Executive Summary
TPR - State Route 49 from State Route 12 to Interstate 24
Cheatham & Robertson Counties

(Initiated by TDOT at the request of the Greater Nashville Regional Planning Organization)

Purpose and Need: The primary needs for improvement include:

- *Geometric Deficiencies* – 11-foot travel lanes, 2-ft shoulders, intersections at awkward grades and angles, and limited sight distance in multiple locations
- *Safety* – At several locations, crash rates exceed the associated statewide crash rates.
- *Operational Deficiencies* – Restricted travel speed and limited passing opportunities due to horizontal and vertical curvature
- *Economic Development* – Cheatham County is a hot spot for residential development near Nashville; officials anticipate commercial and professional service growth.
- *System Linkage* – State Route 49 serves as one of two primary access routes to Ashland City, the county seat, and provides direct access to Interstate 24.

Improvement Options Considered: Within a 1,000 ft corridor, centered on the existing alignment, five improvement options are feasible. The improvement options reference three distinctive segments of State Route 49:

- *Segment 1* - State Route 12 to Bear Wallow Road (Urban)
- *Segment 2* - Bear Wallow Road to Old Clarksville Pike (Rural)
- *Segment 3* - Old Clarksville Pike to Interstate 24 (Urban)

Option 1 – No Build: Provides no improvement to safety or traffic congestion along State Route 49, and therefore does not satisfy the primary purpose and need of this study.

Option 2 – 4-Lane Improvement: Considers an urban four lane cross section for Segments 1 and 3, and a rural four-lane cross-section for Segment 2. For Segment 2, a flush painted median/two-way left turn lane is considered as an alternative to a depressed median.

- Good levels of service through 2032
- Provides an opportunity to address existing safety issues
- Estimated cost: $154,024,000 (flush median/two-way left turn lane on Segment 2), or $138,571,000 (depressed median on Segment 2)

Option 3 – Partial 4-lane/Partial Passing Lane Improvement: Includes the same four-lane, urban facility for Segments 1 and 3. Segment 2, however, is evaluated as a rural, two-lane segment with passing lanes.

- Acceptable levels of service on Segment 2 in 2012 and 2032
- Estimated cost: $112,208,000

Option 4 – Interim Improvements: Budget constraints will make improvements outlined in Options 2 and 3 unlikely in the near future. Therefore, this study also evaluates 11 spot improvements.

- Will likely not satisfy the projected demand for capacity in 2032
- Addresses safety issues and short term traffic demands at much lower costs
- Total estimated cost: $22,446,000

Option 5 – 3- Lane Improvement: Evaluates the impacts of improving State Route 49 to a three-lane cross section, including a mixture of passing lanes and two-way left turn lanes.

- Will likely not address the projected demand for capacity in 2032
- For the near term, will provide additional mobility and improve safety
- Estimated cost: $96,358,000

TRANSPORTATION PLANNING REPORT

State Route 49

FROM STATE ROUTE 12 TO INTERSTATE 24
CHEATHAM & ROBERTSON COUNTIES
PIN# 109542.00

PREPARED BY
CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.
For the
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING	Ed Cole	8/7/08
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION	Steve Allen	8-7-08
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION	Bill Hart	8/4/08

History & Background Information

History

State Route 49 provides connectivity between towns in Stewart, Houston, Dickson, Cheatham, and Robertson Counties. These counties are part of the Greater Nashville Regional Planning Organization (GNRPO). Regional Planning Organizations (RPOs) were recently initiated by the Tennessee Department of Transportation's (TDOT) Long Range Planning Division in an effort to involve local officials and the public in the long range planning process. Improvement to a 105-mile segment of State Route 49, from Dover to the Kentucky State line, was initially identified by the Greater Nashville RPO as the region's top priority. The RPO submitted a request for study to TDOT's Long Range Planning Division. Following evaluation of geometrics, crash rates, traffic operations, and previously planned improvements, the Long Range Planning Division recognized State Route 49 between State Route 12 Interstate 24 as the priority segment of independent utility. This segment of State Route 49 is shown in Figure 1. The preliminary purpose and needs document, prepared by TDOT's Long Range Planning Division is included in Volume II of this report.

No previous planning studies have been conducted for the segment of State Route 49 from State Route 12 to Interstate 24. However, three intersections along this segment have been evaluated in the past:

- 2000: Advance Planning Report (APR) for State Route 49 at State Route 249 (Bear Wallow Road)
- 2000: APR for State Route 49 at Old Clarksville Pike
- 2006 (Revised in 2007): Road Safety Audit Review (RSAR) for State Route 49 at Joe Dowlen Road/York Road

A Categorical Exclusion, developed for improvements to the intersection of State Route 49 and Old Clarksville Pike, was submitted to the Federal Highway Administration (FHWA) on February 28, 2008. TDOT is currently waiting FHWA approval. The APR for this intersection recommends a 64-foot roadway cross-section and an 84-foot right-of-way on State Route 49. In order to accommodate improvements to State Route 49 between State Route 12 and Interstate 24, TDOT will allow a 72-foot roadway cross-section and a 92-foot right-of-way on State Route 49 at Old Clarksville Pike.

This report evaluates five options for improving State Route 49, each within a 1,000 foot corridor, centered on the existing alignment. Specifically, this report identifies the purpose and need for improvements to this segment of State Route 49, as well as the potential impacts of the improvements. Scheduling and funding for improvements to State Route 49 have yet to be established.

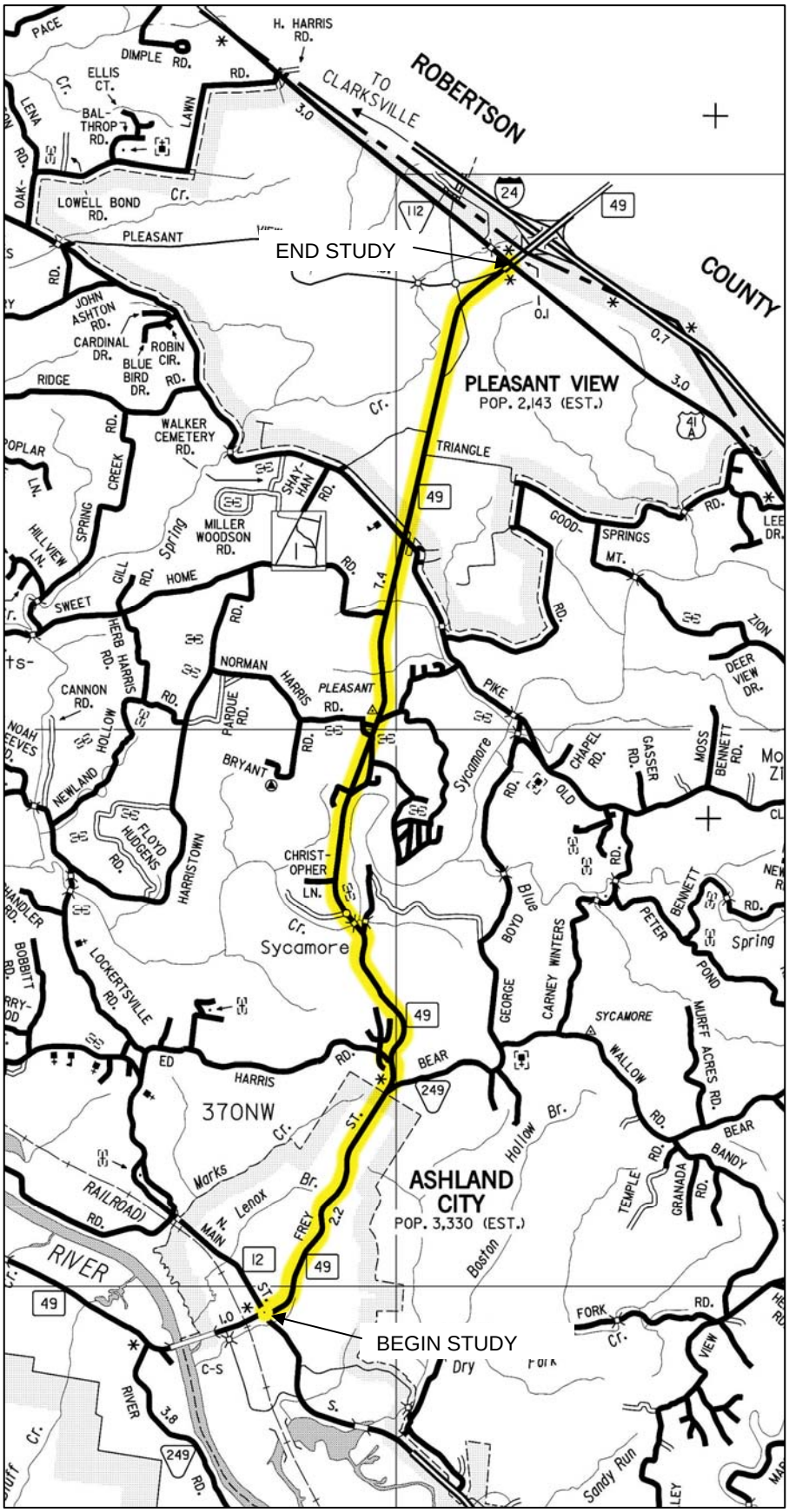


FIGURE 1 – LOCATION MAP

Study Area

Cheatham County has experienced significant growth in recent years and has become an attractive residential destination on the outskirts of Nashville. Currently, the land uses along State Route 49 between State Route 12 and Interstate 24 are a mix of agricultural, residential, and some commercial development. However, according to the Cheatham County officials, 11 new subdivisions are in-progress along State Route 49, between Ashland City and Pleasant View. These subdivisions, which are outlined in Table 1 and shown in Figure 2, range from eight to 525-unit developments. A total of 2,621 new homes are planned along this segment of State Route 49 before 2017.

Table 1
Planned Residential Development

Subdivision	Location	Developed Lots	Undeveloped Lots	Expected Build-out
Morgan Place	Sweethome Road	31	238	2011
Maple Hills	Sweethome Road	61	369	2013
Hidden Lake Resort	Bear Wallow Road	85	315	2017
Oak Hill Subdivision	Bear Wallow Road	0	34	2008
Harris Farms	Old Clarksville Pike	223	30	2008
Pleasant View Village	US Highway 41-A	300	225	2016
Misty Acres	Pleasant View	34	15	2008
The Oaks	Pleasant View	5	3	2007
Pleasant View Downs	US Highway 41-A	86	70	2016
Greens of Lexington	Pleasant View Road	53	44	2010
Triangle Point	Triangle Road	0	400	2012
	Total	**878**	**1,743**	
	Total Units			**2,621**

Existing commercial development along this portion of State Route 49 includes fast-food restaurants, general retail, and gas stations. Most of this development is concentrated in the Ashland City and Pleasant View areas, as well as near the intersection of State Route 49 and Bear Wallow Road. County officials indicated that additional commercial development is expected in order to accommodate the anticipated population increase. Figure 3 illustrates the existing land use characteristics and major traffic generators along SR 49 in Ashland City and Pleasant View.

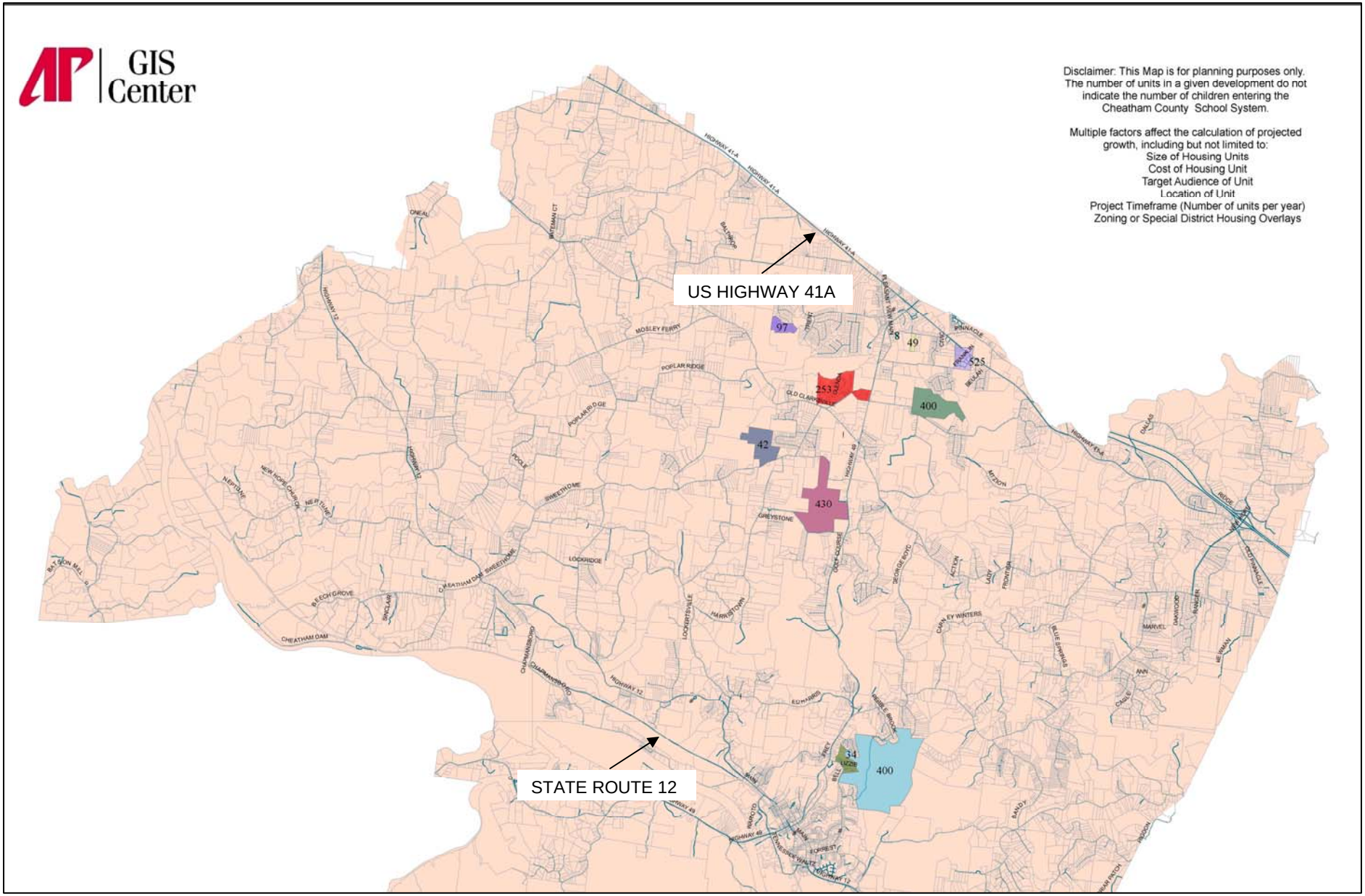
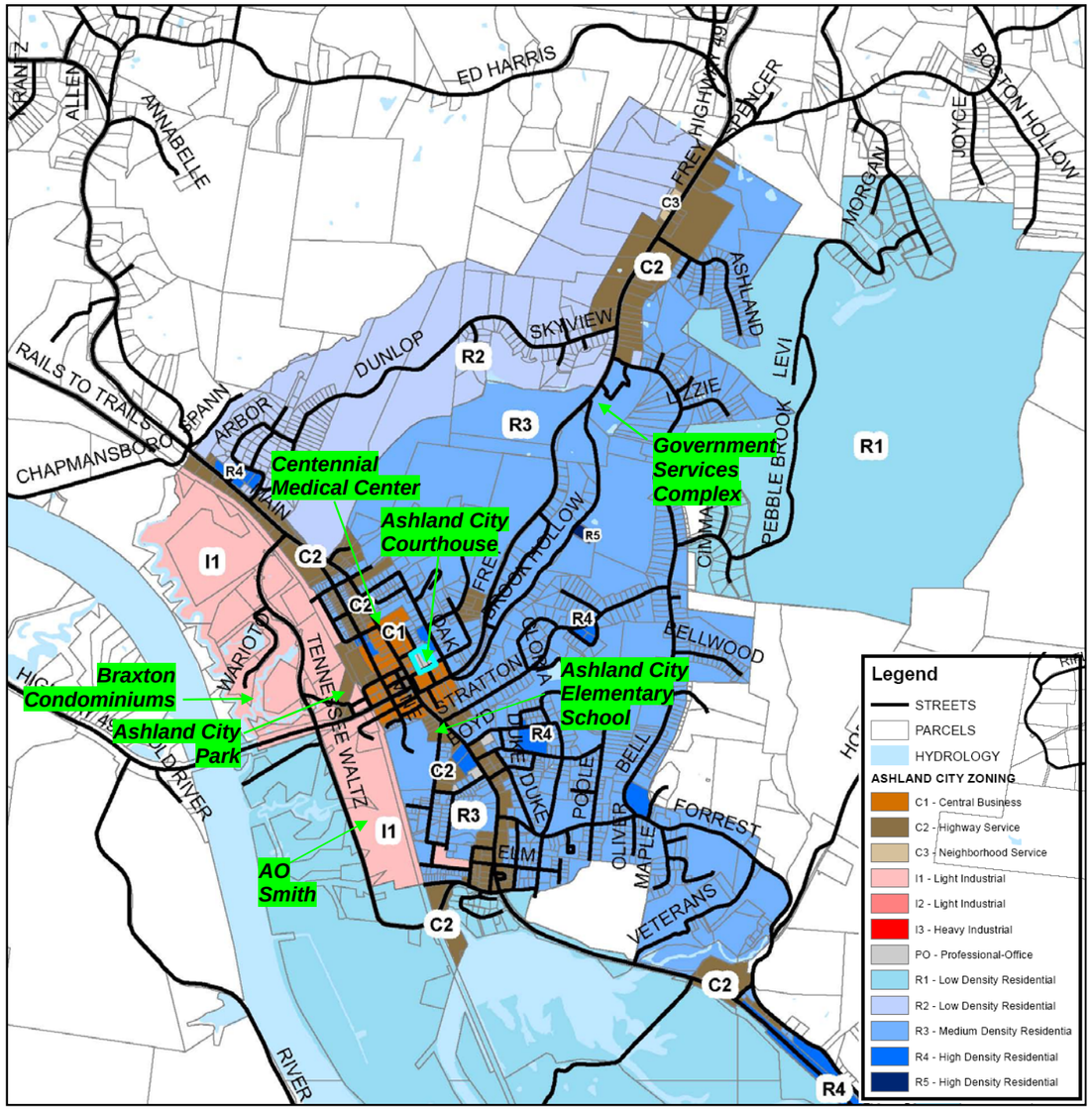
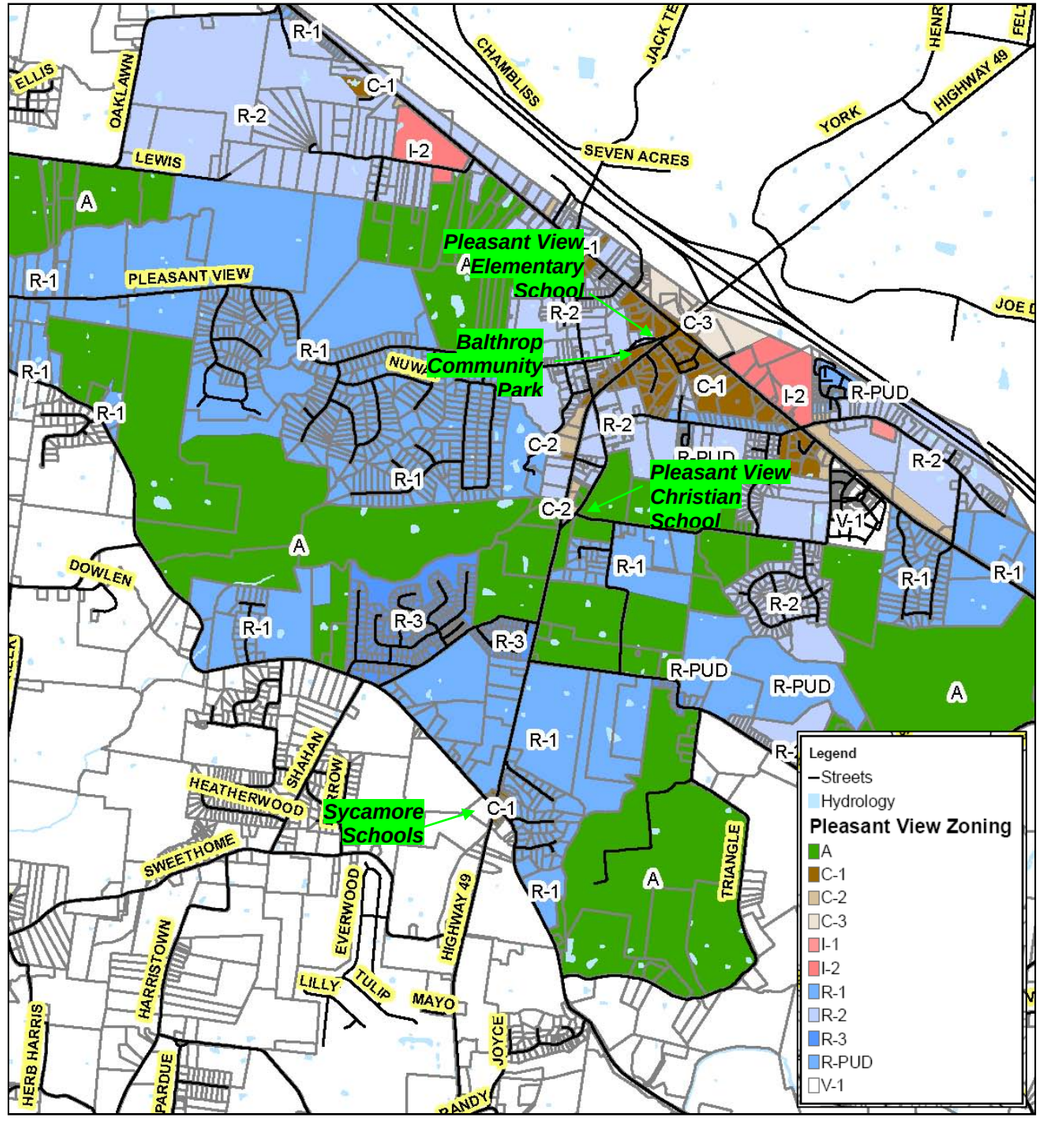


FIGURE 2 – CHEATHAM COUNTY MAJOR SUBDIVISIONS

(Prepared by Austin Peay State University for the Cheatham County Planning Office)



ASHLAND CITY



PLEASANT VIEW

FIGURE 3 –
ASHLAND CITY & PLEASANT VIEW
LAND USE CHARACTERISTICS AND
MAJOR TRAFFIC GENERATORS

According to the Cheatham County Joint Economic and Community Development Committee, 72% (12,860 people) of Cheatham County's workforce commutes to jobs outside the county. Approximately 3,400 people commute to Cheatham County for work. Among the largest employers in Cheatham County is A.O. Smith, a company that produces water heaters. A.O. Smith is located in Ashland City and employees approximately 1,600 workers. In order to retain more residents for employment in Cheatham County, the County plans to provide new office-structured development.

Office Space for Lease Near the Cheatham County Government Services Complex

Many of the new developments along State Route 49 are geared toward retirees; thus, the increases in school enrollment have not kept pace with the population increases. Nonetheless, Cheatham County schools have experienced increases in enrollment. Currently two elementary, two middle, and two high schools serve the Ashland City and Pleasant View communities. County officials are in the process of evaluating locations for a new high school in the area.

Existing Transportation Conditions

Existing Geometry

Table 2 shows the existing geometry along State Route 49, as recorded in TDOT's Tennessee Roadway Information Management System (TRIMS) database. As shown, the segment of State Route 49 between State Route 12 in Ashland City and Interstate 24 includes roadway widths ranging from 26 feet to 118 feet. Between State Route 12 and Pleasant View Road, State Route 49 provides one travel lane in each direction. The shoulder varies, but primarily ranges from two to four feet. From Pleasant View Road to Interstate 24, State Route 49 provides two travel lanes in each direction and a depressed median. Ten-foot shoulders are provided on this portion of State Route 49. The existing right of way varies substantially, from 50 feet to 300 feet wide.

Northbound SR 49 near Sycamore Creek

Table 2
Geometrics

Segment of SR 49	Distance (miles)	ROW (feet)	Number of Lanes	Lane Width (feet)	Shoulder (feet)	Median width (feet)
SR 12 to Bear Wallow	0.08	86	2	12	3/12	
	0.02	60	2	12	12/12	
	1.45	50-60	2	11	3/3	
	0.30	50	2	12	2/2	
	0.16	60	2	12	4/4	10
	0.13	60	2	11	2/2	
Bear Wallow to Old Clarksville	0.15	60	2	11	2/2	
	0.22	60	2	12	3/4	11
	0.95	60	2	11	2/2	
	0.28	100	2	12	9/9	
	0.14	150	2	12	11/11	
	3.04	60	2	11	2/2	
Old Clarksville to Pleasant View Road	2.50	60	2	11	2/2	
Pleasant View Road to US Hwy 41-A	0.08	300	4	12	10/5/5/10	30
US Hwy 41-A to I-24	0.14	300	4	12	10/5/5/10	40

Field observations and United States Geological Survey (USGS) mapping indicate that between State Route 12 and Sycamore Creek, the topography along State Route 49 is extreme, with elevations varying frequently between 400 and 660 feet above mean sea level. Between Sycamore Creek and Interstate 24, the topography transitions to rolling terrain. To date, the majority of new development in the area is located near Pleasant View, where the topography is relatively level.

