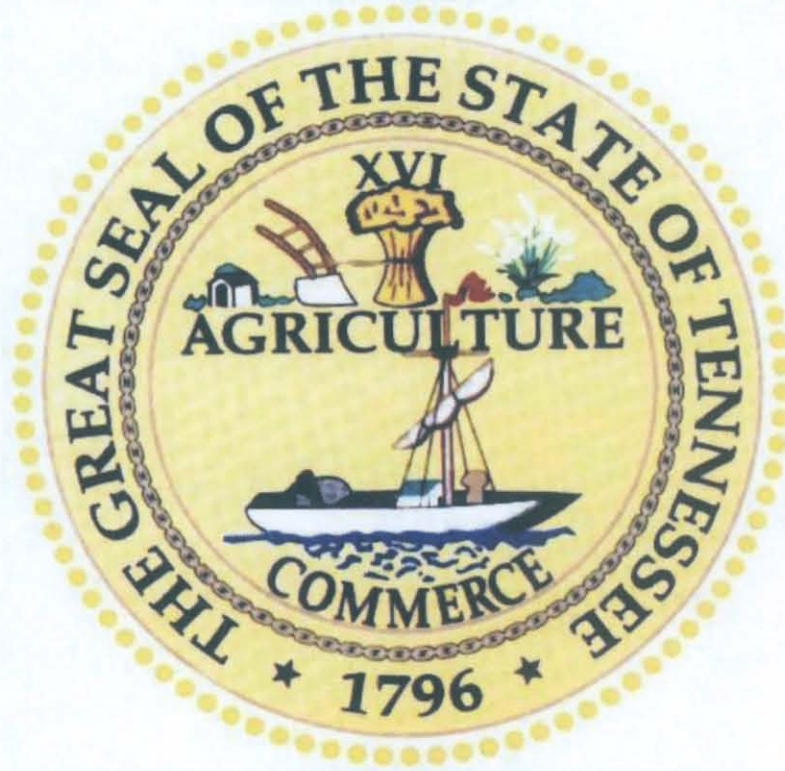


TRANSPORTATION PLANNING REPORT

*State Route 1 (U.S. 70) at
State Route 2 (U.S. 11)
Loudon County
PIN #114003.00*



PREPARED BY
CLINARD ENGINEERING ASSOCIATES, LLC
For the
KNOXVILLE TRANSPORTATION PLANNING ORGANIZATION
and the
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Approved by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING		9-14-10
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION		9-13-10
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION		9/10/10

This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.

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1.0 STUDY HISTORY AND BACKGROUND INFORMATION

1.1 Study History

The Knoxville Regional Transportation Planning Organization (TPO) requested, on behalf of Loudon County, a study of the intersection of State Route 1 and State Route 2, commonly known as Dixie Lee Junction. The intersection is listed in Appendix B of the FY2010 Unified Planning Work Program (UPWP) as a project planned for funding of a Transportation Planning Report (TPR). Proposed improvements to this intersection are in the nearest horizon year (2009-2014) of the Knoxville Regional TPO's adopted Long Range Mobility Plan. The widening of State Route 2 (U.S. 11) from State Route 73 (U.S. 321) to State Route 1 (U.S. 70) is listed under the horizon year of 2015-2024.

1.2 Study Area

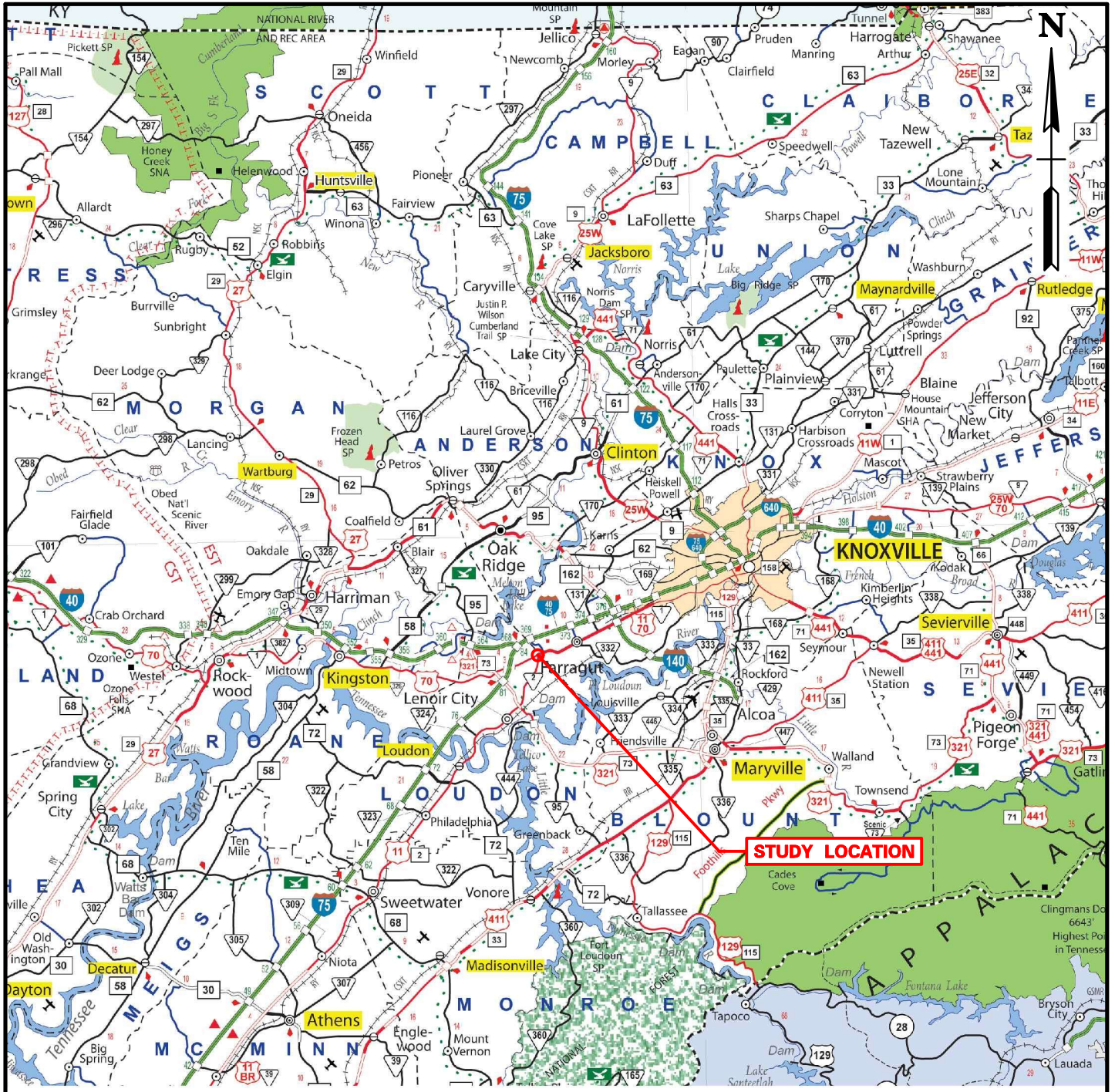
The limits of this study include the intersection and approaches of State Route 1 and State Route 2. Exhibit 1.1 presents a regional map, Exhibit 1.2 presents the intersection location map, and Exhibit 1.3 further details the corridors geographic features on a United States Geological Survey (USGS) map. The area adjacent to the existing intersection is primarily commercial, with some residences and one church.

1.3 Community Profile

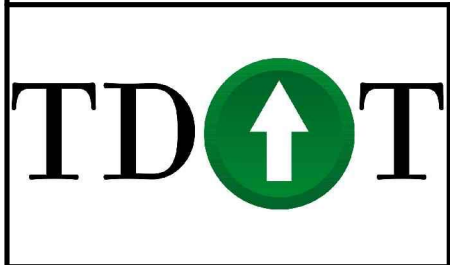
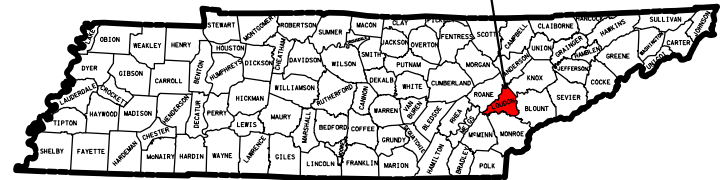
The intersection lies within Loudon County, but is located only 0.1 miles from the Knox County line and the Town of Farragut city limits. Table 1.1 presents geographic data and population densities for the two counties and offers a comparison to the averages seen statewide. Table 1.2 presents the historic population trends for the counties and offers a comparison to the averages seen statewide.

