not required for this project. This project's potential MSAT effects have been analyzed in accordance with FHWA's *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA*. This project has been determined to be one with low potential MSAT effects, and therefore, a qualitative assessment was conducted. The results of the MSAT analyses are reported in Section 3 of this EIS. The guidance provided by TDOT's Standard Specifications for Road and Bridge Construction will be used by contractors to provide construction techniques used to minimize fugitive dust and exhaust emissions during construction. Asbestos and other hazardous materials will be handled properly. Open burning will be conducted in accordance with current regulations. It has been noted that Knox County Department of Air Quality Management has jurisdiction for the project area. They will be provided an opportunity to review

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
			the EIS.
TDEC Division of Natural Areas	May 7, 2008	Provided is a list of rare species that have been observed within one mile and within four miles of the project study area. We ask that TDOT provide planning consideration for the protection of these species listed. Several caves and other karst features with noted habitat for rare species, including Cruze Cave have been observed near or within the project study area. We ask that impacts to these karst habitats and any other encountered in the study area be minimized. Should suitable habitat exist in or downstream of the study area, we ask that TDOT evaluate areas to be disturbed for these species. We also ask that the project be carefully coordinated with the Tennessee Wildlife Resources Agency and the USFWS. For stabilization of disturbed areas, the Division advocates the use of native trees, shrubs, and warm season grasses, where practicable. Care should be taken to prevent revegetation with plants listed by the Tennessee Exotic Pest Plant Council.	TDOT will continue to work with the USFWS and the TWRA to reduce the potential for impacts to sensitive species and habitats while providing a transportation facility that meets the purpose and need of this project. Should any new evidence of suitable habitat be identified within the proposed alignments, TDOT will contact the USFWS to discuss the findings. TDOT will implement measures for stabilization of disturbed areas and prevention of revegetation with plants listed by the Tennessee Exotic Pest Plant Council.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
TDEC Division of Solid/Hazardous Waste Management	May 20, 2008	Reviewed the plans for the proposed project and found no known solid waste issues in the area. There are some hazardous waste generator facilities located in South Knoxville area of Knoxville, TN, but they will not have any adverse impact on this project. If any hazardous waste is generated as a result of construction activities from this project, the Division of Solid Waste Management, Knoxville EAC can provide assistance for proper management. The Division of Solid Waste Management, Knoxville EAC can be reached at (865) 594-6035. There are no other concerns related to Tennessee Hazardous 'Waste Program.	TDOT appreciates the Division of Solid Waste Management's input for this project. Should any hazardous waste sites be located in the project area or any hazardous waste be generated during construction, we will notify the appropriate TDEC personnel. A Phase I Environmental Site Assessment Technical Report was developed for this project and is on file with the TDOT Environmental Division. The findings of this study are discussed in Section 3 of this EIS.
TDEC Ground Water Protection	May 1, 2008	The Division of Ground Water Protection anticipates that the proposed project may impact existing subsurface sewage disposal (SSD) systems. If it becomes apparent that Knox County staff assistance will be requested on this project, we ask that they be given adequate prior notice to allow for scheduling of the additional workload.	TDOT will seek assistance from TDEC Division of Ground Water, if it becomes apparent that assistance is required concerning existing SSD systems

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
TDEC Water Supply	May 6, 2008	There are no regulated dams within the proposed project area. Portions of the proposed work area are in a Source Water Protection Area. Before any construction the water system needs to be notified and special efforts need to be in place to insure no loss of contamination into the source water area. There are private water supplies within a mile of the proposed area. Be advised that not all water wells that are in existence are on this database and that there may be older wells and hand dug wells that have not been recorded with the Water Supply Division. All water wells that are encountered should be plugged and abandoned by a licensed well contractor. There are several registered Underground injection Control (UIC) points within the proposed study area. Be advised that not all old large capacity septic systems or stormwater injection points that are in existence are on this database. All UIC wells that are encountered should be plugged and abandoned according to approval from the UIC program. Any sinkhole that is encountered should be registered with the UIC program and shall be permitted before any disturbance to the area.	TDOT concurs that there are no regulated dams within the proposed project area. TDOT will work with TDEC Water Supply Division before construction begins to implement measures to ensure no loss of contamination into the source water area. TDOT will plug and abandon all water wells that are encountered. All UIC wells will be plugged and abandoned in accordance with approval from the UIC program. TDOT will register any sinkholes that are encountered with the UIC program before any disturbance occurs.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
Tennessee Department of Agriculture	April 28, 2008	The Department of Agriculture accepts the invitation to become a participating agency with TDOT and FHWA in the development of the Environmental Assessment for the proposed project.	TDOT acknowledges the Tennessee Department of Agriculture's acceptance to become a participating agency for the project.
Knoxville Regional Transportation Planning Organization	May 23, 2008	Knoxville Regional Transportation Planning Organization (TPO) made numerous technical edit suggestions for the Project Data Summary and the Coordination Plan for the South Knoxville Boulevard EIS. TPO suggested coordination with TDOT to develop traffic forecasts using the TPO's travel demand model.	TDOT will take into consideration technical edit suggestions made by the TPO. TDOT coordinated with the Knoxville Regional TPO to develop traffic forecasts using the travel demand model. Updated traffic data for the No-Build and build alternatives is included in Sections 1 and 2 of this EIS.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
U.S. Army Corps of Engineers, Nashville District	June 10, 2008	USACE accepts the invitation to become a cooperating and participating agency with TDOT and the FHWA in the development of the EIS for the subject project. As we receive additional information, we will comment on the adequacy of the proposed alternatives. The regulatory authorities and responsibilities of the Corps of Engineers are based mainly on two laws: Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Section 404 requires a Corps permit for any discharge of dredge or fill material into waters of the United States (WUS). Section 10 prohibits the obstruction or alteration of navigable waters of the United States (NWUS) without a Corps permit. Based on the information submitted, we anticipate that several Tennessee River tributaries (i.e., WUS) would be impacted by the alternative alignments. We do not believe that any NWUS would be directly affected by this proposal. Drainage structures (i.e., bridges and culverts) could be built, extended, or widened over these tributary streams. We do not have enough information at this time to estimate whether jurisdictional wetlands would be affected by any proposed alignments.	TDOT acknowledges USACE's acceptance to become a cooperating and participating agency for the project. Based on the initial field investigations for the build alternatives, TDOT concurs that at least some Tennessee River tributaries and jurisdictional WUS would potentially be impacted by this project. The Ecology Study Technical Report contains the details regarding each of the streams anticipated to be impacted by the project and is on file with TDOT Environmental Division. Section 3 of this EIS contains a summary of impacts to natural resources including streams. TDOT will conduct more detailed field investigations during the permitting phase of the project if a build alternative is selected as the preferred alternative. TDOT will continue to coordinate with the USACE throughout the remainder of the project planning and permit stages to disclose what the anticipated impacts to WUS would be and to develop methods to avoid, minimize, and/or mitigate those impacts. There are no Section 10 NWUS that would be regulated in the project area.

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
		Our specific permitting requirements for stream/ wetland road crossings would depend on the specific installation methods and associated impacts. Our permit review includes application of the Section 404 (b) (1) Guidelines (40 CFR 230). The Guidelines require that no discharge of dredge or fill material may be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as alternative does not have other significant adverse environmental consequences.	

Table 4.2. Summary of Initial Coordination Agency Comments and Responses for James White Parkway DEIS.

AGENCY	DATE	COMMENT	RESPONSE
U.S. Geological Survey	April 24, 2008	It is the policy of the USGS to decline requests to be an official participating agency in the NEPA activities of another agency except where the proposed action may directly affect out facilities or the conduct of our work. However, the USGS as part of their mission will continue to provide science support to other agencies when their data and science expertise have relevance to the proposed actions undergoing NEPA review.	TDOT acknowledges the U.S. Geological Survey's decline to become a participating agency for the project.
Knoxville-Knox County Metropolitan Planning Commission	April 29, 2008	The Knoxville Knox County Metropolitan Planning Commission accepts the invitation to become a participating agency with TDOT and the FHWA in the development of the EIS for the subject project.	TDOT acknowledges Knoxville-Knox County Metropolitan Planning Commission's acceptance to become a participating agency for the project.

4.1.2 Tennessee Environmental Streamlining Agreement (TESA) Reviews

This project has been developed following the procedures set forth in the Tennessee Environmental Streamlining Agreement (TESA). The purpose of the TESA is to establish a coordinated planning and project development process for transportation projects in Tennessee in order to ensure agency participation/involvement early and throughout the project development process.

In addition to the Federal Highway Administration (FHWA) and Tennessee Department of Transportation (TDOT), the TESA has been signed by the U.S. Army Corps of Engineers (USACE), Environmental Protection Agency-Region 4 (EPA), U.S. Fish and Wildlife Service (USFWS), Tennessee Valley Authority (TVA), Tennessee Department of Environment and Conservation (TDEC), and Tennessee Wildlife Resources Agency (TWRA). The Tennessee State Historic Preservation Office (SHPO) has conditionally signed the TESA. Signatory agencies with interest in an individual project provide comments and participate in the TESA process for that project.

The process outlined in the TESA applies to all transportation construction projects in the State of Tennessee, regardless of project funding source, administered by TDOT requiring an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) under NEPA, or all major transportation construction projects requiring a Tennessee Environmental Evaluation Report (TEER).

This streamlined environmental process is intended to achieve the timely and efficient identification, evaluation, and resolution of environmental and regulatory issues, by:

- Improving cooperation, consultation, and efficiency of the various agencies;
- Allowing documentation developed by FHWA and TDOT, to serve as a substantial part of the documentation required by other permitting and funding agencies;
- Streamlining the NEPA process;
- Coordinating the process for compliance with NEPA requirements and compliance with Section 404 of the Clean Water Act, Section 401/State water quality certification, and the Aquatic Resource Alteration Permit (ARAP) requirements;
- Linking the information generated from the transportation planning process to the NEPA process;
- Implementing the environmental stewardship and environmental review process improvements established by SAFETEA-LU;
- Accomplishing the project development coordination functions and public involvement functions called for under Section 106 of the National Historic Preservation Act; and
- Facilitating more realistic and predictable transportation projects, schedules and budgets.

The TESA establishes “one decision-making process” to identify and address agency issues at four key points, termed “concurrence points”, during the planning and NEPA process for transportation projects.

- Purpose and Need and Study Area
- Project Alternatives to be Evaluated in the Environmental Document

- Preliminary Draft Environmental Document
- Preferred Alternative and Preliminary Mitigation

The intent of the concurrence points in the process is to achieve general agreement between agencies before a project moves forward and to preclude the routine revisiting of decisions that have been agreed to earlier in the process.

As with all projects that go through the TESA process, the streamlined environmental review process for this project was based on joint interagency decision-making in regular meetings, with the ultimate goal of gaining concurrence from participating agencies at each of the above concurrence points that the information presented was adequate and that the project could advance to the next stage of project development. All participating TESA signatory agencies were allowed the opportunity to explain their jurisdiction and interests and seek to understand the interests of others. The decision on whether or not to concur at a certain point was based on a full understanding of the issues and relative tradeoffs associated with the final decision. Ultimately, each individual participating agency made a decision of whether or not to concur at each concurrence point. In addition to the TESA signatory agencies, the Knoxville Regional Transportation Planning Organization (TPO) was given an opportunity to provide input during the TESA process for this project due to their ongoing participation in the project.

4.1.2.1 Concurrence Point 1 - Purpose and Need and Study Area

The Concurrence Point 1 (CP-1) portion of the James White Parkway (SR-71) project included development of the project purpose and need. The CP-1 document was submitted to the TESA agencies on July 8, 2008 with final concurrence in August 2008. Six agencies provided concurrence with the purpose and need and provided comments they wanted addressed in future concurrence points. In a letter dated September 22, 2008, TDOT provided an explanation of how the comments would be addressed in subsequent concurrence point packages and in the EIS.

4.1.2.2 Concurrence Point 2 - Alternatives

The Concurrence Point 2 (CP-2) package containing the potential project alternatives that were anticipated to be evaluated in the EIS was submitted to the TESA agencies on September 23, 2010 with final concurrence in November 2010. Six agencies provided concurrence with the alternatives and five of those agencies provided comments they wanted addressed in future concurrence points. In a letter dated December 6, 2010, TDOT provided an explanation of how the comments would be addressed in subsequent phases of the project.

4.1.2.3 Concurrence Point 3 – Preliminary Draft Environmental Document

The Concurrence Point 3 (CP-2) package containing the Preliminary Draft EIS was submitted to the TESA agencies on November 4, 2011 with final concurrence on December 23, 2011. Six agencies provided concurrence with the Preliminary Draft EIS and four of those agencies provided comments they wanted addressed in future concurrence points. In the letter dated February 10, 2012, TDOT provided an explanation of how the comments would be addressed in subsequent phases of the project, including the remainder of the environmental phase.

4.2 Public Involvement Activities

4.2.1 Public Information and Scoping Meetings

Briefings with local government officials and/or identified stakeholders have been used as a method to provide project updates at specific milestones and facilitate the flow of information between the officials, stakeholders, and TDOT. Meetings with officials and stakeholders have occurred throughout the development of the current project, including meetings in March 2007, February 2009, and April 2009. Past public involvement meetings were held as part of the previous NEPA studies, including the 1977 EIS and 2001 EA. The Task Force also involved the public in related studies conducted for this project. The past public meetings focused on providing project updates, sharing available information, and solving large issues of concern, such as identifying ways to minimize impacts to local parks and the Meades Quarry Cave system.

4.2.1.1 Summary/Disposition of Comments Raised during Public Involvement Activities

2007 Public Meeting Summary

TDOT held a Public Meeting for the proposed project on March 27, 2007 from 5 p.m. to 7 p.m. at the South Doyle Middle School in Knoxville, Tennessee. A handout containing the public meeting agenda, project history, and summary information, along with a comment sheet, was provided to each person as they signed into the meeting. After providing attendees time to review the handouts, a slide presentation was given that explained the history of the project, the NEPA process, the findings of the NEPA study, and the next steps in the project development process. Following the presentation, attendees were invited to participate in a formal question-and-answer session, followed by an opportunity to view the project displays/maps, and talk one-on-one with available TDOT representatives.

The meeting attendees were given the option of returning their completed comment sheets before leaving the facility by placing them in a drop box or mailing the comment card and/or letters to TDOT by April 17, 2007. A court reporter was also present to record the discussion at the public meeting and to take verbal comments from individuals.

The official record had a total of 19 comments provided by 15 individuals. There were five comments that were received through statements made to the court reporter. Additionally, 11 comment cards and four letters were submitted to TDOT within the 21-day comment period.

Of the approximately14 people who expressed a preference, approximately 7 were in favor of the project. Approximately seven people stated that they were opposed to the project as proposed by TDOT. Ten of the 14 respondents believed the existing Chapman Highway could be improved through addition of or better timing of traffic signals, redesign of key intersections, addition of turn lanes, concrete barriers, and other traffic management efforts in lieu of constructing a new James White Parkway extension.

Summary of Comment Card Responses from the 2007 Public Meeting

By the close of the comment period (received or postmarked by April 17, 2007), TDOT had received 11 completed comment cards. Participants were asked to comment on the transportation needs of the project area. Table 4.3 contains a summary of the responses received.

Table 4.3. Public Comment Summary Regarding Transportation Needs in the Area (2007).

Comment Card Question: ***What do you see as the transportation needs of the area?***	**Number of Respondents**
Less Congested Roadways	6
Safer Roadways	8
More Direct Routes to Destinations (work, school, shopping, recreation)	3
Improved Through Traffic Connections	5
Other	6

Participants were also asked to select which type of highway should be constructed if South Knoxville Boulevard is extended. In total, 10 of the comment cards received had responses to this question. Table 4.4 contains a summary of the responses received.

Table 4.4. Public Comment Summary Regarding Type of Highway (2007).

Comment Card Question: ***If South Knoxville Boulevard is extended, what type of highway should be constructed?***	**Number of Respondents**
Full Access-controlled Freeway (like an interstate highway)	6
Full Access-controlled Parkway (landscaped median)	3
Partial Access-controlled Parkway (access permitted only at intersecting public roads)	0
Non-access-controlled Highway (access permitted at driveways as well as at public roads)	0
Other	4

Participants were also asked what issues and concerns they had about the project. In total, 10 of the comment cards received had responses to this question. Table 4.5 contains a summary of the responses received.

Table 4.5. Public Comment Summary Regarding Issues and Concerns (2007).

Comment Card Question: ***What issues and concerns do you have about the project?***	**Number of Respondents**
Impacts to the Environment (streams, wetlands, soils, species)	6
Impacts to Existing Development (homes, businesses)	3
Air and Noise Impacts	5
Impacts to Historic and/or Archaeological Resources	1
Other	8

Summary of Comments from the 2007 Public Meeting

The most common comments, issues, or concerns discussed at the public meeting or mentioned in oral comments provided to the court reporter, on comment cards, and/or in the letters received by TDOT are outlined and addressed in Table 4.6.

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments related to the opposition of the project as proposed. (*7 comments*)	TDOT has considered all of the comments received in support of the No-Build Alternative and the other alternatives considered. Although the No-Build Alternative would have no costs and the least amount of environmental impacts associated with it, based on previous studies and information provided in Section 1 of the DEIS, it would not meet the purpose and need for the project. The need for the project consisted of several reasons including future traffic projections, congestion/capacity issues, inadequate design of the existing road based on modern design standards, safety issues, and input from local officials and residents. As traffic volumes continue to increase along Chapman Highway and the population continues to increase in the region, the already poor LOS will continue to decline. Each of the build alternatives studied would meet the purpose and need of the project and would not result in significant impacts based on completed technical studies.
Comments related to the belief that existing route(s) could be improved. (*10 comments*)	The James White Parkway project is considered to have independent utility and is considered a necessary component of the transportation network based on existing regional plans, including those developed by local and regional planning organizations. Improvements to other roadways in the region will be identified and developed on an as need basis. Concerns related to specific roadways/interchanges in the area should be directed to the appropriate local officials or organizations who may in turn file requests that studies be conducted by TDOT to determine the need for such improvements. Additional improvements to local roadways/interchanges will likely continue to occur as additional residential, commercial, and/or industrial development occurs resulting in larger populations and increased traffic volumes. Based on detailed studies conducted over a several year period, the James White Parkway-Chapman Highway Corridor Study Task Force provided their recommendations in January 2005 requesting that extension of James White Parkway be studied in an EIS. The majority of Task Force members believed that there was both purpose and need for extension of the James White Parkway south from Moody Avenue to Governor John Sevier Highway. They also stated that safety of the transportation system could be enhanced by creating a divided highway with full access control as an alternative to Chapman Highway. They also concluded that Chapman Highway, would need substantial improvements in order to meet projected travel demand if no alternative route is constructed, and will need safety and operational improvements regardless of whether or not James White Parkway is extended. They stated that additional highway capacity was needed due to changing land use along the corridor, including increased residential development and a

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
	regional commercial area at the intersection of John Sevier Highway and Chapman Highway. A majority of the Task Force and respondents at public meetings held as part of their studies wanted the project to move forward and favored the extension of the parkway (JWP Task Force 2005). The impacts associated with widening existing Chapman Highway would be severe, especially to local businesses and local residents and would not provide an adequate level of service to area motorists. Since Chapman Highway is a primary arterial or main route to and from intended regional destinations improvement of other roadways would not provide long-term improvements to the Chapman Highway level of service. Since improvements to Chapman Highway will be required regardless of the extension of James White Parkway, a Chapman Highway Corridor Improvement Study was prepared in November 2007 (TDOT 2007). The limits of the study were from the Henley Street Bridge to the intersection of Chapman Highway with SR-338 / SR-411in Sevier County. The purpose of the study was to develop “quick-fix” solutions to traffic issues for the interim period prior to determining if James White Parkway would be extended or not. The solutions proposed in that report were primarily corridor access management improvements, which includes but is not limited to, driveway consolidations; the addition of turn lanes at critical intersections; the reconfiguration of existing intersections; the addition of a center turn lane; and improving sight distance at critical intersections. These short-term solutions to the traffic issues considered in the study were not intended to be comprehensive improvements, but were relatively low-cost improvements to be made primarily within existing ROW. Based on the findings of the study, if James White Parkway was extended in addition to improvements to Chapman Highway, future traffic volumes will be reduced on the portion of Chapman Highway between the Henley Street Bridge and the intersection of James White Parkway to the south. The study also concluded that following completion of James White Parkway, greater investment could be made in the Chapman Highway corridor to provide better, more feasible long-term solutions for that roadway.

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments concerning adverse impacts to residents living in the area. (*2 comments*)	This project will not result in substantial impacts in terms of neighborhood cohesion or quality of life. Although some residential displacements will occur, it is expected that overall neighborhood cohesion can be maintained and displaced households will be able to relocate in the same general vicinity in most cases. Although there will be inherent adverse impacts associated with this project that could potentially reduce the quality of life for some individuals, there will also be beneficial impacts, some of which will have the potential to benefit many residents and local communities in terms of improved quality of life.
Comments concerning impacts to existing businesses along Chapman Highway. (*2 comments*)	TDOT began studying the James White Parkway project at the request of the Task Force and local officials concerned about the traffic and safety issues along the existing Chapman Highway (JWP Task Force January 2005). The City of Knoxville and other project stakeholders held workshops for area businesses/business owners to discuss options for resolving the traffic and safety issues with the least amount of impacts to the communities involved. It was determined that bypassing the core business district would involve the fewest overall impacts to existing businesses. The existing Chapman Highway will continue to be utilized as the primary access road to the businesses in the area. It is expected that removing much of the thru traffic from the facility will improve access to the businesses making it a safer area to shop. Once the James White Parkway is constructed, additional improvements would likely be made to the existing Chapman Highway as part of separate improvements administered by the local communities. Those improvements may include addition of traffic signals, realignment of key intersections, and various other options that will enhance the roadway.

