TRANSPORTATION PLANNING REPORT

STATE ROUTE 317

BEGIN: PROPOSED CONNECTOR FROM I-75
END: EAST BRAINERD ROAD
HAMILTON COUNTY
PIN# 107637.00

PREPARED BY
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
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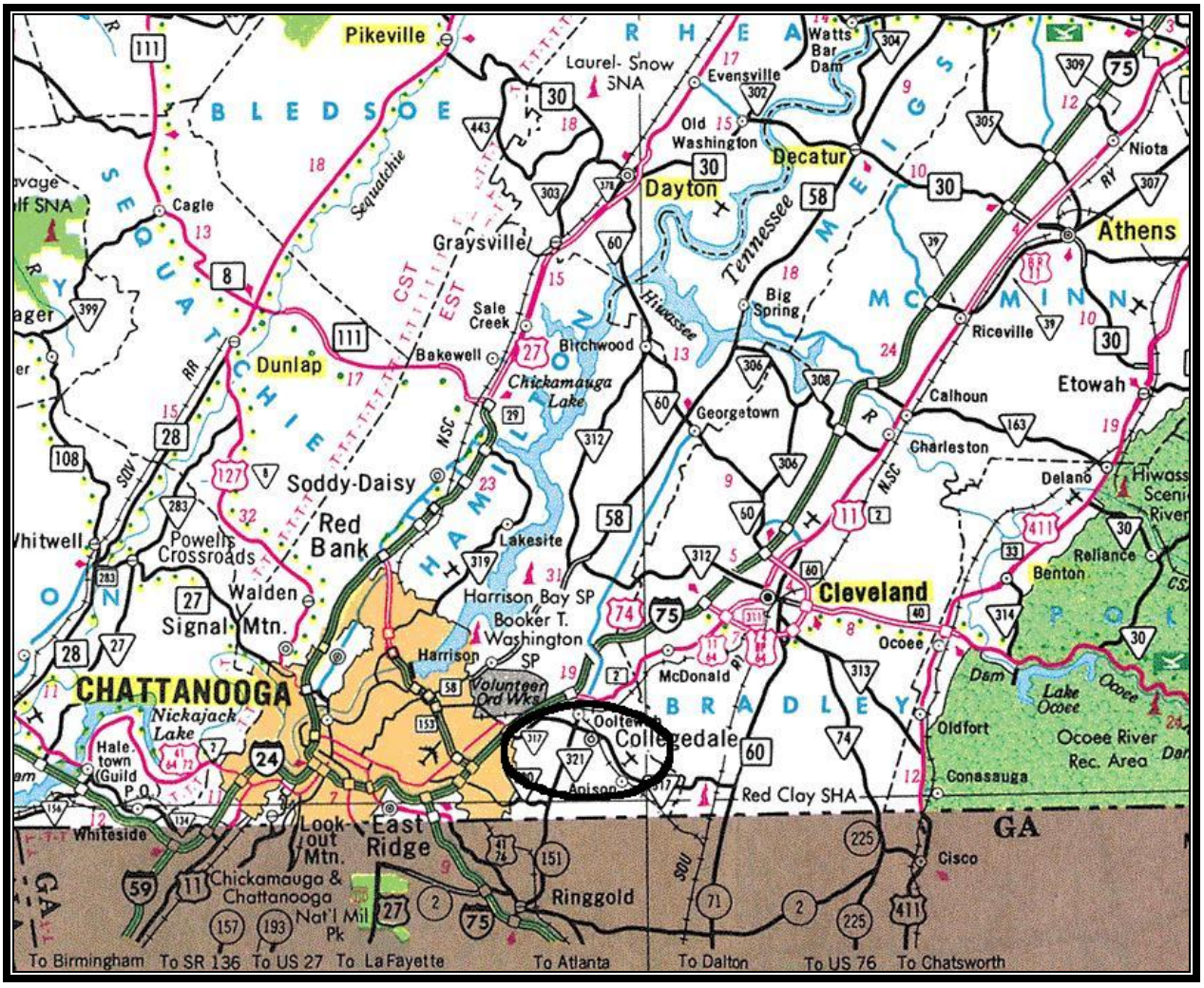
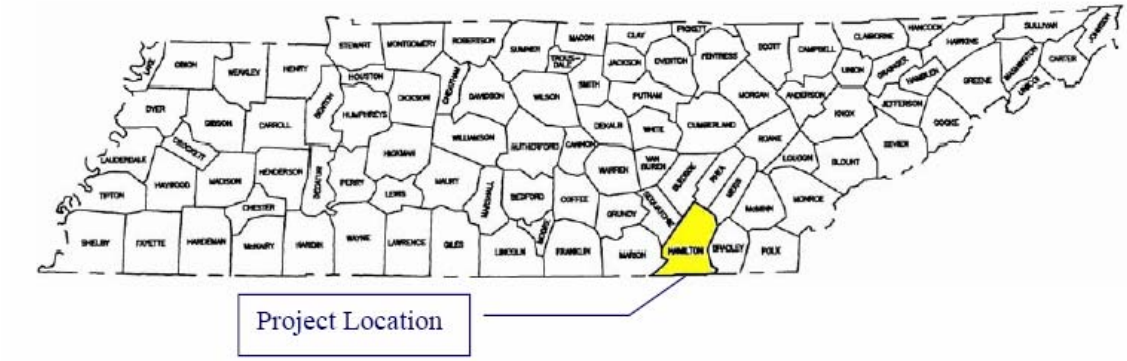
PROJECT VICINITY





NEW I-75 INTERCHANGE
(UNDER CONSTRUCTION)

PROPOSED CONNECTOR

BEGIN PROJECT

SECTION 1

SECTION 2

SECTION 3

SECTION 4

SECTION 5

END PROJECT

COLLEGEDALE
POP. 5,302 (2000 EST.)

OOLTEWAH

Apison

Summit

PROJECT CORRIDOR
STATE ROUTE 317
BEGIN: PROPOSED CONNECTOR FROM I-75
END: EAST BRAINERD ROAD
HAMILTON COUNTY

SCALE

2000 0 2000 4000 6000 FEET

0.2 0 0.2 0.4 0.6 0.8 1.0 MILE

EXISTING CONDTIONS

State Route 317 in Hamilton County begins at State Route 17 near State Route 153 and proceeds eastward past Interstate 75 and into the Collegedale City Limits. The route bisects Collegedale and continues southeasterly into Bradley County terminating at State Route 60, a total distance of approximately 21 miles. This report will focus on a segment of State Route 317 beginning at the proposed connector from new Interstate 75 Enterprise South Interchange and extending to the recently improved intersection of State Route 317 and East Brainerd Road, a total distance of approximately 6.2 miles. With the exception of two short three-lane segments from Little Debbie Parkway to just past State Route 321 and again in the vicinity of Southern Adventist University, the majority of this route consists of a substandard two-lane cross section with negligible shoulders. There is also an at-grade crossing of the Norfolk Southern Railway adjacent to a four-way stop at the entrance to the University. This grade crossing is centered between two 90 degree turns on State Route 317.

The base year (2010) average daily traffic (ADT) along this route ranges from a low of 3,940 near East Brainerd Road to a high of 21,230 between State Route 321 and Southern Adventist University. Norfolk Southern Railway currently provides freight service for area industry. Trucking is also a dominant means for moving goods to and from local businesses and industry. Due to the deficient alignments and lane widths of the existing route, many trucks utilize Little Debbie Parkway to access Interstate 75.

Using the base years 2001 through 2003 average daily traffic and the calculated vehicle miles of travel, a crash rate (crashes per one million vehicle miles) was calculated for the existing route. From the beginning of the project at the proposed connector from Interstate 75 to Layton Drive adjacent to the Collegedale Municipal Airport, the calculated crash rate is 2.38. From Layton Drive to the end of the project at East Brainerd Road, the calculated crash rate is 1.81. This can be compared to the statewide average rate for these years of 2.51. Although the actual crash rates are below the state wide average, there are existing safety concerns which will likely worsen as traffic increases.

The majority of State Route 317 is lacking in shoulder width and sidewalks, thereby inhibiting pedestrian and bicycle traffic. The Wolftever Creek Greenway currently provides a paved pedestrian and bicycling trail. Beginning at the Imagination Station playground behind City Hall, the greenway passes underneath State Route 317 until it intersects Wolftever Creek, follows it east, and goes underneath State Route 321 (Ooltewah-Ringgold Road). It then proceeds over the Ooltewah-Ringgold Road bridge and turns east on the other side of Wolftever Creek to Spalding Drive. From there it continues to its current terminus at Southern Adventist University.

The greenway is intended to be an ongoing project throughout Collegedale with additional phases planned. A map of the greenway is included in this report.

COMMUNITY PROFILE

The majority of the project lies within the Collegedale City Limits. It is a suburban area of Chattanooga, bordering Ooltewah and Apison. As of the 2000 census, the city had a total population of 6,514. Collegedale was founded as the site of Southern Adventist University (then Southern Junior College) in 1916. It was incorporated under a city manager government in 1968. It is best known as the home of McKee Foods Corporation, manufacturer of the "Little Debbie" brand of snack products and one of the largest employers in Hamilton County.

PURPOSE AND NEED OF STUDY

The purpose of this study is to analyze existing and projected data to determine the feasibility of improving State Route 317 from the proposed Interstate 75 connector to East Brainerd Road in Apison. This study was initiated at the request of the City of Collegedale. The new I-75 Enterprise South Interchange is currently under construction and the connector facility from this interchange will create a direct link from State Route 317 to the interstate. Collegedale city officials expect a high rate of growth for the area as compared to the overall Hamilton County growth rate. This expectation is due to a proposed expansion of McKee Foods Corporation as well as new residential developments that are in the planning and/or construction phase. In addition, the Collegedale Municipal Airport which is located on State Route 317 is one of the busiest general aviation airports in Tennessee.

The need for route improvement can be quantified by a “Level of Service” (LOS) analysis. The proficiency of roads are described by their LOS. The criteria are defined as shown in the “Level of Service” section of this report and reflect the ability of roads to accommodate motor vehicle traffic and subsequent physical and psychological comfort levels of drivers. The LOS analysis incorporates several factors including traffic volumes, number of lanes, terrain, percent of no passing zones, directional split, heavy vehicles, and shoulder widths. The projected traffic volumes for the base and design years are depicted in the Project Data Table and on the traffic schematic included in this report.