Table 1.1 – Geographic Data

Category	Loudon County	Knox County	Statewide
Land Area excluding water covered (Square Miles)	228.88	508.46	41,217.12
Persons / Square Mile (2000)	170.7	752.0	138.0
Housing Units / Square Mile (2008)	87.96	386.72	66.92
Data Source: U.S. Census Bureau State and County Quickfacts			

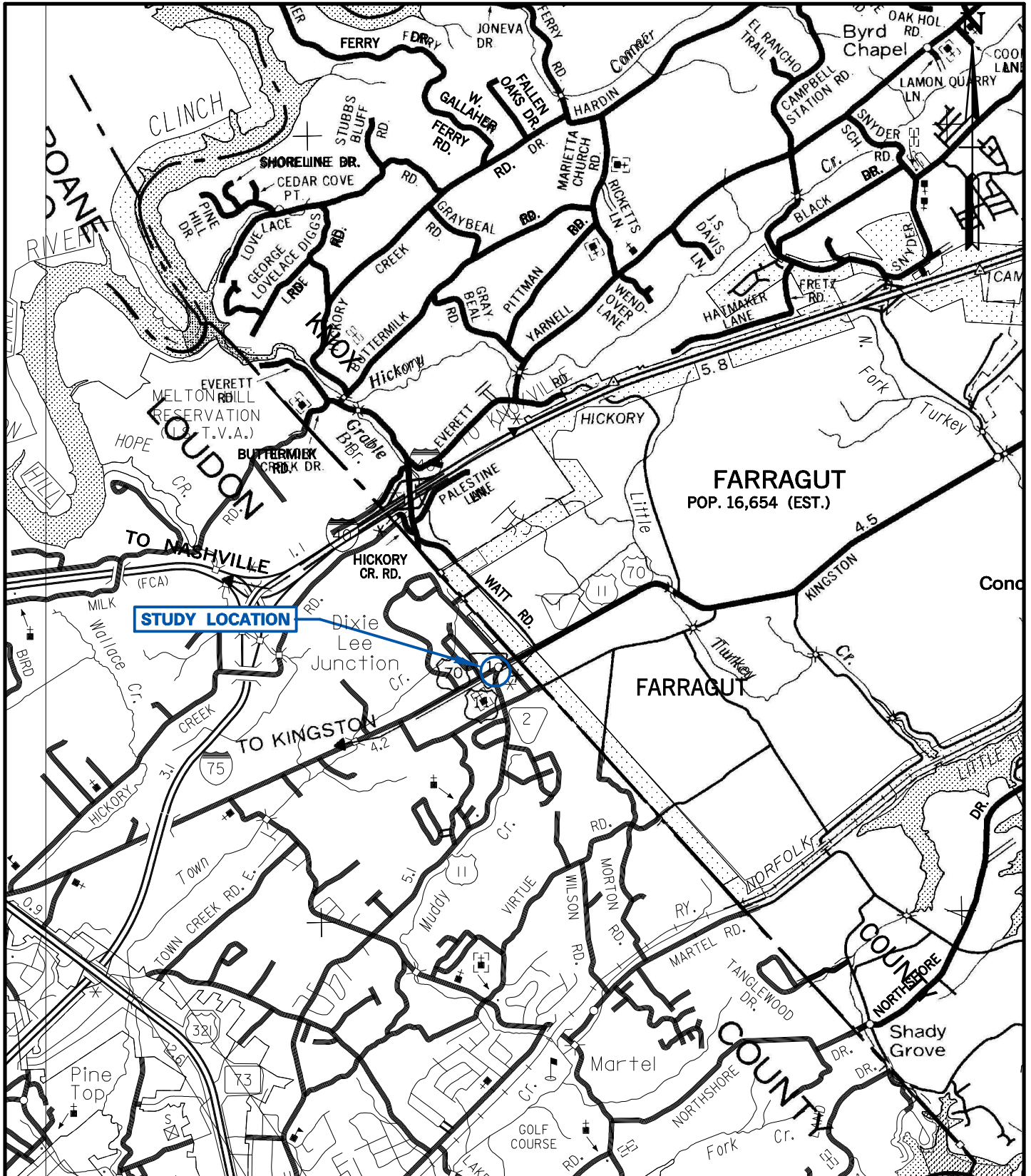


LOUDON COUNTY



VICINITY MAP

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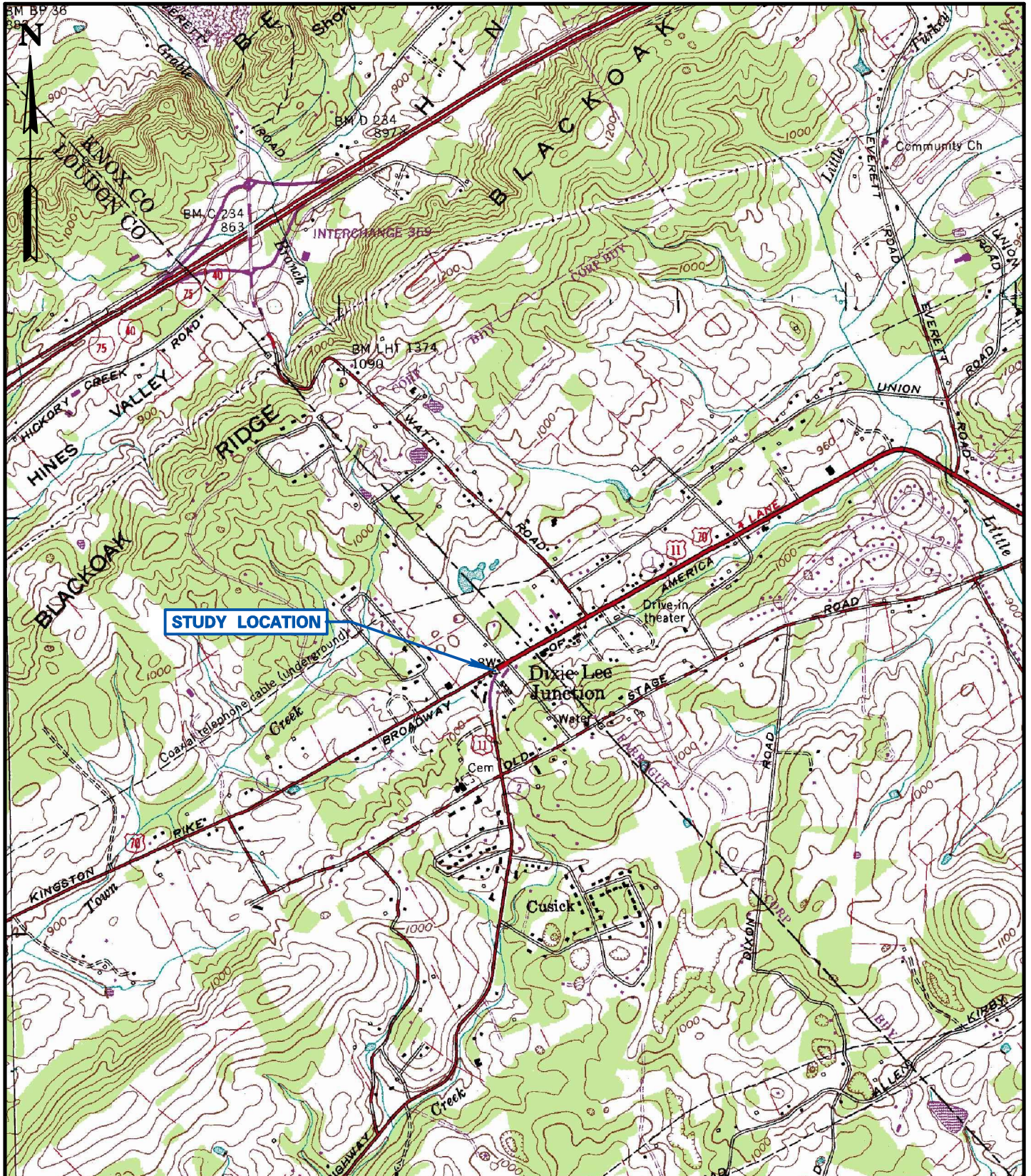
STUDY LOCATION

Dixie Lee Junction

FARRAGUT
POP. 16,654 (EST.)

FARRAGUT

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STUDY LOCATION



TOPOGRAPHY MAP

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Table 1.2 – Population Trends

Year	Loudon County			Knox County			State of Tennessee		
	Pop.	Percent Change	Avg. Growth Rate	Pop.	Percent Change	Avg. Growth Rate	Pop.	Percent Change	Avg. Growth Rate
2000	39,086	--	--	382,032	--	--	5,689,283	--	--
2008	45,363	16.06%	1.88%	423,212	10.78%	1.29%	6,144,104	7.99%	0.97%

Data Source: U.S. Census Bureau

The American Community Survey estimates for 2008 show 22,241 persons employed in Loudon County with a 6.2% unemployment rate. The American Community Survey estimates for 2008 show 221,650 persons employed in Knox County with a 4.7% unemployment rate. Similar estimates for the State of Tennessee for 2008 showed at statewide average of 7.0% unemployment. These estimates for 2008 are considered to be low due to the poor economic conditions of 2009. The Tennessee Commissioner of Labor and Workforce Development stated that Tennessee’s statewide unemployment reached 9.1% for February of 2010, showing a significant increase from the 2008 estimates above.