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments regarding concerns that the project could negatively impact property values, divide or split properties, or lose personal property. (*3 comments*)	Property values could decline for some individual properties due to the project moving traffic closer to homes, reducing the size of a parcel, splitting or dividing a parcel, and/or limiting the access or usability of remaining portions of a parcel. For other affected properties, values will not actually decline, but may not increase as quickly as nearby properties that are less impacted by the project. There is also a potential that property values could increase if tracts are rezoned from residential to commercial, especially if the area expands and additional services are needed and warranted. Similar projects that have resulted in overall improvements to the transportation system and provided improved or safer access to adjacent areas tend to result in beneficial impacts to property values in general. Improved transportation facilities providing safer, more efficient travel to and from an area can promote additional business and residential development resulting in increased property values for nearby properties. Property values are always subject to market fluctuations and other outside influences. TDOT does not control these fluctuations. As the proposed project is currently designed, the minimum ROW for roadway improvements will be acquired. State law prohibits buying more property than that which is required for highway purposes. In regard to tracts where only a portion of the property is being acquired, the ROW appraisers will take this fact into consideration when assessing any damages. In order to minimize the unavoidable effects of ROW acquisition and the displacement of people and/or businesses, TDOT will carry out a ROW and Relocation Program in accordance with Tennessee's Uniform Relocation Assistance Act of 1972, and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (PL91-646), as amended. Owners of property to be acquired will be offered and paid fair market value, based on comparable sales and land use values in the area, for their property rights. Each person to be relocated will be contacted to determine individual needs and desires and to provide replacement property. Relocation services and payments are provided without regard to race, color, religion, or national origin.
Comments regarding concerns about the potential impacts to communities in the area. (*4 comments*)	TDOT will continue to consider minor changes in the final design phase of the project to ensure the roadway and/or associated interchanges coincide with local plans, as long as the integrity of the roadway's design can be maintained to allow it to serve its stated purpose. Overall, this project is expected to benefit the local communities due to improvements in safety and traffic conditions, which is why the local officials from those areas requested that TDOT consider constructing the project. However, some impacts will be unavoidable due to the scope of the project.

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments regarding concerns about potential new development along the proposed corridor and surrounding areas. (*5 comments*)	According to the 2002 South Knox County Sector Plan, much of the proposed study area is included in the Urban Growth and Planned Growth areas of the County. Therefore, it is anticipated that the area will continue to grow with residential, commercial, and possibly some industrial developments. However, much of the land in the project vicinity is undeveloped due to the steep terrain and karst topography. The steeper areas are shown as Slope Protection areas where development would be more restricted due to terrain and potential erosion issues. Thus, these areas would likely remain undeveloped even if James White Parkway is extended and improved access is provided. It is anticipated that construction of the James White Parkway may promote or accelerate the timeframe in which some of the growth and development occurs within the Planned Growth areas. Improved traffic flow and access to southern Knox County and adjacent areas provided by the project may lead to increased residential, commercial, and/or industrial development. Local land use planning and zoning restrictions can be implemented to help control the location, amount, and types of developments that occur. Potential developments and land use changes expected to be promoted by the project are considered in more detail in Section 3 of this EIS.
Comments related to concerns about noise related to the project. (*4 comments*)	TDOT has conducted noise studies for this EIS in accordance with the TDOT Policy on Highway Traffic Noise Abatement (July 13, 2011) http://www.tdot.state.tn.us/environment/airnoise/pdf/TDOTNoisePolicy520-01.pdf. Noise impacts will occur under each build alternative. Noise barriers will be considered in the area near Moody Avenue. Once the final design plans for a preferred alternative have been developed, additional noise studies will be completed to determine exactly where noise impacts will occur and whether noise barriers are feasible in accordance with TDOT's noise policy. TDOT will continue to work with the affected residents to ensure noise impacts are handled appropriately. Substantial noise impacts are defined in greater detail in Section 3.10 and specifically in Table 3.18 above. Most noise impacts identified were either minor (<3 dB) or moderate (4-8 dB).

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments related to concerns about air quality related to the project. (*3 comments*)	The project is included in the latest approved Long Range Transportation Plan, and meets the Transportation Conformity requirements. TDOT completed a $PM_{2.5}$ Hot-Spot Determination for the project and concluded that the project was "not a project of air quality concern." TDOT submitted this determination to the Knoxville Interagency Consultation (IAC) Group on 09/14/2011. The Knoxville IAC Group members concurred with this determination on the following dates: FHWA (09/26/2011), EPA (09/19/2011), and TDEC (09/19/2011). Therefore, a qualitative $PM_{2.5}$ hot-spot analysis is not required for this project. This project's potential Mobile Source Air Toxic (MSAT) effects have been analyzed in accordance with FHWA's *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA*. This project has been determined to be one with low potential MSAT effects, and therefore, a qualitative assessment was conducted. The results of the MSAT analyses are reported in Section 3 of this EIS. The guidance provided by TDOT's Standard Specifications for Road and Bridge Construction will be used by contractors to provide construction techniques used to minimize fugitive dust and exhaust emissions during construction. Asbestos and other hazardous materials will be handled properly. Open burning will be conducted in accordance with current regulations.
Comments regarding concerns about the cost of the project. (*6 comments*)	The cost of this project will be substantial compared to the No-Build Alternative. However, extending James White Parkway has been determined to provide the best option to adequately address the issues related to the purpose and need of the project. Other projects aimed at improving traffic capacity of Chapman Highway and other existing roads to handle the anticipated traffic volumes would also be costly, have their own set of environmental impacts, and make it more difficult to realize the local visions of a pedestrian-friendly Chapman Highway. Preliminary estimates indicate that relocating businesses and utilities along Chapman Highway, along with improving other nearby roads, would not be substantially cheaper than constructing James White Parkway on new alignment. It would be expected that not implementing the James White Parkway project would result in adverse impacts to the local and regional economies. As traffic volumes continue to increase along Chapman Highway, the already poor LOS will continue to decline, if no major changes are made. The lack of optimum transportation infrastructure could curtail business potential for increased production, thereby adversely affecting employment opportunities and associated personal income in the region.

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments related to concerns about impacts to the environment, including forests, cave systems, karst topography/sinkholes, etc. (*8 comments*)	TDOT will continue to work with the USFWS to determine ways to avoid and/or minimize impacts to the Meades Quarry Cave system and the Berry Cave salamander. The TDOT Hydrologic and Dye Trace Study, conducted in 2009, suggested that flows from sinkholes within the current proposed ROW of the build alternative alignments would <u>not</u> enter the Meades Quarry Cave system. These impacts can be lessened by appropriate and judicious mitigation during the design and construction phase of the project. Minimization of the impact of construction on the sinkhole and cave environments include the following measures to be considered and/or employed during the roadway design phase: · Design measures such as minimal cut and fill construction and minimal alterations in the drainage of an area (both surface and subsurface). · Proactive measures such as: o surface drainage filtration systems for existing sinkholes, including grass-lined stormwater channels in place of concrete ditches; o impermeable lining for ditch lines in non-sinkhole areas (to prevent new sinkholes from forming); o the use of graded rock embankments (for stability and groundwater impacts); o where feasible, directing surface highway runoff directly through stormwater pipes and/or ditches into nearby surface streams that remain above the surface until entering larger waterbodies downstream (to reduce roadway contaminants entering groundwater and/or sinkhole/cave systems); and o the use of structural bridges over sensitive sinkholes to maintain more natural drainage/biological integrity of those systems. TDOT will continue to work with the USFWS and TWRA to determine ways to avoid and/or minimize impacts to sensitive species and habitats, natural areas, and karst topography that may occur in the study area. The proposed alternatives being carried forward in the EIS would minimize impacts to these natural resources while providing a transportation facility that meets the purpose and need of this project.

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
Comments related to concerns about impacts to wildlife (fauna and flora). (*6 comments*)	TDOT will continue to work with the USFWS and TWRA to reduce the potential for impacts to sensitive species and habitats while providing a transportation facility that meets the purpose and need of this project. Should any new evidence of suitable habitat be identified within the proposed alignments, TDOT will contact the USFWS to discuss the findings. All reasonable precautions will be taken to minimize short-term and long-term impacts to plants and wildlife and their habitat. Several mitigation measures that will avoid or minimize short-term and long-term adverse impacts to species and their environment will include: · Streamside and in-stream construction work will occur during dry periods; · Removal of vegetation near the streams will occur only as necessary to accomplish the proposed action. Where removal of vegetation is necessary, bank stabilization measures will be used. Streambank restoration measures will include seeding with native species and the placing of rip-rap or other bank stabilization techniques, as outlined in TDEC's Riparian Restoration and Streamside Erosion Control Handbook (TDEC 1998a); and · Proper sediment control measures, such as silt fences, will be used as outlined in the Tennessee Erosion and Sediment Control Handbook (TDEC 2001b) and Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992). TDOT will continue to work with the USFWS to determine ways to avoid and/or minimize impacts to the Meades Quarry Cave system and the Berry Cave salamander. A dye-trace study was conducted in 2009 and based on the results of the groundwater movements the proposed alternatives being carried forward in the Draft EIS should avoid direct impacts to the known Berry Cave salamander population in Meades Quarry Cave. The following measures will be used to the extent possible to help prevent the introduction and spread of invasive species: · Native grasses, shrubs, and trees will be planted for beautification purposes or to prevent erosion, wherever needed. Native species will be consistent with local community types; · Whenever possible, all disturbed soil will be seeded with temporary annual species to reduce the ability of exotics to become established. This will also act to reduce erosion potential during stormwater events; and · Consideration will be given to the types and quality of plants and

Table 4.6. Summary of Common Issues/Concerns from Public Meeting Comments (2007).

COMMENT	DISPOSITION
	soils at borrow sites. Soil from borrow sites used as project fill could contain viable plant parts or seeds and could increase the spread of invasive species to new locations. TDOT will continue to work with the USFWS and TWRA to determine ways to avoid and/or minimize impacts to streams, wetlands, and federally and/or state listed species that may occur in the study area. The proposed alternatives being carried forward in the EIS would minimize impacts to these natural resources.
Comments related to concerns about impacts to watersheds, water runoff, water flow, etc. (*4 comments*)	TDOT will attempt to avoid or minimize stream and wetland impacts to the extent possible during the design phase of the project. However, there will be at least some unavoidable stream impacts. TDOT will work closely with permitting agencies during the design and permitting process to determine the types of bridges and culverts that will be necessary for crossing any perennial or intermittent streams. The project's drainage system will be designed to adequately handle and convey any increased runoff from the additional pavement and structures. Project development will be consistent with Executive Order 11988 concerning floodplains. If in-stream disturbance is necessary, the stream composition and bottom elevations will be altered to the least extent possible. Tree removal will be minimized to maintain stream characteristics. Work within the stream impact area will be performed in the dry season (summer months) to the greatest extent possible. Unavoidable stream impacts will be mitigated as required by applicable laws and regulations. In an effort to minimize sedimentation impacts, erosion and sediment control plans will be included in the project construction plans. TDOT will also implement its Standard Specifications for Road and Bridge Construction, which includes erosion and sediment control standards for use during construction. A Stormwater Pollution Prevention Plan will be prepared for the project. Stream channels requiring relocation (channelization) will be replaced on site to the extent possible, using techniques that will replace existing stream characteristics, such as length, width, gradient, and tree canopy. Waterbody impacts that cannot be mitigated on-site, such as impacts to springs that require rock fill, will either be mitigated off-site by improving a degraded system or by making a comparable payment to an in-lieu-fee program. An in-lieu-fee program will perform off-site mitigation under the direction of state and federal regulatory and resource agencies. The State of Tennessee sets water quality criteria for waters of the state. These standards must be met during construction of the proposed project. Therefore, the project is not expected to adversely affect water quality in the area. In addition, TDOT will coordinate with TDEC's Division of Ground Water Protection in order to protect the quality of groundwater in the area.

2009 Public Meeting Summary

TDOT held a Public Meeting for the proposed project on February 17, 2009 from 5 p.m. to 7 p.m. at the South Doyle Middle School in Knoxville, Tennessee. Approximately 115 people attended the meeting based on the meeting sign-in sheets. Public officials present at the meeting included two County Commissioners, a Knoxville City Councilman, and a Representative from a Senator's office.

A handout containing the public meeting agenda, project history, and summary information, along with a comment sheet, was provided to each person as they signed into the meeting. After providing attendees time to review the handouts, a slide presentation was given that explained the history of the project, the NEPA process, the findings of the environmental studies conducted to date, and the next steps in the project development process. Following the presentation, attendees were invited to participate in a formal question and answer session, followed by an opportunity to view the project displays/maps and talk one-on-one with available TDOT representatives.

The meeting attendees were given the option of returning their completed comment sheets before leaving the facility by placing them in a drop box or mailing the comment card and/or letters to TDOT by March 10, 2009. A court reporter was also present to record the discussion at the public meeting and to take verbal comments from individuals.

The official record had a total of 82 comments provided by 67 individuals. There were 12 comments that were received through statements during the question-and-answer period and two comments made to the court reporter. Additionally, 52 individuals submitted comment cards and 16 individuals submitted letters to TDOT within the 21-day comment period.

Of the approximately 50 people who expressed a preference, 20 people were in favor of the project. A total of approximately 30 people stated that they were opposed to the project as proposed by TDOT. Fourteen of those respondents believed the existing Chapman Highway could be improved through addition of or better timing of traffic signals, redesign of key intersections, addition of turn lanes, concrete barriers, and other traffic management efforts in lieu of constructing a new James White Parkway extension.

Summary of Comment Card Responses from the 2009 Public Meeting

By the close of the comment period (received or postmarked by March 10, 2009), TDOT had received 47 completed comment cards from 52 individuals. Participants were asked to comment on the transportation needs of the project area. Table 4.7 contains a summary of the responses received.

Table 4.7. Public Comment Summary Regarding Transportation Needs in the Area (2009).

Comment Card Question: ***What do you see as the transportation needs of the area?***	**Number of Respondents**
Less Congested Roadways	20
Safer Roadways	30
More Direct Routes to Destinations (work, school, shopping, recreation)	10
Improved Through Traffic Connections	13

Participants were also asked to select which type of highway should be constructed if James White Parkway (South Knoxville Boulevard) is extended. Table 4.8 contains a summary of the responses received.

Table 4.8. Public Comment Summary Regarding Type of Highway (2009).

Comment Card Question: ***If South Knoxville Boulevard is extended, what type of highway should be constructed?***	**Number of Respondents**
Full Access-controlled Freeway (like an interstate highway)	9
Full Access-controlled Parkway (landscaped median)	12
Partial Access-controlled Parkway (access permitted only at intersecting public roads)	11
Non-access-controlled Highway (access permitted at driveways as well as at public roads)	2

Participants were also asked to select where they would prefer the southern termini with John Sevier Highway to be located, if James White Parkway (South Knoxville Boulevard) is extended. Table 4.9 contains a summary of the responses received.

Table 4.9. Public Comment Summary Regarding Issues and Concerns (2009).

Comment Card Question: ***If South Knoxville Blvd is extended to John Sevier Highway, where would you prefer the southern termini with John Sevier Highway to be located?***	**Number of Respondents**
End at the current intersection of John Sevier Highway and Chapman Highway	7
End near the John Sevier Highway and Chapman Highway but not at the same intersection	5
End approx. 1/2 mi northeast of the John Sevier Highway and Chapman Highway	6
End approx. 1 mi northeast of the John Sevier Highway and Chapman Highway	11

Summary of Comments from the 2009 Public Meeting

The most common issues or concerns discussed at the public meeting or mentioned in oral comments provided to the court reporter, on comment cards, and/or in the letters received by TDOT are outlined and addressed in Table 4.10.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Concerned about cost of project, especially during current economic downturn (*20 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 275.
Concerned about existing and potential future congestion at the intersection of Governor John Sevier Highway and Chapman Highway (*19 comments*)	This project is anticipated to improve the existing congestion issues at the intersection of Governor John Sevier Highway and Chapman Highway. The existing outdated interchange configuration will be replaced with a new interchange. As discussed in Section 2 of this EIS, for each build alternative, a planning-level review was conducted to consider potential configurations of the interchange with Governor John Sevier Highway at the southern termini of the project. This includes improvements that would be made to the existing Governor John Sevier Highway/Chapman Highway Interchange to accommodate the James White Parkway traffic traveling to and from Chapman Highway. The resulting interchange recommendations for each alternative should provide exceptional functionality and be more than capable of accommodating the forecasted traffic demand. As reported in Section 2, the existing Chapman Highway north of Governor John Sevier Highway will see a meaningful reduction in traffic and will have improved LOS with the extension of James White Parkway.
Concerned about safety on the existing Chapman Highway (*4 comments*)	The safety issues are primarily due to difficult left turns into and out of the numerous side streets and businesses lining the existing route. One of the primary goals of this project is to improve the safety along the existing Chapman Highway by providing an alternative route for thru traffic and other traffic and allowing the existing roadway to provide safer access to the existing businesses in the area.
Concerned about traffic on the existing Chapman Highway (*2 comments*)	One of the primary goals of this project is to improve overall traffic conditions on Chapman Highway by providing an alternative route for thru traffic and other non-local traffic.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Believe James White Parkway extension will improve Regional Economic Vitality/Growth (*2 comments*)	This project is expected to improve transportation efficiency and safety of Chapman Highway. Improved accessibility and travel efficiency would enhance the potential for new highway-oriented and community-based development. Business growth can occur in the manufacturing, service, wholesale, and retail sectors of the economy through the expansion of existing businesses; attraction of new businesses to the area; reduction in the cost of moving goods and raw materials; and the servicing of inter-regional traffic flows, which can encourage development of travel-related businesses. The impacts on business are reflected in increases in sales, income, employment, and other economic indicators.
Comments related to concerns about residential and business relocations and how the project would affect personal property values (17 comments)	Property values could decline for some individual properties due to the project moving traffic closer to homes, reducing the size of a parcel, splitting or dividing a parcel, and/or limiting the access or usability of remaining portions of a parcel. For other affected properties, values will not actually decline, but may not increase as quickly as nearby properties that are less impacted by the project. There is also a potential that property values could increase if tracts are rezoned from residential to commercial, especially if the area expands and additional services are needed and warranted. Similar projects that have resulted in overall improvements to the transportation system and provided improved or safer access to adjacent areas tend to result in beneficial impacts to property values in general. Improved transportation facilities providing safer, more efficient travel to and from an area can promote additional business and residential development resulting in increased property values for nearby properties. Property values are always subject to market fluctuations and other outside influences. TDOT does not control these fluctuations. As the proposed project is currently designed, ROW will be acquired for roadway improvements. State law prohibits buying more property than that which is required for highway purposes. TDOT prepared a Conceptual Stage Relocation Plan to determine the number of potential displacements that will occur with the proposed alignment. Homes and businesses that needed to be purchased based on preliminary project designs were identified within that study. TDOT will pay a fair market value for all properties impacted by resident displacement/relocation and right-of-way requirements and provide sufficient notice of intent to acquire the property to minimize any harm. The relocation of displaced households, businesses, and any other affected party will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972 and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646). Comparable replacement housing will be provided to all residential relocatees under the provisions of the above laws. The TDOT Right-of-Way Division Relocation and Property Management Office is responsible for the prompt and equitable relocation and reestablishment of persons and businesses that are displaced as a result of