A segment of Section 1 of this project in conjunction with the proposed Interstate 75 Connector has been included in TDOT’s Proposed 2006-2009 Multimodal Transportation Improvement Plan. It is scheduled for preliminary engineering for the upcoming fiscal year. This

project lies within the jurisdiction of the Chattanooga Transportation Planning Organization (TPO) and therefore their Transportation Improvement Program will require an amendment to include this project. An air quality conformity analysis will also be required by the TPO as a result of this inclusion.

LEVEL OF SERVICE

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. General descriptions of operating conditions for each of the levels of service are as follows:

LOS	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonably free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided 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 because of the additional vigilance required for safe operation.
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 or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.

The LOS analysis completed for this route utilized the projected design year (2030) traffic on the existing route as well as on the three proposed optional improvements (A, B, and C). The results can be compared on the Project Data Table.

PROPOSED IMPROVEMENT

Description

The project has been divided into 5 sections for planning and funding purposes. It is proposed to improve the highway generally along its existing corridor, shifting from one side to the other in some areas to improve the horizontal alignment and minimize impacts to homes, businesses, and/or environmental resources. Section 3 is proposed on completely new location in order to get a grade separation over the Norfolk Southern Railway. Three optional build improvements to State Route 317 were analyzed for this report. The conceptual plans attached to this report depict the proposed typical sections for these three options.

Option A – This option proposes to widen Sections 1 through 4 to four 12' traffic lanes with a continuous 12' center turn lane. The proposed widening to Section 5 incorporates two 12' traffic lanes with a continuous 12' center turn lane.

Option B – This option proposed to widen Sections 1 through 4 to four 12' traffic lanes with a 22' raised median. Median breaks would be provided at appropriate locations to be determined later. The proposed widening to Section 5 incorporates two 12' traffic lanes with a continuous 12' center turn lane.

Option C – This option proposed to widen the existing route to two 12' traffic lanes with a continuous 12' center turn lane throughout the entire project. As depicted on the Project Data Table, this improvement will not achieve a desirable LOS in the design year throughout a majority of the project.

All three build options incorporate curbs and gutters, 6' shoulders for bicycle use, and sidewalks on both sides of the route. The necessary right-of-way to build the project will vary depending on the terrain and land use.

A no-build option was also analyzed for this report. The no-build option, as the name implies, denotes that only minor improvements (such as safety improvements and normal maintenance) would be made to the existing road and/or intersection areas.

Summary

All three build options will improve sight distance and improve the deficient horizontal and vertical alignments throughout the route. The improved roadway will also enhance access to the new Interstate 75 Enterprise South Interchange and both commercial and industrial sites along

the route. Other primary beneficial effects particular to Options A and B include: (1) improved local and regional accessibility; (2) improved safety and operating conditions along the project corridor; (3) increased traffic capacity; and (4) enhancement of future planned growth by local and/or regional land use planning agencies. The primary adverse effects of the three proposed build options include: (1) the loss of land for right-of-way; (2) the possible displacement of residences and businesses; and (3) temporary construction impacts (dust, siltation, equipment noise, etc.) during the construction period.

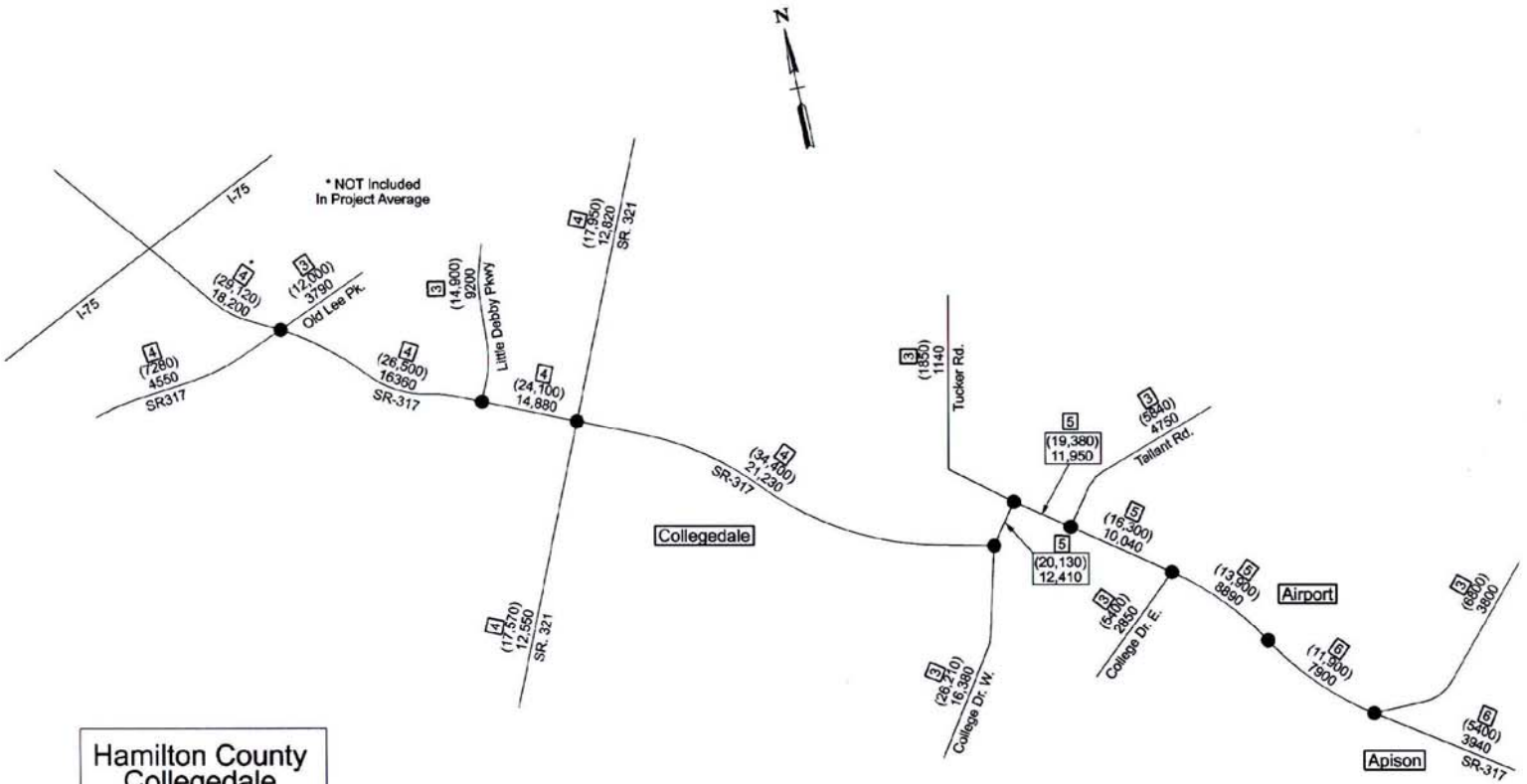
As depicted on the Project Data Table, the design year LOS for both Options A and B range from A to C throughout the entire route. The comparable LOS for both Option C and the no-build option is deficient (E or F) throughout Sections 1 through 3 and C or D in Sections 4 and 5. In addition, the disadvantages of the no-build option include continued inadequate operating conditions inherent with increased traffic volumes and roadway deficiencies such as horizontal and vertical alignments would not be corrected. Some advantages of the no-build option include preserving the existing land use patterns and no disruption of the area due to construction. Also, mitigation measures to moderate environmental impacts would not be necessary.

After reviewing the pros and cons of all options, the optimal solution would utilize a combination of all three build options (A, B, and C) along various segments of this project. Options A and B should be employed throughout the first four sections depending on land use and intended function of the route. Option C should be sufficient for Section 5 considering the LOS and residential impact the improvement will have in that area.

PROJECT DATA TABLE

STATE ROUTE 317

	APPROXIMATE LENGTH	PROPOSED IMPROVEMENT	2010 AVERAGE DAILY TRAFFIC	2030 AVERAGE DAILY TRAFFIC	PERCENT TRUCKS	2030 LEVEL OF SERVICE	R.O.W COST	UTILITY RELOCATION COST	CONSTRUCTION COST	PRELIMINARY ENGINEERING COST	TOTAL COST
SECTION 1											
OPTION A	2.30	5 LANE	15,620	25,300	4	B	$3,091,200	$3,450,000	$18,239,000	$1,823,900	$26,604,100
OPTION B	2.30	4 LANE DIVIDED	15,620	25,300	4	B	$3,400,320	$3,450,000	$20,062,900	$2,006,290	$28,919,510
OPTION C	2.30	3 LANE	15,620	25,300	4	E	$2,163,840	$3,450,000	$12,767,300	$1,276,730	$19,657,870
NO-BUILD	2.30	NONE	15,620	25,300	4	E	N/A	N/A	N/A	N/A	N/A
SECTION 2											
OPTION A	0.50	5 LANE	21,230	34,400	4	C	$672,000	$750,000	$3,965,000	$396,500	$5,783,500
OPTION B	0.50	4 LANE DIVIDED	21,230	34,400	4	C	$739,200	$750,000	$4,361,500	$436,150	$6,286,850
OPTION C	0.50	3 LANE	21,230	34,400	4	F	$470,400	$750,000	$2,775,500	$277,550	$4,273,450
NO-BUILD	0.50	NONE	21,230	34,400	4	F	N/A	N/A	N/A	N/A	N/A
SECTION 3											
OPTION A	1.30	5 LANE	11,470	18,600	5	B	$1,747,200	$1,950,000	$11,347,200	$1,134,720	$16,179,120
OPTION B	1.30	4 LANE DIVIDED	11,470	18,600	5	B	$1,921,920	$1,950,000	$12,481,920	$1,248,192	$17,602,032
OPTION C	1.30	3 LANE	11,470	18,600	5	E	$1,223,040	$1,950,000	$7,943,040	$794,304	$11,910,384
NO-BUILD	1.30	NONE	11,470	18,600	5	E	N/A	N/A	N/A	N/A	N/A
SECTION 4											
OPTION A	1.10	5 LANE	8,890	13,900	5	A	$1,478,400	$1,650,000	$8,723,000	$872,300	$12,723,700
OPTION B	1.10	4 LANE DIVIDED	8,890	13,900	5	A	$1,626,240	$1,650,000	$9,595,300	$959,530	$13,831,070
OPTION C	1.10	3 LANE	8,890	13,900	5	D	$1,034,880	$1,650,000	$6,106,100	$610,610	$9,401,590
NO-BUILD	1.10	NONE	8,890	13,900	5	D	N/A	N/A	N/A	N/A	N/A
SECTION 5											
3 LANE	1.00	3 LANE	5,920	8,650	6	C	$1,344,000	$1,500,000	$4,758,000	$475,800	$8,077,800
NO-BUILD	1.00	NONE	5,920	8,650	6	D	N/A	N/A	N/A	N/A	N/A
TOTAL											
OPTION A	6.20						$8,332,800	$9,300,000	$47,032,200	$4,703,220	$69,368,220
OPTION B	6.20						$9,031,680	$9,300,000	$51,259,620	$5,125,962	$74,717,262
OPTION C	6.20						$6,236,160	$9,300,000	$34,349,940	$3,434,994	$53,321,094