Southbound SR 49 between Bear Wallow Rd and SR 12

Northbound SR 49 in Pleasant View

Existing Structures

The State Route 49 bridge over Sycamore Creek was replaced in early 2006. The current bridge, shown in the photo to the right, provides one travel lane in each direction with 10-foot shoulders. The bridge is a 360-foot long, three-span, concrete girder bridge with two piers.

SR 49 Bridge Over Sycamore Creek

Traffic History

According to yearly traffic counts conducted at TDOT count stations along State Route 49, with exception to the segment from Old Clarksville Pike to Pleasant View Road, traffic volumes along the majority of State Route 49 grew conservatively, at an average rate of 2% pear year, between 2000 and 2006. Old Clarksville Pike to Pleasant View Road was the first segment along the route to experience significant residential development. Traffic volumes on this segment increased at an average rate of 7.4% per year from 2002 and 2006.

Between 2006 and 2007, new residential and commercial development near both Ashland City and Pleasant View caused a large increase in traffic volumes on State Route 49. As shown in Table 3, near Ashland City and Pleasant View, traffic volumes on State Route 49 increased by 6.4 to 8.4% over the past year.

Table 3
Traffic History

Station	Location	2006 AADT	2007 AADT	% Increase AADT	Heavy Vehicle %
26	SR 49, from SR 12 to Bear Wallow	7,903	8,409	6.4%	4
20	SR 49, from Bear Wallow to Old Clarksville Pike	6,442	6,495	0.8%	6
8	SR 49, from Old Clarksville Pk to Pleasant View Rd	9,556	10,175	6.5%	4
6	SR 49, from US Highway 41A to I-24	12,595	13,659	8.4%	3

Roadway Level of Service

Capacity analyses were performed using the 2007 traffic volumes in order to determine the current levels of service along the SR 49 corridor. A "Level of Service" (LOS) index was used to gauge the operational performance on each roadway segment. The LOS is a qualitative measure that describes traffic conditions related to speed and travel time, freedom to maneuver, traffic interruptions, etc. There are six levels ranging from "A" to "F" with "F" being the worst. Each level represents a range of operating conditions. Table 4 shows the traffic flow conditions and approximate driver comfort at each level of service.

Table 4
Level of Service (LOS) Index

LOS	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonable 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 to the driver is still high.
C	Flow with speeds at or near free flow speeds. 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.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little 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 exceed the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Table 5 shows the results of capacity analyses performed for State Route 49 using existing (2007) traffic volumes. In addition to the level of service, Table 5 also shows the volume to capacity ratio (v/c) for each two-lane segment. In general, the volume to capacity ratio should not exceed 1.0, as roadway congestion increases as the volume to capacity ratio becomes closer to 1.0. Although the volume to capacity ratio is well below 1.0 for each segment of State Route 49, the two-lane portions operate at LOS E. This is primarily due to the low average travel speeds and high percentage of time spent following, which are caused by geometry and limited passing opportunities on State Route 49. Capacity analysis reports are included in Volume II of this report.

Table 5
Existing Level of Service Analyses

SR 49 Roadway Segment	v/c	LOS
SR 12 to Ed Harris/Bear Wallow	0.36	E
Ed Harris/Bear Wallow to Old Clarksville Pike	0.31	E
Old Clarksville Pike to Pleasant View Road	0.44	E
Pleasant View Rd to US Hwy 41A	-	A
US Hwy 41A to I-24	-	B

Crash History

Crash rates were developed using TDOT crash data for three segments of State Route 49 between State Route 12 and Interstate 24. A crash rate represents the number of crashes that occur annually along a segment of roadway, per million vehicle-miles traveled. As shown in Table 6, crash rates on State Route 49 from State Route 12 to Bear Wallow Road and from Old Clarksville Pike to US Highway 41A exceed the statewide crash rate for similar roadways (1.701). Note that the segment of State Route 49 from Highway 41A to Interstate 24 is excluded from this table. This is due to the fact that the multi-lane segment is 0.14 miles long and the majority of crashes that occurred in this segment did so at the intersection of State Route 49 and US Hwy 41 A. Crash data, provided by TDOT is included in Volume II of this report.

Table 6
Crash Summary – Roadway Segments

Segment of SR 49	Length	Total Crashes	AADT	Crash Rate	Statewide Average Crash Rate
SR 12 to Bear Wallow Road	2.15	61	7,900	3.28	1.70
Bear Wallow to Old Clarksville	4.84	52	6,440	1.52	1.70
Old Clarksville to US Hwy 41-A	2.51	67	9,560	2.55	1.70

Alternative Modes of Transportation

Currently, sidewalks are not provided on any portion of State Route 49 between State Route 12 and Interstate 24. State Route 49 is not designated as a bike route - existing shoulders range from two to 12-feet, with the majority between two and four feet. However, this portion of State Route 49 is designated as the future Heartland Connector bicycle route on TDOT's Long Range Plan. Therefore, pedestrian and bicycle accommodations would be incorporated with improvements to State Route 49.

Purpose & Need for the Project

TDOT's Long Range Planning Division identified the need for improvements to State Route 49 from State Route 12 to Interstate 24 relative to the entire State Route 49 corridor, from Dover to the Kentucky State line. The purpose of this Transportation Planning Report (TPR) is to determine the specific needs for improvement along the identified portion of State Route 49.

State Route 49, from Dover to the Kentucky State line is an east-west route for five counties, providing access to Interstate 24. The segment of State Route 49 from State Route 12 to Interstate 24 serves as one of two primary access routes to Ashland City, the county seat. As mentioned previously, 72% of Cheatham County's workforce commutes to jobs outside the county. Most of the white collar workers commute to Nashville via Interstate 24 or State Route 12.

In the past several years, Cheatham County (particularly the Pleasant View area) has become one of the new hot spots for residential development near Nashville. According to the Cheatham County Community Planner, in addition to the eleven developments currently under construction, large tracts of land are being purchased and new residential developments are proposed every month. In response to this, commercial development has increased in the Pleasant View area, and the Joint Cheatham County Economic and Community Development Board is actively promoting development of professional office space in order to retain a portion of the new workforce within the County.

As shown in Table 2 of this document, geometric deficiencies are a concern on this portion of State Route 49, particularly as new development brings with it motorists who are unfamiliar with the area. Shoulders along 93% of State Route 49 between State Route 12 and Interstate 24 are less than six-feet wide, and travel lanes along 85% are only 11-feet wide. In addition, several roadways along this segment intersect State Route 49 at awkward grades and angles less than 45-degrees. Sight distance is limited at these intersections as well as other locations due to vertical and horizontal curvature. As expected, given the geometric deficiencies, crash rates along portions of this roadway segment exceed the associated statewide crash rate.

Although the v/c is well below 1.0, most of State Route 49 from State Route 12 to Interstate 24 currently operates at level of service E, which represents a roadway capacity deficiency. This deficiency is primarily due to the horizontal and vertical curvature, which restricts travel speed and reduces passing opportunities. As residential and commercial development in the area increases, so will the traffic volumes along State Route 49.

Therefore, in addition to promoting economic development in Cheatham County and accommodating traffic volumes associated with the new and future development, the primary needs for improvements to this segment of State Route 49 are to improve geometric deficiencies, safety, and system linkage.

Corridor Options Considered

Typically, several corridor alternates are evaluated during the planning process for roadway improvements. The evaluation of improvement options within a single, 1,000 foot corridor is presented in this study. Preliminary investigations into the feasibility of alternate corridors for

State Route 49 from State Route 12 to Interstate 24 revealed two impediments to relocating this segment of State Route 49: 1) topography, and 2) land use patterns.

As shown in Figures 4A and 4B, the topography adjacent to State Route 49 between Ashland City and Sycamore Creek is extreme, with elevations varying frequently between 400 and 660 feet. Between Ashland City and Sycamore Creek, the existing alignment of State Route 49 creates a large horizontal curve to the east. The logical alternate would be to provide a more direct route, west of the existing alignment. However, tributaries of Sycamore Creek and the Cumberland River meander through the terrain west of the existing alignment, requiring at least two bridges for any such alternate alignment. Additional structures, as well as the extensive rock cuts and grading required to relocate west of the existing State Route 49 make this corridor option environmentally undesirable and economically unfeasible.

North of Sycamore Creek, the topography adjacent to State Route 49 begins to level. Relative to the land south of Sycamore Creek, this area is economically appealing for both residential and commercial developers. Accordingly, the majority of new development along State Route 49 from State Route 12 to Interstate 24 has occurred north of Sycamore Creek. Since State Route 49 serves as the primary north-south thoroughfare in this area, both old and new development patterns follow closely State Route 49's existing alignment. Relocation of State Route 49, north of Sycamore Creek would disrupt the County's economic development plans, and therefore would not satisfy a large portion of the purpose and need for this project.

While evaluation of improvement options within only one corridor is presented in this study, it is important to note that the corridor presented is 1,000 feet wide. This width will accommodate the realignment of portions of State Route 49 within the corridor. Appendix A contains aerial photography and USGS mapping, on which the proposed corridor and potential impacts are illustrated.

OPTION 1 - No-Build

Option 1 represents the scenario in which no improvements will be made to State Route 49 from State Route 12 to Interstate 24. Traffic, safety, and economic development impacts, as well as, the cost of this option will serve as a basis for comparison of various cross-section options within the 1,000-foot corridor option.

Typical Cross-Section

As mentioned previously, the existing roadway width of State Route 49 ranges from 26 feet to 118 feet. Between State Route 12 and Pleasant View Road, State Route 49 provides one travel lane in each direction. The shoulder varies, but primarily ranges from two to four feet. From Pleasant View Road to Interstate 24, State Route 49 provides two travel lanes in each direction and a median. Ten-foot shoulders are provided on this portion of State Route 49. The existing right of way varies substantially, from 50 feet to 300 feet wide.

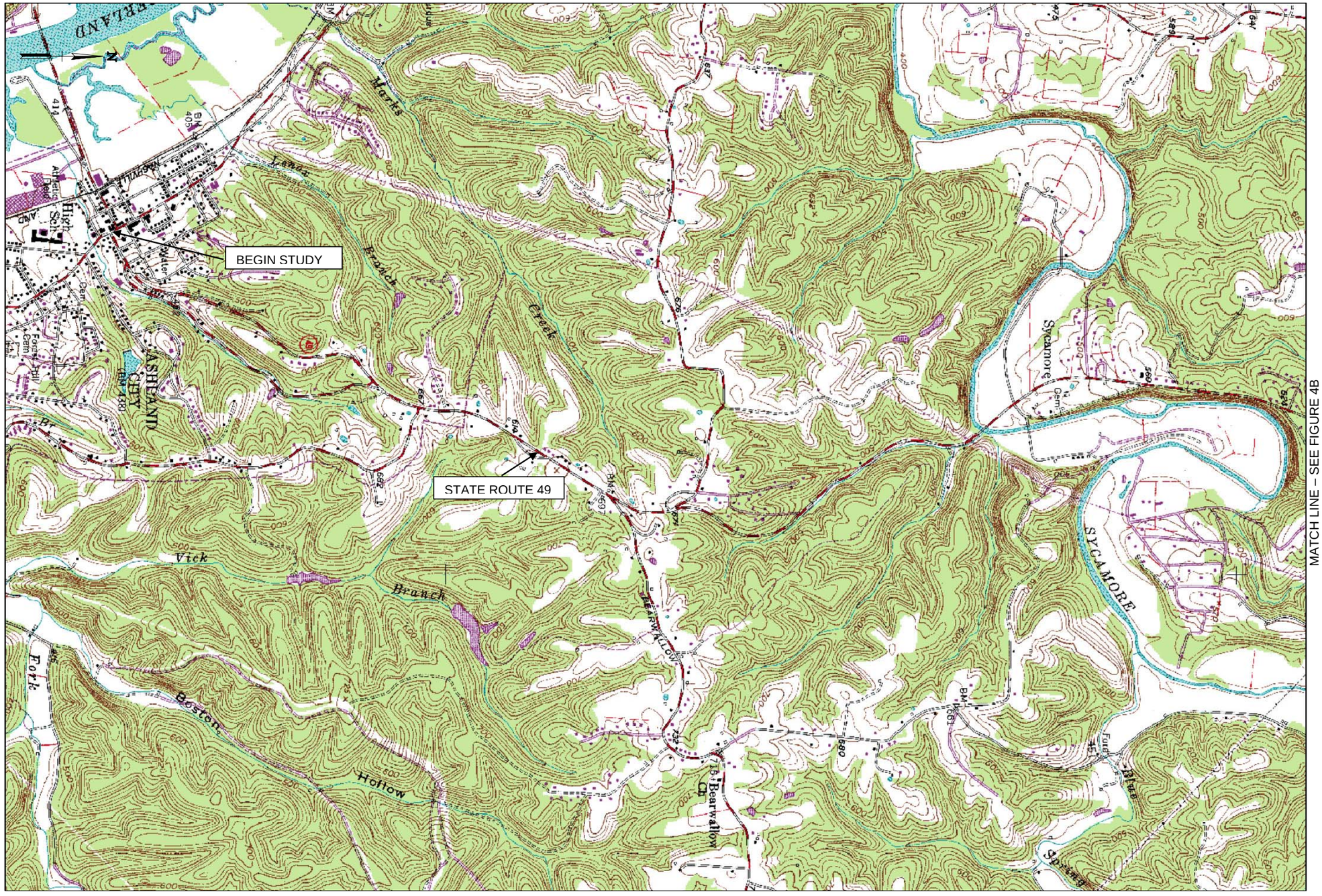


FIGURE 4A –
TOPOGRAPHY BETWEEN
ASHLAND CITY AND
SYCAMORE CREEK

MATCH LINE – SEE FIGURE 4A

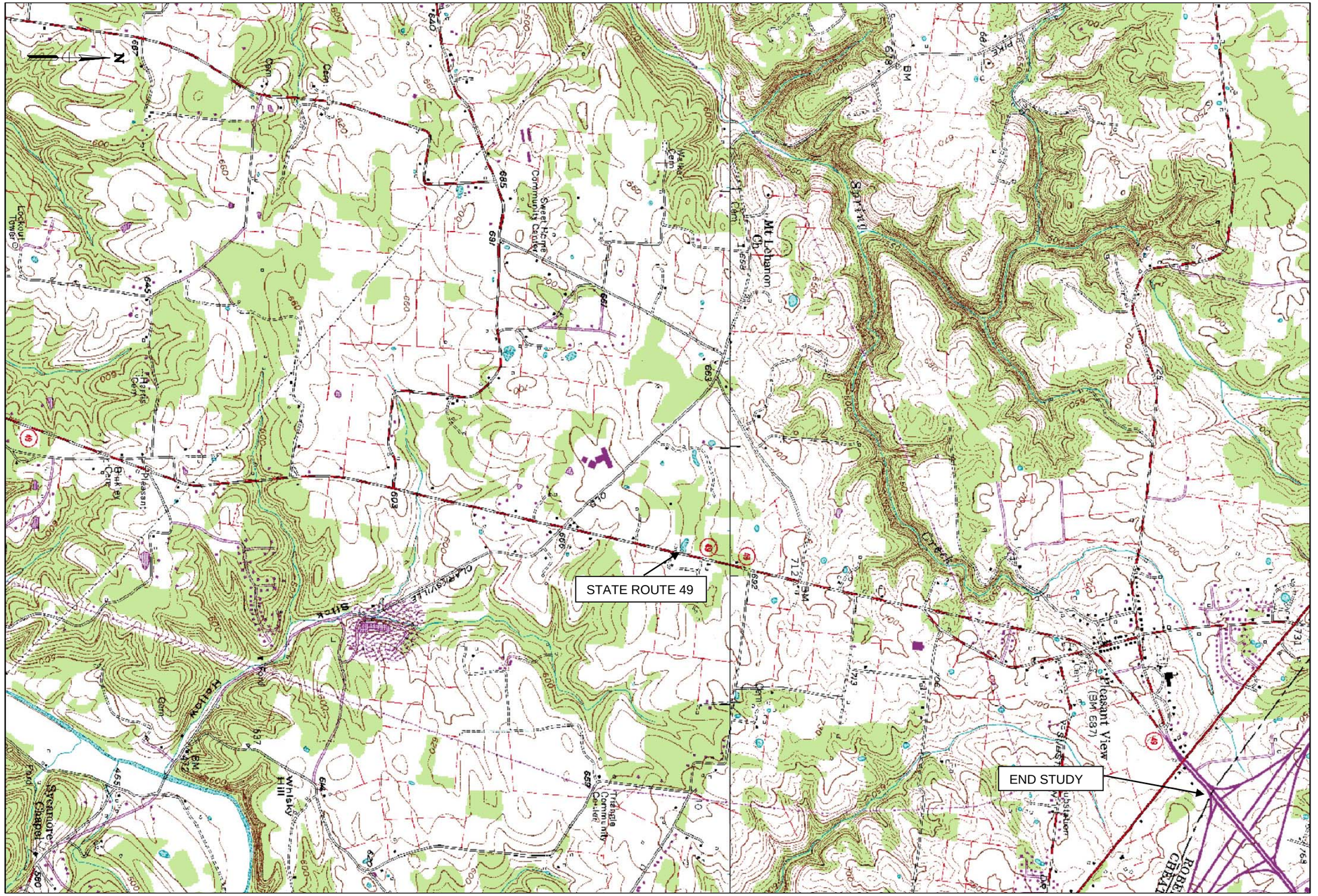


FIGURE 4B –
TOPOGRAPHY BETWEEN
SYCAMORE CREEK & I-24

Anticipated Traffic Impacts

Typical population growth, coupled with the extensive development plans for Cheatham County, is expected to impact traffic volumes along State Route 49 from State Route 12 to Interstate 24 within the next 20 years. Figure 5 shows the projected traffic volumes along State Route 49 for the years 2012 and 2032, as prepared by TDOT's Project Planning Division. Note that these volumes reflect only the developments planned, or those underway, as of July 2007.

In order to estimate the impact of increased traffic volumes on the operation of State Route 49, capacity analyses were conducted for the years 2012 and 2032. As shown in Table 7, the two-lane segments of State Route 49 from State Route 12 to Pleasant View Road will continue to operate at LOS E in 2032. The volume to capacity ratios are expected to increase by at least fifty percent, however, none will exceed 1.0. Note that the segment of State Route 49 from Bear Wallow Road to Old Clarksville Pike will operate at approximately half its capacity in 2032. Capacity analysis reports are included in Volume II of this report.

Table 7
Projected Level of Service – Option 1 (No Build)

SR 49 Roadway Segment	2012			2032		
	V_p (veh/hr)	v/c	LOS	V_p (veh/hr)	v/c	LOS
SR 12 to Ed Harris/Bear Wallow	1,505	0.47	E	2,261	0.71	E
Ed Harris/Bear Wallow to Old Clarksville Pike	1,207	0.38	E	1,688	0.53	E
Old Clarksville Pike to Pleasant View Road	1,534	0.48	E	2,238	0.70	E
Pleasant View Rd to 41A	-	-	A	-	-	B
US HWY 41A to I-24	-	-	B	-	-	C

Structural Impacts

Option 1 will require no acquisition of property and will have no structural impacts.

Environmental Impacts

Option 1 will have no direct impact on environmental resources.

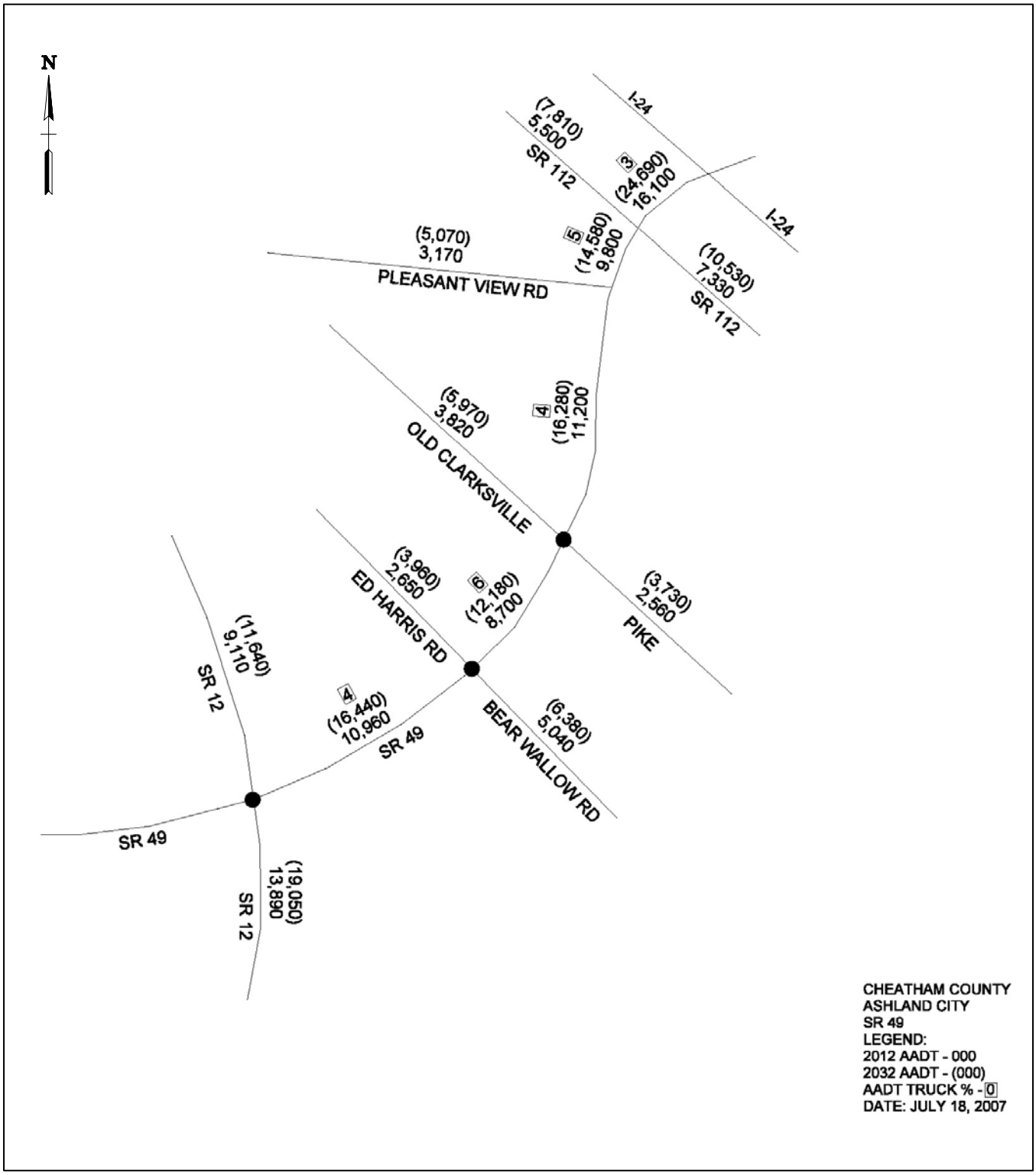


FIGURE 5 – TRAFFIC PROJECTIONS FOR 2012 AND 2032

Cultural Impacts

Option 1 will have no impact on cultural resources; however, increased congestion and continued safety concerns along State Route 49 will likely have an impact on the economic development in the Towns of Pleasant View and Ashland City.

Construction Cost Estimates

The cost of construction for Option 1 is limited to routine maintenance.

OPTION 2 – 4-Lane Improvement

As outlined previously in this report, due to the topography south of Sycamore Creek and the County's land use plans north of Sycamore Creek, the most appropriate corridor in which to make improvements to State Route 49 is along the existing alignment. Option 2 evaluates the impacts of improving State Route 49 to a four-lane highway from State Route 12 to Interstate 24.

Typical Cross-Sections

In the 9.6-mile segment of State Route 49, from State Route 12 to Interstate 24, three distinctive roadway segments are apparent. These segments are outlined below and shown in Figure 6.

Segment 1:	State Route 49, from State Route 12 to Bear Wallow Road
Segment 2:	State Route 49, from Bear Wallow Road to Old Clarksville Pike
Segment 3:	State Route 49, from Old Clarksville Pike to Interstate 24

Given the proximity to Ashland City and Pleasant View, Segments 1 and 3 are considered urban roadway segments. Segment 2 is located outside the limits of Ashland City and Pleasant View, and is therefore considered a rural roadway segment. Typical rural and urban four-lane cross sections are shown in Figure 7A.

As shown, the typical urban cross-section consists of two, 12-foot lanes in each direction with a continuous center turn lane. A four-foot shoulder, curb and gutter and sidewalk are provided on each side. A minimum 92-foot right-of-way is needed to accommodate this cross-section. The typical rural cross-section for Segment 2 will include two, 12-foot travel lanes in each direction with a minimum 48 foot wide depressed median, and 12 foot shoulders on each side. In order to reduce the right-of-way required for Segment 2, a flush median/two-way left turn lane is considered as an alternative to the depressed median, as shown in Figure 7B.

Anticipated Traffic Impacts

The traffic volumes projected by TDOT and shown in Figure 5 of this report were used to conduct capacity analyses for Option 2. The results of the capacity analyses are shown in Table 8. As a four lane facility, each segment of State Route 49 is expected to operate at LOS A or B during the peak hour in 2012. In 2032, each segment is expected to operate at LOS C or better during the peak hour. Capacity analysis reports are included in Volume II of this report.

