Executive Summary: Manchester Bypass

The Tennessee Department of Transportation (TDOT) enlisted the services of Volkert & Associates, Inc. to study the options for a proposed bypass around southern Manchester. **The main purpose of the proposed roadway would be to provide an improved route around central Manchester in order to spur industrial development and enhance the attractiveness of Coffee County's Industrial Parks.** Secondary benefits of the new roadway would be better connectivity for commuters and reduced congestion on State Route 2 (US-41/Hillsboro Boulevard).

Three options were developed to improve industrial access and mobility, and a fourth, previously developed option was also considered. The basic section for any of the three new options should have five lanes; southeast of Coffee County Central High School and the closed landfill, a four-lane divided section could be used. All four options could be expected to reduce congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway). Acceptable levels of service could be achieved at most other intersections. In brief, the four options are:

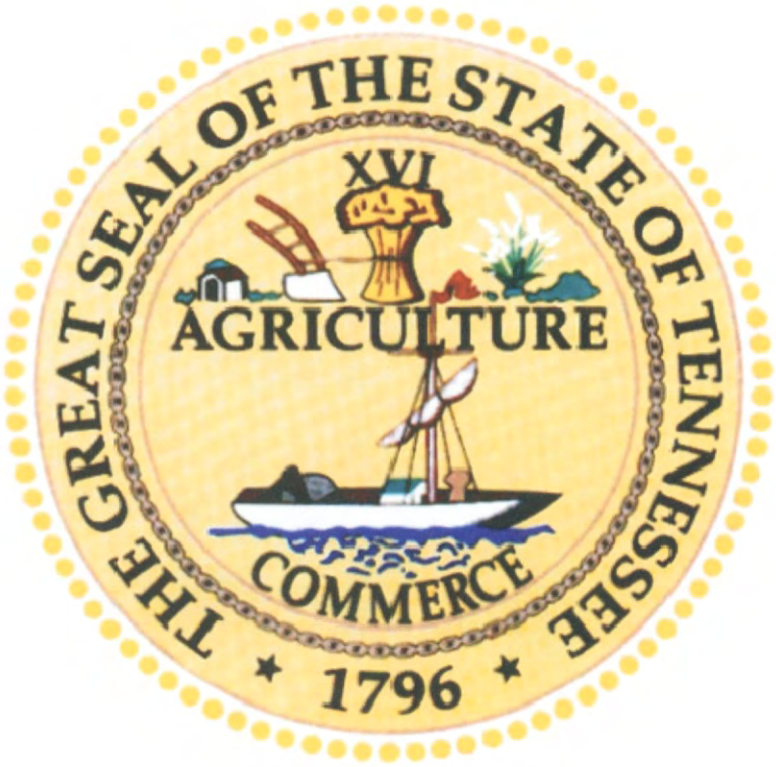
- **Option 1**: From State Route 55 (McArthur Street) to State Route 2 (US-41/Hillsboro Boulevard) using Kennedy Drive, Forrest Wood Drive and Skinner Flat Road. This option would increase congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with Skinner Flat Road. **The projected total cost would be $21,550,800.**
- **Option 2**: From State Route 55 (New Tullahoma Highway) to State Route 2 (US-41/Hillsboro Highway) along a completely new alignment running through the northern fringe of the Arnold Engineering Development Center (AEDC) and southeast of Harvest Drive on the east side of I-24. This option would increase congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with Skinner Flat Road, though less than Option 1. **The projected total cost would be $33,258,800.**
- **Option 3**: From State Route 55 (New Tullahoma Highway) to State Route 2 (US-41/Hillsboro Highway) using AEDC property, Forrest Wood Drive, a road in The Lexington subdivision and a new alignment southeast of Harvest Drive on the east side of I-24. Traffic would be about the same as for Option 2. **The projected total cost would be $34,089,200.**
- **Option 4**: Congestion management. This would include synchronizing and optimizing traffic signal timing for the intersections along State Route 2 (US-41/Hillsboro Boulevard). It would also include construction of dual left-turn lanes at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/ McMinnville Highway) and other turn lanes at various intersections along State Route 2 (US-41/Hillsboro Boulevard). **The projected total cost would be $4,901,600**, including right-of-way acquisition and utility relocations.

It should be noted that Options 1 through 3 were developed in sections in such a way that a variety of other options could be generated using different pieces of each option. The estimated costs range from $20.8 million to $34.1 million.

TRANSPORTATION PLANNING REPORT

Manchester Bypass (Proposed Connector)

FROM STATE ROUTE 55 TO STATE ROUTE 2 (US 41)
COFFEE COUNTY
PIN# 111089.00



PREPARED BY
VOLKERT & ASSOCIATES, INC.
For the
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING		5/7/09
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION		5-7-09
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION		5/7/09

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. HISTORY OF THIS STUDY AND BACKGROUND INFORMATION

The Tennessee Department of Transportation (TDOT) has been requested to evaluate a proposed bypass along the south side of the City of Manchester. City officials would like to bolster the local economy by improving access to the area's industrial parks. They would also like to provide better connectivity for existing and proposed residential development in Manchester's southern quadrant and improve the traffic operations along State Route 2 (US-41/Hillsboro Boulevard). Thus TDOT enlisted the services of Volkert & Associates, Inc. to study the options for improving industrial access, and also the local roadway network. This Transportation Planning Report (TPR) presents the results of that study, including the identification of operational concerns, an analysis of deficiencies, a presentation of four improvement options (most having multiple sections), consideration of the no-build option, cost estimates and a preliminary environmental review.

1.1 HISTORY OF THIS STUDY

The concept of a route around the most congested part of the City of Manchester is not new. As early as 1970, it had been included in the city's Major Thoroughfare Plan. Recognizing the need to update this plan, the Manchester Planning Commission established the Major Thoroughfare Planning Subcommittee (MTPS) on July 19, 2004 in order to accomplish this task. As part of this process, MTPS members met and spoke with TDOT officials regarding potential TDOT involvement in the proposed Manchester Bypass.

On February 3, 2005, the City of Manchester formally requested TDOT assistance with planning and funding for the proposed Manchester Bypass. In May of 2005, local officials met with TDOT representatives in Nashville, and TDOT subsequently authorized a feasibility study. On June 30, 2005, TDOT staff visited Manchester in order to review the proposed roadway's location.

Meanwhile, the MTPS continued work on Manchester's Major Thoroughfare Plan. On October 18, 2005, the Manchester Board of Mayor and Aldermen passed Resolution Number 14-2005 adopting Manchester's Major Thoroughfare Plan, Quadrant 1 (covering Manchester's southern quadrant, and most notably, the proposed Manchester Bypass). On December 1, 2005, the city held a public meeting to review the Major Thoroughfare Plan. Public comments included the suggestion that consideration be given to moving the Manchester Bypass south of Coffee

County Central High School and onto the property of the United States Air Force's Arnold Engineering Development Center (AEDC).

In 2006, TDOT commissioned a study of transportation operations along State Route 2 (US-41/Hillsboro Boulevard) and State Route 55 (McArthur Street/McMinnville Highway) in the City of Manchester. The results of that study indicated that improvements to the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway) could relieve congestion and improve traffic flow through Manchester (see Section 7.5 for further details). With local officials desiring an evaluation of the proposed Manchester Bypass as proposed in the City of Manchester's Major Thoroughfare Plan, TDOT commissioned Volkert and Associates, Inc. in early 2007 to conduct that evaluation.

1.2 LOCATION OF PROPOSED MANCHESTER BYPASS

The proposed Manchester Bypass is located along the south side of the City of Manchester, in Coffee County (see Figure 1). The proposed roadway would run from State Route 55 (New Tullahoma Highway/McArthur Street) in the west to State Route 2 (US-41/Hillsboro Boulevard/ Hillsboro Highway) in the east (see Figures 2 through 4). The western connection point would be on State Route 55 (McArthur Street) at existing Kennedy Drive or on State Route 55 (New Tullahoma Highway) south of Wiley Creek. The eastern connection point would be between Scott Swinney Drive just west of the I-24 interchange with State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) and as much as 1800 feet southeast of Powell Drive on the east side of I-24. It should be noted that the sections shown in Figures 2 through 4 can be combined in a variety of ways, resulting in a total of 12 distinct "build" options for the bypass (see Section 7.4 for further details).

Manchester is located midway between Chattanooga to the southeast and Nashville to the northwest on I-24. McMinnville is located twenty-seven miles northeast of Manchester on State Route 55 (McMinnville Highway), while Tullahoma is located twelve miles southwest of Manchester, also on State Route 55 (New Tullahoma Highway).

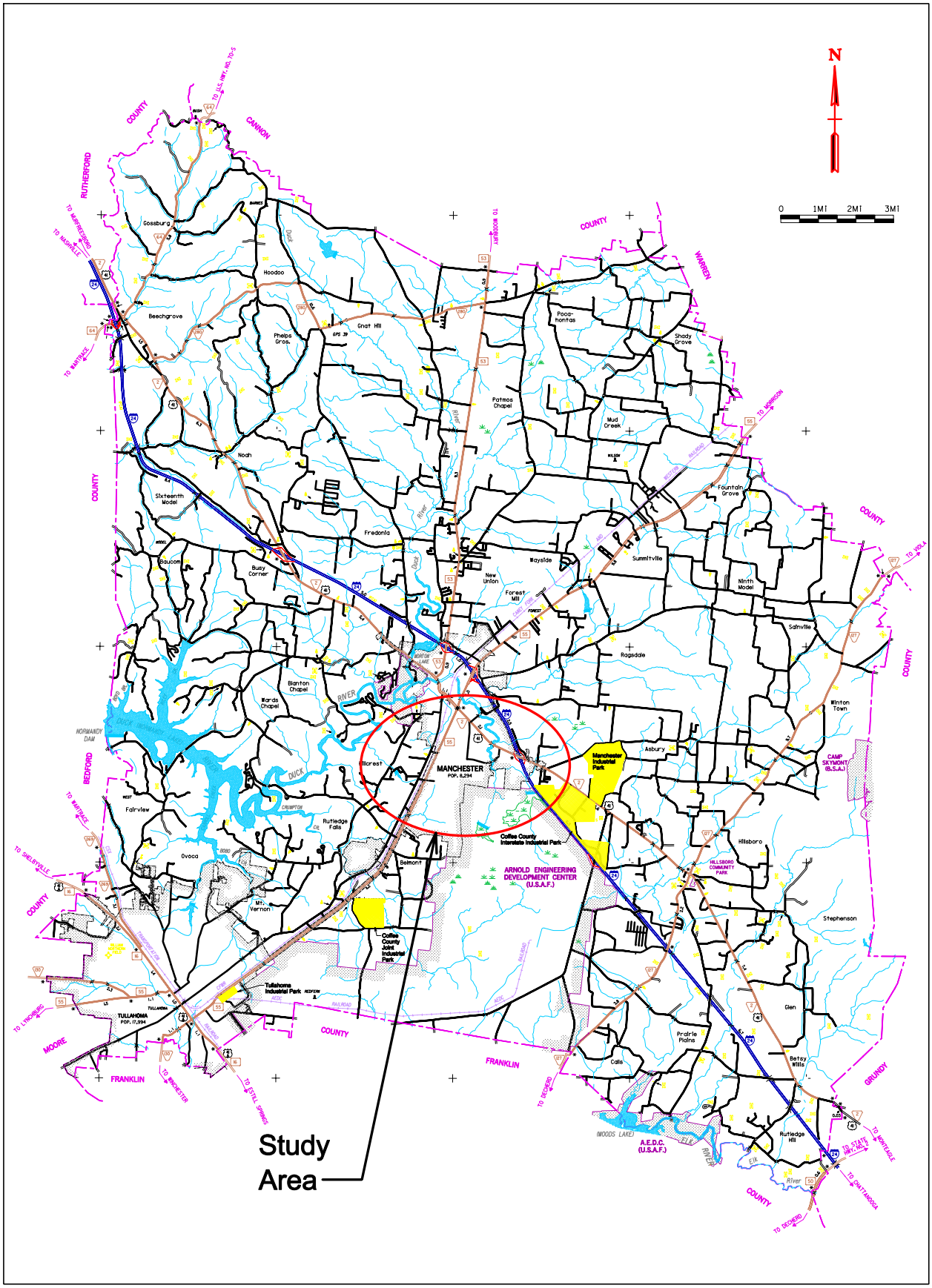


Figure 1. Area Location Map

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure 2.
Manchester
Bypass
Option 1

$$$$SYTIME$$$$$$
$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

N

0 1000 2000 3000

SR-55/McMINNVILLE HWY
SR-2/US-41/HILLSBORO BLVD
CHAPEL RD
HILLS CLOVER LN
WALLS ST
OAK DR
I-24
EXPRESSWAY DR
SR-2/US-41/HILLSBORO BLVD
DOAK RD
WHITE OAK DR
SCOTT SWINNEY DR
SR-2/US-41Y/HILLSBORO HWY
ASBURY RD
SHADY GROVE TRAILER PARK (ABANDONED)
TO MANCHESTER INDUSTRIAL PARK
SR-55/McARTHUR ST
HILLS CHAPEL RD
FORREST WOOD DR
CHICKASAW DR
ESTER LN
SKINNER FLAT RD
HUNT CREEK
JOE HICKERSON RD
POWELL DR
HARVEST DR
2ND AVE
KENNEDY DR
COFFEE COUNTY CENTRAL HIGH SCHOOL
THE LEXINGTON SUBDIVISION
ARNOLD ENGINEERING DEVELOPMENT CENTER
HUCKLEBERRY CREEK
Section 3B
Section 3A
Section 2
Section 1
COFFEE COUNTY INTERSTATE INDUSTRIAL PARK
LANDFILL
WILEY CREEK
SR-55/NEW TULLAHOMA HWY
TO COFFEE COUNTY JOINT INDUSTRIAL PARK & TULLAHOMA INDUSTRIAL PARK

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure 3.
Manchester
Bypass
Option 2

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

N

0 1000 2000 3000

OAK DR
SR-55/McMINNVILLE HWY
SR-2/US-41/HILLSBORO BLVD
CHAPEL RD
HILLS CLOVER LN
WALLS ST
I-24
EXPRESSWAY DR
DOAK RD
WHITE OAK DR
SCOTT SWINNEY DR
SR-2/US-41/HILLSBORO HWY
ASBURY RD
SHADY GROVE TRAILER PARK (ABANDONED)
TO MANCHESTER INDUSTRIAL PARK
SR-55/McARTHUR ST
Section 2
BILLS CHAPEL RD
2ND AVE
KENNEDY DR
COFFEE COUNTY CENTRAL HIGH SCHOOL
FORREST WOOD DR
CHICKASAW DR
ESTER LN
SKINNER FLAT RD
FLINT CREEK
Section 3A
THE LEXINGTON SUBDIVISION
JOE HICKERSON RD
POWELL DR
HARVEST DR
Section 3B
COFFEE COUNTY INTERSTATE INDUSTRIAL PARK
I-24
ARNOLD ENGINEERING DEVELOPMENT CENTER
HUCKLEBERRY CREEK
LANDFILL
SR-55/NEW TULLAHOMA HWY
WILEY CREEK
TO COFFEE COUNTY JOINT INDUSTRIAL PARK & TULLAHOMA INDUSTRIAL PARK
Section 1

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure 4.
Manchester
Bypass
Option 3

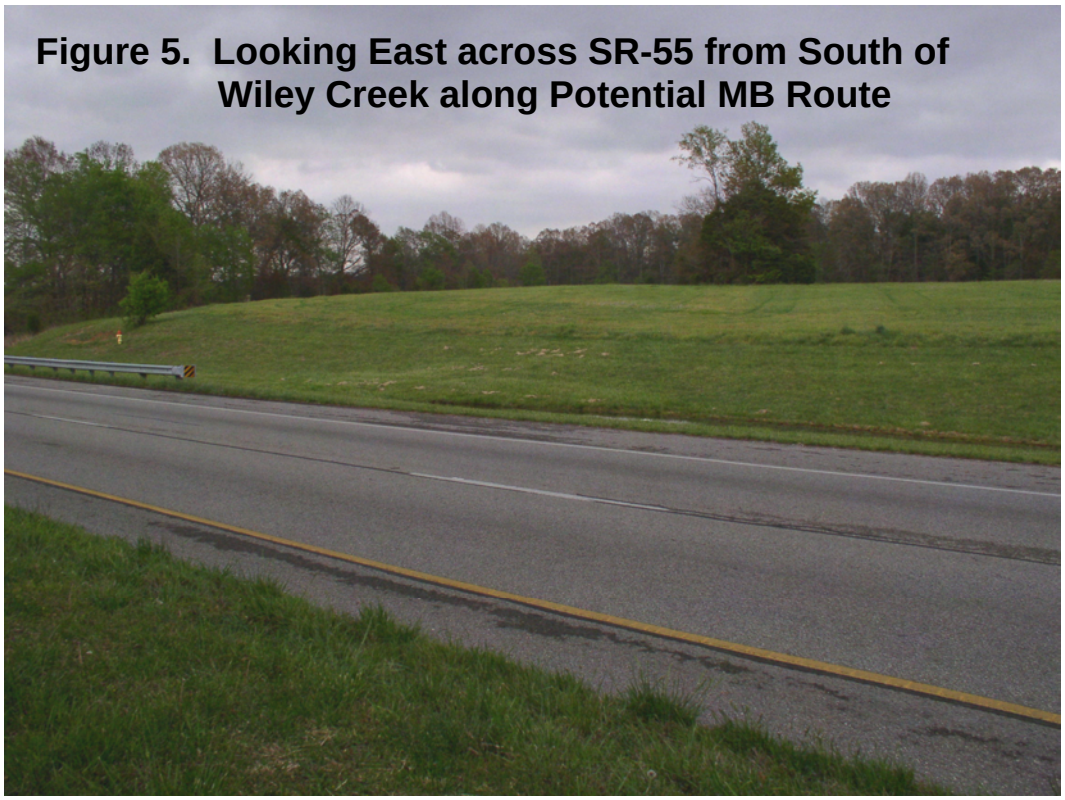
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1.3 COMMUNITY DESCRIPTION

The population of the City of Manchester was estimated to be 9,497 as of July 2005, an increase of 12.7 percent from the 2000 census. Coffee County's population at that time was estimated to be 50,869, including a civilian labor force of 25,360. The median per capita income was $28,887 as of 2004. The county encompasses an area of 435 square miles. (All of this information comes from the Middle Tennessee Industrial Development Association.)

The City of Manchester's proposed Manchester Bypass (MB) would run along or just south of the southern boundary of the City of Manchester, which would mean traversing a mix of land usages. The most rural portions of any of the proposed options would cross grasslands and forested lands (see Figure 5 below and Figure 6 on page 8.) Some of the land along the potential routes is currently used for agricultural purposes (see Figure 7 on Page 8).

Figure 5. Looking East across SR-55 from South of Wiley Creek along Potential MB Route



In recent years, southern Manchester has seen increasing growth in new housing developments, with the city approving a number of subdivisions that included a total of 470 residential lots between the years 2000 and 2005. From 2005 to 2006, the city approved an additional 517 lots, primarily in this same quadrant. These new subdivisions are converting some of Manchester's rural/agricultural land into a residential land usage (see Figure 8 on page 9).

Figure 6. Looking SW at Grasslands between I-24 & Joe Hickerson Rd along Potential MB Route

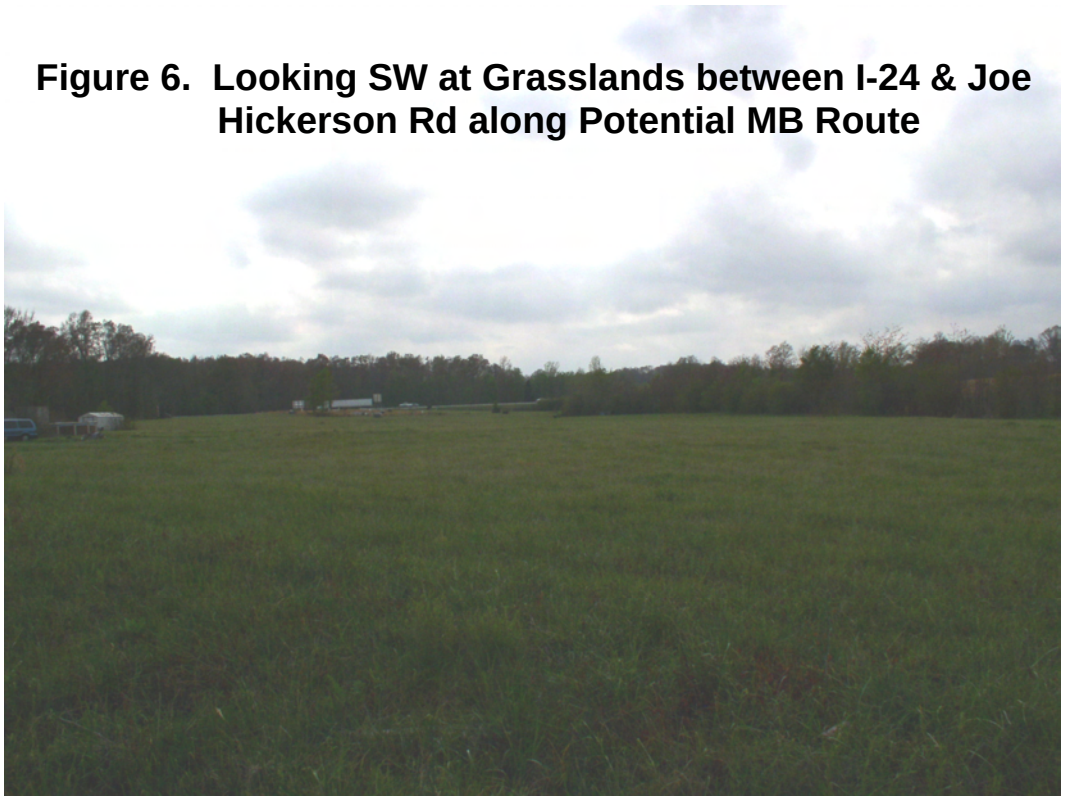




Figure 7. Looking West at Corn Field West of Hills Chapel Rd at Forrest Wood Dr along Potential MB Route



Figure 8. Looking South at The Lexington Subdivision on East Side, South End of Skinner Flat Rd

There are also older, more established residential areas along the proposed routes, most notably along Forrest Wood Drive and also along Skinner Flat Road. These neighborhoods provide a range of housing options, from single-family homes to apartments and condominiums.

In the vicinity of the western terminus of the proposed roadway is Coffee County Central High School, which lies in the southeast quadrant of Kennedy Drive and State Route 55 (McArthur Street) (see Figure 9 on page 10). As noted previously in Section 1.1, there is some public sentiment for having the city locate the proposed roadway south and east of the high school.

There are also commercial facilities located along one of the potential routes. Some of these are found along existing Kennedy Drive just east of State Route 55 (McArthur Street) (see Figures 10 through 12 on pages 10 and 11). There are other commercial facilities located at the other end of this same route, near the intersections of Scott Swinney Drive with State Route 2 (US-41/Hillsboro Boulevard) and Skinner Flat Road. These facilities include Taco Bell and Shoney's restaurants and a Kangaroo service station.