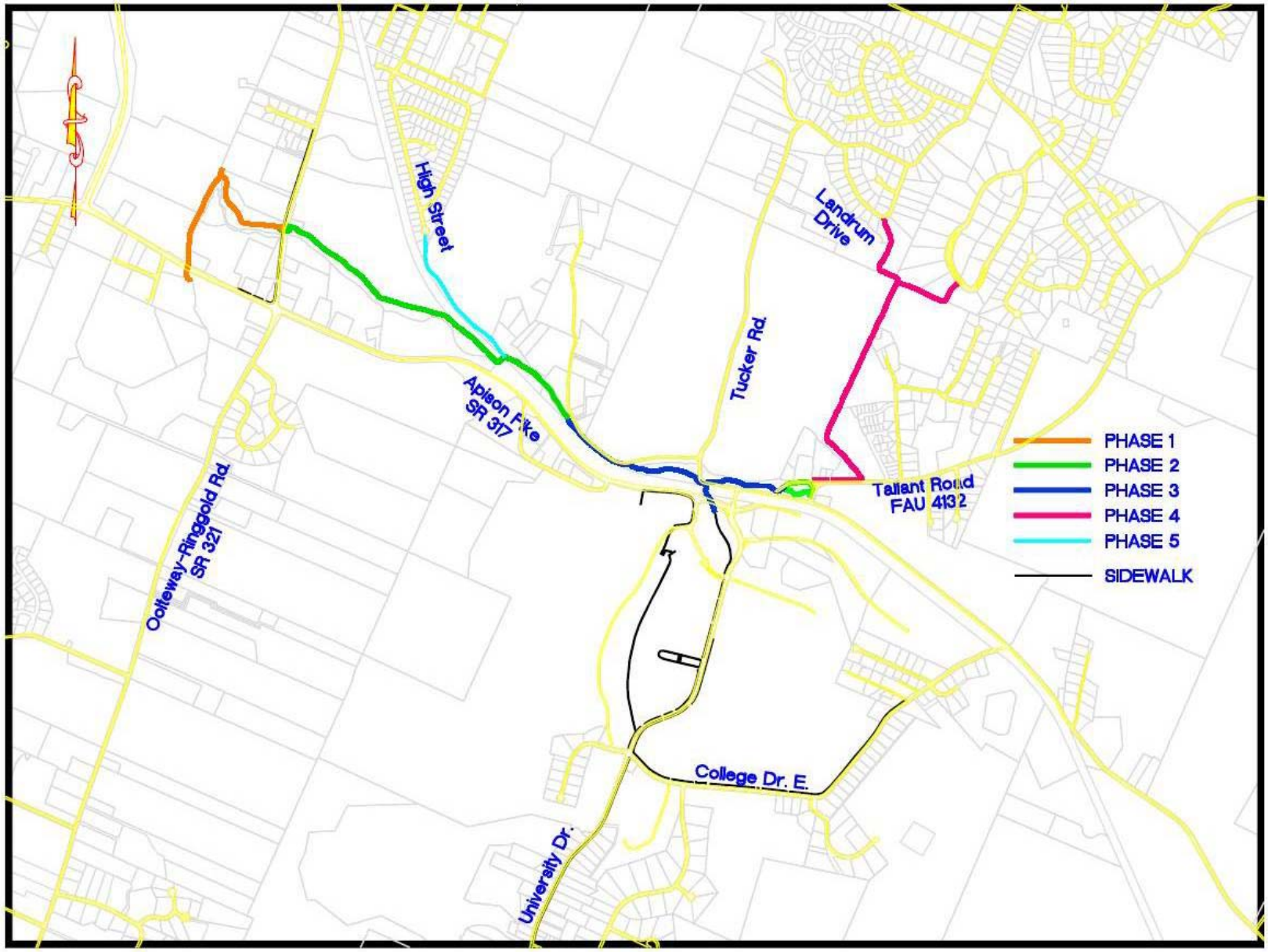


Hamilton County
Collegedale

LEGEND:
2010 ADT - 000
2030 ADT - (000)
ADT Truck % - [0]
Date: March 9, 2006

TA: KRH

WOLFTEVER CREEK GREENWAY



PROJECT AREA TOPOGRAPHY

PROJECT CORRIDOR
STATE ROUTE 317
BEGIN: PROPOSED CONNECTOR FROM I-75
END: EAST BRAINERD ROAD
HAMILTON COUNTY

SCALE

2000 0 2000 4000 6000 FEET

0.2 0 0.2 0.4 0.6 0.8 1.0 MILE

PRELIMINARY ENVIRONMENTAL ANALYSES

TDOT's Environmental Division has conducted a preliminary investigation into this project's possible environment impacts within the "Area of Potential Effects" (APE). The APE is the geographic area in which an undertaking may directly or indirectly impact the environment. A more comprehensive analysis of the impacts will be completed at a later date to comply with the National Environmental Policy Act (NEPA). This analysis will require the consideration of environmental values in the decision making processes by taking into account the environmental impacts of proposed actions and reasonable alternatives to those actions. The preliminary impact investigation conducted for this report includes air and noise, archaeology, historic, hazardous materials and ecology. The conclusions in each of these categories are summarized for this report. Additional environmental disciplines such as social, economic, farmland, displacements, and land use impacts will be evaluated in the NEPA document after a Conceptual Stage Relocation Plan is completed by TDOT's Right-of-Way Division.

Air and Noise

Air Quality

Hamilton County is listed as being in non-attainment for Ozone and $PM_{2.5}$. For this project to go forward, the Hamilton County MPO will need to perform an air quality analysis and include the project in the local Transportation Implementation Plan (TIP).

Determination of Traffic Noise Impacts

A preliminary noise analysis was conducted to predict the distance from the roadway where noise impacts might occur. Noise impact is determined by comparing future project sound levels to a set of Noise Abatement Criteria (NAC) for a particular land use category (See table 1).

The FHWA noise standards (contained in 23 CFR 772) and TDOT noise policy state that traffic noise impacts that warrant consideration of abatement occur when worst-hour equivalent sound levels approach or exceed the NAC listed in Table 1. TDOT policy defines "approach" as one decibel below the NAC.

Table1: Noise Abatement Criteria in 23 CFR 772

Activity Category	L_{eq} (1h) dBA	Description of Activity
A	57 (Exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.

Activity Category	L_{eq} (1h) dBA	Description of Activity
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	---	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

The FHWA noise standards and TDOT policy also define impacts to occur if there is a substantial increase in design year equivalent sound levels above the existing equivalent sound levels when the predicted design year equivalent sound levels are between 57 and 67 dBA L_{eq}. Table 2 presents the TDOT criteria used to define increases in equivalent sound levels.

Table 2: TDOT Criteria to Define Noise Increase

Increase (dBA)	Description of Activity
0 to 5	Minor Increase
6 to 9	Moderate Increase
10 or more	Substantial Increase

The primary areas of concern for this project are residential properties located near the project so the NAC for Activity Category B apply. Therefore, impacts would occur and noise abatement would be considered if future noise levels for an analysis location were 66 dBA or higher, or if a substantial increase in existing noise levels (more than 10 dB) was predicted.

Table 3 presents predicted future equivalent sound levels for varying distances off the roadway given three typical sections and 2030 predicted traffic volumes and a 45 mph design speed. These values do not represent predicted levels at every location along the project in that sound levels will vary with changes in terrain and will be affected by the shielding of objects such as houses or areas of coniferous trees. Many assumptions were made in development of this information and it should be used ONLY AS A GUIDE.

Table 3: Design Year (2030) Worst-Hour Equivalent Sound Levels (dBA) – Undeveloped Areas
Four Lane with Divided Median
Maximum Traffic for Any Section

Distance[(1)]	L_{eq} (1h)
50'	70.5
100'	67.9
150'	65
200'	62.5
250'	60.8
300'	59.5

(1) From centerline.

From Table 3 it can be seen that noise impacts above the abatement criteria might be expected to reach approximately 125 feet from the centerline.

Table 4: Design Year (2030) Worst-Hour Equivalent Sound Levels (dBA) – Undeveloped Areas
Five Lane with Center Turn Lane
Maximum Traffic for Any Section

Distance[(1)]	L_{eq} (1h)
50'	71.1
100'	68.6
150'	66.5
200'	63.8
250'	61.5
300'	59.6

(2) From centerline.

As can be seen in Table 4, noise impacts can be expected slightly further from the roadway in the five lane scenario.

Table 5: Design Year (2030) Worst-Hour Equivalent Sound Levels (dBA) – Undeveloped Areas
Two Lane with Center Turn Lane
Maximum Traffic for Section 5

Distance[(1)]	L_{eq} (1h)
50'	67
100'	64.2
150'	60.8
200'	58
250'	55.7
300'	54

(3) From centerline.

From this table it can be seen that noise impacts above the abatement criteria might be expected past 50 feet from the centerline. This table only applies to Section 5 using reduced traffic volumes over the previous tables.

Archaeology

From the beginning of the proposed project to the western edge of Rabbit Valley all options considered would cross dissected upland topography where the probability of encountering archaeological sites is low. There are no sites recorded in or near this part of the project. From the western edge of Rabbit Valley to the end of the project there is a moderate probability of encountering archaeological sites. There are prehistoric sites recorded within 700-800 feet north of the State Route 317/State Route 321 intersection on Wolftever Creek. Only one other site is recorded in proximity to the proposed project. It is located in Collegedale Gap and will have to be re-surveyed because there is inadequate information on file regarding the nature of the site. Currently there are no significant archaeological sites in the project corridor as presently defined. The project location is typical for most of Tennessee, however, in that there has been no previous systematic survey conducted to locate and evaluate archaeological sites there or in the immediate vicinity. An archaeological survey of the project will undoubtedly result in the identification of sites. Because of the rapid development of the area, however, many sites are expected to be badly disturbed if not completely destroyed.

Historic

TDOT historians assessed the proposed project area and surveyed five older properties within the Area of Potential Effect. Preliminary information on the properties was provided to the Tennessee State Historic Preservation Office (TN-SHPO) to determine if any of the surveyed properties are potentially eligible for listing in the National Register of Historic Places. Based on this initial information, there are no properties within the APE that are either listed in or eligible for listing in the National Register.

