TRANSPORTATION PLANNING REPORT

Hamill Road

at Norfolk Southern Railroad Crossing
HAMILTON COUNTY
PIN# 109527.00

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

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING		2/20/09
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION		2-17-09
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION		2/17/09

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1. STUDY HISTORY AND BACKGROUND

At the request of local officials, the Tennessee Department of Transportation (TDOT) has developed improvement options for an at-grade railroad crossing on Hamill Road at the Norfolk Southern double track in Chattanooga in Hamilton County. Local officials would like to improve the safety and traffic operations of this crossing. Thus TDOT enlisted the services of Volkert & Associates, Inc. to develop options for improvement of this railroad crossing, including a grade separation. This Transportation Planning Report (TPR) presents the results of that study, including an assessment of safety and operational concerns, cost estimates and a preliminary environmental review.

1.1 STUDY HISTORY

Local citizens, emergency service providers and public officials have stated that "something" should be done to improve the railroad crossing on Hamill Road at the Norfolk Southern double track. This location was one of the subjects of an August 2006 report by the Federal Railroad Administration (FRA) entitled *The Impact of Blocked Highway/Rail Grade Crossings on Emergency Response Services* (see Appendix A, which contains the text of Appendix I.B.3 from that report).

Initially, a concept for a grade separation with Hamill Road passing over the railroad tracks was developed. On September 6, 2007, a stakeholders' meeting was held to discuss this concept. As a result of input obtained at that meeting, a concept for a grade separation with the railroad tracks passing over Hamill Road was initiated.

1.2 STUDY LOCATION

The railroad crossing on Hamill Road at the Norfolk Southern double track is located approximately 1700 feet east of State Route 153 in the Hixson community on the northeast side of the City of Chattanooga (see Figure 1). The railroad's Hixson Interlock, where the double track converges into a single track, is located approximately 1.3 miles north of the crossing, just north of Hixson Pike. The northern limit of the railroad's DeButt's Yard is located approximately 1.5 miles south of the crossing, at the south end of the bridge over the Tennessee River.

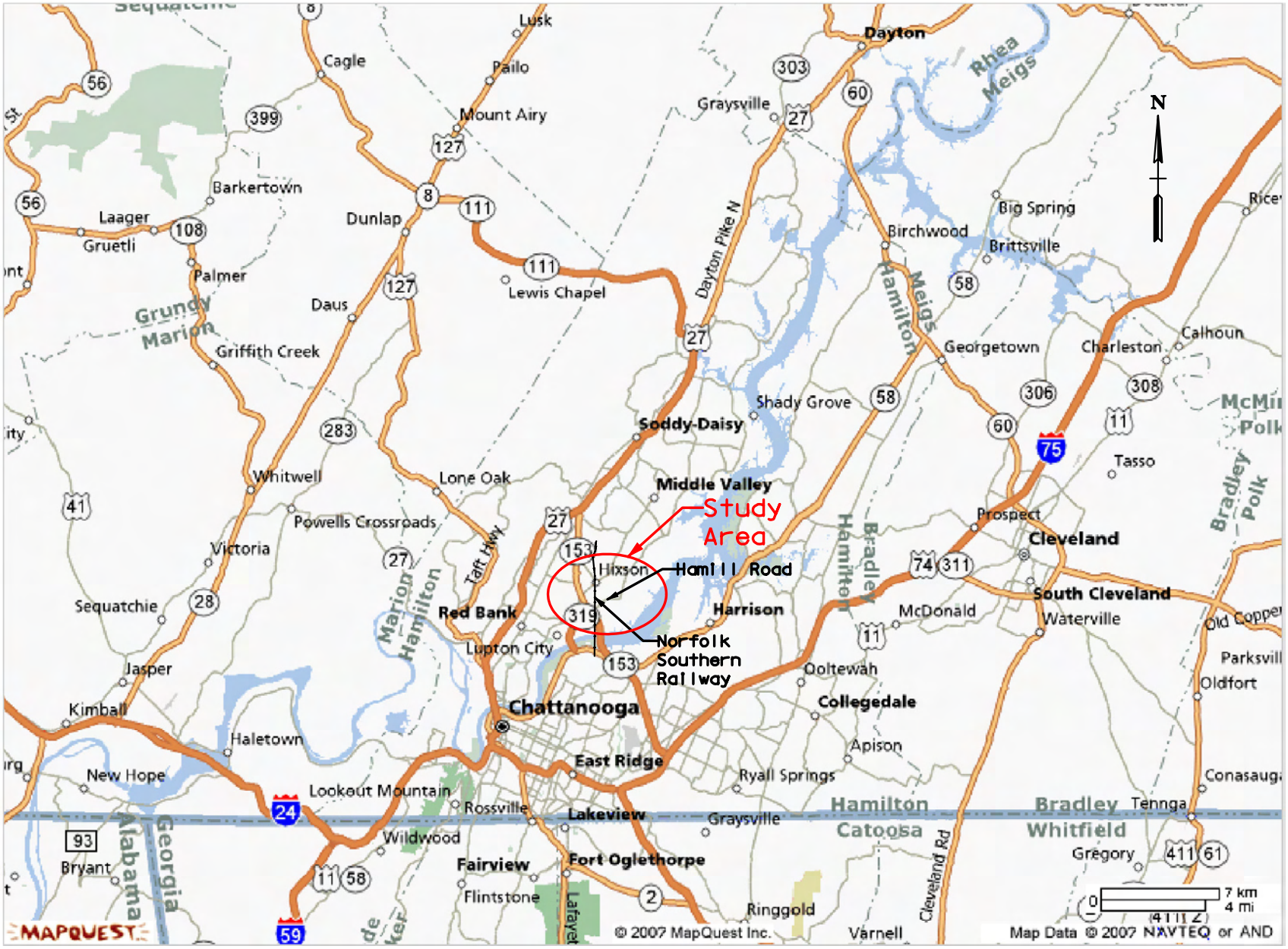


Figure 1. Area Location Map

Figure 2 is a more detailed aerial map showing the railroad crossing and its context in the Hixson community. Approximately 1700 feet east of the railroad crossing is North Chickamauga Creek, which empties into the Tennessee River about 1.2 miles south of the crossing. Memorial Northpark Hospital is located 1200 feet west of the crossing on the north side of Hamill Road. Chattanooga Fire Station Number 19 is located on Brunswick Lane on the west side of the railroad tracks, approximately 4400 feet north-northwest of the crossing. The Tennessee Valley Authority's (TVA's) Sequoyah Nuclear Plant is located about 12 miles northeast of the crossing.

1.3 COMMUNITY DESCRIPTION

The population of the City of Chattanooga was estimated to be 155,190 as of July 2006. Hamilton County's population in 2005 was estimated to be 310,935. The median household income in Chattanooga was estimated to be $32,174 as of 2005. The county encompasses an area of 542 square miles. (All of this information comes from www.city-data.com/city/Chattanooga-Tennessee.html.) The *Chattanooga Times Free Press* reported on April 5, 2007 that the population of the Chattanooga metropolitan area (Hamilton, Marion and Sequatchie Counties in Tennessee and Catoosa, Dade and Walker Counties in Georgia) was expected to pass the 500,000 mark some time last year.

Along Hamill Road in the vicinity of the railroad crossing, land usage is a mix of commercial and single-family residential. East of Crescent Club Drive (see Figure 2), the land usage is exclusively single-family residential. West of Crescent Club Drive, the land usage is primarily commercial, although there are single-family homes west of Godsey Drive on the north side of Hamill Road and between Bradington Avenue and the railroad tracks on the south side of Hamill Road.

1.4 EXISTING TRANSPORTATION CONDITIONS

Hamill Road is an urban arterial and part of a designated evacuation route for TVA's Sequoyah Nuclear Plant (see Appendix B). From State Route 153 proceeding east to Old Godsey Lane, Hamill Road has five 11-foot lanes, 18-inch gutters and 5-foot sidewalks on both sides (see Appendix C). From Old Godsey Lane proceeding east to Bradington Avenue, Hamill Road has four 11-foot lanes with the same gutters and sidewalks. From Bradington Avenue proceeding east to Godsey Drive, Hamill Road transitions down to three 11-foot lanes with the same gutters and sidewalks (see Figure 3 on page 5).

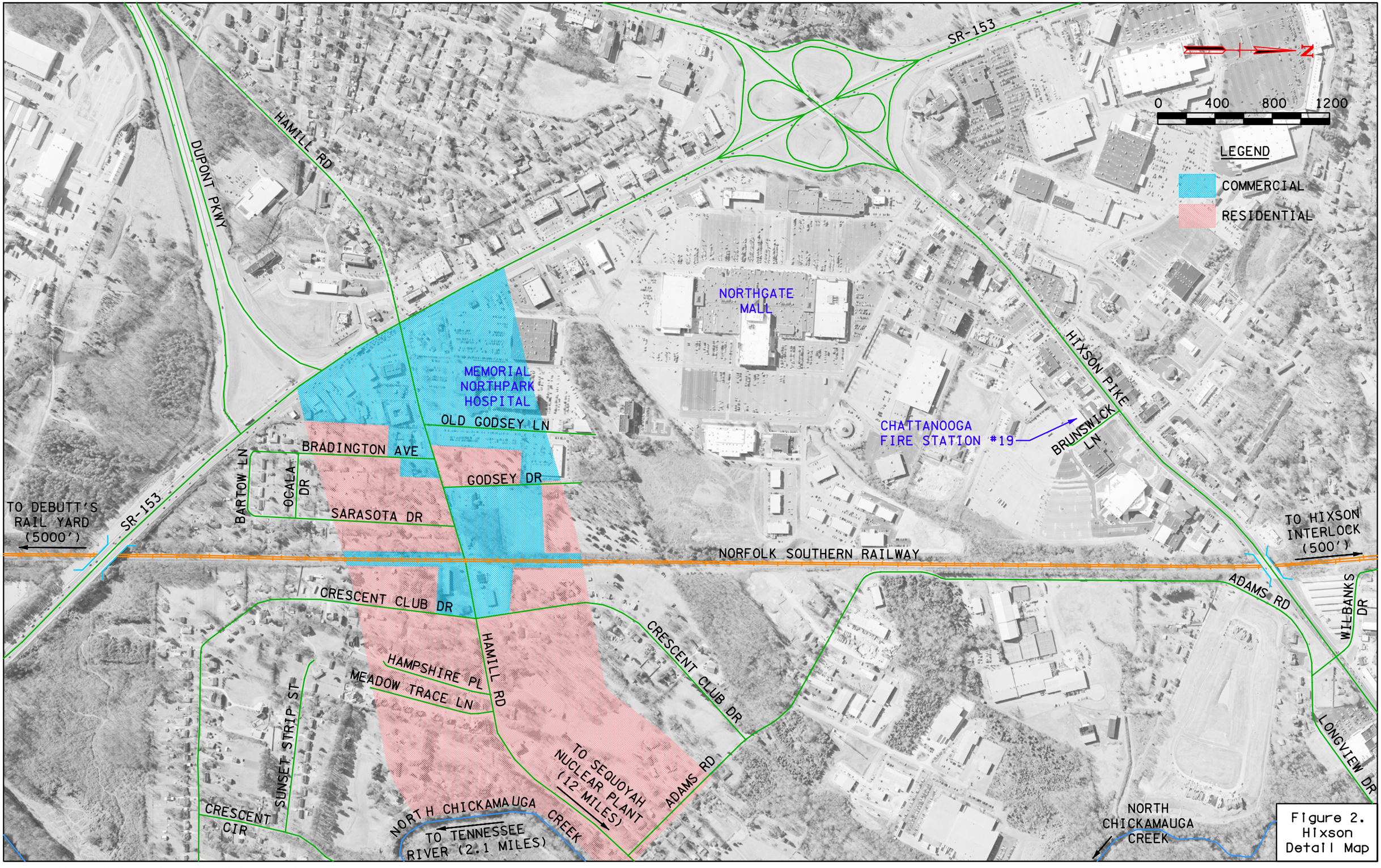


Figure 2.
Hixson
Detail Map

Figure 3. Looking West along Hamill Rd from Godsey Dr

Note also in Figure 3 that eastbound traffic on Hamill Road is backed up all the way to State Route 153 due to a train blocking the crossing. From Godsey Drive proceeding east to just west of Sarasota Drive, Hamill Road has three 11-foot lanes with the same gutters and sidewalks. The gutters and sidewalks end just west of Sarasota Drive, and the pavement transitions quickly down to 24 feet with virtually no shoulders (see Figure 4 on page 6). The 24-foot section without shoulders continues through to the eastern limits of the study area (see Figure 5 on page 6).

Most of the streets that cross Hamill Road in the vicinity of the railroad crossing are local streets conveying relatively modest traffic volumes. Their characteristics are summarized in Table 1.

Table 1. Characteristics of Streets Crossing Hamill Road

Street	Pavement Width	Curb & Gutter?	Sidewalk?	Functional Classification
Old Godsey Lane	24’	Yes	No	Local
Bradington Avenue	22’	Yes	West Side	Local
Godsey Drive	24’	Yes	No	Local
Sarasota Drive	20’	No	No	Local
Crescent Club Drive	20’	No	No	Collector
Hampshire Place	24’	Yes	West Side	Local
Meadow Trace Lane	24’	Yes	Both Sides	Local

Figure 4. Looking East along Hamill Rd from Godsey Dr

Figure 5. Looking East along Hamill Rd from RR Crossing

None of the cross streets has a shoulder. Crescent Club Drive is the only one that serves as a collector. North of Hamill Road (see Figure 6 on page 8), Crescent Club Drive connects to Adams Road and provides access to a significant number of homes and businesses. South of Hamill Road (see Figure 7 on page 8), Crescent Club Drive is the only access point for a residential area of more than 100 homes.

TDOT has a count station (Number 000291) on Hamill Road approximately 200 feet east of Crescent Club Drive. This station reported an Annual Average Daily Traffic (AADT) count of approximately 11,000 vehicles in 2008 (see Appendix D). The FRA report referenced in Section 1.1 states that "over 19,000 highway vehicles pass over the highway-railroad crossing each day". TDOT's projected AADT on Hamill Road at the railroad crossing is 12,720 vehicles for the year 2031 (see Appendix E). Since Crescent Club Drive/Adams Road serves as an important "cut-through" route for traffic between State Route 153 and Hixson Pike, it is difficult to predict exactly what would happen if a grade separation were constructed at the crossing.

TDOT provided crash data (see Appendix F) for Hamill Road between Godsey Drive and Hampshire Place from the years 2003 through 2005. During that time period, there were 5 reported crashes associated with the railroad crossing on Hamill Road at a rate of 2.10 crashes per million vehicle miles. This rate is lower than the statewide average for similar facilities of 3.09 crashes per million vehicle miles. This portion of Hamill Road does not have a crash rate high enough to qualify for the Hazard Elimination Safety Program (HESP).

Figure F.1 in Appendix F is a collision diagram for Hamill Road in the vicinity of the railroad crossing which includes crash data for the year 2006. The most common crash type seems to be rear-end collisions due to traffic being backed up waiting for trains to clear the crossing (see Figure 3 on page 5 and Figure 4 on page 6). It should be noted that in four of the five police crash reports on rear-end collisions, "following improperly" was cited as a contributing factor in the crash.

The other key transportation feature of this study is the railroad itself. There are gates at the crossing (United States Department of Transportation Number 841993J) and a double track. Any potential changes in alignment of the tracks are constrained by the bridges over the tracks at Hixson Pike (approximately one mile north of the crossing—see Figure 8 on page 9) and at State Route 153 (approximately 2500 feet south of the crossing—see Figure 9 on page 9).

Figure 6. Looking North along Crescent Club Dr

Figure 7. Looking South along Crescent Club Dr

Figure 8. Looking North along Tracks toward Hixson Pike

Figure 9. Looking South along Tracks toward SR-153

As noted previously in Section 1.2, the Hamill Road crossing is in close proximity of the Hixson Interlock to the north and Norfolk Southern's DeButt's Yard to the south. Both of those features require trains to slow or even stop at the crossing. The railroad reports an average of 50 trains per day passing through the crossing, resulting in the periodic blockage of vehicular traffic.

2. PURPOSE AND NEED STATEMENT

The purpose of the railroad crossing improvement is to alleviate the delay and congestion at the Hamill Road railroad crossing and minimize the adverse environmental impacts of longer vehicle trips and vehicles idling for extended periods waiting for trains to clear the crossing. Shorter trips and less idling would result in reduced emissions and improved air quality for the Hixson area.