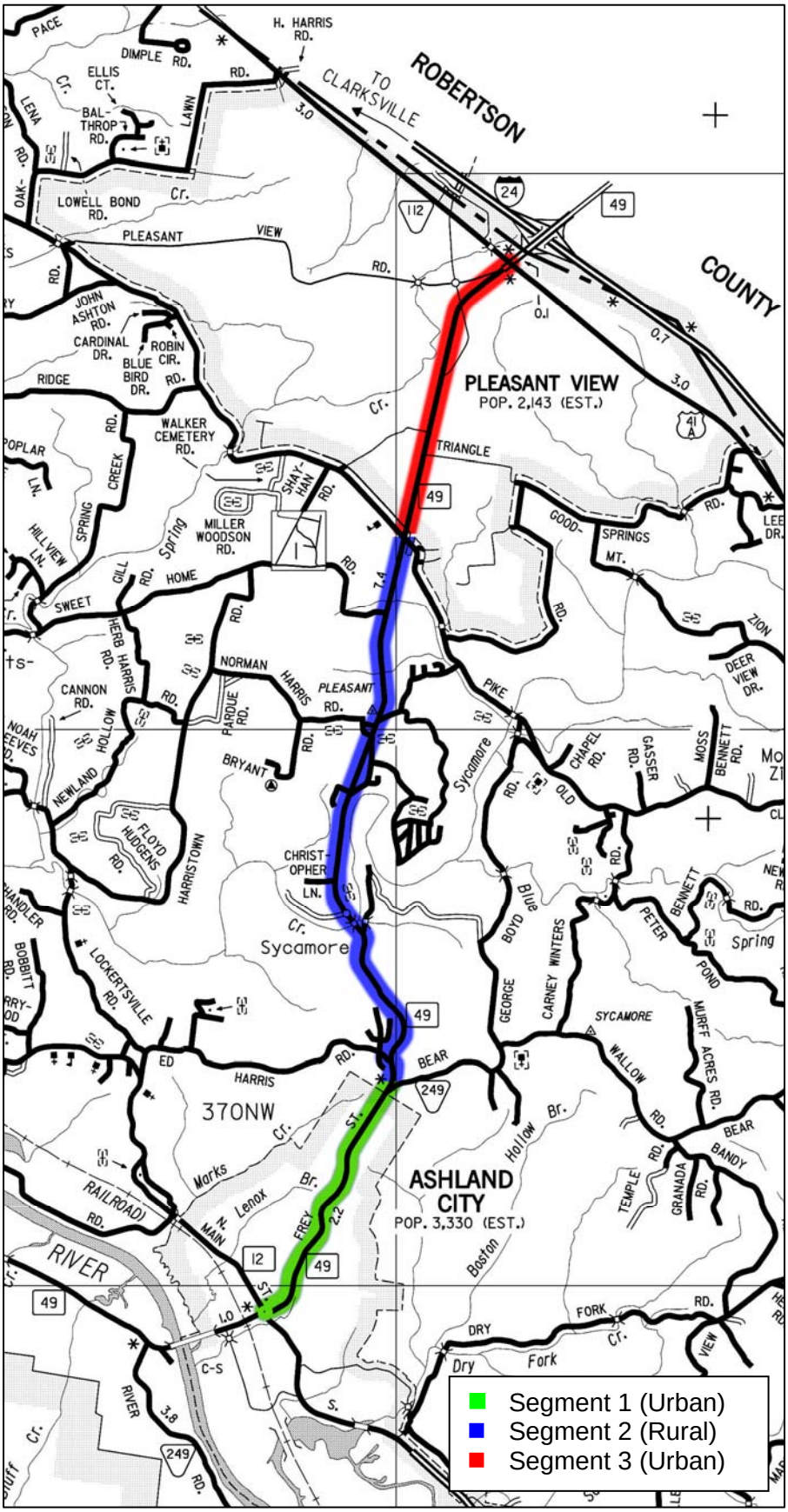
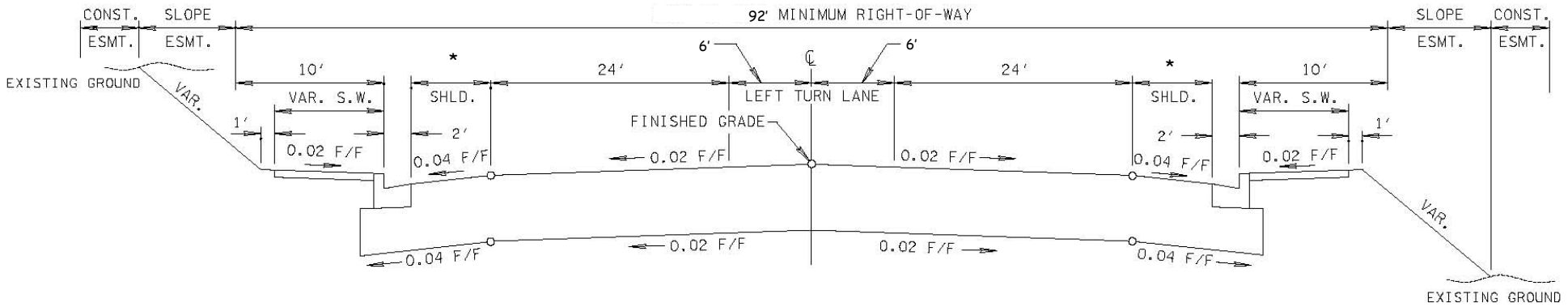
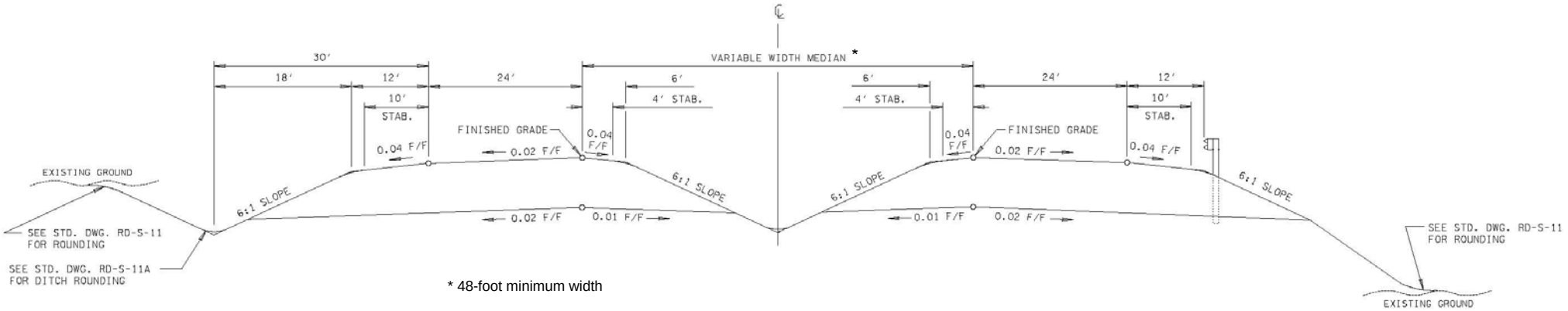


FIGURE 6 – ROADWAY SEGMENTS 1, 2, & 3



* 4-foot minimum shoulder for Segments 1 and 3

URBAN CROSS-SECTION

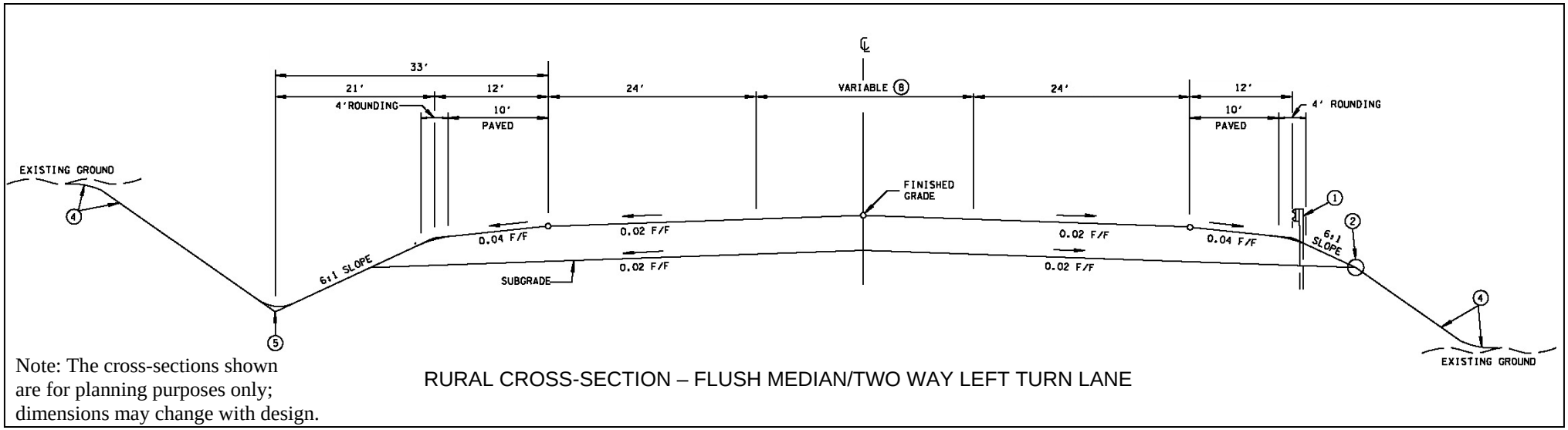


* 48-foot minimum width

RURAL CROSS-SECTION – DEPRESSED MEDIAN

Note: The cross-sections shown are for planning purposes only; dimensions may change with design.

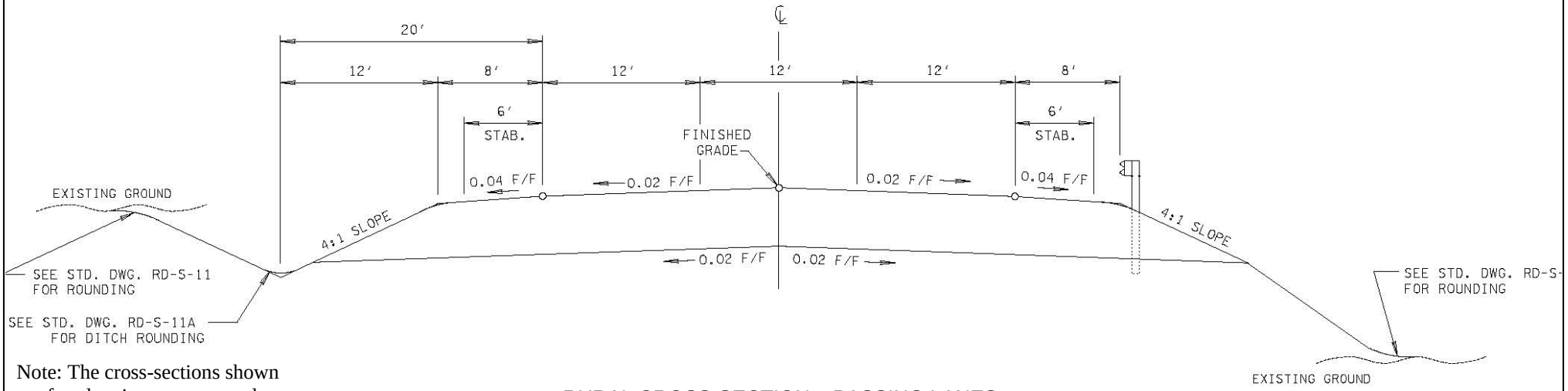
FIGURE 7A – OPTION 2 CROSS-SECTIONS



Note: The cross-sections shown are for planning purposes only; dimensions may change with design.

RURAL CROSS-SECTION – FLUSH MEDIAN/TWO WAY LEFT TURN LANE

FIGURE 7B – OPTION 2, SEGMENT 2 CROSS-SECTION



Note: The cross-sections shown are for planning purposes only; dimensions may change with design.

RURAL CROSS-SECTION – PASSING LANES

FIGURE 8 – OPTION 3, SEGMENT 2 CROSS-SECTION

Table 8
Projected Level of Service – Option 2

SR 49 Roadway Segment	LOS	
	2012	2032
SR 12 to Bear Wallow	B	B
Bear Wallow to Old Clarksville Pike	A	B
Old Clarksville Pike to Pleasant View Rd	B	B
Pleasant View Rd to US Hwy 41A	A	B
US Hwy 41A to I-24	B	C

Cost Estimate

Cost estimates were prepared for each segment using TDOT's 2007 Cost Data Sheet. As shown in Table 9, the cost estimated for Option 2 with a depressed median in Segment 2 is approximately 10% less than the cost estimated for Option 2 with a flush median/two-way left turn lane on Segment 2. The flush median/two-way left turn lane requires less right-of-way acquisition than does the depressed median; however this cost is off-set by the additional construction materials required for the additional travel lane. Detailed cost estimates are included in Appendix B.

Table 9
Cost Estimates – Option 2

Item	Segment 1	Segment 2*	Segment 3	Total*
Construction	$33,027,000	$59,016,000 ($73,770,000)	$23,726,000	$115,769,000 ($130,523,000)
Preliminary Engineering (10%)	$3,303,000	$5,901,000 ($7,377,000)	$2,373,000	$11,577,000 ($13,053,000)
Right-of-Way Acquisition	$3,164,000	$4,039,000 ($3,262,000)	$4,022,000	$11,225,000 ($10,448,000)
Total	**$39,494,000**	**$68,956,000 ($84,409,000)**	**$30,121,000**	**$138,571,000 ($154,024,000)**
Total Cost/Mile	$18,455,000	$14,426,000 ($17,659,000)	$11,074,000	$14,375,000 ($15,978,000)

* Cost for depressed median (Cost for flush median/two-way left turn lane)
Note: Utilities are not included in cost estimates. Cost estimates represent 2007 dollars and have not been adjusted for inflation.

OPTION 3 – Partial 4-lane/ Partial Passing Lane Improvement

As mentioned previously, three distinctive roadway segments are included in the State Route 49 study corridor. Segment 2 is distinguished from Segments 1 and 3 by its topography and land use patterns. In addition, projected traffic volumes for Segment 2 are approximately 25 percent lower than those projected for Segments 1 and 3, and Segment 2 is expected to operate at half its capacity in 2032.

Thus, Option 3 evaluates the impacts of improving Segments 1 and 3 to four-lane highway segments, and improving Segment 2 to incorporate passing lanes. It is important to note that a three lane cross-section was initially considered for Segments 1 and 3. This three lane cross-section included portions with passing lanes and portions with two-way left turn lanes. As discussed in the Highway Capacity Manual, however, the addition of a two-way left turn lane improves operational performance only by reducing the delay associated with vehicles making a left turn - and this reduction is largely dependent on the opposing traffic volumes. The number of access points on Segments 1 and 3 of State Route 49 are relatively low, and most provide access to single-family residential lots which generate few trips during the peak hours. As referenced in discussions of the level-of-service analyses, the future volume to capacity ratio along these segments suggests that ample gaps will be available in opposing traffic volumes. Therefore, the addition of two-way left turn lanes will not address projected 2032 capacity deficiencies on Segments 1 and 3. Likewise, capacity analyses revealed that passing lanes on appropriate portions of Segments 1 and 3 would not significantly improve the segments' projected 2032 levels of service.

The urban cross-sections recommended for Segments 1 and 3 are, therefore, the same as those recommended for Option 2. The 3-lane cross-section, recommended for Segment 2 is shown in Figure 8. This cross-section includes one 12-foot travel lane in each direction with 8 foot shoulders on each side. A 12-foot passing lane will be provided in the direction of travel which corresponds to a positive grade. With appropriate transitions, it is anticipated that passing lanes will be provided on approximately two-miles of the 4.8–mile length of Segment 2. Figure 9 shows the approximate locations where passing lanes may be appropriate in Segment 2.

Results of the capacity analyses for Option 3 are shown in Table 10. These capacity analyses are also based on the traffic volumes projected by TDOT. As shown in Table 10, Segment 2 (Bear Wallow Rd to Old Clarksville Pike) will operate at LOS D during the peak hour in 2012 and 2032. The volume to capacity ratio remains well under 1.0, and the passing lanes provide motorists an opportunity to pass slow moving vehicles and trucks climbing steep grades. All other segments will operate at LOS C or better. Capacity analyses are included in Volume II of this report.

Cost Estimate

The cost estimated for Option 3 is shown in Table 11. The total cost for Option 3 is approximately 19% and 27% less than for Option 2 with a depressed median and flush median/two-way left turn lane, respectively. The difference in cost is primarily due to the two-lane cross-section with passing lanes, recommended for Segment 2 in Option 3. This cross-section requires less right-of-way, reduces the quantity of construction materials, and eliminates the need for widening the bridge over Sycamore Creek. Minimizing construction near Sycamore Creek will also reduce the number of environmental permits required for improvements to State Route 49. Detailed cost estimates are included in Appendix B.

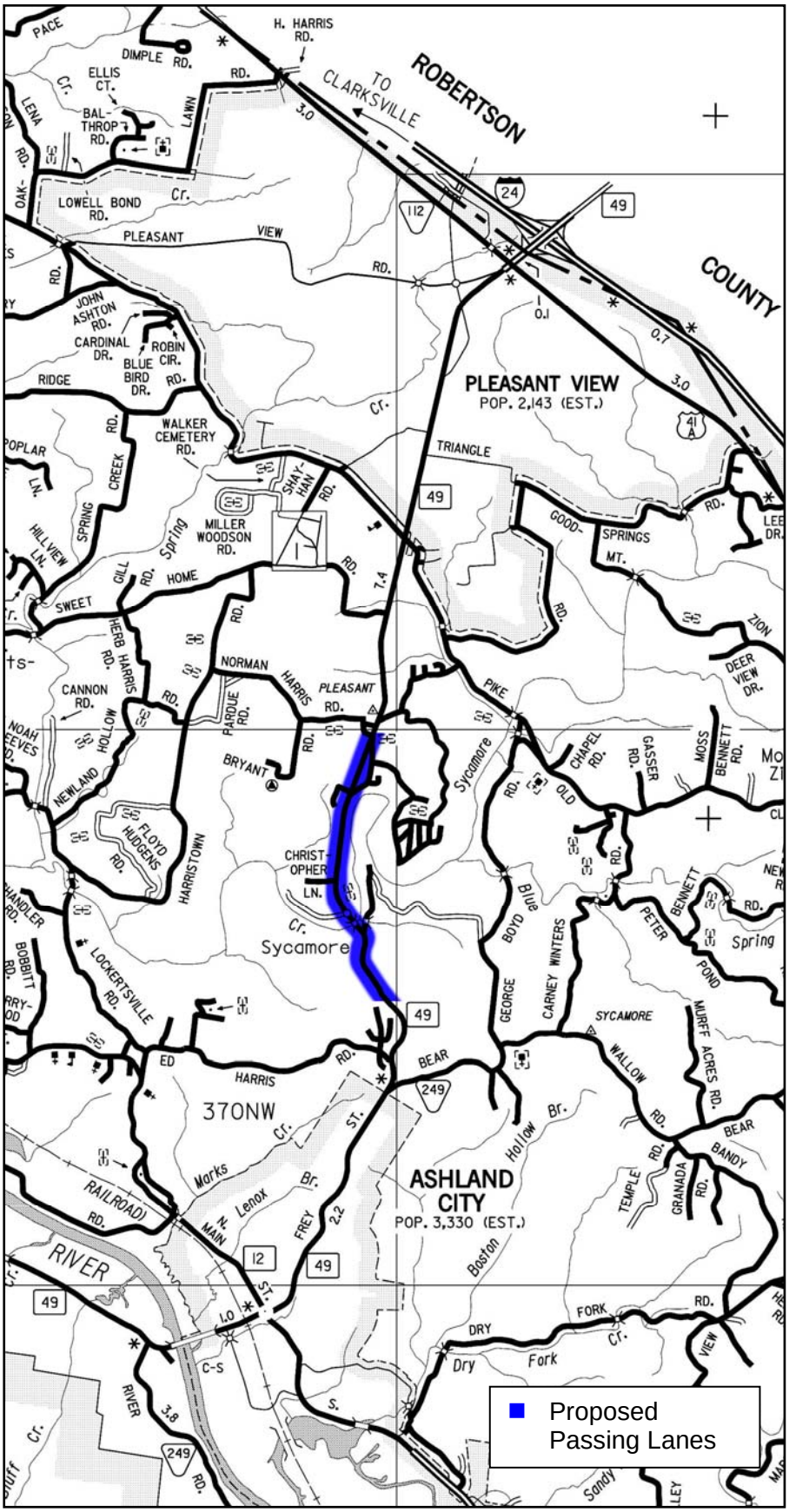


FIGURE 9 – OPTION 3, SEGMENT 2 PASSING LANES

Table 10
Projected Level of Service – Option 3

SR 49 Roadway Segment	2012		2032	
	v/c	LOS	v/c	LOS
SR 12 to Ed Harris/Bear Wallow	-	B	-	B
Ed Harris/Bear Wallow to Old Clarksville Pike	0.46	D	0.65	D
Old Clarksville Pike to Pleasant View Road	-	B	-	B
Pleasant View Rd to US Hwy 41A	-	A	-	B
US Hwy 41A to I-24	-	B	-	C

Table 11
Cost Estimates – Option 3

Item	Segment 1	Segment 2*	Segment 3	Total
Construction	$33,027,000	$36,885,000	$23,726,000	$93,638,000
Preliminary Engineering (10%)	$3,303,000	$3,688,000	$2,373,000	$9,364,000
Right-of-Way Acquisition	$3,164,000	$2,020,000	$4,022,000	$9,206,000
Total	**$39,494,000**	**$42,593,000**	**$30,121,000**	**$112,208,000**
Total Cost/Mile	$18,455,000	$9,911,000	$11,074,000	$11,640,000

* Cost for reconstructing to provide passing lanes on approximately 2 miles of the 4.8 mile segment length
Note: Utilities are not included in cost estimates. Cost estimates represent 2007 dollars and have not been adjusted for inflation.

Structural Impacts (Option 2 and Option 3)

Improvements to State Route 49 within the 1,000 foot corridor will potentially impact several structures located along State Route 49. Figures 1A through 5B of Appendix C illustrate the location of each structural impact. The State Route 49 bridge over Sycamore Creek was recently reconstructed. Should Option 2 be selected, the existing bridge will be widened to carry four lanes of traffic. Should Option 3 be selected, the existing bridge may be used without modification, as passing lanes are not necessary at this location.

Environmental Impacts (Option 2 and Option 3)

Possible environmental impacts of improvements to State Route 49 within the 1,000-foot corridor are also highlighted in Figures 1A through 5B of Appendix C. Sycamore Creek and its tributary to the south will restrict widening of State Route 49 near Sycamore Creek to the west. Widening to the west of the existing alignment in this area will require significant rock cuts. As mentioned previously, an environmental assessment is currently being prepared for improvements to the intersection of State Route 49 and Old Clarksville Pike.

To date, an environmental study has not been prepared for this segment of State Route 49. However, an ecological study was prepared in December 2002, prior to replacement of the State Route 49 bridge over the Sycamore Creek. The study, which is included in Volume II, reports findings of crayfish chimneys, snails, mayflies, caddisflies, and water pennies in a tributary of Sycamore Creek, which travels adjacent State Route 49 on the east side. The ecological report also documents two possible wetland areas on the west side of State Route 49. The first is located 200 feet south of Sycamore Creek. The second is located just north of Sycamore Creek in an inundated zone in the Sycamore Creek floodplain. An email from TDOT's Environmental Permits Office to David Edmondson and Chuck Graves, dated May 2, 2006 indicates that upon re-inspection, the latter was in fact a scour hole, and no permit was required. A copy of this correspondence, as well as the Federal Emergency Management Agency floodplain maps, are also included in Volume II.

Cultural Impacts (Option 2 and Option 3)

Three properties listed on the National Historic Register are located within the 1,000 foot corridor along State Route 49. These properties include the Ashland City Courthouse, located on the northwest corner of the State Route 12 and State Route 49 intersection; Sycamore Mills Bridge, a fixed, cable stayed suspension bridge located on the east side of State Route 49 near the new Sycamore Creek bridge; and the Sycamore Mills Historic District, the location of which is shown in Figure 3A of Appendix C. Information on each of these historic sites are included in Volume II of this report.

In addition to historical impacts, improvements to State Route 49 from State Route 12 to Interstate 24 will also potentially impact property owned by the Girl Scouts of America, located on the northwest corner of State Route 49 and Girl Scout Road. As shown in Figure 5A of Appendix C, the U.S. Post Office, Balthrop Community Park, and the 1st Baptist Church are located immediately adjacent to State Route 49 in Pleasant View. Approximately 165 feet separates the western façade of the post office and the eastern façade of the 1st Baptist Church. Parking for the post office is included in this distance.

Finally, three cemeteries are located within the 1,000 foot corridor along State Route 49. The locations of the cemeteries are shown on Figures 3A and 5A of Appendix C. According to

TDOT's Environmental Division, there has never been a systematic archaeological survey of the Sycamore Creek Valley or existing State Route 49. Such a survey would be conducted prior to preliminary design of improvements to State Route 49.

OPTION 4 – Interim Improvements

Budget constraints will make improvements outlined in Options 2 and 3 unlikely in the near future. Therefore, this study also evaluates several spot improvements that may be implemented. These improvements will likely not satisfy the projected demand for capacity in 2032; however, they will address safety issues and short term traffic demands at much lower costs. The following evaluates 10 spot improvements along the State Route 49 corridor, which may be implemented independently or in combination. Figures 1C through 4C of Appendix C illustrate each location on aerial mapping. Cost estimates for improvements at each location are included in Appendix B.