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
	the James White Parkway project. A relocation agent from the State will maintain continuous contact with those being relocated. Relocation payments will be explained in accordance with eligibility. Housing needs will be determined as well as needs for assistance. Persons being relocated cannot be required to move unless comparable property is made available to them. Ample notice and time for relocation will be given to the occupant. More information on the relocation process is located at the following TDOT website links or by calling TDOT at (615) 741-3196. http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/row/Residential_Brochure_Final_1-1-11.PDF http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/row/NonResidential_Brochure_Final_1-1-11.PDF
Concerned about impacts to/displacement of low-income population (*1 comment*)	There are no anticipated impacts to minority or low-income populations under this build alternative. There is no concentration of minority populations within, adjacent, or near the proposed James White Parkway ROW. The census block groups traversed by the Green Alternative all have minority population percentages that are smaller than the respective county-wide relative share of minority populations. As for low-income populations, Block Group 1 within Census Tract 23 has a higher percentage of low-income populations than Knox County. However, this block group is located adjacent to the ROW near the intersection of the existing James White Parkway and Moody Avenue. It is not anticipated that disproportionate impacts would occur to any low-income populations, since the burden of the new roadway would not be more severe or greater in magnitude than the impacts that will be imposed by the non-low-income populations along the proposed route.
Transportation system management or upgrades to existing Chapman Highway would improve congestion on Chapman Highway in lieu of the James White Parkway project (*14 comments*)	Previous studies have been completed in the past that include options for widening or otherwise improving the existing roadway to make the roadway safer and more efficient. TDOT, the City of Knoxville, and other project stakeholders held several public meetings and workshops to discuss options to resolve the traffic and safety issues with the least amount of impacts to the communities. It was determined that bypassing the core business district would involve the fewest overall impacts to existing businesses, utilities, and other existing structures. TDOT began studying the James White Parkway project at the request of local officials after it was determined that widening existing Chapman Highway was not the best option. The purpose and need of the project could not be met without resulting in substantial impacts and costs associated with widening the existing route. Options such as installing traffic signals and concrete barriers alone would not be capable of meeting the purpose and need of the James White Parkway project in terms of improving the north-south traffic flows between Knoxville and adjacent communities to the south, reducing existing and expected peak time traffic congestion issues on Chapman Highway, and improving traffic safety in the area.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
	In addition, other projects aimed at improving traffic capacity of Chapman Highway and other existing roads to handle the anticipated traffic volumes would make it more difficult to realize the local visions of a pedestrian-friendly Chapman Highway. With traffic volume projections as they are, increasing capacity on Chapman Highway may necessitate addition of travel lanes in some areas. Widening could create a larger barrier to pedestrians and other alternative transportation, as well as local neighborhood traffic. The option of just implementing improvements to Chapman Highway and other local roadways could also result in increased traffic on residential streets, as drivers seek other routes to avoid congestion.
Concerned about Impacts to Existing Businesses on Chapman Highway (*7 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 272.
Comments related to concerns about impacts to the environment, including forests, cave systems, karst topography/ sinkholes, etc. (*21 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 276.
Concerned about impacts to wildlife species (flora and fauna) (8 comments)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 277.
Concerned about impacts to watersheds, water runoff, groundwater, wells, etc. (*6 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 278.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Concerned about impacts to parks/natural areas (*7 comments*)	There are five public city parks located within one mile of the proposed James White Parkway. The Cecil Webb Recreational Facility is located just north of the project terminus near E. Moody Ave. William Hastie Natural Area, Forks of the River Wildlife Management Area, and Marie Myers Park are also within one mile of the proposed Parkway. The James White Parkway project will result in the initial take of approximately 0.79 acres of the William Hastie Natural Area, but with proposed mitigation would increase the size of the park by a total of 0.43 acres. In addition, none of the park's existing functions, activities, features, or attributes is expected to be substantially impacted based on current information. The proposed roadway would provide improved access to the site from downtown Knoxville via the proposed Sevierville Pike Interchange. Noise, visual, and air quality impacts are not anticipated to be substantial and would not alter the current primary uses of the site, which include mountain biking, hiking, trail running, and nature viewing. Loss of green space is one of the unavoidable adverse impacts of the proposed roadway. TDOT will only acquire the amount of ROW required for the roadway. Portions of existing greenways or other bicycle and pedestrian facilities are located in proximity to the new roadway. However, in most instances, the proposed James White Parkway would run relatively perpendicular to existing and proposed facilities and would therefore not impact large portions of any one facility.
Concerned about destructive cutting, filling, and ridge removal (*7 comments*)	Consideration of the vertical aspect of an alignment in rolling to steep terrain, such as that in the project area, can result in substantial cost savings and reduce the need for cut and fill activities. Preliminary cost estimates associated with the proposed build alternatives are contained on Table 2.2. A more detailed discussion of anticipated environmental impacts is contained in Section 3 of this document. If the roadway were designed to follow the existing terrain, which is assumed to mean following the less steep areas along the ridges in the project area, it is more likely that more residential displacements would be required. This is because the existing roadways and homes in the area were constructed on the less steep or more readily developable land along the natural ridges and less steep side slopes leaving primarily steeper areas undeveloped. Although most of the undeveloped land is steeper, with use of the Quantm system, which looks at both the horizontal and vertical aspects of the project, TDOT has been able to identify alignments that can be constructed through the area that balance cuts and fills to reduce environmental impacts and costs to the extent practical.
Concerned about noise related to the project (*5 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 274.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Concerned about air quality/ pollution (*5 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 275.
Concerned about hazardous waste (*2 comments*)	The proposed alternatives being carried forward in the EIS would have minor short-term and no long-term adverse impacts to hazardous/special waste from construction activities. The Thoni Oil Co LUST site is located at the northern corner of the intersection of Chapman Highway and East Governor John Sevier Highway. This is within the proposed 500-foot right-of-way. Due to contaminated soil and groundwater at this site, subsurface disturbance in this area would be completed with care. Any contaminated soil would be disposed of in accordance with TDEC regulations. This would result in a minor short-term adverse impact during construction. Numerous household waste dump sites within the proposed 500-foot right-of-way were identified as being a potential low risk to the James White Parkway project. Any hazardous materials or wastes within these dumps sites are likely to be in *de minimis* or insignificant quantities. These dumps would not be expected to affect construction activities. The Cruze Road dump site is outside the proposed 500-foot right-of-way. Soil contamination would not be expected to be an issue due to the distance between the proposed construction zone and the location of the site. Although, groundwater has the potential to be impacted by this site, the karst topography makes it difficult to accurately determine the direction of the groundwater flow. Regardless, it is not expected that possible contamination from this site will impact the proposed right-of-way. If any new hazardous or special waste sites or potentially contaminated soils would be discovered during demolition of existing buildings or during construction, they would be dealt with in an appropriate manner to ensure contaminants are removed and disposed of properly. There is a potential for minor, short-term adverse impacts during construction due to leaks or spills of contaminants from construction equipment. Therefore, there would be limited chance of introducing contaminants into waters. Use of BMPs and proper maintenance and cleaning of construction equipment and vehicles would reduce the potential for adverse impacts. Construction of the James White Parkway would help to reduce traffic congestion in the area allowing vehicles to move through the area more efficiently and potentially reduce crash rates. These factors would reduce the chance for accidental spills and leaks of hazardous materials or special waste in the project area. Less congestion would also reduce the amount of time vehicles leaking fluids would spend at any one location along the roadway, thus reducing the chance for heavy accumulations of harmful fluids from leaking vehicles.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Would like to see development of modal alternatives, such as biking, pedestrians (*5 comments*)	This project is not expected to result in any severance of existing bicycle and pedestrian facilities and is not expected to limit the potential for development of new facilities in the future. Details of the pedestrian and bicycle accommodations that will be provided within the project area as part of this project will be determined during the design phase of the project. TDOT will continue to work with the City of Knoxville, other project stakeholders, and the public during that time to ensure that this project ties into the goals and context of the community. However, new pedestrian/bicycle facilities would likely be developed separate from this James White Parkway project since some of those may be developed using only local and/or state funding. Bike and Pedestrian facilities are not compatible with the James White Parkway facility due to it being proposed as a fully access controlled facility. Pedestrian and Bicycle considerations are discussed in Section 3.
Believes that mass transit should be considered (*8 comments*)	Although improvements or additions to the local transit system would complement the James White Parkway project in creating a better overall regional transportation network, it is not expected that transit options alone would provide enough of a reduction in vehicular traffic to meet the purpose and need of this project, especially in terms of improving the north-south traffic flows between Knoxville and adjacent communities to the south, reducing existing and expected peak time traffic congestion issues on Chapman Highway, and improving traffic safety in the area. build alternatives requiring new alignment should provide a corridor that can accommodate or complement potential future transit options, such as bus rapid transit options. Because transit systems would likely require straighter, more level layouts, the general layout of the James White Parkway project would be constructed in a manner that would not lead to horizontal and vertical constraints for those transit options. Construction as a freeway design would likely provide the straightest, most level corridor layout for future transit. Transit options are discussed in Section 2.
Believes that the interstate system or other roads need to be expanded in conjunction with this project (*9 comments*)	The James White Parkway project is considered to have independent utility and is considered a necessary component of the transportation network based on existing regional plans, including those developed by local and regional planning organizations. Improvements to other roadways in the region will be identified and developed on an as need basis. Concerns related to specific roadways/interchanges in the area should be directed to the appropriate local officials or organizations who may in turn file requests that studies be conducted by TDOT to determine the need for such improvements. The Knoxville TPO develops the Transportation Improvement Program (TIP) for the Knoxville area to plan transportation project. The TIP provides an opportunity for public involvement and comment. Additional improvements to local roadways/interchanges will likely continue to occur as additional development occurs resulting in larger populations and increased traffic volumes.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Comments regarding desire for decorative enhancements, such as landscaping, bridge components, guardrails, etc associated with the project (3 comments)	During the final design of the project TDOT will solicit input from the public related to the design. The principles of context sensitive design will be used to insure that the design is aesthetically pleasing and that it meets the necessary safety and design features as stipulated in the appropriate state, federal, and American Association of State Highway and Transportation Officials (AASHTO) guidelines.
Concerned about impacts to aesthetics, such as light pollution, diminished scenery, etc. (*2 comments*)	Aesthetic consequences are a part of any new roadway construction project and cannot be fully avoided. However, TDOT will try to minimize aesthetic consequences by limiting disturbance to vegetation and other undeveloped areas within the ROW to the minimum necessary to provide a safe and functional roadway. TDOT will re-seed all disturbed areas within the ROW following construction and will continue to maintain a clean ROW in the future. Reductions in visual quality from the proposed construction of the James White Parkway may result in some adverse impacts to residents of several homes located along the edge of the proposed James White Parkway. These residents would be exposed to views of the new roadway and associated infrastructure and traffic. Although views of traffic will be inherent along the James White Parkway, TDOT will continue to coordinate with residents and local communities to determine potential ways to help reduce impacts, such as planting vegetation screens or providing aesthetically pleasing features as part of the highway design. This will help TDOT provide a context sensitive roadway design that is compatible with both the local and regional setting to the extent practical. Visual impacts are discussed in Section 3. Permits for billboards must be secured with TDOT according to all rules and regulations concerning the placement of billboards.
Concerned over decreased quality of life or community or neighborhood cohesion with implementation of the Build Alternative (*7 comments*)	The disposition to this comment is the same as that provided for the similar comment in Table 4.6 on Page 273.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Concerned about dissection of existing neighborhoods (*14 comments*)	TDOT will continue to consider minor changes in the final design phase of the project to ensure the roadway and/ or associated interchanges coincide with local plans, as long as the integrity of the roadway's design can be maintained to allow it to serve its stated purpose. Overall, this project is expected to benefit the local communities due to improvements in safety and traffic conditions, which is why the local officials from those areas requested that TDOT consider constructing the project. However, some impacts will be unavoidable due to the scope of the project. Minimizing impacts to neighborhoods was a primary factor when developing the project alternatives. Comment response similar to response provided in Table 4.6.
Concerned about urban sprawl/poorly planned development (*10 comments*)	According to the 2002 South Knox County Sector Plan, much of the proposed study area is included in the Urban Growth and Planned Growth areas of the County. Therefore, it is anticipated that the area will continue to grow with residential, commercial, and possibly some industrial developments. However, much of the land in the project vicinity is undeveloped due to the steep terrain and karst topography. The steeper areas are shown as Slope Protection areas where development would be more restricted due to terrain and potential erosion issues. Thus these areas would likely remain undeveloped even if James White Parkway is extended and improved access is provided. It is anticipated that construction of the James White Parkway may promote or accelerate the timeframe in which some of the growth and development occurs within the Planned Growth areas. Improved traffic flow and access to southern Knox County and adjacent areas provided by the project may lead to increased residential, commercial, and/or industrial development. Local land use planning and zoning restrictions can be implemented to help control the location, amount, and types of developments that occur. Potential developments and land use changes expected to be promoted by the project are considered in more detail in Section 3 of this EIS. Comment response similar to response provided in Table 4.6.
Proposed interchanges were not shown at public meeting (*2 comments*)	For each build alternative shown in this EIS, a planning-level review was conducted to consider potential configurations of the interchange with Governor John Sevier Highway at the southern termini of the project. The final interchange configurations for each build alternative are shown on Figures 2.4 through 2.8. An additional interchange is planned to be constructed at the Sevierville Pike crossing of proposed James White Parkway, just southeast of William Hastie Park. The resulting interchange recommendations should provide exceptional functionality and be more than capable of accommodating the forecasted traffic demand.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Concerned about increased access to neighborhoods and associated crime (*2 comments*)	Although the new interchanges, especially the proposed Sevierville Pike interchange, will provide improved access to the area for everyone, including individuals that may wish to commit crimes, the new interchange will also provide improved access and response times for emergency vehicles and law enforcement personnel compared to existing conditions. Concerns over crime should be discussed with local officials and law enforcement personnel. Identification of ways to help deter criminals from conducting their activities in the area may be considered as needed, including increased patrols along local roadways in the area, neighborhood watch groups, and other proactive measures.
Does not believe there is evidence to support need for project (*13 comments*)	The primary objective of the proposed James White Parkway extension is to provide an efficient and safe transportation facility connecting South Knoxville to downtown Knoxville. This completed roadway would enhance transportation service by improving access to and from the South Knoxville area, relieving traffic congestion on existing roads such as Chapman Highway, and by providing a more efficient connection between South Knoxville and medical facilities, educational institutions, and commercial areas in the greater Knoxville metropolitan area. This facility would provide for safer travel in the project area by reducing congestion-related accidents along some of the existing roadways in the project vicinity, especially Chapman Highway, which would see some reduction in traffic volumes due to this project. Chapman Highway is the only north-south arterial connecting South Knoxville with the CBD Loop. Consequently, the traffic demand along this facility often exceeds its capacity and results in traffic congestion. Construction of James White Parkway between Moody Avenue and Governor John Sevier Highway would serve to relieve traffic congestion on Chapman Highway and provide additional capacity for future traffic demands along the north-south corridor. Relieving traffic congestion and providing a connection between Governor John Sevier Highway and the CBD Loop will improve access to the South Knoxville area. The need for the project is based on traffic data, safety data, and input from local officials and is discussed further in Section 1of this EIS.
Concerned about the motives for the project/who is endorsing this project (*2 comments*)	TDOT began studying this project at the request of local officials due to the need to find ways to relieve congestion on Chapman Highway. Section 1 of this EIS discusses the details surrounding the purpose and need for this project. These needs are primarily to relieve traffic on Chapman Highway and provide a better north-south connection from the South Knoxville area and points to the south into and out of downtown Knoxville. The Task Force also recommended conducting environmental studies for extension of James White Parkway to Governor John Sevier Highway based on their own studies in an attempt to find ways of improving the traffic conditions along Chapman Highway.

Table 4.10. Summary of Common Issues/Concerns from Public Meeting Comments (2009).

COMMENT	DISPOSITION
Concerned about impacts to historic and archaeological resources (*1 comment*)	It was determined that none of the surveyed properties within the project area are potentially National Register-eligible and no historic above-ground resources would be affected by the proposed project. It was also determined that the proposed project would not have a Section 4(f) "use" of any historic above-ground property within the project area. The Tennessee State Historic Preservation Officer (SHPO) has concurred with these findings (SHPO 2011), and determined that "… the area of potential effects contains no architectural resources eligible for listing in the National Register of Historic Places affected by this undertaking." A copy of the SHPO letter is included in Appendix E of this EIS.
Proposes a different alternative route (*11 comments*)	Potential alternatives identified by the Quantm system and other methods (see Section 2) were evaluated to determine if they were potential reasonable alternatives. Objective evaluation criteria were developed based on input from various agencies and project stakeholders to help identify and screen potential reasonable alternatives for the project. It should be noted that information from previous studies, public input, and recommendations made by the James White Parkway-Chapman Highway Corridor Task Force were considered to the extent possible in development of alternatives and proposed design concepts for this project.

4.2.2 Project Website

The project website, http://www.tdot.state.tn.us/sr71/ , will continue to be periodically updated with newsletters, maps, and other project information as appropriate or when new information is available. The website also provides links to project contacts so that comments or concerns can be sent directly to TDOT staff.

4.2.3 Frequently Asked Questions

The project website contains answers to frequently asked questions (FAQs) regarding the project. Many of those questions were brought up during previous public meetings or through general questions submitted to TDOT from local residents or stakeholders. To view the FAQs, visit the project website: http://www.tdot.state.tn.us/sr71/faq.shtml .

4.2.4 Public Review of the Draft Environmental Impact Statement

A copy of the notice of availability of the DEIS document will be published in local papers and on the project website once it has been approved. The notice will identify where the DEIS is available for public review, how the public can provide input, and who to contact with comments or for additional information. Copies of the DEIS will be made available for public inspection at local public libraries in the Knoxville area. The DEIS is also available on the TDOT project website at http://www.tdot.state.tn.us/sr71/ . Several agencies, public

officials, and other primary project stakeholders will be sent copies of the DEIS to review. A list of those agencies, official, and stakeholders is contained in Appendix F.

During the official public review period of the DEIS, TDOT will hold a Corridor Public Hearing to solicit public input on the official findings presented in the document and/or on the project in general. Input from the public hearing and public comment period will be used by TDOT to make a decision on the selection of the preferred alternative and preliminary mitigation measures. This input will also be incorporated into the overall study prior to completion of the Final EIS and Record of Decision (ROD).

The following methods can be used to provide comments on the information contained in the EIS or other general project specific concerns:

- Comment form drop box located at the Corridor Public Hearing;
- Mail-in comment forms distributed at the Corridor Public Hearing;
- Oral comments via court reporter(s) at the Corridor Public Hearing;
- Electronic comment forms available on the project website;
- Mail-in letters sent to TDOT at the address listed on the signature page located in the front of the DEIS;
- Telephone; and
- E-mail.

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CHAPTER 5

5.0 LIST OF PREPARERS

Personnel involved in the development of the James White Parkway EIS include the following:

Name	Education and Experience	Primary Responsibilities
Robert B. (Bob) Allen TDOT-Environmental Division	Transportation Planner IV B.A. in Human Services, M.S., Urban and Regional Planning, 24 years experience in Land Use, Conservation, and Transportation Planning.	Coordinated preparation/schedules for NEPA documentation and public involvement activities, conducted FHWA/agency coordination; coordinated TDOT reviews of the EIS and associated documents.
Ann Andrews	B.S., Psychology and Journalism M.B.A., Business Management, 27 years experience with TDOT projects.	Manage TDOT Environmental Documentation Office, Environmental Division.
Leigh Ann Tribble Federal Highway Administration	Environmental Program Engineer	Provided technical assistance and guidance throughout the NEPA process and conducted reviews of the NEPA document and associated documentation. Coordinated FHWA's lead portion of the NEPA document.
Robert McIvor, PE Parsons	B.S., Civil Engineering, 33 years of planning and design of transportation facilities.	Program Manager and reviewer for functional plans.
Luke F. Eggering Parsons	B.S., Fish and Wildlife Management; M.S., Biology; 22 years experience in preparation of environmental documents wetland management; wildlife, fisheries and endangered species management.	Project Manager/Project Scientist; data collection and key participant in description of proposed action, alternatives formulation, environmental impact analysis, public involvement, and preparation of the EIS.
Joel Budnik Parsons	B.S., Fisheries and Wildlife Management, Minor in Biology; M.S., Fisheries and Wildlife Sciences; 15 years experience in natural resource management; biological surveys, wetland determinations; environmental impact assessment; and preparation of environmental documents.	Senior Environmental Scientist/Biologist; key participant in agency coordination, alternatives formulation, data collection, environmental impact analyses, public involvement, and preparation of the EIS and associated Ecology Study Technical Appendix and Biological Assessment.

Name	Education and Experience	Primary Responsibilities
Mike Brugge, PE Parsons	B.S., Civil Engineering; M.S., Highway & Traffic Engineering; 32 years of experience in transportation with a focus on traffic engineering and transportation planning.	Traffic engineer for functional plans and capacity analyses. Prepared Traffic Appendix. Provided Levels of Service for air quality and noise analyses.
Kevin Abel Parsons	B.S., Civil Engineering; 11 years of experience on roadway planning and traffic studies as well as roadway design projects.	Performed analysis of alignment alternatives using Quantm software, and led the development of the resulting functional plans. Prepared GIS mapping of environmental constraints. Prepared capacity analyses. Conducted ambient noise readings at various locations in the project area.
Virginia Flynn Parsons	B.A., Horticulture; M.S., Plan Biology; 13 years of experience in environmental assessment and impact studies, biological community investigations, and ecosystem restoration.	Senior Environmental Scientist assisted with visual quality, cultural resources, construction impacts, and cumulative impacts sections of the EIS.
Lee Gorday Parsons	B.A., Geology; M.A., Geology; 25 years of experience in hydrogeologic systems and groundwater contamination.	Senior Hydrogeologist/Hazardous Materials Specialist; preliminary hydrogeologic data collection for related sections of EIS.
Michael Kulik Parsons	B.S., Environmental Biology; M.S., Environmental Science; Master of Public Affairs. 6 years of experience in environmental assessment and impact studies as well as and hazardous materials assessment.	Senior Environmental Scientist/Hazardous Materials Specialist; data collection and preparation of related sections of EIS. Also assisted in public response comments.
Janet Lewandowski Parsons	A.A.S., Technical Illustration, 30 years of experience in AutoCad and MicroStation, ArcView, and ArcGIS.	CAD/GIS Specialist assisted with generating graphics and maps.
Darren Mitchell Parsons	B.S., Biology; M.S., Biology; 7 years experience in fish and wildlife biology and management, and aquatic entomology and ecology.	Environmental Scientist/Biologist; data collection, impact analysis, and key participant in preparation of EIS and associated Biological Assessment.

Name	Education and Experience	Primary Responsibilities
Randy Norris Parsons	B.S., Plant and Soil Science, M.U.P., Urban Planning/Environmental Planning. 20 years experience in environmental impact assessment, environmental management, and planning.	Project Scientist; responsible for technical review of affected environment and resource impact evaluations.
Katherine Astroth Parsons	B.S., Biology: 3 years experience in fish and wildlife biology and aquatic ecology.	Environmental Scientist; assisted with pedestrian and bicycle considerations, threatened and endangered species, and public comment response sections of EIS.
Anthony Pakeltis Parsons	B.S., Environmental Design; B.U.P., Urban Planning and Development; MUPP Urban Planning and Policy (Transportation); 22 years experience in environmental assessment and impact studies, including air quality, noise, socioeconomic, and traffic analysis.	Air Quality and Noise Analyst; air quality and noise analysis studies.
Craig Moore Parsons	B.S. Civil Engineering; M.S. Civil Engineering; 12 years experience in environmental assessment and impact studies, including air quality, noise, socioeconomic, and traffic analysis.	GIS Analyst – Noise Analysis; coordinated GIS data between CADD and noise analysis software.
Susan Simkus Parsons	B.A., Business Administration, 17 years' experience in transportation planning and environmental impact studies, including noise, socioeconomic, and traffic analysis.	TNM 2.5 noise analysis and technical report preparation.
Molly Salmieri Parsons	B.S., Community and Regional Planning; MBA. Over 11 years experience in environmental, transportation, and military planning projects.	Senior Planner, assisted with data collection and preparation of land use and section and conceptual stage relocation plan of EIS.

Name	Education and Experience	Primary Responsibilities
Matt Schulte Parsons	B.A., English Lit & Writing; M.S. Geographical Studies, emphasis in Spatial analysis and Geo-Information Technologies, 13 years experience in GIS and Environmental Planning.	GIS Analyst/Planner; coordinated GIS data acquisition and processing, checked data accuracy and consistency, and produced maps for various project uses.
Rebecca Porath Parsons	B.S., Fisheries and Wildlife Management, M.S., Zoology. Over 12 years experience in environmental, biological, and natural resource planning projects.	Senior Environmental Scientist, assisted with preparation of purpose and need, description of alternatives, public comment response, and formatting/review of EIS.