2.1 DELAY

Of primary local concern is the delay in response time for emergency vehicles that occurs when the crossing is blocked by a train. As noted in Section 1.2, Memorial Northpark Hospital is located just 1200 feet west of the crossing on the north side of Hamill Road. When the crossing is blocked by a train, the detour route via State Route 153, Hixson Pike, Longview Drive, Adams Road and Crescent Club Drive (see Figure 2) adds approximately eight minutes or 3.4 miles to reach the east side of the tracks during non-peak hours. The area around Northgate Mall is frequently congested during peak hours, so it can be anticipated that ambulances would have to endure further delay in response time.

Chattanooga Fire Station Number 19 is also located on the west side of the railroad tracks (see Figure 2). However, unlike the hospital, the fire station is located close to Hixson Pike, which has a grade separation over the railroad. Therefore, a grade separation on Hamill Road may not be as critical for fire response time as it is for medical emergencies, but it would be advantageous to have multiple routes available to all types of emergency vehicles.

2.2 CONGESTION

Congestion is also a concern due to Hamill Road being designated as an emergency evacuation route for TVA's Sequoyah Nuclear Plant (see Appendix B). In the event of an emergency at the plant, it could be expected that all major routes out of the area would be

congested, and TVA's evacuation plan is intended to minimize and dissipate that congestion. If Hamill Road were blocked during a time of emergency, it would force additional traffic onto Hixson Pike, creating and/or exacerbating congestion on that route.

2.3 ENVIRONMENTAL BENEFITS

Given the vehicular traffic volumes and the number of trains passing through the Hamill Road crossing on an average day, substantial quantities of pollutants are being emitted from idling vehicles. The total combined quantity of hydrocarbons, nitrogen oxides and carbon monoxide emitted annually from idling vehicles at this crossing is estimated to be on the order of several tons (see Appendix G). Furthermore, some drivers choose to detour around the site rather than wait for a train to clear. As noted in the preceding section, this may add eight minutes or more of travel time for each vehicle making the detour. A grade separation on Hamill Road would lower emissions generated by idling vehicles and by vehicles making a lengthy detour, thus contributing to improved air quality in the Hixson area.

3. PRELIMINARY ENVIRONMENTAL EVALUATION

A preliminary investigation of the environmental context of the railroad crossing has been undertaken as part of this study. This investigation included a review of existing sources of information and field observations by Volkert personnel on July 27 and 30, 2007 and November 1, 2007. However, this preliminary investigation should NOT be construed as a comprehensive environmental assessment. Comprehensive studies would need to be conducted by qualified, trained personnel after completion of this study and prior to the approval of the required environmental documentation and permitting.

As a first step, Hamill Road and the railroad crossing were located on the United States Geological Survey's (USGS's) Daisy and East Chattanooga Quadrangle maps (see Appendix H). The most notable feature is that there are no "blue-line" streams within the expected construction limits of the potential improvement options.

Another source of information that was utilized in the course of this study was the Federal Emergency Management Agency's Flood Insurance Rate Maps (see Appendix I). As indicated on the maps, the improvement options would not encroach into the 100-year flood plain on the west side of the railroad tracks. However, on the east side of the railroad tracks, the proposed

project *would* encroach into FEMA's "Zone X" in the vicinity of Crescent Club Drive and possibly at other locations. The Zone X designation indicates that this area is within the 100-year flood plain, but can be expected to flood at average depths of less than one foot.

Aside from flood plains, Volkert's field visits revealed a few important existing drainage features that need to be considered in conjunction with a grade separation at the railroad crossing. First, there are two detention ponds along the north side of Hamill Road west of the railroad tracks (see Figures 10 and 11 on page 13). Second, a six-foot by three-foot concrete box culvert outlets on the north side of Hamill Road about 200 feet west of the railroad tracks (see Figure 12 on page 14). It seems any water currently exiting this culvert dissipates in the wooded area in the northwest quadrant of Hamill Road and the railroad tracks. With a grade separation, this would no longer be feasible (either the dissipation area would be partially filled if Hamill Road passed over the tracks or water would flow to the low spot in the road if Hamill Road went under the tracks). In the absence of survey data, it is impossible to make a definitive determination, but this study assumes it would be possible to extend this culvert under the railroad tracks and outlet it into the 24-inch pipe passing under Crescent Club Drive approximately 300 feet north of Hamill Road (see Figure 13 on page 14). Given the sizes of the box culvert and the pipe under Crescent Club Drive, it appears a detention pond would be needed between these two structures. A detailed drainage study to determine specific requirements would be needed as part of the design process for a grade separation.

The next potential area of environmental concern is the presence of threatened or endangered species within the proposed project's construction limits. The Tennessee Division of Natural Heritage lists some 19 "rare" species in the USGS Daisy and East Chattanooga Quadrangles as shown in Table 2. For additional details, see Appendix J. As noted in the introduction to this section, a detailed assessment by a qualified biologist would be necessary as part of the environmental document to determine if any of these species would be affected by a grade separation.

Table 2. Rare Species in the USGS Daisy & East Chattanooga Quadrangles

Category	Total Number	Federal Status "Listed Endangered"	State Status "Endangered"
Vascular Plant	9	0	4
Invertebrate Animal	3	2	2
Vertebrate Animal	7	0	2

Figure 10. Looking East at Detention Pond East of Old Godsey Ln

Figure 11. Looking East at Detention Pond East of Godsey Dr

Figure 12. Looking East at Outlet of 6'x3' Box Culvert

Figure 13. Looking South at Inlet of Pipe under Crescent Club Dr

The final component of the environmental overview was a search for evidence of any potential hazardous material sites within the proximity of the Hamill Road railroad crossing. No evidence of hazardous material sites, such as underground storage tanks, was observed during field visits. However, several buildings that could be affected by the proposed project were noted as having some potential for harboring hazardous materials, as shown in Table 3. The "Project Reference Point" (PRP) from which all distances are approximated in Table 3 is the center line of Hamill Road midway between the two railroad tracks.

Table 3. Potential Hazardous Material Sites

Site Number	Description	Location Relative to the PRP	Most Likely Hazards
1	Business: Center FOR TRADITIONAL MEDICINE	130' west, 20' north	Asbestos, other
2	Business: IMAGINE ARTISANS	120' east, 110' north	Asbestos, other
3	Block building	180' east, 110' north	Asbestos, other
4	Businesses: Volunteer Tape, Tutoring, Dance Stuff	260' east, 180' north	Asbestos, other
5	Business: Jeanne A. Scanland, M.D. PLASTIC SURGERY	650' west, 270' south	Medical waste
6	One-story frame residence	520' west, 250' south	Asbestos, household cleaners/solvents, motor fuels
7	One-story rock & frame residence	430' west, 230' south	Asbestos, household cleaners/solvents, motor fuels
8	One-story frame residence	320' west, 200' south	Asbestos, household cleaners/solvents, motor fuels
9	One-story brick residence	170' west, 170' south	Asbestos, household cleaners/solvents, motor fuels
10	Metal warehouse	160' east, 130' south	Asbestos, other
11	Business: Hamill Road Produce Market	340' east, 30' north	Asbestos, other

4. PRELIMINARY HISTORIC PROPERTIES REVIEW

The National Register of Historic Places (NRHP) lists 93 sites in Hamilton County (see Appendix K). None of these are near the Hamill Road railroad crossing. Field visits did not reveal any historically significant properties that would be affected by any of the planned improvement options.

5. IMPROVEMENT OPTIONS

As discussed in Section 1.1, the concept of a grade separation with Hamill Road passing over the railroad tracks was initially evaluated. Following the stakeholders' meeting, the concept of a grade separation with the railroad tracks passing over Hamill Road was added to the study. These two options are discussed in detail in the following sections in light of the preceding background information.

Table 4 on page 17, TDOT's "checklist of determinants for location study", provides some general context for the two "build" options. In this table, Option 1 is the concept of Hamill Road going over the railroad tracks and Option 2 is the concept of the railroad tracks passing over Hamill Road.

The typical section for both grade separation options includes four 11-foot lanes, a four-foot flush median, eight-foot shoulders, curb and gutter and five-foot sidewalks as shown in Figure 14. This section is compatible with the current configuration to the west and would improve Hamill Road eastward for pedestrians and bicyclists.

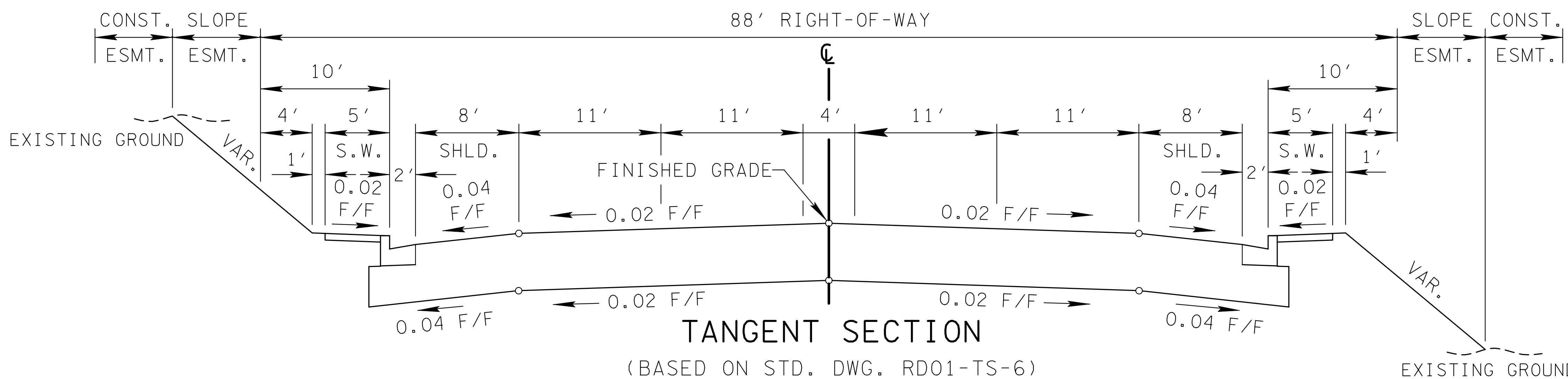
Table 4. Checklist of Determinants for Location Study

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

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

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	



TANGENT SECTION

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

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure 14.
Typical
Section

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

5.1 HAMILL ROAD OVER RAILROAD TRACKS (OPTION 1)

The first option considered to improve the Hamill Road railroad crossing was a grade separation, with Hamill Road going over the railroad tracks. A plan view and profile for this concept are given in Appendix L. On the west end, the four lanes shown in the typical section (see Figure 14) would transition back to the existing five lanes in the vicinity of Old Godsey Lane. On the east end, the four lanes shown in the typical section would transition back to the two existing lanes between Crescent Club Drive and Hampshire Place. It should be noted that this is the option preferred by Norfolk Southern as it would be the least disruptive to their operations.

This concept would do an excellent job of meeting the purpose and need for this project. It would provide improved response times for emergency vehicles and shorten travel times for vehicles evacuating the Sequoyah Nuclear Plant. Since vehicles would no longer be stopping for trains, it would also provide the environmental benefit of reducing pollutants from idling vehicles.

The projected total cost for construction of a bridge over the railroad tracks would be $12,348,200 as shown in Appendix M. Annual maintenance costs can be expected to be in line with the costs for a typical grade separation, and less than for the current at-grade crossing. It should be noted the design of this concept would require trade offs between right-of-way acquisition versus retaining walls in order to maximize access, minimize disruptions for land owners and minimize cost.

Consideration may be given to lowering the railroad tracks, perhaps three to six feet, thus lowering the bridge height and reducing the impact on adjacent property owners. The estimated cost for lowering the tracks in this manner would be $2,000,000. This could be cost beneficial if it significantly reduces the impact on the property owners.

Other advantages of a bridge on Hamill Road over the railroad tracks are: rear-end collisions may be reduced and bicyclists and pedestrians would have a safer facility. Some disadvantages of this concept include: construction activities would encroach into the 100-year flood plain, four homes and nine businesses might need to be relocated, other homes and businesses could have their access affected and the total construction cost is high.

The summary data for a bridge on Hamill Road over the railroad tracks are given in Table 5 on page 20.

Table 5. Summary Data Table--Hamill Road over Railroad (Option 1)

Hamill Road at Norfolk Southern Railroad
Hamilton County

From: Old Godsey Lane
To: Hampshire Place

Item	Existing	Hamill Rd over Railroad
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	Local	Local
Length (Miles)	0.4	0.4
Cross Section (Feet)	55 --> 24	55 --> 24
Present AADT (2011)	8030*	8030*
Future AADT (2031)	12720*	12720*
DHV (2031)	1399*	1399*
Percent Trucks	3 AADT, 2 DHV*	3 AADT, 2 DHV*
Estimated Right-of-way Acquisition (Acres)	N/A	10.10
Estimated Right-of-way Tracts Affected	N/A	28
Estimated Family Displacements	N/A	4
Estimated Business Displacements	N/A	9
Estimated Non-profit Displacements	N/A	0
Estimated Right-of-way Cost	N/A	$4,466,000
Estimated Utility Cost, Reimbursable	N/A	$385,000
Estimated Utility Cost, Non-reimbursable	N/A	$0
Estimated Construction Cost	N/A	$6,872,200
Estimated Preliminary Engineering Cost	N/A	$625,000
Total Estimated Project Cost	N/A	$12,348,200

* See Appendix E

5.2 RAILROAD TRACKS OVER HAMILL ROAD (OPTION 2)

Option 2, added after the stakeholders' meeting, would be to improve the Hamill Road railroad crossing with a grade separation, with the railroad tracks passing over Hamill Road. Plan views and profiles for this concept are given in Appendix N. The typical section would be the same as for Option 1, shown previously in Figure 14 and described in Section 5. On the west end, the four lanes shown in the typical section would transition to match the existing four lanes in the vicinity of Bradington Avenue. On the east end, the four lanes shown in the typical section would transition back to two lanes at the Crescent Club Drive intersection. Eastbound on Hamill Road, the right lane would be a "right turn only" lane onto Crescent Club Drive southbound. Traffic southbound on Crescent Club Drive would be able to turn freely into an additional lane westbound on Hamill Road. It should be noted that Option 2 is less desirable than Option 1 from Norfolk Southern's perspective as it would require the construction of temporary "runaround" tracks to keep trains in operation while the bridge was being constructed.

As with the previous option, Option 2 would do an excellent job of meeting the defined purpose and need. It would provide improved response times for emergency vehicles and shorten travel times for vehicles evacuating the Sequoyah Nuclear Plant. Since vehicles would no longer be stopping for trains, it would also provide the environmental benefit of reducing pollutants from idling vehicles.

The projected total cost for construction of a railroad bridge over Hamill Road would be $12,110,700 as shown in Appendix O. Annual maintenance costs can be expected to be in line with the costs for a typical grade separation, and less than for the current at-grade crossing. It appears that construction costs may be somewhat higher than for Option 1, but right-of-way costs would be lower since fewer homes and businesses would be displaced.

Other advantages of a railroad bridge over Hamill Road are the same as for Option 1: rear-end collisions may be reduced and bicyclists and pedestrians would have a safer facility. Some disadvantages of this concept include: construction activities would encroach into the 100-year flood plain, two homes and four businesses might need to be relocated and other homes and businesses could have their access affected.

The summary data for a railroad bridge over Hamill Road are given in Table 6 on page 22.