Location No. 1: Northbound Passing Lanes (Log mile 6.16 to approx. 7.02):

Field observations indicate that the northbound grade on State Route 49, beginning at Vanhook Drive and ending just south of the Brook Hollow Drive is long and steep. While passing lanes at this location will not provide sufficient capacity to meet projected traffic demands, the opportunity for vehicles to pass slow moving trucks could improve safety and reduce delay along this section of roadway.

Northbound SR 49 near Vanhook Drive

As shown in Figure 1B of Appendix D, the west side of the road is on a high embankment with a steep grade that is protected by continuous guard rail. Adjacent to the east side of State Route 49 through this area is a series of homes located at an elevation higher than the roadway surface. Access to the majority of these homes is provided by Vanhook Drive.

This study assumes that this portion of State Route 49 will be widened to the west in order to provide a passing lane. Final design will likely include a combination of widening to the east and west, which may result in acquisition of homes on the east side. Figure 10 reflects improving this portion of State Route 49 to include two 12-foot northbound travel lanes, one 12-foot southbound travel lane and 10-foot shoulders on each side. The cost for this improvement is estimated at $3,766,000.

Location No. 2: State Route 49 @ Bear Wallow Road (Log Mile 7.95)

Bear Wallow Road intersects State Route 49 from the east, just north of Hidden Lakes Resort. Due to the skewed horizontal and vertical geometry of this intersection, southbound left and westbound right turns are difficult to make without encroaching on the on-coming traffic lane. As mentioned previously in this report, an APR was prepared for this intersection in 2000. The APR evaluated three approach alignments to address the geometric deficiencies at this location. Each realigned Bear Wallow to intersect State Route 49 at a perpendicular angle, near Bear Wallow's existing terminus. Field observations and discussion with local officials during the Field Review led to the evaluation of a fourth approach alignment, shown in Figure 11.

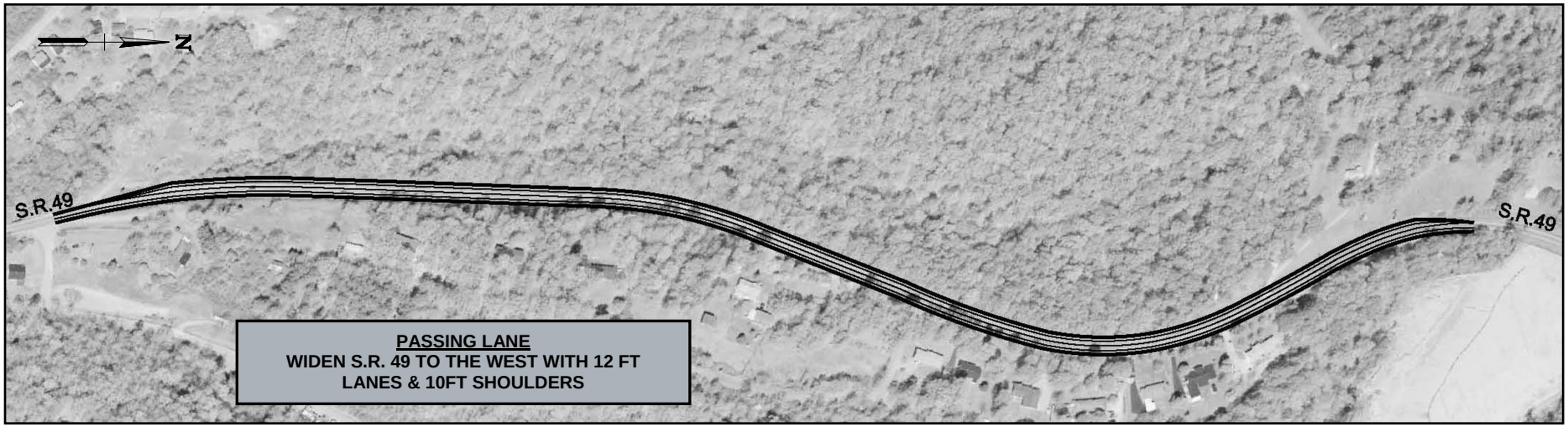


FIGURE 10 – Location No. 1

The fourth alignment considers realigning Bear Wallow to intersect State Route 49 opposite Ed Harris Road. In order to avoid a large fill section, the new intersection would be constructed approximately 360 feet south of the existing intersection of State Route 49 and Ed Harris Rd. Accordingly, the eastern terminus of Ed Harris Road would be realigned approximately 360 feet to the south. One barn would be acquired for right-of-way; however the acquisition of homes is not anticipated. Following realignment, a cul-de-sac could be formed on the existing portion of Bear Wallow Road, thereby maintaining access to the home located just west of the proposed realigned portion. The estimated cost of this approach alignment is $1,402,000. According to local officials, Cheatham County is willing to make a contribution to the cost for these improvements.

Northbound SR 49 at Bear Wallow Rd

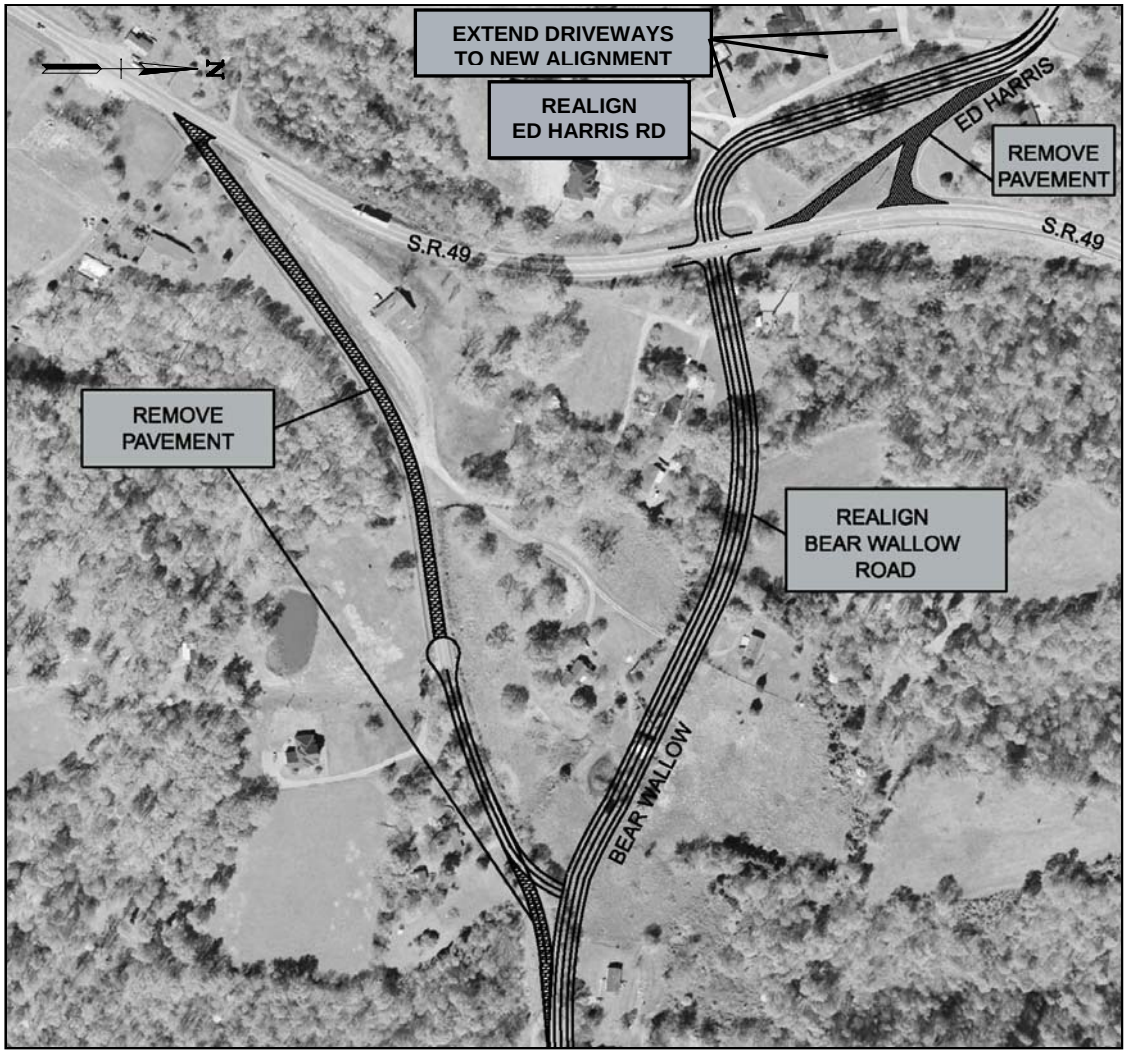


FIGURE 11 – Location No. 2

Location No. 3: Southbound Passing Lanes (Log mile 8.23 to approx. 9.44)

Currently, signs are posted to warn trucks of the steep downward grade from Ed Harris Road to the Sycamore Creek bridge. This long, steep grade is a good candidate for southbound passing lanes. As discussed previously in this report, a tributary of Sycamore Creek flows adjacent to the east side of State Route 49, south of Sycamore Creek. As a result, this portion of State Route 49 must be widened to the west. This will require a large amount of rock cut.

Northbound SR 49 north of Ed Harris Rd

Option 3 of this report evaluates a partial passing lane from Bear Wallow Road to Old Clarksville Pike. The southbound passing lane shown in Figure 12 represents a portion of the passing lane location outlined in Option 3. If coupled with an additional passing opportunity, southbound passing lanes at this location could maintain good levels of service in 2032 on Segment 2 of the State Route 49 corridor. In addition, the recommendations, which reflect improving the existing lanes to 12-foot widths with 10-foot shoulders on each side, will likely improve safety through this portion of State Route 49. The estimated cost of this improvement is $4,486,000.

Location No. 4: Northbound Passing Lanes (Log mile 9.62 to approx. 11.13)

Relative to previous sections suggested for passing lanes, the section of State Route 49 from the Sycamore Creek Bridge to Golf Course Lane/Norman Harris Road has a relatively gentle grade. However, the grade is long and would provide an additional northbound passing opportunity for motorists traveling behind large, slow moving trucks. Coupled with the southbound passing lanes evaluated previously, Segment 2 of the State Route 49 corridor would operate at acceptable levels of service until 2032. Location No. 4 is shown in Figure 13.

Northbound SR 49 north of Sycamore Creek

The estimated cost for this improvement is $5,324,000.

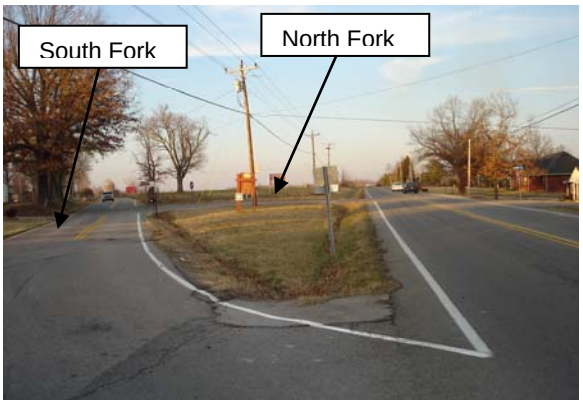
FIGURE 12 – Location No. 3

FIGURE 13 – Location No. 4

Location No. 5: State Route 49 @ Norman Harris Road (Log mile 11.18)

Norman Harris Road intersects State Route 49 from the west, just south of the Maple Hills Subdivision. Immediately west of State Route 49, Norman Harris Road forks, and forms two adjacent intersections with State Route 49. As shown in the photo below and left, the northern fork intersects State Route 49 at roughly a 90-degree angle. The southern fork, on the other hand, intersects State Route 49 at a skew, such that it serves only eastbound right and northbound left turning vehicles. As shown in the photo below and right, the two-way striping on this fork of Norman Harris stops short of the intersection with State Route 49, and the pavement width narrows, leaving room for only one vehicle. This creates a conflict between westbound right and northbound left turning vehicles.

In order to improve operations and remove the point of conflict between eastbound right and northbound left turning vehicles, it is recommended that the two-way striping on the southern fork be removed and a Do Not Enter sign be posted for northbound left turns. Turning radii at the intersection of the northern fork and State Route 49 should be increased to accommodate northbound left turns. The cost of this improvement is estimated at $12,000. Norman Harris Road is not a State Route. Therefore, a local funding contribution may be required.



Looking north at SR 49 and southern fork of Norman Harris Rd

Looking west at the southern fork of Norman Harris Rd

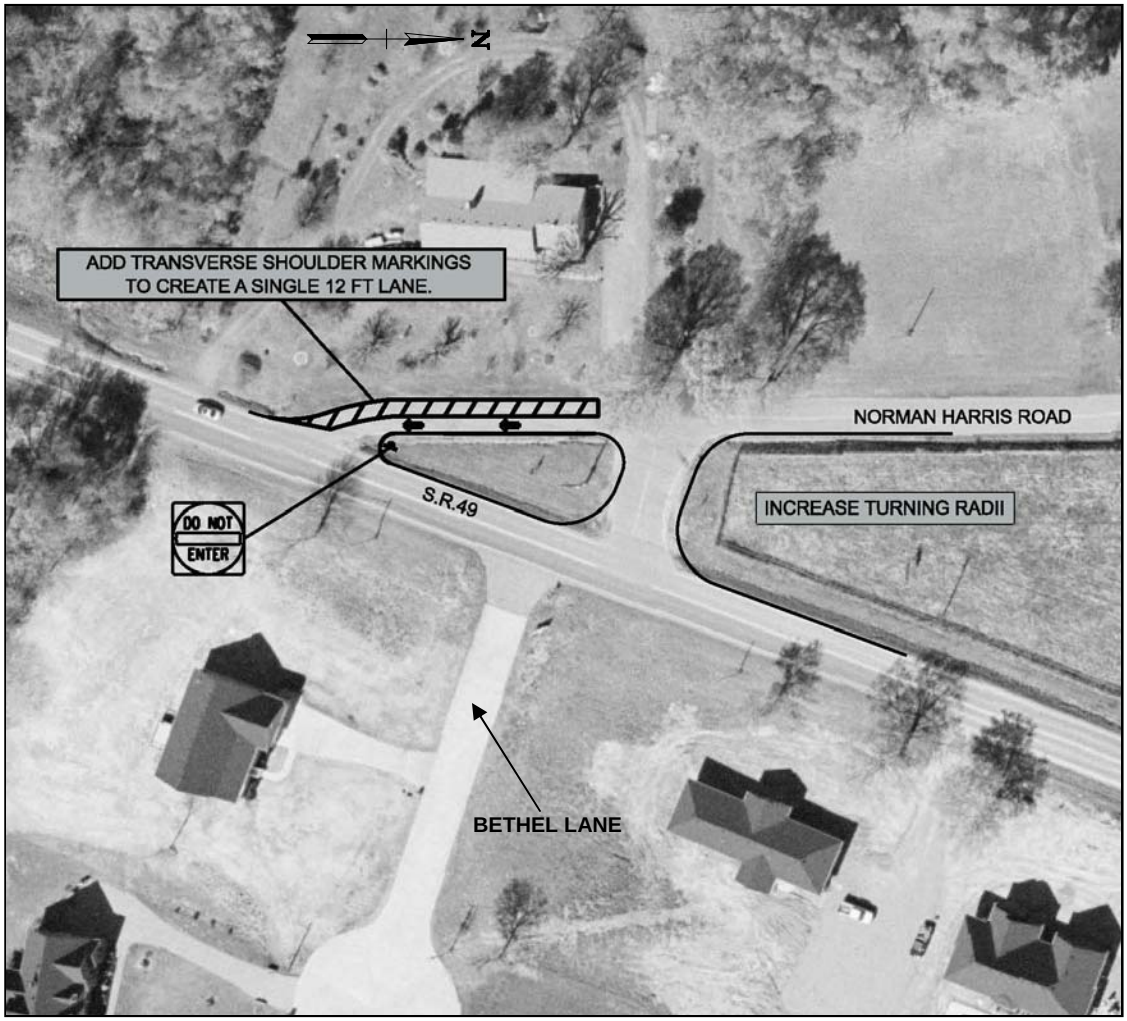


FIGURE 14 – Location No. 5

Location No. 6: State Route 49 @ Randy Road (Log mile 11.27)

Randy Road intersects State Route 49 from the east, just north of Norman Harris Road. As shown in the following photo, the intersection is located on an upgrade near the crest of a vertical curve. The vertical curve limits sight distance for westbound left turning vehicles. In addition, Randy Road forks immediately east of State Route 49. As shown in Figure 15, both the northern and southern forks provide a travel lane in each direction, creating a conflict between southbound left turning vehicles and those waiting to turn left from Randy Road.

To improve the geometry at this intersection, it is recommended that Randy Road be realigned to intersect State Route 49 at a 90-degree angle. To address sight distance limitations, Randy Road should be raised so that the westbound left turning vehicles can see beyond the crest of the vertical curve. The cost of these improvements is estimated at $36,000. Randy Road is not a State Route. Therefore, a local funding contribution may be required.

Westbound Randy Rd at SR 49

Looking north from Randy Rd

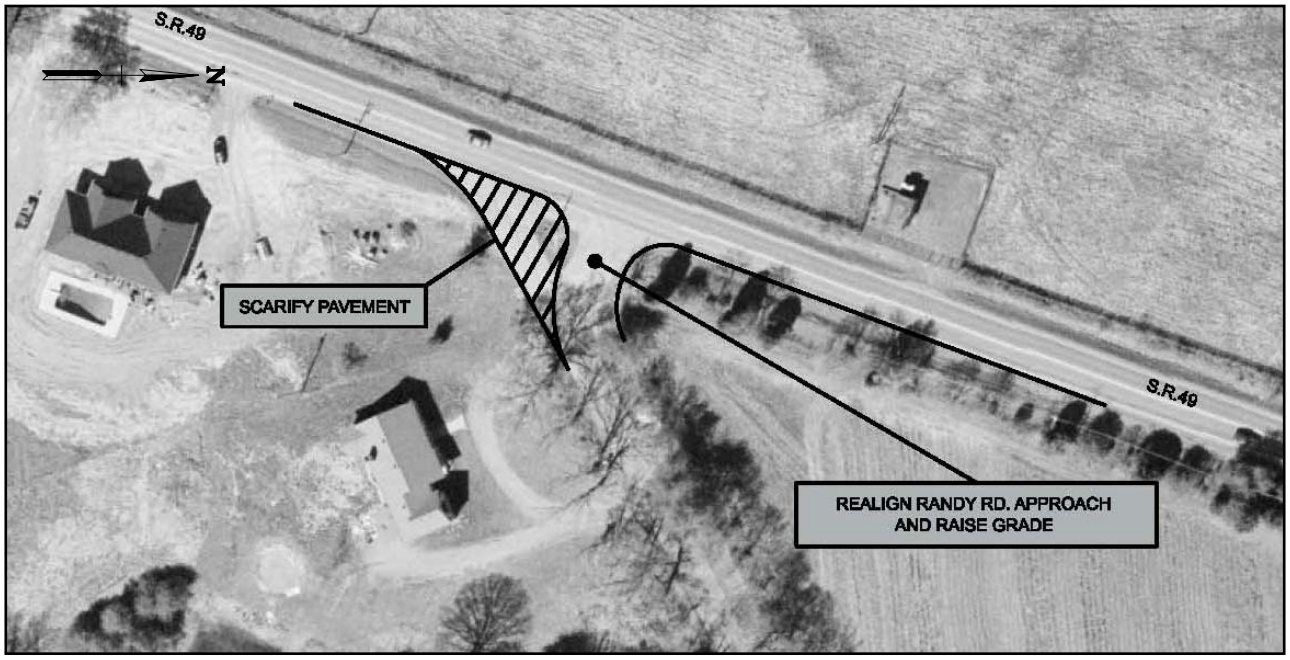


FIGURE 15 – Location No. 6

Location No. 7: Correction of Vertical Alignment (Log mile 12.79 to 14.77)

Existing State Route 49, from Old Clarksville Pike to Pleasant View Main Street is a relatively straight section of roadway. The vertical alignment, however, varies frequently, limiting passing opportunities and sight distance from intersecting roadways and driveways. Correcting the vertical alignment along this section of State Route 49 would provide an opportunity for passing, which would maintain traffic operations further into the future. This improvement, coupled with standard 12-foot travel lanes and 10-foot shoulders would also improve safety along the roadway and at intersections from Old Clarksville Pike to Pleasant View Main Street. The cost estimated for this improvement is $5,264,000.

Northbound SR 49, north of Old Clarksville Pike

Location No. 8: State Route 49 @ Pleasant View Main St (Log mile 14.77)

The intersection of State Route 49 and Pleasant View Main Street is located just south of Pleasant View. Pleasant View Church of Christ is located on the northeast corner of this intersection. As shown in the photo below and left, the sign for Pleasant View Church of Christ limits the sight distance for westbound left turning vehicles. As shown in the photo below and right, sight distance is also limited for westbound right turning vehicles. South of Pleasant View Main Street, State Route 49 curves to the east. This curve, coupled with a steep roadside embankment, limits sight distance when looking to the south from Pleasant View Main Street.

In order to improve sight distance at this location, the sign for the Pleasant View Church of Christ should be relocated to the east. Additionally, the embankment along State Route 49, south of Pleasant View Road should be graded such that sight distance is improved. Although the majority of the present embankment is located within existing right-of-way, acquisition of additional right-of-way may be necessary in order to relocate the slope. The cost of these improvements is estimated at $26,000. Figure 16 illustrates these improvements.

Looking north from Pleasant View Main St

Looking south from Pleasant View Main St

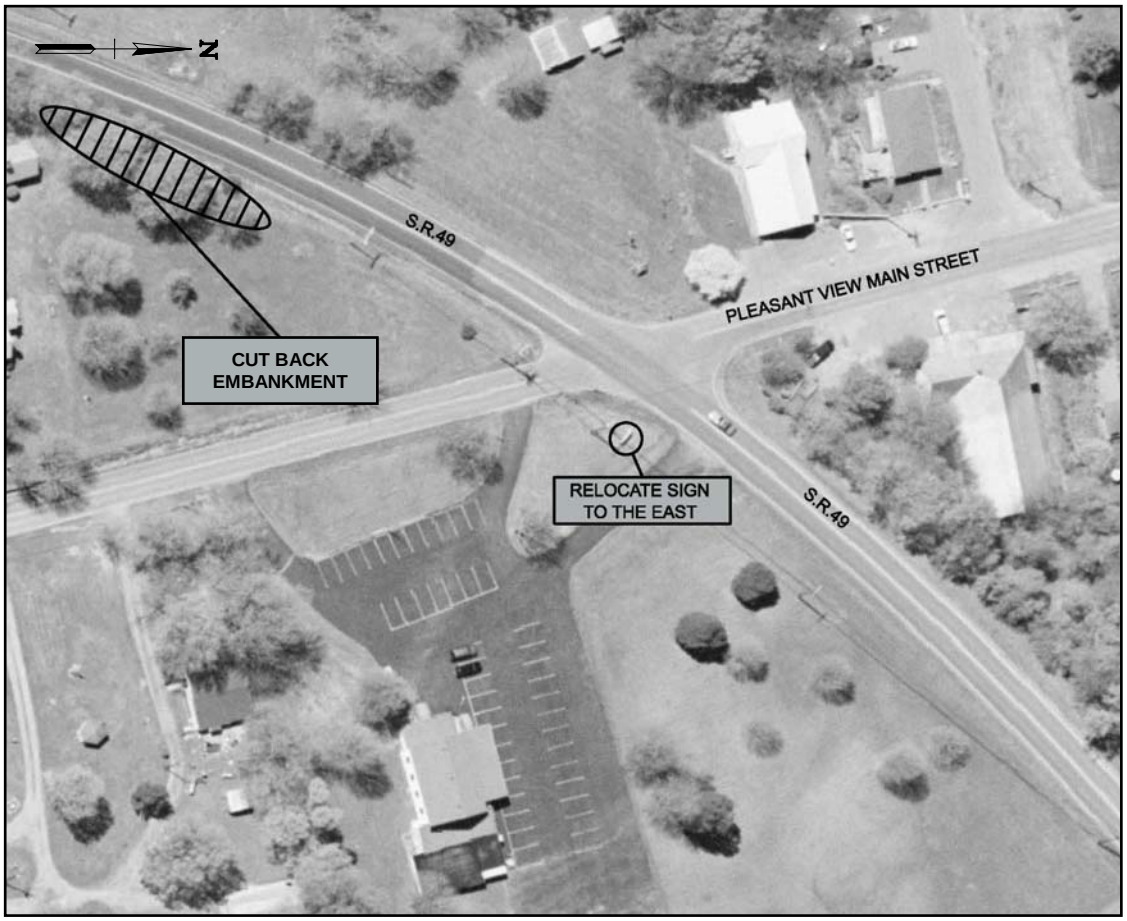


FIGURE 16 – Location No. 8

Location No. 9: Two-way Left Turn Lane (Log mile 14.77 to 15.3)

As discussed previously in this report, construction of a two-way left turn lane on Segment 3 will not provide capacity to meet the projected 2012 or 2032 demand. However, as traffic volumes and roadside development increase, the number of left turning vehicles will likely increase. A two-way left turn lane will provide an opportunity for thru traffic to pass the left turning vehicles without experiencing the delay associated with the left turns. Due to the number of commercial access points, this interim improvement is suggested only for the section of State Route 49 from Pleasant View Main Street to US Hwy 41A. The Town of Pleasant View and Cheatham County should consider access

Northbound SR 49, north of Pleasant View Main St

management regulations for future development along the remainder of State Route 49.