CHAPTER 6

6.0 REFERENCES

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CHAPTER 7

7.0 List of Acronyms

A

AADT	Annual Average Daily Traffic
ACHP	Advisory Council on Historic Preservation
ADT	Average Daily Traffic
AMBC	Appalachian Mountain Bike Club
ARAP	Aquatic Resources Alteration Permit
APE	Area of Potential Effect
AST	Aboveground Storage Tank

B

BA	Biological Assessment
BMP	Best Management Practice
BRT	Bus Rapid Transit

C

CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CBD	Central Business District
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CSD	Context Sensitive Design
CSS	Context Sensitive Solutions
CWA	Clean Water Act

D

dB	Decibels
dBA	A-weighted equivalent sound level in decibels
DEIS	Draft Environmental Impact Statement
DHV	Design Hourly Volume

E

EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act

F

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FINDS	Federal Index System
FIRM	Flood Insurance Rate Maps
FNSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act

G

GIS	Geographic Information System
GPS	Global Positioning System

H

HIST LUST	Historic Leaking Underground Storage Tank
HIST UST	Historic Underground Storage Tank

I

IAC	Interagency Consultation
IL	Insertion Loss

J

K

KAT	Knoxville Regional Transit
KRMP	Knoxville Regional Mobility Plan
KRTPO	Knoxville Regional Transportation Planning Organization

L

LOS	Level-of-Service
LRTP	Long Range Transportation Plan
LUST	Leaking Underground Storage Tank

M

MCL	Maximum Containment Levels
MPC	Metropolitan Planning Commission
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MSAT	Mobile Source Air Toxics

N

NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHIP	Natural Heritage Inventory Program
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory

O

P

Q

Quantm	Trimble's Quantm Alignment Planning System

R

RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
ROI	Region of Influence
RONA	Record of Non-Applicability
ROW	Right-of-Way
RTAP	Regional Transportation Alternatives Plan

RTV	Rational Threshold Values

S

SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act-A Legacy for Users
SHPO	State Historic Preservation Officer
SPCC	Spill Prevention Control and Countermeasures
SQG	Small Quantity Generator
STIP	Statewide Transportation Improvement Program
SWPPP	Stormwater Pollution Prevention Plan

T

Task Force	James White Parkway-Chapman Highway Corridor Task Force
TDOT	Tennessee Department of Transportation
TDEC	Tennessee Department of Environment and Conservation
TDL	Total Dissolved Solids
TEMA	Tennessee Emergency Management Agency
TESA	Tennessee Environmental Streamlining Agreement
TIP	Transportation Improvement Program
TNCGP	Tennessee Construction General Permit
TN-EPPC	Tennessee Exotic Pest Plant Council
TNM	Traffic Noise Prediction Model
TMDL	Total Maximum Daily Load
TPO	Transportation Planning Organization
TSM	Transportation System Management
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency

U

USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
UT	University of Tennessee

V

VMT	Vehicle Miles Traveled

W

WWC	Wet Weather Conveyance

X

Y

Z

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APPENDIX A – KNOXVILLE REGIONAL TPO 2011-2014 TRANSPORTATION IMPROVEMENT PROGRAM AND 2009-2034 KNOXVILLE REGIONAL MOBILITY PLAN PROJECT SHEETS FOR THE JAMES WHITE PARKWAY (SR-71) PROJECT

Knoxville Regional TPO 2011-2014 Transportation Improvement Program (TIP) Sheet for James White Parkway Project Vicinity in Knox County.

Knoxville Regional Transportation Planning Organization
TRANSPORTATION IMPROVEMENT PROGRAM FY 2011-2014

TIP No.	2011-022	Revision No.	0
TDOT PIN	101420	LRTP No.	666
Project Name	James White Pwy (SR 71)		
Lead Agency	TDOT		
Total Project Cost	$77,800,000		

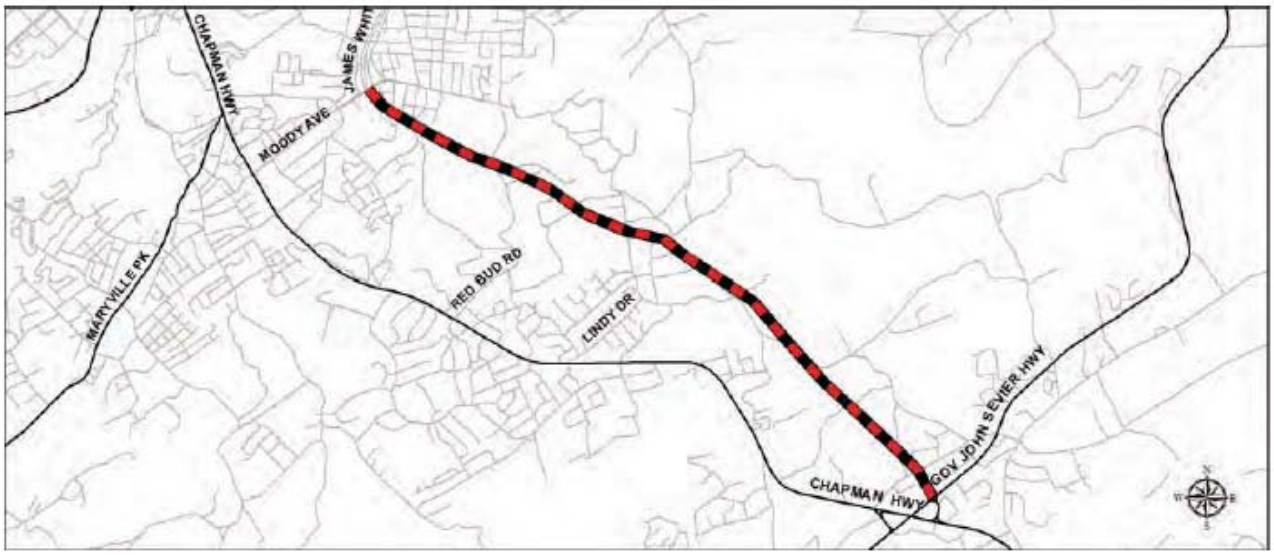
Project Description	Construct new 4 lane.		
Termini/Intersection	Chapman Hwy to Moody Ave		
Counties	Knox		
City/Agency	Knoxville		
Length	4.5 (miles)	Conformity Status	Non-Exempt

Additional Details	

Programmed Funds

FY	Type of Work	Funding Type	Total Funds	Federal	State	Local	Other
2014	ROW	STP	$19,600,000	$15,680,000	$3,920,000	$0	$0
		Total	$19,600,000	$15,680,000	$3,920,000	$0	$0

Revision Date	
Revision Details	
Previous TIP No.	2002-019, 2004-014, 2006-012, 2008-025



2009-2034 Knoxville Regional Mobility Plan (KRMP) Sheet for James White Parkway Project Vicinity in Knox County.

Table 34: Knoxville Regional Roadway Project List

New LRMP #	Old LRTP #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	Proposed Completion Timeframe	Year of Expenditure Cost	Source of Funds	Planning Area	1	2	3	4	5	6	7	8
659	120	Tazewell Pike (SR 331)	Intersection w/ Old Broadway & Greenway Dr	Knoxville	0.0	Intersection improvement	2015 - 2024	$6,088,730	STP	KRTPO		√		√		√	√	√
660	137	Gleason Drive	Montvue Rd to Gallaher View Rd	Knoxville	1.0	Reconstruct 2-lane section	2015 - 2024	$7,973,337	Local	KRTPO		√				√	√	√
661	138	I-75/ Callahan Rd Interchange	Callahan Rd Interchange	Knoxville	0.0	Reconfigure existing interchange to improve safety and operations	2015 - 2024	$28,993,953	NHS	KRTPO	√	√		√		√	√	√
662	139	I-75/ Merchant Dr Interchange	Merchant Dr Interchange	Knoxville	0.0	Reconfigure existing interchange to improve safety and operations	2015 - 2024	$28,993,953	NHS	KRTPO	√	√		√		√	√	√
663	145	Northshore Drive (SR 332)	Lyons View Pike to Morrell Rd	Knoxville	2.2	Reconstruct 2-lane section	2015 - 2024	$18,233,572	State	KRTPO		√			√	√	√	√
664	New	Broadway (SR 33) (US 441)	Intersection with Hall of Fame Dr	Knoxville	0.0	Intersection improvement	2015 - 2024	$2,899,395	STP-TPO	KRTPO	√	√				√	√	
665	110	Murphy Road Extension	Washington Pike to Millertown Pike	Knoxville/ Knox County	1.3	Construct new 4-lane road	2015 - 2024	$11,307,642	STP-TPO	KRTPO		√		√	√	√	√	√
666	105	South Knoxville Blvd (SR 71)	Moody Ave to Chapman Hwy (SR 71) (US 441)	Knoxville/ Knox County	5.3	Construct new 4-lane road	2015 - 2024	$137,721,276	State	KRTPO		√		√	√	√	√	√
667	154	Strawberry Plains Pike	Moshina Rd to south of I-40	Knoxville/ Knox County	1.4	Widen 2-lane to 4-lane	2015 - 2024	$15,700,225	Local	KRTPO		√			√	√	√	√
668	New	Kingston Pike (SR 1) (US 11/70)	Smith Rd to Campbell Station Rd	Farragut	1.4	Widen 4-lane to 6-lane	2025 - 2034	$20,647,857	State	KRTPO		√			√	√	√	√
669	New	Everett Road	Proposed Synder Rd Extension to Kingston Pk (SR 1) (US 11/70)	Farragut	2.1	Reconstruct 2-lane section	2025 - 2034	$6,194,357	Local	KRTPO		√			√	√	√	√
670	New	Snyder Road Extension	Campbell Station Rd to Everett Rd north of I-40	Farragut	2.5	Construct new 2-lane road	2025 - 2034	$16,518,286	STP-TPO	KRTPO		√			√	√	√	√
671	92	Central Avenue Pike	Beaver Creek Dr to Emory Rd (SR 131)	Knox County	2.3	Reconstruct 2-lane section	2025 - 2034	$8,775,339	Local	KRTPO		√		√		√	√	√
672	96	Dante Road	Central Avenue Pike to Dry Gap Pk	Knox County	2.1	Reconstruct 2-lane section	2025 - 2034	$15,795,611	Local	KRTPO		√				√	√	√
673	113b	Oak Ridge Highway (SR 62)	Byington-Beaver Ridge Rd (SR 131) to Pellissippi Pkwy (SR 162)	Knox County	4.2	Widen 2-lane to 4-lane	2025 - 2034	$45,425,286	State	KRTPO		√			√	√	√	√

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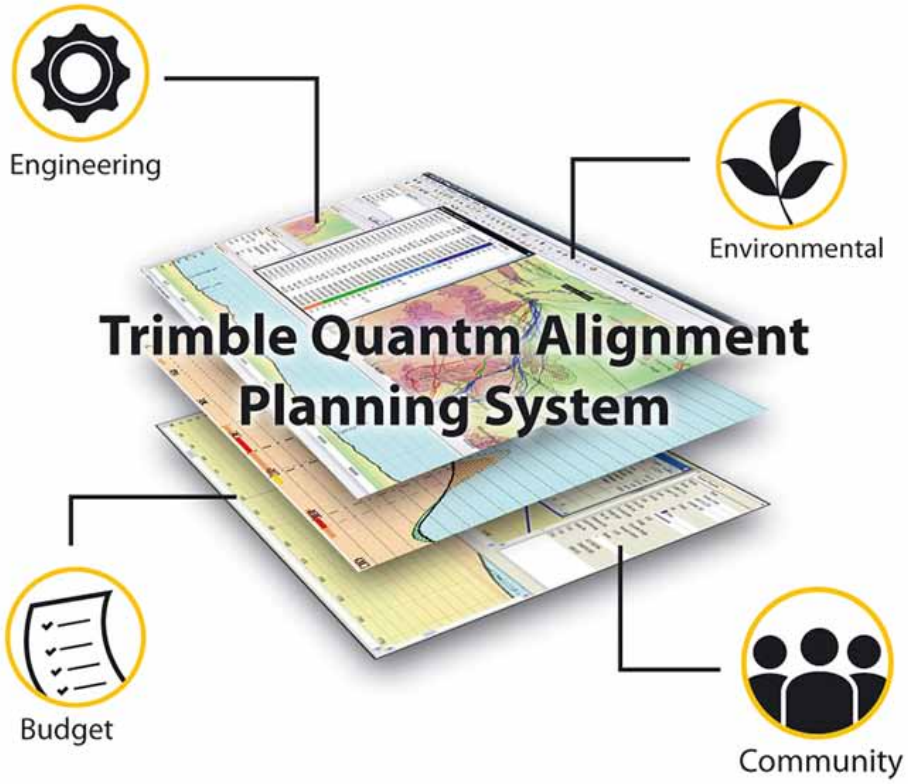
APPENDIX B – DESCRIPTION OF THE TRIMBLE QUANTM ALIGNMENT PLANNING SYSTEM TECHNOLOGY UTILIZED IN THE JAMES WHITE PARKWAY ALTERNATIVES DEVELOPMENT PROCESS

The services and technology of Trimble Quantm Alignment Planning (Quantm) system) was used to facilitate the identification, screening, and evaluation of all reasonable build alternatives for the James White Parkway EIS. More detailed information regarding the Quantm System can be found on their website at: [http://www.trimble.com/alignment/road-alignment.aspx?dtID=overview].

The Quantm System is a unique route optimization technology and methodology supported by a team that incorporates road and rail engineers, Geographical Information System (GIS) technicians, transport researchers, mathematicians and system developers.

The Quantm System is a tool used to screen multiple alignment alternatives in a short period of time. It helps to evaluate all possible alternatives in an efficient manner, while simultaneously seeking out the most cost effective horizontal and vertical alignments. It is a computer-based planning tool that assists in the determination of optimal corridors/alignments subject to constraints imposed by geometric design criteria, the environment, community input, and construction costs. This innovative technology can literally evaluate thousands of alignment alternatives to support the iterative nature of the NEPA process and demonstrate that all reasonable alternatives have been considered, including community-suggested alignments.



The Quantm System provides a 3-dimensional analysis which integrates engineering (terrain, geometric criteria, earthworks and structures), environmental [e.g. wetlands and other water bodies, 4(f), species and habitat, archeological, etc.], and various cost factors into a single application to support the decision-making process. Clear graphical output and data illustrate the relative differences between alternatives in terms of alignment costs and environmental/community impacts.

The Quantm System has been designed to support road and rail planners through the complex process of selecting corridors and alignments by allowing a holistic approach that simultaneously considers environmental protection, cultural heritage, community values, terrain, geometric/design standards, crossing of features, and minimizing construction costs. This approach has also demonstrated a considerable reduction in project planning time.

The Quantm System has been successfully applied in over 150 road and rail projects in nine countries worldwide and 20 U.S. states including Texas, Arkansas, Alabama, Louisiana, North Carolina, and Georgia. Alignment construction savings in excess of 20% have been independently documented while reducing environmental and social impact. Project planners and engineers have applied the system from the feasibility and corridor analysis stages of a project to the NEPA and alignment selection stages, and they have achieved major savings when using the Quantm system for the value engineering process at the commencement of the Design/Build stage of projects. The system's built in audit trail allows the planners to track the scenarios investigated and document the rationale for the selection of a preferred corridor or alignment.

In addition to the mapping of other environmental constraints, the mapping of sinkholes and other karst features was one of the major advantages of using the Quantm System for this project. As these areas and other environmental constraints were mapped, the Quantm System was used to estimate in the development of avoidance or impact minimization alternatives.

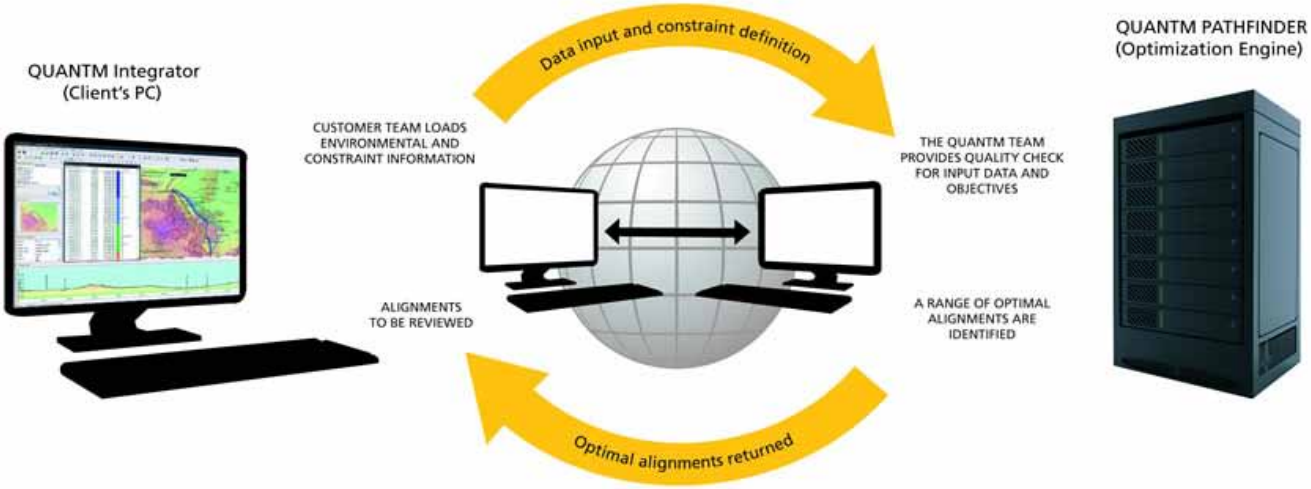
The Quantm process begins by entering study area data into a software program called Integrator. Integrator is used to create various study area scenarios for which alignments will be generated. These scenarios are sent to Quantm where a separate software program named Pathfinder generates these alignment alternatives. Study area data can include any constraints or pertinent information known about the study area. At the very minimum, topographical data, beginning and end points for generated alternatives, and construction cost data must be entered. Constraints entered for this study were churches, cemeteries, schools, parks, cave locations, sinkhole locations, water features, roadways, property costs, dense residential neighborhood locations, and geological data. Integrator was told how to interact with each of these. Total avoidance was used to stay away from culturally significant locations and dense neighborhoods. Some roads, creeks and sinkholes were set up to be spanned with bridges. Smaller creeks were set to be crossed using culverts. Cut slopes and benching were set based on geology. Costs were assigned to all construction related items, including costs for earthwork, bridges, culverts, retaining walls, property, drainage, induced sinkhole repair, and stormwater pollution prevention measures. Roadway design criteria were also entered into Integrator. This included things like maximum and minimum curvature, maximum profile grades, and roadway widths.

After setting up a study area scenario in Integrator, the file is sent to Quantm Pathfinder for alternatives development. Pathfinder has various ways to do this. It can either roam around the study area looking for the 50 best alignments that meet the criteria entered into the scenario (this is called an unseeded optimization), or it can use a seed alignment (from user) and refine it horizontally and vertically, or just vertically. Pathfinder attempts to avoid

everything that it is told to, while minimizing costs from construction activities. Sometimes it cannot avoid particular items or areas. In these instances it attempts to minimize the impact as much as it can by placing the smallest amount of roadway possible through the area.

For the James White Parkway study, unseeded optimization was carried out for multiple ending points along Governor John Sevier Highway. Evaluation of the 50 best alignments for each end point was done to identify trends of the majority of the alternatives. The three most promising alternatives for each end point were scrutinized by project staff. Based on these evaluations, four Quantm alternatives and the Task Force Committee alignment were chosen to be carried forward for further consideration as potential reasonable alternatives to study in the EIS. Each was sent back to Quantm for a vertical refinement that identified additional cost saving measures. In other words, the placement of the alignments were adjusted within the areas of steep terrain to provide the best balance between cut and fill areas that would be required to construct the alignments.

How the Quantm System Works:



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APPENDIX C: AGENCY COORDINATION LETTERS AND OTHER STAKEHOLDER COORDINATION LETTERS

Appendix C contains the following correspondence associated with the coordination associated with this Environmental Impact Statement

Agency	Date
Response from Tennessee Department of Economic and Community Development NEPA Contact	May 27, 2008
Response from National Park Service – Great Smoky Mountain National Park	June 9, 2008
Response from U.S. Environmental Protection Agency	May 29, 2008
Response from Natural Resources Conservation Service	August 16, 2011
Response from Tennessee Wildlife Resources Agency	May 1, 2008
Response from U.S. Fish and Wildlife Service	May 30, 2008, November 5, 2010, November 17, 2011, and December 9, 2011
Response from TDEC Air Pollution Control Division	April 22, 2008
Response from TDEC Air Pollution Control Division	April 28, 2008
Response from TDEC Division of Natural Areas	May 7, 2008
Response from TDEC Division of Solid/Hazardous Waste Management	May 20, 2008
Response from TDEC Ground Water Protection	May 1, 2008
Response from TDEC Water Supply	May 6, 2008
Response from Tennessee Department of Agriculture	April 28, 2008
Response from Knoxville Regional Transportation Planning Organization	May 23, 2008
Response from U.S. Army Corps of Engineers, Nashville District	June 10, 2008
Response from U.S. Geological Survey	April 24, 2008
Response from Tennessee Historical Commission – SHPO	May 1, 2008
Response from Knoxville-Knox County Metropolitan Planning Commission	April 29, 2008

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

April 17, 2008

Mr. Michael Atchison
Director of Special Projects
Department of Economic and Community Development
TDECD NEPA Contact
312 8th Avenue North
Nashville, Tennessee 37243

SUBJECT: Invitation to be a Participating Agency for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee – Environmental Impact Statement.

Dear Mr. Atchison:

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), is initiating an Environmental Impact Statement (EIS) for the proposed construction of South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee, a distance of approximately four miles depending upon the alternative route considered. The proposed project is considered necessary to improve access from the South Knoxville area to the Central Business District (CBD) in downtown Knoxville, while potentially relieving congestion and safety issues on existing roadways, including Chapman Highway (U.S. 441/State Route 33). We have enclosed a Project Data Summary, project vicinity maps, and the Coordination Plan for this project.

The Department of Economic and Community Development has been identified as an agency that may have an interest in the project because of your jurisdictional authority, special expertise, and regional interest. With this letter, we extend your agency an invitation to become a participating agency with TDOT and FHWA in the development of the EIS for the subject project. This designation does not imply that your agency either supports the proposal or has any special expertise with respect to evaluation of the project.

declined
Mike Atchison 5/27/08

TDOT is in the early stages of planning for this project and would like to know if the proposed project will have any effect, either favorable ort adverse, on any programs being planned or executed by your agency. We request that you review the enclosed material and advise us with your comments on potential environmental and location studies. The EIS will assess a wide range of concerns including

impacts on the social, economic, and ecological environment. Your input will assist us in the preparation of the EIS.

Pursuant to Section 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), *participating agencies* are responsible to identify, as early as practicable, any issues of concern regarding the project's potential environmental or socioeconomic impacts that could substantially delay or prevent an agency from granting a permit or other approval that is needed for the project. We suggest that your agency's role in the development of the project should include the following as they relate to your area of expertise:

1. Provide meaningful and early input on defining the purpose and need, determining the range of alternatives to be considered, and the methodologies and level of detail required in alternatives analysis;
2. Participate in coordination meetings and joint field reviews as appropriate;
3. Conduct a timely review of and comment on the preliminary Draft EIS to reflect the views and concerns of your agency regarding the adequacy of the document, alternatives considered, and the anticipated impacts and mitigation; and
4. Conduct a timely review and comment on the preferred alternative and preliminary mitigation to reflect the views and concerns of your agency on the appropriateness of the measures to minimize harm.