1.4 Existing Transportation Conditions

Historic Traffic

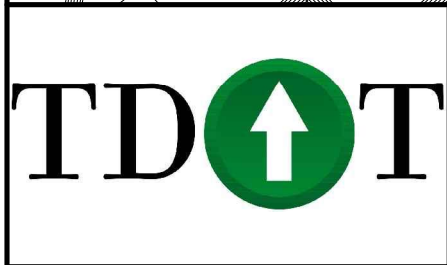
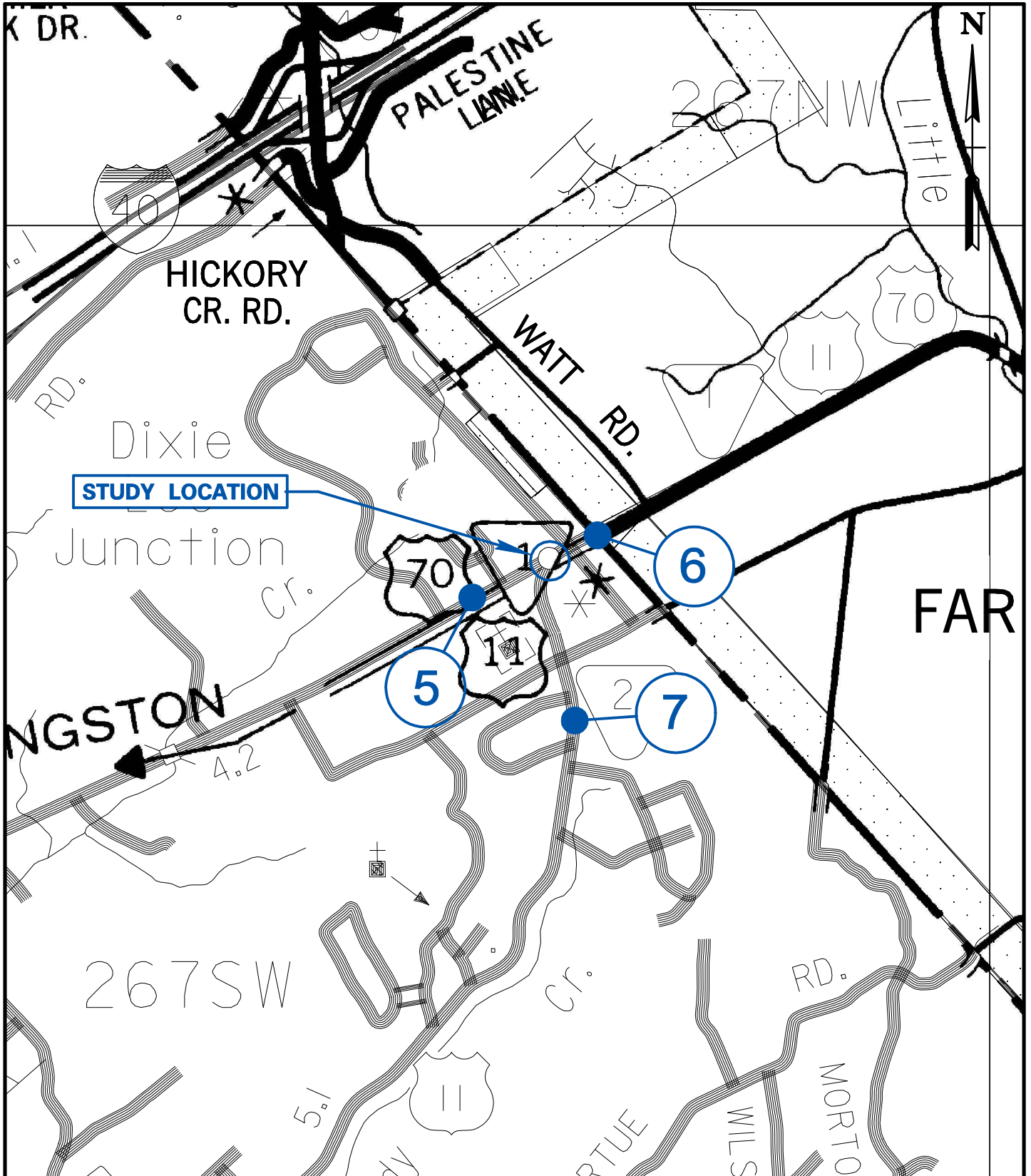
TDOT collects traffic data at locations on the intersection approaches on a regular basis. Table 1.3 presents data for the count stations on the three (3) intersection approaches. A moderate growth rate can be seen for this area. Count stations 5 and 6 are immediately adjacent to the study intersection, while count station 7 has one significant roadway between the count station and the study intersection. Figure 1.4 depicts the TDOT count stations adjacent to the study intersection. Additionally, eight (8) hour turning movement counts were provided at the intersection from January 2008.

Table 1.3 – Historic Traffic Data

TDOT Sta.	Route	Location	2008 AADT	Annual Growth Rate
5	SR-1 (US-70)	West of Intersection	4,250	1.13%
6	SR-1 (US-70)	East of Intersection	15,060	1.19%
7	SR-2 (US-11)	South of Intersection	10,430	1.05%

Current Development

The recently completed Creekwood Development contains approximately 200 acres located adjacent to Interstate 75 between State Route 1 (U.S. 70) and State Route 73/95 (US-321). The development is mostly vacant at this time, but could impact the traffic volumes along State Route 1 (U.S. 70) at the study intersection. While the majority of traffic generated from this development would utilize State Route 73/95 (US-321) and Interstate 75, the development could result in noticeable increases of traffic volumes on the eastbound approach of State Route 1 (U.S. 70) at the study intersection.



COUNT STATIONS

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1.5 Review of Existing Corridor Conditions and Deficiencies

The study intersection is currently a three-legged T-intersection with the eastbound approach of State Route 1 (U.S. 70) being stop-controlled. Currently, the northbound approach of State Route (U.S. 11) and the westbound approach of State Route 1 (U.S. 70) are connected as the continuous route. The eastbound approach of State Route 1 (U.S. 70), which is stop-controlled, intersects the continuous route roadway within a horizontal curve, creating a geometrically undesirable intersection. The posted speed on all approaches is forty-five (45) mph. In addition to eastbound State Route 1 (U.S. 70), Harrison Lane, Shipley Lane, and seven (7) driveway accesses intersect within this horizontal curve. Exhibit 1.5 shows the eastbound approach to a stop condition. Exhibit 1.6 shows the view from the stop-controlled leg towards State Route 1 (U.S. 70). Exhibit 1.7 shows the view from the stop-controlled leg towards State Route 2 (U.S. 11). The State Route 1 (U.S. 70) approach east of the intersection is currently a five (5) lane roadway section with eight foot (8') shoulders. The State Route 1 (U.S. 70) approach west of the intersection is currently a two (2) lane roadway section with one foot (1') shoulders. The State Route 2 (U.S. 11) approach south of the intersection is currently a two (2) lane roadway section with three foot (3') shoulders.



Exhibit 1.5 – Stop-Controlled Leg of Existing Intersection



Exhibit 1.6 – View East Towards S.R. 1 (U.S. 70)



Exhibit 1.7 – View South Towards S.R. 2 (US-11)

1.6 Safety (Crash and Geometrics)

Crash summary sheets were provided for the study intersection. The existing intersection has a major skew in order to provide free-flow conditions along the major volume route. The intersection skew and the lack of left turn lanes from State Route 2 (U.S. 11) create limited sight distances as well as unprotected stopping locations for turning vehicles. With the current geometrics of the intersection favoring the high movement route, roadway continuity is broken along State Route 1 (U.S. 70). This causes the eastbound traffic continuing along State Route 1 (U.S. 70) to stop while giving right-of-way to traffic from State Route 2 (U.S. 11) entering State Route 1 (U.S. 70) in either direction. The existing alignment contains sixty-seven (67) crossing conflict points and eighty-six (86) merge/diverge conflict points along a 1200' long stretch of roadway in and adjacent to a horizontal curve. The friction caused by the fourteen (14) driveway and sideroad entrances within this 1200' roadway segment have significant impacts on safety and operations. Exhibit 1.8 shows a conflict diagram of the existing roadway. Twenty (20) crashes occurred at the study intersection during the three (3) year period from 2006 through 2008. The crash rate at the intersection was 1.21 for the years 2006 through 2008 with an actual-to-critical ratio of 2.39. This crash rate does not meet the minimum actual-to-critical ratio threshold of 3.5 to qualify the intersection for safety funding under the highway safety improvement program (HSIP).

1.7 Structures / Bridges

There are no known bridges or box culverts in the immediate vicinity of the intersection of State Route 1 (U.S. 70) and State Route 2 (U.S. 11).