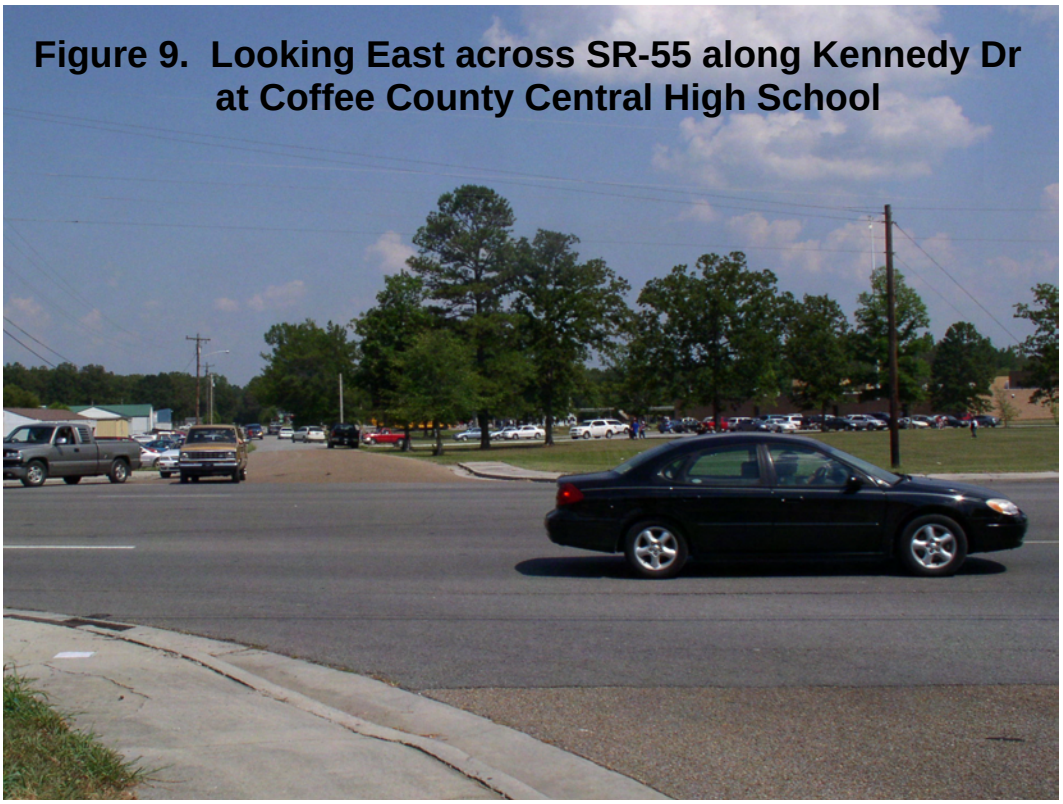


Figure 9. Looking East across SR-55 along Kennedy Dr at Coffee County Central High School

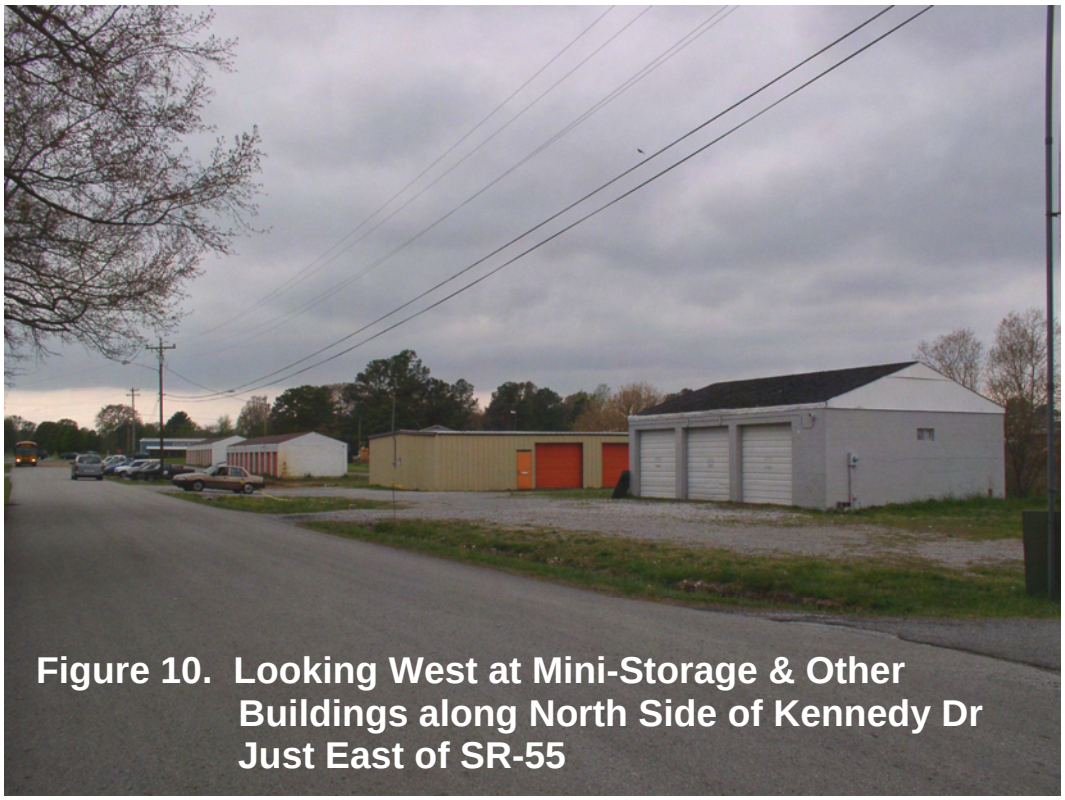


Figure 10. Looking West at Mini-Storage & Other Buildings along North Side of Kennedy Dr Just East of SR-55

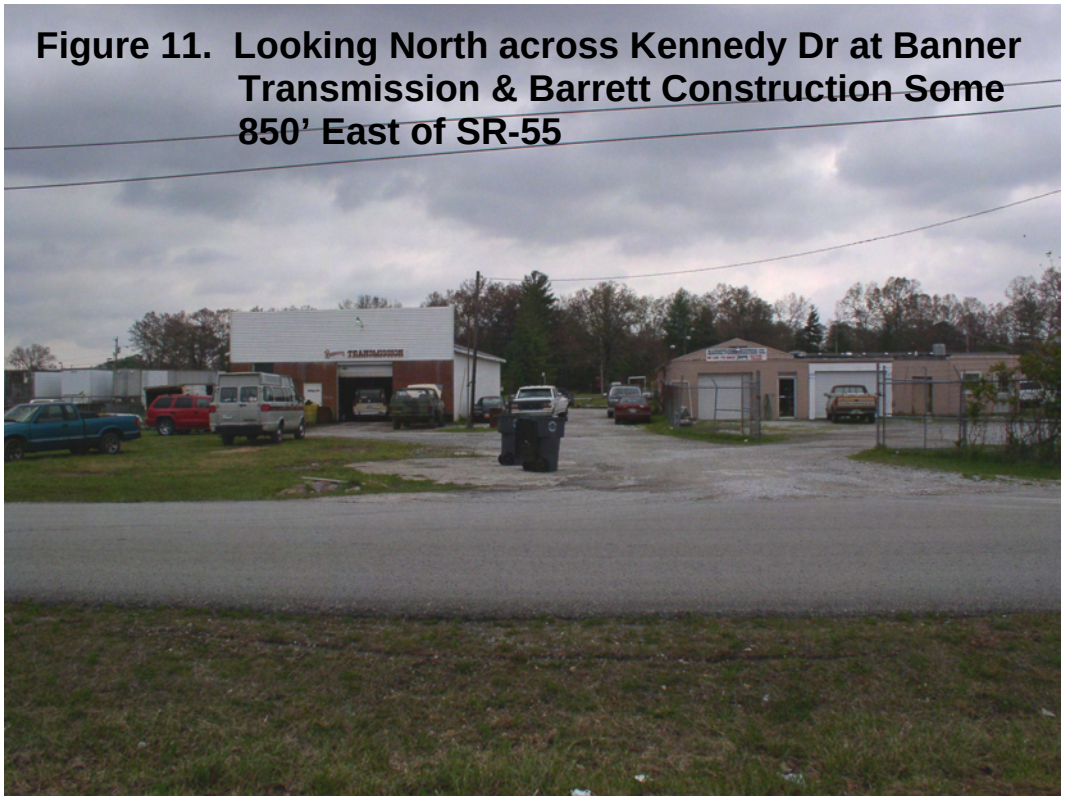


Figure 11. Looking North across Kennedy Dr at Banner Transmission & Barrett Construction Some 850' East of SR-55

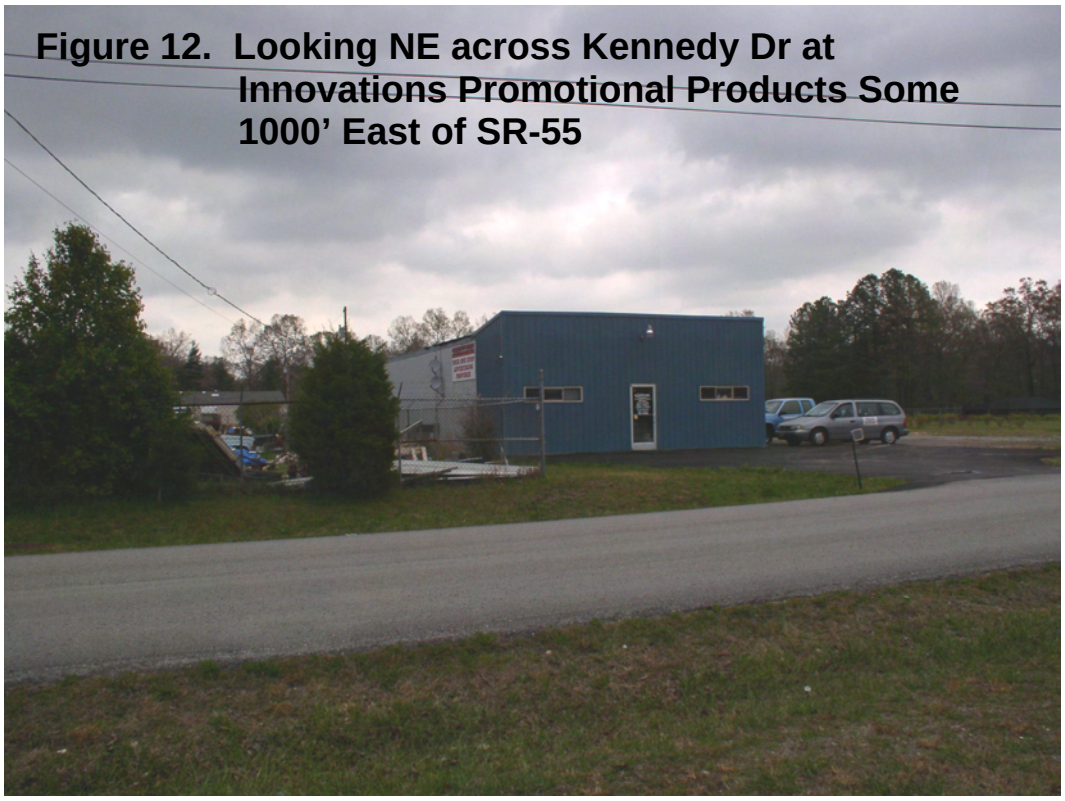


Figure 12. Looking NE across Kennedy Dr at Innovations Promotional Products Some 1000' East of SR-55

In addition, there is considerable industrial development within close proximity of the proposed Manchester Bypass. The Manchester Industrial Park and Coffee County Interstate Industrial Park are located near the eastern terminus of the proposed roadway while the Coffee County Joint Industrial Park and Tullahoma Industrial Park are located southwest of the proposed roadway along State Route 55 (New Tullahoma Highway) (see Figure 13, obtained from the Industrial Board of Coffee County's website). These industrial parks encompass almost 1600 acres.

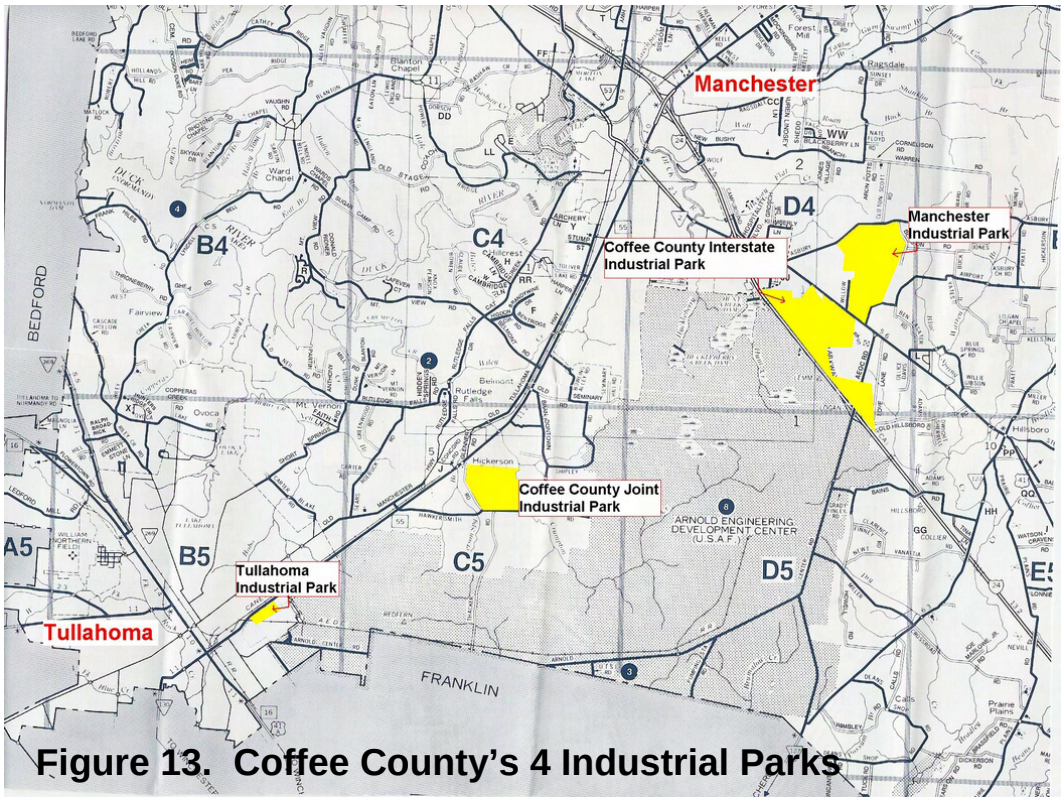


Figure 13. Coffee County's 4 Industrial Parks

1.4 EXISTING TRANSPORTATION CONDITIONS

State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) and State Route 55 (New Tullahoma Highway/McArthur Street/McMinnville Highway) are urban arterial highways. Their intersection in downtown Manchester (see Figure 14 on page 13) is congested during peak hours. From State Route 55 (McArthur Street/McMinnville Highway) proceeding southeast to Walls Street, State Route 2 (US-41/Hillsboro Boulevard) is a five-lane roadway with a two-way left-turn lane, 12-foot travel lanes, 12-foot paved shoulders and 5-foot sidewalks. The shoulders are striped as right-turn lanes at major intersections. From Walls Street proceeding southeast to Joe Hickerson Road, State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) has the same section, but without the sidewalks. From Joe Hickerson Road proceeding southeast to



Figure 14. Looking NW along SR-2 toward Intersection with SR-55

Asbury Road, State Route 2 (US-41/ Hillsboro Highway) transitions down to a three-lane section. From Asbury Road proceeding southeast, State Route 2 (US-41/ Hillsboro Highway) transitions down to a two-lane section.

Some of the key intersections along State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) for the purposes of this study include Hills Chapel Road (see Figure 15 on page 14), Clover Lane (see Figure 16 on page 14) and Expressway Drive/Scott Swinney Drive/Skinner Flat Road (see Figures 17 through 20 on pages 15 and 16).

From south of Wiley Creek proceeding northeast to the property line between the closed landfill and Coffee County Central High School, State Route 55 (New Tullahoma Highway) is a four-lane divided highway with 12-foot travel lanes, 10-foot paved outside shoulders and 4-foot paved inside shoulders. The median of State Route 55 (New Tullahoma Highway) is approximately 30 feet wide. At the property line between the closed landfill and Coffee County Central High School, State Route 55 (New Tullahoma Highway) transitions quickly to a five-lane roadway with a two-way left-turn lane, 12-foot travel lanes, no shoulders and 5-foot sidewalks. Proceeding northeast, this same section is maintained up to the intersection with State Route 2



Figure 15. Looking NE at Intersection of Hills Chapel Rd with SR-2



Figure 16. Looking NE at Intersection of Clover Ln with SR-2



Figure 17. Looking SE along SR-2 toward Intersection with Expressway Dr/Scott Swinney Dr



Figure 18. Looking SW at Intersection of Expressway Dr with SR-2

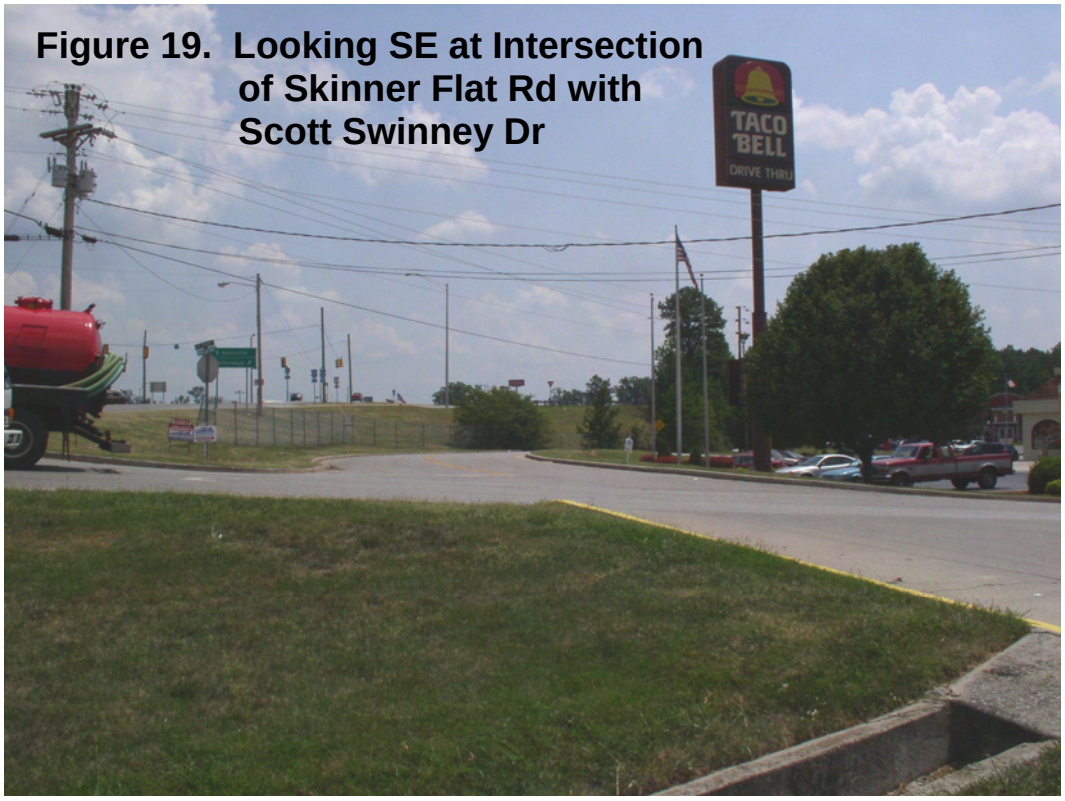


Figure 19. Looking SE at Intersection of Skinner Flat Rd with Scott Swinney Dr



Figure 20. Looking NE at Signalized Intersection of Scott Swinney Dr with SR-2 & at Stop-Controlled Intersection of Skinner Flat Rd with Scott Swinney Dr

(US-41/Hillsboro Boulevard). State Route 55 (McArthur Street) experiences congestion at the intersection with Kennedy Drive when the school day begins and ends at Coffee County Central High School (see Figure 21).

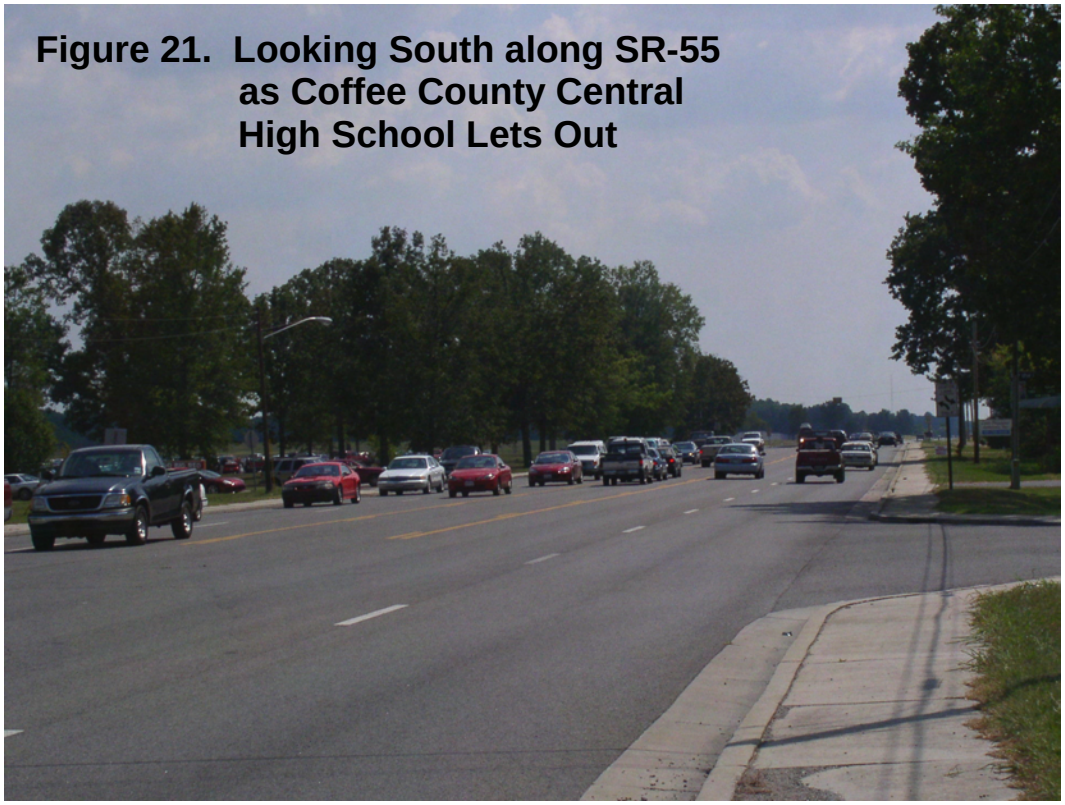


Figure 21. Looking South along SR-55 as Coffee County Central High School Lets Out

The existing streets along portions of the potential routes for the Manchester Bypass (MB) are generally minor local streets with approximately 20 feet of pavement or less and minimal shoulders. These streets include Forrest Wood Drive (see Figure 22 on page 18), Skinner Flat Road (see Figure 8 on page 9 and Figure 23 on page 18), an unnamed street in The Lexington subdivision (see Figures 24 through 26 on pages 19 and 20), and the access drive of the abandoned Shady Grove Trailer Park (see Figure 27 on page 20). The existing right of way along these minor streets is generally 50 feet in most areas. Dedicated right of way is 60 feet in the new subdivisions.

Projected traffic volumes for the entire study area are shown in Appendix A. Under current historic growth trends, traffic volumes are projected to increase by 40 percent by the year 2032. This is particularly significant for the already congested intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway).



Figure 22. Looking West along Forrest Wood Dr from Chickasaw Dr

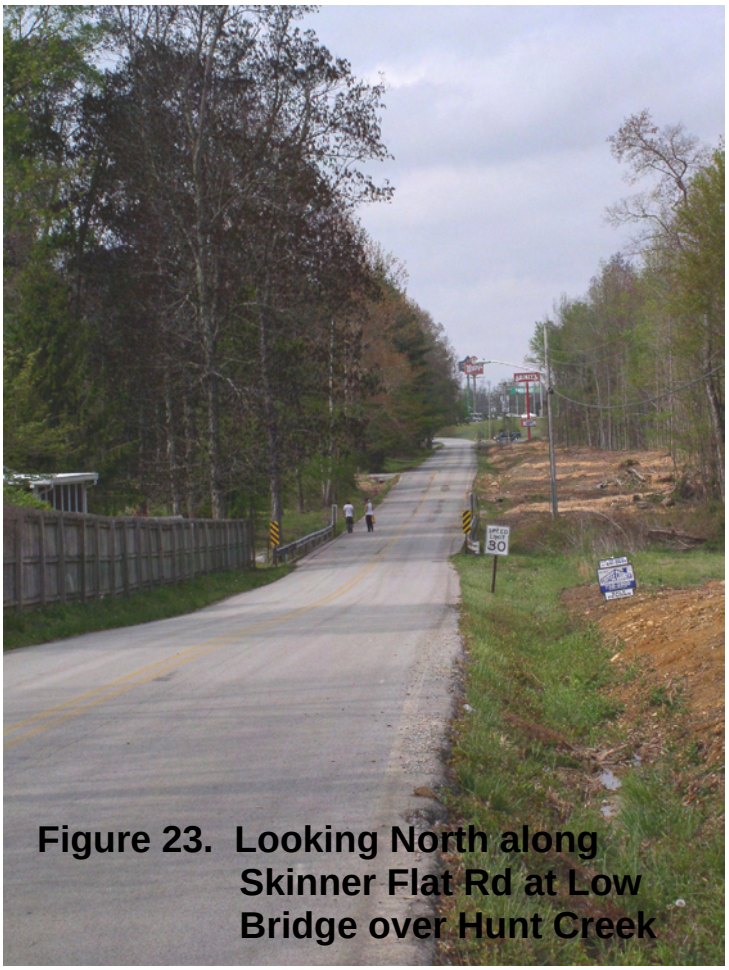


Figure 23. Looking North along Skinner Flat Rd at Low Bridge over Hunt Creek



Figure 24. Looking West along Roadway in The Lexington Subdivision, toward Skinner Flat Rd

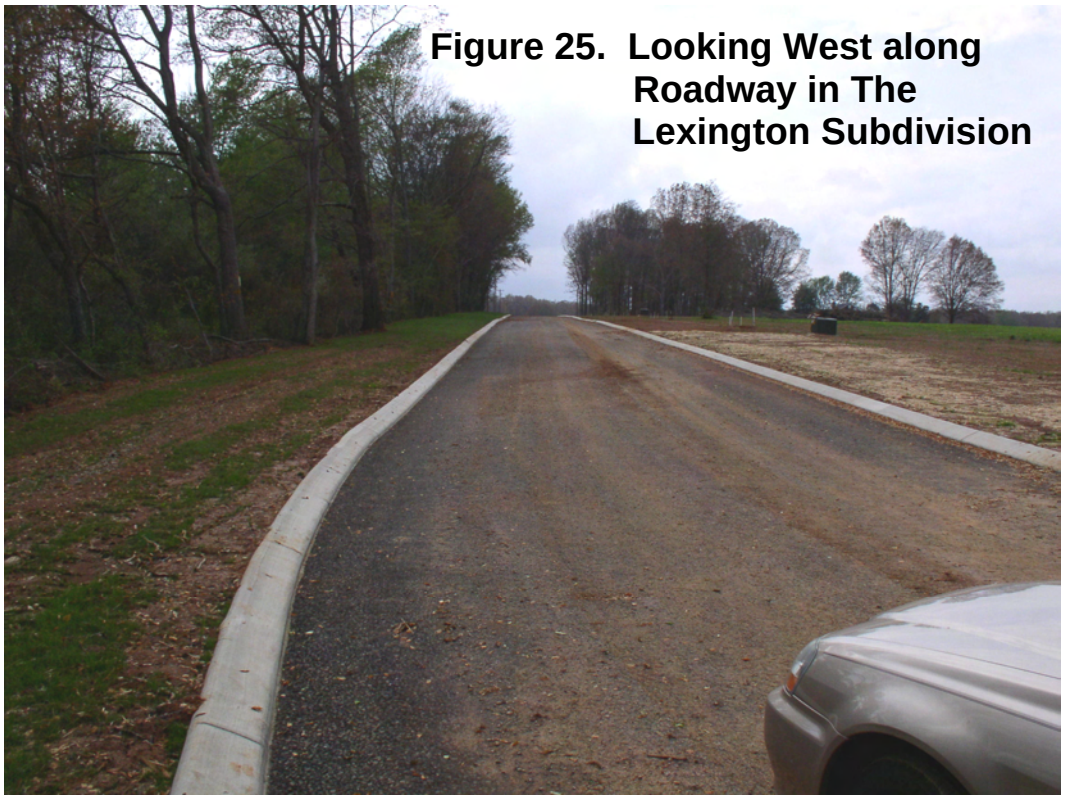


Figure 25. Looking West along Roadway in The Lexington Subdivision



Figure 26. Looking East along Potential MB Route in The Lexington Subdivision



Figure 27. Looking North toward SR-2 along Access Drive of Abandoned Shady Grove Trailer Park

With regards to bicycle and pedestrian accommodation, State Route 55 (McArthur Street) currently has sidewalks north of Kennedy Drive. Coffee County Central High School is located on Kennedy Drive adjacent to the proposed Manchester Bypass, and in close proximity to many residential areas. This school seems to be a natural generator of bicycle and pedestrian traffic. Given the Federal Highway Administration's and TDOT's emphases on creating bicycle and pedestrian friendly facilities, it seems imperative that the proposed Manchester Bypass accommodate both of these types of traffic, with shoulders and sidewalks north and east of the school and wide shoulders southeast of the school as shown in the typical sections developed for this study (see Figure 28).