Hazardous Materials

Spills on highways are a potential source of water quality degradation and a possible public health hazard. The Tennessee Emergency Management Agency (TEMA) has the responsibility and authority for coordination of all state and local agencies during accidents involving hazardous materials. The TEMA has demonstrated its ability to effectively manage such incidents. There is one known underground storage tank (UST) site (Exxon) along the proposed project. There are no known hazardous substance sites. There are property requirements at the UST site. The project will be re-evaluated when preliminary right-of-way plans are completed to determine the impacts on the UST sites. TDOT has demonstrated its ability to deal with UST sites to minimize impacts on the environment. In the event hazardous substances/wastes are encountered within the proposed right-of-way, their disposition shall be subject to the applicable sections of the Federal Resource Conservation and Recovery Act, as amended; and the Comprehensive Environmental Response, Compensation, and Liability Act, as amended; and the Tennessee Hazardous Waste Management Act of 1983.

Ecology

Studies to determine the impacts of the proposed options on the local ecology were conducted by Civil & Environmental Consultants, Inc. (CEC) biologists Tim Nehus and John Nunley on 19 - 20 April 2006. Studies included both literature and database surveys as well as pedestrian reconnaissance. Particular attention was given to locating streams, wetlands, and specialized habitats such as glades, caves, springs, and sinkholes that could harbor protected species or influence water quality.

Project Type

At the time of this study, the project as proposed consists of construction of approximately one mile of new alignment and improvements to 5.5 miles of existing road near Collegedale, Hamilton County. One option divided into three sections was evaluated. The entire project parallels the existing Apison Pike with the exception of a one mile section of new alignment beginning west of

Spaulding Drive and ending near the Little Debbie's facility southeast of Tallant Road. The new alignment will span the NSC Railroad.

Project Setting

The proposed project is located in southeastern portion of Hamilton County, Tennessee. This portion of the county is within the following eco-regions: the Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f), the Southern Sandstone Ridges (67h), and the Southern Shale Valleys (67g). The western portion of the project to SR-321 and the section between Tucker Road and the Little Debbie's facility are within Eco-region 67f which is characterized by low rolling ridges and valleys composed of limestone and cherty dolomite. A narrow section of the project just west of Collegedale is within Eco-region 67h and is characterized by steep forested ridges with stony, sandy and low fertility soils. The geology of this region is dominated by sandstone with areas of shale and siltstone. The eastern portion of the project is within Eco-region 67g and is characterized by lowlands, rolling valleys and hilly areas. The geology of this region is primarily Cambrian-age shale with some narrow bands of limestone. Soils in the vicinity of the project are derived from the Fullerton-Bodine, Colbert-Talbott, Montevallo-Hanceville, and Armuchee-Enders-Apison Associations (USDA General Soil Map for Hamilton County, 1982). These associations roughly correspond with the eco-regions and are discussed seriatim from the east. The Fullerton-Bodine Association consists of sloping to steep, well drained to excessively drained cherty soils over limestone. The Colbert-Talbott Association consists primarily of moderately steep, well drained loamy soils on uplands. The Montevallo-Hanceville Association consists of steep, well drained loamy soils over sandstone and shale on mountains and ridges. The Armuchee-Enders-Apison Association consists of sloping to steep, well drained loamy soils over shale bedrock on mountains and ridges.

Terrestrial Ecology

Much of the land in the project corridor has been disturbed by agriculture and other commercial/industrial developments. The land within the western portion of the proposed project from Old Lee Highway is primarily forested with residential uses becoming more common toward Little Debbie Parkway. The land from Little Debbie Parkway through Collegedale is commercial and light industrial. The section of the project on new alignment and the remaining eastern section are primarily forested with some agricultural (pasture) land uses and residences. The forested plant community included red maple, eastern red cedar, oak, hickory and sycamore. Plant communities found in the area are characteristic of communities formed over limestone, sandstone and shale. Different communities may develop on different strata; elevation differences also have an influence. Both upland and floodplain forested habitats provide food, cover, and

nesting opportunities for numerous small mammals, including rabbits, squirrels, and other rodents, as well as numerous reptiles, native birds, and an assortment of insects.

Direct Impacts - As stated earlier, the area is altered from agricultural and commercial activities; however, large tracts of forests are also present. Any vegetation removed as a result of construction activities would result in a loss of wildlife habitat. Highway noise can affect the use of habitats by wildlife; however, noise levels are expected to be about the same as presently exists. Since this project is a mix of rural and commercial, noise is not a factor within existing habitats.

Indirect Impact - The forested areas of the project corridor provide excellent benefits to wildlife as shelter, nesting, and foraging habitat. Loss of habitat initially displaces wildlife from the area, forcing them to concentrate into a smaller area, which causes over-use of the habitat. This ultimately lowers the carrying capacity of the remaining habitat and is manifested in some species as becoming more susceptible to disease, predation, and starvation.

Cumulative Impacts - In the rural area in the vicinity of the proposed alignment, wildlife habitat is of good quality (Table 1). Any of the forested areas not directly removed for construction purposes will remain suitable for wildlife habitat for the most part.

Table 1. Total terrestrial habitat acreages potentially affected per Section of Alignment (estimated)*

Alternative (or quadrant)	Forested, scrub/shrub, forested floodplain	Pasture, agricultural, or early stages of old-field succession	Commercial/Industrial/ Residential	Total acres per Section
SR-317 Alternative	28 ac.	15 ac.	26 ac.	69 ac.

*Note: These acreage amounts were calculated based on information in the *Preliminary Field Review Plans* prepared by TDOT's Bureau of Planning and Development. They include all areas within existing rights-of-way in the project area that are already owned by the state, portions of which are likely to be used for project construction.

Aquatic Ecology

The project (SR-317 Apison Pike) has been located, and the chosen option will be designed to avoid major impacts to waters of the state to the extent practicable. Efforts to further minimize impacts will continue throughout the design, permitting, and construction process. Unavoidable impacts will be mitigated as required by applicable laws and regulations. Mitigation is discussed further in the sections applying to streams and wetlands. In an effort to minimize sedimentation impacts, erosion and sediment control plans will be included in the project construction plans. TDOT will also implement its Standard Specifications for Road and Bridge Construction which

includes erosion and sediment control standards for use during construction. The State of Tennessee sets water quality criteria for waters of the state; these standards must be met during the construction of the bridge replacement.

Streams, Springs, Seeps and other Water bodies - There are numerous water resources potentially affected by the proposed improvements to State Route 317 and all are located within the Middle Tennessee-Chickamauga Watershed. Ten perennial streams, one intermittent stream, and three springs were located during the field survey. These aquatic resources along with potential direct impacts are described in Table 2. The determinations as to which are waters of the State and/or of the U.S. have not been confirmed by TDEC and the Corps of Engineers. All aquatic impacts identified as project development continues will be avoided, minimized, or mitigated to the extent possible and incorporated into the permitting. A TDEC *Habitat Assessment Data Sheet-High Gradient Streams* was completed for each of the perennial streams. A stream is considered by TDEC to be impaired if the stream's score is <75% of the median reference score of that eco-region. Therefore, scores $\geq$131 in eco-region 67f, $\geq$126 in eco-region 67h, and $\geq$117 in eco-region 67g are representative of unimpaired streams. Using these criteria streams STR-3, STR-5, STR-6, STR-7, STR-8 and STR-11 are considered unimpaired. These streams are identified on the Form G Maps included in this report. Habitat Assessment scores are listed in Table 2.

Direct Impacts - The project could potentially affect nine streams, eight springs, three ponds and five wet weather conveyances. It is difficult to determine the exact impact type at this site with the present information; therefore, the information in Table 2 represents the anticipated worst case impact, with the assumption that these impacts will be reduced during further project design where possible.

Indirect Impacts - The primary indirect impact is sedimentation. Runoff from new construction may cause sedimentation; likewise removal of the old bridge may also cause sedimentation. These impacts would be minimized by good sediment control planning and implementation.

Table 2. Streams, watercourses, and waterbodies affected by the proposed State Route 317 (Apison Pike) improvements, Hamilton County.

Stream/ water course/water body	Project Segment	Location (coordinates)	Potential Impacts	Legal Designation (unconfirmed)	Stream/Watercourse/ Waterbody Description
STR-1	SR-317 (Apison Pk)	N35.06828; W85.08589	Crossing, Runoff, Turbidity,	Stream	

Stream/ water course/water body	Project Segment	Location (coordinates)	Potential Impacts	Legal Designation (unconfirmed)	Stream/Watercourse/ Waterbody Description
		-- N35.06439; W85.07519	Sedimentation, and Habitat Loss		
STR-2	SR-317 (Apison Pk)	N35.06657; W85.08164	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-3	SR-317 (Apison Pk)	N35.06316; W85.07895	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
SPR-1	SR-317 (Apison Pk)	N35.06313; W85.07555	Fill, Crossing, runoff	Spring	
STR-4	SR-317 (Apison Pk)	N35.06199; W85.07217	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-5	SR-317 (Apison Pk)	N35.06108; W85.07026	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-6	SR-317 (Apison Pk)	N35.05599; W85.05537 and N35.05503; W85.04695	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-7	SR-317 (Apison Pk)	N35.05246; W85.04311	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-8	SR-317 (Apison Pk)	N35.04727; W85.03636	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-9	SR-317 (Apison Pk)	N35.03730; W85.02601	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
STR-10	SR-317 (Apison Pk)	N35.03356; W85.02536	Crossing, Runoff, Turbidity,	Stream	

Stream/ water course/water body	Project Segment	Location (coordinates)	Potential Impacts	Legal Designation (unconfirmed)	Stream/Watercourse/ Waterbody Description
			Sedimentation, and Habitat Loss		
SPR-2	SR-317 (Apison Pk)	N35.03137; W85.02487	Crossing, fill, runoff	Spring	
STR-11	SR-317 (Apison Pk)	N35.02866; W85.02545	Crossing, Runoff, Turbidity, Sedimentation, and Habitat Loss	Stream	
SPR-3	SR-317 (Apison Pk)	N35.02736; W85.02537	Fill, runoff	Spring	

Mitigation - Stream channels requiring relocation (channelization) should be replaced on site to the extent possible, using techniques that will replace existing stream characteristics such as length, width, gradient, and tree canopy. Water body impacts that cannot be mitigated on site, such as impacts to springs which require rock fill, will either be mitigated off-site by improving a degraded system or by making a comparable payment to an in-lieu-fee program which will perform such off-site mitigation under the direction of state and federal regulatory and resource agencies.