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		1



4/22/2010 3:58:41 PM
P:\2008\08050 TDOT PLANNING Contract\08050_14 SR-1 SR-2 (Loudon) TPR\DCN\08050_14_Conflict Points_Existing.sht

EXHIBIT 1.8



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
EXISTING CONFLICTS
2006 COLOR AERIAL
SCALE: 1"=100'

1.8 Utility Infrastructure

Overhead utilities are abundant at the existing intersection location as shown in Exhibit 1.9. Additionally, a natural gas distribution pipeline is located adjacent to the study intersection on Harrison Lane as shown in Exhibit 1.10.



Exhibit 1.9 – Overhead Utilities



Exhibit 1.10 – Natural Gas Pipeline

1.9 Early Environmental Screening (EES)

In preparation of Transportation Planning Reports (TPR), the Tennessee Department of Transportation (TDOT) has introduced an early environmental screening (EES) process for the project study area. By screening the latest available environmental data during the early stages of project planning, TDOT and the resource and permitting agencies will be better prepared to anticipate potential environmental issues and mitigation requirements. The environmental data reviewed in this TPR include the following layers:

- Archaeological/Historic Architecture – Historic properties and cemetery sites;
- Community Impacts – Sensitive community populations
- Ecology – Scenic waterways, natural areas, large wetlands, protected species;
- Hazardous Substances/Geology – Hazardous substance sites, pyritic rock/geotechnical, caves; and,
- Parks & Public Land – parks (federal/state/local), public lands/buildings, railroads, wildlife management areas.

Preliminary Archeological/Historic Architecture

Historic Properties & Structures – No project impact is anticipated as there are no National Register listed properties abutting or within the project study area or corridor.

Cemetery-Archaeological Sites – No impact on the project as there are no known cemetery sites within or abutting the project study area or corridor. It is anticipated that a ‘normal’ effort to complete this environmental review as part of NEPA.

Preliminary Community Impact

Sensitive Populations – Impacts to sensitive community populations may occur with significant intersection modifications or roadway realignments. Within the study area, preliminary maps reveal a population that is approximately 13% below the state poverty level and linguistically isolated populations.

Preliminary Ecology

Scenic Waterways – No project impact is expected as there are no scenic waterways or Tennessee Department of Environment and Conservation (TDEC) conservation sites within the project study area or corridor.

Large Wetlands Impacts – Although the EES document noted 9.78 acres within 4000’ of the study intersection, the national wetlands map indicates there are no wetlands within the proposed areas of improvement for any of the options within this study.

Bats, Rare, and Federally Protected Species – No project impact is anticipated. There is no occurrence of Indiana or gray bats within four (4) miles of the proposed project study area or corridor. There is no known occurrence of a rare, state, or federally-protected terrestrial species within the proposed transportation study area or corridor.

Aquatic Species, Rare and Federally Protected Species – No impact to the project is anticipated. There is no known occurrence of a rare, state, or federally-protected aquatic species within the project study area or corridor.

Preliminary Hazardous Substances/Geology

Pyritic Rock/Geotechnical – No project impact is anticipated. Pyritic rock is not known to occur in the study area/corridor or project does not involve excavation. Limestone and dolomite are present.

Caves – No project impact is anticipated as there are no known caves in the project study area or corridor.

Preliminary Hazardous Materials and Hazardous Substance Sites – No project impact is anticipated as there are no known contaminated land tracts abutting or within the project study area or corridor.

Preliminary Parks, Public Lands, and Railroads

Tennessee Natural Areas Programs – No impact on the project is anticipated as the project study area or corridor does not include a Natural Area.

Tennessee Wildlife Management Area (WMA) – No project impact is anticipated as a WMA does not abut nor is located within the project study area or corridor.

Parks – No impact on the project is anticipated as there are no parks located within or abutting the project study area or corridor.

Railroads – No impact on the project is anticipated. There are no railroads located within the project study area or corridor.

2.0 PURPOSE AND NEED

The purpose and need at the intersection is to provide additional capacity, improve the overall safety of the intersection, and to better provide for alternative modes of transportation.

State Route 1 (U.S. 70) is a primary east-west arterial route, running the length of the State of Tennessee. The western approach of State Route 1 (U.S. 70) is classified as an urban minor arterial; while the eastern approach of State Route 1 (U.S. 70) is classified as an urban principle arterial and is a statewide bicycle route.

State Route 2 (U.S. 11) is a primary route beginning in Murfreesboro and traveling through Manchester, Chattanooga, Cleveland, Athens, Sweetwater, Loudon, and Lenoir City, before terminating at the study intersection. The intersection approach of State Route 2 (U.S. 11) is classified as an urban principle arterial.

Based on the findings of this study in conjunction with the field review with local stakeholders, the purpose and need of an improved intersection of State Route 1 (U.S. 70) and State Route 2 (U.S. 11) include:

- Additional intersection capacity
- Improved intersection operations
- Improved intersection geometrics and safety
- Improved facility for alternative modes of transportation

3.0 OPTIONS ANALYZED

3.1 Intersection Option Discussion

This report examines the consideration for a no-build option, two (2) signalized intersection options, and a roundabout intersection option. These options are introduced below and discussed throughout the remainder of this report.

Option 1: No-Build

This option assumes no modifications or improvements are made over the planning horizon to add capacity. Routine maintenance related activities such as resurfacing, signing, and safety improvements may occur. This option does not support the project's stated purpose to provide operation improvements, enhance safety, and support future economic growth.

Option 2: Signalized Intersection and Approaches

This option includes the realignment of intersection approaches so that State Route 2 (U.S. 11) intersects State Route 1 (U.S. 70) at a ninety (90) degree angle at the existing church entrance location and the installation of a traffic signal. The eastern approach of State Route 1 (U.S. 70) would carry the upstream five (5) lane roadway section to the intersection. The approach would consist of one (1) westbound through lane along State Route 1 (U.S. 70) and two (2) left turn lanes to State Route 2 (U.S. 11). The western approach of State Route 1 (U.S. 70) would consist of one (1) shared thru/right lane and one (1) exclusive left turn bay. The southern approach of State Route 2 (U.S. 11) would consist of one (1) left turn lane and one (1) free-flow right turn add lane. The existing roadway section of State Route 2 (U.S. 11) remaining from the realignment would be maintained as a frontage road to control access to the existing businesses. The property located within the southeast quadrant of the proposed intersection would have access off of the frontage road and a section of controlled access right-of-way would eliminate future driveway accesses from being allowed at that location.

Option 3: Signalized Intersection and Approaches

This option includes the extension of a five (5) lane roadway section through the intersection as well as the realignment of the State Route 2 (U.S. 11) approach. This option leaves the continuous route as it currently exists as well as the eastbound approach of State Route 1 (U.S. 70) intersecting within a horizontal curve. However, the eastbound approach realignment and the installation of a traffic signal should provide safety benefits at the intersection. The eastern approach of State Route 1 (U.S. 70) would consist of two (2) southbound through lanes along State Route 2 (U.S. 11), one (1) exclusive right turn bay to State Route 1 (U.S. 70), and one (1) exclusive left turn bay to the business access frontage road. The western approach of State Route 1 (U.S. 70) would consist of one (1) exclusive left turn bay to eastbound State Route 1 (U.S. 70) and one (1) shared thru/right lane to the business access frontage road and southbound State Route 2 (U.S. 11) respectively. The southern approach of State Route 2 (U.S. 11) would consist of one (1) exclusive left turn bay to westbound State Route 1 (U.S. 70), one (1) exclusive thru lane along eastbound State Route 1 (U.S. 70), and one (1) shared thru/right lane to eastbound State Route 1 (U.S. 70) and the business access frontage road respectively.

Option 4: Roundabout Intersection and Approaches

This option includes the construction of a roundabout intersection and approach realignments. The eastern approach of State Route 1 (U.S. 70) would consist of one (1) right turn bypass lane to westbound State Route 1 (U.S. 70) and two (2) lanes entering the roundabout to southbound State Route 2 (U.S. 11). The western approach of State Route 1 (U.S. 70) would consist of one (1) lane entering the roundabout to both southbound State Route 2 (U.S. 11) and eastbound State Route 1 (U.S. 11). The southern approach of State Route 2 (U.S. 11) would consist of one (1) right turn bypass lane to eastbound State Route 1 (U.S. 70) and one (1) lane entering the roundabout to westbound State Route 1 (U.S. 70). The existing roadway section of State Route 2 (U.S. 11) remaining from the realignment would be utilized as a frontage road to provide access to the existing businesses. The Two Rivers Church entrance was relocated away from the roundabout approaches.

3.2 Measures of Effectiveness (MOE) Discussion

Congestion Reduction

Currently, congestion is isolated to the stop-controlled approach of State Route 1 (U.S. 70). During the morning peak period, the stop-controlled approach experiences poor operational conditions and long vehicle queues. The increase in traffic volumes as expected by historical growth and future land use would significantly increase the delays and queues experienced by vehicles on this minor approach as well as disruption caused by turning vehicles along the major route.