1.5 FREIGHT TRAFFIC

Movement of freight from, to and through Manchester primarily occurs on State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) and State Route 55 (New Tullahoma Highway/ McArthur Street/McMinnville Highway). Cities near Manchester include Tullahoma, McMinnville, Nashville and Chattanooga as noted in Section 1.2. Truck/freight traffic was calculated for the years 2012 and 2032 using the traffic projections and truck percentages shown in Figure A.1 in Appendix A. The resulting truck/freight traffic flow is shown in Figure A.2 in Appendix A.

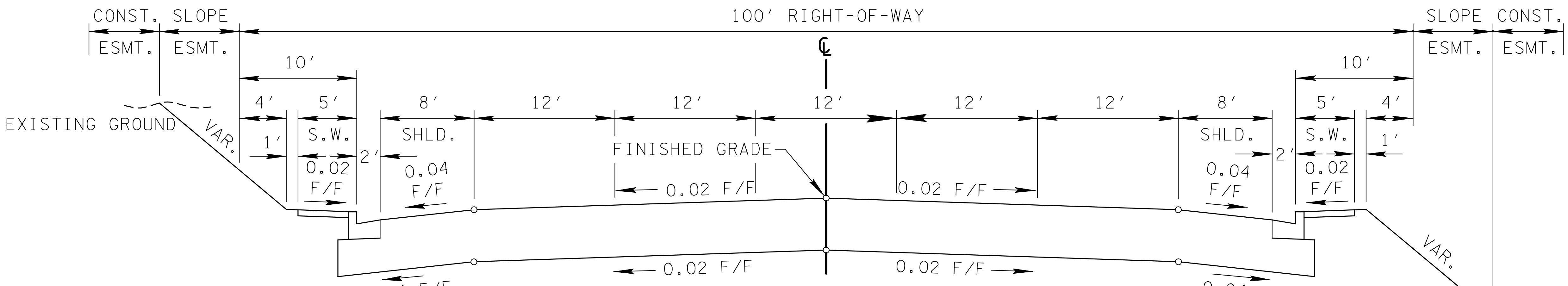
In order to determine the likely routes used by trucks approaching the key intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway), percentages for each approach movement were calculated based on the volumes on the other three legs of the intersection. These are also shown in Figure A.2 in Appendix A.

The truck movements most likely to be affected by the proposed Manchester Bypass are the north-south movement on State Route 55 (New Tullahoma Highway/McArthur Street/ McMinnville Highway), the movement from northbound State Route 55 (McArthur Street) to southbound State Route 2 (US-41/Hillsboro Boulevard) and the movement from northbound State Route 2 (US-41/Hillsboro Boulevard) to southbound State Route 55 (McArthur Street). It is estimated that approximately 560 trucks per day would divert to the proposed bypass.

TENNESSEE D.O.T.
DESIGN DIVISION

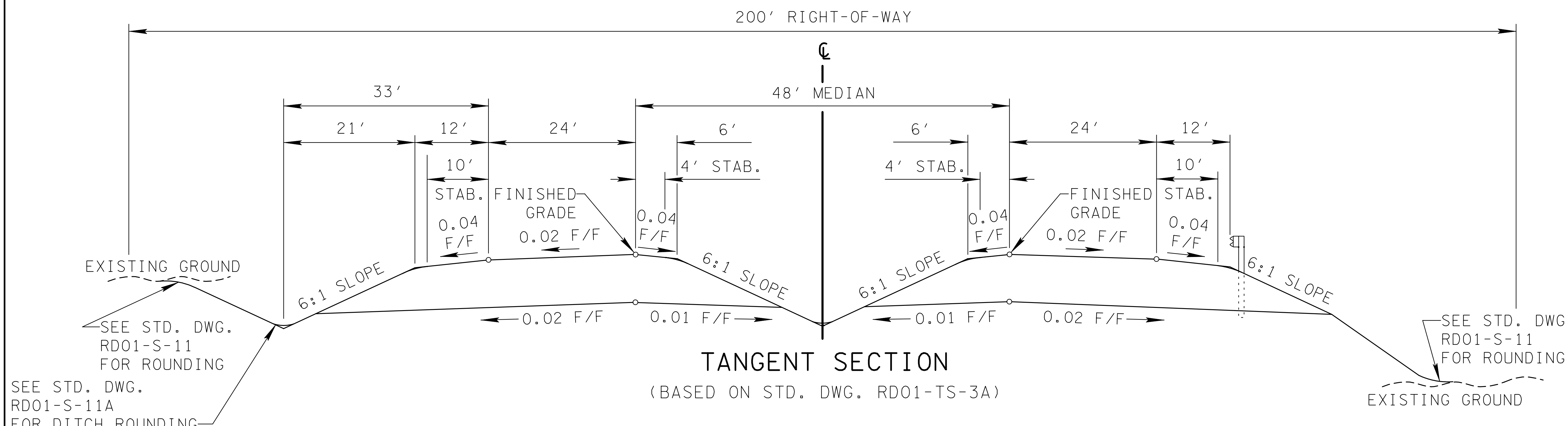
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



TANGENT SECTION

(BASED ON STD. DWG. RD01-TS-6)



TANGENT SECTION

(BASED ON STD. DWG. RD01-TS-3A)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure 28.
4 & 5-Lane
Typical
Sections

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$

2. PURPOSE AND NEED

The original reason for this study and purpose of the proposed roadway were to improve local street connectivity in order to enhance the mobility of commuters and provide access to residential areas. Given the local nature of such a roadway, TDOT encouraged local officials to work through the Department's Office of Local Programs in order to explore possible assistance with funding. However, as detailed below in Section 2.1, this study has evolved over the past year such that the current emphasis is on provision of an improved route around central Manchester in order to spur industrial development and enhance the attractiveness and viability of Coffee County's industrial parks. Secondary benefits of the proposed bypass would be better connectivity for commuters, and reduced congestion on State Route 2 (US-41/Hillsboro Boulevard), especially at the intersection with State Route 55 (McArthur Street/McMinnville Highway).

A bypass route intended to encourage industrial development can be expected to draw considerable truck traffic (see Section 1.5). It was noted during the field review on April 24, 2007 that routing truck traffic through the neighborhoods of southern Manchester would be detrimental to those neighborhoods. Since a bypass would be geared toward trucks, improving local street connectivity and residential access would still be needed. Thus a separate report was developed focusing on the local street network.

2.1 ECONOMIC DEVELOPMENT POTENTIAL

When Volkert and Associates, Inc. began this current study, the emphasis was to be on local street connectivity for the enhancement of access to residential development. However, at the field review in Manchester on April 24, 2007, it became apparent that the city and Coffee County were also interested in developing the proposed Manchester Bypass in order to improve the economic prospects of the area, and particularly the desirability of the county's industrial parks. This emphasis was moved to the forefront in a meeting between TDOT and local officials in Manchester on January 22, 2008.

Industrial development in Coffee County and the desirability of the county's industrial parks are adversely affected by at least two factors. Firstly, the delivery of products by industry is hampered by the congestion in downtown Manchester. Furthermore, there are four school zones along State Route 55 (New Tullahoma Highway/McArthur Street/McMinnville Highway)

between the industrial parks to the southwest and the intersection of State Route 55 (McMinnville Highway) with I-24 on the northeast side of Manchester. Trucks hauling freight could shorten their delivery times if they are able to avoid the school zones during the hours when the school day begins and ends.

In order to spur industrial development and avoid the school zone associated with Coffee County Central High School, the proposed bypass should be aligned through the northern fringe of the United States Air Force's Arnold Engineering Development Center (AEDC) (see Figures 3 and 4). Depending on the final alignment, such a route could preserve the character of the local streets while meeting the need for providing industry with a better route. Local officials report that in years past they spoke with a previous commander of the AEDC who was willing to consider a potential route through AEDC property. Recent discussions between local and AEDC officials seem to reaffirm this possibility. However, based on TDOT's prior experience, acquisition of any property from the AEDC might require a lengthy process. Thus it might also be worthwhile to consider a route that avoids the AEDC property altogether (see Figure 2).

2.2 STREET CONNECTIVITY AND MOBILITY

As mentioned in Section 1.3, southern Manchester has seen increasing development of new housing in recent years. While this development may be slowed somewhat by the current national downturn in the housing market, there is still a local need for a route to connect the existing and developing residential areas of southern Manchester. In addition, industrial parks to the southwest and southeast of Manchester (see Figure 13 on page 12) are significant traffic generators contributing to the east-west flow of commuter traffic. Furthermore, Coffee County Central High School could benefit from the proposed roadway as noted previously in Section 1.4 through improved access for bicyclists and pedestrians.

2.3 CONGESTION

Peak-hour congestion is already a concern along State Route 2 (US-41/Hillsboro Boulevard), and would only become worse with a 40 percent increase to the 2032 design year traffic shown in Figure A.1 in Appendix A. Local officials report that drivers currently use Oak Drive and Hills Chapel Road or Clover Lane to cut through a residential area and avoid the congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/ McMinnville Highway). These local roads are not designed to accommodate heavy traffic flows.

Traffic volumes can only be expected to increase with the ongoing development of new housing in Manchester's southern quadrant.

As a secondary benefit, the proposed Manchester Bypass might alleviate congestion on State Route 2 (US-41/Hillsboro Boulevard), although the impact appears to be relatively minor based on traffic projections (see Figure A.1 in Appendix A, Figure B.1 in Appendix B and Figure D.1 in Appendix D). Adding and/or lengthening turn lanes and improving the signal timings and coordination along State Route 2 (US-41/Hillsboro Boulevard) might do more to reduce congestion (see Section 7.5).

3. FIELD REVIEW

A field review of the project corridor was held on April 24, 2007. Those in attendance were:

Mayor Johnnie W. Brown	City of Manchester
Ms. Sara Brown	SCTDD RPO
Mr. Landon Castleberry	TDOT Design, Region 2
Mr. Gary Chapman	TDOT Survey, Region 2
Mr. Terry Gladden	TDOT Project Planning
Mr. Steve Hylton	TDOT Planning
Mr. Phil Lohr	Volkert & Assoc., Inc.
Ms. Betty Parnell	TDOT Environmental Planning
Mr. Scot St. John	St. John Engineering
Mr. Lonnie Norman	City of Manchester
Ms. Betty Superstein	City of Manchester
Ms. Leigh Ann Tribble	FHWA
Mr. Ed Watt	Volkert & Assoc., Inc.
Mr. Gary Webber	TDOT Project Planning
Mr. Alvin West	City of Manchester
Mr. Alan Wolfe	TDOT Traffic, Region 2

4. PRELIMINARY ENVIRONMENTAL EVALUATION

A preliminary investigation of the environmental context of the proposed roadway has been undertaken as part of this study. This investigation included a review of existing sources of

information and field observations by Volkert personnel on April 24, 2007 and August 10, 2007. However, this preliminary investigation should NOT be construed as a comprehensive environmental assessment. Comprehensive environmental studies will need to be conducted by qualified, trained personnel prior to the approval of the required environmental document and permitting.

As a first step, the proposed Manchester Bypass was located on the United States Geological Survey's (USGS's) Manchester Quadrangle map (see odd-numbered Figures H.3 through H.27 in Appendix H). The most notable feature is that there are several "blue-line" streams within the approximate construction limits of the proposed roadway (see Table 1). During construction of the proposed roadway, it would be necessary to protect all of these streams using appropriate storm water pollution prevention measures. Due to the drought in the summer of 2007 and the inaccessibility of many of these stream crossings, it has not been determined to what extent these streams regularly convey flowing water. The quad map seems to indicate the presence of a marshy area just east of Coffee County Central High School (see Figures H.3, H.5 and H.21 in Appendix H). This would be another area needing thorough investigation that is beyond the scope of this study.

Table 1. Blue Line Streams within Study Area

Figure	Option(s)	Description
H.5	1, 2, 3	Unnamed tributary of Huckleberry Creek
H.7	1, 2, 3	Unnamed tributaries of Huckleberry Creek
H.9	1, 2, 3	Huckleberry Creek
H.13	1	Hunt Creek
H.19	2, 3	Unnamed tributary of Wiley Creek
H.23	2, 3	Hunt Creek
H.27	2, 3	Unnamed tributary of Hunt Creek

Another source of information that was consulted in the course of this study was the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Maps. Much of the study area lies within FEMA's "Zone X", outside the 500-year flood plain. However, in the vicinity of Huckleberry Creek and Hunt Creek, the proposed roadway *would* encroach into FEMA's "Zone A" and "Zone AE", which are within the area that can be expected to be inundated by a 100-year flood. Local officials noted that the low bridge on Skinner Flat Road over Hunt Creek (see Figure 23 on page 18) typically floods two or three times annually.

The next potential area of environmental concern is the presence of threatened or endangered species within the limits of the study area. It should be noted that the northern part of the Arnold Engineering Development Center is designated as a Wildlife Management Area (see Figure 29). The Tennessee Division of Natural Heritage lists some 78 "rare" species in the USGS Manchester Quadrangle as shown in Table 2. As noted in the introduction to this section, a detailed assessment by a qualified biologist would be necessary as part of the environmental document to determine if any of these species would be affected by the proposed roadway.

Figure 29. Looking South onto AEDC Wildlife Management Area from The Lexington Subdivision



Table 2. Rare Species in USGS Manchester Quadrangle

Category	Total Number	Federal Status "Listed Endangered"	State Status "Endangered"
Vascular Plant	62	0	21
Nonvascular Plant	1	0	0
Invertebrate Animal	3	0	0
Vertebrate Animal	12	0	1

The final component of Volkert's environmental overview was a search for evidence of any potential hazardous material sites within the proximity of the proposed roadway. The only obvious evidence of typical hazardous material sites, such as underground storage tanks, was the Kangaroo service station located in the southwest quadrant of the intersection of State Route 2 (US-41/Hillsboro Boulevard) with Scott Swinney Drive (see Figure 18 on page 15). However, there are a few other locations that could be affected by the proposed roadway that appear to have some potential for harboring hazardous materials, as listed in Table 3. But depending on the selected alignment, most of these locations can be avoided.

Table 3. Potential Hazardous Material Sites

Site Number	Description	Location	Most Likely Hazards
1	Closed landfill	East side of SR-55, north of Wiley Creek	Unknown
2	Sewer pump station	South end of Kennedy Dr, 3300' east of SR-55	Human waste
3	Sewer pump station	South end of Ester Ln	Human waste
4	Kangaroo service station	SW quadrant of SR-2 /Scott Swinney Dr	Leaking motor fuels from underground storage tanks

Photographs of Site Number 1 are shown in Figures 30 through 32 below and on page 29, Site Number 2 in Figure 33 on page 30 and Site Number 4 in Figure 18 on page 15.

Figure 30. Looking SE at SW Corner of Potential Haz-Mat Site Number 1

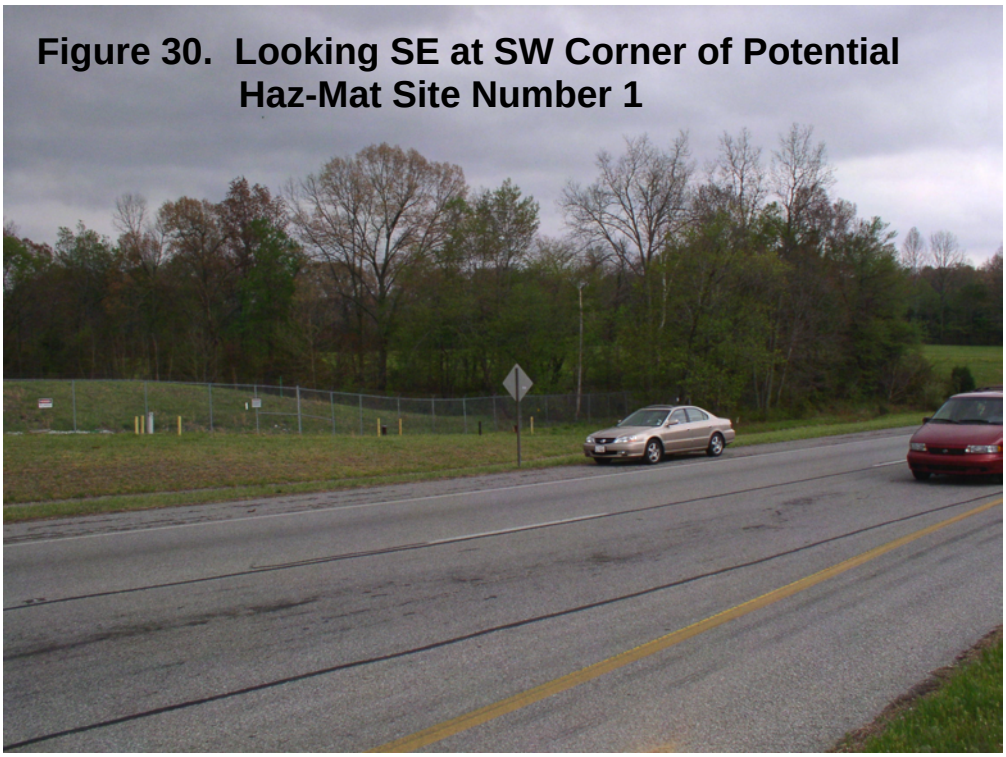




Figure 31. Looking East at Potential Haz-Mat Site Number 1



Figure 32. Looking NE at Potential Haz-Mat Site Number 1



Figure 33. Looking South at Potential Haz-Mat Site Number 2

5. HISTORIC PROPERTIES REVIEW

The National Register of Historic Places (NRHP) lists ten sites in Coffee County. None of these are located close to the proposed roadway. Field visits did not reveal any obvious additional candidates for listing in the register. Thus there do not appear to be any historically significant properties that need to be taken into consideration in planning for the Manchester Bypass.

6. DEFICIENCY ANALYSIS

To evaluate the capacity of the current roadway network, analyses were conducted using *Synchro 7* traffic analysis software. *Synchro 7* includes automated implementations of the Transportation Research Board's *Highway Capacity Manual* (HCM), 2000 edition. For stop-controlled intersections, the HCM defines Levels of Service (LOS) ranging from A (delay less than or equal to 10 seconds) to F (delay greater than 50 seconds), as shown in Table 4 on page 31. For signalized intersections, the HCM defines Levels of Service (LOS) ranging from A (delay less than or equal to 10 seconds) to F (delay greater than 80 seconds), as also shown in Table 4 on page 31.

Table 4. Level of Service for Stop-controlled & Signalized Intersections

LOS	Delay (seconds), Stop-controlled Intersections	Delay (seconds), Signalized Intersections
A	0 - 10	0 - 10
B	> 10 - 15	> 10 - 20
C	> 15 - 25	> 20 - 35
D	> 25 - 35	> 35 - 55
E	> 35 - 50	> 55 - 80
F	> 50	> 80

Another important measure of intersection performance is the volume to capacity ratio (v/c). If the v/c ratio is greater than one, the movement or intersection (whichever is applicable) is "oversaturated", traffic flow will be severely congested and estimates of delay have little value.

Turning movement projections were provided by TDOT for the year 2032 for a number of the "key intersections" described in Section 1.4. As shown in Table 5, State Route 2 (US-41/ Hillsboro Boulevard) does not have adequate capacity to meet the projected demand.

Table 5. Capacity Analysis Summary—Current Configuration (No Build)

Intersection	Control Type	2032 Peak	Intersection Average		Worst Movement			
			Delay (sec)	HCM LOS	Label	v/c	Delay (sec)	HCM LOS
SR-2 at SR-55	Signal	A.M.	----	F	NWB Left	1.44	----	F
		P.M.	----	F	SB Left	2.03	----	F
SR-2 at Hills Chapel Rd	Signal	A.M.	15.4	B	NB Left	0.48	41.4	D
		P.M.	55.3	E	NWB Left	1.18	----	F
SR-2 at Clover Ln	Signal	A.M.	49.5	D	NWB Left	1.06	----	F
		P.M.	----	F	SEB Thru	1.40	----	F
SR-2 at Scott Swinney Dr	Signal	A.M.	12.8	B	NB Left	0.40	54.1	D
		P.M.	45.5	D	EB Thru	1.12	----	F
SR-55 at Kennedy Dr	Stop	A.M.	0.8	A	WB Left	0.35	32.8	D
		P.M.	1.4	A	WB Left	0.63	115.4	F

Note that no estimate of delay is shown where it would be expected to be severe.

7. PROPOSED OPTIONS

Based on all of the preceding background information, four options have been developed to address the purpose and need of the proposed roadway as discussed in Section 2. There are 12 possible combinations of the three basic "build" options, a "congestion management" option and the no-build option. Option 1 (see Figure 2 on page 4) follows one of the routes proposed in the original scope of this study. Option 2 (see Figure 3 on page 5) was added following the field review held on April 24, 2007 and would traverse entirely new territory. Option 3 (see Figure 4 on page 6) is similar to one in the original scope of this study, although the connection point to State Route 55 (New Tullahoma Highway) is further south. Options 1 through 3 can be combined in various ways as discussed in Section 7.4. Option 4 (congestion management) does not involve new roadways and was proposed in a previous study commissioned by TDOT.

Options 1 through 4 would all be suitable for trucks from a geometric standpoint. Options 1 through 3 would provide connectivity where it is currently lacking. Options 1 and 3 would follow portions of the existing roadway network (Forrest Wood Drive for both, Kennedy Drive and Skinner Flat Road for Option 1 and a road in The Lexington subdivision for Option 3). Each of Options 1 through 4 is discussed in detail in the following sections. Table 7 on page 34, TDOT's "checklist of determinants for location study", provides some general context for each of Options 1 through 4. (Note that Item 15 in Table 7 refers to Potential Hazardous Material Site Number 4 from Table 3 on page 28.)

In considering how many lanes are required for a potential bypass, it is important to understand how the HCM defines level of service (LOS). Based on pages 12-7 and 12-8 in the HCM, for multilane highways, Table 6 on page 33 describes the conditions for each level of service.

With a two-lane highway, there would be virtually no opportunity for vehicles to pass, resulting in LOS E. This would not be acceptable for design. A three-lane highway would better accommodate left turns, but would not allow for passing, so the LOS would be about the same.