Table 6. Summary Data Table--Railroad over Hamill Road (Option 2)

Hamill Road at Norfolk Southern Railroad
Hamilton County

From: Old Godsey Lane
To: Crescent Club Drive

Item	Existing	Railroad over Hamill Rd
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	Local	Local
Length (Miles)	0.3	0.3
Cross Section (Feet)	55 --> 24	55 --> 48
Present AADT (2011)	8030*	8030*
Future AADT (2031)	12720*	12720*
DHV (2031)	1399*	1399*
Percent Trucks	3 AADT, 2 DHV*	3 AADT, 2 DHV*
Estimated Right-of-way Acquisition (Acres)	N/A	11.69
Estimated Right-of-way Tracts Affected	N/A	47
Estimated Family Displacements	N/A	2
Estimated Business Displacements	N/A	4
Estimated Non-profit Displacements	N/A	0
Estimated Right-of-way Cost	N/A	$1,838,000
Estimated Utility Cost, Reimbursable	N/A	$274,000
Estimated Utility Cost, Non-reimbursable	N/A	$0
Estimated Construction Cost	N/A	$9,164,700
Estimated Preliminary Engineering Cost	N/A	$834,000
Total Estimated Project Cost	N/A	$12,110,700

* See Appendix E

6. ASSESSMENT OF OPTIONS

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

6.1 GUIDING PRINCIPLE #1

The first guiding principle is to "Preserve and Manage the Existing Transportation System". The no-build option does not require any side streets to be closed or relocated, thus preserving the existing street system, but does nothing to manage the situation when a train is blocking the crossing. Either of the grade separation options would entail changes to the existing street network, but since Hamill Road and the railroad tracks would both follow their current horizontal alignments, those transportation links would be preserved. However, the difference between the two grade separation options is in their accommodation of existing cross streets. Having Hamill Road go over the railroad tracks would necessitate removing and/or changing at least some of the cross street connections, thus changing the existing local street network. Having the railroad tracks pass over Hamill Road, on the other hand, would mean that the cross street connections could be maintained in their current locations, maintaining the existing street network.

6.2 GUIDING PRINCIPLE #2

The second guiding principle is to "Move a Growing, Diverse and Active Population." With the railroad crossing being blocked periodically every day, the no-build option would do a poor job of moving any population. Either of the build options would serve well on this principle, as they would not only keep vehicular traffic flowing, but would also improve the usability of Hamill Road for bicyclists and extend the sidewalks eastward for the benefit of pedestrians.

6.3 GUIDING PRINCIPLE #3

The third guiding principle is to "Support the State's Economy." All of the options receive mixed reviews on this principle. The no-build option would do the best job of preserving the existing businesses in the vicinity of the crossing. However, it would not enhance the desirability of housing east of the railroad or improve access for customers east of the railroad who might want to shop in the vicinity of the Hamill Road/State Route 153 intersection. Either of the grade

separation options would enhance the desirability of housing east of the railroad and/or improve access for customers east of the railroad who might want to shop in the vicinity of the Hamill Road/State Route 153 intersection. However, both of the build options would have an adverse impact on some existing businesses near the crossing. This impact would be more significant if Hamill Road were to go over the railroad tracks.

6.4 GUIDING PRINCIPLE #4

The fourth guiding principle is to "Maximize Safety and Security." The no-build option would fare poorly on this principle, as there is a risk of serious crashes between vehicles and trains, and there have been a number of rear-end collisions in recent years associated with the at-grade crossing. Furthermore, there could be issues with congestion in the event of an emergency at the Sequoyah Nuclear Plant.

Either of the grade separation options would do an excellent job of maximizing safety of the crossing. However, since having Hamill Road go over the railroad tracks would almost certainly eliminate some of the cross street connections, this configuration might be marginally safer than having the railroad tracks pass over Hamill Road, as intersections of any kind are locations of increased vehicular conflict. Both of the grade separation options should maximize traffic flow in the event of an emergency evacuation of the Sequoyah Nuclear Plant.

6.5 GUIDING PRINCIPLE #5

The fifth guiding principle is to "Build Partnerships for Livable Communities." A major impetus behind this study is the advocacy of local officials who have a strong desire to improve the safety of the crossing and provide convenient routes for emergency vehicles. This was abundantly clear from comments made at the "stakeholders meeting" in Chattanooga on September 6, 2007. Thus either of the grade separation options appears to have substantial local support and could offer a variety of benefits to the community in terms of providing a healthier and safer environment in which to live and work.

6.6 GUIDING PRINCIPLE #6

The sixth guiding principle is to "Promote Stewardship of the Environment". The no-build option would do nothing to mitigate the issue of emissions from idling vehicles. Either of the grade

separation options would reduce emissions. Construction of either of the grade separation options would contain some risk of environmental impacts, most notably in areas of encroachment into the 100-year flood plain. This risk can be minimized through the design and implementation of a comprehensive storm water pollution prevention plan.

6.7 GUIDING PRINCIPLE #7

The seventh guiding principle is to "Emphasize Financial Responsibility". To achieve that end, this Transportation Planning Report (TPR) has been prepared in accordance with the goals and objectives set forth in Tennessee's Long Range Transportation Plan (LRTP).

In achieving the LRTP's goal of providing responsibility, accountability and sustainability in the expenditure of transportation funds, this planning document includes the project's estimated cost. These cost estimates are important decision tools when evaluating and maximizing the use of available transportation resources.

Furthermore, the historic, existing and projected project data documented in the TPR is instrumental in achieving the objective of selecting and programming transportation projects based on regional needs and effectiveness.

7. SUMMARY

The study described in this report looked at the "no-build" option and at two options for a grade separation on Hamill Road at the Norfolk Southern railroad tracks (see Table 7 on page 26). The merits and drawbacks of the two build options were considered in relation to each other and also in relation to the no-build option (that is, doing nothing to the existing crossing). The no-build option performs the worst in terms of meeting the project's defined purpose and need of reducing delay and alleviating congestion at the railroad crossing and minimizing the adverse environmental impacts of longer vehicle trips and vehicles idling for extended periods waiting for trains to clear the crossing.

Either of the grade separation options would serve quite well in terms of meeting the project's purpose and need. In fact, there are relatively small differences between the two grade separation options. Having Hamill Road go over the railroad tracks (Option 1) is preferred by Norfolk Southern, but could be expected to have more impact on homes and businesses near

Table 7. Comparison of Options

Option	Cost	Benefit
No-build	$0 for construction Slow access for emergency vehicles Congestion on Hixson street network Tons of emissions annually from idling vehicles Unfriendly facility for bicycles and pedestrians	Best access for existing homes and businesses
1—Hamill Rd over RR	$12.3M for construction 4 family displacements 9 business displacements	Quick access for emergency vehicles by removing at-grade crossing Congestion mitigation in event of emergency evacuation Reduced emissions from idling vehicles Safest option (fewest cross street connections) Bicycle and pedestrian friendly facility
2—RR over Hamill Rd	$12.1M for construction 2 family displacements 4 business displacements	Quick access for emergency vehicles by removing at-grade crossing Congestion mitigation in event of emergency evacuation Reduced emissions from idling vehicles Good access to remaining homes and businesses Bicycle and pedestrian friendly facility

the crossing, and maintaining access could be more difficult. Having the railroad tracks pass over Hamill Road (Option 2) would be more difficult from a construction standpoint, due in large part to the proximity of the bridge on State Route 153 over the railroad tracks. As demonstrated by this report, a grade-separated railroad crossing could be implemented for the benefit of the citizens of Hamilton County and the State of Tennessee.

APPENDIX A

EXCERPT FROM *THE IMPACT OF BLOCKED HIGHWAY/RAIL GRADE CROSSINGS ON EMERGENCY RESPONSE SERVICES*

to use one of the three overpasses available if trains block highway-railroad grade crossings.

The proposed solution to this problem is the construction of 16 overpasses that would provide access to all areas at any time. This tactic is expensive and complex and will take a long time to complete. For this reason, an alternative, short-term approach is being considered that makes use of technology developed at the Texas Transportation Institute (TTI). Doppler radars, video cameras and wireless technology will be used to inform first responders about blocked crossings and the best alternative routes (see Houston in the Communications section of the Appendix).

3. Chattanooga, TN

Chattanooga (population 156,000) is located in southeastern Tennessee in Hamilton County. It is on a bend in the Tennessee River between Lookout and Signal Mountains and at the junction of Interstates 75, 24 and 59. Four railroads move traffic through Chattanooga. The Norfolk Southern Railroad (NS) runs two lines through the city; from north to south and from east to west, the CSX railroad enters the city from the west and departs to the south, with a branch to the east. The Chattanooga Belt Railroad runs from east to west through the city, while the Chattanooga and Chickamauga Railroad runs south out of the city.

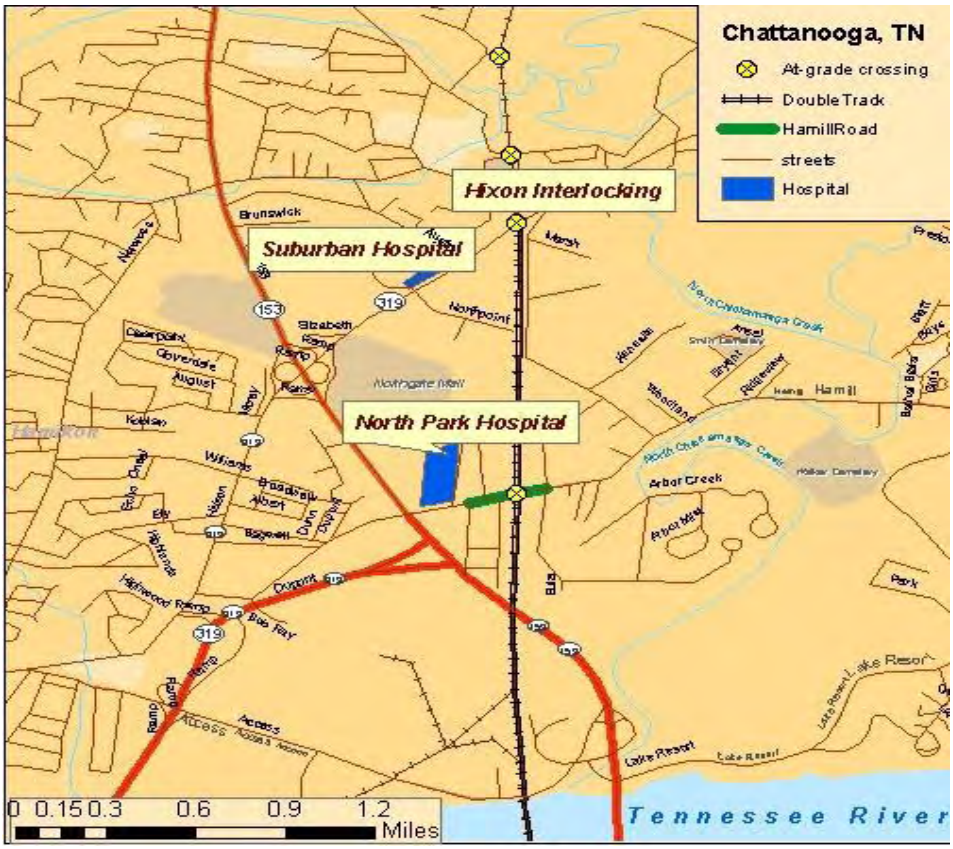
The Hamill Road Crossing is near the northern edge of Chattanooga on NS track. Between 36 and 44 trains and over 19,000 highway vehicles pass over the highway-railroad crossing each day. Auto traffic at this crossing will most likely increase due to considerable commercial and real estate development in the area.

The Hamill Road crossing is on a double tracked rail line. One mile north, the double tracks converge to single track at the Hixon Interlocking. Northbound trains sometimes have to slow down at the Hamill Road crossing to allow oncoming southbound trains to pass through the interlocking. Some southbound trains have to slow down at the crossing to drop off crews or for switching activity at Norfolk Southern DeButts Rail Yard, which is 1.4 miles to the south and just over the Tennessee River Bridge. Slow north- and south-bound trains can occupy the crossing one right after another. As a result, the Hamill Road crossing is frequently blocked from 30-55 minutes at a time. This can cause auto traffic to back up until it blocks Highway 153, one-quarter mile away, which is a designated evacuation route for a Tennessee Valley Authority nuclear plant and serves as a major traffic artery for school buses, fire trucks, and ambulances. When Highway 153 is blocked by traffic, the alternative route to cross the Tennessee River to the south can take an additional 10-15 minutes in travel time.

The city police and fire departments report the Hamill Road crossing has caused serious delays for emergency vehicles. The hospital and fire station are on the west side of the railroad tracks and about 5,000 people live to the east. The entrance to the North Park Hospital, an acute care facility, is on Hamill Road, one-quarter of a mile southwest of the crossing. Emergency vehicles and patients are delayed when the crossing is blocked.

Approaching from the east, emergency vehicles can detour about a mile to the north where there is a grade separated crossing, but that results in a delay of several minutes and then contending with the backup on the other side crossing to reach the Hospital. City officials and the Norfolk Southern Railroad have received numerous complaints from the public concerning this crossing and are working together to develop a solution. Right now, the city of Chattanooga is widening Hamill Road from two to four lanes up to the crossing so that traffic does not back up onto Highway 153. The Hamilton County Rail Authority plans to conduct a feasibility study to evaluate a highway rail grade separation.

Map 3A



***Source**: FRA Office of Policy and Program Development*

C. Public/Private Investments

1. Greenville, NC

The city of Greenville is located in eastern North Carolina; the city and surrounding metropolitan area have a total population of around 142,500. Greenville is intersected by the railroad lines of Norfolk Southern (NS) running east-west and CSX Corporation going north-south (see Map 4A, pg. 15). Railroad operations block local roads, causing delays in the vehicle flow between southeast residential neighborhoods and destinations in the northwest of the city. Local streets are blocked during the movement of freight

APPENDIX B

SEQUOYAH NUCLEAR PLANT EVACUATION ROUTES

SEQUOYAH EVACUATION MAP AND ROUTES

If an evacuation is ordered, it is important that you follow the evacuation routes shown on the map.

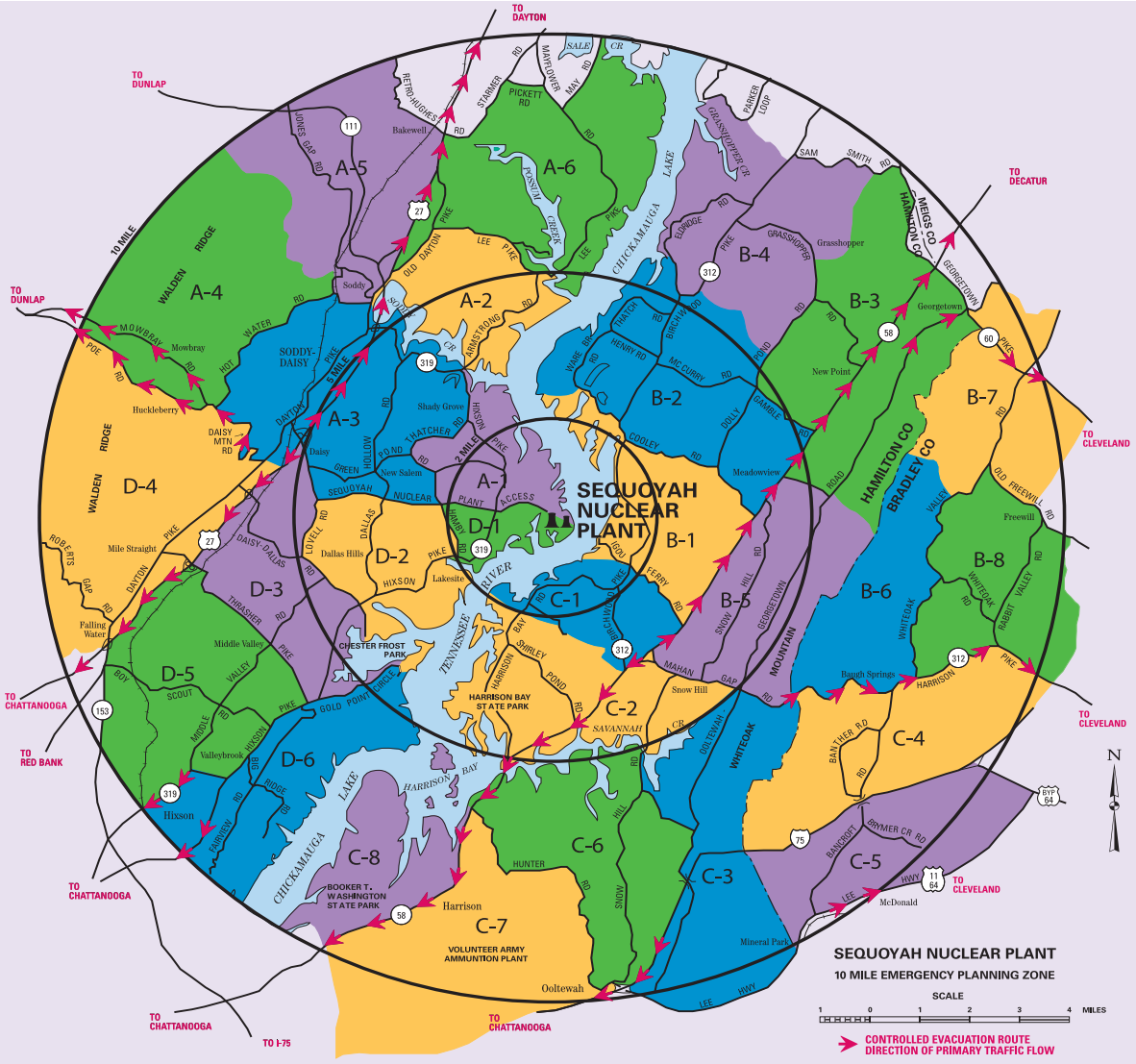
The 10-mile Emergency Planning Zone (EPZ) is divided into sectors. For quick reference, locate the sector in which you live or work and write it in the space below.