In order for the Department of Economic and Community Development to be designated as a participating agency for this project, you must respond in writing with an acceptance within 45 days of the date of this letter.

By this letter, TDOT requests that you review the enclosed material and advise us with your comments on potential environmental impacts.

If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during the preparation of this EIS, please contact Tom Love, TDOT Environmental Division, at 615-741-5364. Thank you for your cooperation and interest in this project.

Sincerely,

Charles E. Bush
Transportation Manager II

Enclosures: Project Data Summary (including Maps)
Coordination Plan

United States Department of the Interior

NATIONAL PARK SERVICE
Great Smoky Mountains National Park
107 Park Headquarters Road
Gatlinburg, Tennessee 37738

IN REPLY REFER TO:

D30

June 9, 2008

Charles Bush
Transportation Manager II
Tennessee Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

Dear Mr. Bush:

We have received your invitation to become a participating agency with Tennessee Department of Transportation (TDOT) and Federal Highway Administration (FHWA) in the development of the Environmental Impact Statement (EIS) for the South Knoxville Boulevard Project. We have reviewed the Project Data Summary and vicinity maps provided for this project.

Great Smoky Mountains National Park has no jurisdiction or authority with respect to the project; therefore, we are declining this invitation to be a participating agency. We appreciate the opportunity to review the preliminary project information and for the consideration given to our agency. If you have any questions, please call Landscape Architect Imelda Wegwerth at 865-436-1302.

Sincerely,

for Dale A. Ditmanson
Superintendent

TAKE PRIDE IN AMERICA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

May 29, 2008

Charles Bush
Transportation Manager II
Tennessee Department of Transportation
James K. Polk Building
505 Deaderick Street, Suite 900
Nashville, Tennessee 37243-0334

SUBJECT: Participating Agency Request for the Environmental Impact Statement for the Proposed South Knoxville Boulevard from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee

Dear Mr. Bush:

The U.S. Environmental Protection Agency (EPA) received your letter dated April 17, 2008, inviting EPA to become a "participating agency" with the with the Tennessee Department of Transportation (TDOT) and Federal Highway Administration in the development of the Environmental Impact Statement (EIS) for the proposed South Knoxville Boulevard from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee. In accordance with this request, we accept your invitation to become a participating agency for this project and will endeavor to participate in project activities in the manner suggested in your letter, subject to resource limitations. EPA's participating agency status and level of involvement does not, however, preclude our independent review and comment responsibilities under Section 102(2)(C) of the National Environmental Policy Act and Section 309 of the Clean Air Act, or our authorities under Section 404 of the Clean Water Act. Similarly, our being a participating agency should not imply that EPA will necessarily concur with all aspects of TDOT's EIS.

Your letter also requested EPA to provide comments on the "Project Coordination Plan" included with your letter. In accordance with this request, EPA does not have any comments on this plan. We appreciate the opportunity to work with the TDOT as a participating agency on this important project. Please contact Ben West, as our primary agency representative for this project, at (404) 562-9643 to discuss this letter or if you have questions.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

cc: Federal Highway Administration – Tennessee Division

Internet Address (URL) • http://www.epa.gov
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
9737 Cogdill Road; Suite 152C
Knoxville, TN 37932
Phone 865-671-3830 x. 112
rick.livingston@tn.usda.gov

August 16, 2011

Mr. David Thompson,
State of Tennessee
Department of Transportation
Environmental Division
Suite 900 James K. Polk Building
505 Deaderick Street
Nashville, TN 37043-0334

Project: James White Parkway (SR-71) from Chapman Hwy. to Moody Ave.
Project #: 47024-1230-04; PIN: # 10142.00; Knox County, TN

Dear Mr. Thompson,

Please find the attached form NRCS-CPA-106 for this project. All assessments were made from the information that was provided for the project. No site visit was made

Much of our soils information is available on-line at http://websoilsurvey.nrcs.usda.gov/app/
Additional information on Prime Farmland may be obtained at our websites
www.tn.nrcs.usda.gov/technical/soils/fppa.html or www.nrcs.usda.gov/programs/fppa/ .

Feel free to contact me if I may be of further assistance.

Sincerely,

Richard L. Livingston
Resource Soil Scientist

Attachment

Helping People Help the Land

An Equal Opportunity Provider and Employer

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

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

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 8/11/2011	4. Sheet 1 of 1
1. Name of Project James White Parkway (SR-71) EIS	5. Federal Agency Involved Federal Highway Administration	
2. Type of Project New Roadway	6. County and State Knox County, Tennessee	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 8/11/11	2. Person Completing Form Richard Livingston
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated < 500 / Average Farm Size 66
5. Major Crop(s) Corn (indicator crop)	6. Farmable Land in Government Jurisdiction Acres: 177,300 % 52.7	7. Amount of Farmland As Defined in FPPA Acres: 12,990 % 18.7
8. Name Of Land Evaluation System Used LESA	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS 8/16/11

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment			
	GREEN	BLUE	RED	
A. Total Acres To Be Converted Directly	82	92	91	
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor	82	92	91	
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	11.0	16.5	20.0	
B. Total Acres Statewide And Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	<0.01	<0.01	<0.01	
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	99	99	99	
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	24	28	29	
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15	12	13	13	
2. Perimeter in Nonurban Use — 10	8	8	8	
3. Percent Of Corridor Being Farmed — 20	0	0	0	
4. Protection Provided By State And Local Government — 20	20	20	20	
5. Size of Present Farm Unit Compared To Average — 10	4	5	5	
6. Creation Of Nonfarmable Farmland — 25	3	4	4	
7. Availability Of Farm Support Services — 5	4	4	4	
8. On-Farm Investments — 20	3	3	3	
9. Effects Of Conversion On Farm Support Services — 25	0	0	0	
10. Compatibility With Existing Agricultural Use — 10	3	3	3	
TOTAL CORRIDOR ASSESSMENT POINTS — 160	57	60	60	
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100	24	28	29	
Total Corridor Assessment (From Part VI above or a local site assessment) — 160	57	60	60	
TOTAL POINTS *(Total of above 2 lines)* — 260	81	88	89	

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

5. Reason For Selection:

Signature of Person Completing this Part: DATE

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

TENNESSEE WILDLIFE RESOURCES AGENCY

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

May 1, 2008

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

Re: Invitation to Participate in the Development Process for an Environmental Impact Statement for a Proposed South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee

Dear Mr. Bush:

The Tennessee Wildlife Resource Agency has received and reviewed the information your office provided to us regarding the invitation to become a participating agency in the development of an Environmental Impact Statement for the proposed South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee. Our current concerns are potential environmental impacts associated with potential stream and wetland impacts, and impacts to federally and state listed species that may occur do to the construction of this project. We accept the invitation to participate in this process and encourage continued consultation with our agency in future phases of this project to further reduce impacts to fish and wildlife resources.

We thank you for the opportunity to comment during the initial coordination process and look forward to working with TDOT personnel in the future to reduce potential impacts to fish and wildlife resources associated with this project.

Sincerely,

Robert M. Todd

Robert M. Todd
Fish and Wildlife Environmentalist

cc: Rob Lindbom, Region IV Habitat Biologist
Bob Nichols, Region IV Manager

The State of Tennessee

IS AN EQUAL OPPORTUNITY, EQUAL ACCESS, AFFIRMATIVE ACTION EMPLOYER

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

May 30, 2008

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

Re: Initial Coordination for the South Knoxville Boulevard (State Route 71) Project, from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee

Dear Mr. Bush:

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), is initiating an Environmental Impact Statement (EIS) for the proposed construction of the South Knoxville Boulevard (State Route 71). The project would extend from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee. The proposed project is considered necessary to improve access from the South Knoxville area to the Central Business District in downtown Knoxville, while potentially relieving congestion and improving safety conditions on existing roadways in the area.

TDOT and the FHWA have requested that the U.S. Fish and Wildlife Service (Service) be a participating agency in the development of the EIS. Acceptance of this request does not imply that the Service supports the proposal or has any special expertise with respect to the evaluation of the project.

We have reviewed the project summary and the possible role that our agency would have in the development of the South Knoxville Boulevard. We accept the invitation to be a participating agency in the development of this project. However, with the undersized staff and limited budget that currently exist at our office, our involvement and available service may be limited in nature. We will strive to provide timely input, participate in coordination meetings, and comment on all alternatives.

According to our records, personnel from the Service, Tennessee Wildlife Resources Agency, University of Tennessee, and TDOT met on March 11, 2008, to discuss the status and importance of the Berry Cave salamander (*Gyrinophilus gulolineatus*) population that resides in

the Meades Quarry Cave system located near the northern portion of the study area. A survey documented the Meades Quarry Cave population as the most robust population of this species currently known, making urgent the protection of this population from threats that would lead to its decline. It was recommended that a dye-tracing study be conducted by TDOT to delineate the surface recharge zone that is hydologically connected to Meades Quarry Cave. **The Service believes that the South Knoxville Boulevard EIS could not be considered complete without consideration of such data during the alternatives analysis.**

We strongly encourage TDOT to initiate a dye-tracing study to delineate the surface recharge zone of Meades Quarry Cave. Without this data, we do not believe the potential threats to the cave, the Berry Cave salamander, and the state-listed Tennessee Cave salamander (*Gyrinophilus palleucus*) populations that reside there can be adequately analyzed during the ongoing NEPA process. The Service would lack data that are necessary to evaluate whether the possibility of road development in the vicinity of Meades Quarry Cave, considered with other data on distribution, status, and threats, poses the threat of extinction in the foreseeable future of the Berry Cave salamander. Absent such data and assurances from TDOT that any road construction projects in the vicinity of Meades Quarry Cave would include measures to prevent impacts to the cave system, we would likely find that the potential for such a project poses a considerable threat to the species. This could affect future determinations regarding the potential need for protecting the Berry Cave salamander under the Endangered Species Act (ESA). Absent appropriate assurances, emergency listing of this species pursuant to section 4 of the ESA may be necessary.

If you have any questions regarding the information which we have provided, please contact Robbie Sykes of my staff at 931/528-6481, extension 209.

Sincerely,

Lee A. Barclay

Lee A. Barclay, Ph.D.
Field Supervisor

xc: Robert Todd, TWRA, Nashville, TN
LeighAnn Tribble, FHWA, Nashville, TN
Ben West, EPA, Atlanta, GA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

November 5, 2010

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

Re: Concurrence Point 2. South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee. (FWS #2010-CPA-0811).

Dear Mr. Love:

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing an Environmental Impact Statement (EIS) for the proposed construction of the South Knoxville Boulevard (State Route 71). The project would extend from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee. The EIS is being developed by TDOT to document the impacts of the subject project, in accordance with the National Environmental Policy Act and the Tennessee Environmental Streamlining Agreement (TESA). In accordance with TESA, TDOT has requested that the U.S. Fish and Wildlife Service (Service) review and provide concurrence (or non concurrence) on Concurrence Point 2, *Project Alternatives to be Evaluated in the Environmental Document*. The proposed project is considered necessary to improve access from the South Knoxville area to the Central Business District in downtown Knoxville, while potentially relieving congestion and improving safety conditions on existing roadways in the area.

Our database suggests that suitable roost habitat for the Indiana bat may exist within the project corridor and would likely be altered by the proposed action. Due to the lack of past survey efforts in Tennessee, we do not have sufficient information to determine whether Indiana bats utilize this area. At the NEPA level, we ask that TDOT examine habitat suitability within the various corridors and factor potential Indiana bat impacts into their decision when choosing a preferred alignment. Further coordination with our office, consisting of a more detailed analysis, would be required once the final alignment is chosen in order to receive Section 7 coverage under the Endangered Species Act.

The Berry Cave salamander (*Gyrinophilus gulolineatus*) is classified by the State as subspecies of the Tennessee cave salamander and receives protection under the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974 (Tennessee Code Annotated §§ 70-8-101-112). The Service is currently reviewing the petition to list the Berry Cave salamander as a federally endangered species under the Endangered Species Act. According to our records, personnel from the Service, Tennessee Wildlife Resources Agency, The University of Tennessee, and TDOT met on March 11, 2008, to discuss the status and importance of the Berry Cave salamander populations that reside in the Meades Quarry Cave system (Meades Quarry, Meades River, and Fifth caves), located near the northern portion of the study area. Surveys have confirmed that Berry Cave salamander populations exist in all three caves within this system and that the Meades Quarry Cave population is the most robust population known, making urgent the protection of this cave system from water quality impacts. Due to the proximity of the proposed roadway to this cave system, it was recommended that a dye-tracing study be conducted by TDOT to determine which karst features within the Toll Subwatershed are hydrologically connected to the Meades Quarry Cave system. TDOT contracted with ARCADIS to perform a hydrogeologic dye trace study from April through June 2009. Dye trace results demonstrated a general southwest to northeast orientation of groundwater flow and appeared to substantiate the hypothesis that Cruze Cave and Meades Quarry Cave systems are not hydrologically connected.

In TDOT's determination as to which alignments should be carried forward through the NEPA process, substantial focus was given to environmental constraints. TDOT has recommended the elimination of Alignment 1 from further consideration in the EIS based on its proximity to the Meades Quarry Cave system and Alignment 5 due to potential impacts to Burnett Creek. Alignments 2, 3, and 4 are recommended for further analysis because they meet the stated purpose and need and are determined to have less environmental impacts than similar alternatives. These three alignments were purposefully designed to avoid or minimize impacts to the Meades Quarry Cave system and the State threatened Berry Cave salamander.

TDOT has additionally proposed filtration systems for sinkholes that recharge the Meades Quarry Cave system which cannot otherwise be avoided by modifications in roadway design (p. 43). While properly installed and maintained peat filtration systems may filter toxic runoff in some capacity, they would also, by design, limit the amount of organic input available to the Meades Quarry Cave system. This could have detrimental impacts to invertebrate populations on which the Berry Cave salamander feeds. While the Service agrees that the three alternatives recommended for further analysis could minimize direct construction impacts to the Meades Quarry Cave system based on their avoidance of karst features, TDOT has no control over zoning ordinances and cannot guarantee that commercial development would not occur along the new roadway (p. 37) that might impact the Meades Quarry Cave system. Therefore, we strongly encourage TDOT to meet with the Knoxville-Knox County Metropolitan Planning Commission and attempt to receive written assurance that no development would be permitted along the roadway (if it is constructed) which could potentially affect the recharge area for the Meades Quarry Cave system.

Concurrence Point 2 was prepared by TDOT to identify the various build alternatives considered and those to be carried forward in the NEPA process. We have reviewed the Concurrence Point 2 package (*Project Alternatives to be Evaluated in the Environmental Document*) and **concur** that it is adequate and that TDOT should proceed to Concurrence Point 3, *Draft Environmental Impact Statement*. The signed TESA Concurrence Point 2 form for this project is attached.

If you have any questions regarding our comments, please contact John Griffith of my staff at 931/528-6481 (ext. 228) or by email at john_griffith@fws.gov.

Sincerely,

Mary E. Jennings

Mary E. Jennings
Field Supervisor

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

November 17, 2011

Ms. Leigh Ann Tribble
Federal Highway Administration
Tennessee Division Office
404 BNA Drive, Suite 508
Nashville, Tennessee 37217

Subject: FWS #12-CPA-0026. South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee.

Dear Ms. Tribble:

Thank you for your letter dated October 24, 2011, transmitting a biological assessment (BA) for the proposed construction of South Knoxville Boulevard from Governor John Sevier Highway to Moody Avenue in Knox County, Tennessee. The Tennessee Department of Transportation (TDOT) has determined that the proposed project "is not likely to affect" the Federal Candidate Berry Cave Salamander (*Gyrinophilus gulolineatus*) due to construction commitments to reduce contaminants into sinkholes that could recharge Meades Quarry Cave and Cruze Cave systems. In addition, dye trace studies indicated that Meades Quarry Cave and Cruze Cave systems would not be impacted by runoff from the proposed roadway. Furthermore, TDOT has agreed to perform Indiana bat (*Myotis sodalis*) surveys for presence/probable absence of the species within the chosen alignment. The Tennessee Division Office agrees with the determination made TDOT that the project is "not likely to adversely affect" the Berry Cave salamander based on groundwater studies and commitments to minimize runoff into nearby sinkholes. Personnel of the U.S. Fish and Wildlife Service have reviewed the information provided and offer the following comments.

We concur with the survey proposal put forward by TDOT to ascertain whether the Indiana bat may utilize the project area as summer roosting habitat. Under our current guidance, survey results are good for two years.

In TDOT's determination as to which alignments should be carried forward through the NEPA process, substantial focus was given to environmental constraints. TDOT has recommended the elimination of Alignment 1 from further consideration in the EIS based on its proximity to the Meades Quarry Cave system and Alignment 5 due to potential impacts to Burnett Creek.

Alignments 2, 3, and 4 are recommended for further analysis because they meet the stated purpose and need of the project and are determined to have less environmental impacts than similar alternatives. These three alignments were purposefully designed to avoid or minimize impacts to the Meades Quarry Cave system and the Berry Cave salamander.

While the Service agrees that the three alternatives recommended for further analysis could minimize direct construction impacts to the Meades Quarry Cave system based on their avoidance of karst features, TDOT has no control over zoning ordinances and cannot guarantee that commercial development would not occur along the new roadway that might impact the Meades Quarry Cave system. Therefore, we recommend that TDOT propose this facility as a controlled-access highway or meet with the Knoxville-Knox County Metropolitan Planning Commission (MPC) and attempt to receive written assurance that no development would be permitted along the roadway (if constructed) which could potentially affect the recharge area for the Meades Quarry Cave system. Unless the facility is constructed as a controlled-access highway or a commitment is obtained from the local MPC to restrict commercial development, TDOT should assess potential impacts to the Berry Cave salamander from future development along the proposed roadway. We ask that TDOT address our concerns for unlimited development prior to providing section 7 concurrence for this species.

If you have any questions regarding our comments, please contact John Griffith of my staff at 931/525-4995 or by email at john_griffith@fws.gov.

Sincerely,

Mary E. Jennings

Mary E. Jennings
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

December 9, 2011

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

Re: FWS# 12-CPA-0084. Concurrence Point 3. James White Parkway (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee.

Dear Ms. Andrews:

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), has prepared an Environmental Impact Statement (EIS) for the proposed construction of the James White Parkway (State Route 71). The project would extend from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee. The EIS was developed by TDOT to document the impacts of the subject project, in accordance with the National Environmental Policy Act and the Tennessee Environmental Streamlining Agreement (TESA). In accordance with TESA, TDOT has requested that the U.S. Fish and Wildlife Service (Service) review and provide concurrence (or nonconcurrence) on Concurrence Point 3, *Preliminary Environmental Impact Statement*. The proposed project is considered necessary to improve access from the South Knoxville area to the Central Business District in downtown Knoxville, while potentially relieving congestion and improving safety conditions on existing roadways in the area.

Table 3.26 of this document quantifies the approximate acreage of forested habitat that would be impacted by each build alternative. The percentage of forested area estimated within right-of-way for the Green and Blue alternatives is 54% and 64% for the Red Alternative. TDOT proposes removal of suitable roosting habitat during the winter months as their primary form of mitigation for the project. The assumption is that no Indiana bats will be recorded during the summer surveys or that project impacts would not rise to a level of adverse effect to this species. Additional measures to avoid or minimize harm may be requested if Indiana bats are documented within the project area. We acknowledge TDOT's commitment to summer surveys along the chosen alignment to ascertain whether Indiana bats are using the area as summer roosting habitat. Under our current guidance, survey results are good for two years.

The James White Parkway Task Force requested a fully access-controlled parkway in a 2005 resolution to the Knox County Commissioner. In our November 5, 2010, response to the Concurrence Point 2 package, we requested that TDOT attempt to obtain assurances that no commercial development would be allowed along the proposed roadway within the recharge area of the Meades Quarry Cave system (Meades Quarry, Meades River, and Fifth caves) to protect Berry Cave salamander populations in these caves. TDOT has committed, under Build Alternatives in the Executive Summary section of the EIS document, to construction of a fully access-controlled facility. Based on dye trace study results indicating no groundwater connection between the affected No Name Cave (EIS p. 160, paragraph 3) and Meades Quarry cave system, southerly shifts in alignments to avoid sinkholes that recharge the Meades Quarry Cave system, TDOT's commitment to working with the Service and the Tennessee Department of Environment and Conservation to explore means of reducing contaminants entering into affected sinkholes (EIS p. 165), and the assurance that secondary development would be limited by a fully access controlled facility; we believe that TDOT is adequately addressing our concerns for impacts to the Berry Cave salamander.

We have reviewed the *Draft Environmental Impact Statement* and **concur** that the environmental concerns have been adequately addressed and TDOT should proceed to the development of Concurrence Point 4, *Preferred Alternative and Preliminary Mitigation Package*. The signed TESA Concurrence Point 3 for this project is attached.

If you have any questions regarding our comments, please contact John Griffith of my staff at 931/525-4995 or by email at john_griffith@fws.gov.

Sincerely,

Mary E. Jennings
Field Supervisor

Enclosure

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
AIR POLLUTION CONTROL DIVISION
9th Floor - L&C Annex
401 Church Street
Nashville, Tennessee 37243-1531

Mr. Charles E. Bush, Transportation Manager II
Tennessee Department of Transportation
Environmental Division
Suite 900-James Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

April 22, 2008

Dear Mr. Bush:

In reference to your request for an Environmental Impact Statement concerning *the Tennessee Department of Transportation (TDOT) and the Federal Highway Administration (FHWA) / South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County Construction Project* dated April 17, 2008.

The Division directly serves 91 counties within the state and oversees and assists in the actions of Davidson, Hamilton, Knox, and Shelby counties, which have their own local air pollution control programs. For Environmental Impact concerns with Air Quality in **Knox County,** please contact the local air program.

Knoxville/Knox

Lynne A. Liddington, Director
Department of Air Quality Management
140 Dameron Avenue
Knox County Health Department - Suite 242
Knoxville, TN 37917-6413
Phone: (865) 215-5900
Lynne direct: (865) 215-5914

(Continued on next Page)

Email:laliddington@aqm.co.knox.tn.us
FAX: (865) 215-5902

Please contact me at phone number (615) 532-0550 should you need further assistance concerning Air Quality.