A four-lane divided highway would allow for passing but would require 200 feet of right of way, which would be prohibitively expensive in the urban/suburban context of Option 1. The most suitable section for Option 1 would be the five-lane curb-and-gutter section shown previously in Figure 28 on page 22. This would provide LOS A and safe operations for left turns.

Table 6. Level of Service for Multilane Highways

Level of Service	Description
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The general level of physical and psychological comfort provided the driver is high.
B	Reasonably free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided the driver is high.
C	Flow with speeds at or near free flow. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension because of additional vigilance required for safe operation.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At the lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.
F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceeds the capacity, or ability of the highway to accommodate that number of vehicles. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.

For Options 2 and 3, from State Route 55 (New Tullahoma Highway) to Kennedy Drive, a four-lane divided highway shown previously in Figure 28 on page 22 would allow for passing, the required 200 feet of right of way should not be prohibitively expensive and there would be no need to provide access (unless requested by the Arnold Engineering Development Center). This four-lane section would provide LOS A.

East of Kennedy Drive on Option 2 there would be at least a few access points (e.g., Hills Chapel Road, Skinner Flat Road, possibly some driveways, etc.) and more potential bicyclists and pedestrians using the route to access Coffee County Central High School. Option 3 has numerous residential driveways in this same area and the required right of way would be prohibitively expensive for a four-lane divided highway. Thus the most suitable section for this portion of Options 2 and 3 would be the five-lane curb-and-gutter section shown previously in Figure 28 on page 22.

Table 7. Checklist of Determinants for Location Study

If preliminary field reviews indicate the presence of any of the following facilities or ESE categories, place an "X" in the blank opposite the item. Where more than one option is to be considered, place its alphanumeric designation in the blank.

1.	Agricultural land usage	1,2,3
2.	Airport (existing or proposed)	1,2,3
3.	Commercial area, shopping center	1,4
4.	Floodplains	1,2,3,4
5.	Forested land	1,2,3
6.	Historical, archaeological, cultural, natural landmarks or cemeteries	
7.	Industrial park, factory	1,2,3,4
8.	Institutional usages	
	a. School or other educational institution	1,2,3,4
	b. Church or other religious institution	
	c. Hospital or other medical facility	
	d. Public building, e.g., fire station	
	e. Defense installation	1,2,3,4
9.	Recreational usages	
	a. Park or recreational area, State Natural Area	
	b. Wildlife refuge or wildlife management area	1,2,3
10.	Residential establishment	1,2,3,4
11.	Urban area, town, city or community	1,2,3,4
12.	Waterway, lake, pond, river, stream, spring, wetland.	1,2,3,4
	Permit required: Coast Guard _____ Section 404	1,2,3
	Section 10 _____ TVA Section 26a review	
	NPDES 1,2,3 Aquatic Resource Alteration Permit	1,2,3
	Class V Injection Wells	
13.	Location coordinated with local officials	1,2,3,4
14.	Railroad crossings	
15.	Hazardous material site (Underground storage tanks - U.S.T.)	1,4
16.	Other	

7.1 OPTION 1: SR-55 TO SR-2 VIA SKINNER FLAT RD

The first option considered for improving the existing roadway network primarily to promote industrial development was shown previously in Figure 2 on page 4. Note that it is divided into three sections, the first running from State Route 55 (New Tullahoma Highway) in the west to Kennedy Drive, the second section running from Kennedy Drive to 1000 feet west of Skinner Flat Road, and the third section running from 1000 feet west of Skinner Flat Road along Skinner Flat Road to State Route 2 (US-41/Hillsboro Boulevard). A more detailed view of this concept is shown in Figures H.2 through H.15 in Appendix H. The corresponding annual average daily traffic (AADT) is shown in Figure B.1 in Appendix B. Truck movement for this option is shown in Figure B.2 in Appendix B.

As shown in Table 8, Option 1 would reduce some of the congestion on State Route 2 (US-41/Hillsboro Boulevard) at State Route 55 (McArthur Street/ McMinnville Highway), Hills Chapel Road and Clover Lane (see Table 5 on page 31 for comparison). However, it would increase the congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with Scott Swinney Drive.

Table 8. Capacity Analysis Summary—Option 1

Intersection	Control Type	2032 Peak	Intersection Average		Worst Movement			
			Delay (sec)	HCM LOS	Label	v/c	Delay (sec)	HCM LOS
SR-2 at SR-55	Signal	A.M.	----	F	NWB Left	1.24	----	F
		P.M.	----	F	NB Left	1.69	----	F
SR-2 at Hills Chapel Rd	Signal	A.M.	12.7	B	NB Left	0.47	36.1	D
		P.M.	30.3	C	NWB Left	0.97	103.9	F
SR-2 at Clover Ln	Signal	A.M.	23.7	C	NWB Left	0.84	46.7	D
		P.M.	----	F	NWB Left	1.21	----	F
SR-2 at Scott Swinney Dr	Signal	A.M.	----	F	WB Left	1.26	----	F
		P.M.	----	F	EB Thru	1.58	----	F
Hills Chapel Rd at Bypass	Stop	A.M.	5.6	A	SB Left	0.63	32.5	D
		P.M.	6.7	A	SB Left	0.69	34.7	D
SR-55 at Bypass	Signal	A.M.	18.5	B	WB Left	0.71	43.0	D
		P.M.	62.3	E	NB Thru	1.13	----	F

Regarding the purpose and need for the proposed roadway, Option 1 would route truck traffic around the congestion in downtown Manchester and avoid some of the school zones along State Route 55 (McArthur Street/McMinnville Highway). However, the noise and pollution

associated with truck traffic would be detrimental to the character of the neighborhoods traversed by this option along Forrest Wood Drive and Skinner Flat Road. Regarding the second part of the purpose and need for the proposed roadway, Option 1 could be expected to have some benefits for commuters by increasing the connectivity to the local streets in southern Manchester.

The projected total cost for construction of Option 1, Section 1 would be $4,256,900, Section 2 would be $8,414,900 and Section 3 would be $8,879,000. For details on these costs, see Appendix C. The summary data for Option 1, including a total cost of $21,550,800, are given in Table 9 on page 37.

Table 9. Summary Data Table--Option 1, Total

Manchester Bypass
Coffee County

From: State Route 55 (McArthur Street)
To: State Route 2 (US-41/Hillsboro Boulevard)

Item	Existing	Option 1
Functional Class	Urban Local	Urban Minor Arterial
System Class	STP	STP
Length (Miles)	1.5	3.1
Cross Section (Feet)	20/Variable	80/100
Present AADT (2012)	1,400	See Figure B.1
Future AADT (2032)	1,960	See Figure B.1
DHV (2032)	196	N/A
Percent Trucks	N/A	See Figure B.1
Estimated Right-of-way Acquisition (Acres)	N/A	24.58
Estimated Right-of-way Tracts Affected	N/A	119
Estimated Family Displacements	N/A	5
Estimated Business Displacements	N/A	5
Estimated Non-profit Displacements	N/A	0
Estimated Right-of-way Cost	N/A	$2,909,000
Estimated Utility Cost, Reimbursable	N/A	$1,762,000
Estimated Utility Cost, Non-reimbursable	N/A	$0
Estimated Construction Cost	N/A	$15,472,800
Estimated Preliminary Engineering Cost	N/A	$1,407,000
Total Estimated Project Cost	N/A	$21,550,800

7.2 OPTION 2: SR-55 TO SR-2 VIA SOUTHERN BYPASS

The second option considered for improving the existing roadway network primarily to promote industrial development was also shown previously in Figure 3 on page 5. Note that it is divided into four sections (labeled as 1, 2, 3A and 3B), the first running from State Route 55 (New Tullahoma Highway) in the west to Kennedy Drive, the second section running from Kennedy Drive to 1000 feet west of Skinner Flat Road, the third section running from 1000 feet west of Skinner Flat Road to Joe Hickerson Road on the east side of I-24, and the fourth running from Joe Hickerson Road to State Route 2 (US-41/Hillsboro Highway). A more detailed view of this concept is shown in Figures H.16 through H.21, H.4 through H.11 and H.22 through H.27 in Appendix H. The corresponding annual average daily traffic (AADT) is shown in Figure D.1 in Appendix D. Truck movement for this option is shown in Figure D.2 in Appendix D.

Since the traffic projections are the same as for Option 1 for the intersections of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway), Hills Chapel Road and Clover Lane, the capacity analysis results for those intersections as shown in Table 10 on page 39 are identical also.

Five intersections were analyzed that are different than for Option 1. Option 2 would increase the congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with Scott Swinney Drive, but less than Option 1. Intersections of the Manchester Bypass with State Route 2 (US-41/Hillsboro Highway), Skinner Flat Road, Hills Chapel Road and State Route 55 (New Tullahoma Highway) can be expected to flow fairly well under Option 2. These results are also shown in Table 10 on page 39.

Regarding the purpose and need for the proposed roadway, Option 2 would route truck traffic around the congestion in downtown Manchester, avoid the school zones along State Route 55 (McArthur Street/McMinnville Highway) and provide a new connector across I-24. It would route truck traffic, and the noise and pollution associated therewith, south of the neighborhoods traversed by Option 1 along Forrest Wood Drive and Skinner Flat Road. Regarding the second part of the purpose and need for the proposed roadway, Option 2 could be expected to have some benefits for commuters by increasing the connectivity to the local streets in southern Manchester and providing the new connector across I-24.

Table 10. Capacity Analysis Summary—Option 2 or 3

Intersection	Control Type	2032 Peak	Intersection Average		Worst Movement			
			Delay (sec)	HCM LOS	Label	v/c	Delay (sec)	HCM LOS
SR-2 at SR-55	Signal	A.M.	----	F	NWB Left	1.24	----	F
		P.M.	----	F	NB Left	1.69	----	F
SR-2 at Hills Chapel Rd	Signal	A.M.	12.7	B	NB Left	0.47	36.1	D
		P.M.	30.3	C	NWB Left	0.97	103.9	F
SR-2 at Clover Ln	Signal	A.M.	23.7	C	NWB Left	0.84	46.7	D
		P.M.	----	F	NWB Left	1.21	----	F
SR-2 at Scott Swinney Dr	Signal	A.M.	47.3	D	EB Thru	1.06	----	F
		P.M.	----	F	EB Thru	1.38	----	F
SR-2 at Bypass	Signal	A.M.	24.0	C	SEB Thru	0.93	27.9	C
		P.M.	10.9	B	NWB Thru	0.89	14.8	B
Skinner Flat Rd at Bypass	Stop	A.M.	8.8	A	SB Left	0.42	42.8	E
		P.M.	14.8	B	SB Left	0.78	110.5	F
Hills Chapel Rd at Bypass	Stop	A.M.	5.4	A	SB Left	0.60	29.8	D
		P.M.	6.7	A	SB Left	0.68	33.5	D
SR-55 at Bypass	Signal	A.M.	14.4	B	NB Thru	0.81	20.9	C
		P.M.	27.6	C	WB Left	0.98	76.4	E

The projected total cost for construction of Option 2, Section 1 would be $9,606,300, Section 2 would be $7,651,900, Section 3A would be $12,577,600 and Section 3B would be $3,423,000. For details on these costs, see Appendix E. The summary data for Option 2, including a total cost of $33,258,800, are given in Table 11 on page 40.

Table 11. Summary Data Table--Option 2, Total

Manchester Bypass
Coffee County

From: State Route 55 (New Tullahoma Highway)
To: State Route 2 (US-41/Hillsboro Highway)

Item	Existing	Option 2
Functional Class	N/A	Urban Minor Arterial
System Class	N/A	STP
Length (Miles)	N/A	4.9
Cross Section (Feet)	N/A	48/120/200 & 80/100
Present AADT (2012)	N/A	See Figure D.1
Future AADT (2032)	N/A	See Figure D.1
DHV (2032)	N/A	N/A
Percent Trucks	N/A	See Figure D.1
Estimated Right-of-way Acquisition (Acres)	N/A	81.24
Estimated Right-of-way Tracts Affected	N/A	12
Estimated Family Displacements	N/A	0
Estimated Business Displacements	N/A	0
Estimated Non-profit Displacements	N/A	0
Estimated Right-of-way Cost	N/A	$703,300
Estimated Utility Cost, Reimbursable	N/A	$270,000
Estimated Utility Cost, Non-reimbursable	N/A	$0
Estimated Construction Cost	N/A	$29,593,500
Estimated Preliminary Engineering Cost	N/A	$2,692,000
Total Estimated Project Cost	N/A	$33,258,800

7.3 OPTION 3: SR-55 TO SR-2 VIA THE LEXINGTON SUBDIVISION

The third option considered for improving the existing roadway network primarily to promote industrial development was also shown previously in Figure 4 on page 6. Note that it is divided into four sections (labeled as 1, 2, 3A and 3B), the first running from State Route 55 (New Tullahoma Highway) in the west to Kennedy Drive, the second section running from Kennedy Drive to 1000 feet west of Skinner Flat Road, the third section running from 1000 feet west of Skinner Flat Road to Joe Hickerson Road on the east side of I-24, and the fourth running from Joe Hickerson Road to State Route 2 (US-41/Hillsboro Highway). A more detailed view of this concept is shown in Figures H.16 through H.21, H.4 through H.11 and H.22 through H.27 in Appendix H. The corresponding annual average daily traffic (AADT) is the same as for Option 2 (see Figure D.1 in Appendix D). Truck movement for this option is the same as for Option 2 (see Figure D.2 in Appendix D).

Since the traffic projections for Option 3 are the same as for Option 2, the capacity analysis results for all intersections are as shown previously in Table 10 on page 39.

Regarding the purpose and need for the proposed roadway, Option 3 would route truck traffic around the congestion in downtown Manchester, avoid the school zones along State Route 55 (McArthur Street/McMinnville Highway) and provide a new connector across I-24. However, the noise and pollution associated with truck traffic would be detrimental to the character of the neighborhoods traversed by this option along Forrest Wood Drive and through The Lexington subdivision. Regarding the second part of the purpose and need for the proposed roadway, Option 3 could be expected to have some benefits for commuters by increasing the connectivity to the local streets in southern Manchester and providing the new connector across I-24.

Since Section 1 is the same as for Option 2, the projected total cost for construction of Option 3, Section 1 would be $9,606,300. Since Section 2 is the same as for Option 1, the projected total cost for construction of Option 3, Section 2 would be $8,414,900. The projected total cost for construction of Option 3, Section 3A would be $12,645,000. Since Section 3B is the same as for Option 2, the projected total cost for construction of Option 3, Section 3B would be $3,423,000. For details on these costs, see Appendices C, E and F. The summary data for Option 3, including a total cost of $34,089,200, are given in Table 12 on page 42.

Table 12. Summary Data Table--Option 3, Total

Manchester Bypass
Coffee County

From: State Route 55 (New Tullahoma Highway)
To: State Route 2 (US-41/Hillsboro Highway)

Item	Existing	Option 3
Functional Class	Urban Local	Urban Minor Arterial
System Class	STP	STP
Length (Miles)	0.9	4.9
Cross Section (Feet)	20/Variable	48/120/200 & 80/100
Present AADT (2012)	N/A	See Figure D.1
Future AADT (2032)	N/A	See Figure D.1
DHV (2032)	N/A	N/A
Percent Trucks	N/A	See Figure D.1
Estimated Right-of-way Acquisition (Acres)	N/A	70.72
Estimated Right-of-way Tracts Affected	N/A	95
Estimated Family Displacements	N/A	1
Estimated Business Displacements	N/A	0
Estimated Non-profit Displacements	N/A	0
Estimated Right-of-way Cost	N/A	$1,342,300
Estimated Utility Cost, Reimbursable	N/A	$1,013,000
Estimated Utility Cost, Non-reimbursable	N/A	$0
Estimated Construction Cost	N/A	$29,087,900
Estimated Preliminary Engineering Cost	N/A	$2,646,000
Total Estimated Project Cost	N/A	$34,089,200

7.4 VARIOUS COMBINATIONS OF OPTIONS 1 THROUGH 3

The proposed roadway section breaks are located in such a way that it would be possible to construct a route using any of 12 combinations of roadway Sections 1, 2 and 3. For this section of the report, the roadway section names are shortened as shown in Table 13. Reference should also be made to Figures 2 through 4 on pages 4 through 6.

Table 13. Shortened Roadway Section Names

Option	Roadway Section	Shortened Name	Meaning
1	1	1N	Section 1, Northern Route
2 or 3	1	1S	Section 1, Southern Route
1 or 3	2	2N	Section 2, Northern Route
2	2	2S	Section 2, Southern Route
1	3	3W	Section 3, Western Route
3	3A & 3B	3C	Section 3, Central Route
2	3A & 3B	3S	Section 3, Southern Route

Combining the various roadway sections from Table 13, the cost for each of the combinations is given in Table 14.

Table 14. Cost for Combinations of Options 1 through 3

Roadway Sections	Option #	Total Cost	Avoids All School Zones?	Avoids AEDC?
1N-2N-3W	1	$21,550,800	No	Yes
1N-2N-3C	---	$28,739,800	No	Yes
1N-2N-3S	---	$28,672,400	No	No
1N-2S-3W	---	$20,787,800	No	No
1N-2S-3C	---	$27,976,800	No	No
1N-2S-3S	---	$27,909,400	No	No
1S-2N-3W	---	$26,900,200	Yes	No
1S-2N-3C	3	$34,089,200	Yes	No
1S-2N-3S	---	$34,021,800	Yes	No
1S-2S-3W	---	$26,137,200	Yes	No
1S-2S-3C	---	$33,326,200	Yes	No
1S-2S-3S	2	$33,258,800	Yes	No

Notice that Section 1S avoids all school zones, while Section 1N does not—it passes Coffee County Central High School. Thus Section 1S better meets the purpose and need of the proposed roadway. Also notice that only Combinations 1N-2N-3W and 1N-2N-3C avoid the Arnold Engineering Development Center's property, which could prove difficult to acquire.

7.5 OPTION 4: CONGESTION MANAGEMENT

A fourth option for improving the existing roadway network primarily to promote industrial development was also considered in a previous study commissioned by TDOT. The key components of the congestion management strategies are as follows:

- Synchronize and optimize the signal timing for the intersections along State Route 2 (US-41/Hillsboro Boulevard).
- Construct dual left-turn lanes and increase the length of right-turn lanes at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway). The dual left-turn lanes should be at least 400 feet long for the southbound to eastbound and westbound to southbound movements. For the eastbound to northbound and northbound to westbound movements, 100-foot-long dual left-turn lanes should be sufficient. All right-turn lanes should be at least 200 feet long. See Figure H.28 in Appendix H.
- Provide more turn lanes at the intersections of State Route 2 (US-41/Hillsboro Boulevard) with Hills Chapel Road and Clover Lane. Hills Chapel Road should have a 200-foot right-turn lane and 200-foot dual left-turn lanes. Clover Lane should have a 250-foot right-turn lane and a 250-foot optional lane (left, through or right). State Route 2 (US-41/Hillsboro Boulevard) westbound at Clover Lane should have 200-foot dual left-turn lanes. See Figure H.29 in Appendix H.

These strategies would reduce travel time delays and improve traffic flow along State Route 2 (US-41/Hillsboro Boulevard). The estimated cost for these improvements is $4,901,600. See Appendix G for further details.

8. ASSESSMENT OF OPTIONS

TDOT has adopted seven guiding principles against which all transportation projects are to be evaluated. These guiding principles are discussed below as they relate to the improvements discussed in this report.

8.1 GUIDING PRINCIPLE #1

The first guiding principle is to “Preserve and Manage the Existing Transportation System”. The no-build option, Option 2 and Option 4 would preserve the existing system. However, the no-build option does a poor job of managing the existing system, especially as traffic volumes

increase. Option 2 on the other hand would manage the existing system by redistributing some of the traffic flow onto the new bypass and enhancing street connectivity. Option 4 would manage the existing system by increasing the capacity of key intersections, most notably State Route 2 (US-41/Hillboro Boulevard) at State Route 55 (McArthur Street/McMinnville Highway).

Options 1 and 3 would preserve the *routes* along portions of the existing roadway network, such as along Forrest Wood Drive. However, they would significantly alter the *character* of these existing roadways, changing them from local streets to five-lane minor arterials. The eastern terminus of Option 1 (at Scott Swinney Drive/Skinner Flat Road) would actually detract from the current system by greatly increasing congestion at that intersection. From Skinner Flat Road to State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway), Option 3 would preserve more of the existing system than Option 1.

Options 1 through 3 would have at least a marginal positive impact on the congestion at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway). They would also benefit the intersections of State Route 2 (US-41/Hillsboro Boulevard) with Hills Chapel Road and Clover Lane.

8.2 GUIDING PRINCIPLE #2

The second guiding principle is to “Move a Growing, Diverse and Active Population.” Due to current and increasing peak-hour congestion, the no-build option would do the worst job of moving any population. By diverting traffic around the school zones on State Route 55 (McArthur Street/McMinnville Highway) and the congestion on State Route 2 (US-41/Hillsboro Boulevard) and increasing the connectivity of the road network in southern Manchester, Option 1 would provide some benefit to truckers and commuters in this area. Options 2 and 3 would provide even more benefits. Since Options 1 through 3 would be designed to accommodate bicyclists and pedestrians, all three could help promote the use of alternate means of transportation to the automobile. Option 4 would provide some benefits to truckers and commuters by improving movement through the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway).

8.3 GUIDING PRINCIPLE #3

The third guiding principle is to "Support the State's Economy." The no-build option would do a poor job of this, as truckers are unhappy with the poor access to I-24 through downtown Manchester and commuters (or in other words, "workers") are already frustrated by the congestion. Option 1 and Option 3 would provide truckers/commuters some benefit, but both could have a somewhat detrimental impact on property values for home owners along these routes. The option that best meets this principle is Option 2, which would not only provide a *good* alternative route for trucks around the congestion and school zones in the downtown area but would also benefit commuters/workers. Option 4 would help truckers/commuters some by reducing delay at the intersection of State Route 2 (US-41/Hillsboro Boulevard) with State Route 55 (McArthur Street/McMinnville Highway). Having a good truck route would benefit industrial development in the vicinity of Manchester, and in the broader picture, enhance the state's economy.

8.4 GUIDING PRINCIPLE #4

The fourth guiding principle is to "Maximize Safety and Security." TDOT provided crash data for State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) from State Route 55 (McArthur Street/McMinnville Highway) to Asbury Road and for State Route 55 (McArthur Street) from Kennedy Drive to State Route 2 (US-41/Hillsboro Boulevard). These data covered the years 2002 through 2004. During that time period, there were 354 reported crashes on State Route 2 (US-41/Hillsboro Boulevard/Hillsboro Highway) at a crash rate of 5.88 per million vehicle miles and there were 131 reported crashes on State Route 55 (McArthur Street) at a crash rate of 3.32 per million vehicle miles. These rates exceed the statewide average for similar facilities of 2.82 crashes per million vehicle miles. Neither roadway has a crash rate high enough to qualify for Hazard Elimination Safety Program (HESP) funding.

Consideration should also be given to the safety of road users who choose alternatives to motorized vehicles. Currently, there are no sidewalks and virtually no shoulders on Forrest Wood Drive, Skinner Flat Road or through The Lexington subdivision. Neither the no-build option nor Option 4 provide good, safe routes for bicyclists or pedestrians through the residential areas of southern Manchester. Any of Options 1 through 3 would do a good job of this, as each would be designed with shoulders wide enough to accommodate bicycles and

sidewalks for pedestrians where appropriate. Option 2 would be somewhat safer than Options 1 or 3 because it would have few, if any, driveways.

8.5 GUIDING PRINCIPLE #5

The fifth guiding principle is to "Build Partnerships for Livable Communities." Local officials have consistently stated that the community supports a proposed roadway. Clearly, there is frustration with the congestion in downtown Manchester. Truckers and the citizens of Manchester would like an alternative. Option 2 would do an excellent job of preserving the character of the neighborhoods of southern Manchester while providing the benefits that truckers and commuters are requesting. On the other hand, as noted previously in Sections 7.1 and 7.3, providing an arterial through the neighborhoods of southern Manchester for the benefit of truckers would have an adverse impact on the quality of life of these neighborhoods and may not receive the same support. Based on the traffic projections, it appears that a bypass may have only a small benefit in terms of reducing congestion on State Route 2 (US-41/Hillsboro Boulevard). Thus it appears that the no-build option may be more attractive on this principle than Options 1 or 3, as it would not adversely affect the livability of the neighborhoods of southern Manchester. Option 4 would be better than the no-build option in that it would reduce congestion in downtown Manchester while maintaining the livability of the neighborhoods of southern Manchester.

8.6 GUIDING PRINCIPLE #6

The sixth guiding principle is to "Promote Stewardship of the Environment". Options 1 through 3 would traverse some environmentally sensitive areas, including Huckleberry Creek, Hunt Creek, other blue-line streams and at least one marshy area. The no-build option would not endanger the environment either by construction or by the long-term presence of a new roadway. It could be expected to have some long-term issues with pollutants and vehicle emissions due to increasing congestion on State Route 2 (US-41/Hillsboro Boulevard). However, since none of Options 1 through 4 is projected to eliminate congestion on State Route 2 (US-41/Hillsboro Boulevard), their long-term environmental benefits in reduced pollution and vehicle emissions may be small. Option 4, involving only the construction of some turn lanes along State Route 2 (US-41/Hillsboro Boulevard), would have minimal risk to the environment during construction.