Level of Service

The concept of Level of Service (LOS) uses quantitative values such as speed, travel time, density, delay, and percent time spent following another vehicle to reflect the quality of service along a particular facility. Each of the three (3) intersection types; minor approach stop, signalized intersection, and roundabout intersection have different measures of effectiveness as defined by the Highway Capacity Manual 2000 (HCM 2000). An intersection with stop-control on the minor approach is defined by the delay experienced by vehicles on that approach. A LOS for that intersection as a whole is not defined by the HCM 2000. A signalized intersection is also defined by vehicle delay, but is defined for approaches as well as for the intersection as a whole. The current edition of the HCM does not define LOS for roundabout intersections. In order to be able to qualitatively be able to analyze these independent types of intersections, the average vehicle delay for the entire intersection as well as the average vehicle delay along the worst movement was recorded for both the morning and afternoon peak periods. Table 3.1 shows the HCM 2000 LOS criteria for stop-controlled minor approaches. Table 3.2 shows the HCM 2000 LOS criteria for signalized intersections. The HCM 2000 does not define LOS for roundabout intersections. However, the NCHRP Report 572 research for the HCM 2010 recommends using the sign-controlled delay criteria for roundabout LOS. This LOS criteria is shown in Table 3.3.

Table 3.1 – Level of Service (LOS) Criteria for Minor Approach Stop Condition

Level of Service	Average Control Delay (s/veh)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Information Source: Highway Capacity Manual (2000), Transportation Research Board

Table 3.2 – Level of Service (LOS) Criteria for Signalized Intersections

Level of Service	Average Control Delay (s/veh)
A	0-10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

Information Source: Highway Capacity Manual (2000), Transportation Research Board

Table 3.3 – NCHRP 572 Recommended Roundabout LOS Criteria

Level of Service	Average Control Delay (s/veh)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Information Source: NCHRP Report 572, Roundabouts in the United States

The forecasted traffic volumes used for analysis at the intersection for the years 2015 and 2035 were provided by the TDOT Traffic Division. The Knoxville MPO computer assignment model was not used due to the volumes being inconsistent with cycles counts and showing negative growth rates. Table 3.3 presents the analysis results of the presented options for the design years 2015 and 2035. It is important to look at both the overall intersection delay as well as the worst movement delay in determining the optimal design solution in addition to other factors.

Table 3.4 – Analysis Summary

Year	Intersection Type	AM Delay (s/veh) / LOS		PM Delay (s/veh) / LOS	
		Overall	Worst Movement	Overall	Worst Movement
2015	OPTION 1 (No-Build)	>100 / F	>100 / F	>100 / F	>100 / F
	OPTION 2 (Signalized)	11 / B	17 / B	16 / B	29 / C
	OPTION 3 (Signalized)	14 / B	25 / C	16 / B	28 / C
	OPTION 4 (Roundabout)	8 / A	9 / A	15 / B	17 / B
2035	OPTION 1 (No-Build)	>100 / F	>100 / F	>100 / F	>100 / F
	OPTION 2 (Signalized)	13 / B	22 / C	21 / C	37 / D
	OPTION 3 (Signalized)	17 / B	25 / C	19 / B	25 / C
	OPTION 4 (Roundabout)	10 / A	12 / B	63 / F	>100 / F

3.3 Modal Inter-relationships

Although significant public transportation options are available in Knoxville and within Knox County, few public transportation options are available within Loudon County. The East Tennessee Human Resource Agency (ETHRA) provides demand response service for medical, employment, and other essential trips within the area. Additionally, a program called Tennessee Vans has commuter vanpools within the area to eliminate transportation-related employment barriers. State Route 1 (U.S. 70) is listed as a statewide bicycle route. The section of State Route 1 (U.S. 70) east of the intersection has paved shoulders to accommodate bicycles, but there are minimal paved shoulders on the adjacent roadway section to the west of the intersection. The proposed Options 2, 3, and 4 each include paved shoulders within the limits of improvements. Although roundabout intersections can accommodate pedestrians and bicyclists, inexperienced cyclist and pedestrians with visual disabilities may have difficulties.

3.4 Cost Estimates

Cost estimates are provided for each of the proposed options. The costs are summarized in the Summary Data Tables and Itemized Cost Estimates are provided in this report. The estimated cost of each of the options discussed is presented in Table 3.4.

Table 3.5 – Cost Summary Table

OPTION	ROW	UTILITY	CONSTRUCTION	PE	TOTAL
Option 2: Signalized Intersection	\$441,000	\$71,000	\$1,365,000	\$137,000	\$2,014,000
Option 3: Signalized Intersection	\$1,556,000	\$71,000	\$1,807,000	\$181,000	\$3,615,000
Option 4: Roundabout Intersection	\$708,000	\$71,000	\$1,484,000	\$148,000	\$2,411,000

4.0 ASSESSMENT OF OPTIONS

TDOT's Seven Guiding Principles

The Tennessee Department of Transportation has adopted seven (7) guiding principles against which all transportation projects are to be evaluated. These guiding principles address concerns for system management, mobility, economic growth, safety, community, environmental stewardship, and fiscal responsibility. These guiding principles are discussed in the following paragraphs as they relate to the options discussed in this report.

Guiding Principle 1: Preserve and Manage the Existing Transportation System

Option 1 utilizes only the existing transportation system, but may result in poor management of the roadway due to increased issues related to safety and operations as traffic volumes increase.

Option 2 utilizes the largest portion of the existing roadway while still addressing the safety and operational improvements needed at the existing intersection. This option operates effectively for the forecasted traffic volumes while restoring the route continuity along State Route 1 (U.S. 70). Additionally, the option makes use of the portion of State Route 2 (U.S. 11), which was realigned by converting it to an access road for the existing businesses.

Option 3 requires the most significant changes to the existing roadway and new alignments outside of the existing facility. This option operates effectively for the forecasted traffic volumes, while leaving a continuous roadway along the most heavily traveled route. This option also makes use of the portion of State Route 2 (U.S. 11) which was realigned by converting it to an access road for the existing businesses.

Option 4 utilizes a large portion of the existing roadway, but requires a large intersection footprint for the new roundabout intersection. This option operates effectively during AM and off-peak traffic, but has unacceptable operations during the forecasted PM peak traffic volumes. This option also makes use of the portion of State Route 2 (U.S. 11), which was realigned by converting it to an access road for the existing businesses.

Guiding Principle 2: Move a Growing, Diverse, and Active Population

Each of the improvement options within this study will improve the safety and operations of the existing intersection. Additionally, pedestrian and bicycle accommodations would be present within each of the options. Options 2 and 3 would better accommodate bicyclists and pedestrians with visual disabilities.

Guiding Principle 3: Support the State's Economy

The land use around the intersection is primarily commercial, with some residential property as well as a church adjacent to the intersection. Option 2 does not require the relocation of any businesses or residences. Additionally, the option improves the access to the existing adjacent church. Option 3 requires the acquisition of one (1)

business and significantly more right-of-way than the other options. Option 4 does not require the relocation of any businesses or residences. However, the option does require the modification of the main church entrance to a right-in/right-out access.

Guiding Principle 4: Maximize Safety and Security

Each of the improvement options within this study should significantly improve safety by the increase in sight distance as well as the control and/or consolidation of access along the traveled route. Additionally, the presence of turn lanes/bays will provide a protected location for turning traffic to be stored. Roundabout intersections have been shown to reduce crash severities.

Guiding Principle 5: Build Partnerships for Livable Communities

TDOT's Long Range Transportation Plan promotes and encourages projects that have public and community support. This project study, originated by the Knoxville Regional TPO, was identified as a need for the region and is supported by local public officials. As this project advances, the public involvement process will continue as required by the provisions of the National Environmental Policy Act (NEPA).

Guiding Principle 6: Promote Stewardship of the Environment

Further environmental studies will be required if state and/or federal funds are planned for the proposed project. If such funds are involved, a document consistent with the National Environmental Policy Act (NEPA) will be required.

Although the EES document noted 9.78 acres of wetlands within a 4000' corridor of the study intersection, the national wetlands map indicates there are no wetlands within the areas of improvement for any of the options within this study. A mapping of known wetlands around the study area is included in the appendix. Efforts to avoid impacts to the existing adjacent church and natural gas pipeline should be taken to minimize environmental impacts.

Guiding Principle 7: Promote Financial Responsibility

It is important to improve the existing infrastructure within the State of Tennessee as necessary while minimizing costs to the taxpayers. Construction cost estimates were prepared for each option considered. Option 2 improvements offer minimal cost solutions to the existing operational and safety issues. Some savings associated with a potential improvement in safety and travel time as well as revenue generated by potential economic development may offset many of the improvement costs. Option 3 has a higher cost in order to accomplish the purpose and need of this study. Option 4 has a higher estimated cost which could be offset by future maintenance savings.

5.0 SUMMARY

Future improvements to the existing intersection of State Route 1 (U.S. 70) and State Route 2 (U.S. 11) are necessary to address the local and regional needs of the area by enhancing operational characteristics and increased safety. Each of the improvement options should provide an enhanced facility for users in both the areas of operations and safety. No formal recommendation of any specific option is provided. The optimal solution for the intersection improvements should take into account public input from the NEPA process, safety priorities, as well as available funds for improvements.