Sincerely,

Ms. Pamela J. Stephens

Ms. Pamela J. Stephens
Environmental Specialist IV
Mobile and Air Resources Management Program
Tennessee Department of Environment and Conservation
Air Pollution Control Division

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Air Pollution Control Division
9th Floor L&C Annex, 401 Church Street
Nashville, TN 37243-1531

April 28, 2008

Mr. Charles E. Bush
Transportation Manager II
Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

Subject: Invitation to be a Participating Agency for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee – Environmental Impact Statement.

Dear Mr. Bush:

The Division of Air Pollution Control has reviewed the information provided on the Environmental Impact Statement (EIS) for the South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee. Knox County is designated as nonattainment for ozone and fine particulates (PM2.5) under the Federal National Ambient Air Quality Standards (NAAQS) as mentioned in the Project Data Summary Sheet. As per the Transportation Conformity rules in 1200-3-34, the project must ultimately demonstrate conformity in the latest Long Range Transportation Plan for the Knoxville Area, as indicated in the EIS. As Knox County is designated nonattainment for PM2.5, a hot-spot analysis might also be required.

In addition, there may be Mobile Source Air Toxic (MSAT) concerns; please contact Tameka Macon (615-781-5767) with the Tennessee Division of the Federal Highway Administration for any applicable guidance.

This agency's other interests, above what would be addressed through the standard NEPA process, concern the control of fugitive dust and equipment exhaust emissions during the construction phase. Additionally, our concerns include that any structures requiring demolition are asbestos free, as per the requirements of Chapter 1200-3-11, Hazardous Materials. I would also like to point out that the open burning regulations have changed dramatically. Before the burning any wood waste, please refer to Chapter 1200-3-4; Open Burning Certification Process at http://state.tn.us/environment/apc/apcregs/.

In Knox County, the Knox County Department of Air Quality Management has jurisdiction. We request that the local program also have the opportunity to review the EIS, as there might be additional local requirements not mentioned above. The Knox County Department of Air Quality Management can be contacted at (865) 215-5900.

We appreciate the chance to comment on the document. If you have any questions or comments, please feel free to call me at (615) 532-0554.

Sincerely,

Barry R. Stephens

Barry R. Stephens, P.E.
Director

cc: David Owenby
Mary Parkman
Joe Sanders

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Natural Areas
7th Floor L&C Annex
401 Church Street
Nashville, Tennessee 37243
Phone 615/532-0431 Fax 615/532-0046

May 7, 2008

Charles Bush
TDOT Environmental Division
Suite 900 - James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243-0334

Subject: South Knoxville Boulevard/SR 71, Knox County

Dear Mr. Bush:

Thank you for the request for environmental coordination on the South Knoxville Boulevard/SR 71 project in Knox County. We have reviewed the state's natural heritage database, and find that the following rare species have been observed within one mile of the project study area:

Type	Scientific Name	Common Name	Global Rank	State Rank	Fed. Prot.	St. Prot.
Amphibian	Gyrinophilus palleucus	Tennessee Cave Salamander	G2G3	S2	**	T
Bird	Accipiter striatus	Sharp-shinned Hawk	G5	S3B	No Status	D
Bird	Ixobrychus exilis	Least Bittern	G5	S2B	**	D
Bird	Tyto alba	Common Barn-owl	G5	S3	**	D
Fish	Phoxinus tennesseensis	Tennessee Dace	G3	S3	**	D
Flowering Plant	Aureolaria patula	Spreading False-foxglove	G3	S3	**	S
Flowering Plant	Cimicifuga rubifolia	Appalachian Bugbane	G3	S3	**	T
Flowering Plant	Helianthus occidentalis	Naked-stem Sunflower	G5	S2	**	S
Flowering Plant	Hydrastis canadensis	Goldenseal	G4	S3	**	S-CE
Flowering Plant	Onosmodium molle ssp. occidentale	Western False Gromwell	G4G5T4?	S1S2	**	T
Mollusc	Athearnia anthonyi	Anthony's River Snail	G1	S1	LE,XN	E

Study Area One Mile Radius List Continued:

Mollusc	Dromus dromas	Dromedary Pearlymussel	G1	S1	LE	E
Mollusc	Io fluvialis	Spiny Riversnail	G2	S2	**	**
Mollusc	Plethobasus cooperianus	Orange-foot Pimpleback	G1	S1	LE	E
Non-Vascular Plant	Funaria americana	**	G3?	S1?	**	T

We ask that TDOT provide planning consideration for the protection of the species listed above. Several caves and other karst features with noted habitat for rare species including Cruze Cave have been observed near or within the project study area. We ask that impacts to these karst habitats and any other encountered in the study area be minimized. We recommend that TDOT contact the Tennessee Cave Survey (http://webwhisper.com/tcs/default.html) for a database review to determine whether additional caves exist in the study area.

Within four miles of the study area, the following additional rare species have been observed:

Type	Scientific Name	Common Name	Global Rank	State Rank	Fed. Prot.	St. Prot.
Bird	Falco peregrinus	Peregrine Falcon	G4	S1N	No Status	E
Fish	Acipenser fulvescens	Lake Sturgeon	G3G4	S1	**	E
Fish	Carpiodes velifer	Highfin Carpsucker	G4G5	S2S3	**	D
Fish	Noturus flavipinnis	Yellowfin Madtom	G1	S1	LT,XN	E
Fish	Percina tanasi	Snail Darter	G2G3	S2S3	LT	T
Flowering Plant	Arabis patens	Spreading Rockcress	G3	S1	**	E
Flowering Plant	Cardamine flagellifera	Running Bittercress	G3	S2	**	T
Flowering Plant	Panax quinquefolius	American Ginseng	G3G4	S3S4	**	S-CE
Flowering Plant	Silene regia	Royal Catchfly	G3	SH	**	E-P
Flowering Plant	Tetragonotheca helianthoides	Pineland Squarehead	G5	SH	**	E-P
Heron Rookery	Heron rookery	Heron Rookery	GNR	SNR	**	**
Mammal	Sorex longirostris	Southeastern Shrew	G5	S4	**	D
Mollusc	Fusconaia edgariana	Shiny Pigtoe	G1	S1	LE	E
Mollusc	Quadrula intermedia	Cumberland Monkeyface	G1	S1	LE	E
Non-Vascular Plant	Homaliadelphus sharpii	Sharp's Homaliadelphus	G3?	S1	**	E
Non-Vascular Plant	Radula voluta	A Liverwort	G3	S2	**	S

Should suitable habitat exist in or downstream of the study area, we ask that TDOT evaluate areas to be disturbed for these species. We also ask that the project be carefully coordinated with the Tennessee Wildlife Resources Agency and the US Fish and Wildlife Service.

For stabilization of disturbed areas, the Division advocates the use of native trees, shrubs, and warm season grasses, where practicable. Care should be taken to prevent revegetation with plants listed by the Tennessee Exotic Pest Plant Council as harmful exotic plants.

Please keep in mind that not all areas of Tennessee have been surveyed and that a lack of records for any particular area is not a statement that rare species are absent from that area. For information regarding the protection status and ranks, please visit our website at http://state.tn.us/environment/na .

Thank you for considering Tennessee's rare species throughout the planning of this project. Should you have any questions, please do not hesitate to contact me at (615) 532-0440.

Sincerely,

Silas Mathes
Heritage Data Manager

FILE COPY

MAY 16 2008

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DIV SOLID WASTE MGT

APR 21 2008

Group No_____ File No_____
ID No_____

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

COPY

April 17, 2008

Mr. Mike Apple
Director
Tennessee Department of Environment and Conservation
Division of Solid/Hazardous Waste Management
L&C Tower, 5th Floor,
401 Church Street,
Nashville, Tennessee 37243-1535

SUBJECT: Initial Coordination for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee – Environmental Impact Statement.

Dear Mr. Apple:

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), is initiating an Environmental Impact Statement (EIS) for the proposed construction of South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in South Knoxville, Knox County, Tennessee, a distance of approximately four miles depending upon the alternative route considered. The proposed project is considered necessary to improve access from the South Knoxville area to the Central Business District (CBD) in downtown Knoxville, while potentially relieving congestion and safety issues on existing roadways, including Chapman Highway (U.S. 441/State Route 33). We have enclosed a Project Data Summary, which includes project vicinity maps for this project. This material is intended to initiate the scoping process.

TDOT is in the early stages of planning for this project and would like to know if the proposed project will have any effect, either favorable or adverse, on any programs being planned or executed by your agency/organization. We request that you review the enclosed material and advise us with your comments on potential environmental impacts. Areas of specific concern to your agency/organization will be addressed during the development of our environmental and location studies.

101420.00

The Department's environmental document, i.e. the EIS, will assess a wide range of concerns including impacts on the social, economic, and ecological environment. Your input will assist us in the preparation of the EIS. The Draft EIS will be circulated to federal, state, and local agencies and officials for review and comments.

If there are any areas you feel require special consideration, we will be glad to cooperate with you in any way to avoid possible adverse effects or conflicts with any of your proposed programs.

We would appreciate receiving your comments, suggestions, and information on this proposal within 45 days of the date of this letter. If you have any questions, please contact Mr. Tom Love at 615-741-5364. Thank you for your cooperation and interest in this project.

Sincerely,

Charles E. Bush
Transportation Manager II

Enclosures: Project Data Summary (including Maps)

TDEC SOLID WASTE MANAGEMENT- MEMO

Date: May 20, 2008

To: Larry Cook, TDEC

CC:

From: Ryan Miller, TDEC RM

RE: Environmental Review – Environmental Review – Initial Coordination for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee – Environmental Impact Statement.

I have reviewed the plans for the proposed South Knoxville Boulevard (State Route 71). I have found no known solid waste issues in this area. If any Solid Waste issues arise, please contact this office at (865) 594-5469.

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF SOLID WASTE MANAGEMENT

OFFICE CORRESPONDENCE

TO	DATE

DATE: May 20, 2008

TO: Larry Cook, DSWM, Knoxville EAC

FROM: Revendra Awasthi, DSWM, Knoxville EAC RA

RE: Environmental Review, Initial Coordination for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, TN

There is no Treatment-Storage-Disposal facility located in the neighborhood of this project location. There are some hazardous waste generator facilities located in South Knoxville area of Knoxville, TN, but they will not have any adverse impact on this project. If any hazardous waste is generated as a result of construction activities from this project, the Division of Solid Waste Management, Knoxville EAC can provide assistance for proper management. The Division of Solid Waste Management, Knoxville EAC can be reached at (865) 594-6035.

There are no other concerns related to Tennessee Hazardous Waste Program.

STATE OF TENNESSEE
Department of Environment and Conservation
Ground Water Protection
10th Floor, L & C Tower
401 Church Street
Nashville, Tennessee 37243

May 1, 2008

Mr. Charles E. Bush
Transportation Manager II
Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
505 Deadrick Street
Nashville, TN 37243-0334

Re: Initial Coordination for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee – Environmental Impact Statement

Dear Mr. Love:

The Division of Ground Water Protection regulates all aspects of the subsurface sewage disposal (SSD) program in the State of Tennessee. Knox County operates their own SSD program through a contract/agreement with the Department. In this regard, Knox County staff has worked closely with municipalities and/or property owners on those construction projects where it is anticipated that the project will potentially impact existing SSD systems.

Regarding the above referenced project, the Division of Ground Water Protection anticipates that it may impact existing SSD systems. If it becomes apparent that Knox County staff assistance will be requested on this project, we ask that they be given adequate prior notice to allow for scheduling of the additional workload.

If you have any questions or think that assistance will be requested on this project, you should contact Mr. Ronnie Neese at (865) 215-5200.

Sincerely,

Alan Schwendimann
Director
Division of Ground Water Protection

CC: Mr. Ronnie Neese, Knox County Environmental Health Division

VAS/deh

EIresponse95doc

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
WATER SUPPLY
9th Floor, 401 Church Street
Nashville, Tennessee 37243-1549
Phone: (615) 532-0191: Fax: (615) 532-0503

May 6, 2008

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

RE: Proposed South Knoxville Boulevard (SR 71) from Governor John Sevier Highway (SR 168) to Moody Avenue Knox County, Tennessee Environmental Impact Statement

Mr. Bush:

The Division of Water Supply has received and reviewed the request for Proposed South Knoxville Boulevard (SR 71) from Governor John Sevier Highway (SR 168) to Moody Avenue Knox County, Tennessee Environmental Impact Statement and would like to thank the Department of Transportation for the opportunity to comment on this plan.

Safe Dams Program:

A file review was conducted of all registered sites in the Safe dam program. There are no regulated dams within the proposed project area. The contact for information in the Safe Dams Program can be obtained from Mr. Lyle Bentley Manger of the Safe Dams Section in the Division of Water Supply. Mr. Bentley may be reached by e-mail lyle.bentley@state.tn.us reached at (615) 532-0154.

Source Water Protection Program:

A review of the community and non-community water supplies in the area shows portions of the proposed work area to be in a Source Water Protection Area (Please see attached map). Before any construction the water system needs to be notified and special efforts need to be in place to insure no loss of contamination into the source water area. Any information on the Source Water/Wellhead Protection areas can be directed to Mr. Scotty D. Sorrells Manager Groundwater Management Section. Mr. Sorrells may be reached by e-mail scotty.sorrells@state.tn.us or by telephone at (615) 532-9224.

Water Well Program:

A file review was conducted of all the registered private water wells within this proposed area. Please contact Mr. Luke Ewing with the names of the topographic quads. There are private water supplies within a mile of the proposed area. Please be advised that not all the water wells that are in existence are on this database and that there may be older wells that we have no record of as well as hand dug wells whose existence we would not have recorded. All water wells that are encountered should be plugged and abandoned by a licensed well contractor. Any information related to the Water Well Program can be directed to Mr. Luke Ewing Manager Water Well Program. Mr. Ewing can be reached by e-mail luke.ewing@state.tn.us or by telephone at (615) 532-0176. All of the wells drilled for testing and or production will need to be registered with the water well program and appropriately tagged and recorded.

Underground Injection Control:

A file review was conducted of all the registered Underground injection Control (UIC) points within the area of review. There are several registered UIC sites are within the proposed area. Please be advised that not all old large capacity septic systems or stormwater injection points that are in existence are on this database. All UIC wells that are encountered should be plugged and abandoned according to approval from the UIC program. Also please be advised that the area has the potential for karst activity. Any sinkhole that is encountered should be registered with the UIC program and shall be permitted before any disturbance to the area.

Any information on the UIC programs can be directed to Ms. Carolyn Sullivan UIC program Groundwater Management Section. Ms. Sullivan may be reached by e-mail carolyn.sullivan@state.tn.us or by telephone at (615) 532-0180.

This letter represents a brief review off best available data sources and not a comprehensive field evaluation. Please verify all information contained within this letter in the field.

The issuance of this letter does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State, or local laws or regulations.

If you have any questions, feel free to call me at (615) 532-9224 or email at scotty.sorrells@state.tn.us.

Sincerely,

Scotty D. Sorrells
Manager Ground Water Management Section
Source Water Protection Coordinator
Division of Water Supply

c: Thomas A. Moss Deputy Director DWS
Lyle Bentley Chief SDP
Luke Ewing Manager WWP
Carolyn Sullivan UIC

TENNESSEE DEPARTMENT OF AGRICULTURE
Ellington Agricultural Center
P.O. Box 40627
Nashville, TN 37204

April 28, 2008

Mr. Tom Love
Environmental Manager
Tennessee Department of Transportation
Suite 900, James K. Polk Building
505 Deadrick Street
Nashville, TN 37243-0334

Re: Invitation to be a Participating Agency
South Knoxville Boulevard (SR71),
Knox County, Tennessee

Dear Mr. Love:

The Department of Agriculture accepts the invitation to become a participating agency with TDOT and FHWA in the development of the Environmental Assessment for the above-referenced project.

Please do not hesitate to contact us if you have questions.

Sincerely,

Terry J. Oliver
Deputy Commissioner

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

May 1, 2008

Mr. Charles Bush
Tennessee Dept. of Transportation
Suite 700/J. K. Polk Bldg.
Nashville, Tennessee, 37243-0349

RE: FHWA, SR-71/SR-168 TO MOODY AVENUE, UNINCORPORATED, KNOX COUNTY

Dear Mr. Bush:

In response to your request, received on Monday, April 21, 2008, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with t he a ppropriate S tate H istoric P reservation O ffice bef ore t hey c arry o ut their p roposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

Considering available information, we find that the project as currently proposed MAY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES. You should continue consultation with our office, designated consulting parties and invite them to participate in consultation, and provide us with appropriate survey documentation for review and comment. Please direct questions and comments to Joe Garrison (615) 532-1550-103. We appreciate your cooperation.

Sincerely,

E. Patrick McIntyre

E. Patrick McIntyre
Executive Director and
State Historic Preservation Officer

EPM/jyg

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

Suite 403 • City County Building • 400 Main Street • Knoxville, Tennessee 37902
Telephone: 865 215-2500 • Fax: 865 215-2068 • E-mail: contacttpo@knoxtrans.org
Web Site: www.knoxtrans.org

May 23, 2008

Charles E. Bush
Transportation Manager 2
TDOT Environmental Division
James K. Polk Bldg.
505 Deaderick St, Suite 900
Nashville, TN 37243

Dear Mr. Bush:

Subject: Project Data Summary and Coordination Plan for Agency & Public Involvement Comments
Environmental Impact Statement (EIS) for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue

The enclosed attachment contains the Knoxville Regional Transportation Planning Organization (TPO) comments on the Project Data Summary and the Coordination Plan for Agency & Public Involvement Comments for the South Knoxville Boulevard EIS. Please contact me at (865) 215-3790 or Amy Brooks, Transportation Planner at (865) 215-4001 with any questions.

Sincerely,

Jeff Welch
Director
Knoxville Regional TPO

Enclosures: TPO comments on the Coordination Plan for the South Knoxville Boulevard EIS

The TPO coordinates a comprehensive, multi-modal transportation planning process for the Knoxville regional area.

Comments for the Project Data Summary and the Coordination Plan for the South Knoxville Boulevard EIS, Knox County, TN from the Knoxville Regional Transportation Planning Organization (TPO).

Project Data Summary Comments	
Page	**Comment**
4	The entire project not just a portion of the project was included in the 2005-2030 LRTP, Project # 105.
5	There is no mention of the "James White Parking Extension Study" completed in January 2005.
5	There is no mention of the comprehensive traffic study that was completed in November 2007: 'Traffic Study Report: Chapman Highway Corridor Improvement Study". This study was commissioned by TDOT and performed by Palmer Engineering.
6	This document may be too preliminary to cite traffic forecasts. The TPO would like to coordinate with TDOT to develop forecasts using our travel demand model. In order to evaluate the forecasts in Table 1, the TPO needs additional background information on how these forecasts and level of service ratings were developed.
8	Table 2. Crash Rates on Chapman Highways: the Sevier County Lane to Fronda Lane and Overbrook Lane is a long segment and may need to be broken up further since some are four-lane sections and some are five-lane sections.
14	Paragraph 2, line 2: remove "and regions, such as the Knoxville region."
14	Please also note that as a non-attainment area for PM 2.5 a PM 2.5 hotspot analysis is required.
15	Paragraph 1, line 1: remove "conforms" and replace with "conform"
15	Project 105 in the LRTP map shows the project extended from Chapman Highway south to John Sevier Highway.
Coordination Plan Comments	
Page	**Comment**
11	Change "Metropolitan Commission of Knoxville and Knox County" to "Knoxville-Knox County Metropolitan Planning Commission"
12	Remove "Knoxville Area Transit" (repeated from page 11)
12	Add Knoxville Regional Transportation Planning Organization
General Comments	
Overall, both documents are well-written, clear and concise.	
Please notify the TPO if you need a copy of the 2005 "James White Parkway Extension Study".	

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
Regulatory Branch
3701 Bell RD
Nashville, TN 37214

June 10, 2008

Regulatory Branch

SUBJECT: File No. 200800877; Proposed South Knoxville Boulevard (SR-71) from Governor John Sevier Highway (SR-168) to Moody Avenue, in Knoxville, Knox County, Tennessee

Mr. Charles E. Bush (TM 2)
Tennessee Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
Nashville, Tennessee 37243-0334

Dear Mr. Bush:

We gladly accept the Cooperating Agency role in the preparation of the EIS for this project. Our Cooperating Agency responsibilities are described in the CEQ regulations implementing NEPA. In addition, we accept the Participating Agency role in the development of the EIS document with TDOT and FHWA. Our Participating Agency responsibilities are explained in Section 6002 of SAFETEA-LU.

The project data, coordination plan, and maps submitted indicate that TDOT plans to construct the South Knoxville Boulevard at the subject location. Most of the proposed study area is classified as Urban Growth and Planned Growth in the 2002 South Knox County Sector Plan. These areas contain a mixture of rural open and forested spaces, low to moderate density residential developments, and commercial/retail businesses. The only north-south major artery connecting South Knoxville and the downtown business district is Chapman Highway (US-441). Chapman Highway is a heavily congested route experiencing higher than average crash rates.

At this point in the process, four main alternatives are anticipated to be carried forward for detailed review in the EIS: "No-Build" and up to three "Build" alternatives involving new alignment. As we receive additional information, we will comment on the adequacy of the proposed alternatives.

The regulatory authorities and responsibilities of the Corps of Engineers (Corps) are based mainly on two laws: Section 404 of the Clean Water Act (33 USC 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). Section 404 requires a Corps permit for any discharge of dredged or fill material into waters of the United States (WUS). Section 10 prohibits the obstruction or alteration of navigable waters of the United States (NWUS) without a Corps permit.

Based on the information submitted, we anticipate that several Tennessee River tributaries (i.e., WUS) would be impacted by the alternative alignments. We do not believe that any NWUS would be directly affected by this proposal. Drainage structures (i.e., bridges and culverts) could be built, extended, or widened over these tributary streams. We do not have enough information at this time to estimate whether jurisdictional wetlands would be affected by any of the proposed alignments.

Our specific permitting requirements for stream/wetland road crossings would depend on the specific installation methods and associated impacts. Road crossings that would not involve substantial aquatic habitat alteration may qualify for authorization under our Nationwide Permit (NWP) program (33 CFR 330). Those activities that do not qualify for NWP authorization would require authorization by a standard Department of the Army permit.

Finally, our permit review includes application of the Section 404(b)(1) Guidelines (40 CFR 230). The Guidelines require that no discharge of dredged or fill material may be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

If you have any questions or wish to discuss DA permit requirements for the project in more detail, please contact me at 615/369-7519 or jose.r.hernandez@usace.army.mil.