As shown in the photo above, buildings and parking are located near the existing edge of pavement. To minimize the amount of right-of-way required, improvements to this section of State Route 49 should include an enclosed drainage system and four–foot shoulders. For the purposes of this study, it was assumed that State Route 49 would be widened on both sides. The estimated cost for this improvement is $2,044,000. Figure 17 illustrates the improvements.

Location No. 10: State Route 49 @ Hwy 41A (Log mile 15.3)

According to TDOT crash records, eleven crashes occurred at the intersection of State Route 49 and Highway 41A in 2005. Field observations indicate that the geometry of the northbound and southbound approaches is such that the turning path for northbound and southbound left turns overlap slightly. Recommendations for improving the geometry at this intersection are shown in Figure 18.

As shown, right-of-way is currently available for all improvements. Existing pavement is available to accommodate the additional receiving lane on State Route 49, south of Highway 41A. The estimated cost of these improvements is $86,000.

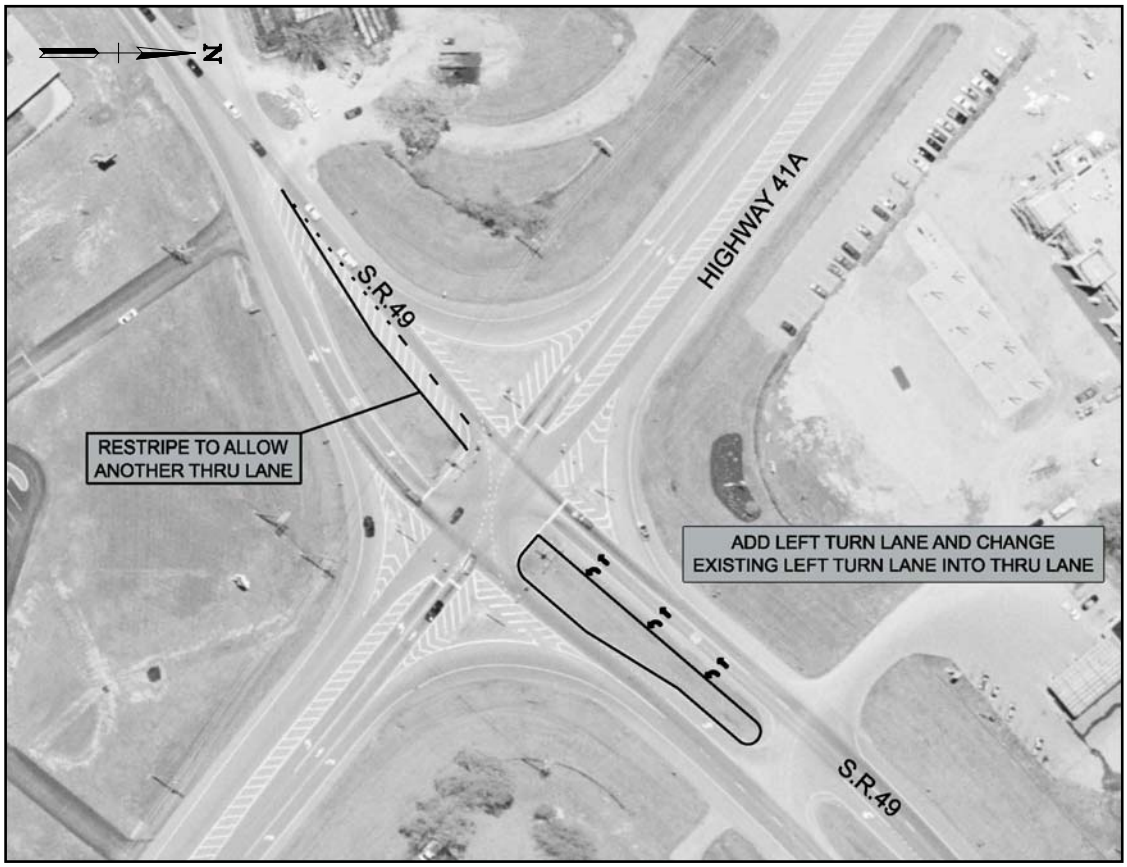


FIGURE 18 – Location No. 10

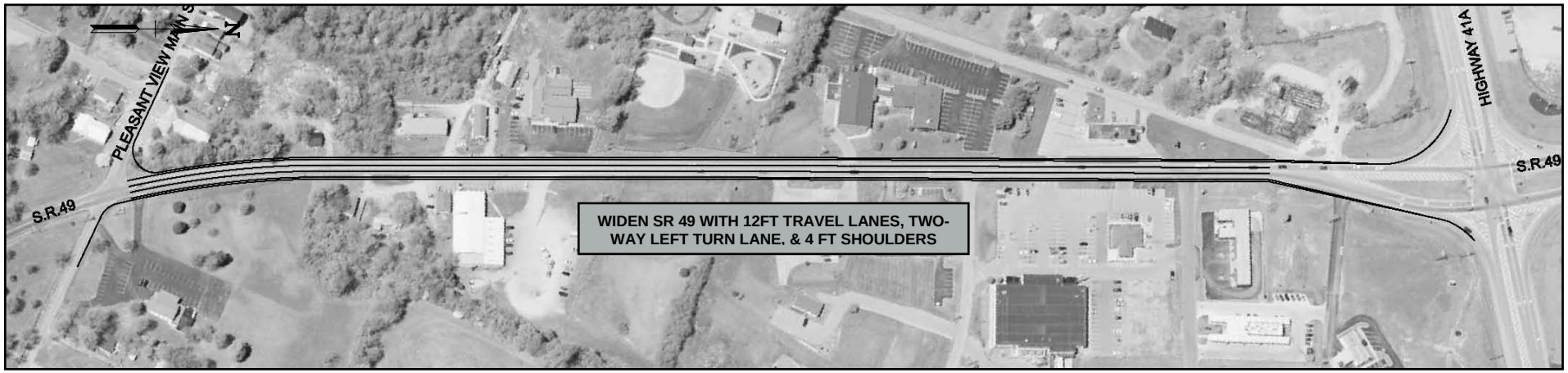


FIGURE 17 – Location No. 9

Recommended Priority of Spot Improvements

The total cost of all spot improvements included in Option 4 is $22,446,000. Table 12 ranks the spot improvement locations, by tier, based on benefit to safety and to mobility. Spot improvement locations in the first tier should be given highest priority. As shown, the first tier includes improvement to the intersections of State Route 49 with Highway 41A and Bear Wallow Rd, as well as correction of the vertical alignment from Old Clarksville Pike to Pleasant View Main Street.

Table 12
Priority of Spot Improvements

Spot Improvement Location		Safety Benefit	Mobility Benefit	Tier	Cost
10	SR 49 @ Hwy 41A	+	+	***	$86,000
2	SR 49 @ Bear Wallow	+	+	***	$1,402,000*
7	Correction of Vertical Alignment	+	+	***	$5,264,000
9	Two-Way Left Turn Lane	=	+	**	$2,044,000
1	Northbound Passing Lanes	=	+	**	$3,766,000
3	Southbound Passing Lanes	=	+	**	$4,486,000
5	SR 49 @ Norman Harris Rd	+	-	*	$12,000
8	SR 49 @ Pleasant View Main St	+	-	*	$26,000
6	SR 49 @ Randy Rd	+	-	*	$36,000
4	Northbound Passing Lanes	=	=	*	$5,324,000

* A local contribution may be available.
Note: Cost estimates represent 2007 dollars and do not include adjustments for inflation.

"+" represents High Benefit
"=" represents Medium Benefit
"-" represents Low Benefit

*** First Tier Projects
** Second Tier Projects
* Third Tier Projects

OPTION 5 – 3-Lane Improvement

On February 22, 2008, members of the Cheatham County Economic Development Board and CTE attended a tour of the SR 49 Corridor, hosted by the Cheatham County Planning Department. The purpose of the tour was to review observations of possible spot/segment improvements that had been previously identified by the host of the tour.

Following the tour, CTE met with TDOT to compare the spot/segment improvements identified by the Cheatham County Planning Department to those included in Option 4 of this report. Each had been addressed, with exception to a three-lane improvement along the entire route. Minutes of the tour in Cheatham County and from CTE's meeting with TDOT are included in Appendix A.

Option 5, therefore, evaluates the impacts of improving State Route 49, from State Route 12 to Interstate 24 to a three-lane highway. Where appropriate, the cross-section would include a two-way left turn lane in lieu of passing lanes. Figure 19 approximates the portions of SR 49 that would be appropriate for two-way left turn lanes in lieu of passing lanes.

As mentioned previously in this report, a three-lane cross-section was initially considered for Segments 1 and 3. This three-lane cross-section also included portions with passing lanes and portions with two-way left turn lanes. As noted, the addition of two-way left turn lanes will not address projected 2032 capacity deficiencies. Likewise, capacity analyses revealed that passing lanes on appropriate portions of Segments 1 and 3 would not significantly improve the segments' projected 2032 levels of service.

Option 5, therefore, is proposed only as a short term improvement that will provide additional mobility and improve safety. Additional lanes will likely be required to accommodate projected traffic volumes prior to 2032. Table 13 shows the projected 2012 and 2032 levels of service for Option 5.

Table 13
Projected Level of Service – Option 5

SR 49 Roadway Segment	2012 LOS	2032 LOS
SR 12 to Ed Harris/Bear Wallow	E	E
Ed Harris/Bear Wallow to Old Clarksville Pike	C	D
Old Clarksville Pike to Pleasant View Road	E	E
Pleasant View Rd to US Hwy 41A	A	B
US Hwy 41A to I-24	B	C

Typical Cross-Section

Figure 8 of this report shows a three lane cross-section with a passing lane. Figure 20 shows a three lane cross-section with a two-way left turn lane. In order to minimize the right-of-way required, a minimum four-foot shoulder may be used.

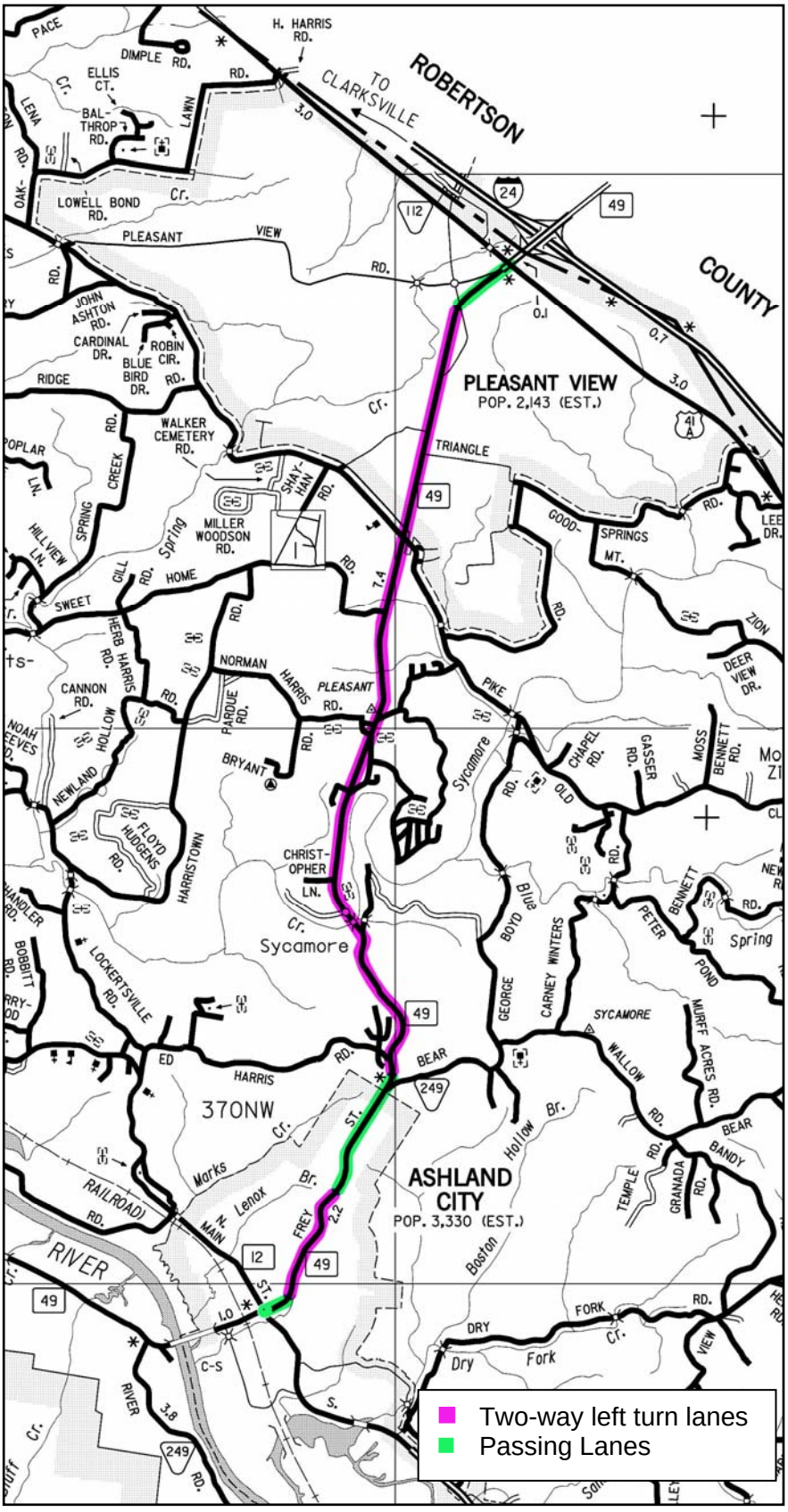


FIGURE 19 – OPTION 5, PASSING & TWO-WAY LEFT TURN LANES

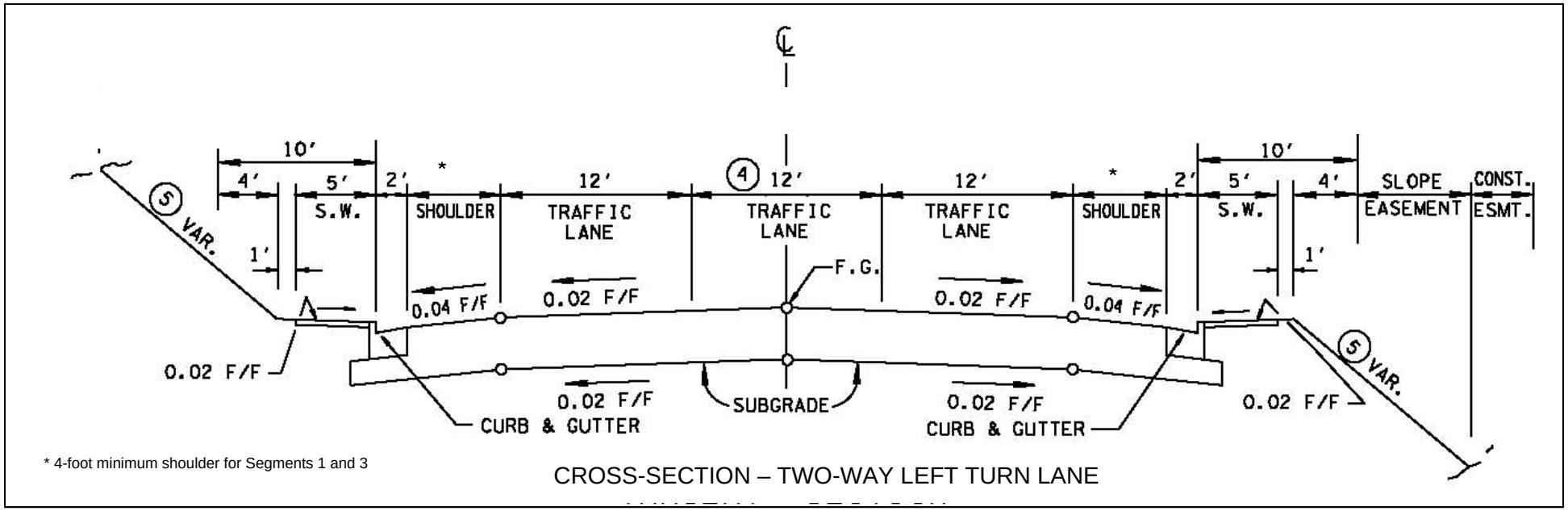


FIGURE 20 – OPTION 5, TWO-WAY LEFT TURN LANE CROSS-SECTION

Cost Estimate

The cost of improving State Route 49 to a three-lane highway was estimated using TDOT's 2007 Cost Data Sheet. As shown in Table 14, the total cost is estimated at $96,358,000.

Table 14
Cost Estimates – Option 5

Item	Segment 1	Segment 2	Segment 3	Total
Construction	$19,816,000	$44,262,000	$13,503,000	$77,581,000
Preliminary Engineering (10%)	$1,982,000	$4,426,000	$1,350,000	$7,758,000
Right-of-Way Acquisition	$3,165,000	$4,039,000	$3,815,000	$11,019,000
Total	**$24,963,000**	**$52,727,000**	**$18,668,000**	**$96,358,000**
Total Cost/Mile	$11,665,000	$11,031,000	$7,236,000	$10,143,000

Note: Utilities are not included in cost estimates. Cost estimates represent 2007 dollars and have not been adjusted for inflation.

Structural, Environmental and Cultural impacts of Option 5 are the same as for Options 2 and 3.

ASSESSMENT OF CORRIDOR OPTIONS

TDOT has developed a set of seven guiding principles by which all transportation projects are to be evaluated. These guiding principles include preservation and management of the existing transportation system, movement of a diverse and active population, support of the state's economy, maximization of safety and security, development of partnerships for livable communities, promotion of stewardship of the environment, and promotion of financial responsibility. The following paragraphs discuss the relationships between each corridor option evaluated in this report and the seven guiding principles.

Guiding Principle 1: Preserve and Manage the Existing Transportation System

As demonstrated in this document, Option 1 (No-build) will not adequately serve future traffic volumes and economic development patterns. The 1,000-foot corridor evaluated in this report, however, will accommodate improvements to the existing system – improvements that will support future traffic volumes and economic development.

Improvements to the existing alignment will also maintain the important regional connections of State Route 49 at State Route 12 in the heart of Ashland City, and State Route 49 at Interstate 24. On a local scale, the flexibility provided by the 1,000-foot corridor will accommodate improvements to the vertical and horizontal alignment of State Route 49 at key locations, such as Bear Wallow Road and Highway 41A.

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

Construction of eleven new subdivisions is underway along State Route 49 between Ashland City and Pleasant View. These new subdivisions will be home to residents who will diversify

both the population and travel patterns in Cheatham County. Currently, 72% of Cheatham County's workforce commutes to jobs outside the county. While it is anticipated that a portion of the new residents will also commute to Nashville or Clarksville, Cheatham County's Joint Economic and Community Development group is interested in retaining some of the new workforce in Cheatham County. With new office development planned and supporting commercial land uses, State Route 49 will likely serve not only its current purpose as access to Interstate 24 and State Route 12, but also as a route for short trips within the Pleasant View and Ashland City areas.

As the land adjacent to State Route 49 develops, the number of access points along State Route 49 will also increase. Option 1 and Option 2 accommodate two-way left turn lanes on Segments 1 and 3. Option 4 and Option 5 accommodate two-way left turn lanes in Ashland City and Pleasant View. These turn lanes will facilitate access to the new roadside development.

Not only will improvements to State Route 49 accommodate higher traffic volumes and access to new development, but State Route 49 will also provide an alternative mode of transportation for travel between Pleasant View and Ashland City. State Route 49 will be designated as a bike route, with four-foot shoulders near Pleasant View and Ashland City, and eight to ten-foot shoulders from Bear Wallow Rd to Old Clarksville Pike. Sidewalk will also be provided along State Route 49 in Pleasant View and Ashland City to accommodate pedestrians.

Guiding Principle 3: Support the State's Economy

Improvements to State Route 49 will help to facilitate the movement of goods - such as products produced by A.O. Smith - to, from and through Cheatham County. The state will receive revenue on these goods. Improvements to State Route 49 will also encourage residential, commercial, and industrial development. As described by Cheatham County's slogan, "Close to Everything, Away from it all," the proximity of new development to Nashville, combined with the rural atmosphere of Cheatham County will likely entice both businesses and residents of other states.

Guiding Principle 4: Maximize Safety & Security

Excluding Bear Wallow to Old Clarksville Pike, State Route 49 from State Route 12 to US Hwy 41A has a crash rate that exceeds the respective statewide crash rate. From field observations, it is evident that a primary cause of crashes on State Route 49 is the roadway geometry. Narrow shoulders, tight horizontal and vertical curves, as well as awkward intersections characterize the geometry along much of State Route 49 from State Route 12 to US Hwy 41A. Improvements to State Route 49, as identified in this study, will provide 12-foot lanes and wide shoulders, as well as the opportunity to straighten curves and realign awkward intersections. Budget constraints make improvements to the entire corridor unlikely in the near future. Option 4 outlines eleven specific opportunities to improve safety along the corridor.

Guiding Principle 5: Build Partnerships for Livable Communities

In 2004, TDOT adopted a new planning process, which encouraged public involvement in future transportation projects. Through this process, TDOT has received valuable insight into factors that might affect a project's design. TDOT has also been able to design new projects to reflect the priorities of the affected public.

The RPO program is an important vehicle for TDOT's public involvement program. The evaluation of State Route 49 included in this report is a direct result of action taken by the GNRPO, as well as the exchange of ideas between the GNRPO, Cheatham County, and TDOT. A Field Review was held on September 5, 2007, wherein representatives of each organization met to officially discuss the State Route 49 corridor. Ideas and concerns brought forth during this meeting should direct the design of improvements to State Route 49 so that the needs of both the Cheatham County community and the State of Tennessee are met. An attendance list and minutes from the September 5th meeting are included in Appendix A of this report.

Guiding Principle 6: Promote Stewardship of the Environment

Detailed environmental assessments are needed to fully address the impacts of the corridor option presented in this study. However, Table 15 shows some of the possible environmental and cultural impacts along State Route 49, as identified in the 2002 ecological study, as well as, those that were identified during on-site field reviews. These impacts, which should be considered for avoidance, mitigation, or other measures, are also shown in Figures 1A through 5B of Appendix C.

Table 15
Known Environmental and Cultural Impacts

Impacts	Location		
	State Route 12 to Ed Harris/Bear Wallow Rd	Ed Harris/Bear Wallow Rd to Old Clarksville Pk	Old Clarksville Pk to Interstate 24
Blue Line Streams	X	X	
Wetlands		X	
Floodplains	X	X	
Churches	X		X
Historic Site	X	X	
Cemeteries		X	X
Forested Land	X	X	X
Endangered Species			

Guiding Principle 7: Promote Financial Responsibility

Table 16 summarizes the construction costs for each option evaluated. It is important to note that these improvements will promote economic development in Cheatham County, accommodate future traffic volumes, and alleviate the costs associated with safety related crashes along State Route 49.

The cost estimates, as depicted in this report, are offered for comparison purposes and will fluctuate with inflation and any unexpected conditions. It is the Department'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 the taxpayers.

Table 16
Cost Estimates - Summary

Corridor Option		Total Cost
Option 1	**No Build**	**$0**
Option 2	**Depressed Median on Segment 2**	**$138,571,000**
	Flush Median/Two-Way Left Turn Lane on Segment 2	**$154,024,000**
Option 3	**Passing Lanes on Segment 2**	**$112,208,000**
Option 4	**Interim Improvements**	**$22,446,000**
Option 5	**3-Lane Cross-section**	**$96,358,000**

APPENDICES

APPENDIX A
FIELD REVIEW INFORMATION &
MINUTES FROM 2-22-08 TOUR

CTE
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Meeting & Field Review Minutes-Revised

Subject:	**TPR – SR 49 from SR 12 in Ashland City to I-24 in Pleasant View**
Meeting Date:	September 5, 2007
Location:	Cheatham County Planning Office, Ashland City
Transcription Date:	September 28, 2007
Attendees:	TDOT: Gary Webber, Ken Elrod, David Thompson, Billy Binion, Rick Hackett, Bob Allen, C.L. Tilley; Cheatham County: Mayor McCarver, Mayor Orange, Sharon Caton, James Fenton; GNRPO: Jeff Pancirov; FHWA: Gary Fottrell; CTE: Jim Morinec, Kim King
Copies:	Attendees, Bill Hart, Terry Gladden

Purpose:

The purposes of this meeting were as follows: 1) To familiarize the stakeholders with the TPR process, specifically regarding State Route 49; 2) To receive feedback from the stakeholders on the corridor option and typical cross-sections presented; and 3) To identify additional historical, environmental, or culturally significant impacts along the corridor. The following summarizes the information provided by the attendees:

Meeting:

CTE began the meeting with an explanation of the TPR process and background on the project. CTE explained that the original request from the RPO was to evaluate improvements to the entire 105-mile segment of SR 49 from Dover to the Kentucky State line. The TDOT Long Range Planning Division identified the segment from SR 12 to I-24 as the priority segment based on geometrics, crash history, traffic operations, and other planned improvements.

CTE then explained the purpose and need, as identified at that time. Primary needs involved addressing geometric, safety, and capacity issues, as well as economic development. CTE presented an aerial photograph, with the proposed corridor, traffic generators, and potential impacts displayed. CTE also provided each attendee with a copy of a map of the existing roadway segment, projected traffic volumes (prepared by TDOT), and examples of cross-section options. It was explained that while the examples of cross-sections included only 4-lane options, a three-lane option for this corridor will also be considered.