The following summarizes the options considered in this report:

Option 1: No Build ~\$0

The operational analysis shows that the existing intersection configuration provides very poor conditions for the stop-controlled minor approach, with overall intersection delays dramatically increasing with volumes from increased growth. Due to the historic growth as well as the potential for businesses to locate within the Creekwood Development, the No-Build option does not support the projects purpose to provide operation improvements, enhance safety, and support future economic growth. This option was reviewed, but is not recommended.

Option 2: Signalized Intersection and Approaches ~\$2.0 Million

This option fully addresses the purpose and need stated within this report. This option provides acceptable levels of service for both the morning and afternoon peak periods through the design year of 2035. Option 2 utilizes the smallest intersection footprint of the proposed options and can be easily altered for future improvements to increase capacity. A signalized intersection is extremely familiar to drivers and can be coordinated with adjacent traffic signals to promote corridor progression. The signalized intersection option would require maintaining proper signal timing in order to keep optimal operations as traffic volumes increase as well as other maintenance typical of traffic signal devices. Additionally, the proposed section of controlled access adjacent to the signalized intersection is necessary to promote safety and minimize operational impacts due to driveway friction at the intersection. The frontage road provides a safer, low-speed roadway for business accesses. Traffic signals provide a familiar and safer place to accommodate pedestrian and bicycle crossings of the roadway; which is a factor since State Route 1 (U.S. 70) is a statewide bicycle route. The proposed signalized intersection for Option 2 has eight (8) merge/diverge conflict points and fifteen (15) crossing conflict points, for a total of twenty-three (23) intersection conflict points. Option 2 has an estimated cost of approximately \$2.0 million.

Option 3: Signalized Intersection and Approaches ~\$3.6 Million

This option provides sufficient capacity and acceptable operations for the year 2035. The intersection geometrics are significantly improved over the existing intersection due to the proposed signal and safer accommodation of business accesses adjacent to the intersection. However, the signalized intersection remains within a horizontal curve with a posted speed of forty-five (45) mph. Additionally, this option requires the acquisition of one (1) business. This option provides acceptable levels of service for both the morning and afternoon peak periods through the design year of 2035. Option 3 requires

the acquisition of more right-of-way than the other options and one (1) business relocation. Option 3 does have some operational benefit over Option 2 by keeping the primary traffic route as a continuous roadway. A signalized intersection is familiar to drivers and can be coordinated with adjacent traffic signals to promote corridor progression. The signalized intersection option would require maintaining proper signal timing in order to keep optimal operations as traffic volumes increase as well as other maintenance typical of traffic signal devices. The frontage road provides a safer, low-speed roadway for business accesses. Traffic signals provide a familiar and safe place to accommodate pedestrian and bicycle crossings of the roadway; which is a factor since State Route 1 (U.S. 70) is a statewide bicycle route. The proposed signalized intersection for Option 3 has twelve (12) merge/diverge conflict points and twenty-four (24) crossing conflict points, for a total of thirty-six (36) intersection conflict points. Option 3 has an estimated cost of approximately \$3.6 million.

Option 4: Roundabout Intersection and Approaches ~\$2.7 Million

This option does not provide sufficient capacity to operate efficiently during afternoon peak period for the forecasted 2035 traffic volumes. This option does have acceptable morning and off-peak operations as well as the significant expected safety benefits which usually accompany roundabout intersections. Proper design of the roundabout intersection should ensure much better geometrics than the existing intersection. Roundabout intersections have been shown to accommodate pedestrian and bicyclists. However, roundabout intersections can be difficult for inexperienced cyclist and pedestrians with visual disabilities. Option 4 provides acceptable operations during the morning peak period, but has difficulty in handling the higher traffic volumes during the 2035 afternoon peak period. Option 4 results in major delays for the eastbound approach of State Route 1 (U.S. 70) during the afternoon peak period for 2035 forecasted traffic. The roundabout intersection provides minimal disturbance of traffic flow during off-peak travel periods as well as not requiring significant maintenance for operations. The roundabout intersection does require a large intersection footprint and is not easily expanded to accommodate higher capacities in the future. Although roundabout intersections can accommodate pedestrians and bicyclists, inexperienced cyclists and pedestrians with visual disabilities may have difficulties. The proposed roundabout intersection for Option 4 has eleven (11) merge/diverge conflict points and two (2) crossing conflict points, for a total of thirteen (13) intersection conflict points. Option 4 has an estimated cost of approximately \$2.7 million.

CHECKLIST OF DETERMINANTS FOR LOCATION STUDY

	If any of the following facilities are located in the project area or corridor, place an "x" in the blank opposite its letter designation in the appropriate category.	Where more than one location is to be considered, place its letter designation in the appropriate category.
1.	Agricultural land use	_____
2.	Airport (existing or proposed)	_____
3.	Commercial area, street center	_____
4.	Floodplains	_____
5.	Forested land	_____
6.	Historical, cultural, or landmark	_____
7.	Industrial park, factory	_____
8.	Institutional usages	
a.	School or educational institution	_____
b.	Church or religious institution	X
c.	Hospital or medical facility	_____
d.	Public building, fire station	_____
e.	Defense installation	_____
9.	Recreation usages	
a.	Park or recreation area	_____
b.	Game preserve/wildlife area	_____
10.	Residential establishments	X
11.	Urban area, town, community	_____
12.	Waterway, lake, pond (Permit required:)	
	stream, spring	_____
	Coast Guard	_____
	Section 404	_____
	TVA Section 26a re	_____
	NPDES	X
	Aquatic Resource /	_____
13.	Other - Pipelines	X
14.	Location coordinate	X
15.	Railroad crossings	_____
16.	Hazardous materials	_____

DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE: State Route 1 SECTION: Western Approach
 REGION: I COUNTY: Loudon PROJECT NO.: _____
 LOCATION: State Route 1 (U.S. 70) at State Route 2 (U.S. 11)

PRESENT ADT (2015)	6,790
FUTURE ADT (2035)	8,150
PERCENT TRUCKS	6
DHV (2035)	910
FUNCTIONAL CLASSIFICATION	Urban Arterial
MINIMUM DESIGN SPEED	50 MPH (POSTED 45 MPH)
ACCESS CONTROL	N/A
MINIMUM RADIUS	716' (0.08 Max S.E.)
MAXIMUM GRADE	7.0%
MINIMUM STOPPING SIGHT DISTANCE	425'
SURFACE WIDTH	32'
NUMBER OF LANES	2 @ 12'
USABLE SHOULDER WIDTH	4'
MEDIAN WIDTH	N/A
MINIMUM RIGHT OF WAY	~60'
SIGNALIZATION	N/A

REMARKS: _____

ROUTE: State Route 1 SECTION: Eastern Approach
 REGION: I COUNTY: Loudon PROJECT NO.: _____
 LOCATION: State Route 1 (U.S. 70) at State Route 2 (U.S. 11)

PRESENT ADT (2015)	18,620
FUTURE ADT (2035)	22,340
PERCENT TRUCKS	5
DHV (2035)	2,367
FUNCTIONAL CLASSIFICATION	Urban Arterial
MINIMUM DESIGN SPEED	50 MPH (POSTED 45 MPH)
ACCESS CONTROL	N/A
MINIMUM RADIUS	716' (0.08 Max S.E.)
MAXIMUM GRADE	9.0%
MINIMUM STOPPING SIGHT DISTANCE	425'
SURFACE WIDTH	68'
NUMBER OF LANES	5 @ 12'
USABLE SHOULDER WIDTH	4'
MEDIAN WIDTH	12'
MINIMUM RIGHT OF WAY	~80'
SIGNALIZATION	N/A

REMARKS: _____

ROUTE: State Route 2 SECTION: Southern Approach
 REGION: I COUNTY: Loudon PROJECT NO.: _____
 LOCATION: State Route 1 (U.S. 70) at State Route 2 (U.S. 11)

PRESENT ADT (2015)	12,790
FUTURE ADT (2035)	15,350
PERCENT TRUCKS	4
DHV (2035)	1,568
FUNCTIONAL CLASSIFICATION	Urban Arterial
MINIMUM DESIGN SPEED	50 MPH (POSTED 45 MPH)
ACCESS CONTROL	N/A
MINIMUM RADIUS	716' (0.08 Max S.E.)
MAXIMUM GRADE	7.0%
MINIMUM STOPPING SIGHT DISTANCE	425'
SURFACE WIDTH	32'
NUMBER OF LANES	2 @ 12'
USABLE SHOULDER WIDTH	4'
MEDIAN WIDTH	N/A
MINIMUM RIGHT OF WAY	~60'
SIGNALIZATION	N/A

REMARKS: _____

COST DATA SHEETS

Route:	SR-1 (US-70) at SR-2 (US-11)
Description:	Intersection at L.M. 14.04
	Option 2: Signalized Intersection
County:	Loudon County
Length:	0.0 Miles
Date:	5/5/2010