The evacuation routes for each sector are described on pages 4 and 5. If an evacuation is ordered, locate the number for your sector and follow that route. Emergency workers will patrol these roads and will provide any aid or guidance you need.

Note: Individuals in doubt as to sector of residence or work should contact their local Emergency Management Agency.

MY SECTOR NUMBER IS:

HOME	WORK



APPENDIX C

AERIAL VIEW OF LANES ON HAMILL ROAD

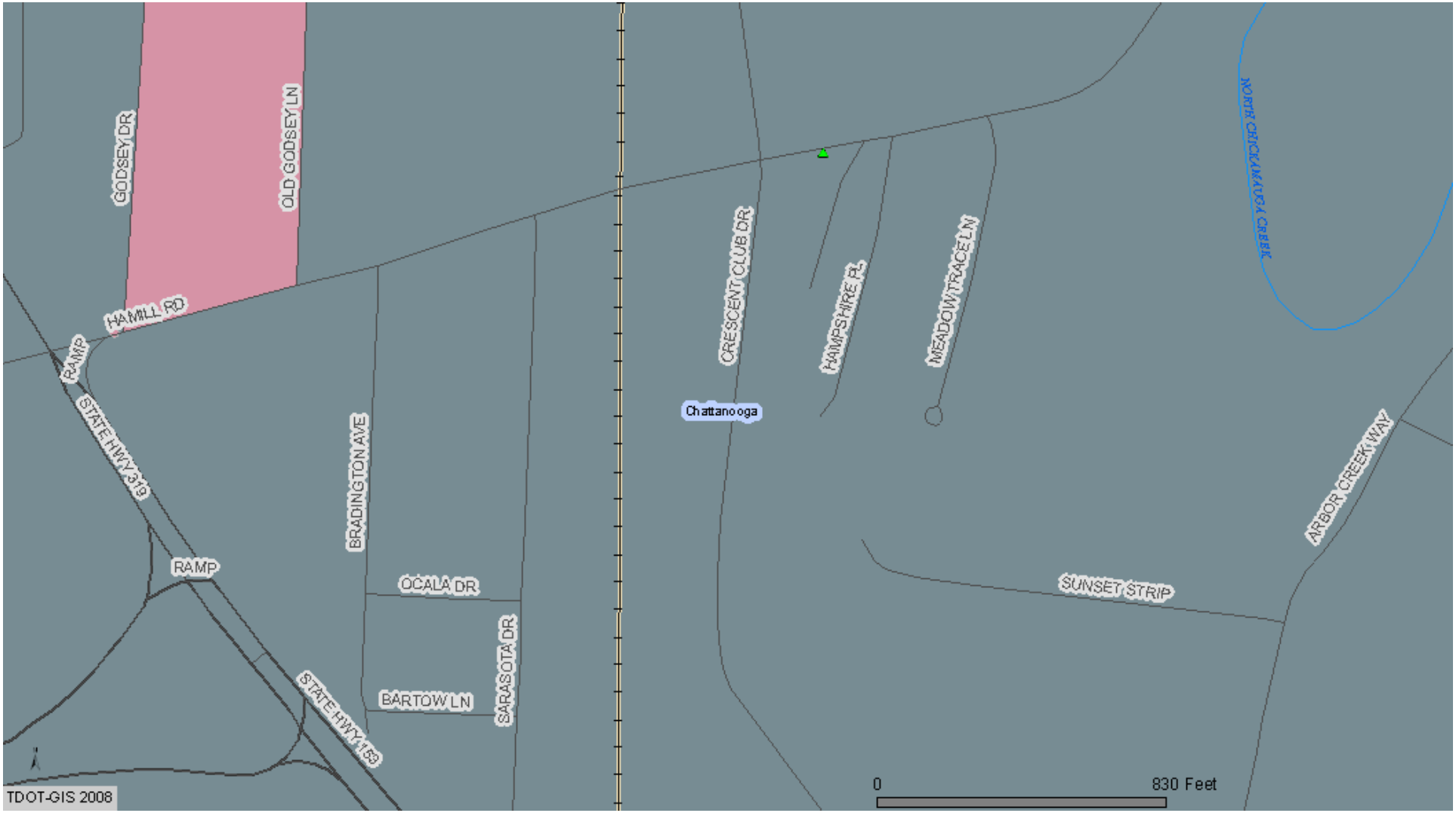
From maps.live.com, 8/25/08

APPENDIX D

AADT AT TDOT COUNT STATION 000291

Rec	Station Number	Year	Annual Average Daily Count
1	000291	2008	10768
2	000291	2007	10815
3	000291	2006	10885
4	000291	2005	11924
5	000291	2004	11326
6	000291	2003	10930
7	000291	2002	11308
8	000291	2001	10931
9	000291	2000	10959
10	000291	1999	9816
11	000291	1998	10307
12	000291	1997	14865
13	000291	1996	10218
14	000291	1995	9997
15	000291	1994	8987
16	000291	1993	8210
17	000291	1992	7519
18	000291	1991	10224
19	000291	1990	10528
20	000291	1989	9387
21	000291	1988	10951
22	000291	1987	9224
23	000291	1986	8017
24	000291	1985	8840

From http://ww3.tdot.state.tn.us/TrafficHistory/template/viewer.htm?co=33 on 8/27/08.


GODSEY DR
OLD GODSEY LN
HAMILL RD
RAMP
STATE HWY 319
RAMP
BRADINGTON AVE
OCALA DR
SARASOTA DR
BARTOW LN
STATE HWY 153
CRESCENT CLUB DR
HAMPSHIRE PL
MEADOW TRACE LN
Chattanooga
NORTH CHICKAMAUGA CREEK
ARBOR CREEK WAY
SUNSET STRIP
TDOT-GIS 2008
0
830 Feet

APPENDIX E

TRAFFIC PROJECTIONS FOR HAMILL ROAD AT RR CROSSING

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: _____ ROUTE: HAMILL ROAD [4133]
COUNTY: HAMILTON CITY: CHATTANOOGA
PROJECT PIN NUMBER: _____
PROJECT DESCRIPTION: BRIDGE AND APPROACHES OVER SOUTHERN RAILROAD @ L.M. 1.20.

DIVISION REQUESTING:

MAINTENANCE	☐	PAVEMENT DESIGN	☐
PLANNING	☒	STRUCTURES	☐
PROG. DEVELOPMENT & ADM.	☐	SURVEY & DESIGN	☐
PUBLIC TRANS. & AERO.	☐	TRAFFIC SIGNAL DESIGN	☐
		OTHER _____	☐

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____
PROJECTED LETTING DATE: _____

TRAFFIC ASSIGNMENT:

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
8,030	2011	12,720	1399	11	2031	65-35	2	3		

REQUESTED BY: NAME TERRY GLADDEN DATE 5-31-07
DIVISION PLANNING
ADDRESS 900 J. K. POLK BUILDING
NASHVILLE TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 7-19-07
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: BILL HART Billy Hart DATE 7-19-07
TRANSPORTATION MANAGER 2
SUITE 900, JAMES K. POLK BUILDING

RECEIVED
JUL 23 '07
V&A

COMMENTS:

RAILROAD CROSSING AT GRADE TO BE REPLACED BY BRIDGE.

THIS TRAFFIC BASED ON A 2006 SPECIAL BRIDGE COUNT. FUTURE TRAFFIC BASED ON GROWTH RATE FROM THE CHATTANOOGA COMPUTER ASSIGNMENT MODEL.

EEW		
MKW		
DAY		
SEM		
DMS		

Cc: MR. BILL AMDERSON

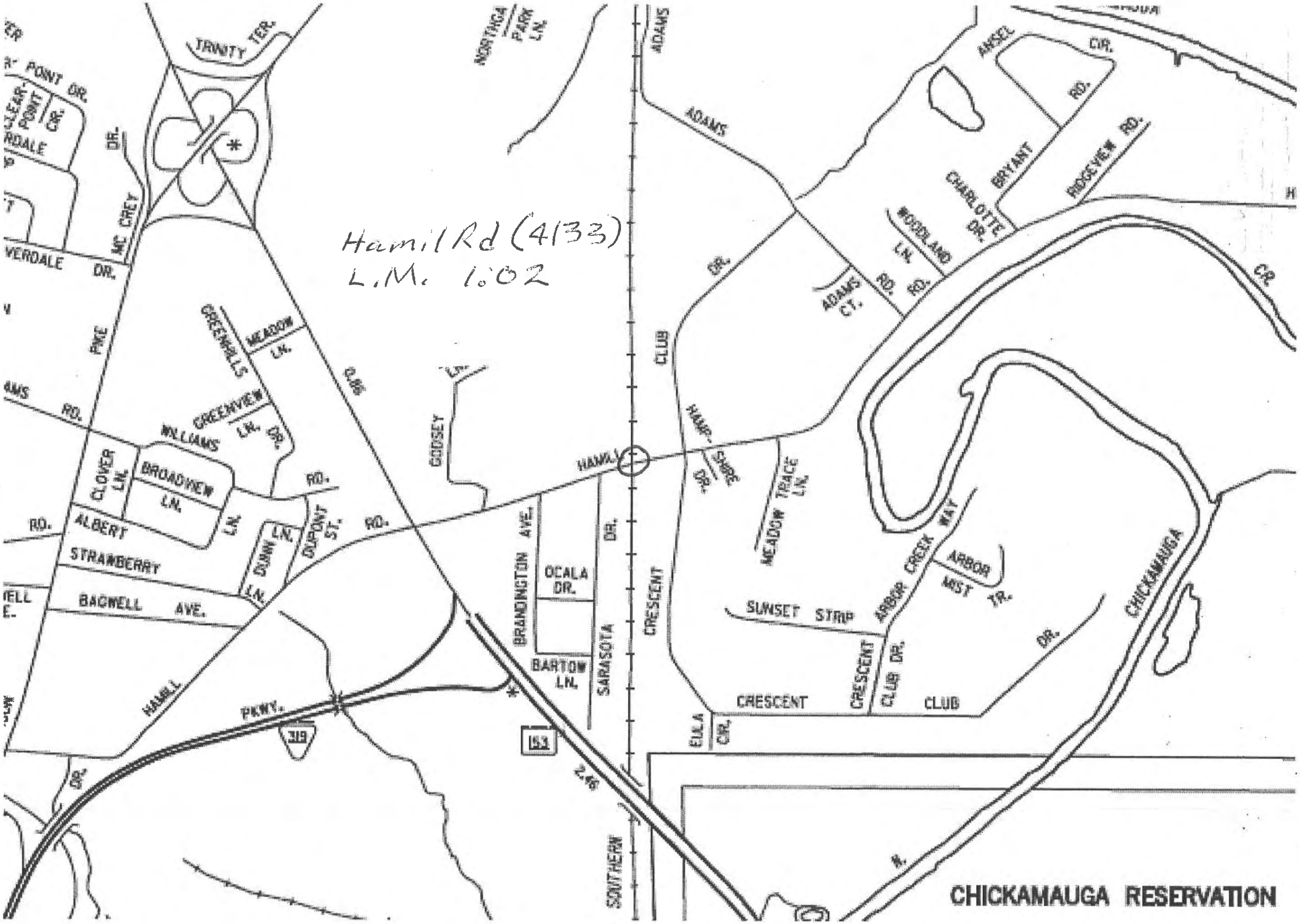
DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR AADT's OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

File 670103.17

(REV. 11/6/06)

841-993J


Hamil Rd (4133)
L.M. 1.02
TRINITY TER.
NORTHGA PARK LN.
ADAMS
ANSEL
CIR.
RD.
BRYANT
RIDGEVIEW RD.
CHARLOTTE DR.
WOODLAND LN.
ADAMS CT.
RD.
RD.
DR.
CLUB
HAMPSHIRE DR.
MEADOW TRACE LN.
CR.
MC CREY
DR.
VERDALE DR.
PIKE
GREENHILLS
MEADOW LN.
GREENVIEW LN.
DR.
WILLIAMS
RD.
CLOVER LN.
BROADVIEW LN.
LN.
ALBERT
STRAWBERRY
BAGWELL AVE.
DUNN LN.
DUPONT ST.
RD.
GODSEY
HAMIL
BRANDINGTON AVE.
OCALA DR.
BARTOW LN.
SARASOTA
DR.
CRESCENT
CREEK
WAY
ARBOR MIST TR.
SUNSET STRIP
CRESCENT CLUB DR.
CRESCENT
CLUB
DR.
CHICKAMAUGA
EULA CIR.
HAMILL
PKWY.
319
153
2.46
SOUTHERN
CHICKAMAUGA RESERVATION

APPENDIX F

CRASH DATA, 2003 THROUGH 2006

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION
SAFETY PLANNING SECTION

CRASH DATA REQUEST

Requested by: Name: Terry Gladden Date: 5/31/07
Division: Project Planning
Address: TDOT Hq Telephone No.: 253-2433
Project No.:
Location: Region: 2 County: Hamilton City: Chattanooga
Route: Hamill Rd FAU 4133
Location on Route: area of RR Norfolk Southern

Beginning Log Mile: _____ Ending Log Mile: _____

MAP SHOWING LOCATION MUST BE ATTACHED

TYPE OF CRASH DATA REQUESTED

	CHECK Yes	CHECK No	TIME PERIOD OR YEARS REQUESTED (3 Years or Specify)
Crash Listing:	☒	☐	
Collision Diagram:	☐	☒	
Crash Rates:	☒	☐	
High Hazard Rank:	☐	☐	
Update Previous Request:	☐	☐	
Special Request:	☐	☐	Describe Specifics:

Request Analyzed By: D Hay Date: 7-12-07

Reviewed By: David Lollar Date: 7/16/07
David Lollar, Transportation Specialist 2