CTE then asked that the attendees review the aerial photograph presented and mark additional impacts/areas of concern. CTE noted that the Cheatham County Courthouse and the cemetery located at the northern terminus of Golf Club Lane should be included on the drawing. During this effort, the following additional impacts/concerns were identified (starting in Pleasant View and moving south to Ashland City):

- ✓ Balthrop Park
- ✓ Post Office – directly across from Balthrop Park
- ✓ Baptist Church (Southwest corner of SR 49 and Church Street)
- ✓ Slave Quarters (South of Pleasant View Main Street at SR 49)
- ✓ Potential realignment of Church Street to intersect SR 49 immediately south of Balthrop Park
- ✓ Livery Stables (Historic Significance – Southwest corner of Pleasant View Main St and SR 49)

- ✓ Wetlands (Southeast corner of SR 49 and Triangle Road)
- ✓ Planned mixed-use development on Dozier Property (along SR 49, southwest of Old Clarksville Pike)
- ✓ Two access locations for Maple Hills subdivision – one on SR 49 and one on Sweethome Rd
- ✓ Possible future one-way connection from Sycamore Schools to Sweethome Road
- ✓ Powder Mill (Historic Significance/Potential Conservation Site – east of SR 49, near Sycamore Creek)
- ✓ Sycamore Powder House (Historic Significance – west of SR 49, near Sycamore Creek)
- ✓ Birdsong Bed & Breakfast (Historic Significance – east of SR 49, near Powder Mill)
- ✓ Girl Scout Property (northwest corner of SR 49 and Girl Scout Road)
- ✓ Wetland along tributary of Sycamore Creek, east side of SR 49
- ✓ Renewed concern about the intersection of Bear Wallow Road and SR 49 – school buses must turn around in Food Lion parking lot to travel north on SR 49 from Bear Wallow
- ✓ Access from Hidden Lake Resort to Bear Wallow Road
- ✓ Property on north end of Vanhook Road at SR 49, currently for sale, will be rezoned commercial
- ✓ TDOT representatives noted design constraints (topography & blue-line streams) – particularly near Sycamore Creek.

In addition, representatives of Cheatham County requested that improvements be designed to minimize ROW acquisition – particularly from Pleasant View to Old Clarksville Pike. Representatives of Cheatham County also expressed concern about traffic and parking near the Courthouse in Ashland City on court-days. Lose & Associates is working with a group called Renaissance Ashland City to prepare a plan for downtown Ashland City that would rectify problems such as this. James Fenton, Cheatham County's Joint Economic and Community Development Director will send the Renaissance Ashland City plans to CTE.

Sharon Caton will send a GIS representation of Cheatham County's FEMA floodplain areas. CTE will update the list of potential impacts based on the information supplied during the meeting and verify the historical significance of relevant properties.

Field Review:

Attendees then drove the segment of SR 49 from SR 12 to I-24 as a group in a van provided by TDOT. During this time, attendees pointed out impacts/areas of concern listed above, and identified the land northeast of Bell Street and SR 49 as having been filled recently. A utility building at the intersection of SR 49 and Norman Harris Road, as well as a Comcast Communication satellite station on the east side of SR 49 near Bear Wallow Road were also identified.

TDOT suggested that, in order to minimize ROW on four-lane cross-section options near Ashland City and Pleasant View, CTE should consider the minimum 72-foot urban cross-section with four-foot shoulders and curb and gutter. This cross-section would require a 92-foot ROW.

These minutes represent our understanding of the discussion and decisions reached during the meeting and field review. Please forward additions and/or corrections to kim.king@cte.aecom.com.

Sincerely,

CTE

Kimberly C King

Kim King, E.I.
Transportation Planner

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Draft Meeting Minutes

Subject:	**SR 49 TPR, Cheatham County**
Meeting Date:	February 22, 2008
Location:	Cheatham County Library (Driving Tour of SR 49)
Transcription Date:	February 25, 2008
Attendees:	Cheatham County: Mayor Orange, Sharon Caton, Mayor McCarver, Ginger Jarrett, Gene Hannah, John Anthony, Gary Binkley, Darwin Newton, Nancy Rucker, Chris LaCross; TDOT: Kenny Elrod; CTE: Kim King
Copies:	Attendees, Gary Webber (TDOT), Terry Gladden (TDOT), Bill Hart (TDOT), Jeff Pancirov (GNRPO), James Fenton (Cheatham County)

The purpose of this meeting was to review observations of the SR 49 corridor, made by Sharon Caton (Community Planner) and Kenny Elrod (TDOT Engineer). Following a Cheatham County Economic and Community Development Board meeting at the Cheatham County Library, several members of the board, as well as, Kenny Elrod and Kim King toured the corridor. The following observations were discussed concerning possible spot/segment improvements along State Route 49:

- **SR 12 @ SR 49 (dog-leg intersection):** Several ideas were discussed for realigning the dog-leg at the intersection of SR 12 and SR 49. The first option (Option 1) involved the extension of SR 49 from SR 12 to the Tennessee Waltz Bypass (Attachment 1).

  The second option (Option 2) suggested using/extending Brook Hollow Road, which currently parallels SR 49 east of SR 12, as a one-way pair with SR 49 (Attachment 2). Brookhollow Road would carry two eastbound lanes and SR 49 would carry two westbound lanes. It was noted that this option would not eliminate the dog-leg for westbound vehicles that wish to continue south on 49 past SR 12.

  The group also discussed a third option (Option 3), the realignment of the west leg of SR 49, as shown in the Renaissance Ashland City Plan (Attachment 3). Both Options 2 and 3 would likely face opposition from home/business owners along the route. No conclusion was reached as to the recommended improvements at this intersection.

- **SR 12 to northern tie-in of Brookhollow:** If Option 1 or Option 3 were chosen for the realignment of SR 49 @ SR 12, the suggestion was made to widen SR 49 from SR 12 to the skating rink (near the northern tie-in of Brookhollow), to include a center turn lane (at a minimum) and a sidewalk on the north/west side.

- **Brookhollow to Bear Wallow**: Widen SR 49 to include a center turn lane. The suggestion was also made to acquire ROW for four lanes.

- **SR 49 @ Bear Wallow/Ed Harris**: Several options were also presented for improving the intersection of SR 49 and Bear Wallow/Ed Harris Rd. Attachment 4 illustrates the options. Option 1 involved constructing a new segment of Bear Wallow from George Boyd Rd to intersect SR 49 directly opposite Ed Harris Rd. This segment would serve as part of a one-way pair with the existing segment of Bear Wallow from George Boyd Rd to SR 49. Each

would carry two lanes of traffic. The western end of Bear Wallow Road (existing road) would be realigned to intersect SR 49 at a 90-degree angle.

Option 2 involved construction of a new segment of Bear Wallow from George Boyd Rd to intersect SR 49 directly opposite the existing Ed Harris Rd. Unlike Option 1, however, this segment would replace the existing segment of Bear Wallow from George Boyd Rd to SR 49, and carry bi-directional traffic.

Option 3 was the same as Option 2 with one exception. To avoid the large drop-off opposite Ed Harris Rd, Option 3 considered forming the new four-legged intersection of SR 49 with Bear Wallow/Ed Harris just south of the existing intersection of SR 49 and Ed Harris Rd.

The group favored Option 3 above Options 1 or 2.

- **Bear Wallow to Sycamore Creek Bridge:** Widen SR 49 to the west, to include passing lanes with left turn lanes where necessary. It was also suggested that the horizontal geometry be addressed in the widening process. Sharon Caton suggested that the passing lanes transition such that equal opportunity be given to northbound and southbound traffic.

- **Sycamore Creek Bridge:** It was suggested that the Sycamore Creek Bridge could accommodate three lanes with four-foot shoulders without widening.

- **Girl Scout Rd to top Old Clarksville Pike:** Widen SR 49 to include passing lanes with left turn lanes where necessary.

- **SR 49 @Old Clarksville Pike:** TDOT is currently developing plans for improvements to the intersection of SR 49 @ Old Clarskville Pike. Sharon Caton and Kenny Elrod expressed concerns over the design and will mention the concerns to TDOT's Design Division.

- **Old Clarksville Pike to Pleasant View Main Street:** Widen SR 49 to include passing lanes and left turn lanes where necessary. Four-lane ROW should be obtained.

- **Pleasant View Main St to 41 A:** Widen SR 49 to include a two-way left turn lane.

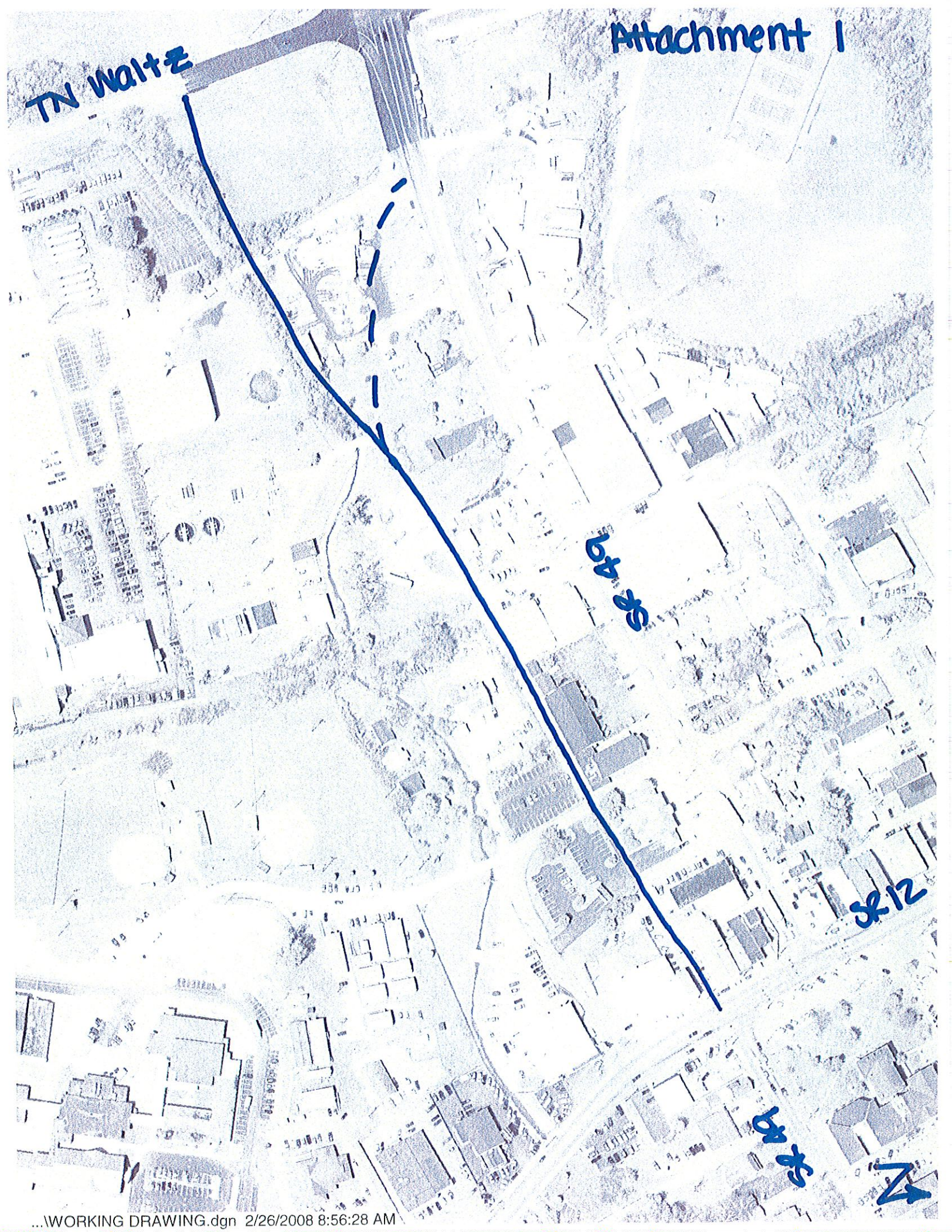
- **SR 49 @ Hwy 41A:** No recommendations were made for this intersection; however, Mayor McCarver mentioned that they are still having problems with northbound traffic missing the curve to the right and continuing into on-coming traffic.

These minutes represent our understanding of the observations/concerns discussed during the meeting. Please forward additions and/or corrections within five business days.

Sincerely,

CTE

Kim King, E.I.
Transportation Planner


Attachment 1
TN Waltz
64 St
SR 12
64 St
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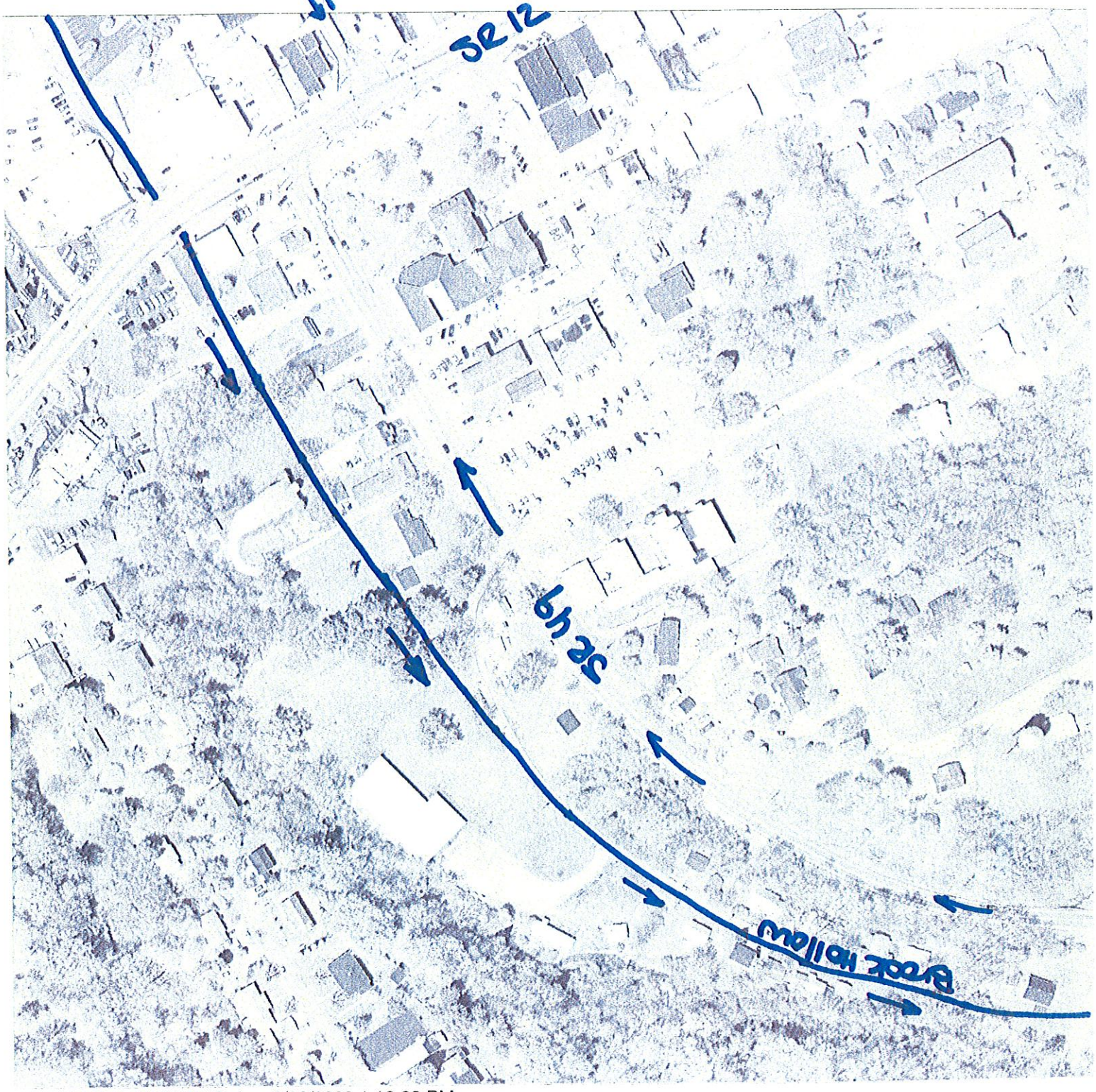
Attachment 2



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Attachment 3

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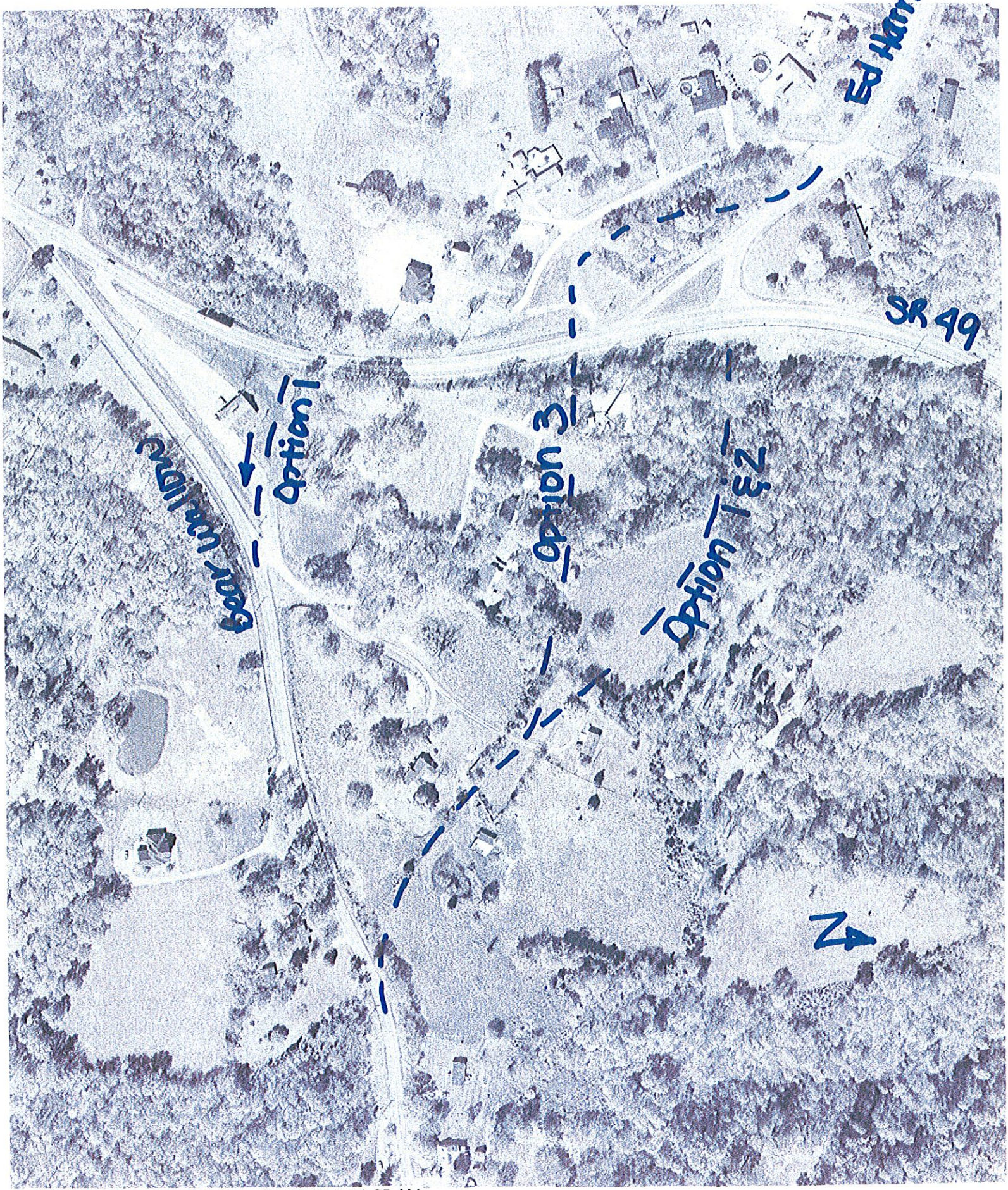
Attachment 4



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Project 60025996
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File 300

Meeting Minutes

Subject:	**SR 49 TPR, Cheatham County**
Meeting Date:	February 25, 2008
Location:	TDOT, 10th Floor Conference Room
Transcription Date:	February 29, 2008
Attendees:	TDOT: Steve Allen, Bill Hart, Terry Gladden, Gary Webber; CTE: Jim Morinec, Kim King
Copies:	Attendees, Bill Orange, Sharon Caton, James Fenton, Jeff Pancirov

On February 22, CTE attended a tour of the SR 49 corridor, led by Sharon Caton (Cheatham County Community Planner) and Kenny Elrod (TDOT Engineer). The purpose of the tour was to review observations of possible spot/segment improvements that had been previously identified by Sharon Caton and Kenny Elrod. CTE prepared and distributed draft minutes from the tour on February 25th.

The purpose of the meeting with TDOT on February 25th was to discuss the draft meeting minutes prepared by CTE, and to assure that all reasonable needs for improvement are documented in the Transportation Planning Report for SR 49. The following summarizes the information provided by the attendees as well as the direction given by TDOT:

- In regard to realigning the intersection of SR 49 @ SR 12 (dog-leg intersection), TDOT agreed to consider the option documented as Attachment 3 in the Draft Meeting Minutes (02/22/08). This option was also shown in the Renaissance Ashland City plans. CTE noted that this option is included in the Revised Draft of the SR 49 TPR, submitted on January 31, 2008.

- For the intersection of SR 49 @ Bear Wallow Road, TDOT agreed to consider Option 3 documented on Attachment 4 of the Draft Meeting Minutes (02/22/08). This option called for realigning Bear Wallow Road from a point approximately 0.3 miles east of SR 49. The realigned portion of Bear Wallow Road will intersect SR 49 just south of Ed Harris Road, at the crest of the vertical curve. The eastern terminus of Ed Harris Road will be realigned to the south, to intersect SR 49 directly opposite the realigned Bear Wallow Rd. TDOT directed CTE to modify the option presented in the Revised Draft of the SR 49 TPR according to the alignment shown in Attachment 4.

- TDOT directed CTE to revise the Draft TPR, submitted on January 31st, to include an option for a three-lane cross-section from SR 12 to I-24. The three lane cross-section will be used for either two-way left turns or passing lanes at various locations throughout the study area. CTE should develop a cost estimate for this option and evaluate the benefits to safety and mobility along SR 49.

- The TPR should maintain all other spot improvements identified by CTE in the Revised Draft, submitted on January 31st.

- CTE should make revisions to the Revised Draft and resubmit to TDOT.

- ❖ CTE should update Cheatham County as to the status of the TPR and the improvements TDOT has agreed to consider. CTE should inform Cheatham County that the TPR will prioritize the spot improvements and provide cost estimates for each.

- ❖ CTE will make sure that enough time is available in the current schedule to complete the revisions to the TPR.

These minutes represent our understanding of the discussion and decisions reached during the meeting. Please forward additions and/or corrections within five business days.