RIGHT-OF-WAY

LAND, IMPROVEMENTS, & DAMAGES	\$	432,000
INCIDENTALS	\$	9,000
RELOCATION PAYMENTS	\$	0
RIGHT-OF-WAY COSTS	\$	441,000

UTILITY RELOCATION

NON-REIMBURSABLE	\$	71,000
UTILITY COSTS		71,000

CONSTRUCTION

CLEAR AND GRUBBING	\$	4,000
EARTHWORK	\$	26,000
PAVEMENT REMOVAL	\$	7,000
DRAINAGE	\$	14,000
STRUCTURES	\$	0
PAVING	\$	755,000
RETAINING WALLS	\$	15,000
MAINTENANCE OF TRAFFIC	\$	40,000
TOPSOIL	\$	3,000
SEEDING	\$	0
SODDING	\$	15,000
SIGNING & STRIPING	\$	14,000
LIGHTING	\$	0
SIGNALIZATION	\$	125,000
FENCE	\$	8,000
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (10%)	\$	103,000
EROSION CONTROL (5%)		56,000
MOBILIZATION	\$	56,000
CONSTRUCTION COST	\$	1,241,000
10% ENG. & CONT.	\$	124,000
TOTAL CONSTRUCTION COST	\$	1,365,000
10% PRELIMINARY ENGINEERING	\$	137,000
TOTAL COST *	\$	2,014,000

* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR-1 (US-70) at SR-2 (US-11)
Description:	Intersection at L.M. 14.04
	Option 3: Signalized Intersection
County:	Loudon County
Length:	0.0 Miles
Date:	5/5/2010

RIGHT-OF-WAY

LAND, IMPROVEMENTS, & DAMAGES	\$	1,344,000
INCIDENTALS	\$	12,000
RELOCATION PAYMENTS	\$	200,000
RIGHT-OF-WAY COSTS	\$	1,556,000

UTILITY RELOCATION

NON-REIMBURSABLE	\$	71,000
UTILITY COSTS		71,000

CONSTRUCTION

CLEAR AND GRUBBING	\$	18,000
EARTHWORK	\$	63,000
PAVEMENT REMOVAL	\$	21,000
DRAINAGE	\$	9,000
STRUCTURES	\$	0
PAVING	\$	1,039,000
RETAINING WALLS	\$	0
MAINTENANCE OF TRAFFIC	\$	40,000
TOPSOIL	\$	4,000
SEEDING	\$	0
SODDING	\$	18,000
SIGNING & STRIPING	\$	17,000
LIGHTING	\$	0
SIGNALIZATION	\$	125,000
FENCE	\$	0
GUARDRAIL	\$	6,000
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (10%)	\$	136,000
EROSION CONTROL (5%)		75,000
MOBILIZATION	\$	72,000
CONSTRUCTION COST	\$	1,643,000
10% ENG. & CONT.	\$	164,000
TOTAL CONSTRUCTION COST	\$	1,807,000
10% PRELIMINARY ENGINEERING	\$	181,000
TOTAL COST *	\$	3,615,000

* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

Route:	SR-1 (US-70) at SR-2 (US-11)
Description:	Intersection at L.M. 14.04
	Option 4: Roundabout Intersection
County:	Loudon County
Length:	0.0 Miles
Date:	5/5/2010

RIGHT-OF-WAY

LAND, IMPROVEMENTS, & DAMAGES	\$	696,000
INCIDENTALS	\$	12,000
RELOCATION PAYMENTS	\$	0
RIGHT-OF-WAY COSTS	\$	708,000

UTILITY RELOCATION

NON-REIMBURSABLE	\$	71,000
UTILITY COSTS		71,000

CONSTRUCTION

CLEAR AND GRUBBING	\$	11,000
EARTHWORK	\$	40,000
PAVEMENT REMOVAL	\$	22,000
DRAINAGE	\$	14,000
STRUCTURES	\$	0
PAVING	\$	989,000
RETAINING WALLS	\$	15,000
MAINTENANCE OF TRAFFIC	\$	50,000
TOPSOIL	\$	3,000
SEEDING	\$	0
SODDING	\$	15,000
SIGNING & STRIPING	\$	17,000
LIGHTING	\$	10,000
SIGNALIZATION	\$	125,000
FENCE	\$	9,000
GUARDRAIL	\$	0
RIP RAP OR SLOPE PROTECTION	\$	0
OTHER CONST. ITEMS (10%)	\$	132,000
EROSION CONTROL (5%)		73,000
MOBILIZATION	\$	70,000
CONSTRUCTION COST	\$	1,595,000
10% ENG. & CONT.	\$	160,000
TOTAL CONSTRUCTION COST	\$	1,755,000
10% PRELIMINARY ENGINEERING	\$	176,000
TOTAL COST *	\$	2,710,000

* For estimating future project costs, a compounded inflation rate of 10% per year will be applied from the date of this estimate.

TPR CONCEPT PLANS



TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		1



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DRAFT

RIGHT-OF-WAY LINES ARE APPROXIMATE AND ARE FOR PLANNING PURPOSES ONLY.
 APPROX. R.O.W. ACQUISITION +/- 2 ACRES



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

OPTION 2

2006 COLOR AERIAL
 SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		2



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DRAFT

RIGHT-OF-WAY LINES ARE APPROXIMATE
 AND ARE FOR PLANNING PURPOSES ONLY.
 APPROX. R.O.W. ACQUISITION +/- 6 ACRES



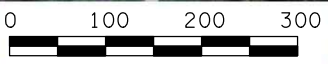
TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2010		3



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DRAFT

RIGHT-OF-WAY LINES ARE APPROXIMATE
 AND ARE FOR PLANNING PURPOSES ONLY.
 APPROX. R.O.W. ACQUISITION +/- 3 ACRES



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

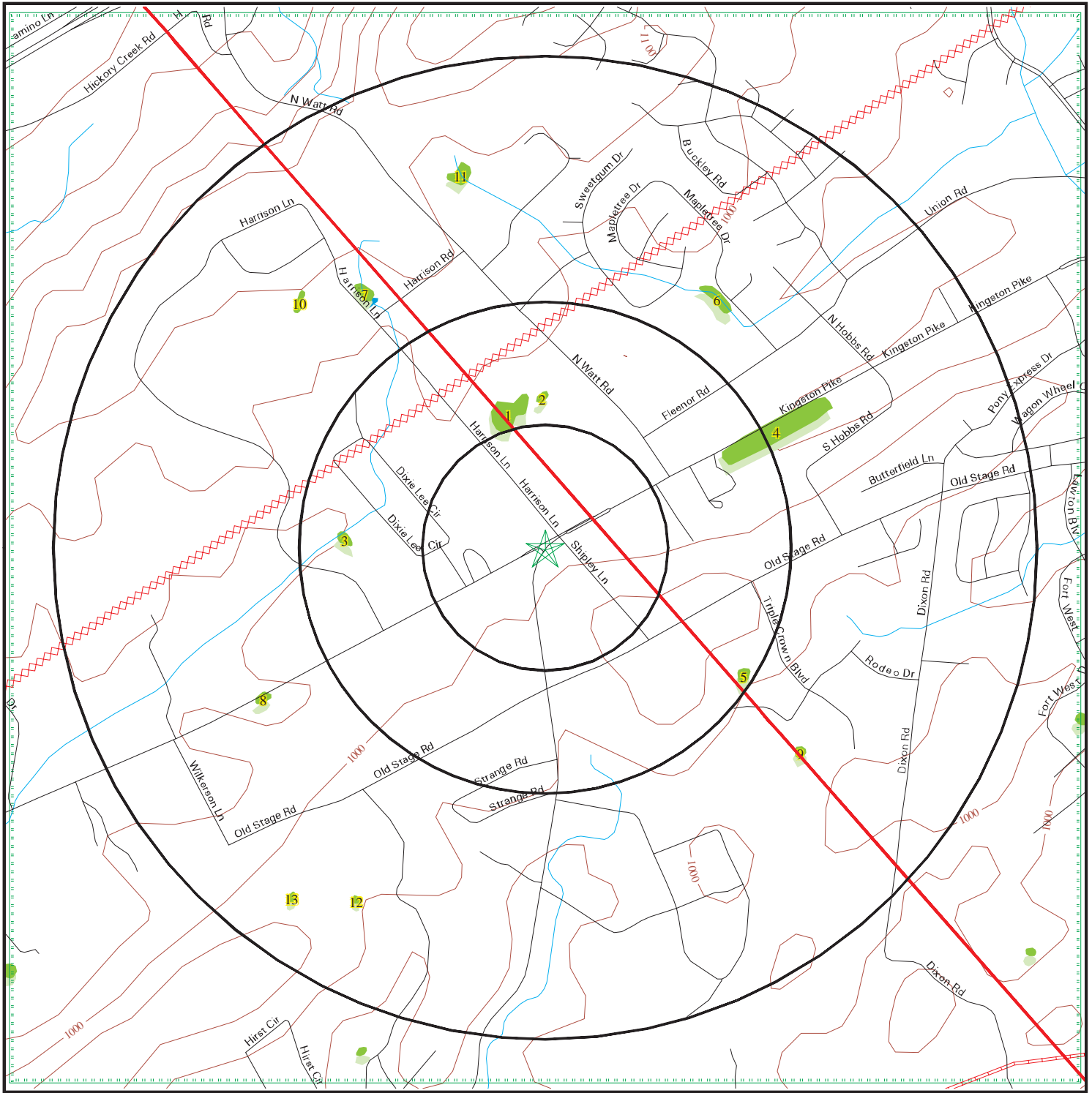
OPTION 4

2006 COLOR AERIAL
 SCALE: 1"=100'

EARLY ENVIRONMENTAL SCREENING (EES)