Harold Dilmore Date: 7/17/07
Harold Dilmore, Transportation Manager 1

Bill Anderson Date: 7/18/07
Bill Anderson, Transportation Manager 2

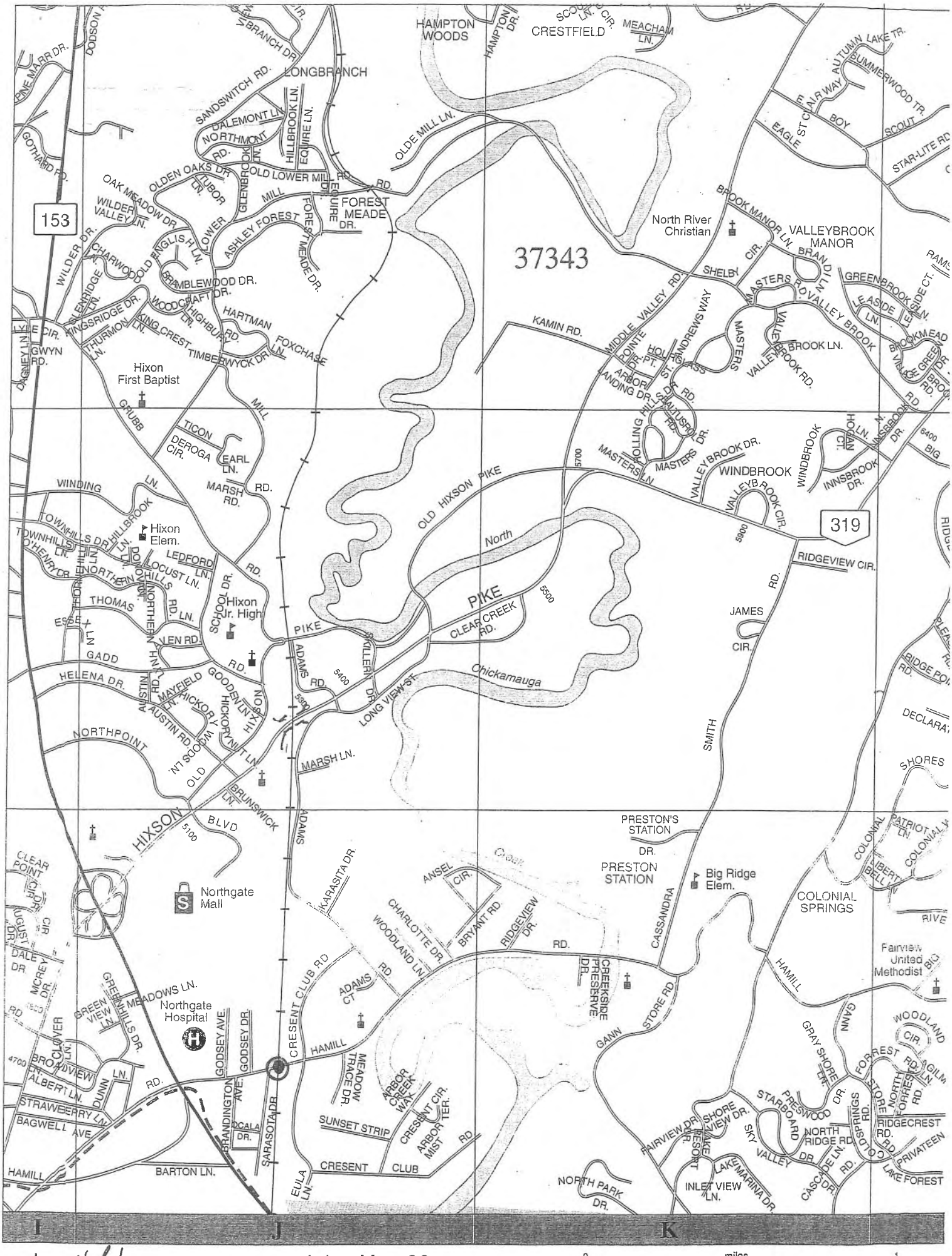
RECEIVED
JUL 23 '07
V&A

Comments:

EEW		
MKW		
DAY		
SEM		
JMS		

File 670103.17

(REV. 09/05/06)


37343
153
319
HAMPTON WOODS
CRESTFIELD
MEACHAM LN.
LONGBRANCH
SANDSWITCH RD.
DALEMONT LN.
NORTHMONT RD.
HILLBROOK LN.
EQUIRE LN.
OLDE MILL LN.
OLD LOWER MILL RD.
OLDEN OAKS DR
TUDOR LN.
GLENBROOK LN.
FOREST MEADE DR.
WILDER VALLEY LN.
OAK MEADOW DR.
WILDER DR.
CHARWOOD LN.
ENGLISH LN.
ASHLEY FOREST
BRAMBLEWOOD DR.
KINGSRIDGE DR.
WOODCRAFT DR.
HIGHBURY RD.
HARTMAN
FOXCHASE
KING CREST LN.
THURMON LN.
TIMBERWYCK DR.
GWYN RD.
Hixon First Baptist
GRUBB
MILL
TICON
DEROGA CIR.
EARL LN.
MARSH RD.
WINDING LN.
TOWNHILLS DR.
HILLBROOK LN.
O'HENRY DR.
Hixon Elem.
LEDFORD LN.
LOCUST LN.
NORTHERN HILLS DR.
THOMAS RD.
ESSEX LN.
ALLEN RD.
SCHOOL DR.
Hixon Jr. High
GADD RD.
HELENA DR.
MAYFIELD LN.
AUSTIN RD.
GOODEN LN.
HICKORY NUT LN.
WOODS LN.
NORTHPOINT
OLD
BRUNSWICK LN.
MARSH LN.
HIXSON BLVD
5100
CLEAR POINT CIR.
AUGUST DR.
DALEY DR
MCREY DR.
GREEN VIEW LN.
MEADOWS LN.
Northgate Mall
Northgate Hospital
CLOVER LN.
BROADVIEW LN.
ALBERT LN.
DUNN RD.
STRAWBERRY LN.
BAGWELL AVE.
HAMILL
BARTON LN.
GODSEY AVE
GODSEY DR.
BRANDINGTON AVE
OCALA DR.
SARASOTA DR
CRESENT CLUB RD
ADAMS RD
ADAMS CT
MEADOW TRACE DR.
ARBOR CREEK WAY
CRESCENT CIR.
ARBOR TER.
SUNSET STRIP
CRESENT CLUB RD
EULA LN
KARASITA DR
ANSEL CIR.
CHARLOTTE DR.
WOODLAND LN
BRYANT RD.
RIDGEVIEW DR.
CREEKSIDE PRESERVE DR.
PRESTON'S STATION DR.
PRESTON STATION
CASSANDRA
Big Ridge Elem.
COLONIAL SPRINGS
HAMILL
STORE RD
GANN
Fairview United Methodist
WOODLAND CIR.
GRAY SHORE DR.
FORREST RD.
NORTH STORE RD.
RIDGECREST RD.
PRIVATEEN
LAKE FOREST
NORTH RIDGE RD
SKY VALLEY DR
STARBOARD
PRESWOOD
SHORE VIEW DR.
FAIRVIEW DR.
RESORT
LAKE MARINA DR.
INLET VIEW LN.
NORTH PARK DR.
CASCADE LN.
COLLINS SPRINGS RD.
North River Christian
BROOK MANOR LN.
VALLEYBROOK MANOR
SHELBY CIR.
BRANDON
GREENBROOK LN.
LEASIDE CT.
LEASIDE LN.
BROOKMEAD
VALLEY GREEN DR.
MASTERS RD.
VALLEY BROOK
VALLEY BROOK LN.
VALLEY BROOK RD.
MASTERS
ST. ANDREWS WAY
MIDDLE VALLEY RD.
KAMIN RD.
POINTE DR.
HOLE PT.
PASS
ARBOR LANDING DR.
HILLS DR.
AUTUMN LAKE TR.
SUMMERWOOD TR.
E. CLAIR WAY
BOY SCOUT
EAGLE
STAR-LITE RD
RAMS
HOGAN CT.
N. INNSBROOK DR.
INNSBROOK DR.
WINDBROOK
WINDBROOK CIR.
VALLEYBROOK DR.
MASTERS LN.
ROLLING HILLS DR.
AUTUMN RD.
OLD HIXSON PIKE
5700
5900
6400
BIG
North
PIKE
CLEAR CREEK RD.
5500
RIDGEVIEW CIR.
JAMES CIR.
SMITH
Chickamauga
LONG VIEW ST.
KILLARN DR.
5400
5300
DECLARA
SHORES
RIDGE RD.
I
J
K
0
miles
1
Hamill Rd.
841-9935 Sou
Joins Map 30

MEMO

MR. RICK BEALS
TRANSPORTATION MANAGER
TENNESSEE DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE

MR. BEALS

THE HAMILL ROAD RAILROAD CROSSING, IS ON THE NORFOLK SOUTHERN RAILWAY IN CHATTANOOGA, TN. HAMILL ROAD CROSSES HIGHWAY 153 IN HAMILTON COUNTY, TENNESSEE. THERE HAVE BEEN NUMEROUS COMPLAINTS OVER THE YEARS ABOUT TRAINS BLOCKING THIS CROSSING, AND CARS HAVING TO WAIT, CAUSING TRAFFIC PROBLEMS ALL THE WAY BACK ONTO HIGHWAY 153.

THIS RAILROAD CROSSING IS APPROXIMATELY 1/4 MILE EAST OF HIGHWAY 153. THIS CROSSING IS ALSO 1.2 MILES NORTH OF THE TENNESSEE RIVER BRIDGE, WITH THE DEBUTTS YARD LIMITS STARTING JUST OVER THE BRIDGE, AT TIMES TRAINS ARE HELD OUT OF THE YARD, ALLOWING A NORTH BOUND TRAIN TO DEPART THE YARD, THIS REQUIRES CONSIDERABLE TIME, WHICH IN TURN LEAVES THE TRAIN BLOCKING THE HAMILL ROAD CROSSING. A DETOUR AROUND THIS BLOCKED CROSSING REQUIRES A 2.4 MILE TRIP USING BACK ROADS AND HIGHWAY HIXSON PIKE, THEN TURNING BACK SOUTH ON HIGHWAY 153. (PICTURES ENCLOSED)

THE NORFOLK SOUTHERN OPERATES BETWEEN 36 TO 44 TRAINS IN A 24 HOURS PERIOD OVER THIS LINE. THE CITY OF CHATTANOOGA IS WIDENING HAMILL ROAD TO FOUR LANES TO HELP WITH TRAFFIC PROBLEMS, BUT TRAINS BLOCKING THIS CROSSING COULD STILL BE A PROBLEM IN THE FUTURE.

SINCERELY,

BRYSON JOHNSON

TENNESSEE DEPARTMENT OF TRANSPORTATION

COUNTY	= Hamilton County	Date:	7/12/2007
Route	= FAU 4133 Hamill Rd		
Location	= Area near Norfolk Southern RR crossing		
Highway Type	= Two lane urban		
FUNCTIONAL CLAS	Urban minor arterial		
DATA YEARS	= 2003 - 2005 RR crossing related		
ADT YEARS USED=	2006 Trims		
COMMENTS	= Two possible crossing related crashes happened in 2006.		
	None were incapacitating injury crashes.		
ANALYZED BY	= DH		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.98	1.18	0.20	10,890	2,178
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.20	10,890	2,178

INTERSECTION

Log Mile = 0

Leg		Traffic AADT
North	=	0
East	=	0
South	=	0
West	=	0
Entering AADT	=	0

2006 Trims

Two Lane Urban
2003 - 2005

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	5	0	0	0	0
No. of Years	=	3				
SW avg. rate	=	3.094	0.014	0.079	0.093	0.746
03-05 S/W Rates						
Exposure (E)	=	2.3849				
Crash Rate (A)	=	2.097	0.000	0.000	0.000	0.000
Critical Rate (C)	=	5.954				
Severity Index (SI)	=	0.0000				
Actual Rate/SW Average	=	0.68	0.00	0.00	0.00	0.00
Ratio of A/C	=	0.35				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

Hamilton County
Hamill Rd
FAU 4133
Area of RR crossing.
2003 to present

2003 had three possible rail road related crashes. All were non injury.
2004 had one rail road related crash. It was non injury.
2005 had one crash that may have been rail road related . It was non injury.
2006 had two crashes possibly related to the rail road. One was incapacitating injury.

The railroad crossing may have contributed to seven crashes out of twenty two crashes from log mile .98 to log mile 1.18 on either side of the track.
Checked Hamill Rd between SR 153 and the RR crossing but log mile .98 was the point of the first crash to mention the RR crossing.
Many of the crashes between SR 153 occurred in the area of the Hospital and medical center.

Of the seven crashes:
Two of the were traveling toward the crossing , mentioned traffic as contributing factor but didn't mention the crossing.

Three mentioned the contributing factor was caused by train at the crossing causing traffic backup.

One crash showed traffic at the crossing but didn't show train .

One crash occurred when a west bound vehicle with a trailer went across the track and the trailer disconnected. The trailer then struck an east bound vehicle head on.

ROUTE FEATURE DESCRIPTION LISTING

HAMILTON County - 04133

COUNTY: HAMILTON **COUNTY NO.** 33

ROUTE: 04133 **SPECIAL CASE:** None **CTY SEQ:** 1

LOG MILE	ITEM CODE	ROUTE FEATURE	DESC CODE
0.700	9	TRAFFIC SIGNAL / SPEED LIMIT 40 MPH	905
0.700	3	SR-153 RT. & LT.	310
0.830	5	E890 (GODSEY LN.) LT.	530
0.890	5	E893 (BRADINGTON AV.) RT.	520
0.980	5	E894 (SARASOTA DR.) RT.	520
1.020	6	GRADE CROSSING [841993J]: NORFOLK-SOUTHERN RWY.	610
1.100	5	E897 (CRESCENT CLUB DR.) RT. & LT.	510
1.220	5	E695 (MEADOW TRACE LN.) RT.	520
1.300	4	FCU-4419 (PROPOSED) RT. & LT.	410
1.500	5	E898 (ADAMS RD.) LT.	530

County	Route	Log Mile	Date of Crash	Time of	Total Killed	Total Inj	Type of Crash	Location	Total Veh	Driver Actions	Manner of First	Vehicle Maneuver	Vehicle Going	Case Number	
HAMILTON	04133	0.980	06/17/2005	800	0	0	Prop Damage (over)	AT AN INTERSECTION	2	No Contributing Actions	Angle	Right Turn to Street	SOUTH	7694774	
HAMILTON	04133	0.980	07/12/2003	1935	0	0	Prop Damage (over)	AT AN INTERSECTION	1	Following Improperly	Rear-End	Going Straight	EAST	8750478	Traffic Unknown
HAMILTON	04133	0.980	03/22/2005	5	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Failure to Yield Right of Way	Angle	Left Turn to Street	EAST	9649628	
HAMILTON	04133	1.000	10/31/2003	1005	0	1	Non-Incap Injury	ALONG ROADWAY	3	Following Improperly	Rear-End	Going Straight	WEST	8534467	
HAMILTON	04133	1.000	08/17/2006	855	0	2	Non-Incap Injury	ALONG ROADWAY	3	Following Improperly	Rear-End	Slowing or Stopped Other	WEST	9866830	Hospital
HAMILTON	04133	1.030	09/26/2005	840	0	0	Prop Damage (over)	ALONG ROADWAY	2	Failure to Yield Right of Way	Angle	Left Turn to Private Drive		9035293	Medical Center
HAMILTON	04133	1.100	08/19/2003	705	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Reckless or Negligent Driving	Angle	Going Straight	EAST	8198296	Traffic Train
HAMILTON	04133	1.100	04/24/2003	826	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Following Improperly	Rear-End	Going Straight	NORTH	8210946	
HAMILTON	04133	1.100	09/07/2004	1527	0	2	Non-Incap Injury	AT AN INTERSECTION	2	Failure to Yield Right of Way	Angle	Left Turn to Street	NORTH	8649271	
HAMILTON	04133	1.100	07/18/2003	1710	0	1	Non-Incap Injury	AT AN INTERSECTION	2	Failure to Yield Right of Way	Angle	Going Straight	SOUTH	8748747	
HAMILTON	04133	1.100	03/24/2006	1251	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Failure to Yield Right of Way	Angle	Going Straight	SOUTH	9275269	
HAMILTON	04133	1.100	09/11/2006	1539	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Following Improperly	Rear-End	Going Straight	WEST	9275396	Traffic Train
HAMILTON	04133	1.100	03/12/2005	1640			Prop Damage (over)	AT AN INTERSECTION		No Contributing Actions	Head-On	Going Straight	WEST	9645347	
HAMILTON	04133	1.100	05/02/2005	1722	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Failure to Yield Right of Way	Rear-End	ing or Stopped for Turning T	EAST	9649764	
HAMILTON	04133	1.100	11/20/2006	1805	0	0	Prop Damage (over)	ALONG ROADWAY	2	LANE DEPARTURE	Angle	ng or Overtaking Another V	EAST	9793353	
HAMILTON	04133	1.100	08/02/2005	1300	0	1	Non-Incap Injury	AT AN INTERSECTION	2	Failure to Yield Right of Way	Head-On	Left Turn to Street	EAST	9835987	
HAMILTON	04133	1.100	08/20/2005	935	0	0	Prop Damage (over)	AT AN INTERSECTION	2	Following Improperly	Rear-End	Going Straight	WEST	9835991	
HAMILTON	04133	1.130	06/02/2003	1150	0	0	Prop Damage (over)	ALONG ROADWAY	1	Other (Narrative)	Head-On	Going Straight	WEST	8199784	
HAMILTON	04133	1.150	10/15/2006	1833	0	1	Non-Incap Injury	ALONG ROADWAY	2	ntive (Eating, Reading, Talking,	Rear-End	Going Straight	WEST	9795415	LM 1.03
HAMILTON	04133	1.180	10/10/2004	1222	0	0	Prop Damage (over)	AT AN INTERSECTION	3	Following Improperly	Rear-End	Going Straight	WEST	9164781	Traffic Train
HAMILTON	04133	1.180	07/28/2005	805	0	0	Prop Damage (over)	ALONG ROADWAY	3	Following Improperly	Rear-End	Going Straight	WEST	9835985	Traffic Unknown

098 9/2/03 WB Vehicle with trailer crossed RR tracks. Trailer disconnected. 8537055
Hit EB Vehicle head on.