Sincerely,

CTE

Kim King, E.I.
Transportation Planner

APPENDIX B
DETAILED COST ESTIMATES

COST DATA SHEET - LOCATION NO. 1

Section: Location No. 1 (Northbound Passing Lanes)
X-Sect: NA
Length: 4500'

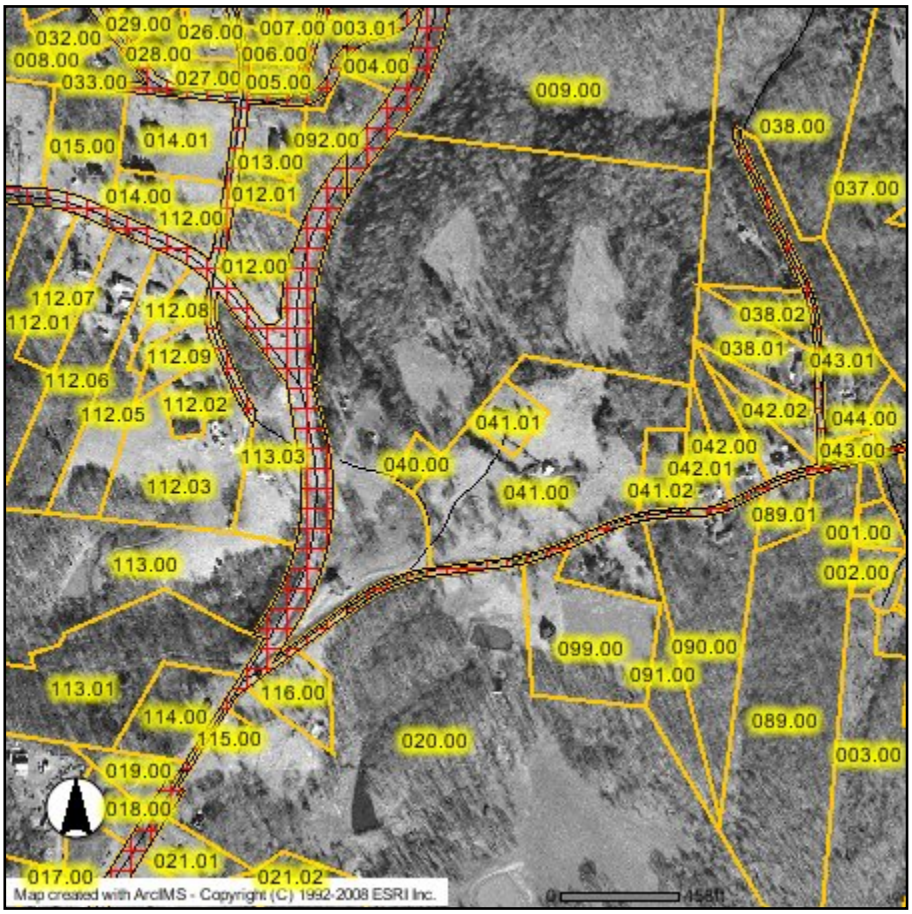
Right-of-Way		
Land (3.1 acres)		$47,000
Incidentals (3 tracts)		$13,000
Relocation Payments		
Total Right-of-Way Cost		**$60,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$117,000**
Construction		
Clear and Grubbing		$157,000
Earthwork		$960,000
Pavement Removal		
Drainage		
Structures		
Railroad Crossing or Separation		
Paving		$1,143,000
Retaining Walls		$0
Maintenance of Traffic		$5,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$4,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$65,000
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$2,334,000**
Other Construction Items		$350,000
Erosion Control (5% Construction Items)		$116,700
Mobilization (50,000+ 4.5% Construction Items)		$155,000
Construction Cost		$2,956,000
10% Engineering & Cont.		$296,000
Total Construction Cost		**$3,369,000**
Preliminary Engineering (10%)		**$337,000**
TOTAL COST		**$3,766,000**

Location No. 1 – Northbound Passing Lanes
Parcel Map

COST DATA SHEET - LOCATION NO. 2

Section: Location No. 2 (SR 49 @ Bear Wallow Rd)
X-Sect: NA
Length: 2000'

Right-of-Way		
Land (3.5 acres + 1 barn)		$303,000
Incidentals (5 Tracts)		$22,000
Relocation Payments		
Total Right-of-Way Cost		**$325,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$33,000**
Construction		
Clear and Grubbing		$16,000
Earthwork		$170,000
Pavement Removal		$16,000
Drainage		$4,000
Structures		$0
Railroad Crossing or Separation		$0
Paving		$431,000
Retaining Walls		$0
Maintenance of Traffic		$5,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$1,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$7,000
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$650,000**
Other Construction Items		$98,000
Erosion Control (5%)		$33,000
Mobilization (50,000+ 4.5% Construction Items)		$79,000
Construction Cost		$860,000
10% Engineering & Cont.		$86,000
Total Construction Cost		**$979,000**
Preliminary Engineering (10%)		**$97,900**
TOTAL COST		**$1,402,000**



Location No. 2 - State Route 49 @ Bear Wallow Rd
Parcel Map

COST DATA SHEET - LOCATION NO. 3

Section: Location No. 3 (Southbound Passing Lanes)
X-Sect: NA
Length: 6400

Right-of-Way		
Land (3 acres)		$45,000
Incidentals (4 tracts)		$17,000
Relocation Payments		
Total Right-of-Way Cost		**$62,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$140,000**
Construction		
Clear and Grubbing		$188,000
Earthwork		$409,000
Pavement Removal		$0
Drainage		$0
Structures (Culvert)		$12,000
Railroad Crossing or Separation		$0
Paving		$1,981,000
Rock Cut		$136,000
Maintenance of Traffic		$5,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$6,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$57,000
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$2,794,000**
Other Construction Items		$419,000
Erosion Control		$140,000
Mobilization (50,000+ 4.5% Construction Items)		$176,000
Construction Cost		$3,529,000
10% Engineering & Cont.		$353,000
Total Construction Cost		**$4,022,000**
Preliminary Engineering (10%)		**$402,000**
TOTAL COST		**$4,486,000**

COST DATA SHEET - LOCATION NO. 4

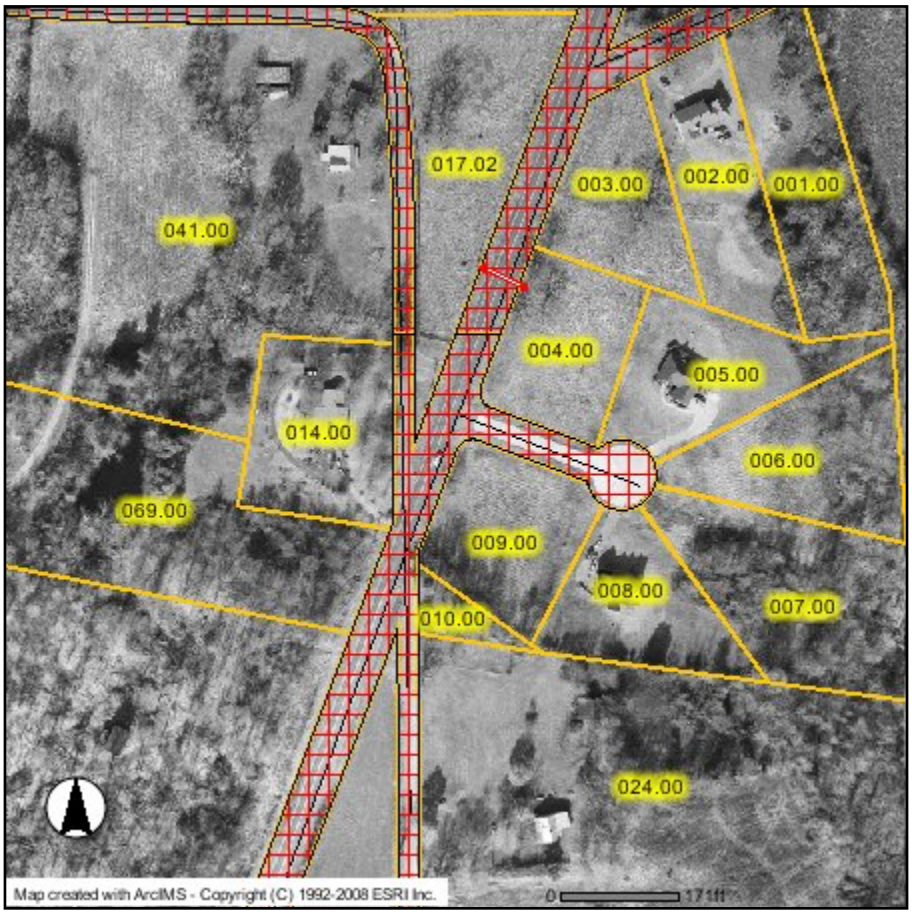
Section: Location No. 4 (Northbound Passing Lane)
X-Sect: NA
Length: 8000'

Right-of-Way		
Land (3.5 acres)		$753,000
Incidentals (36 Tracts)		$157,000
Relocation Payments		
Total Right-of-Way Cost		**$910,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$139,000**
Construction		
Clear and Grubbing		$187,000
Earthwork		$152,000
Pavement Removal		$0
Drainage		$0
Structures		$0
Railroad Crossing or Separation		$0
Paving		$2,438,000
Retaining Walls		$0
Maintenance of Traffic		$5,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$7,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$2,789,000**
Other Construction Items		$418,000
Erosion Control (5% Construction Items)		$139,000
Mobilization (50,000+ 4.5% Construction Items)		$176,000
Construction Cost		$3,522,000
10% Engineering & Cont.		$352,000
Total Construction Cost		**$4,013,000**
Preliminary Engineering (10%)		**$401,000**
TOTAL COST		**$5,324,000**

COST DATA SHEET - LOCATION NO. 5

Section: Location No. 5 (SR 49 @ Norman Harris)
X-Sect: NA
Length: NA

Right-of-Way		
Land		$0
Incidentals		$0
Relocation Payments		$0
Total Right-of-Way Cost		**$0**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$400**
Construction		
Clear and Grubbing		$0
Earthwork		$0
Pavement Removal		$0
Drainage		$0
Structures		$0
Railroad Crossing or Separation		$0
Paving		$5,000
Retaining Walls		$0
Maintenance of Traffic		$1,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$2,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$8,000**
Other Construction Items		$1,000
Erosion Control (5% of Construction Items)		$400
Mobilization (5% of Construction Items)		$400
Construction Cost		$10,000
10% Engineering & Cont.		$1,000
Total Construction Cost		**$11,000**
Preliminary Engineering (10%)		**$1,000**
TOTAL COST		**$12,000**

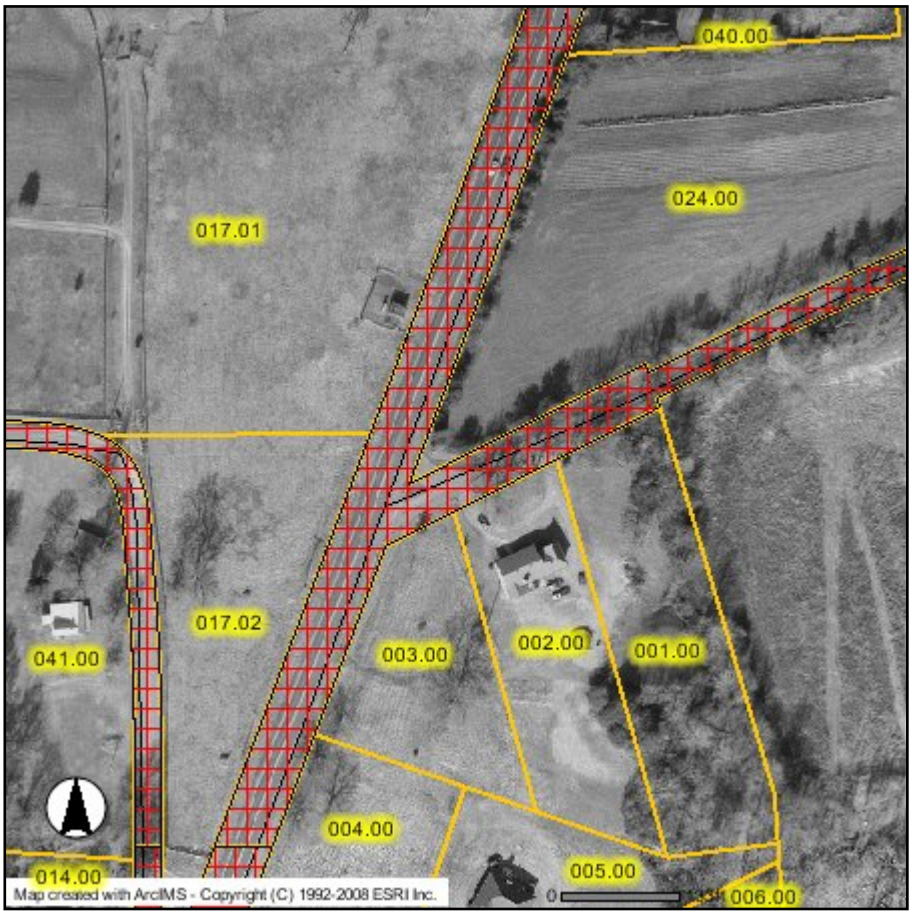


Location No. 5 - State Route 49 @ Norman Harris Rd
Parcel Map

COST DATA SHEET - LOCATION NO. 6

Section: Location No. 6 (SR 49 @ Randy Rd)
X-Sect: NA
Length: NA

Right-of-Way		
Land (0.25 acres)		$3,750
Incidentals		$0
Relocation Payments		$0
Total Right-of-Way Cost		**$3,750**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$1,039**
Construction		
Clear and Grubbing		$0
Earthwork		$2,880
Pavement Removal		$850
Drainage		$0
Structures		$0
Railroad Crossing or Separation		$0
Paving		$15,718
Retaining Walls		$0
Maintenance of Traffic		$1,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$340
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$20,788**
Other Construction Items		$3,100
Erosion Control (5% of Construction Items)		$1,000
Mobilization (5% of Construction Items)		$1,039
Construction Cost		$25,927
10% Engineering & Cont.		$2,593
Total Construction Cost		**$29,560**
Preliminary Engineering (10%)		**$2,956**
TOTAL COST		**$36,000**



Location No. 6 - State Route 49 @ Randy Rd
Parcel Map

COST DATA SHEET - LOCATION NO. 7

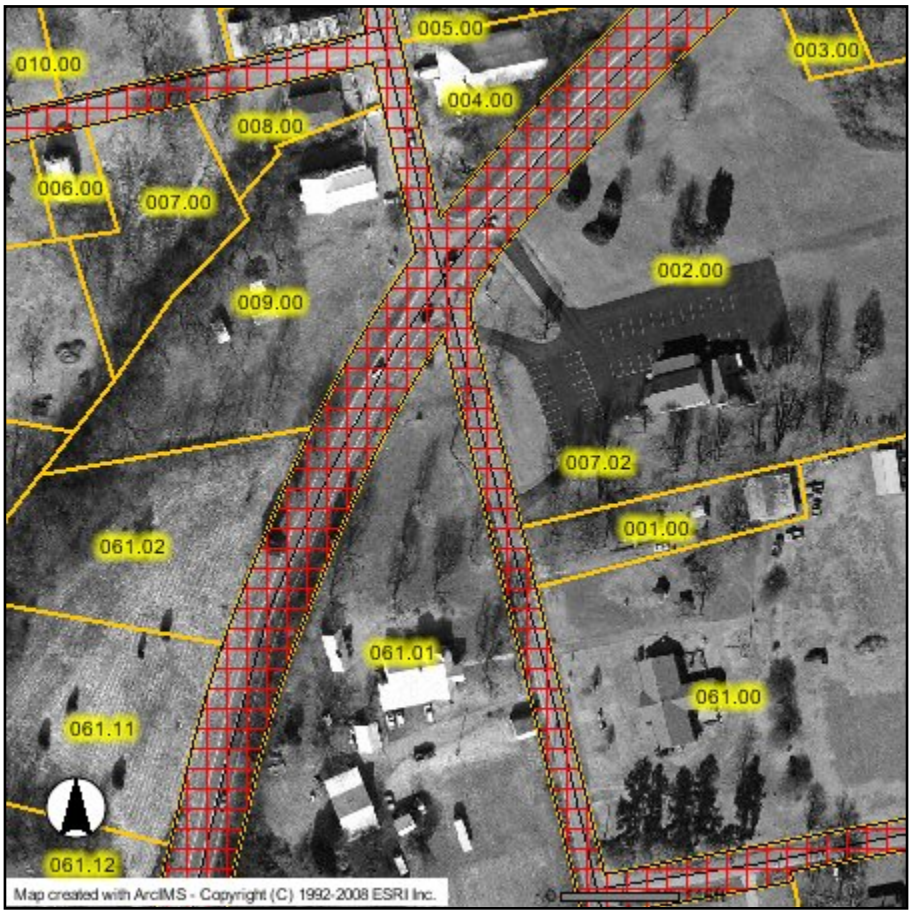
Section: Location No. 7 (Correction of Vertical Alignment)
X-Sect: NA
Length: 10,500'

Right-of-Way		
Land (2.5 acres)		$38,000
Incidentals (10 Tracts)		$44,000
Relocation Payments		$0
Total Right-of-Way Cost		**$82,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$164,000**
Construction		
Clear and Grubbing		$220,000
Earthwork		$470,000
Pavement Removal		$104,000
Drainage		$0
Structures		$0
Railroad Crossing or Separation		$0
Paving		$2,474,000
Retaining Walls		$0
Maintenance of Traffic		$5,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$7,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$3,280,000**
Other Construction Items		$492,000
Erosion Control (5% of Construction items)		$164,000
Mobilization (50,000+ 4.5% Construction Items)		$198,000
Construction Cost		$4,134,000
10% Engineering & Cont.		$413,000
Total Construction Cost		**$4,711,000**
Preliminary Engineering (10%)		**$471,000**
TOTAL COST		**$5,264,000**

COST DATA SHEET - LOCATION NO. 8

Section: Location No. 8 (SR 49 @ Pleasant View Main St)
X-Sect: NA
Length: NA

Right-of-Way		
Land (0.1 acres)		$2,000
Incidentals (1 Tract)		$4,000
Relocation Payments		$0
Total Right-of-Way Cost		**$6,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$1,000**
Construction		
Clear and Grubbing		$400
Earthwork		$11,000
Pavement Removal		$0
Drainage		$0
Structures		$0
Railroad Crossing or Separation		$0
Paving		$0
Retaining Walls		$0
Maintenance of Traffic		$0
Topsoil	(included in erosion control)	
Seeding		$200
Sodding		$0
Signing		$400
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$12,000**
Other Construction Items		$2,000
Erosion Control (5% C		$600
Mobilization (5% of Construction Items)		$600
Construction Cost		$15,000
10% Engineering & Cont.		$2,000
Total Construction Cost		**$18,000**
Preliminary Engineering (10%)		**$2,000**
TOTAL COST		**$26,000**



Location No. 8 - State Route 49 @ Pleasant View Main Street
Parcel Map

COST DATA SHEET - LOCATION NO. 9

Section: Location No. 9 (Two-Way Left Turn Lane)
X-Sect: NA
Length: 2,800'

Right-of-Way		
Land (1.5 acres)		$23,000
Incidentals (8 tracts)		$35,000
Relocation Payments (parking)		$80,000
Total Right-of-Way Cost		**$138,000**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$59,000**
Construction		
Clear and Grubbing		$0
Earthwork		$41,000
Pavement Removal		$24,000
Drainage		$169,000
Structures		$0
Railroad Crossing or Separation		$0
Paving		$944,000
Retaining Walls		$0
Maintenance of Traffic		$3,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$2,000
Lighting		$0
Signalization		$0
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$1,183,000**
Other Construction Items		$177,000
Erosion Control (5% Construction Items)		$59,000
Mobilization (50,000+ 4.5% Construction Items)		$103,000
Construction Cost		$1,522,000
10% Engineering & Cont.		$152,000
Total Construction Cost		**$1,733,000**
Preliminary Engineering (10%)		**$173,000**
TOTAL COST		**$2,044,000**

COST DATA SHEET - LOCATION NO. 10

Section: Location No. 10 (SR 49 @ US Hwy 41A)
X-Sect: NA
Length: NA

Right-of-Way		
Land		$0
Incidentals		$0
Relocation Payments		$0
Total Right-of-Way Cost		**$0**
Utility Relocation		
Reimbursable		
Non-Reimbursable		
Total Utility Cost		**$3,000**
Construction		
Clear and Grubbing		$1,000
Earthwork		$1,000
Pavement Removal		$0
Drainage		$0
Structures		$0
Railroad Crossing or Separation		$0
Paving		$37,000
Retaining Walls		$0
Maintenance of Traffic		$3,000
Topsoil	(included in erosion control)	
Seeding	(included in erosion control)	
Sodding	(included in erosion control)	
Signing		$10,000
Lighting		$0
Signalization		$2,000
Fence		$0
Guardrail		$0
Rip Rap or Slope Protection	(included in erosion control)	
Construction Items Subtotal		**$54,000**
Other Construction Items		$8,000
Erosion Control (5% C		$3,000
Mobilization (5% of Construction Items)		$3,000
Construction Cost		$68,000
10% Engineering & Cont.		$7,000
Total Construction Cost		**$78,000**
Preliminary Engineering (10%)		**$8,000**
TOTAL COST		**$86,000**

Location No. 10 - State Route 49 @ Hwy 41A
Parcel Map

APPENDIX C
AERIAL & USGS MAPS ILLUSTRATING
CORRIDOR IMPACTS

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		

THE BRAXTON AND MARINA
ASHLAND CITY PARK
CENTENNIAL MEDICAL CENTER
SR 12
SKY VIEW DR.
A.O. SMITH INDUSTRIAL PARK
HISTORIC ASHLAND CITY COURTHOUSE
SR 49
CHURCH
ASHLAND CITY ELEMENTARY
GOVERNMENT SERVICES COMPLEX
OAK HILL 34 UNITS
BELL ST.
HIDDEN LAKES RESORT 400 UNITS

MATCH LINE - SEE FIGURE 2A

N

0 400 800

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 1A
AERIAL

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		

THE BRAXTON AND MARINA
ASHLAND CITY PARK
CENTENNIAL MEDICAL CENTER
SR 12
SKY VIEW DR.
A.O. SMITH INDUSTRIAL PARK
SR 49
HISTORIC ASHLAND CITY COURTHOUSE
CHURCH
ASHLAND CITY ELEMENTARY
GOVERNMENT SERVICES COMPLEX
OAK HILL 34 UNITS
BELL ST.
HIDDEN LAKES RESORT 400 UNITS

MATCH LINE - SEE FIGURE 2B

N

0 400 800

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 1B
USGS

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
S.R.49	2007	INTERIM	

THE BRAXTON AND MARINA

ASHLAND CITY PARK

SR 12

CENTENNIAL MEDICAL CENTER

SKY VIEW DR.

A.O. SMITH INDUSTRIAL PARK

LOCATION NO. 1: NORTHBOUND PASSING LANES (LOG MILE 6.16 TO APPROX. 7.02)

HISTORIC ASHLAND CITY COURTHOUSE

SR 49

CHURCH

ASHLAND CITY ELEMENTARY

GOVERNMENT SERVICES COMPLEX

OAK HILL 34 UNITS

BELL ST.

HIDDEN LAKES RESORT 400 UNITS

MATCH LINE - SEE FIGURE 2C

N

0 400 800

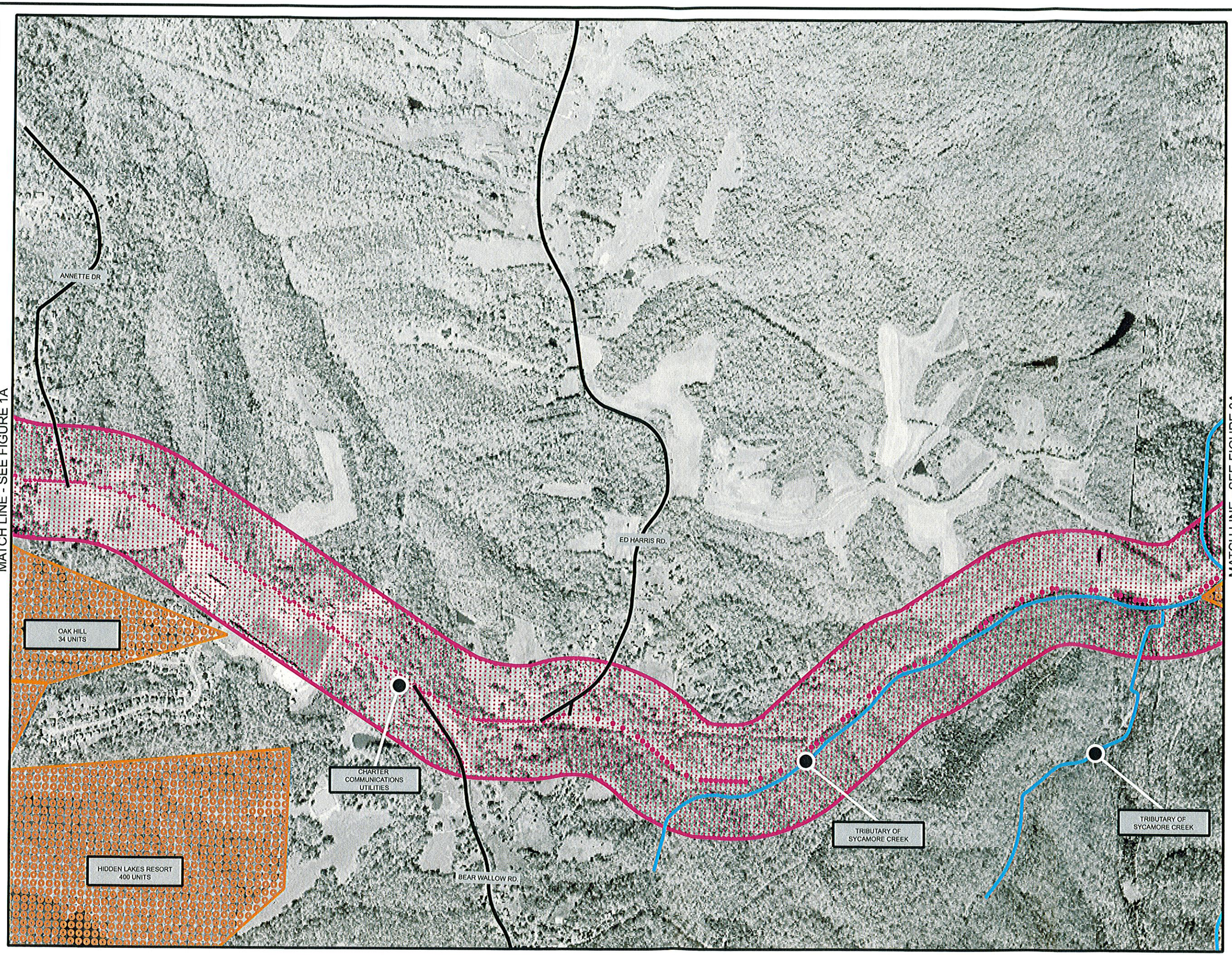
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE IC SPOT IMPROVEMENTS

...\421_Exhibits\FIG1C.dgn 4/22/2008 4:16:21 PM

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 2A
AERIAL

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		

MATCH LINE - SEE FIGURE 1B

MATCH LINE - SEE FIGURE 3B

ANNETTE DR

Creek

929

ED HARRIS RD.

OAK HILL
34 UNITS

CHARTER
COMMUNICATIONS
UTILITIES

HIDDEN LAKES RESORT
400 UNITS

BEAR WALLOW RD.

TRIBUTARY OF
SYCAMORE CREEK

TRIBUTARY OF
SYCAMORE CREEK

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 2B
USGS

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TENNESSEE D.O.T.

DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
S.R.49	2007	INTERIM	

MATCH LINE - SEE FIGURE 1C

MATCH LINE - SEE FIGURE 3C

ANNETTE DR

LOCATION NO. 3: SOUTHBOUND PASSING LANES (LOG MILE 8.23 TO APPROX. 9.44)

ED HARRIS RD.

LOCATION NO. 2: STATE ROUTE 49 @ BEAR WALLOW ROAD (LOG MILE 7.95)

OAK HILL
34 UNITS

CHARTER
COMMUNICATIONS
UTILITIES

HIDDEN LAKES RESORT
400 UNITS

BEAR WALLOW RD.