Options 1 through 3 would carry some risk of environmental impacts, particularly in the areas where there are crossings of the aforementioned creeks and blue-line streams. This risk can be mitigated through the design and implementation of a comprehensive storm water pollution prevention plan. Without a thorough environmental assessment, which is beyond the scope of this study, it is impossible to state categorically which option poses the greatest risk to the environment. Nonetheless, it appears that Option 2 might pose the greatest risk, as it traverses mostly undeveloped forests and grasslands and a Wildlife Management Area (see Figure 29 on page 27), while Options 1 and 3 follow existing paved roadways along significant portions of their projected routes.

8.7 GUIDING PRINCIPLE #7

Cost estimates based on various options were calculated for this report. The cost estimates, as depicted in this report, are offered for comparison purposes and will fluctuate with inflation and any unexpected conditions. It is TDOT's goal to follow a comprehensive transportation planning process, promote coordination among public and private operators of transportation systems, and support efforts to provide stable funding for the public component of the transportation system. This entails exercising financial responsibility in the development and implementation of roadway projects and minimizing costs to taxpayers.

9. SUMMARY

The study described in this report looked at the no-build option and at four options for improving truck and commuter traffic flow through Manchester. The improvement options were: Option 1—State Route 55 (New Tullahoma Highway) to State Route 2 (US-41/Hillsboro Boulevard) via Skinner Flat Road, Option 2—State Route 55 (New Tullahoma Highway) to State Route 2 (US-41/Hillsboro Highway) via an entirely new route, Option 3—State Route 55 (New Tullahoma Highway) to State Route 2 (US-41/Hillsboro Highway) via The Lexington subdivision and Option 4—congestion management with improvements to intersections along State Route 2 (US-41/Hillsboro Boulevard).

The no-build option performs the worst in terms of meeting the proposed roadway's primary purpose and need of providing an improved route around central Manchester in order to spur industrial development and enhance the attractiveness and viability of Coffee County's industrial parks. Option 1 does provide a route around central Manchester, but as enumerated in Section

7.1, has some undesirable features. The differences between Option 2 and 3 are fairly small. Option 4 would improve traffic flow somewhat through downtown Manchester, but would not avoid the school zones.

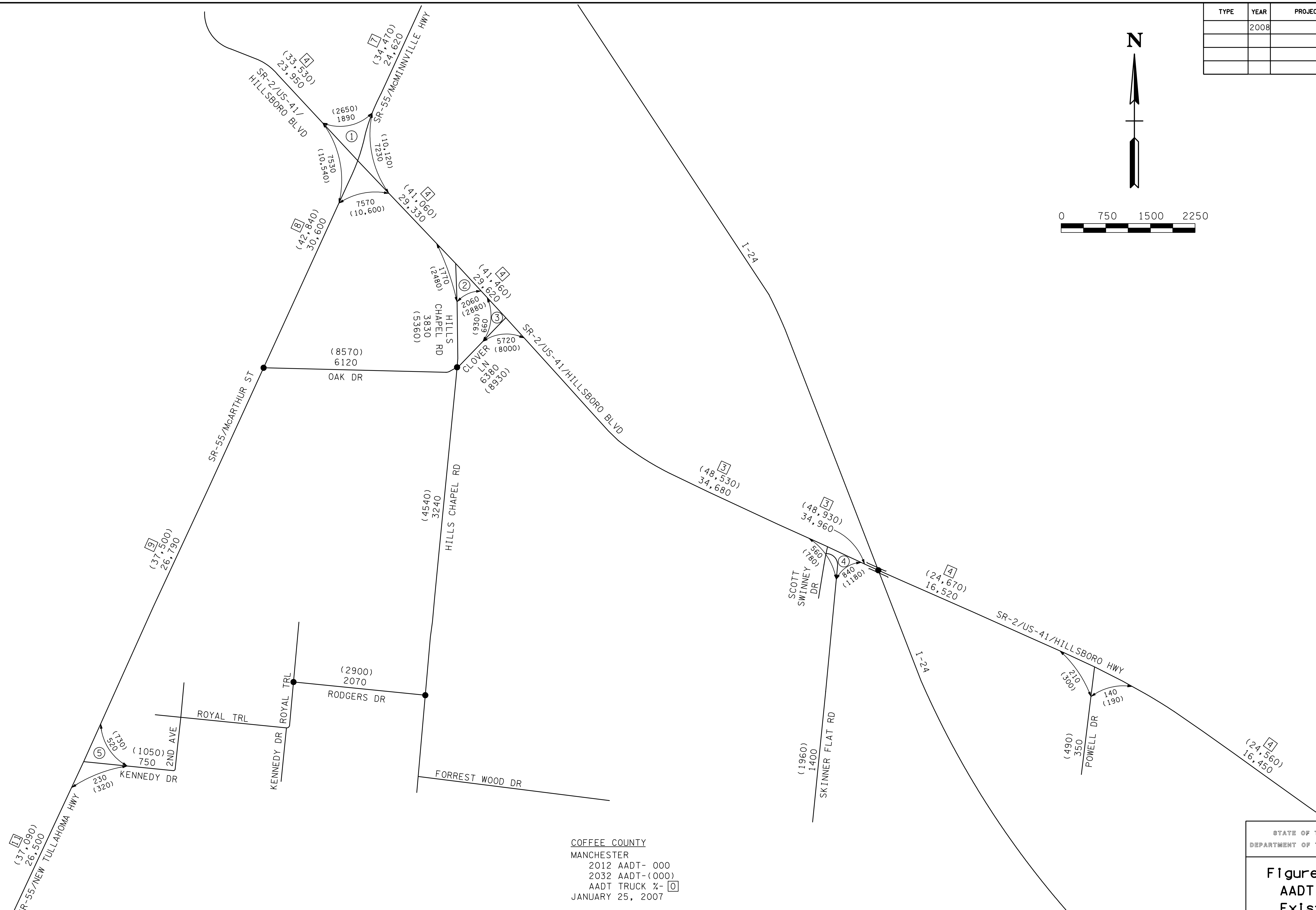
As demonstrated by this report, there are technically viable options that could be implemented for the benefit of the citizens of Coffee County. A proposed bypass (that is, any combination of Options 1 through 3) may receive consideration as a state route, but it would need to go through the South Central Tennessee Development District East Regional Planning Organization and obtain its recommendation for future possible prioritization.

APPENDIX A

PROJECTED TRAFFIC FOR CURRENT CONFIGURATION

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure A.1.
AADT for
Existing
Configuration

$$$$SYTIME$$$$$$
$$$DGNSPEC$$

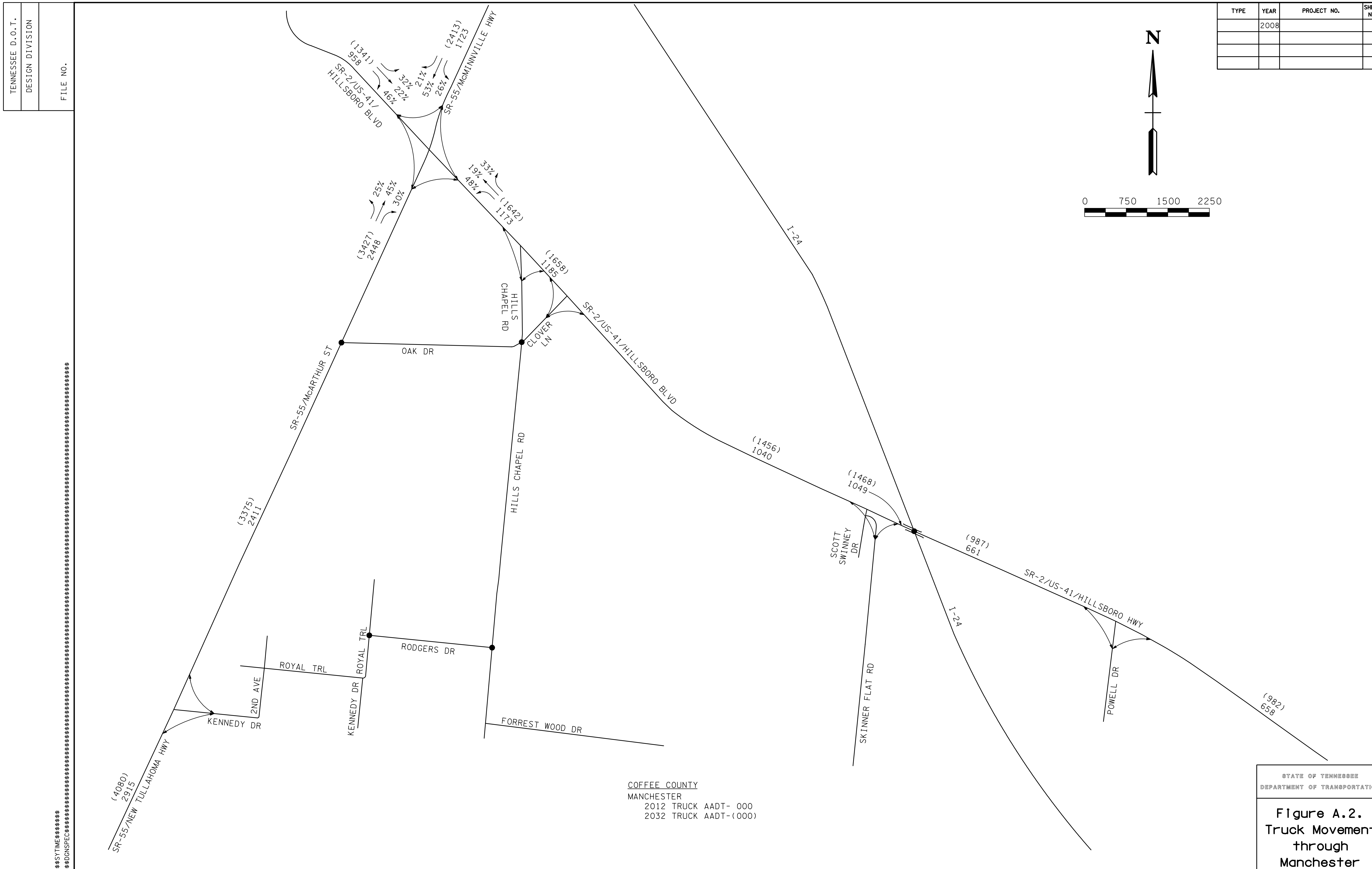
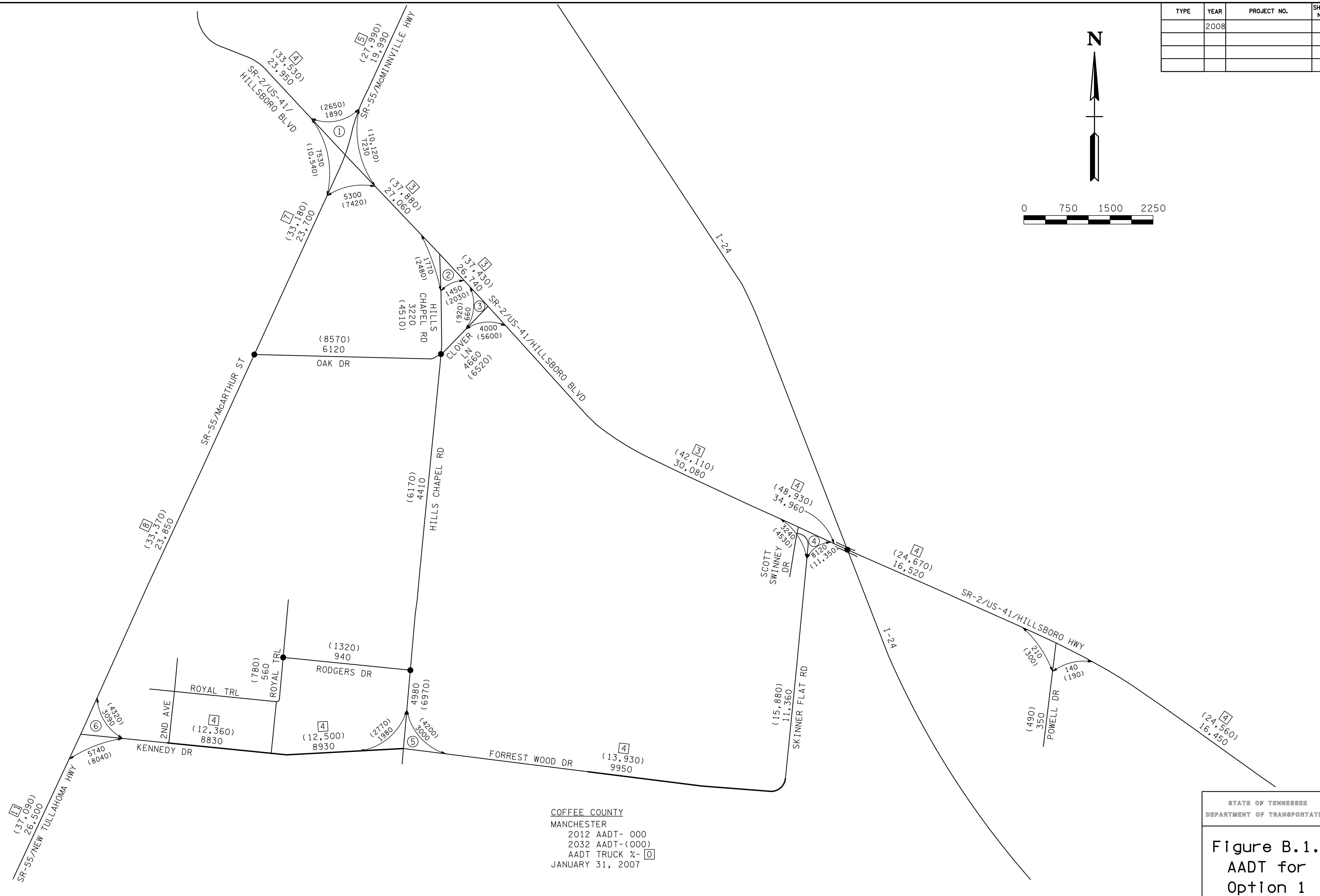


Figure A.2.
Truck Movement
through
Manchester

APPENDIX B

PROJECTED TRAFFIC FOR OPTION 1

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



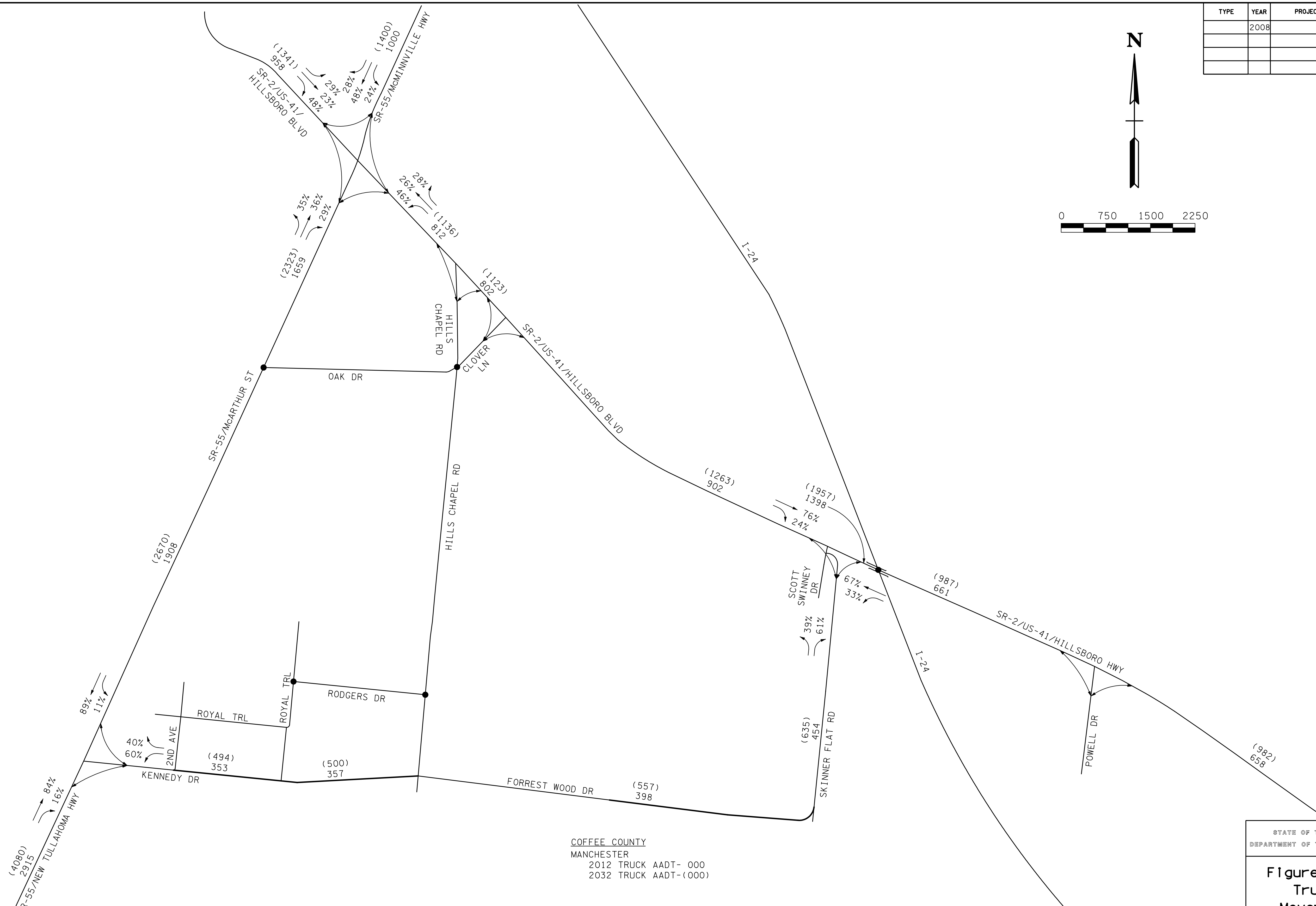
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure B.1. AADT for Option 1

$$$$SYTIME$$$$$$
$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure B.2.
Truck
Movement
for Option 1

APPENDIX C

COST ESTIMATES FOR OPTION 1

Table C.1. Cost Data Sheet--Option 1, Section 1

Project: Manchester Bypass, Manchester, Coffee County
Section: 1, From State Route 55 (McArthur Street) to Kennedy Drive
Length: 0.6 miles

Right of Way				
Land (3.56 Acres)		$	150,000	
Improvements		$	149,000	
Damages		$	71,000	
Incidentals		$	73,000	
Relocation Payments	(0 residences)	$	-	
	(4 businesses & farms)	$	104,000	
	(0 non-profits)	$	-	
Total Right-of-Way Cost				**$ 547,000**
Utility Relocation				
Reimbursable		$	375,000	
Non-reimbursable		$	-	
Total Adjustment Cost				**$ 375,000**
Construction				
Clearing and Grubbing		$	6,900	
Earthwork		$	79,000	
Pavement Removal		$	16,000	
Drainage (Includes Erosion Control)		$	988,000	
Structures		$	-	
Railroad Crossing or Separation		$	-	
Paving		$	1,023,000	
Retaining Walls		$	-	
Maintenance of Traffic		$	31,000	
Topsoil		$	-	
Seeding		$	-	
Sodding		$	22,000	
Signing		$	17,000	
Lighting		$	94,000	
Signalization		$	150,000	
Fence		$	19,000	
Guardrail		$	-	
Rip-Rap or Slope Protection		$	-	
Other Construction Items (8.5%)		$	208,000	
Mobilization		$	125,000	
	Construction Cost	$	2,778,900	
	10% Eng. & Cont.	$	278,000	
Total Construction Cost				**$ 3,056,900**
Preliminary Engineering (10%)				**$ 278,000**
Total Cost				**$ 4,256,900**

Table C.2. Cost Data Sheet--Option 1 or 3, Section 2

Project: Manchester Bypass, Manchester, Coffee County
Section: 2, From Kennedy Drive to 1000' west of Skinner Flat Road
Length: 1.5 miles

Right of Way			
Land (13.02 Acres)	$	149,000	
Improvements	$	218,000	
Damages	$	-	
Incidentals	$	195,000	
Relocation Payments (1 residence)	$	29,000	
(0 businesses & farms)	$	-	
(0 non-profits)	$	-	
Total Right-of-Way Cost			**$ 591,000**
Utility Relocation			
Reimbursable	$	457,000	
Non-reimbursable	$	-	
Total Adjustment Cost			**$ 457,000**
Construction			
Clearing and Grubbing	$	24,000	
Earthwork	$	190,000	
Pavement Removal	$	38,000	
Drainage (Includes Erosion Control)	$	1,896,000	
Structures	$	414,000	
Railroad Crossing or Separation	$	-	
Paving	$	2,476,000	
Retaining Walls	$	-	
Maintenance of Traffic	$	39,000	
Topsoil	$	-	
Seeding	$	-	
Sodding	$	53,000	
Signing	$	14,000	
Lighting	$	226,000	
Signalization	$	-	
Fence	$	2,900	
Guardrail	$	23,000	
Rip-Rap or Slope Protection	$	17,000	
Other Construction Items (8.5%)	$	461,000	
Mobilization	$	265,000	
Construction Cost	$	6,138,900	
10% Eng. & Cont.	$	614,000	
Total Construction Cost			**$ 6,752,900**
Preliminary Engineering (10%)			**$ 614,000**
Total Cost			**$ 8,414,900**

Table C.3. Cost Data Sheet--Option 1, Section 3

Project: Manchester Bypass, Manchester, Coffee County
Section: 3, From 1000' west of Skinner Flat Road to State Route 2 (US-41/Hillsboro Boulevard)
Length: 1.0 mile

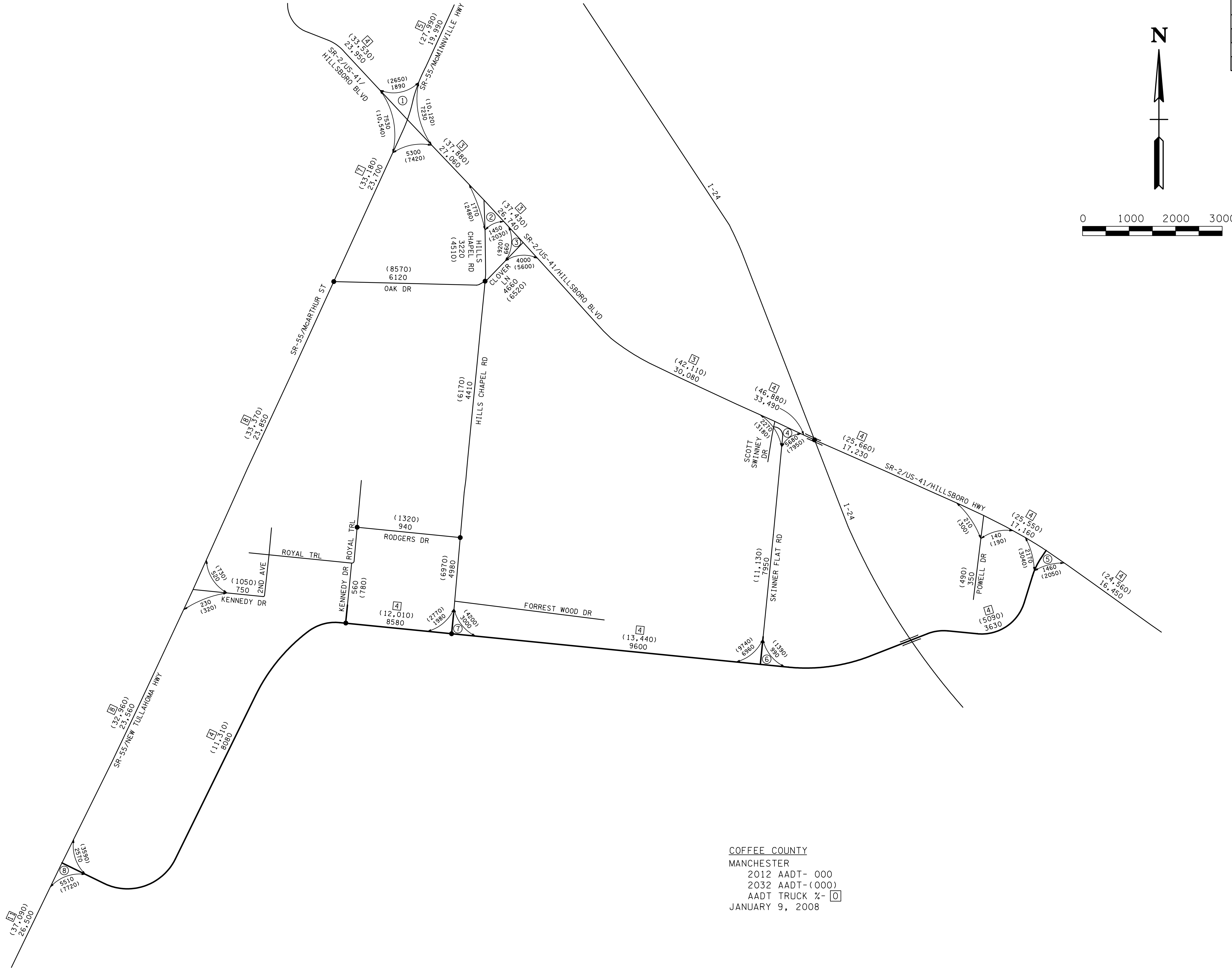
Right of Way				
	Land (8.00 Acres)	$	431,000	
	Improvements	$	1,055,000	
	Damages	$	17,000	
	Incidentals	$	126,000	
	Relocation Payments (4 residences)	$	116,000	
	(1 business & farm)	$	26,000	
	(0 non-profits)	$	-	
	Total Right-of-Way Cost			**$ 1,771,000**
Utility Relocation				
	Reimbursable	$	930,000	
	Non-reimbursable	$	-	
	Total Adjustment Cost			**$ 930,000**
Construction				
	Clearing and Grubbing	$	15,000	
	Earthwork	$	124,000	
	Pavement Removal	$	48,000	
	Drainage (Includes Erosion Control)	$	1,249,000	
	Structures	$	1,035,000	
	Railroad Crossing or Separation	$	-	
	Paving	$	1,606,000	
	Retaining Walls	$	-	
	Maintenance of Traffic	$	68,000	
	Topsoil	$	-	
	Seeding	$	-	
	Sodding	$	35,000	
	Signing	$	18,000	
	Lighting	$	147,000	
	Signalization	$	150,000	
	Fence	$	-	
	Guardrail	$	23,000	
	Rip-Rap or Slope Protection	$	17,000	
	Other Construction Items (8.5%)	$	386,000	
	Mobilization	$	227,000	
	Construction Cost	$	5,148,000	
	10% Eng. & Cont.	$	515,000	
	Total Construction Cost			**$ 5,663,000**
	Preliminary Engineering (10%)			**$ 515,000**
Total Cost				**$ 8,879,000**