TRIMS ROAD SEGMENT REPORT

HAMILTON County - 04133

COUNTY: HAMILTON

COUNTY NO: 33

ROUTE NBR	SPEC CASE	CTY SEQ	BEG LOG MILE	END LOG MILE	SP SY	SP SY2	SP SY3	US RTE	US RTE2	FUNCTIONAL CLASS	ADM SYS	URB AREA	INC AREA	GOV CON	ROAD NAME	HPMS SEC_ID
04133	0	1	0.000	3.050	01					U / MIN ART	STP NONSTATE URBAN	52	52	MUNICIPAL	HAMILL RD	

TRIMS TRAFFIC REPORT

HAMILTON County - 04133

COUNTY: HAMILTON

ROUTE	SC	CO SQ	BEG LOG MILE	END LOG MILE	YR OF TRAFFIC	AVERAGE DAILY TRAFFIC	PEAK HOUR %	DESIGN HOUR VOLUME	DIRECT DIST %	% PASS CARS	% SINGLE UNIT TRUCKS	% MULTI UNIT TRUCKS	CYCLE COUNTS STATION NBR	CYCLE COUNTS STATION COUNTY	CLASS COUNTS STATION NBR	CLASS COUNTS STATION COUNTY	IS CLASS COUNT?
04133	0	1	0.700	3.050	2006	10890	10	12	65	97	2	1	291	33			

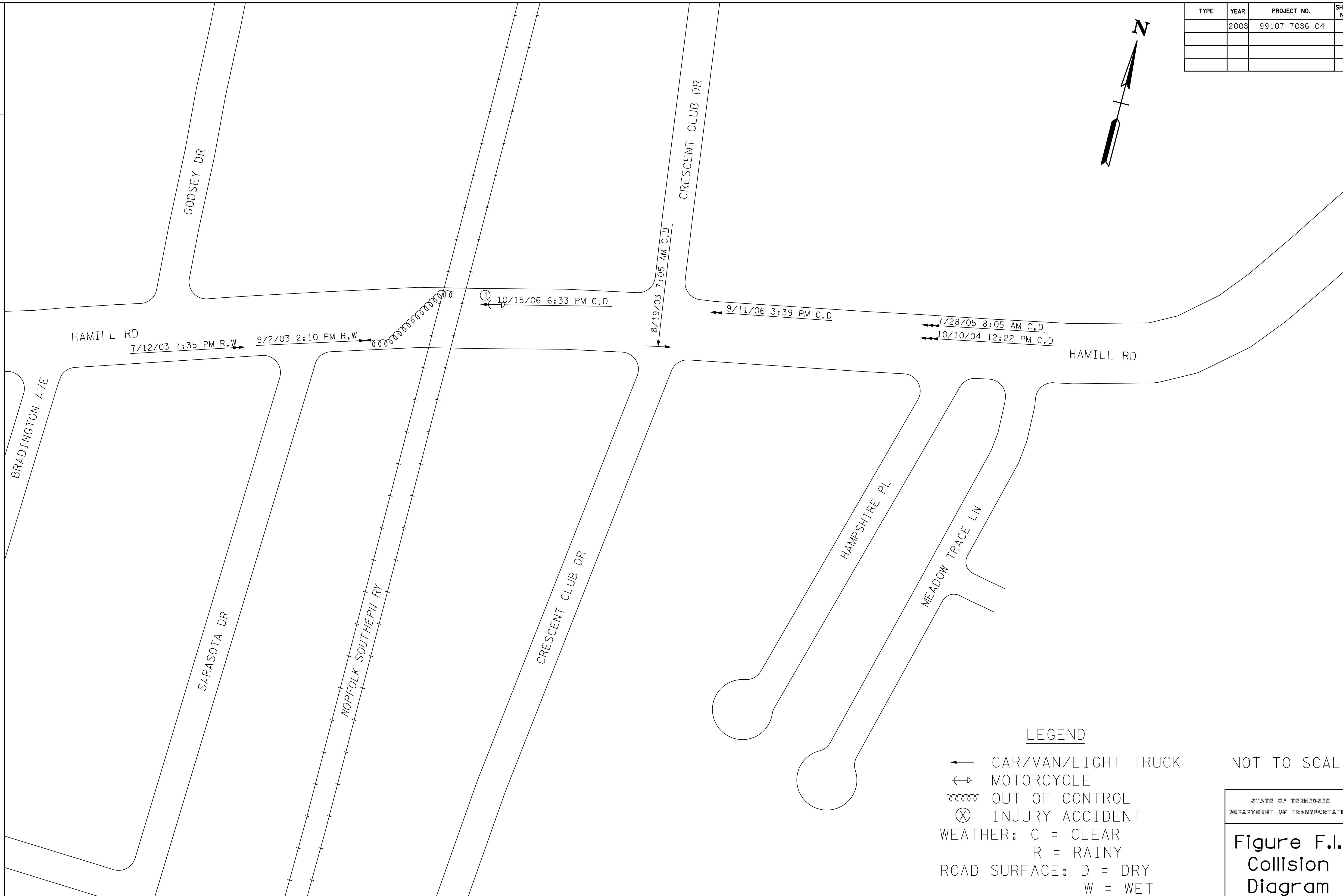
HAMILTON County - 04133

County: HAMILTON (33) ***Route No.*** 04133 ***Special Case*** 0-NONE ***County Sequence*** 1

Beg Log Mile	End Log Mile	ROW	Access Control	Operation	Illum-ination	School Spd Lmt	Spd Lmt	Truck Spd Lmt	Terrain	Land Use	Thru Lanes	Nbr Lanes	Feature Information			
													Seq. #	Type	Width	Composition
0.900	1.200	40	0-NONE	2-TWO WAY			40			7-RESIDENTIAL	2	2	8	DRAINAGE		DITCH
		40									2	2	9	SHOULDER (OUTSIDE)	1.0	SOIL (DIRT)
		40									2	2	10	PAVEMENT	20.0	ASPHALT CONCRETE
		40									2	2	12	SHOULDER (OUTSIDE)	1.0	SOIL (DIRT)
		40									2	2	13	DRAINAGE		DITCH

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure F.I.
Collision
Diagram

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

APPENDIX G

ESTIMATED ANNUAL EMISSIONS FROM IDLING VEHICLES

Emission rates are from
http://www.epa.gov/otaq/stateresources/policy/transp/tcms/extended_idling.pdf on 9/5/07,
reconfirmed on 1/22/08.

50 trains/day * 6000'/train / 12mi/hr * mi/5280' = 4.73 hrs/day crossing is closed
(4.73/24)(12720 veh/day) = 2509 veh/day stop at the crossing
2509 veh/day * 4.73hrs/day / 50trains/day * 60 min/hr * 0.5trains/veh = 7129 min/day of cars idling
Emission rates: THC→ 0.1743 g/min, NO_X → 0.0386 g/min, CO → 1.8164 g/min
Annual emission THC = (7129 min/day) (365 days) (0.1743 g/min) (lb / 454 g) = 999 lbs
Annual emission NO_X = (7129 min/day) (365 days) (0.0386 g/min) (lb / 454 g) = 221 lbs
Annual emission CO = (7129 min/day) (365 days) (1.8164 g/min) (lb / 454 g) = 10411 lbs
Total emissions = 999 + 221 + 10411 = 11631 lbs = 5.8 tons

APPENDIX H

DAISY AND EAST CHATTANOOGA QUADRANGLE MAPS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
TENNESSEE VALLEY AUTHORITY
MAPPING SERVICES BRANCH

DAISY QUADRANGLE
TENNESSEE-HAMILTON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC) 112-NW

Mapped and edited by Tennessee Valley Authority
Published by the Geological Survey

Control by NOS/NCAA, USGS, and TVA

Revised by TVA in 1975 by photogrammetric methods using aerial photographs taken 1974 and by reference to TVA-USGS quadrangle dated 1969. Map field checked by TVA, 1976

Polyconic projection, 1927 North American datum
10,000 foot grid based on Tennessee rectangular coordinate system
1000 metre Universal Transverse Mercator Grid ticks, Zone 16, shown in blue

Fine red dashed lines indicate selected fence and field lines visible on aerial photographs. This information is unchecked

Red tint indicates areas in which only land mark buildings are shown

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DASHED LINES REPRESENT HALF-INTERVAL CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
TENNESSEE DIVISION OF GEOLOGY, NASHVILLE, TENN. 37219.
U.S. TENNESSEE VALLEY AUTHORITY, CHATTANOOGA, TENN. 37401 OR KNOXVILLE, TENN. 37902.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

UTM GRID AND 1976 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Heavy-duty ..... Poor motor road
Medium-duty ..... Wagon and jeep track
Light-duty ..... Foot trail
U. S. Route ○ State Route
In developed areas, only through roads are classified

DAISY, TENN.
N3507.5-W8507.5/7.5
1976

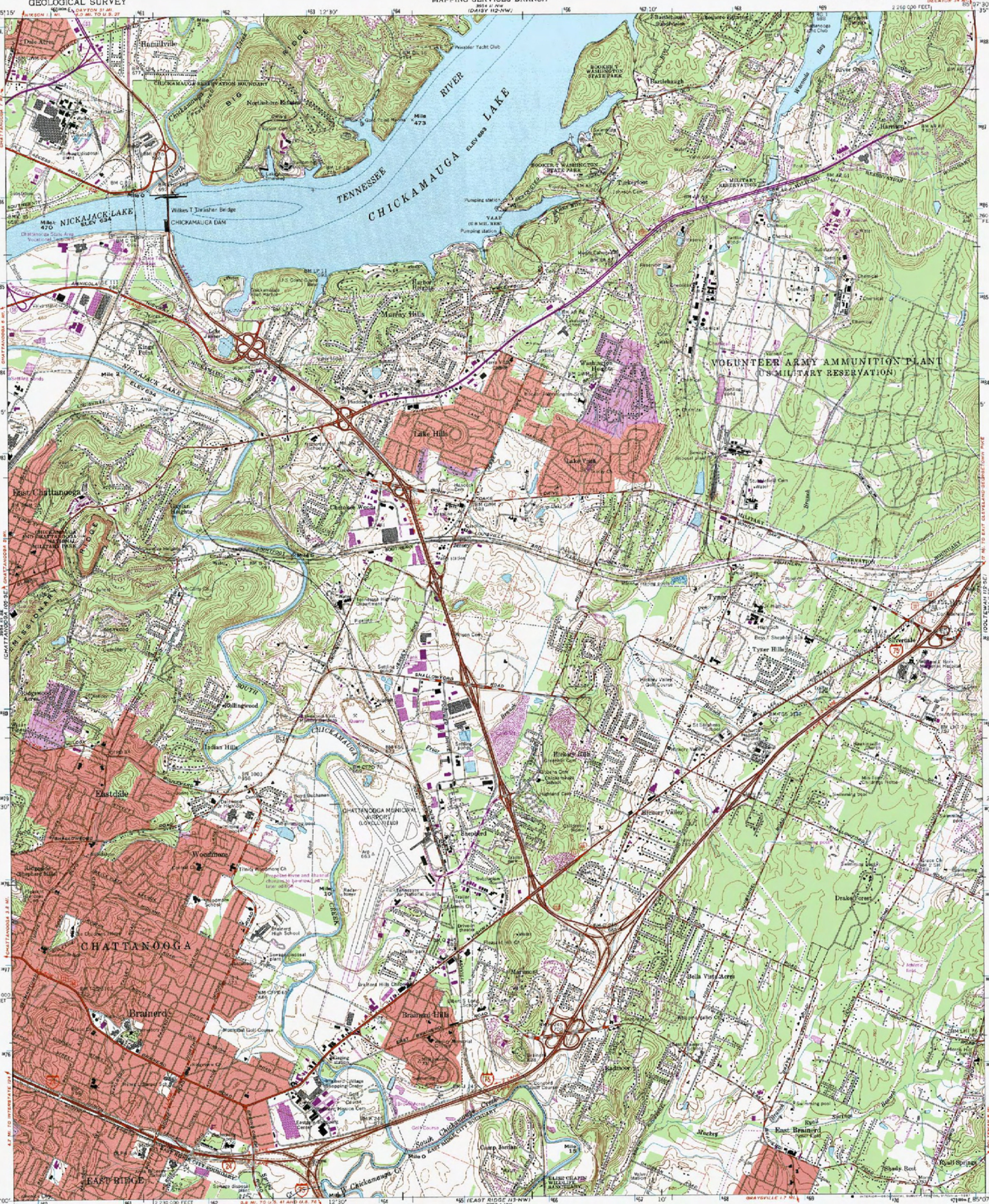
AMS 3654 II NW-SERIES V841

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
TENNESSEE VALLEY AUTHORITY
MAPPING SERVICES BRANCH

EAST CHATTANOOGA QUADRANGLE

TENNESSEE-HAMILTON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC) 112-SW



Mapped and edited by Tennessee Valley Authority
Published by the Geological Survey

Control by NOS/NOAA, USGS, CE, and TVA

Revised by TVA in 1969 by photogrammetric methods using aerial photographs taken 1968 and by reference to TVA-USGS quadrangle dated 1958. Map field checked by TVA, 1969

Polyconic projection. 1927 North American datum
10,000 foot grid based on Tennessee rectangular coordinate system
1000 metre Universal Transverse Mercator Grid ticks
Zone 16, shown in blue

Fine red dashed lines indicate selected fence and field lines visible on aerial photographs. This information is unchecked

Red tint indicates areas in which only landmark buildings are shown

UTM GRID AND 1976 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Revisions shown in purple and recompilation of woodland areas compiled by the Tennessee Valley Authority from aerial photographs taken 1976. This information not field checked

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DASHED LINES REPRESENT HALF INTERVAL CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
TENNESSEE DIVISION OF GEOLOGY, NASHVILLE, TENN. 37219,
U.S. TENNESSEE VALLEY AUTHORITY, CHATTANOOGA, TENN. 37401 OR KNOXVILLE, TENN. 37902.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

To place on the predicted North American Datum 1983, move the projection lines 5 meters south and 4 meters west as shown by dashed corner ticks

ROAD CLASSIFICATION

Heavy-duty — Poor motor road
Medium-duty — Wagon and jeep track
Light-duty — Foot trail
Interstate Route — U. S. Route — State Route
In developed areas, only through roads are classified