TRIBUTARY OF
SYCAMORE CREEK

TRIBUTARY OF
SYCAMORE CREEK

N

0 400 800 1200

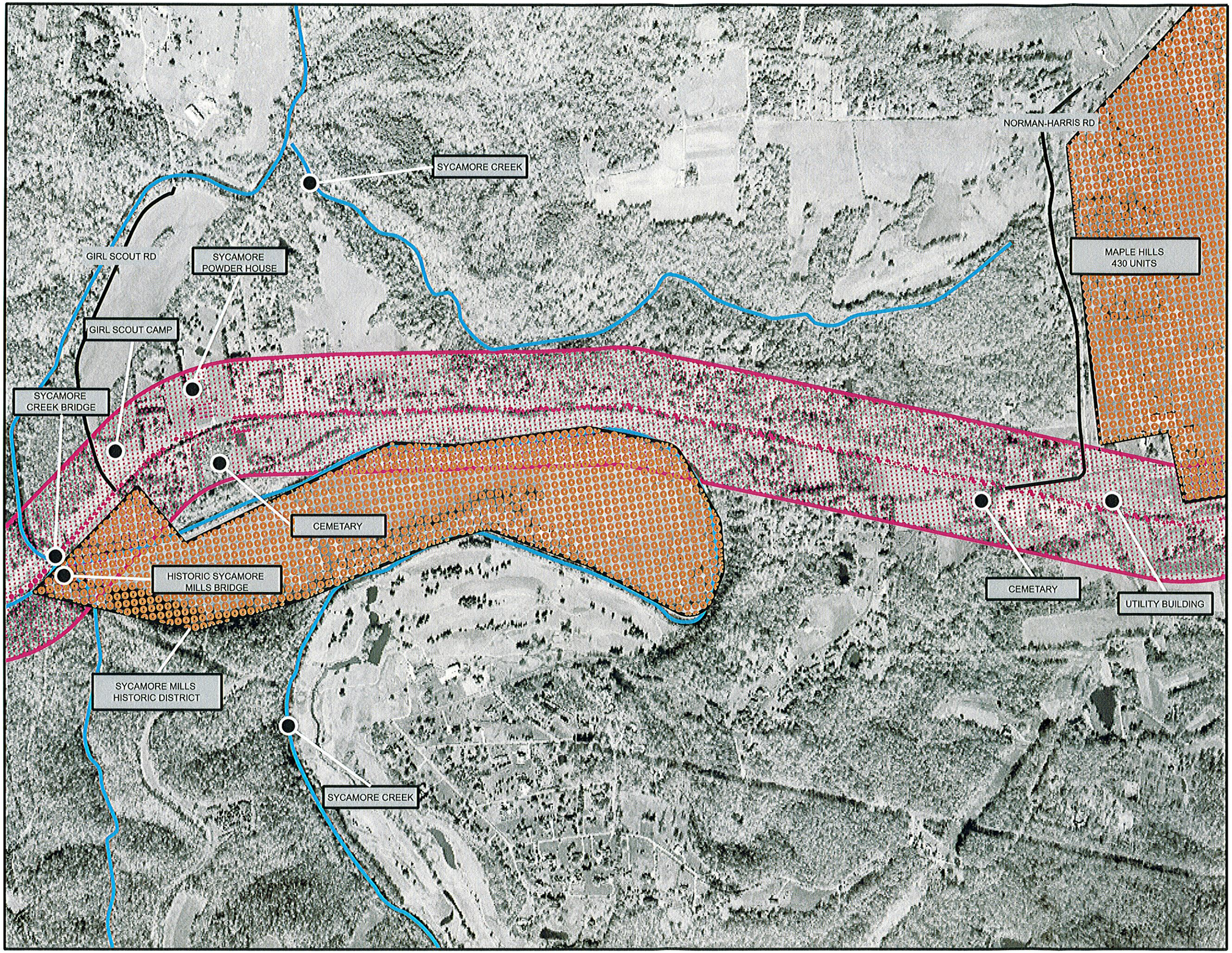
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 2C
SPOT IMPROVEMENTS

...\421_Exhibits\FIG2C.dgn 4/22/2008 4:17:06 PM

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		



MATCH LINE - SEE FIGURE 2C

MATCH LINE - SEE FIGURE 4C

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 3A
AERIAL

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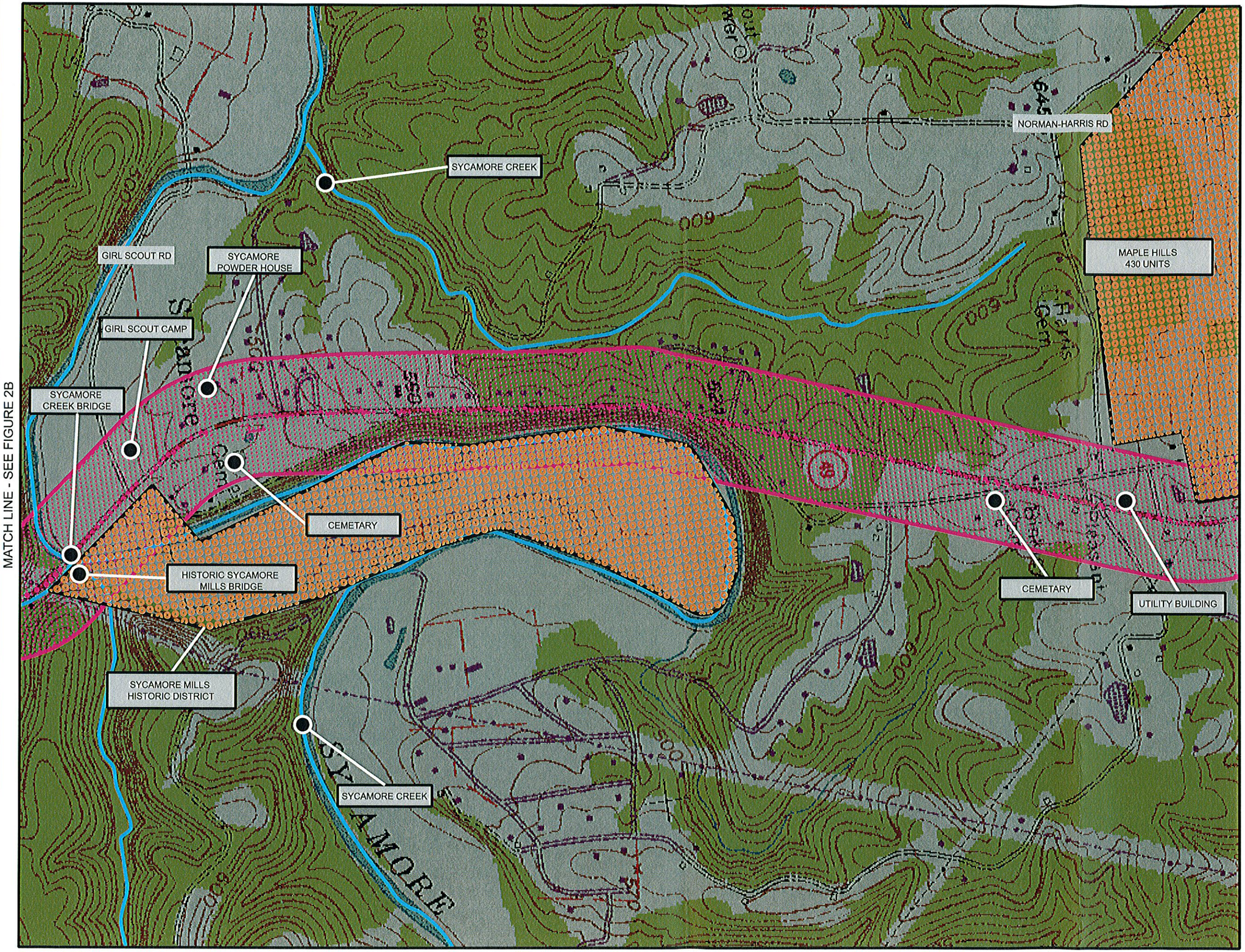
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 3B
USGS

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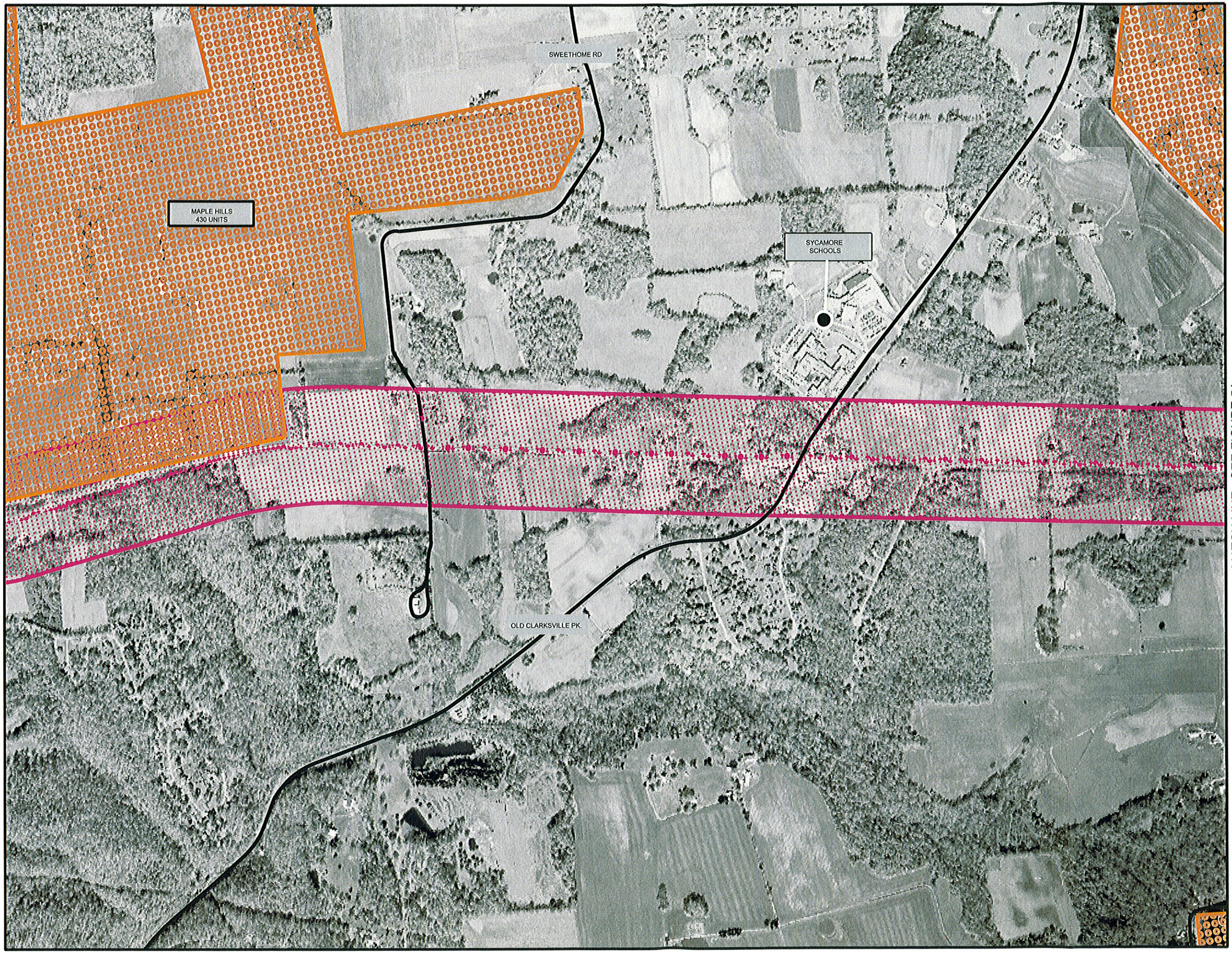
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		



MATCH LINE - SEE FIGURE 3A

MATCH LINE - SEE FIGURE 5A

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 4A
AERIAL

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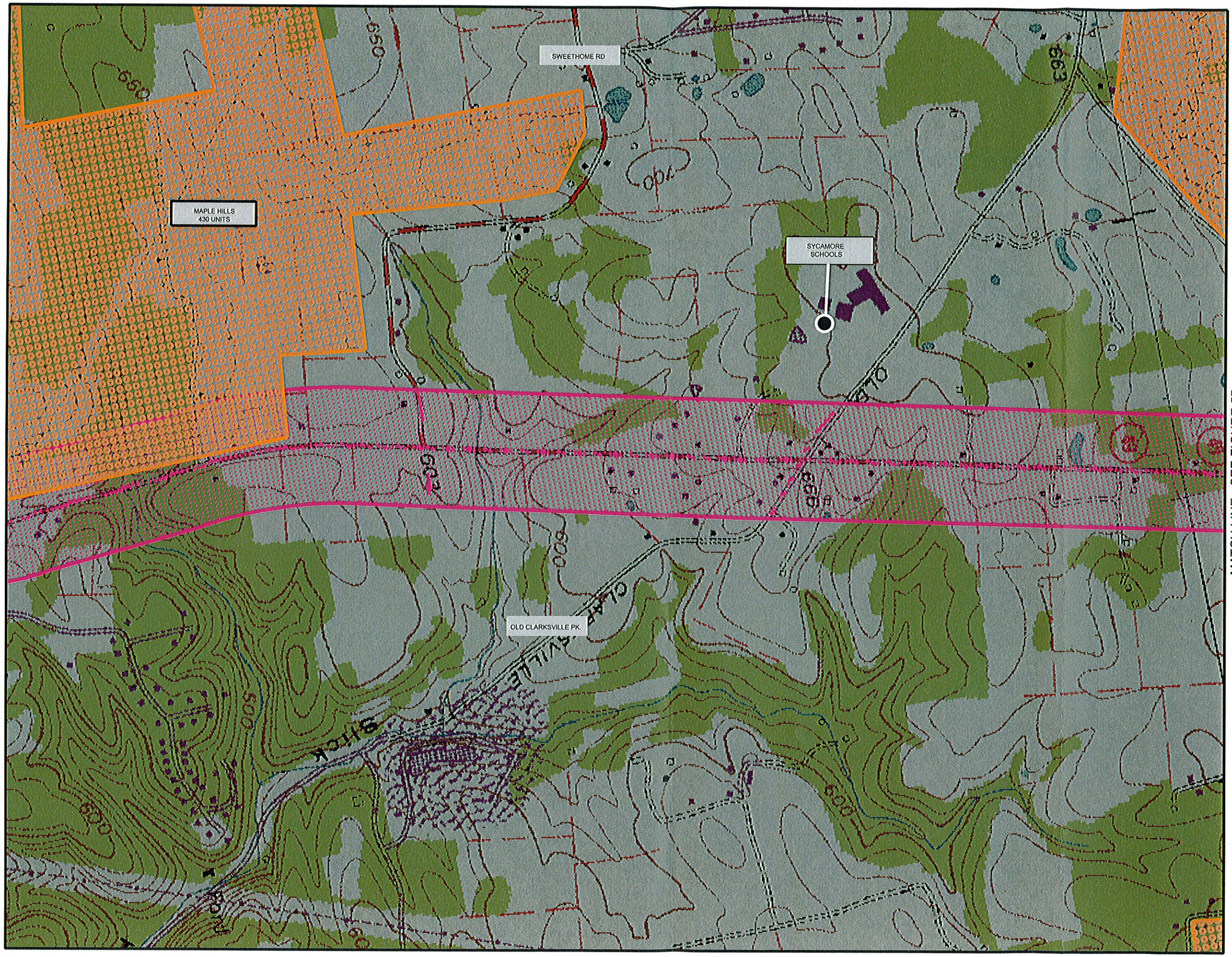
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		

MATCH LINE - SEE FIGURE 3B



MATCH LINE - SEE FIGURE 5B

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 4B
USGS

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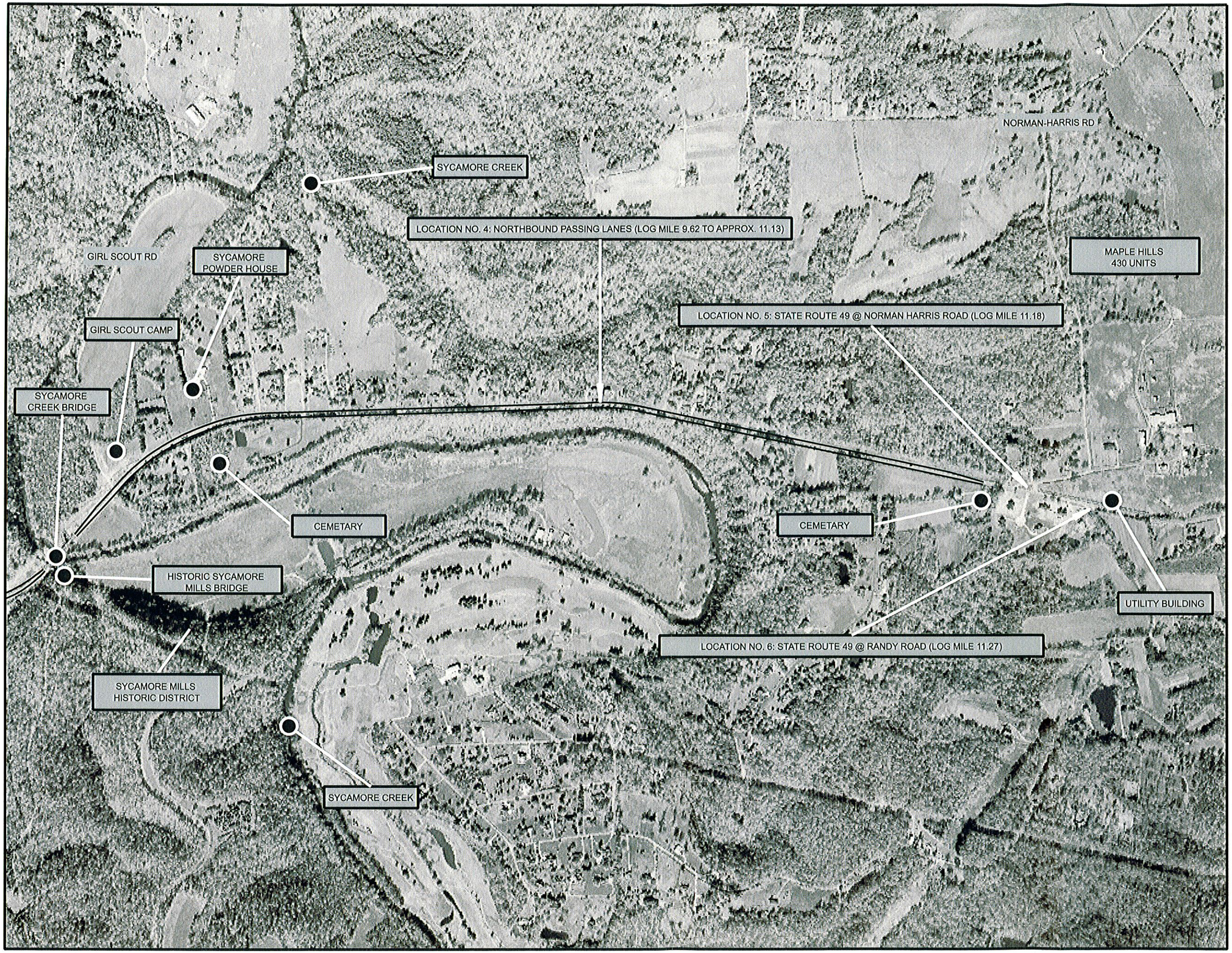
TENNESSEE D.O.T.	DESIGN DIVISION	FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
S.R.49	2007	INTERIM	



MATCH LINE - SEE FIGURE 2C

MATCH LINE - SEE FIGURE 4C

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 3C
SPOT IMPROVEMENTS

...\421_Exhibits\FIG3C.dgn 4/22/2008 4:18:06 PM

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
S.R.49	2007	INTERIM	

MATCH LINE - SEE FIGURE 3C

MATCH LINE - SEE FIGURE 5C

N

0 400 800 1200

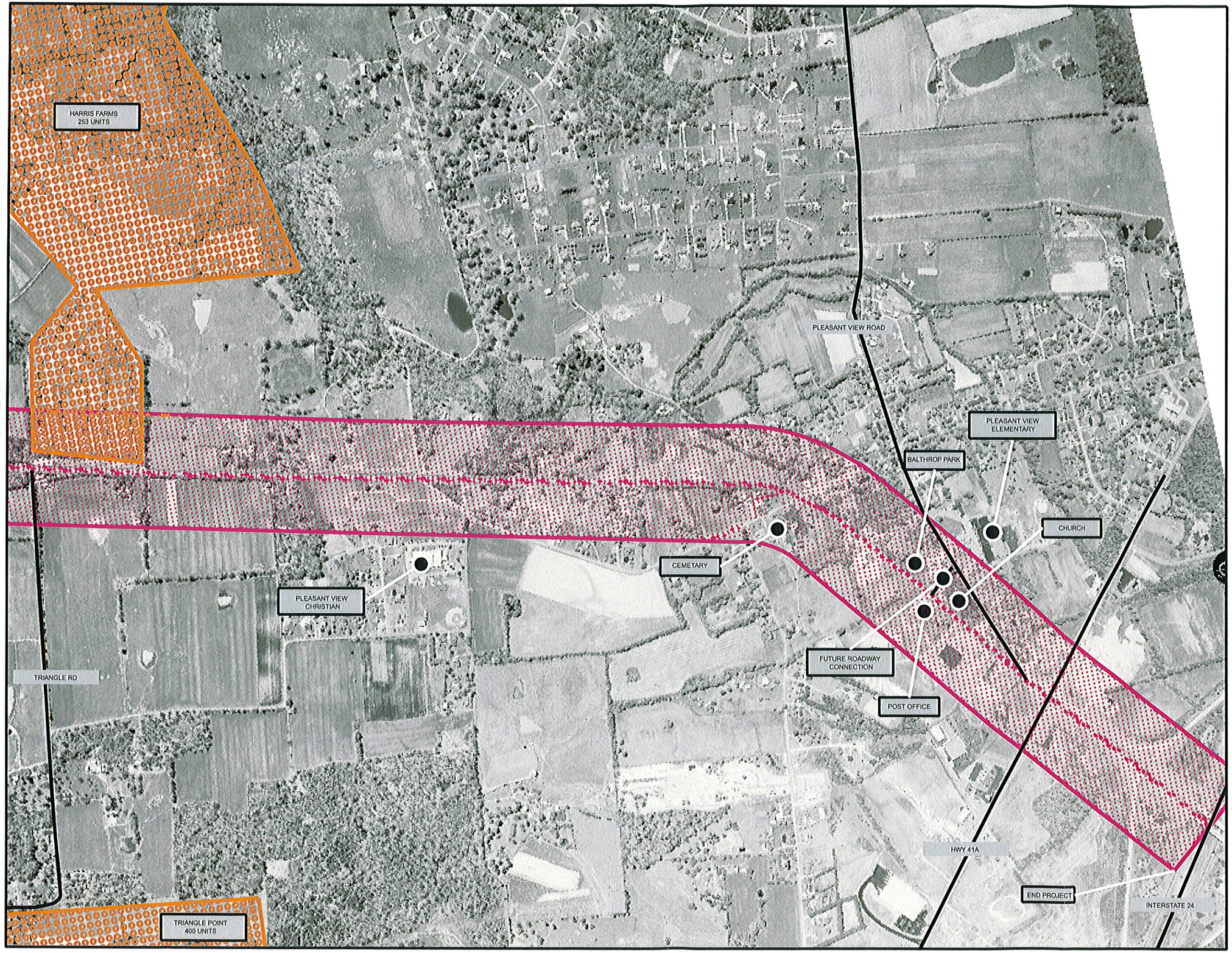
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 4C
SPOT
IMPROVEMENTS

...\421_Exhibits\FIG4C.dgn 4/22/2008 4:19:07 PM

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		



N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 5A
AERIAL

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2007		

MATCH LINE - SEE FIGURE 4B

HARRIS FARMS
253 UNITS

PLEASANT VIEW ROAD

PLEASANT VIEW
ELEMENTARY

BALTHROP PARK

CHURCH

CEMETARY

PLEASANT VIEW
CHRISTIAN

FUTURE ROADWAY
CONNECTION

POST OFFICE

TRIANGLE RD

HWY 41A

END PROJECT

INTERSTATE 24

TRIANGLE POINT
400 UNITS

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 5B
USGS

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
S.R.49	2007	INTERIM	

MATCH LINE - SEE FIGURE 4C

HARRIS FARMS
253 UNITS

LOCATION NO. 7: {END} CORRECTION OF VERTICAL ALIGNMENT (LOG MILE 12.79 TO 14.77)

PLEASANT VIEW ROAD

LOCATION NO. 8: STATE ROUTE 49 @ PLEASANT VIEW MAIN STREET (LOG MILE 14.77)

PLEASANT VIEW
ELEMENTARY

BALTHROP PARK

CHURCH

CEMETARY

PLEASANT VIEW
CHRISTIAN

FUTURE ROADWAY
CONNECTION

TRIANGLE RD

LOCATION NO. 9: TWO-WAY LEFT TURN LANE (LOG MILE 14.77 TO 15.30)

POST OFFICE

HWY 41A

LOCATION NO. 10: STATE ROUTE 49 @ HIGHWAY 41A (LOG MILE 15.30)

END PROJECT

TRIANGLE POINT
400 UNITS

INTERSTATE 24

N

0 400 800 1200

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

FIGURE 5C
SPOT IMPROVEMENTS

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