Wetlands - Five (5) potential wetlands were identified during the site visit (Table 3). These potential wetlands were evaluated using the criteria established in the Corps of Engineers *1987 Wetland Delineation Manual*. Location and size of these areas are estimated; therefore, a survey to determine its exact size and location within the project right-of-way is needed. A few other small areas of wetland vegetation were also noted in the vicinity of culverts and ditches and were the result of improper grading and drainage. These potential wetland areas at culvert outlets lacked hydric soil characteristics.

Direct Impacts - Areas of the potential wetlands located within cut or fill lines will likely be destroyed.

Indirect Impacts - The drainage patterns of the remaining (unfilled) wetland areas may be affected and this could result in localized changes in water levels and vegetation patterns. Efforts should be made during further project design to minimize these effects.

Cumulative Impacts - The project could potentially destroy any of the area within cut or fill lines and may have additional impacts (see indirect impacts) on the remaining wetland area.

Avoidance of Wetland Impacts - The alignment has been located to miss wetlands to the extent possible. Moving the current proposed alignment would involve placing a curve in an

otherwise straight road and is likely not a feasible solution. However, further consideration of slight alignment shifts should be evaluated to further minimize impacts to wetlands.

Minimization - As project design proceeds, further efforts should be made to minimize impacts to wetlands remaining outside the ROW and to reduce drainage patterns and water levels.

Mitigation - Mitigation is required for all wetland impacts which do not meet requirements for general Aquatic Resource Alterations Permits (State of Tennessee) or for certain Nationwide Section 404 permits (U.S. Army Corps of Engineers). The minimum replacement ratio for wetlands is 2:1 and may be higher depending on hydrogeomorphic analyses or whether optimum mitigation sites are unavailable. The first option for any substantial replacement mitigation is on-site (near the project or within the watershed). The mitigation option most favored by regulatory agencies is that of restoration of a former wetland. Enhancement of an existing but degraded wetland may also be an option, but higher replacement ratios are generally required. Both the site selection and the mitigation, when proposed, will be subject to the approval of regulatory agencies. In the event that no acceptable mitigation site can be obtained locally, the regulatory agencies may allow mitigation further away or allow use of credits in a mitigation bank.

Table 3. Potential wetland impacts for proposed State Route 317 (Apison Pike), Hamilton County, Tennessee.

Wetland Type	Location (coordinates)	Likely Project Impact on Wetland	Primary functions of the wetland	Wetland Size (acres) (Estimated)		Description
				Total	Likely eliminated or drained	
WTL-1	N35.05494; W85.04755	Fill, runoff*	Wildlife habitat and watering; possible flood attenuation, ground water and surface water recharge	1.5	0.5	
WTL-2	N35.05333; W85.04426	Fill, runoff*	Wildlife habitat and watering; possible flood attenuation, ground water and surface water recharge	0.15	0.15	
WTL-3	N35.05319; W85.04401	Fill, runoff*	Wildlife habitat and watering;			

Wetland Type	Location (coordinates)	Likely Project Impact on Wetland	Primary functions of the wetland	Wetland Size (acres) (Estimated)		Description
			possible flood attenuation, ground water and surface water recharge	0.05	0.05	
WTL-4	N35.05282; W85.04739	Fill, runoff*	Wildlife habitat and watering; possible flood attenuation, ground water and surface water recharge	0.08	0.08	
WTL-5	N35.04734; W85.03617	Fill, runoff*	Possible flood attenuation, ground water and surface water recharge	0.05	0.025	

Beneficial Ecological Floodplain Values - Ecological values associated with the floodplains of the surveyed streams are the bottomland hardwoods that provide shading, bank stabilization, filtration of sediments, and food and cover for wildlife and fishes. Impacts to these have been avoided or minimized by crossing the floodplain at a near-perpendicular angle, with appropriately sized bridges.

Endangered and Threatened Species

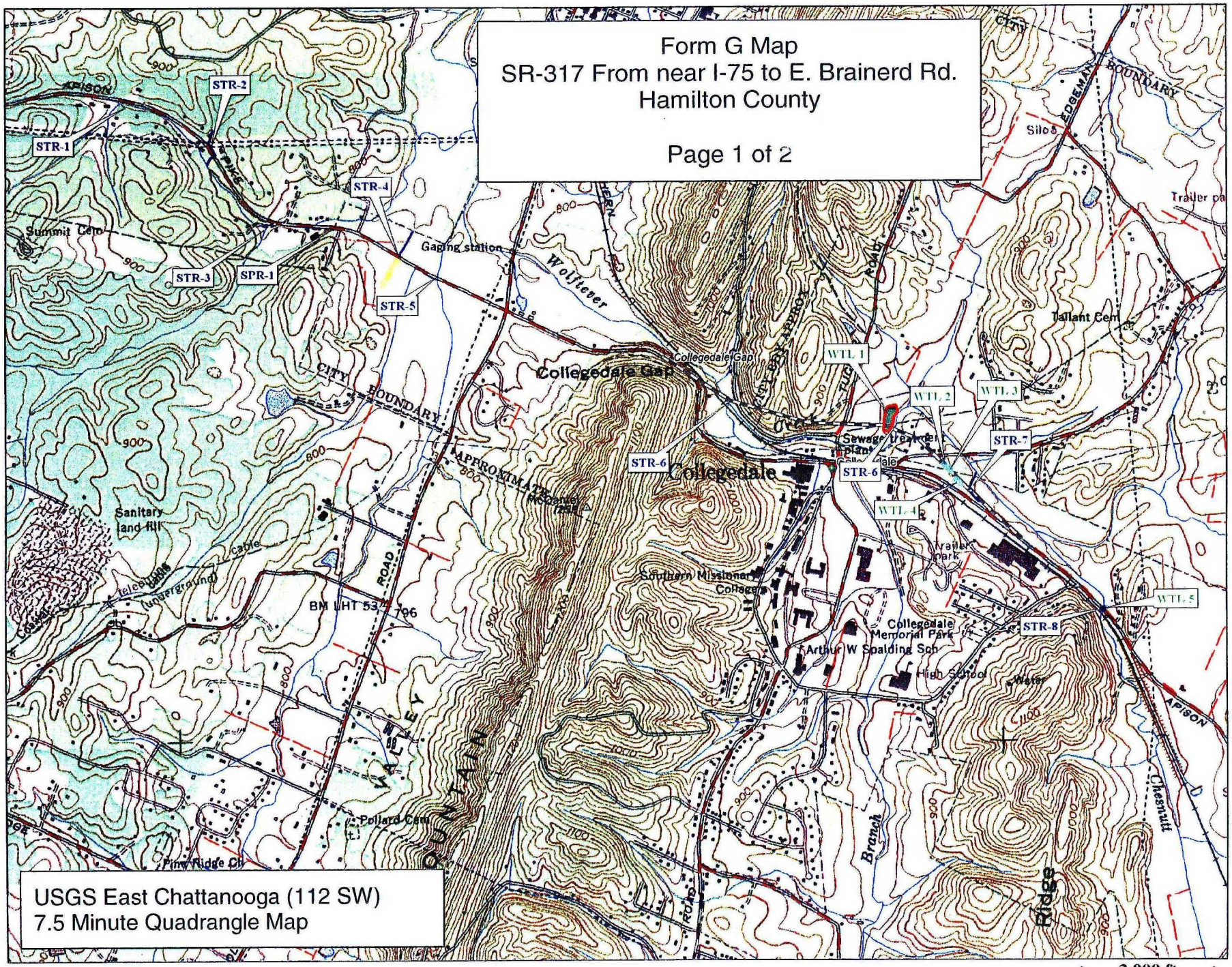
Information from several sources, as well as prior experience with habitats in the area, was used to prepare for field surveys to locate protected species or habitats. These sources included database information provided by the Tennessee Department of Environment and Conservation (TDEC), the USFWS, and books and/or databases. The USFWS correspondence indicates that no federally listed or proposed endangered or threatened species occur within the impact area for this project. Since no sensitive species were discovered during the field review or from review of the TDEC Division of Natural Heritage database, it is not anticipated that any significant impacts to federally listed endangered or threatened species will occur from the proposed project. The TDEC Division of Natural Heritage database was reviewed on 4 April 2006 and does not report any occurrences of federally listed plants or animals within four miles of the project corridor.

Direct and Indirect Impacts - No federally listed endangered or threatened species will be affected by this project.

Required Permits

Stream and Miscellaneous Water Quality Permits - Alterations to streams or other aquatic sites designated as waters of the State or waters of the United States require either individual or general Aquatic Resource Alteration Permits (ARAP) from the State of Tennessee, individual or Nationwide 404 U.S. Army Corps of Engineers permits, and, where applicable, a TVA 26a permit or letter of no objection. Construction projects disturbing one or more acres of land require storm water control permits issued by the State of Tennessee pursuant to the National Pollutant Discharge Elimination System. For any project that affects water flowing into a sinkhole or cave, or for any impact that may affect the ground water via a sinkhole, a Class B Injection Well permit may be required. This process involves obtaining a permit before the project is let if sinkholes are known to exist. If other sinkholes are encountered after construction has begun, the appropriate TDOT offices will be notified and the appropriate steps taken to comply with laws, regulations, and permits. These or any other permit requirements identified in the project development process will be complied with.

Wetland Permits - All wetland impacts require confirmation by, and coordination with, permitting agencies. All require either general or individual Aquatic Resource Alteration Permits (ARAP) from the State of Tennessee. Almost all require either Nationwide or individual permits form the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean water Act. Other agencies such as the U.S. Fish and Wildlife Service and the Environmental Protection Agency may be involved in the permitting process. Wetland impacts which are subject to either State or Federal jurisdiction, and which do not meet criteria for either general or Nationwide permits require individual permits; these typically require compensatory mitigation for impacts. In general, isolated wetlands with less than 0.25 acre impacts may come under the guidelines of a general permit issued by the State of Tennessee; no mitigation is required. This permit cannot be used, however, for a cumulative series of small impacts. Some wetland impacts of less than 0.5 acres qualify for Corps of Engineers nationwide permits. TDOT should carry out further coordination with the regulatory agencies before preparing mitigation plans and submitting permit applications. Permit requirements and mitigation plans will be based on these discussions.