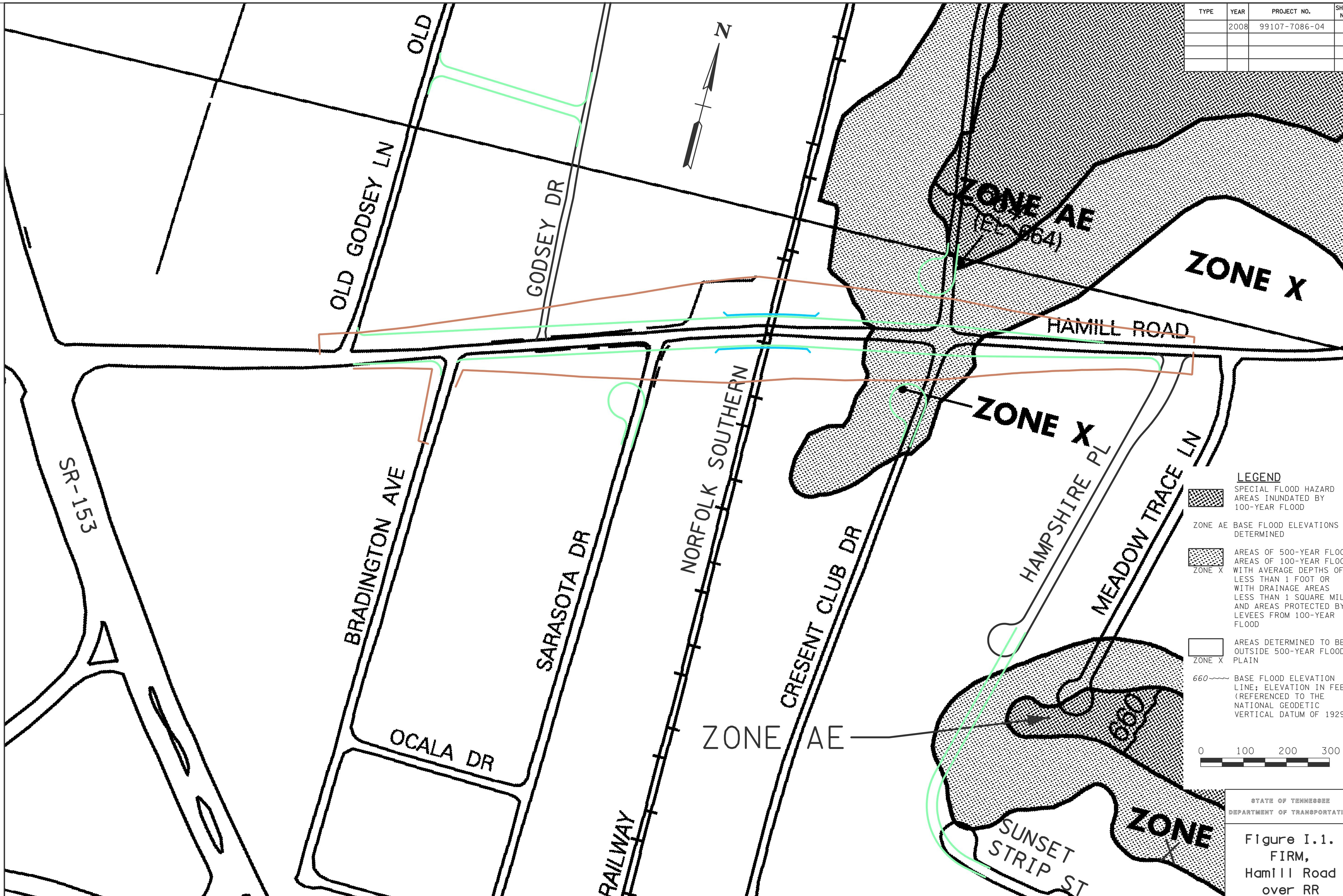
EAST CHATTANOOGA, TENN.
35085-A2-TF-024
1969
PHOTOREVISED 1976
DMA 3954 II SW-SERIES V844

APPENDIX I

FLOOD INSURANCE RATE MAPS

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	



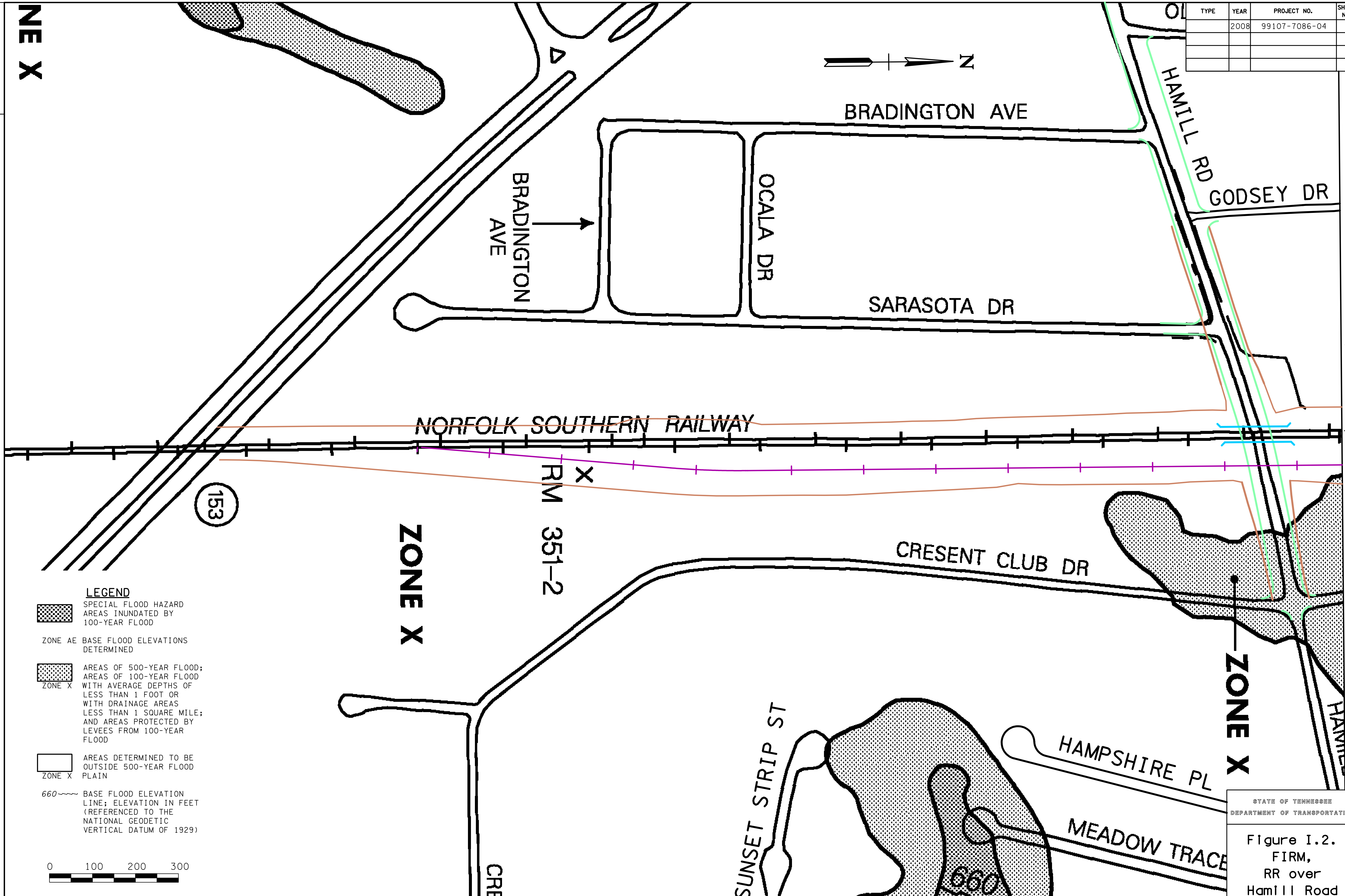
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure I.1. FIRM, Hamill Road over RR

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

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	

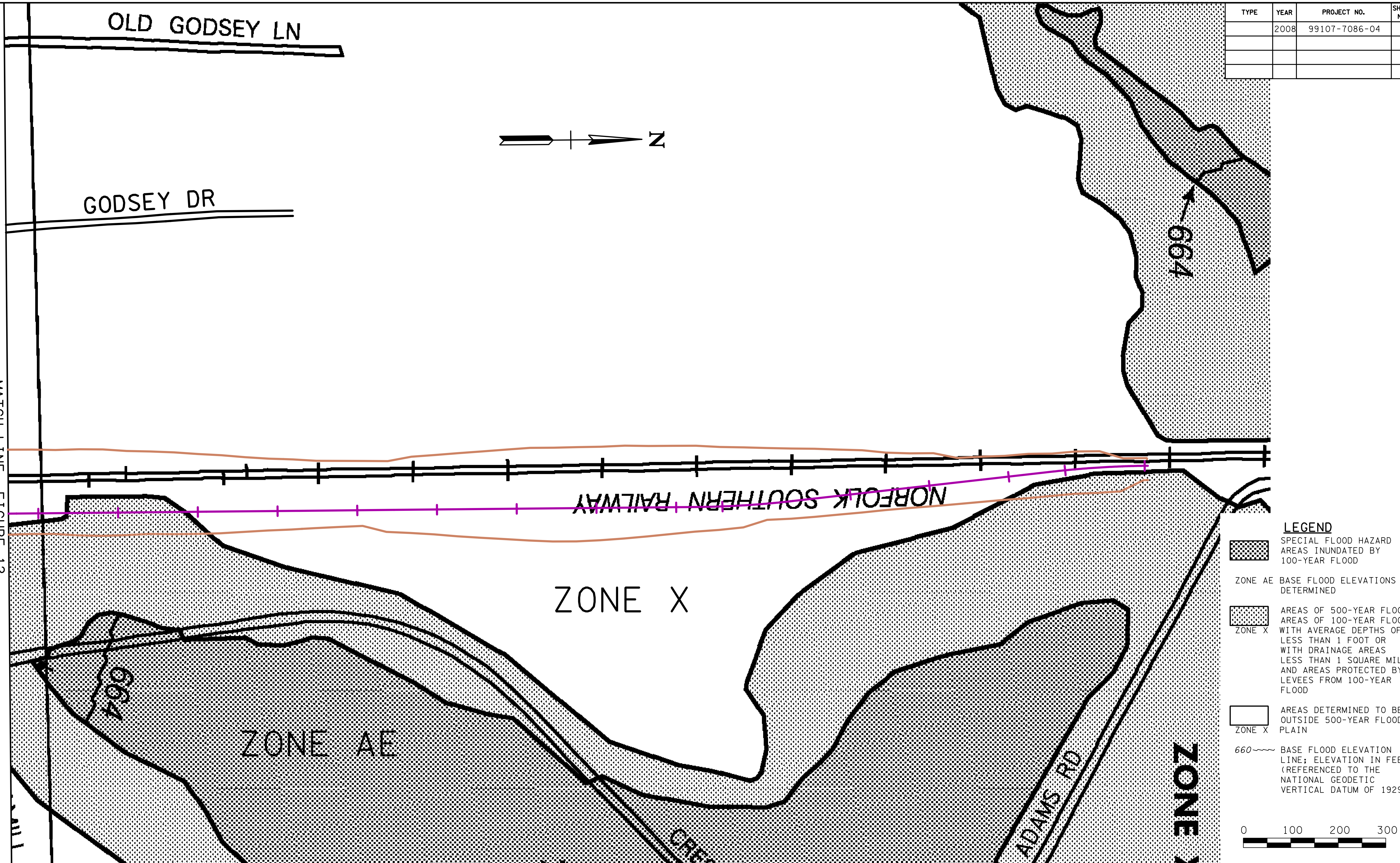


STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure I.2.
FIRM,
RR over
Hamill Road

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	


OLD GODSEY LN
GODSEY DR
N
664
MATCH LINE, FIGURE 12
NORFOLK SOUTHERN RAILWAY
ZONE X
664
ZONE AE
ROAD
ZONE
ZONE A
CRESENT CLUB DR
ADAMS RD
ZONE X
LEGEND
SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
ZONE AE BASE FLOOD ELEVATIONS DETERMINED
ZONE X AREAS OF 500-YEAR FLOOD; AREAS OF 100-YEAR FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD
ZONE X AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOOD PLAIN
660 BASE FLOOD ELEVATION LINE; ELEVATION IN FEET (REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929)
0 100 200 300

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure I.3.
FIRM,
RR over
Hamill Road

9/16/2008
P:\Projects\670103\Maps\670103RROverHamill-FEMA2.dgn

APPENDIX J

RARE SPECIES IN USGS DAISY AND EAST CHATTANOOGA QUADRANGLES

List of Rare Species by 7.5 ' USGS Quadrangle

Tennessee Division of Natural Heritage
www.state.tn.us/environment/nh/

April 2006

Curtistown		Global Rank	State Rank	State Status	Federal Status
Vascular Plant					
Castanea dentata	American Chestnut	G4	S2S3	S	
Helianthus eggertii	Eggert's Sunflower	G3	S3	T	DM
Hydrastis canadensis	Goldenseal	G4	S3	S-CE	
Lilium philadelphicum	Wood Lily	G5	S1	E	
Panax quinquefolius	American Ginseng	G3G4	S3S4	S-CE	
Platanthera integrilabia	White Fringeless Orchid	G2G3	S2S3	E	C

Cypress Inn		Global Rank	State Rank	State Status	Federal Status
Vertebrate Animal					
Etheostoma boschungi	Slackwater Darter	G1	S1	T	LT
Etheostoma corona	Crown Darter	G3	S1S2	E	
Hemitremia flammea	Flame Chub	G3	S3	D	

Daisy		Global Rank	State Rank	State Status	Federal Status
Vascular Plant					
Delphinium exaltatum	Tall Larkspur	G3	S2	E	
Diervilla sessilifolia var. rivularis	Mountain Bush-honeysuckle	G3	S2	T	
Gelsemium sempervirens	Yellow Jessamine	G5	S1S2	S	
Nestronia umbellula	Nestronia	G4	S1	E	
Panax quinquefolius	American Ginseng	G3G4	S3S4	S-CE	
Scutellaria montana	Large-flowered Skullcap	G3	S2	T	LT
Viola tripartita var. tripartita	Three-parted Violet	G5T3?	S2S3	S	
Invertebrate Animal					
Lampsilis abrupta	Pink Mucket	G2	S2	E	LE
Vertebrate Animal					
Aimophila aestivalis	Bachman's Sparrow	G3	S2	E	
Haliaeetus leucocephalus	Bald Eagle	G5	S3	D	LT

Dale Hollow Dam		Global Rank	State Rank	State Status	Federal Status
Vascular Plant					
Collinsia verna	Spring Blue-eyed Mary	G5	S1	E	
Hydrastis canadensis	Goldenseal	G4	S3	S-CE	
Invertebrate Animal					
Dromus dromas	Dromedary Pearlymussel	G1	S1	E	LE
Lampsilis abrupta	Pink Mucket	G2	S2	E	LE
Lithasia armigera	Armored Rocksnail	G3G4	S1S2		
Pseudanophthalmus fowlerae	Fowler's Cave Beetle	GH	S1		C
Pseudanophthalmus inquisitor	Searcher Cave Beetle	G1	S1		C
Villosa trabalis	Cumberland Bean	G1	S1	E	LE
Vertebrate Animal					
Etheostoma cinereum	Ashy Darter	G2G3	S2S3	T	

List of Rare Species by 7.5 ' USGS Quadrangle

Tennessee Division of Natural Heritage
www.state.tn.us/environment/nh/

April 2006

Dyersburg		Global Rank	State Rank	State Status	Federal Status
Vascular Plant					
Iris fulva	Copper Iris	G5	S2	T	
Vertebrate Animal					
Egretta caerulea	Little Blue Heron	S3N	S2B	G5	D
Limnothlypis swainsonii	Swainson's Warbler	G4	S3	D	

Eagan		Global Rank	State Rank	State Status	Federal Status
Nonvascular Plant					
Lejeunea blomquistii	Blomquist Leafy Liverwort	G1G2	S1S2	S	
Vertebrate Animal					
Etheostoma baileyi	Emerald Darter	G4G5	S2	D	
Etheostoma sagitta	Arrow Darter	G3G4	S2	D	
Notropis buccatus	Silverjaw Minnow	G5	S1	T	
Phoxinus cumberlandensis	Blackside Dace	G2	S2	T	LT

Eagle Creek		Global Rank	State Rank	State Status	Federal Status
Invertebrate Animal					
Ophiogomphus acuminatus	Tennessee Snaketail	G3	S2		

East Chattanooga		Global Rank	State Rank	State Status	Federal Status
Vascular Plant					
Panax quinquefolius	American Ginseng	G3G4	S3S4	S-CE	
Scutellaria montana	Large-flowered Skullcap	G3	S2	T	LT
Trillium lancifolium	Narrow-leaved Trillium	G3	S1	E	
Trillium rugelii	Southern Nodding Trillium	G3	S2	E	
Invertebrate Animal					
Cambarus extraneus	Chickamauga Crayfish	G2	S1S2	T	
Plethobasus cooperianus	Orange-foot Pimpleback	G1	S1	E	LE
Vertebrate Animal					
Accipiter striatus	Sharp-shinned Hawk	G5	S3B	D	No Status
Aimophila aestivalis	Bachman's Sparrow	G3	S2	E	
Falco peregrinus	Peregrine Falcon	G4	S1N	E	No Status
Percina tanasi	Snail Darter	G2G3	S2S3	T	LT
Rallus elegans	King Rail	G4	S2	D	
Sorex longirostris	Southeastern Shrew	G5	S4	D	

East Cleveland		Global Rank	State Rank	State Status	Federal Status
Vascular Plant					
Silphium pinnatifidum	Southern Prairie-dock	G3Q	S2	T	

Description of Federal and State Ranks & Status Codes

GLOBAL RANK - The global or world-wide rank of a species which is a non-legal rank indicating the rarity and vulnerability of a species

G1	Extremely rare and critically imperiled in the world with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction
G2	Very rare and imperiled within the world, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction
G3	Rare and uncommon in its range or found locally in a restricted range, generally from 21-100 occurrences
G4	Widespread, abundant, and apparently secure globally, but with cause for long-term concern
G5	Demonstrably widespread and secure globally
GH	Of historical occurrence throughout its range, e.g. formally part of the established biota, with the expectation that it may be rediscovered
GU	Can not be ranked using available information
GX	Believed to be extirpated throughout its range
HYB	Hybrid within its range in Tennessee
SSYN	Synonym for another species
_Q	Questionable taxonomy (GRANKs only)
_T#	Subspecific taxon rank (GRANKs only)

STATE RANK - The state rank of a species in Tennessee. Like the G_rank this is a non-legal rank indicating the rarity and vulnerability of a species at the state level.