APPENDIX D

PROJECTED TRAFFIC FOR OPTIONS 2 & 3

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

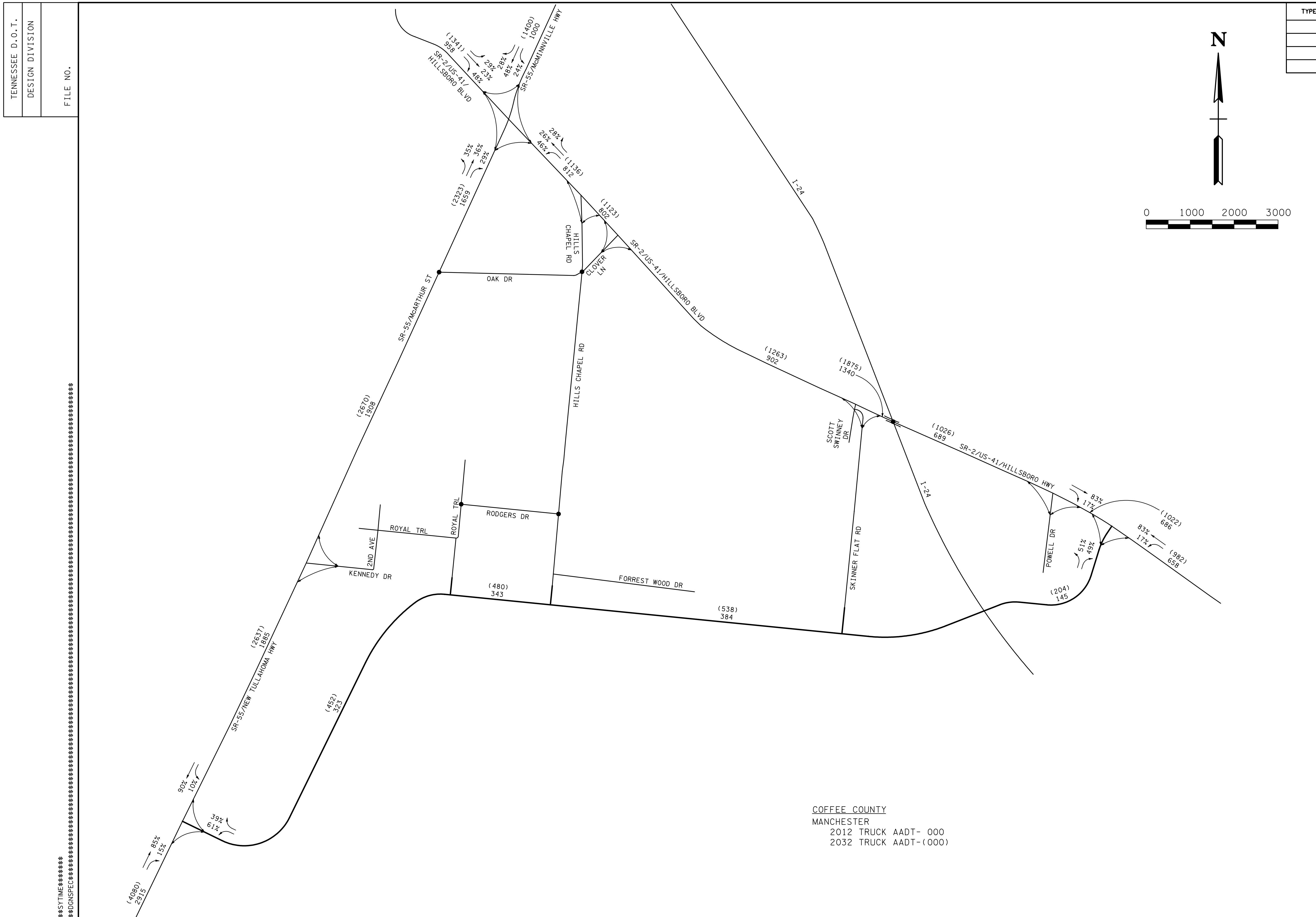


STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure D.1.
AADT for
Options 2 & 3

$$$SYTIME$$$$$$
$$$DGNSPEC$$

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



COFFEE COUNTY
MANCHESTER
2012 TRUCK AADT- 000
2032 TRUCK AADT-(000)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure D.2. Truck Movement for Options 2 & 3

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$

APPENDIX E

COST ESTIMATES FOR OPTION 2

Table E.1. Cost Data Sheet--Option 2 or 3, Section 1

Project: Manchester Bypass, Manchester, Coffee County
Section: 1, From State Route 55 (New Tullahoma Highway) to Kennedy Drive
Length: 1.8 miles

Right of Way			
Land (43.00 Acres)	$	342,000	
Improvements	$	-	
Damages	$	-	
Incidentals	$	3,300	
Relocation Payments (0 residences)	$	-	
(0 businesses & farms)	$	-	
(0 non-profits)	$	-	
Total Right-of-Way Cost			**$ 345,300**
Utility Relocation			
Reimbursable	$	168,000	
Non-reimbursable	$	-	
Total Adjustment Cost			**$ 168,000**
Construction			
Clearing and Grubbing	$	83,000	
Earthwork	$	1,015,000	
Pavement Removal	$	-	
Drainage (Includes Erosion Control)	$	1,810,000	
Structures	$	-	
Railroad Crossing or Separation	$	-	
Paving	$	3,026,000	
Retaining Walls	$	-	
Maintenance of Traffic	$	5,000	
Topsoil	$	153,000	
Seeding	$	47,000	
Sodding	$	-	
Signing	$	15,000	
Lighting	$	269,000	
Signalization	$	150,000	
Fence	$	114,000	
Guardrail	$	-	
Rip-Rap or Slope Protection	$	-	
Other Construction Items (8.5%)	$	569,000	
Mobilization	$	321,000	
Construction Cost	$	7,577,000	
10% Eng. & Cont.	$	758,000	
Total Construction Cost			**$ 8,335,000**
Preliminary Engineering (10%)			**$ 758,000**
Total Cost			**$ 9,606,300**

Table E.2. Cost Data Sheet--Option 2, Section 2

Project: Manchester Bypass, Manchester, Coffee County
Section: 2, From Kennedy Drive to 1000' west of Skinner Flat Road
Length: 1.5 miles

Right of Way				
Land (18.59 Acres)		$	149,000	
Improvements		$	-	
Damages		$	-	
Incidentals		$	7,000	
Relocation Payments	(0 residences)	$	-	
	(0 businesses & farms)	$	-	
	(0 non-profits)	$	-	
Total Right-of-Way Cost				**$ 156,000**
Utility Relocation				
Reimbursable		$	-	
Non-reimbursable		$	-	
Total Adjustment Cost				**$ -**
Construction				
Clearing and Grubbing		$	36,000	
Earthwork		$	189,000	
Pavement Removal		$	-	
Drainage (Includes Erosion Control)		$	2,368,000	
Structures		$	-	
Railroad Crossing or Separation		$	-	
Paving		$	2,529,000	
Retaining Walls		$	-	
Maintenance of Traffic		$	-	
Topsoil		$	-	
Seeding		$	-	
Sodding		$	56,000	
Signing		$	8,900	
Lighting		$	225,000	
Signalization		$	-	
Fence		$	95,000	
Guardrail		$	-	
Rip-Rap or Slope Protection		$	-	
Other Construction Items (8.5%)		$	469,000	
Mobilization		$	270,000	
	Construction Cost	$	6,245,900	
	10% Eng. & Cont.	$	625,000	
Total Construction Cost				**$ 6,870,900**
Preliminary Engineering (10%)				**$ 625,000**
Total Cost				**$ 7,651,900**

Table E.3. Cost Data Sheet--Option 2, Section 3A

Project: Manchester Bypass, Manchester, Coffee County
Section: 3A, From 1000' west of Skinner Flat Road to Joe Hickerson Road
Length: 1.0 mile

Right of Way			
Land (11.32 Acres)	$	94,000	
Improvements	$	-	
Damages	$	-	
Incidentals	$	20,000	
Relocation Payments (0 residences)	$	-	
(0 businesses & farms)	$	-	
(0 non-profits)	$	-	
Total Right-of-Way Cost			**$ 114,000**
Utility Relocation			
Reimbursable	$	26,000	
Non-reimbursable	$	-	
Total Adjustment Cost			**$ 26,000**
Construction			
Clearing and Grubbing	$	22,000	
Earthwork	$	1,300,000	
Pavement Removal	$	-	
Drainage (Includes Erosion Control)	$	1,502,000	
Structures	$	4,230,000	
Railroad Crossing or Separation	$	-	
Paving	$	1,734,000	
Retaining Walls	$	-	
Maintenance of Traffic	$	25,000	
Topsoil	$	-	
Seeding	$	-	
Sodding	$	40,000	
Signing	$	7,600	
Lighting	$	147,000	
Signalization	$	-	
Fence	$	55,000	
Guardrail	$	61,000	
Rip-Rap or Slope Protection	$	33,000	
Other Construction Items (8.5%)	$	779,000	
Mobilization	$	428,000	
Construction Cost	$	10,363,600	
10% Eng. & Cont.	$	1,037,000	
Total Construction Cost			**$ 11,400,600**
Preliminary Engineering (10%)			**$ 1,037,000**
Total Cost			**$ 12,577,600**

Table E.4. Cost Data Sheet--Option 2 or 3, Section 3B

Project: Manchester Bypass, Manchester, Coffee County
Section: 3B, From Joe Hickerson Road to State Route 2 (US-41/Hillsboro Highway)
Length: 0.6 miles

Right of Way			
Land (8.33 Acres)	$	78,000	
Improvements	$	-	
Damages	$	-	
Incidentals	$	10,000	
Relocation Payments (0 residences)	$	-	
(0 businesses & farms)	$	-	
(0 non-profits)	$	-	
Total Right-of-Way Cost			**$ 88,000**
Utility Relocation			
Reimbursable	$	76,000	
Non-reimbursable	$	-	
Total Adjustment Cost			**$ 76,000**
Construction			
Clearing and Grubbing	$	16,000	
Earthwork	$	76,000	
Pavement Removal	$	-	
Drainage (Includes Erosion Control)	$	886,000	
Structures	$	-	
Railroad Crossing or Separation	$	-	
Paving	$	1,127,000	
Retaining Walls	$	-	
Maintenance of Traffic	$	5,000	
Topsoil	$	-	
Seeding	$	-	
Sodding	$	27,000	
Signing	$	12,000	
Lighting	$	90,000	
Signalization	$	150,000	
Fence	$	-	
Guardrail	$	-	
Rip-Rap or Slope Protection	$	-	
Other Construction Items (8.5%)	$	204,000	
Mobilization	$	122,000	
Construction Cost	$	2,715,000	
10% Eng. & Cont.	$	272,000	
Total Construction Cost			**$ 2,987,000**
Preliminary Engineering (10%)			**$ 272,000**
Total Cost			**$ 3,423,000**

APPENDIX F

COST ESTIMATES FOR OPTION 3

Table F.1. Cost Data Sheet--Option 3, Section 3A

Project: Manchester Bypass, Manchester, Coffee County
Section: 3A, From 1000' west of Skinner Flat Road to Joe Hickerson Road
Length: 1.0 mile

Right of Way			
Land (6.37 Acres)	$	210,000	
Improvements	$	-	
Damages	$	-	
Incidentals	$	108,000	
Relocation Payments (0 residences)	$	-	
(0 businesses & farms)	$	-	
(0 non-profits)	$	-	
Total Right-of-Way Cost			**$ 318,000**
Utility Relocation			
Reimbursable	$	312,000	
Non-reimbursable	$	-	
Total Adjustment Cost			**$ 312,000**
Construction			
Clearing and Grubbing	$	12,000	
Earthwork	$	1,290,000	
Pavement Removal	$	21,000	
Drainage (Includes Erosion Control)	$	1,371,000	
Structures	$	4,182,000	
Railroad Crossing or Separation	$	-	
Paving	$	1,604,000	
Retaining Walls	$	-	
Maintenance of Traffic	$	53,000	
Topsoil	$	-	
Seeding	$	-	
Sodding	$	35,000	
Signing	$	13,000	
Lighting	$	144,000	
Signalization	$	-	
Fence	$	26,000	
Guardrail	$	61,000	
Rip-Rap or Slope Protection	$	33,000	
Other Construction Items (8.5%)	$	752,000	
Mobilization	$	414,000	
Construction Cost	$	10,011,000	
10% Eng. & Cont.	$	1,002,000	
Total Construction Cost			**$ 11,013,000**
Preliminary Engineering (10%)			**$ 1,002,000**
Total Cost			**$ 12,645,000**

APPENDIX G

COST ESTIMATES FOR OPTION 4

Table G.1. Cost Data Sheet--Option 4

Project: Manchester Bypass, Manchester, Coffee County
Section: State Route 2 (US-41/Hillsboro Boulevard) at State Route 55 (McArthur Street)
Length: N/A

Right of Way				
Land (0.81 Acres)		$	261,000	
Improvements		$	514,000	
Damages		$	171,000	
Incidentals		$	63,000	
Relocation Payments	(0 residences)	$	-	
	(3 businesses & farms)	$	78,000	
	(0 non-profits)	$	-	
Total Right-of-Way Cost				**$ 1,087,000**
Utility Relocation				
Reimbursable		$	362,000	
Non-reimbursable		$	-	
Total Adjustment Cost				**$ 362,000**
Construction				
Clearing and Grubbing		$	1,600	
Earthwork		$	17,000	
Pavement Removal		$	34,000	
Drainage (Includes Erosion Control)		$	631,000	
Structures		$	-	
Railroad Crossing or Separation		$	-	
Paving		$	475,000	
Retaining Walls		$	168,000	
Maintenance of Traffic		$	438,000	
Topsoil		$	-	
Seeding		$	-	
Sodding		$	16,000	
Signing		$	124,000	
Lighting		$	177,000	
Signalization		$	450,000	
Fence		$	-	
Guardrail		$	-	
Rip-Rap or Slope Protection		$	-	
Other Construction Items (8.5%)		$	216,000	
Mobilization		$	129,000	
	Construction Cost	$	2,876,600	
	10% Eng. & Cont.	$	288,000	
Total Construction Cost				**$ 3,164,600**
Preliminary Engineering (10%)				**$ 288,000**
Total Cost				**$ 4,901,600**

APPENDIX H

PROPOSED ROADWAY CORRIDORS AND QUAD MAPS

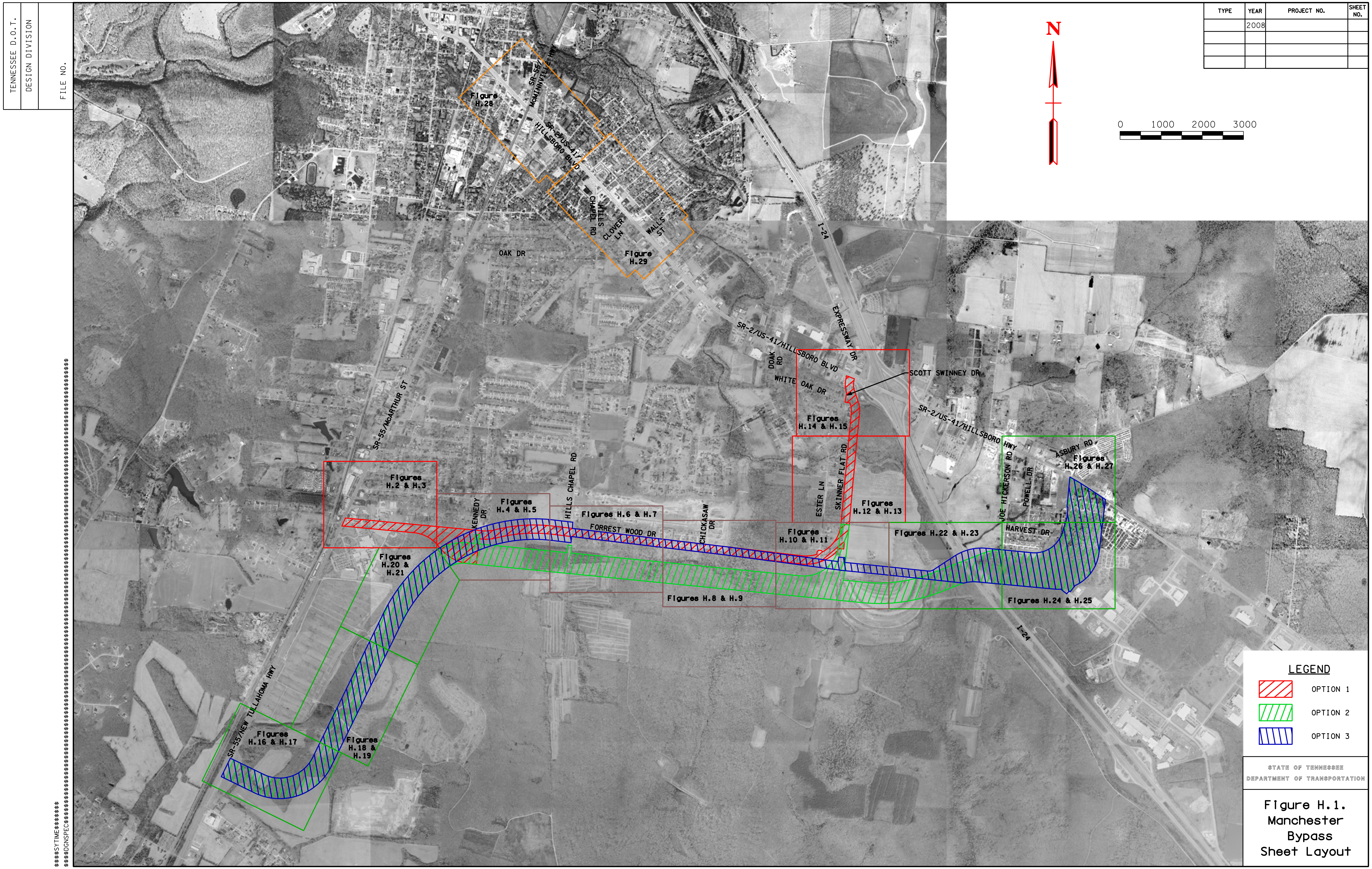


Figure H.1. Manchester Bypass Sheet Layout

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.2.
Manchester
Bypass
Option 1

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

N

NORTHSIDE CLOCKS

SR-55/McARTHUR ST

TO COFFEE COUNTY JOINT INDUSTRIAL PARK

BLOCK STORAGE BLDG.

BLOCK BLDG.

METAL BLDG.

BARRETT CONSTRUCTION CO.
Banner
TRANSMISSION

METAL BLDG.

BLOCK BLDG.

BRICK & BLOCK BLDG.

METAL BLDG.

INNOVATIONS
Promotional
Products

2ND AVE

KENNEDY DR

COFFEE COUNTY CENTRAL HIGH SCHOOL

LEGEND

OPTION 1

0 100 200 300

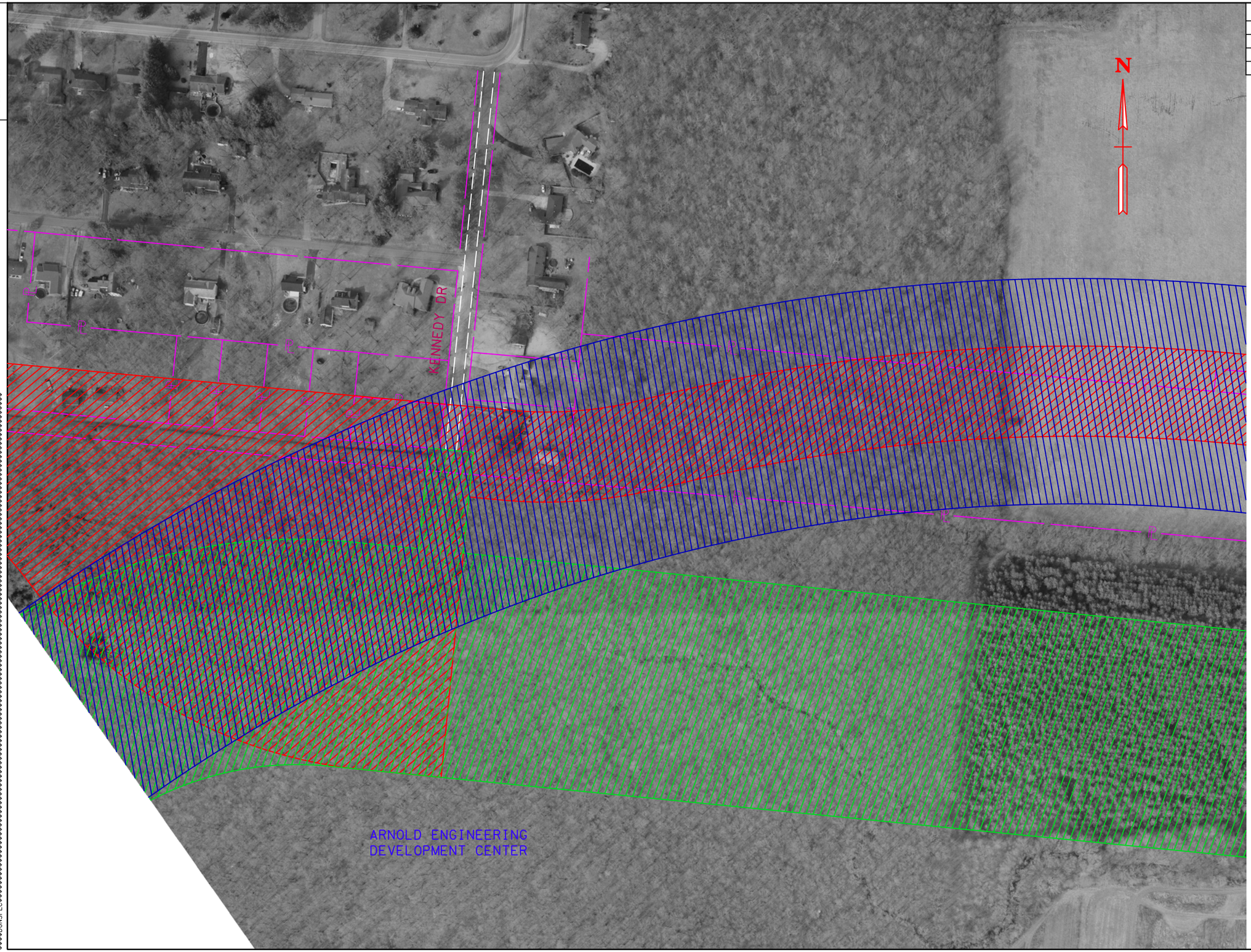
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.3.
Manchester
Bypass Quad Map
Option 1

$$$$SYTIME$$$$$
$$$$DGNSPEC$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