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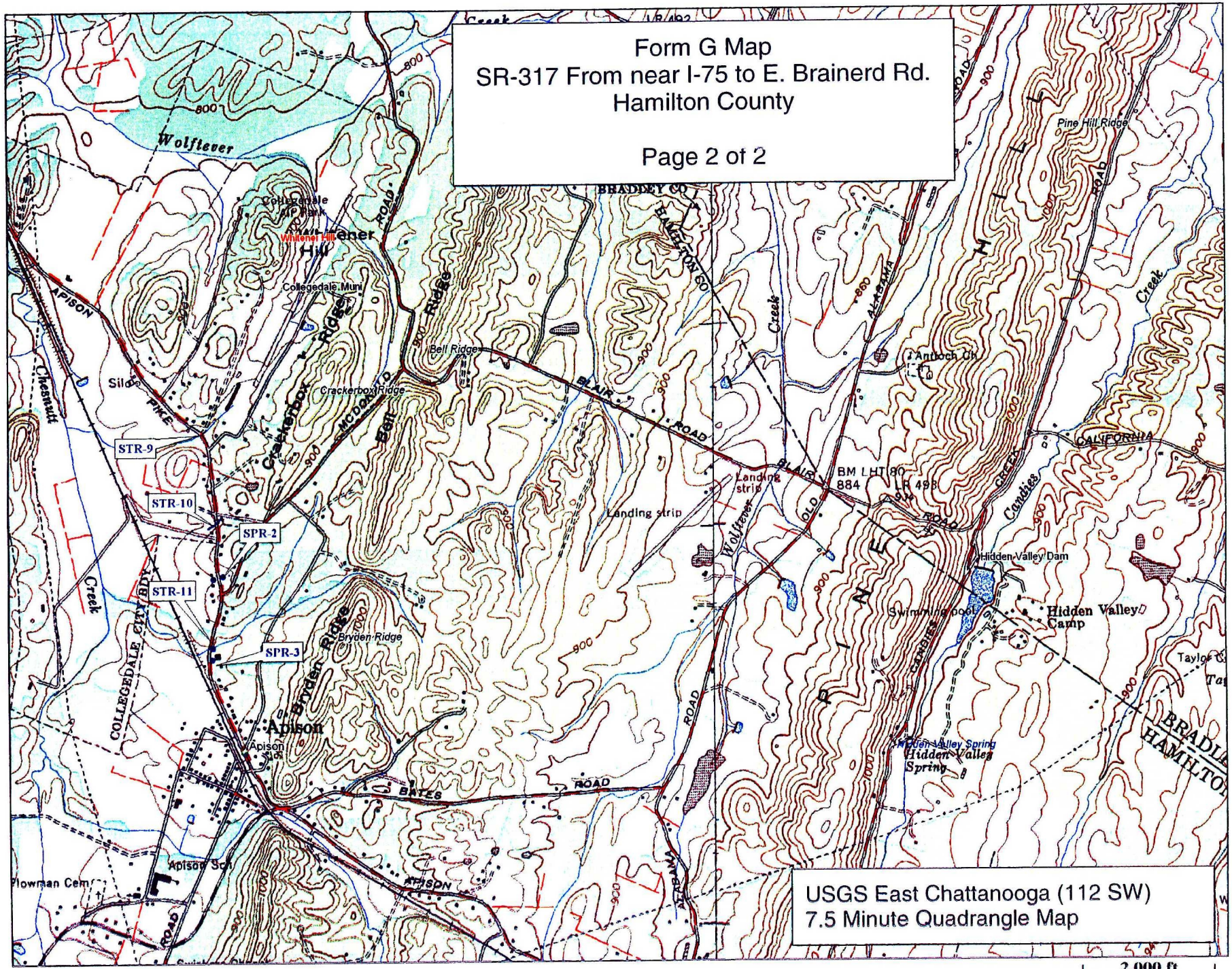

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

Index Of Sheets

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

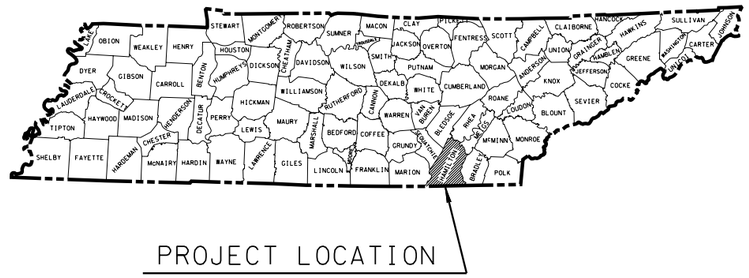
TENN.	YEAR	SHEET NO.
	2006	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

HAMILTON COUNTY

STATE ROUTE 317

FROM PROPOSED INTERSTATE 75 CONNECTOR TO EAST BRAINERD ROAD

STATE HIGHWAY NO. 317 F.A.H.S. NO.



BEGIN PROJECT

END PROJECT

TITLE MAP SCALE: 1"= 1 MILE

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 1995 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

TDOT ROAD SP. SV. 2 C.L. TILLEY

CADD TECH. CHARLES GILLIHAN

APPROVED:

CHIEF ENGINEER

DATE:

APPROVED:

COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

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TENNESSEE D.O.T.
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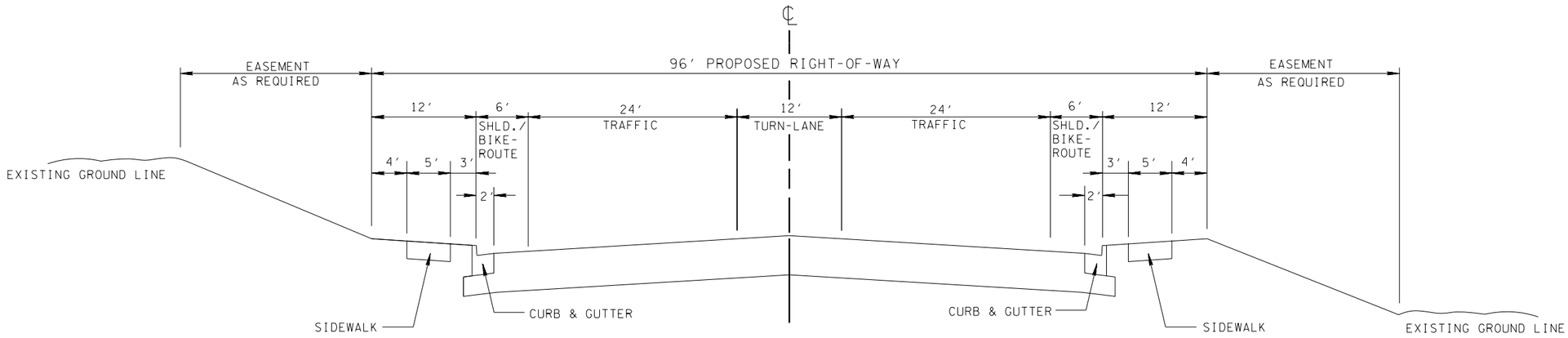

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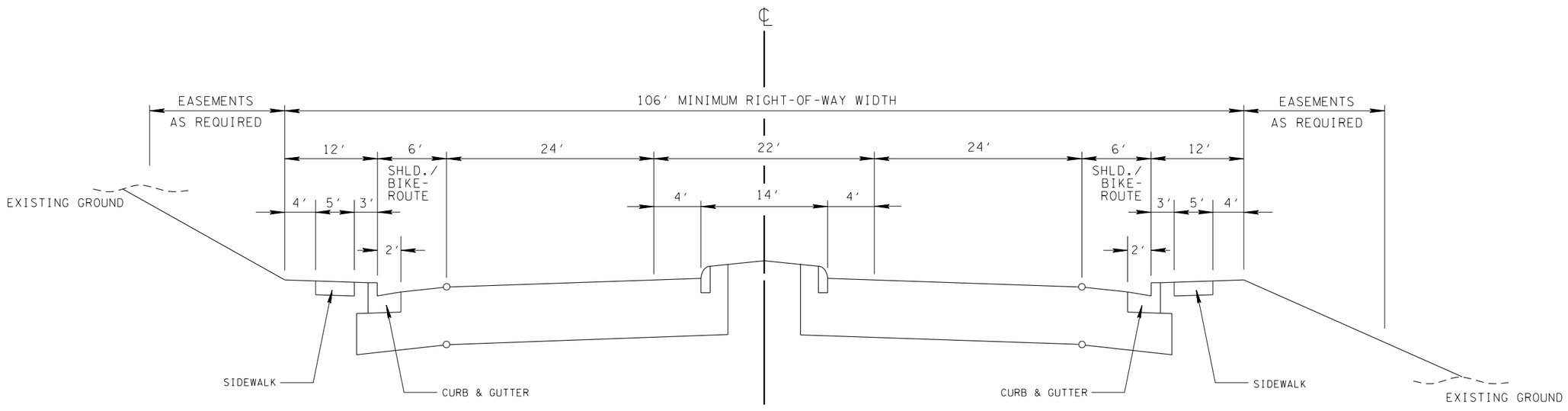

PROPOSED TYPICAL SECTION

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OPTION B: FROM PROPOSED INTERSTATE 75 CONNECTOR TO LAYTON DRIVE

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

HAMILTON COUNTY
STATE ROUTE 317
PROPOSED TYPICAL SECTIONS
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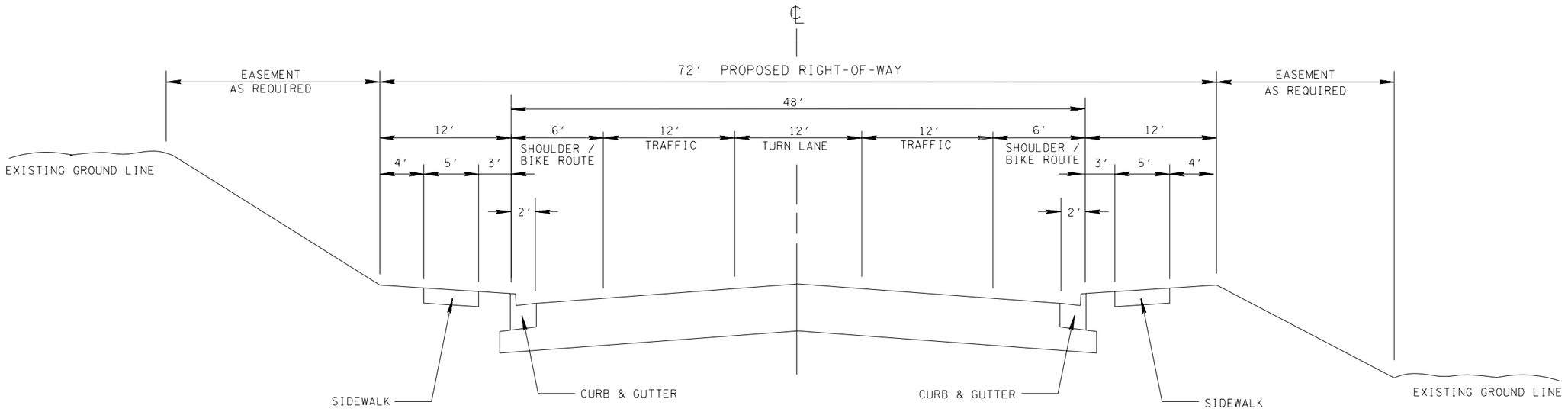