Sincerely,

J. Ruben Hernandez
Project Manager
Operations Division

United States Department of the Interior

U. S. GEOLOGICAL SURVEY

Reston, VA 20192

In Reply Refer To:
Mail Stop 423

APR 2 4 2008

Charles E. Bush
Transportation Manager, Environmental Division
Tennessee Department of Transportation
Suite 900, Polk Building
505 Deaderick St.
Nashville, TN 37243-0334

Subject: Invitation to Serve as a Participating Agency for the South Knoxville Boulevard (SR 71) from Governor John Sevier Highway (SR 168) to Moody Avenue Environmental Impact Statement, Knox County, TN

Dear Mr. Bush:

This is in response to your letter dated April 17, 2008 requesting that the U.S. Geological Survey (USGS) serve as a participating agency on the subject environmental impact statement. It is the policy of the USGS to decline requests to be an official participating agency in the NEPA activities of another agency except where the proposed action may directly affect our facilities or the conduct of our work. However, the USGS as part of our mission will continue to provide science support to other agencies when our data and scientific expertise have relevance to their proposed actions undergoing NEPA review. Such assistance could include attending or making presentations at scoping and technical meetings, and conducting special studies and data collection projects.

If you have any questions concerning our decision, you can contact me at (703) 648-4423. For information concerning the natural resources of the project area, contact Scott Gain, Director of the USGS Tennessee Water Science Center, at (615) 837-4700.

Sincerely,

James F. Devine
Senior Advisor for Science Applications

KNOXVILLE-KNOX COUNTY
MPC
METROPOLITAN
PLANNING
COMMISSION
TENNESSEE

1956-2006
Celebrating Fifty Years of Public Service

April 29, 2008

Charles E. Bush
Transportation Manager II
Tennessee Department of Transportation
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

SUBJECT: Invitation to be a Participating Agency for South Knoxville Boulevard (State Route 71) from Governor John Sevier Highway (State Route 168) to Moody Avenue in Knox County, Tennessee – Environmental Impact Statement

Dear Mr. Bush:

The Knoxville Knox County Metropolitan Planning Commission accepts your invitation to become a participating agency with the Tennessee Department of Transportation (TDOT) and the Federal Highway Administration in the development of the environmental impact statement for the subject project. We look forward to working with TDOT on this important project.

Sincerely,

Jeffrey A. Welch
TPO Director

Suite 403 • City County Building
400 Main Street
Knoxville, Tennessee 37902
865 • 215 • 2500
FAX • 215 • 2068
www.knoxmpc.org

APPENDIX D – PRELIMINARY SECTION 4(F) SUMMARY REPORT

James White Parkway (SR-71) from Chapman Highway to Moody Avenue, Knox County, Tennessee

Preliminary Section 4(f) Summary Report

Proposed Action

The Tennessee Department of Transportation (TDOT) proposes to construct James White Parkway [State Route (SR) 71] from Chapman Highway to Moody Avenue in Knox County, Tennessee (formerly referred to as the South Knoxville Boulevard project). The project will provide an improved north/south highway corridor between downtown Knoxville and the South Knoxville area. This roadway is expected to provide much needed traffic relief for existing Chapman Highway (SR-71, U.S. 441), which currently provides the primary north-south route into downtown Knoxville from South Knoxville and areas further south, including portions of Blount and Sevier Counties. Figure D.1 shows the project vicinity.

The proposed build alternatives for the James White Parkway project include the Green Alternative, Blue Alternative, and Red Alternative. The Green Alternative begins on new alignment near the existing Chapman Highway/Governor John Sevier Highway intersection. The Blue and Red Alternatives begin near that same location, but include widening a portion of Governor John Sevier Highway eastward before breaking off to the north on new alignment. All three build alternatives share the same alignment from Prospect Road, northward to the northern termini at Moody Avenue/Sevierville Pike, where the proposed roadway connects with existing James White Parkway. Figure D.2 shows the layout of the build alternatives.

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Figure D.1. Map of the proposed James White Parkway Project Vicinity in Knox County, Tennessee.

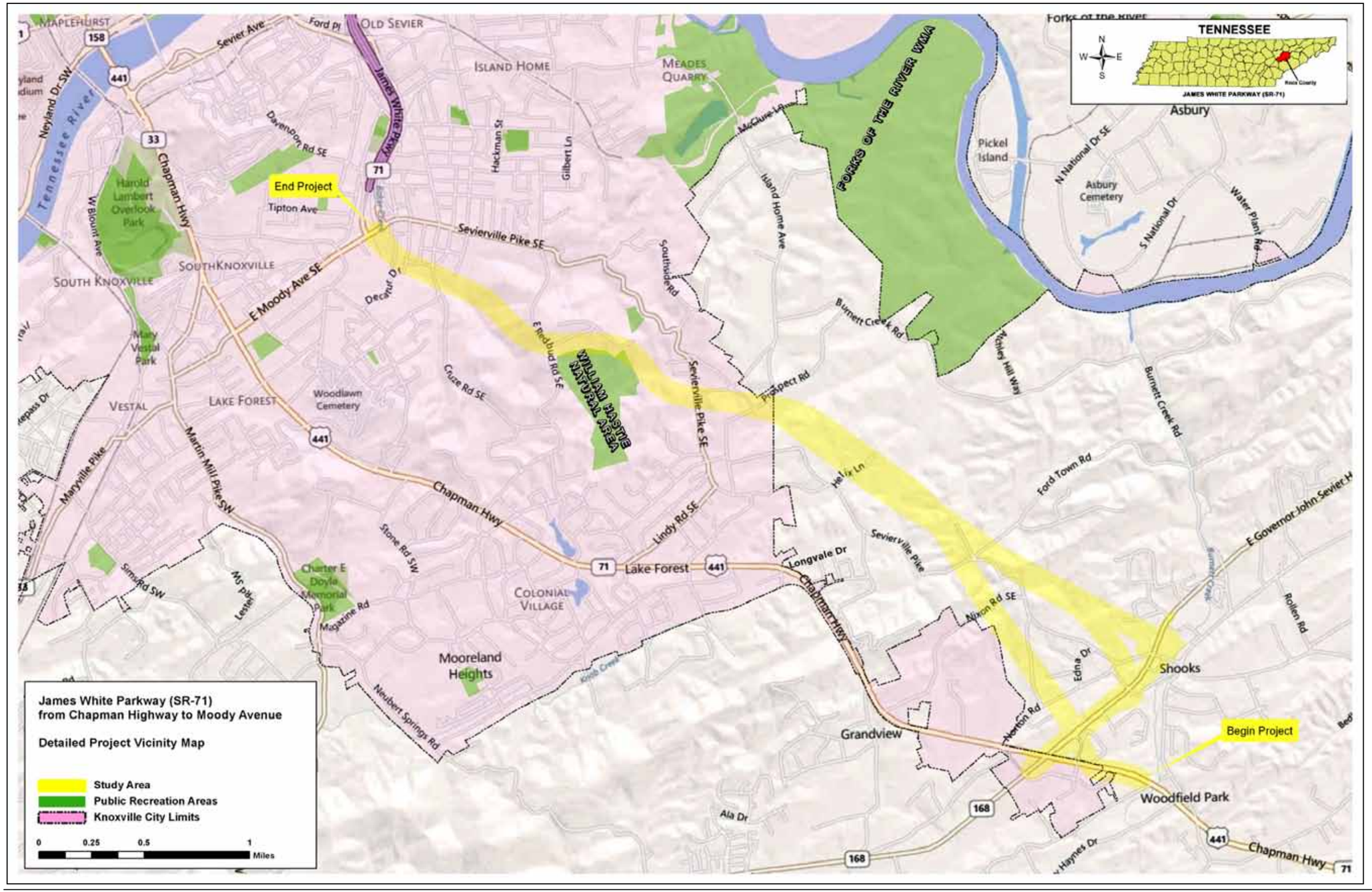

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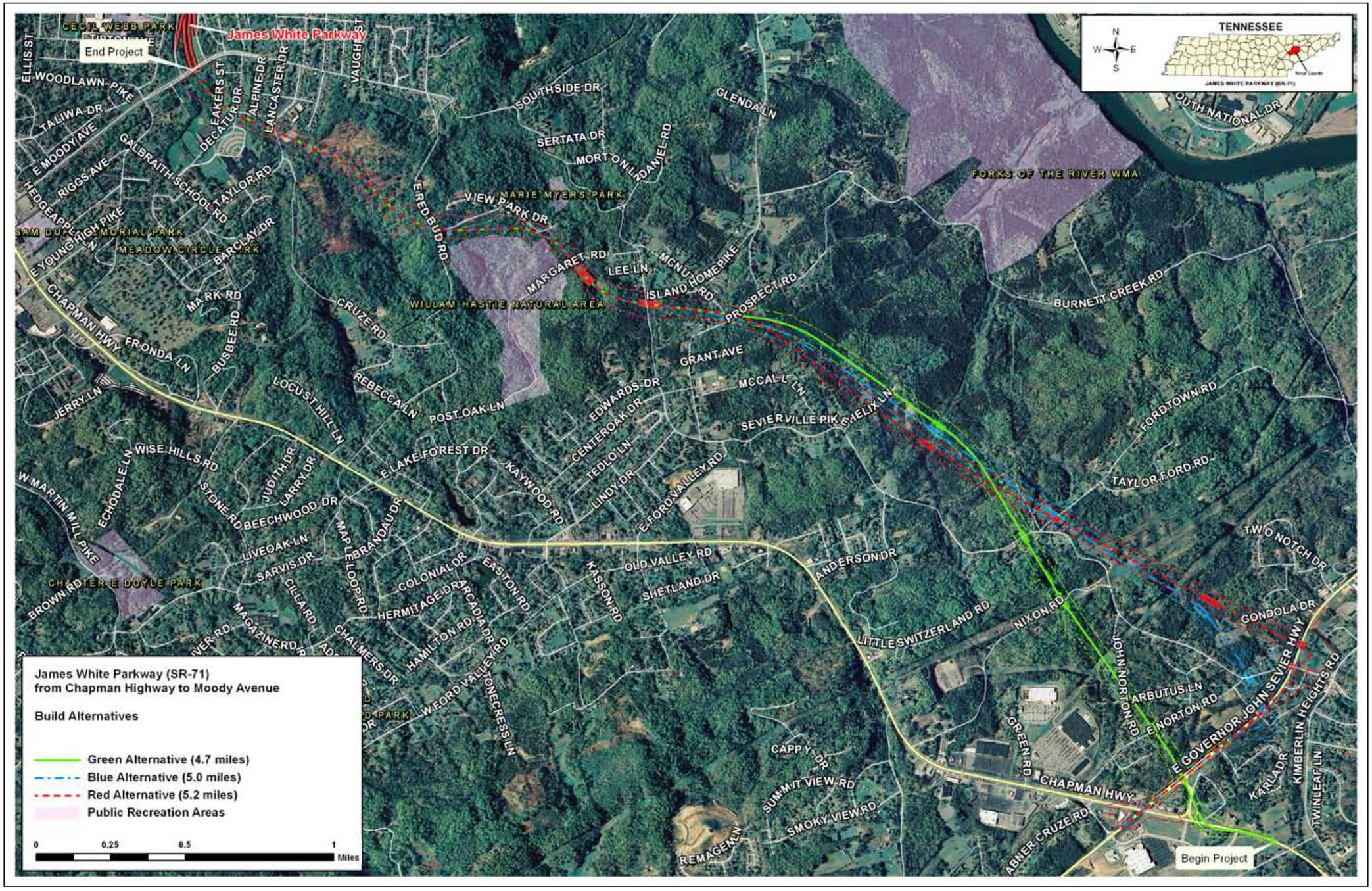
Figure D.2. Map of the James White Parkway Build Alternatives.



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Description of Section 4(f) Property

As a public facility owned by the City of Knoxville and managed through the City's Parks and Recreation Department, and because it is used for recreation/park purposes, the William Hastie Natural Area is afforded special protections under Section 4(f) of the USDOT Act (recodified in 49 U.S.C. 303 and 23 U.S.C. 138). All three James White Parkway build alternatives are anticipated to result in a minor impact to one Section 4(f) resource, William Hastie Natural Area. William Hastie Natural Area consists of approximately 77 acres (*estimated using James White Parkway GIS data*) of forested land located just a few miles south of Ijams Nature Center, adjacent to the Lake Forest Neighborhood. Like Ijams Nature Center, the terrain at William Hastie Natural Area is within a karst region and contains several sinkholes and caves. The center of the area contains a low or subsided area surrounded by a series of steep hills and ridges providing a somewhat enclosed setting. Figure D.3 shows the location of William Hastie Natural Area in relation to the James White Parkway build alternative alignments and ROW.

William Hastie Natural Area was purchased by the City of Knoxville in 2003 to be set aside as a public natural area to provide recreational uses close to downtown Knoxville. William Hastie Natural Area was named in honor of William Henry Hastie, the first African-American to serve as a federal trial judge. Born in Knoxville in 1904, Hastie was a key advisor and litigation strategist for the civil rights movement. He died in 1976 after serving 22 years on the Federal bench (http://www.ci.knoxville.tn.us/parks/hastie.asp). See the attached information sheet in the Appendix at the end of this document for more information.

The existing primary uses of William Hastie Natural Area are nature viewing, mountain biking, hiking, and trail running. Although the City of Knoxville did not initially develop a trail system on the property, a group called the Appalachian Mountain Bike Club (AMBC, http://www.ambc-sorba.org/) provided over 1,000 hours of volunteer work to develop a series of unpaved trails extending over four miles within the area boundaries. The trail system within the William Hastie Natural Area consists of an old jeep road extending between Margaret Lane to the northeast and Post Oak Drive to the southwest that serves as the main artery, with three loop trails attached. Figure D.4 shows the trail system within the William Hastie Natural Area.

It is also recognized that through a unique partnership among the Legacy Parks Foundation, AMBC, TWRA, Ijams Nature Center, City of Knoxville, Knox County, private donors and private land owners the "South Loop Trail" is being finalized. Legacy Parks Foundation has completed property acquisitions/easements to provide land for thirty miles of natural surface trails connecting five parks and natural areas. When finalized, the new South Loop Trail will connect Ijams Nature Center, Forks of the River Wildlife Management Area, William Hastie Natural Area and Marie Myers Park with several trailheads and parking along the route. These trails are used by hikers, mountain bikers, and trail runners. The primary South Loop Trail will extend from the northeast corner of William Hastie Natural Area and extend to Marie Myers Park to the northeast. The James White Parkway build alternatives will cross this trail near the southeast end of View Park Drive. The Legacy Parks Foundation website, http://www.legacyparks.org/, contains more information regarding the South Loop Trail and other recreation properties within South Knoxville. A Legacy Parks Foundation map and map showing the current ownership of the properties containing the trails are also included in the Attachments at the end of this Appendix. TDOT will incorporate this trail system into the final design of the James White Parkway project. There is a proposed James White Parkway bridge extending over Margaret Lane and a nearby sinkhole. It is likely that the South Loop Trail can be constructed under the bridge and then along the James White

Parkway ROW before continuing on to Marie Myers Park. Alternatively, a pedestrian culvert or underpass could be considered at the existing trail crossing location. A James White Greenway is also proposed to be constructed along James White Parkway and can be connected to the South Loop Trail near this location.

Figure D.3. Map of the William Hastie Natural Area in Relation to the James White Parkway Build Alternatives.

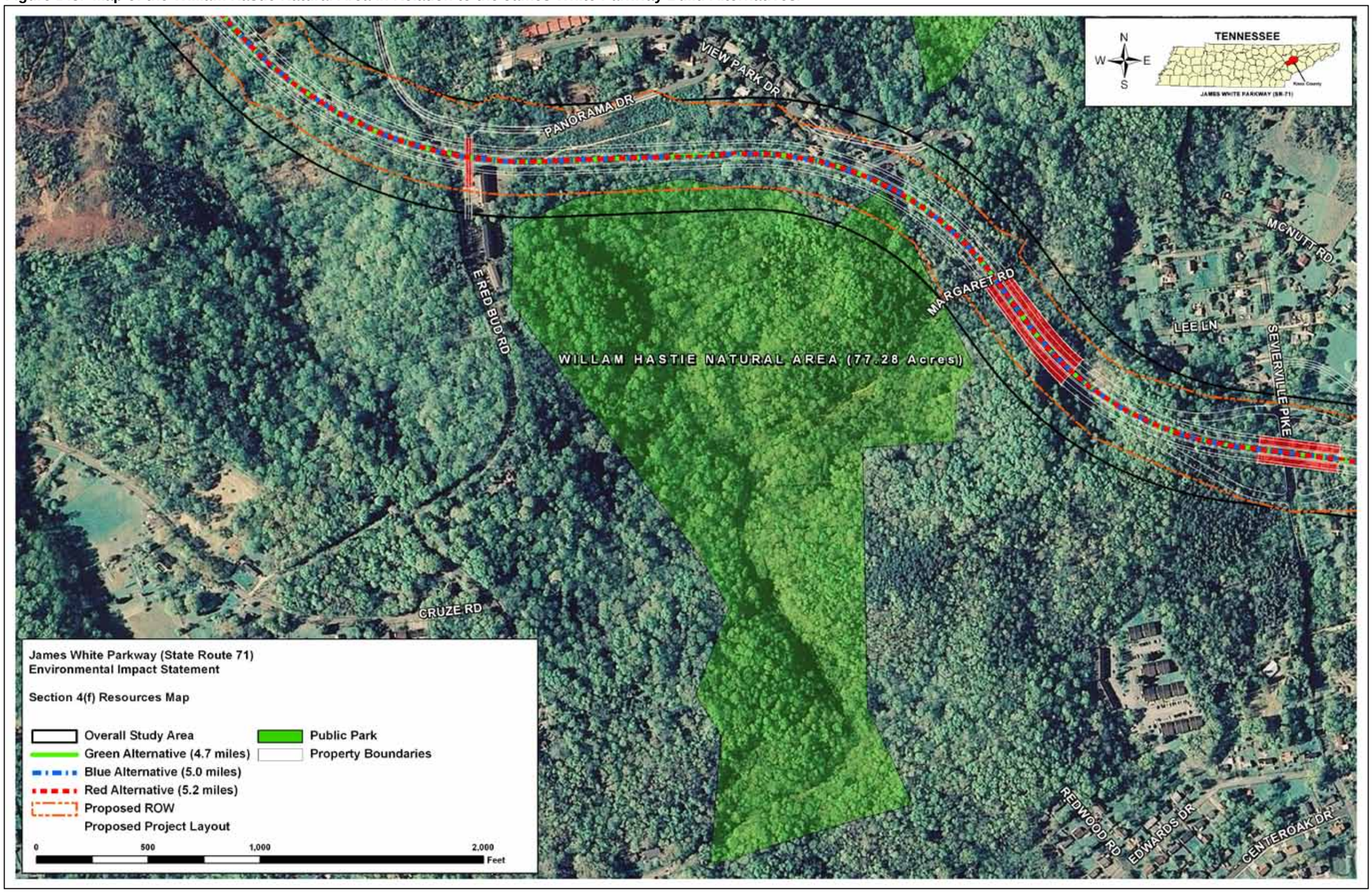

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Figure D.4. Appalachian Mountain Bicycle Association William Hastie Natural Area Trails.

Source: http://www.ambc-sorba.org/site/wp-content/uploads/2009/11/Hastie-lg.png

Project Impacts on Section 4(f) Property

All three of the James White Parkway build alternatives will impact the William Hastie Natural Area along its northern border. Due to other constraints identified and considered throughout the alternative development process including, threatened and endangered species habitats, karst features, dense residential developments, and other resources; the location of the project alignments were pushed up against the boundaries of the William Hastie Natural Area. Although it may be possible for additional minor revision of the proposed ROW lines in this area, it is anticipated that at least a small portion of the natural area will need to be acquired for use for the transportation project. Figure D.5 shows the anticipated "take areas" that will need to be acquired for the project. The total amount of land anticipated to be acquired includes 0.79 acres of the total 77.28 acres within the William Hastie Natural Area. This represents approximately 1% of the total area. The northern boundary of the Natural Area contains two areas that protrude into the proposed ROW of the alternatives. These small areas are not critical to the function or quality of the site and are proposed to be replaced by adjacent land with the same general characteristics as the take areas. The following section describes the proposed mitigation areas in more detail.

In addition to the direct take of the existing property, other potential impacts the build alternatives may have on the William Hastie Natural Area include noise and visual impacts. However, due to the position of the build alternative Alignments in relation to the primarily utilized portions of the site, these impacts are not expected to be substantial and would not limit any of the existing uses or functions of the site. Most of the activity within the William Hastie Natural Area occurs on the AMBA trails, which are primarily located toward the core of the site and do not extend all of the way to the northern boundary where the proposed build alternatives are aligned. Although some occasional use of the northern boundary of the site may occur, there is no evidence that this portion of the site is currently frequented by park visitors. Therefore, any visual or noise impacts that do occur at the very northern boundary of the park would not impede the primary recreational uses of the area, which are primarily located to the south of this area. As distance from the proposed ROW increases, the probability for noise and visual impacts will quickly become reduced.

The predicted worst hour noise level for the area did not meet or exceed the NAC, nor was there a substantial increase in design year noise levels above the existing noise levels of the area. Receivers were modeled at distances 300, 400, and 500 feet from the edge of the proposed James White Parkway. Design year sound levels measured 56, 55, and 54 respectively. As a result, it is not anticipated the William Hastie Natural Area would be impacted by noise. Substantial noise impacts are not anticipated for the William Hastie Natural Area, because the roadway will lie primarily above the elevation of the area allowing sound to travel over the area. In addition, the forested areas that will remain along the border of the ROW will provide an additional buffer that will help reduce noise levels inside the primarily used portions of the site, including the AMBA trail system.

Visual impacts from within the William Hastie Natural Area are also expected to be minimal due to the roadway being developed above the majority of the site in elevation, and due to the visual buffer that will be provided by the remaining forest separating the primarily used areas of the site from the project ROW. Shifting the alignment away from the park towards the adjacent ridgetop and residential area would create an adverse visual impact and adversely impact the Mountain View neighborhood.

The air quality study for the James White Parkway project did not identify measurable impacts in the vicinity of the Natural Area.