National Wetlands Inventory Map

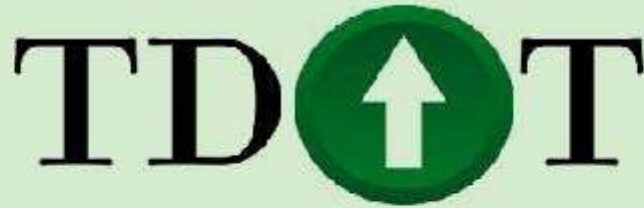


- | | | | | | |
|--|-----------------|--|-------------------------------|--|-----------------------------------|
| | Major Roads | | Power Lines | | Water |
| | Contour Lines | | Pipe Lines | | National Wetland Inventory |
| | Waterways | | Fault Lines | | State Wetlands |
| | County Boundary | | Electronic NWI data available | | Electronic NWI data not available |



SITE NAME: SR-1/SR-2
 ADDRESS: 19453 Hwy 11 E
 Lenoir City TN 37772
 LAT/LONG: 35.8602 / 84.2257

CLIENT: Clinard Engineering Associates
 CONTACT: Chris Berry
 INQUIRY #: 2686863.1s
 DATE: January 27, 2010



Tennessee Department of Transportation
 EARLY ENVIRONMENTAL SCREENING PROCESS (EES)
 PROJECT SCORING

Project Score Factors

	Total Impacts Evaluated	Total Impacts to Evaluate	EES Evaluation
Project Impact Areas:	15	15	Complete
Date of Evaluation:	February 12, 2010		
Evaluation done by:	Gena J. Gilliam		
	Transportation Planner 3		
County:	Loudon		
Route:	State Route 1		
PIN:	114003.00		
Termini:	State Route 1 at State Route 2 "Dixie Lee Junction"		

Impact Ranking of Features Evaluated: Total by Rank

Features with No Impact	12
Cemetery Sites & Cemetery Properties	
National Register Sites	
Bat	
Terrestrial Species	
TDEC Conservation Sites & TDEC Scenic Waterways	
Superfund Sites	
Caves	
Pyritic Rock	
Railroads	
Tennessee Natural Areas Program	
Wildlife Management Areas	
TWRA Lakes & Other Public Lands	
Features with Low Impact	1
Aquatic Species	

Features with Moderate Impact **0**

Features with Substantial Impact **1**

Large Wetland Impacts

Community Impacts Present:

Institutions:

Populations:

Linguistically isolated populations

Populations below poverty - State average- 13%

EES Project Impact: **Complete**

Impacts Evaluated Within 1,000 Ft of Study Area

CEMETERY SITES & CEMETERY PROPERTIES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	<input type="checkbox"/> None - No impact on the project as there are no known cemetery sites within or abutting the project study area or corridor. It is anticipated that a 'normal' effort to complete this environmental review as part of NEPA.
--	---

INSTITUTIONS & SENSITIVE COMMUNITY POPULATIONS

Sensitive Populations Project Impact:

Present**Not Present**

	Present	Not Present
Institutions:		
Hospital	<input type="checkbox"/>	<input checked="" type="checkbox"/>
School	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Church	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Public Building	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Populations:		
No population present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
65 and older populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disability populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Households without a vehicle	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minority populations 24%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Linguistically isolated populations	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Populations below poverty - State average - 13%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Populations below poverty - State average - 27%	<input type="checkbox"/>	<input checked="" type="checkbox"/>

BAT

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	<input type="checkbox"/> None – No project impact is anticipated. There is no occurrence of Indiana or gray bats within 4 miles of the proposed project study area or corridor.
--	--

RAILROADS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	<input checked="" type="checkbox"/> None – No impact on the project is anticipated. There are no railroads located within the project study area or corridor.
--	--

Impacts Evaluated Within 2,000 Ft of Study Area

NATIONAL REGISTER SITES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	<input checked="" type="checkbox"/> None – No project impact is anticipated as there are no National Register listed properties abutting or within the project study area or corridor.
--	---

SUPERFUND SITES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	<input checked="" type="checkbox"/> None – No project impact is anticipated as there are no known contaminated land tracts abutting or within the project study area or corridor.
--	--

PYRITIC ROCK

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	<input checked="" type="checkbox"/> None – No project impact is anticipated. Pyritic rock is not known to occur in the study area/corridor or project does not involve excavation. Limestone (symbolized as dark green) and dolomite (symbolized as light green) are present.
--	--

TWRA LAKES & OTHER PUBLIC LANDS

Impact

Project Impact (Environment, Time,	<input type="checkbox"/> None – No impact on the project is anticipated as there area no parks located within or
---	---

Cost, Design, and Maintenance)

abutting the project study area or corridor.

Impacts Evaluated Within 4,000 Ft of Study Area

TERRESTRIAL SPECIES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)

- None** - No impact to the project is anticipated. There is no known occurrence of a rare, state, or federally-protected terrestrial species within the proposed transportation study area or corridor.

TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)

- None** – No project impact is expected as there are no scenic waterways or TDEC Conservation Sites within project study area or corridor.

LARGE WETLAND IMPACTS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)

- Substantial** – Regions 1, 2, and 3: A substantial impact to the project is probable as there is greater than 2 acres of wetlands within the project study area or corridor. Compensatory mitigation will be required. Design effort will be needed to avoid and minimize impacts to wetlands to the maximum extent practicable. If a floodplain is crossed by the project, floodplain culverts may be necessary.

TENNESSEE NATURAL AREAS PROGRAM

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)

- None** – No impact on the project is anticipated as the project study area or corridor does not include a Natural Area.

WILDLIFE MANAGEMENT AREAS

Impact

**Project Impact
(Environment, Time,
Cost, Design, and
Maintenance)**

None – No project impact is anticipated as a WMA does not abut nor is located within the project study area or corridor.

Impacts Evaluated Within 10,000 Ft of Study Area

AQUATIC SPECIES

Impact

**Project Impact
(Environment, Time,
Cost, Design, and
Maintenance)**

Low – Minimal impact on the project is likely as there is a known occurrence of a rare or state protected aquatic species located within the project study area or corridor. A survey for the species is likely to be required.

CAVES

Impact

**Project Impact
(Environment, Time,
Cost, Design, and
Maintenance)**

None – No project impact is anticipated as there are no caves in the project study area or corridor.

EES Report

PIN 114003.00

Option: 114003_5301V01

1,000 Foot Corridor

Version Date: February 10, 2010

Created by: JONATHAN ROGERS

Cemetery Sites & Cemetery Properties

Cemeteries None were found

Cemetery Property None were found

Institutions & Sensitive Community Populations

Institutions None were found

Populations:

No population present None were found

65 & older populations None were found

Disability populations None were found

Households without a vehicle None were found

Minority populations 24% None were found

Linguistically isolated populations Present

Populations below poverty-State average-13% Present

Populations below poverty-State average-27% None were found

Bat None were found

Railroads None were found

EES Report

PIN 114003.00
10,000 Foot Corridor

Option: 114003_5301V01
Version Date: February 10, 2010
Created by: JONATHAN ROGERS

Aquatic Species

Hemitremia flammea

Total= 1

USESA SPROT
 D

Caves

None were found

EES Report

PIN 114003.00
2,000 Foot Corridor

Option: 114003_5301V01
Version Date: February 10, 2010
Created by: JONATHAN ROGERS

National Register Sites		None were found
Superfund Sites		None were found
Pyritic Rock	Classification	<u>Total</u> =
Pyritic Rock		None were found
TWRA Lakes & Other Public Lands		
TWRA Lakes		None were found
Other Public Lands		None were found

EES Report

PIN 114003.00
4,000 Foot Corridor

Option: 114003_5301V01
Version Date: February 10, 2010
Created by: JONATHAN ROGERS

Terrestrial Species None were found

TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites None were found

TDEC Scenic Waterways None were found

Large Wetland Impacts

Total Acreage= 9.78

PEM1C	0.28	acres
PEM1C	1.07	acres
PEM1C	1.36	acres
PFO1A	6.27	acres
POWHh	0.34	acres
POWHh	0.46	acres

Tennessee Natural Areas Program None were found

Wildlife Management Areas None were found