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FROM LAYTON DRIVE TO EAST BRAINERD DRIVE

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DEPARTMENT OF TRANSPORTATION

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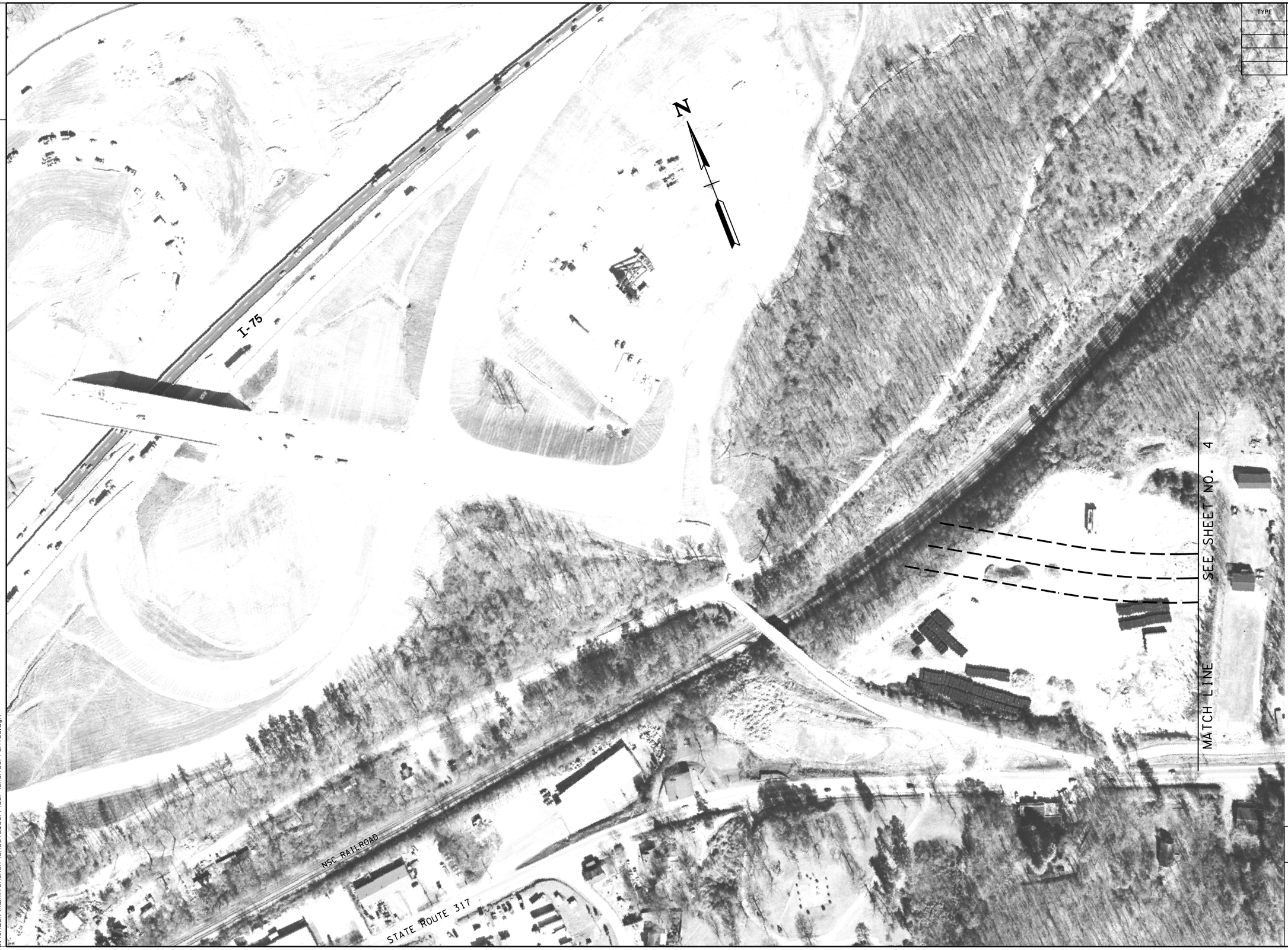

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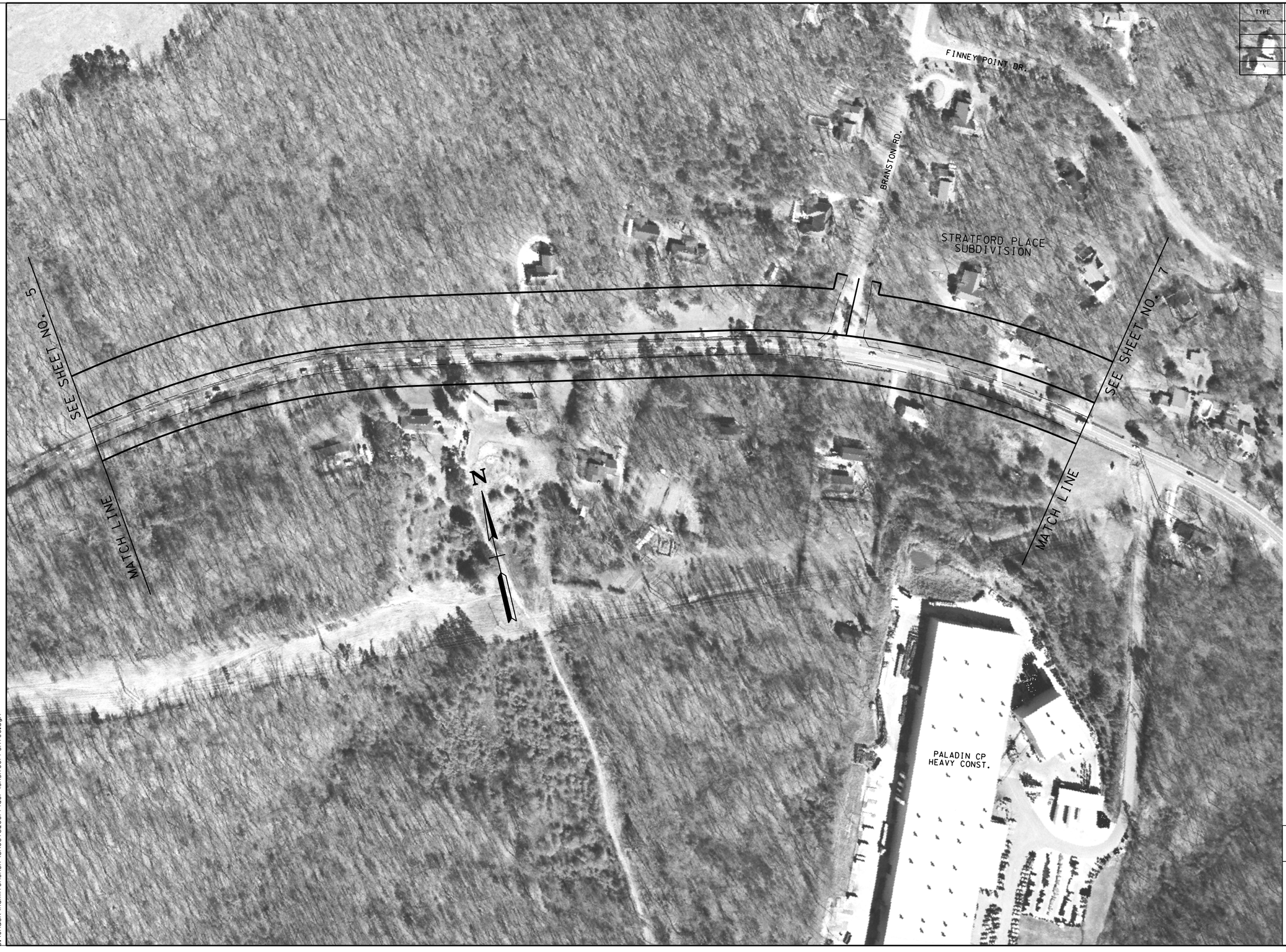

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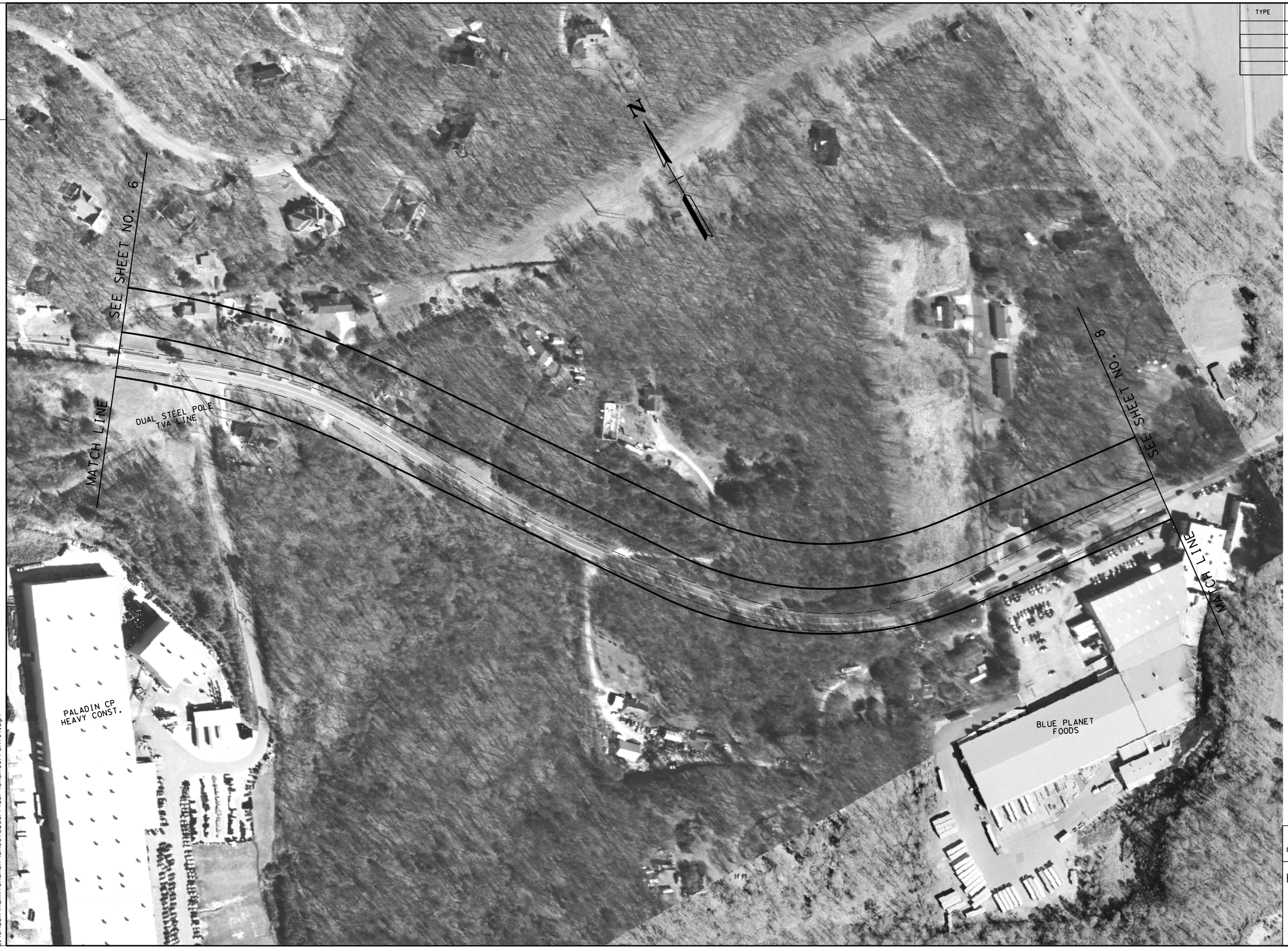