As mentioned previously, the proposed South Loop Trail is expected to be extended from William Hastie Natural Area northeastward across the James White Parkway build alternative alignments which will promote additional use in that area. However, TDOT will include this feature into the design of the project so that the project will not sever any connections this trail is intended to provide and will design the trail to fit into the context of the setting. It is likely that the proposed James White Greenway will be established along the James White Parkway and will provide additional access and connections resulting in a net benefit to recreational uses in this area. Figure D.6 shows the location of the AMBA trail system in relation to the project build alternatives.

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Figure D.5. Map of the William Hastie Natural Area Take/Use and Proposed Mitigation Areas for the James White Parkway Project.

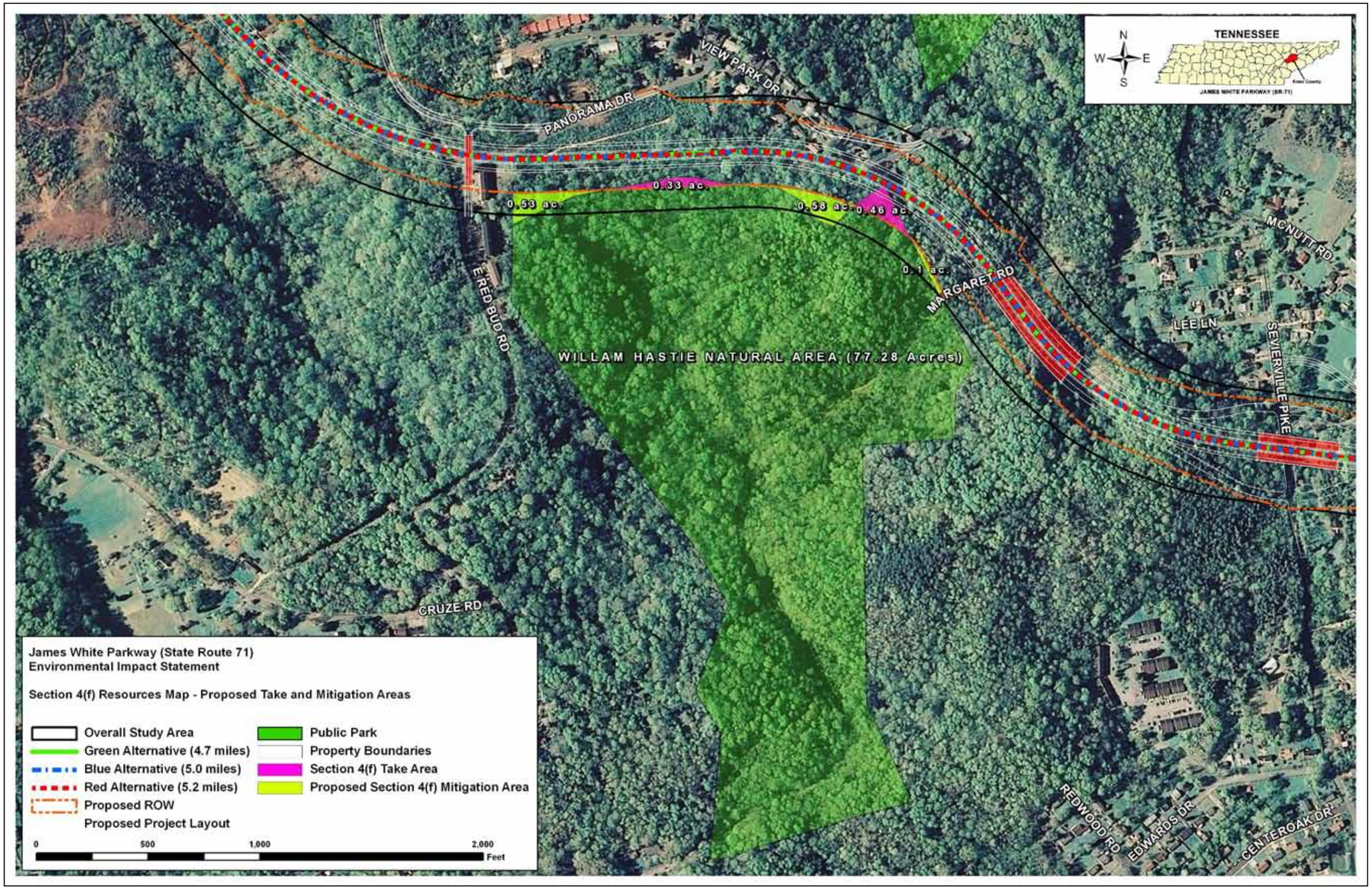

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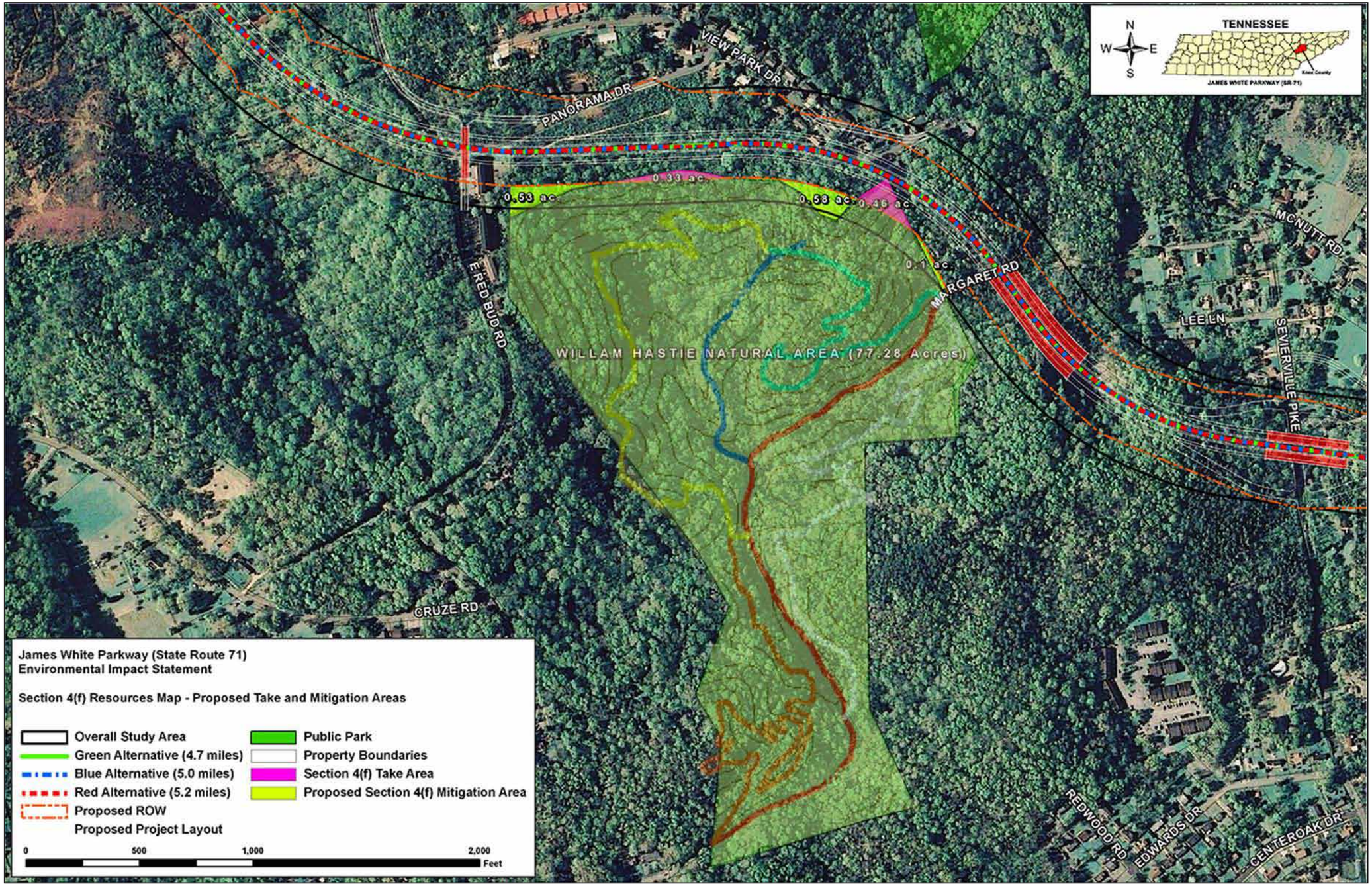
Figure D.6. Map of the William Hastie Natural Area and AMBA Trails in Relation to the James White Parkway Project Take and Proposed Mitigation Areas.



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Proposed Measures to Minimize and Mitigate Impacts to Section 4(f) Property

TDOT proposes to mitigate the impacts of the direct take of the two small segments along the northern boundary of the William Hastie Natural Area by acquiring three small segments of land that will remain from other affected parcels that attach to the existing Natural Area. Figure D.5 above shows the proposed mitigation areas in light green shading. These three segments would be purchased during the ROW acquisition phase of the project and immediately transferred to the City of Knoxville to become part of the William Hastie Natural Area. The total amount of area contained in the proposed mitigation areas is 1.22 acres. As mentioned above, approximately 0.79 acres of land would be required for the proposed James White Parkway ROW from within the existing William Hastie Natural Area. Therefore, with the transfer of the 1.22 acres of mitigation property, the total size of the William Hastie Natural Area would become 77.71 acres, for an overall increase in size of 0.43 acres from the existing 77.28 acres. In addition, the resulting northern boundary of the William Hastie Natural Area would become a more regular-shaped area that would line the edge of the proposed James White Parkway ROW boundary.

James White Parkway would provide quicker access to the William Hastie Natural Area for downtown users via the proposed interchange to be placed on Sevierville Pike. This interchange would provide good access with users only being required to make two quick left turns after leaving the proposed new roadway to gain access to the Natural Area via Margaret Lane.

In addition, the South Loop Trail connecting William Hastie Natural Area to Marie Myers Park will be included in the final design of the James White Parkway to allow adequate access and connections between the existing facilities in the area. The proposed James White Greenway expected to follow the James White Parkway corridor will add additional connections and recreational uses in the South Knoxville Area.

Summary of Basis for a Potential De Minimis Impact Finding

Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended the existing Section 4(f) legislation to simplify the processing and approval of projects that have what is referred to as de minimis (minimal) impacts on lands protected by Section 4(f). De minimis impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not adversely affect the activities, features, and attributes of the Section 4(f) resource.

Based on the best available information and conceptual layouts of the build alternatives, the James White Parkway project will result in the initial take of 0.79 acres of the William Hastie Natural Area, but with proposed mitigation would increase the size of the park by a total of 0.43 acres. In addition, none of the parks existing functions activities, features, or attributes are expected to be substantially impacted based on current information. The proposed roadway would provide improved access to the site from downtown Knoxville via the proposed Sevierville Pike Interchange. Noise, visual, and air quality impacts are not anticipated to be substantial and would not alter the current primary uses of the site, which include mountain biking, hiking, trail running, and nature viewing. It is possible that some of those impacts can be reduced through additional mitigation measures and/or context sensitive solutions/design features such as vegetation screens, noise barriers, and/or other options. Unless additional information provided by the public or local officials provide additional evidence that a de minimis finding is not appropriate, TDOT intends to request a de minimis impact finding for the James White Parkway impacts to William Hastie Natural

Area. Should further studies or information indicate otherwise, FHWA will require that a full Section 4(f) Evaluation be conducted to determine if any other reasonable alternatives exist to fully avoid the William Hastie Natural Area.

TDOT has provided the local officials with jurisdiction over the William Hastie Natural Area with a letter describing the proposed project impacts and mitigation to make up for those impacts. This letter also notified the officials that TDOT was considering requesting a de minimis impact finding due to the net minor impacts expected. Following the Corridor Public Hearing, which includes the findings of the NEPA and Section 4(f) studies, all public comments regarding the Section 4(f) resource will be evaluated, summarized, and then provided to the local officials with jurisdiction so they can make and informed decision as to whether to concur with TDOT that a de minimis impact finding is appropriate. Should they concur, TDOT will present the information and local official concurrence letter to FHWA for their final review and determination on the finding.

APPENDIX D SECTION 4(F) SUMMARY REPORT ATTACHMENTS:

Attachment 1: Information Sheet for City of Knoxville Parks and Recreation Department William Hastie Natural Area;

Attachment 2: Legacy Parks Foundation's Knoxville's Urban Wilderness Map;

and

Attachment 3: Property Ownership for Properties Containing Existing and Proposed Trails in the South Knoxville Area.

Attachment 1: Information Sheet for City of Knoxville Parks and Recreation Department William Hastie Natural Area.

PARKS | Complete Parks List

William Hastie Natural Area

Parks and Recreation Division
Parks
Greenways

Facilities:

- 75 acres
- open space
- 4+ miles of unpaved trails (hiking, mountain biking, and trail running)

adopt a park
KNOXVILLE PARKS AND RECREATION

William Hastie Natural Area Adoptees
- Lake Forest Neighborhood Association
- Appalachian Mountain Bike Club

Directions: From I-40, take the James White Parkway exit 388; follow James White Parkway over the Tennessee River; take the Moody Ave. exit (last exit); turn left onto Sevierville Pk; stay on Sevierville Pk for approx. three miles; pass Marie Myers Park on your right; remain on Sevierville Pk; shortly thereafter, follow the sign to turn right onto Margaret Rd. which leads into William Hastie Natural Area

Mountain biking is a natural fit for Knoxville's hilly terrain, and riders will have over four more miles of new, wooded trails to enjoy thanks to the Appalachian Mountain Bicycle Association's winter of hard work at the William Hastie Natural Area. The group logged more than 1,000 labor hours at the 75-acre site this winter, cutting trails that are suitable for hiking, trail running and mountain biking.Working with the Lake Forest Neighborhood Association, Parks and Recreation continues to look at ways to make this public wilderness more friendly.

PARK RULES & REGULATIONS:

1.) For the protection of our park and the safety of its users, the following are prohibited

- No alcoholic beverages
- No firearms

- No open fires
- No hitting golf balls anywhere in the park
- No motorized vehicles in park
- No equestrian activity

2.) Per city ordinance, all animals must be maintained on a leash.
3.) Please be respectful of other trail users
4.) Please help to keep our parks beautiful by disposing trash in proper receptacles.
5.) Hours - Open dawn to dusk unless otherwise posted.

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Attachment 2: Legacy Parks Foundation's Knoxville's Urban Wilderness Map.

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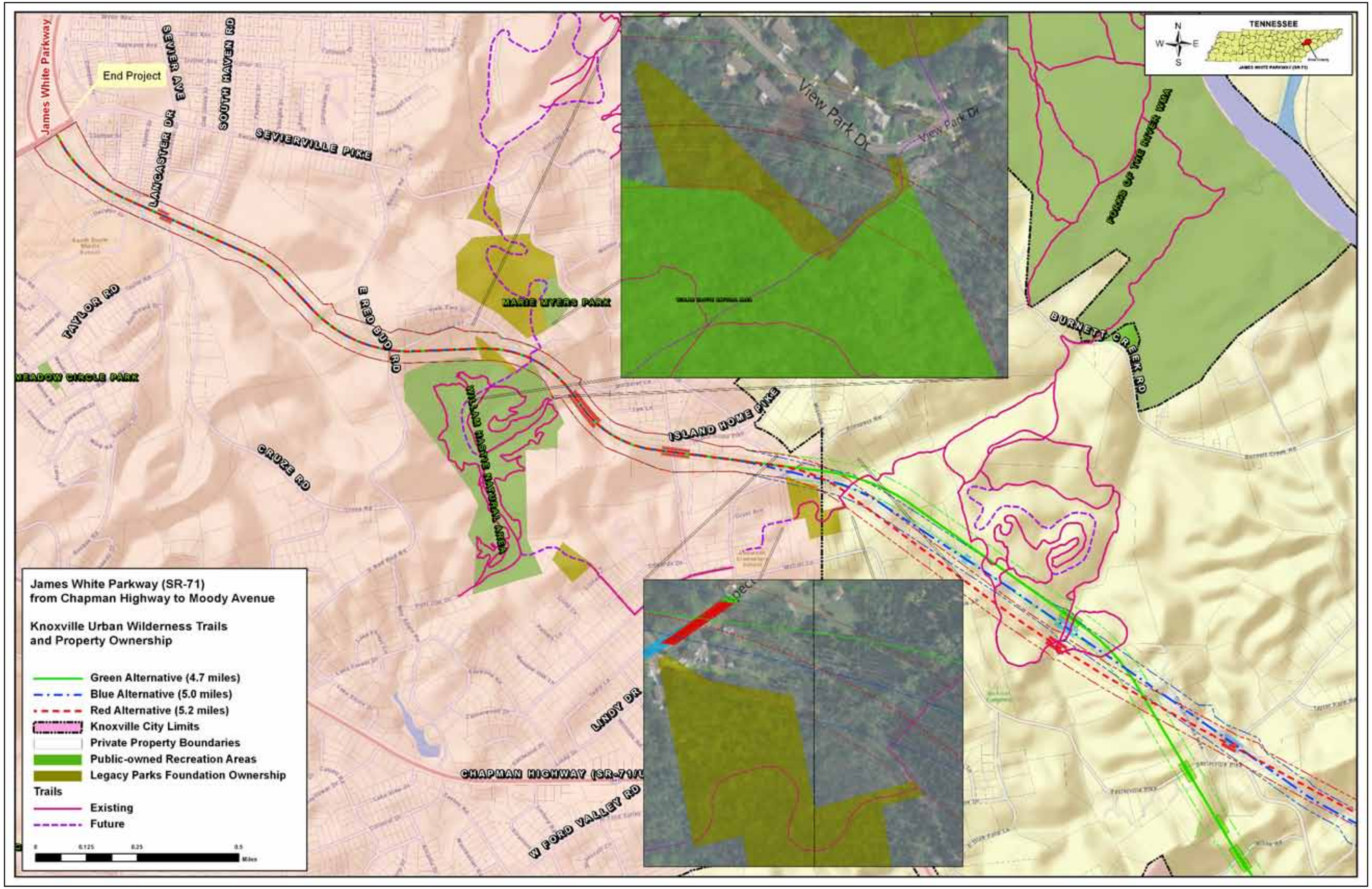
Attachment 3: Property Ownership for Properties Containing Existing and Proposed Trails in the James White Parkway Study Area.



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APPENDIX E - CULTURAL RESOURCES COORDINATION LETTERS

Appendix E contains the following cultural resources coordination correspondence associated with this Environmental Impact Statement.

Agency	Date
Architectural Clearance from Tennessee Historical Commission – SHPO	September 8, 2011
Archaeology Clearance from Tennessee Historical Commission – SHPO	September 29, 2011

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

September 8, 2011

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

RE: FHWA, ARCHITECTURAL SURVEY REPORT, SR-71/CHAPMAN HWY TO MOODY AVE., KNOXVILLE, KNOX COUNTY

Dear Ms. Carver:

In response to your request, received on Monday, August 29, 2011, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

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

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

Sincerely,

E. Patrick McIntyre, Jr.

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

EPM/jyg

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

September 29, 2011

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

RE: FHWA, ARCHAEOLOGICAL ASSESSMENT, SR-71/JAMES WHITE PARKWAY EXTENS., KNOXVILLE, KNOX COUNTY, TN

Dear Mr. Kline:

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

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

Your cooperation is appreciated.

Sincerely,

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

EPM/jmb

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APPENDIX F – LIST OF DRAFT ENVIROMENTAL IMPACT STATEMENT RECIPIENTS

Copies of the Draft Environmental Impact Statement (DEIS) were distributed to the agencies, public officials, individuals, tribes, and public facilities listed in Table F.1 to encourage review and comment on the document. The entire DEIS document was also made available for electronic viewing or downloading on the project website at: http://www.tdot.state.tn.us/sr71/ .

Table F-1. List of Recipients that Received Copies of the James White Parkway (SR-71) DEIS for Review.

AGENCY TYPE	NAME
Federal	U.S. Department of the Interior Office of Environmental Policy and Compliance
Federal	U.S. Department of the Interior Great Smoky Mountains National Park
Federal	U.S. Department of the Interior U.S. Geological Survey
Federal	U.S. Geological Survey Water Resources Division
Federal	U.S. Geological Survey USGS National Center
Federal	U.S. Department of the Interior Office of Surface Mining
Federal	U.S. Department of Defense U.S. Army Corps of Engineers, Nashville District Regulatory Branch
Federal	U.S. Department of Housing and Urban Development
Federal	U.S. Department of Commerce National Oceanic and Atmospheric Administration
Federal	U.S. Department of Agriculture Natural Resources Conservation Service
Federal	Federal Railroad Administration Office of Railroad Development
Federal	U.S. Environmental Protection Agency Environmental Assessment Office
Federal	Federal Aviation Administration
Federal	Federal Emergency Management Agency
Federal	Federal Energy Regulatory Commission
Federal	U.S. Fish and Wildlife Service
Federal	Department of Energy Office of Environment, Safety, and Health
Federal	Tennessee Valley Authority Environmental Policy and Planning
State	Tennessee Department of Economic and Community Development Local Planning Assistance Office
State	Tennessee Department of Economic and Community Development NEPA Contact
State	Tennessee Department of Agriculture NEPA Contact

Table F-1. List of Recipients that Received Copies of the James White Parkway (SR-71) DEIS for Review.	
AGENCY TYPE	**NAME**
State	Department of Education
State	Tennessee Department of Environment & Conservation Commissioner
State	Tennessee Department of Environment & Conservation Tennessee Historical Commission
State	Tennessee Wildlife Resources Agency NEPA Contact
State	Tennessee Housing Development Agency
Local	Metropolitan Planning Commission of Knoxville and Knox County
Local	Honorable Bill Haslam Mayor-City of Knoxville
Local	Honorable Mike Ragsdale Mayor-Knox County
Local	East Tennessee Human Resources Agency
Local	Knox County Housing Authority
Local	Knox County Department of Air Quality Management
Local	Knoxville's Community Development Corporation
Local	Knoxville Area Transit
Local	East Tennessee Development District
Private	Appalachian Regional Commission
Private	World Wildlife Fund
Private	Tennessee Wildlife Federation
Private	Tennessee Conservation League
Private	Tennessee Trails Association
Private	Tennessee Chapter of the Sierra Club
Private	Tennessee Environmental Council
Private	Tennessee Conference of NAACP
Private	NAACP-Knoxville Chapter
Private	The Nature Conservancy
Private	Sierra Club
Private	Chickasaw Group – Sierra Club