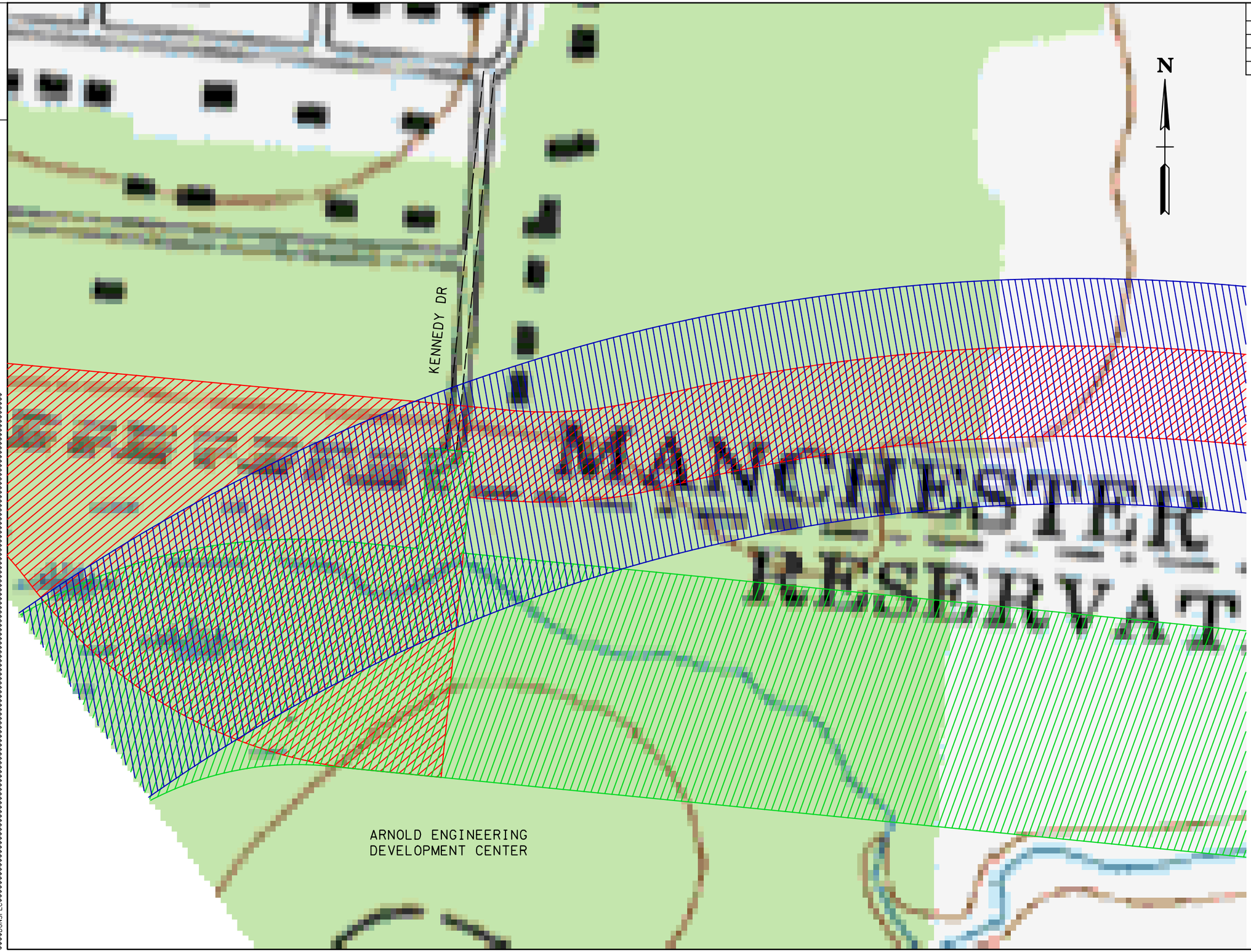
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.4.
Manchester Bypass
Options 1, 2 & 3

$$$$SYTIME$$$$$$$$
$$$$DGNSPEC$$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



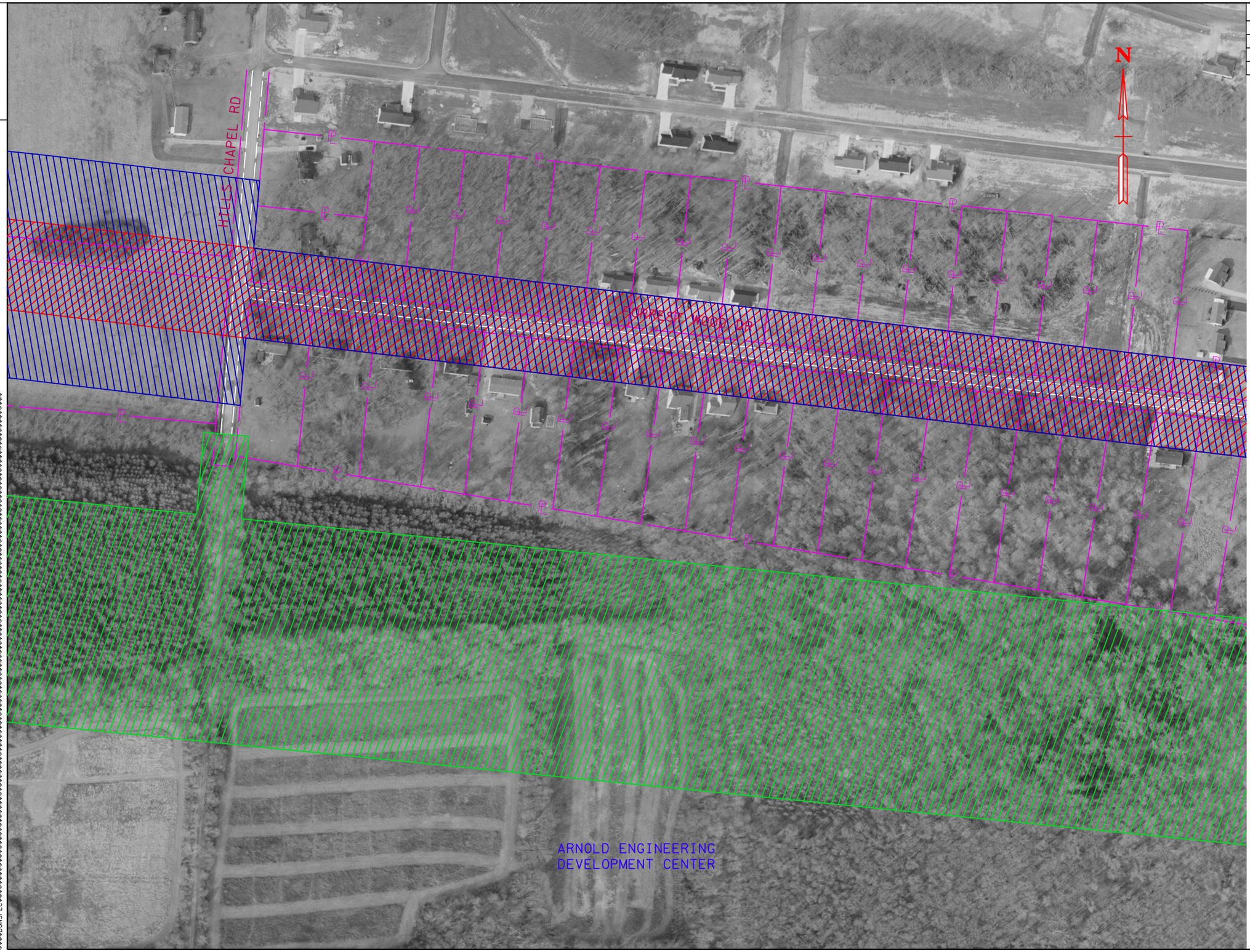
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.5.
Manchester Bypass
Quad Map
Options 1, 2 & 3

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.6.
Forrest Wood Dr
Options
1, 2 & 3

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

HILLS CHAPEL RD

FORREST WOOD DR

CORN FIELD

ARNOLD ENGINEERING DEVELOPMENT CENTER

N

LEGEND

OPTION 1

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

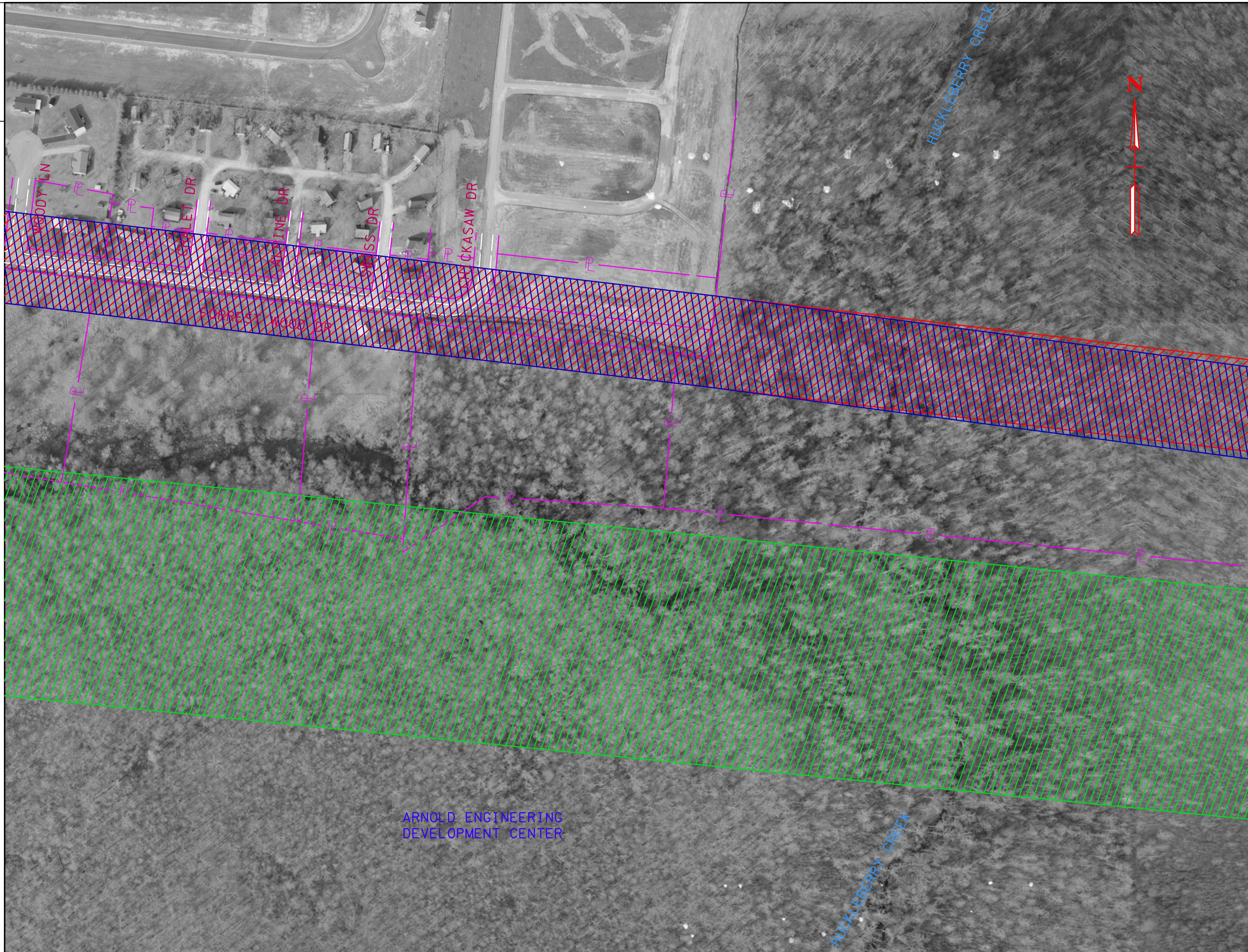
Figure H.7.
Forrest Wood Dr
Quad Map
Options 1, 2 & 3

$$$$SYTIME$$$$$$$$
$$$$DGNSPEC$$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.8.
Forrest Wood Dr
Options
1, 2 & 3

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

N

WOODY LN
CHALET DR
ALPINE DR
SWISS DR
CHICKASAW DR
FORREST WOOD DR
HUCKLEBERRY CREEK
ARNOLD ENGINEERING
DEVELOPMENT CENTER
1050

LEGEND

OPTION 1
OPTION 2
OPTION 3

0 100 200 300

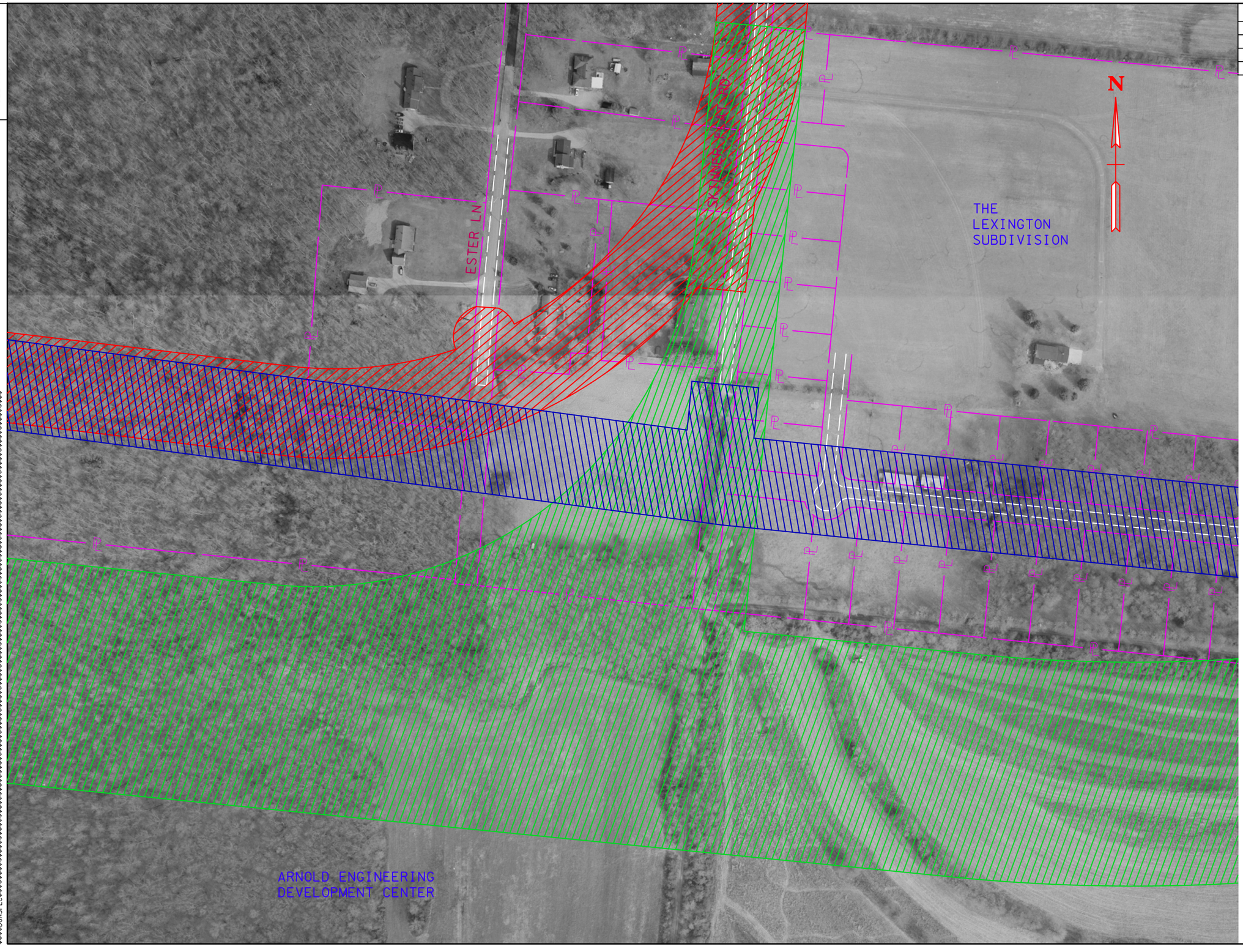
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.9.
Forrest Wood Dr
Quad Map
Options 1, 2 & 3

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

OPTION 2

OPTION 3

0 100 200 300

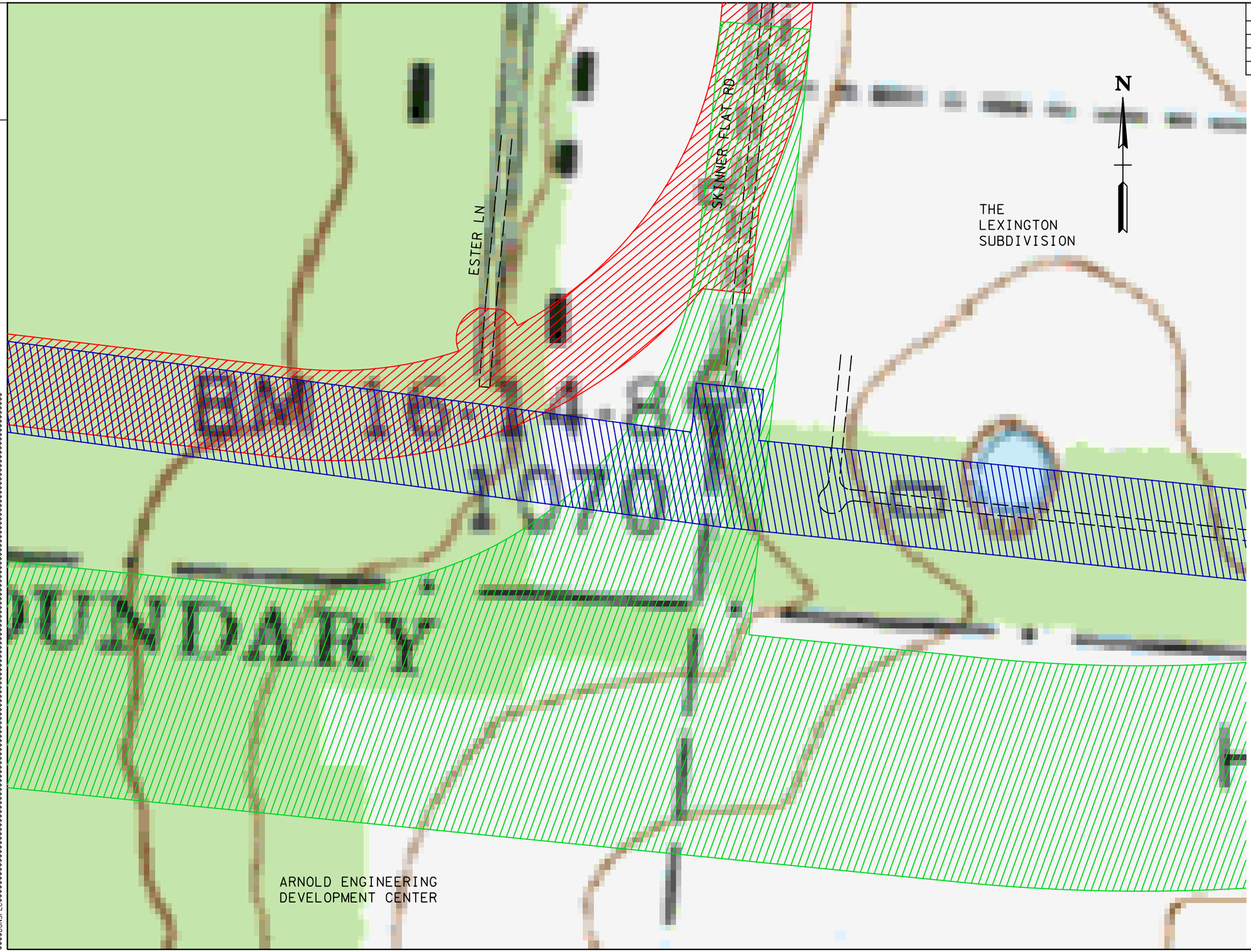
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.10.
Skinner Flat Rd
Options
1, 2 & 3

$$$$SYTIME$$$$
$$$$DGNSPEC$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.11.
Skinner Flat Rd
Quad Map
Options 1, 2 & 3

$$$$SYTIME$$$$$$$$
$$$$DGNSPEC$$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

0 100 200 300

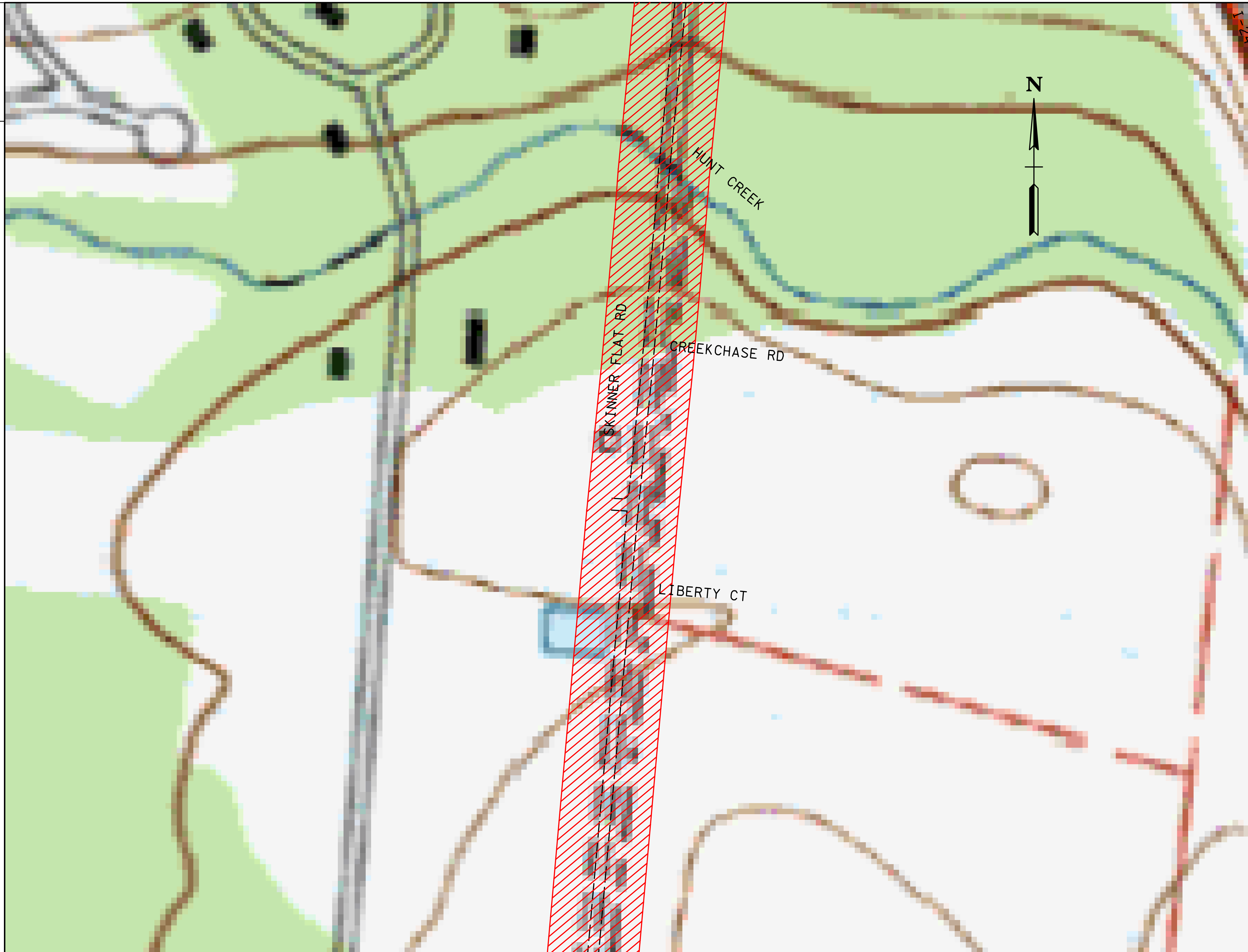
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.12.
Skinner Flat Rd
Option 1

$$$$$SYTIME$$$$$$$
$$$$$DGNSPEC$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.13.
Skinner Flat Rd
Quad Map
Option 1

$$$$SYTIME$$$$$$
$$$DGNSPEC$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