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N

SEE SHEET NO. 8

MATCH LINE

SEE SHEET NO. 10

MATCH LINE

CROSS ROADS PLAZA

ECKERDS PHARMACY

DON SELF INSURANCE

SUNTRUST BANK

AMSOUTH BANK

LITTLE DEBBIE OUTLET STORE

MOLED CREDIT UNION

KAL MOTOR SALES

EXXON SERVICE CENTER (U.S.T.)

APSON CROSSING SHOPPING CENTER

GLENN DOWNING DR.

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END SECTION 2
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

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SEE SHEET NO. 10

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SPALDING DR.

SANBURN DR.

GAS LINE

SPALDING DR.

PARKING AREA
TRAIL HEAD

TUCKER RD.

STATE ROU

UNIVERSITY DR.

SEE SHEET NO. 12

MATCH LINE

INDUSTRIAL DR.

COLLEGE DR. WEST

HICKMAN RD.

SOUTHERN
ADVENTIST
UNIVERSITY

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STATE OF TENNESSEE
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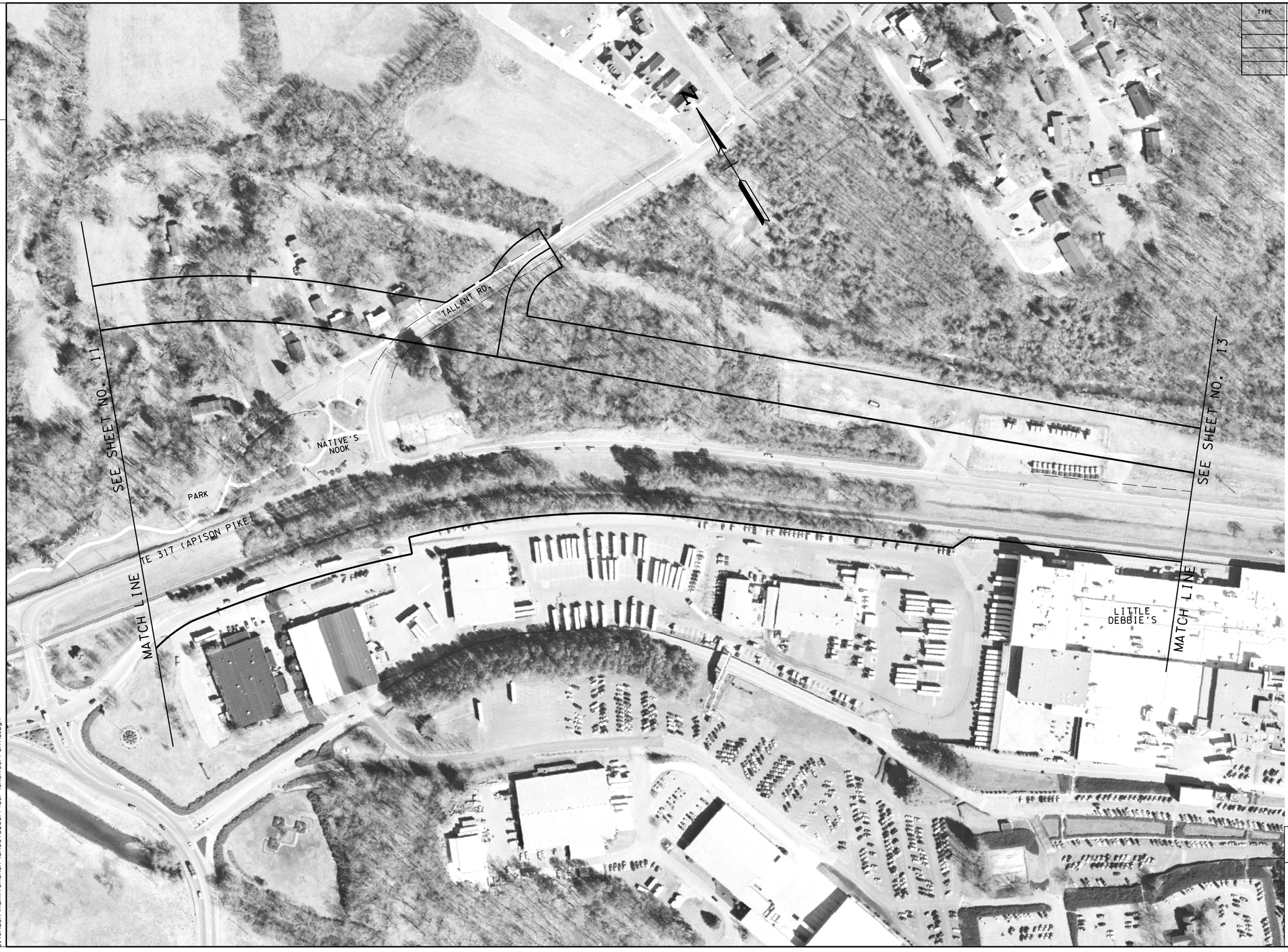

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HAMILTON COUNTY
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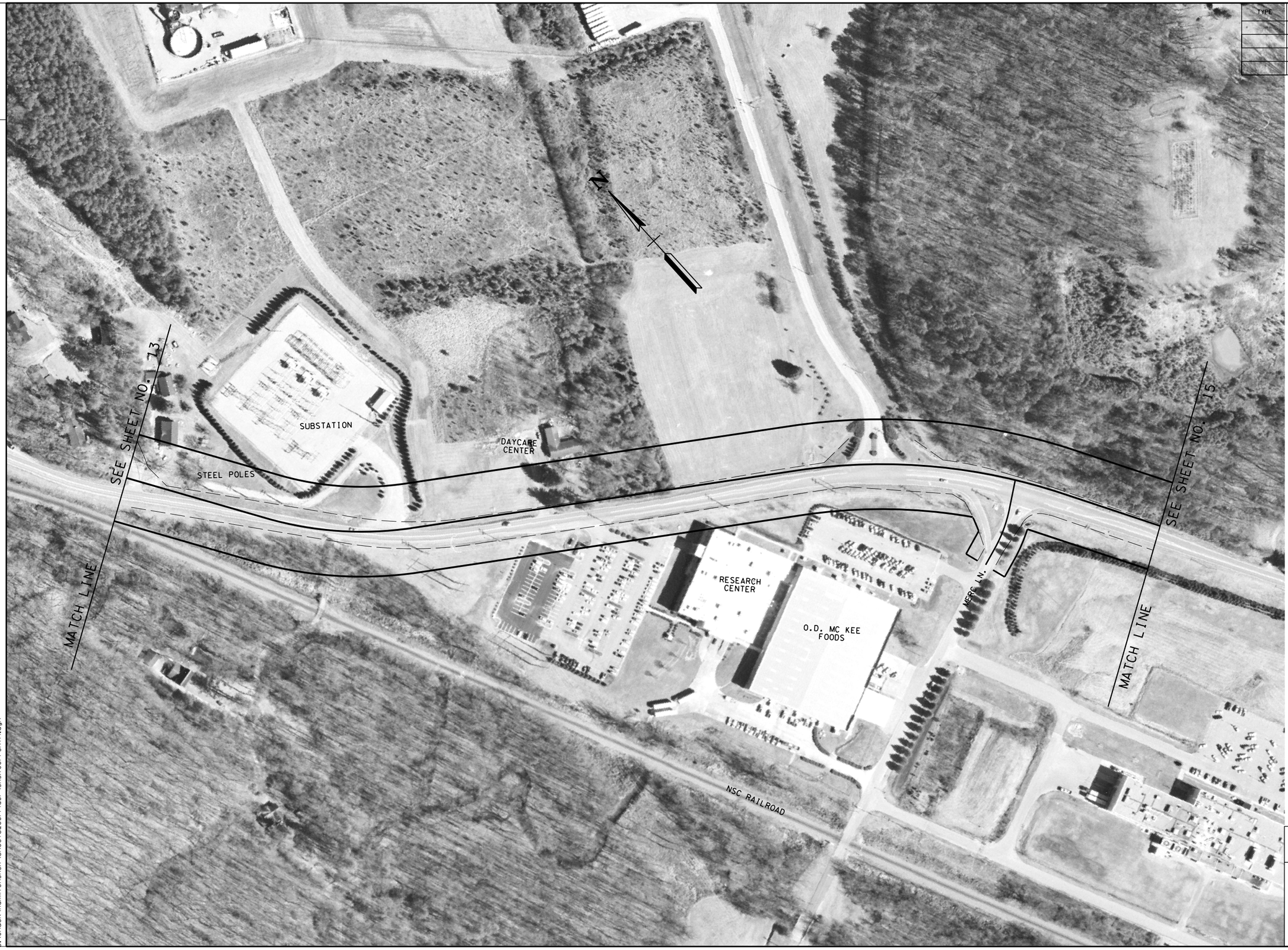

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HAMILTON COUNTY
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STATE OF TENNESSEE
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HAMILTON COUNTY
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

HAMILTON COUNTY
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STATE OF TENNESSEE
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HAMILTON COUNTY
STATE ROUTE 317

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

HAMILTON COUNTY
STATE ROUTE 317

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