0 100 200 300

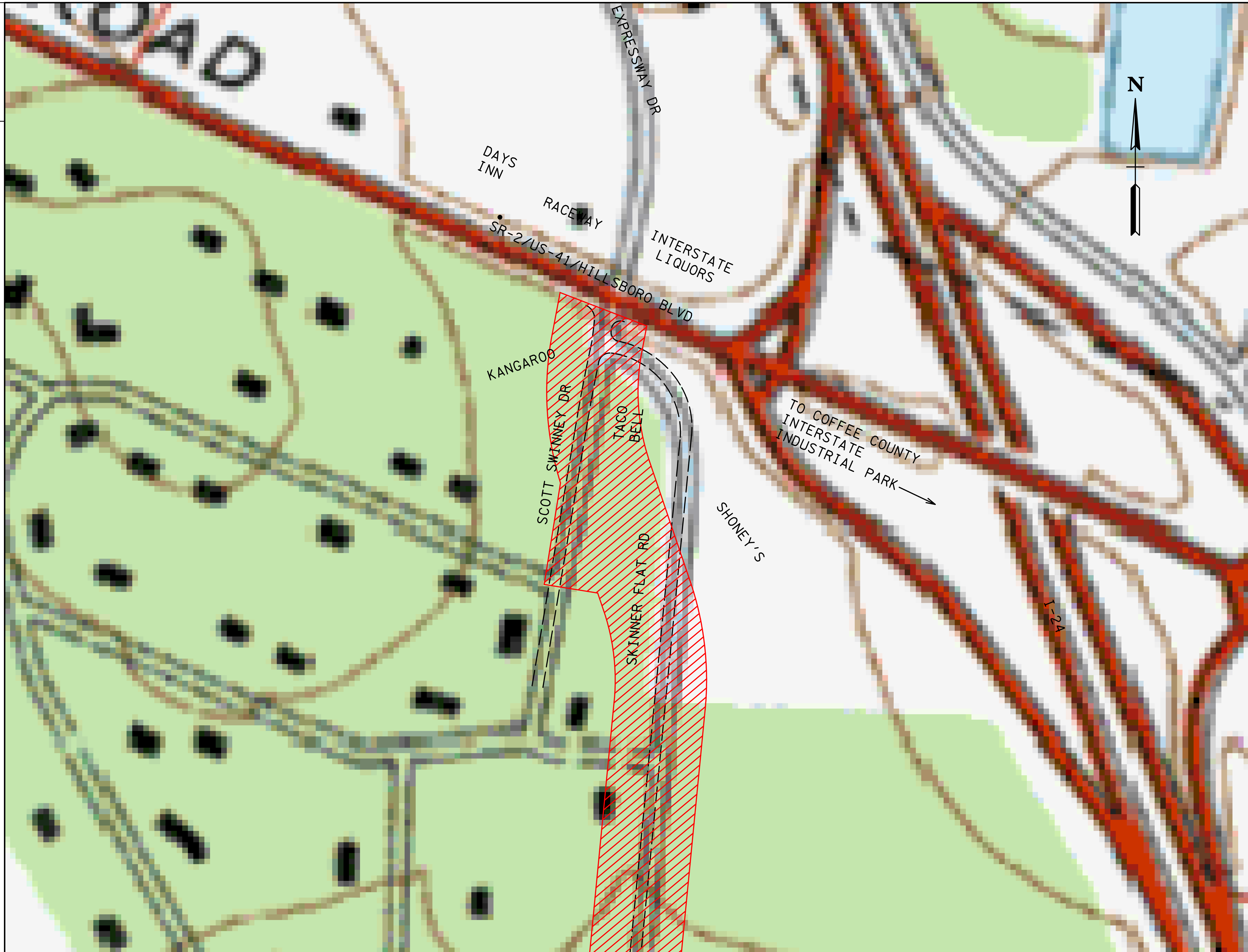
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.14.
Skinner Flat Rd
Option 1

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 1

0 100 200 300

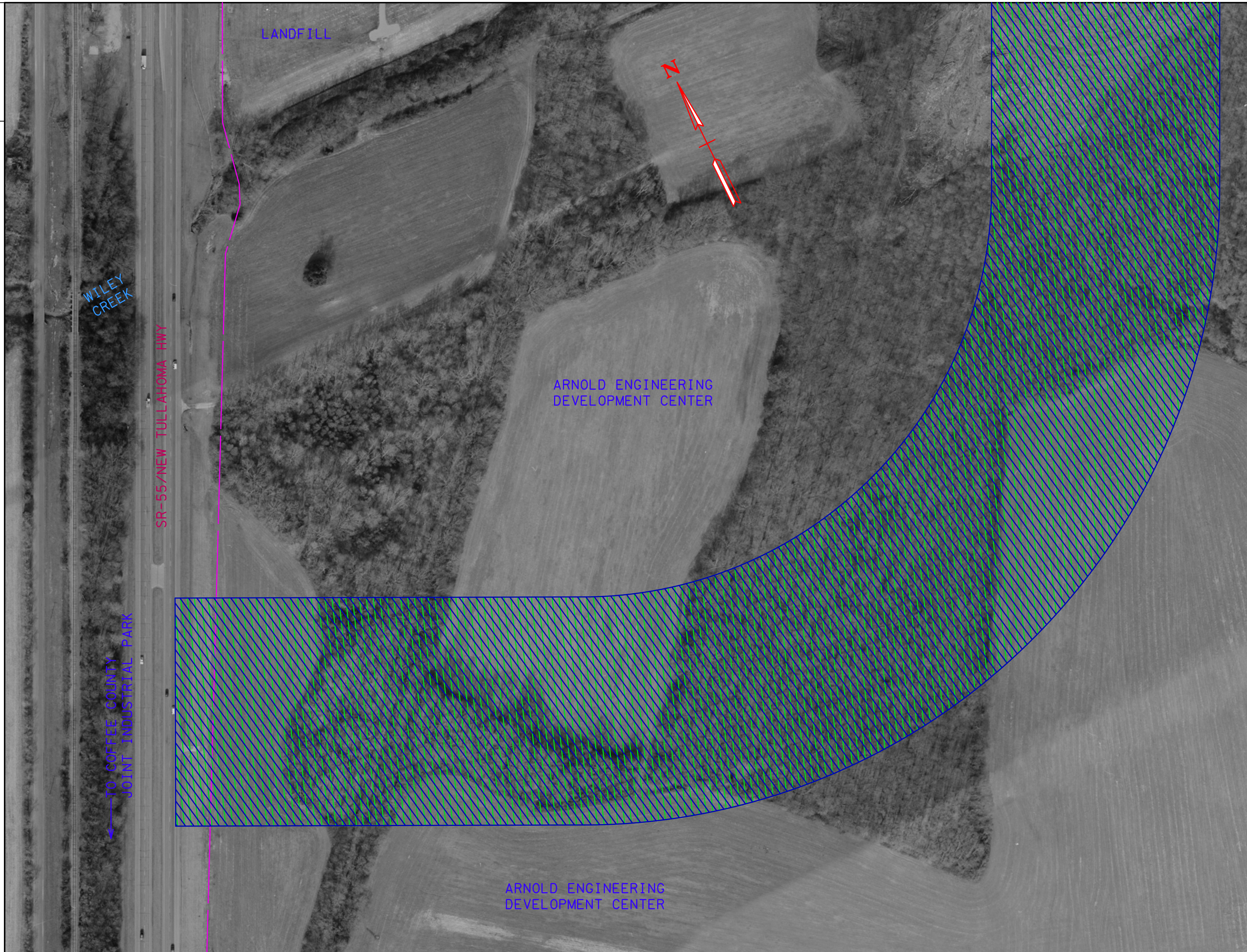
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.15.
Skinner Flat Rd
Quad Map
Option 1

$$$$SYTIME$$$$$$
$$$DGNSPEC$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

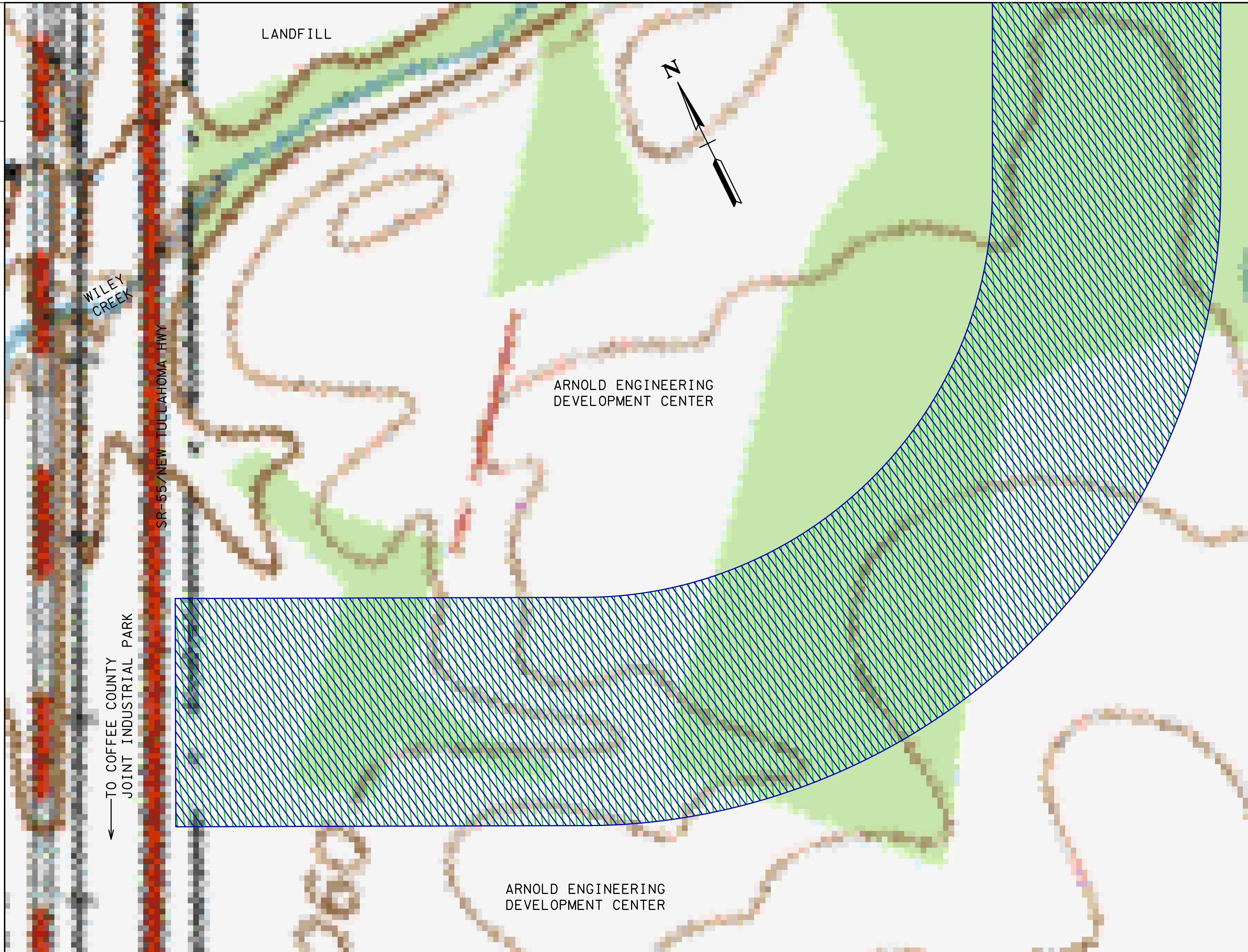
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.16.
Manchester Bypass
Options 2 & 3

$$$$SYTIME$$$$$
$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

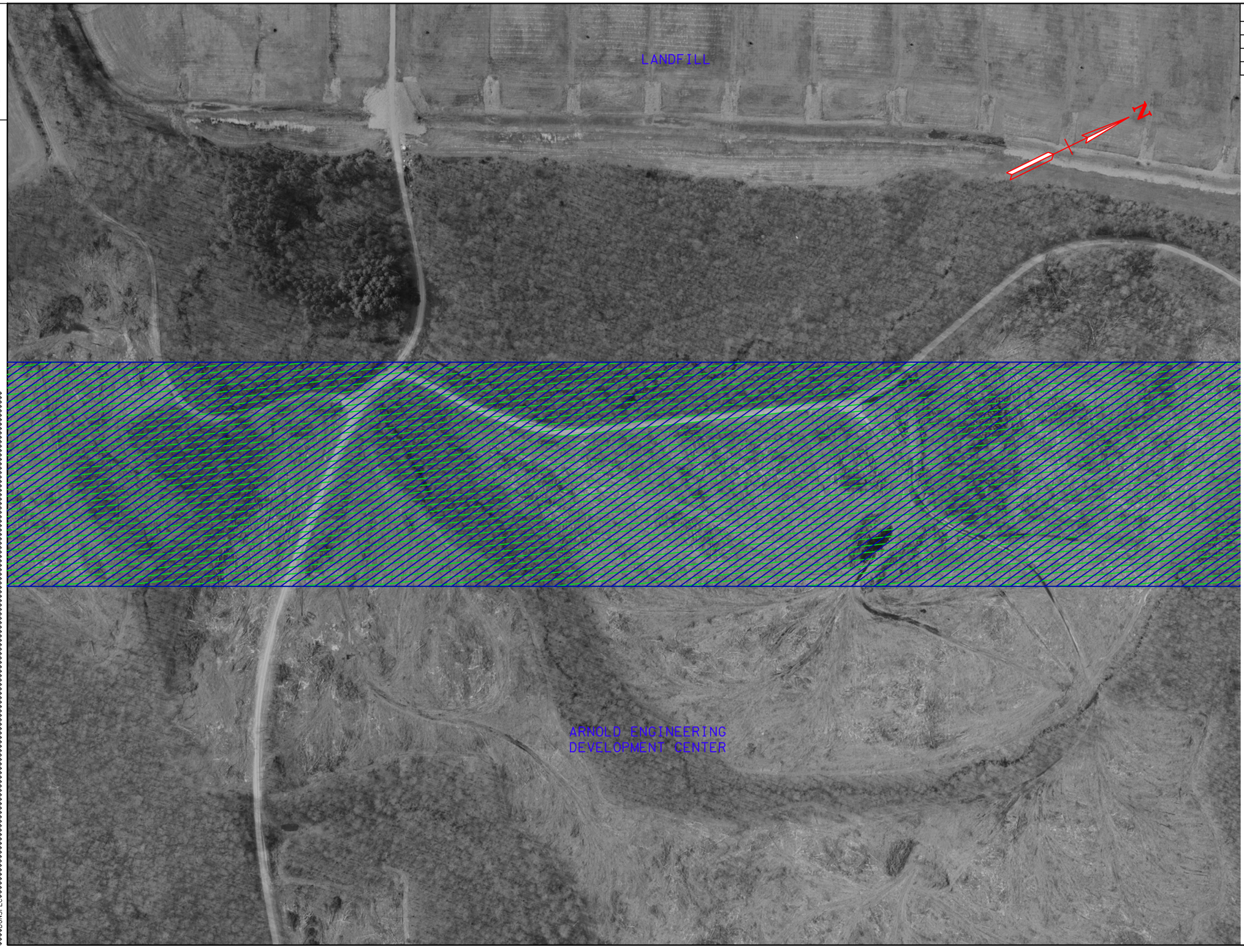
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.17.
Manchester Bypass
Quad Map
Options 2 & 3

$$$DGNSPEC$$$
$$$$SYTIME$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.18.
Manchester Bypass
Options 2 & 3

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

LANDFILL

N

ARNOLD ENGINEERING
DEVELOPMENT CENTER

LEGEND

OPTION 2

OPTION 3

0 100 200 300

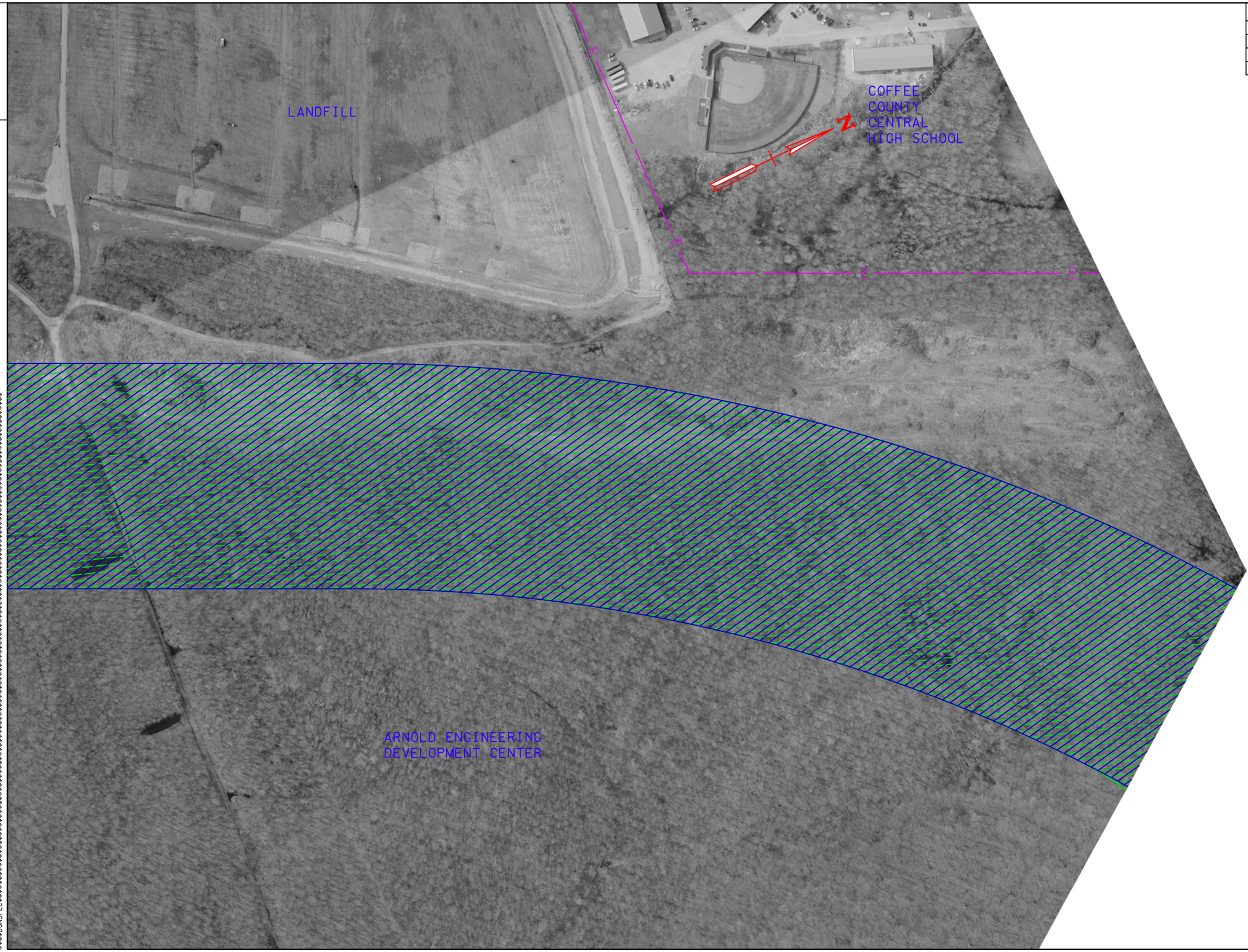
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.19.
Manchester Bypass
Quad Map
Options 2 & 3

$$$$SYTIME$$$$$$$$
$$$$DGNSPEC$$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

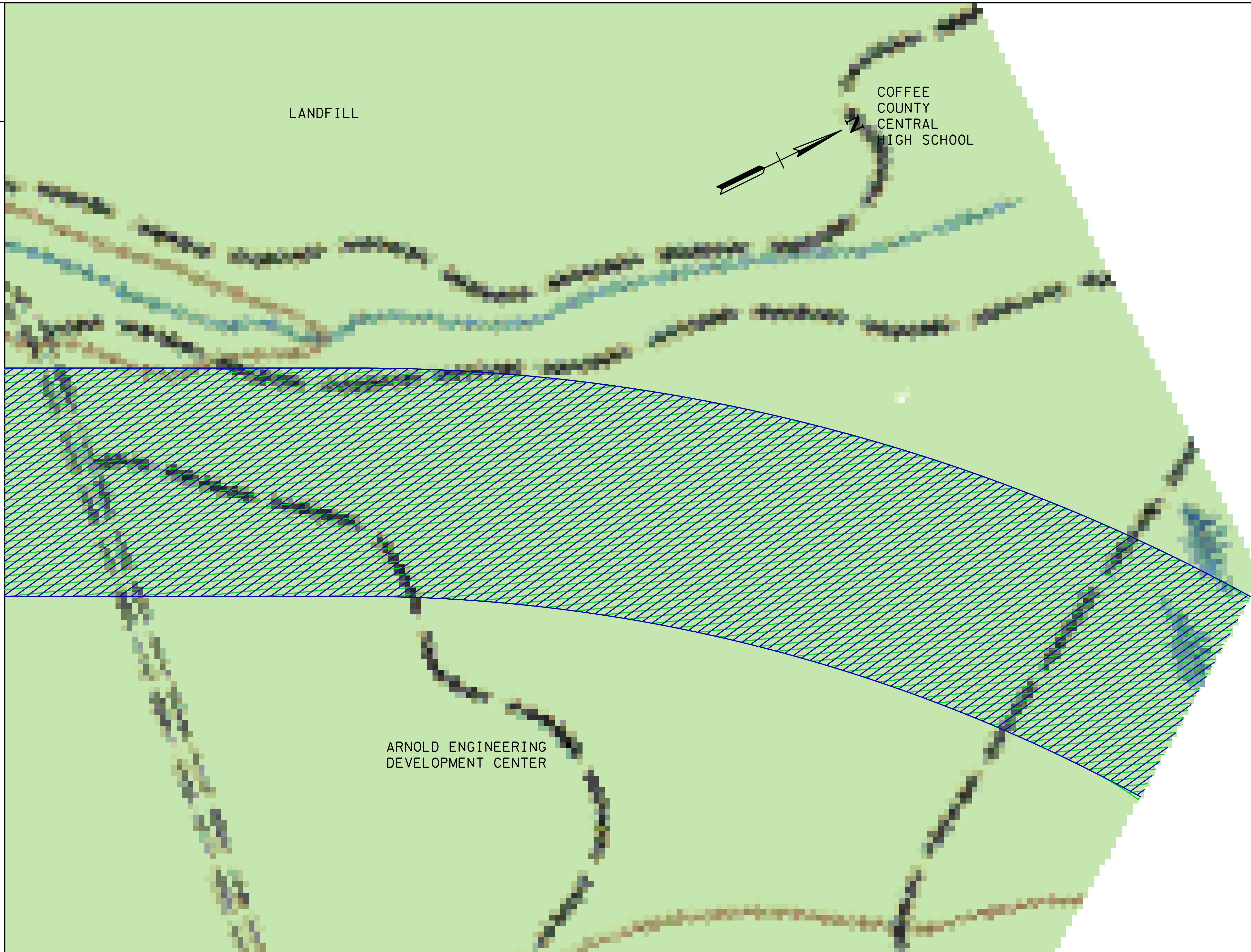
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.20.
Manchester Bypass
Options 2 & 3

$$$$SYTIME$$$$$$$$
$$$$DGNSPEC$$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.21.
Manchester Bypass
Quad Map
Options 2 & 3

$$$$SYTIME$$$$$$
$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

HUNT CREEK

I-24

N

THE
LEXINGTON
SUBDIVISION

HUNT CREEK

HUNT CREEK DAM

ARNOLD ENGINEERING
DEVELOPMENT CENTER

LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.22.
The Lexington
Options 2 & 3

$$$$SYSTIME$$$$
$$$$DGNSPEC$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

HUNT CREEK

N

I-24

THE
LEXINGTON
SUBDIVISION

Hunt Creek Dam

HUNT CREEK

HUNT CREEK DAM

ARNOLD ENGINEERING
DEVELOPMENT CENTER

LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.23.
The Lexington
Quad Map
Options 2 & 3

$$$$SYTIME$$$$$
$$$$DGNSPEC$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.24.
Manchester Bypass
Options 2 & 3

$$$$SYTIME$$$$
$$$$DGNSPEC$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

HARVEST DR
POWELL DR
DEFORD LN
JOE HICKERSON RD
EZ LN
I-24 WB

N

LEGEND
OPTION 2
OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.25.
Manchester Bypass
Quad Map
Options 2 & 3

$$$$SYTIME$$$$$
$$$$DGNSPEC$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		



LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.26.
Manchester Bypass
Options 2 & 3

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

Red Hill Ch

CENTRAL FUNERAL HOME

ASBURY RD

POWELL DR

CONVENIENCE CENTER

SR-2/US-41/HILLSBORO HWY

SHADY GROVE TRAILER PARK (ABANDONED)

TO COFFEE COUNTY INTERSTATE INDUSTRIAL PARK

DEFORD LN

BM U

1070

Trailer

Cem

N

LEGEND

OPTION 2

OPTION 3

0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.27.
Manchester Bypass
Quad Map
Options 2 & 3

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

ORR ST
SR 2/US 41/HILLSBORO BLVD
EMERSON ST
PARK AVE
ECKERD
RAVEN ST
RYE ST
JACKSON ST
MADISON ST
COLLEGE ST
WALGREENS
BILL'S LIQUOR STORE
SR 2/US 41/HILLSBORO BLVD
JACKSON ST
RYE ST
MADISON ST
COLLEGE ST

N

0 100 200 400

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.28.
Congestion
Management
Option 4

$$$$$SYTTIME$$$$$$$
$$$$$DGNSPEC$$$$$$$

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008		

POLK ST
JOHNSON ST
McKELLAR DR
WINNERS LN
FAMILY DOLLAR
ULTRA NAILS
WALLS ST
SR-2/US-41/HILLSBORO BLVD
HILLS CHAPEL RD
SUMMER ST
SUMMER ST
SUMMER ST
WOODLAND DR
BOND ST
CLOVER LN
Bank
ROGERS CIR
ROGERS CIR
N
0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure H.29.
Congestion
Management
Option 4

$$$$$SYTIME$$$$$$$
$$$$$DGNSPEC$$$$$$$