S1	Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction
S2	Very rare and imperiled within the state, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction
S3	Rare and uncommon in the state, from 21-100 occurrences
S4	Widespread, abundant, and apparently secure within the state, but with cause for long-term concern
S5	Demonstrably widespread and secure in the state
SH	Of historical occurrence in Tennessee, e.g. formally part of the established biota, with the expectation that it may be rediscovered
SU	Can not be ranked using available information
SX	Believed to be extirpated from the state
S#S#	Denotes a "range rank" because the rarity of the species is uncertain (e.g. S1S3)
S?, S_?	Unranked at this time or rank uncertain
SE	Exotic species established in the state
SE#	Exotic numeric (e.g. the Asian clam *Corbicula fluminea* would be SE5)
SP	Potentially occurring in Tennessee, but not yet documented by DNH
_N	Occurs in Tennessee in a non-breeding status (mostly applies to vertebrates)

Description of Federal and State Ranks & Status Codes

_B	Breeds in Tennessee
SA	Accidental or casual in the state (several birds)
SR	Reported from the state, but insufficient data to assign rank
SRF	Reported falsely from the state
HYB	Hybrid within its range in Tennessee
SSYN	Synonym for another species
_Q	Questionable taxonomy (GRANKs only)
_T#	Subspecific taxon rank (GRANKs only)

FEDERAL STATUS - The federal listing under the U.S. Endangered Species Act

LE, Listed Endangered	Taxon is threatened by extinction throughout all or a significant portion of its range
E/SA,Endangered by Similarity of Appearance	Taxon is treated as an endangered species because it may not be easily distinguished from a listed species
LT, Listed Threatened	Taxon is likely to become an endangered species in the foreseeable future
T/SA,Threatened by Similarity of Appearance	Taxon is treated as a threatened species because it may not be easily distinguished from a listed species
PE, Proposed Endangered	Taxon proposed for listing as endangered
PT, Proposed Threatened	Taxon proposed for listing as threatened
C, Candidate species* **	Taxon for which the USFWS has sufficient information to support proposals to list the species as threatened or endangered, and for which the Service anticipates a listing proposal
(PS) Partial Status (based on taxonomy)	Taxon which is listed in part of its range, but for which Tennessee subspecies are not included in the Federal designation
(PS:status) Partial Status (based on political boundaries)	Taxon which is listed in part of its range, but for which Tennessee populations are not included in the Federal designation e.g. (PS:LE)
(XN) Non-essential experimental population in portion of range	Taxon which has been introduced or re-introduced in an area from which it has been extirpated, and for which certain provisions of the Act may not apply

Description of Federal and State Ranks & Status Codes

STATE STATUS -The legal listing in Tennessee

E, Endangered	Any species or subspecies whose prospects of survival or recruitment within the state are in jeopardy or are likely to become so within the foreseeable future
T, Threatened	Any species or subspecies that is likely to become an endangered species within the foreseeable future
D, Deemed in Need of Management	Any species or subspecies of nongame wildlife which the executive director of the TWRA believes should be investigated in order to develop information relating to populations, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully. This category is analogous to "Special Concern."
S, Special Concern	Any species or subspecies of plant that is uncommon in Tennessee, or has unique or highly specific habitat requirements or scientific value and therefore requires careful monitoring of its status.

Additional Modifiers for Plants

PE, Proposed Endangered	Any species or subspecies of plant nominated by the Scientific Advisory Committee to be added to the list of Tennessee's endangered species. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State endangered.
PT, Proposed Threatened	Any species or subspecies of a plant nominated by the Scientific Advisory Committee to be added to the list of Tennessee threatened species. After a public hearing, these plants will formally become State threatened.
E-PT, Endangered-Proposed Threatened	Species which are currently on the state list of endangered plants, but are proposed by the Scientific Advisory Committee to be down-listed to threatened. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State threatened.
E-PS, Endangered Proposed Special Concern	Species which are currently on the state list of endangered plants, but are proposed by the Scientific Advisory Committee to be down-listed to special concern. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State special concern.
T-PE, Threatened Proposed Endangered	Species which are currently on the state list of threatened plants, but are proposed by the Scientific Advisory Committee to be listed on the state endangered list. After approval by the commissioner of the Dept. of Environment & Conservation and the concurrence of the commissioner of Agriculture, these plants will formally become State endangered.

Description of Federal and State Ranks & Status Codes

T-PS, Threatened Proposed Special Concern	Species which are currently on the state list of threatened plants, but are proposed by the Scientific Advisory Committee to be down-listed to special concern. After a public hearing, these plants will formally become State special concern.
P, Possibly Extirpated	Species or subspecies that have not been seen in Tennessee for the past 20 years. May no longer occur in Tennessee.
C, Commercially Exploited	Due to large numbers being taken from the wild and propagation or cultivation insufficient to meet market demand. These plants are of long-term conservation concern, but the Division of Natural Heritage does not recommend they be included in the normal environmental review process.

APPENDIX K

HAMILTON COUNTY LISTINGS IN THE NATIONAL REGISTER OF HISTORIC PLACES

National Register of Historic Places listings for Hamilton County

Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED
1	TN	Hamilton	Audubon Acres Site (40 HA 84)	Address Restricted	Chattanooga	1982-10-07
2	TN	Hamilton	Bachman, Nathan L. School	281 Anderson Pike	Walden	2001-04-17
3	TN	Hamilton	Bonny Oaks	5114 Bonny Oaks Dr.	Chattanooga	1980-08-11
4	TN	Hamilton	Brabson House	407 E. 5th St.	Chattanooga	1973-04-11
5	TN	Hamilton	Brainerd Junior High	4201 Cherryton Dr.	Chattanooga	1980-09-15
6	TN	Hamilton	Brainerd Mission Cemetery	5700 Eastgate Loop	Chattanooga	1979-12-06
7	TN	Hamilton	Brown House	9521 Ooltewah-Georgetown Rd.	Ooltewah	1973-04-11
8	TN	Hamilton	Brown's Ferry Tavern	Brown's Ferry Rd.	Chattanooga	1971-03-24
9	TN	Hamilton	Central Block Building	630--638 Market St.	Chattanooga	1995-09-01
10	TN	Hamilton	Chattanooga Bank Building	8th St.	Chattanooga	1980-09-15
11	TN	Hamilton	Chattanooga Car Barns	301 Market St.	Chattanooga	1979-07-09
12	TN	Hamilton	Chattanooga Electric Railway	211-241 Market St.	Chattanooga	1980-02-29
13	TN	Hamilton	Chattanooga National Cemetery	1200 Bailey Ave.	Chattanooga	1996-09-16
14	TN	Hamilton	Chattanooga Plow Power House	1533-1535 Chestnut St.	Chattanooga	1999-10-07
15	TN	Hamilton	Chattanooga, Harrison, Georgetown & Charleston Railroad Tunnel	Below N. Crest Rd.	Chattanooga	1978-08-24
16	TN	Hamilton	Chickamauga and Chattanooga National Military Park	S of Chattanooga on U.S. 27	Chattanooga	1966-10-15
17	TN	Hamilton	Civil War Fortification	Bonny Oaks Dr.	Chattanooga	1976-01-31
18	TN	Hamilton	Connor Toll House	4212 Anderson Pike	Signal Mountain	1977-08-22
19	TN	Hamilton	Crane Building	1317 Chestnut St.	Chattanooga	1983-11-10
20	TN	Hamilton	Cravens--Coleman House	1 Cravens Ter.	Chattanooga	1990-10-25

Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED
21	TN	Hamilton	Cummings, Judge Will, House	W. of Chattanooga at 4025 Cummings Rd.	Chattanooga	1980-07-03
22	TN	Hamilton	Douglas, Hiram, House	About 5 mi. N of Ooltewah on Snow Hill Rd.	Ooltewah	1973-04-24
23	TN	Hamilton	East Tennessee Iron Manufacturing Company Blast Furnace	Address Restricted	Chattanooga	1980-05-08
24	TN	Hamilton	Faxon-Thomas Mansion	10 Bluff View Ave.	Chattanooga	1980-11-25
25	TN	Hamilton	Ferger Place Historic District	Evening Side Dr. and Morning Side Dr.	Chattanooga	1980-05-01
26	TN	Hamilton	First Baptist Church Education Building	317 Oak St.	Chattanooga	1980-02-29
27	TN	Hamilton	Fort Wood Historic District	Roughly bounded by Palmetto, McCallie, Central and 5th Sts.	Chattanooga	1979-04-18
28	TN	Hamilton	Fountain Square	600--622 Georgia Ave. and 317 Oak St.	Chattanooga	1979-03-28
29	TN	Hamilton	Gaskill House	427 E. 5th St.	Chattanooga	1979-12-06
30	TN	Hamilton	Glenwood Historic District	Roughly bounded by Parkwood Dr., Glenwood Dr., Oak St., and Derby St.	Chattanooga	1989-07-25
31	TN	Hamilton	Hamilton County Courthouse	W. 6th St. and Georgia Ave.	Chattanooga	1978-11-21
32	TN	Hamilton	Hampton Place Archeological Site (40HA146)	Address Restricted	Chattanooga	1984-05-22
33	TN	Hamilton	Highland Park Methodist Episcopal church	Bailey Ave.	Chattanooga	1980-02-29
34	TN	Hamilton	Hutcheson House	360 S. Crest Rd.	Chattanooga	1978-11-21
35	TN	Hamilton	Isbester, Caleb, House	551 Oak St.	Chattanooga	1982-03-25
36	TN	Hamilton	James Building	735 Broad St.	Chattanooga	1980-02-29
37	TN	Hamilton	James County Courthouse	Mulberry St.	Ooltewah	1976-11-07
38	TN	Hamilton	Kelley House	1903 McCallie Ave.	Chattanooga	1980-05-14
39	TN	Hamilton	King, M. L., Boulevard Historic District	Roughly M. L. King Blvd. between Browns and University Sts.	Chattanooga	1984-03-20

Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED
40	TN	Hamilton	Lookout Mountain Caverns and Cavern Castle	Scenic Hwy.	Chattanooga	1985-11-26
41	TN	Hamilton	Lookout Mountain Incline Railway	Off U.S. 11	Chattanooga	1973-04-26
42	TN	Hamilton	Louise Terrace Apartments	314 and 316 Walnut St.	Chattanooga	1998-10-30
43	TN	Hamilton	Maclellan Building	721 Broad St.	Chattanooga	1985-04-04
44	TN	Hamilton	Mallards Dozen Archeological Site (40HA147)	Address Restricted	Chattanooga	1984-05-22
45	TN	Hamilton	Market and Main Streets Historic District	Roughly bounded by Cowart, King, Market and Main Sts.	Chattanooga	1992-07-24
46	TN	Hamilton	Market Square-Patten Parkway	Roughly bounded by E. 8th, and E. 9th Sts., Georgia and Lindsay Aves.	Chattanooga	1980-05-01
47	TN	Hamilton	Market Street Warehouse Historic District	1118-1148 Market St.	Chattanooga	1984-04-05
48	TN	Hamilton	Matthews, Pleasant L., House	SW of Georgetown on Ooltewah-Georgetown Rd.	Georgetown	1976-12-12
49	TN	Hamilton	McConnell, Chancellor T. M., House	517 E. Fifth St.	Chattanooga	1992-04-17
50	TN	Hamilton	Medical Arts Building	McCallie Ave.	Chattanooga	1980-09-15
51	TN	Hamilton	Mikado Locomotive No. 4501	2202 N. Chamberlain Ave.	Chattanooga	1979-03-28
52	TN	Hamilton	Miller Brothers Department Store	629 Market St.	Chattanooga	1987-09-17
53	TN	Hamilton	Missionary Ridge Historic District	N. and S. Crest Rd. from Delong Reservation to 700 S. Crest Rd.	Chattanooga	1996-09-05
54	TN	Hamilton	Moccasin Bend Archeological District	Address Restricted	Chattanooga	1986-09-08
55	TN	Hamilton	Model Electric Home	1516 Sunset Rd.	Chattanooga	1993-07-15
56	TN	Hamilton	Municipal Building	E. 11th St.	Chattanooga	1980-02-29
57	TN	Hamilton	Northside United Presbyterian	923 Mississippi Ave.	Chattanooga	1980-09-15
58	TN	Hamilton	Ochs Building	Georgia Ave.	Chattanooga	1978-11-17

Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED
59	TN	Hamilton	Old Library Building	200 E. 8th St.	Chattanooga	1973-03-14
60	TN	Hamilton	Old Post Office	E. 11th and Lindsay Sts.	Chattanooga	1973-04-13
61	TN	Hamilton	Read House	Broad and 9th Sts.	Chattanooga	1976-12-23
62	TN	Hamilton	Ross's Landing	Riverfront Pkwy. west of Market St.	Chattanooga	1974-06-27
63	TN	Hamilton	Saints Peter and Paul Catholic Church and Buildings	214 E. 8th St.	Chattanooga	1979-12-11
64	TN	Hamilton	Schwartz, Robert, and Company Building	736-738 Cherry St.	Chattanooga	1984-07-19
65	TN	Hamilton	Second Presbyterian Church	700 Pine St.	Chattanooga	1980-02-29
66	TN	Hamilton	Shavin, Seamour and Gerte, House	334 N. Crest Rd.	Chattanooga	1993-03-23
67	TN	Hamilton	Shiloh Baptist Church	506 E. 8th St.	Chattanooga	1979-01-19
68	TN	Hamilton	Signal Knitting Mills	205 Manufacturers Rd.	Chattanooga	1999-03-05
69	TN	Hamilton	Signal Mountain Elementary School	809 Kentucky Ave.	Signal Mountain	2001-04-19
70	TN	Hamilton	Signal Mountain Historic District	Roughly along James Blvd., Brady Point Rd., and Signal Point Rd.,	Signal Mountain	2001-10-05
71	TN	Hamilton	Soldiers and Sailors Memorial Auditorium	McCallie Ave.	Chattanooga	1980-09-15
72	TN	Hamilton	Southern Railway Freight Depot	1140 Newby St.	Chattanooga	1983-06-16
73	TN	Hamilton	St. Elmo Historic District	Alabama, St. Elmo, and Tennessee Aves.	Chattanooga	1982-04-15
74	TN	Hamilton	St. Paul's Episcopal Church	7th and Pine Sts.	Chattanooga	1978-09-01
75	TN	Hamilton	Stone Fort Land Company Historic District	10th, Newby, E. 11th and Market Sts.	Chattanooga	1999-07-01
76	TN	Hamilton	Stringer Ridge Historic District	Address Restricted	Chattanooga	1984-05-22
77	TN	Hamilton	Tennessee Valley Railroad Museum Rolling Stock	2022 N. Chamberlain Ave.	Chattanooga	1980-08-06
78	TN	Hamilton	Terminal Station	1434 Market St.	Chattanooga	1973-02-20

Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED
79	TN	Hamilton	Tivoli Theater	709 Broad St.	Chattanooga	1973-04-11
80	TN	Hamilton	Topside	N of Signal Mountain off TN 8 on Wilson Ave.	Signal Mountain	1973-04-11
81	TN	Hamilton	Trigg--Smartt Building	701--707 Broad St.	Chattanooga	1986-06-26
82	TN	Hamilton	Trinity Methodist Episcopal Church	McCallie Ave.	Chattanooga	1980-02-29
83	TN	Hamilton	Turnbull Cone and Machine Company	1400 Fort and W. Fourteenth Sts.	Chattanooga	1992-07-15
84	TN	Hamilton	U.S. Post Office	Georgia Ave.	Chattanooga	1980-02-29
85	TN	Hamilton	Vulcan Archeological Site (40HA140)	Address Restricted	Chattanooga	1984-05-22
86	TN	Hamilton	W Road	W Rd. from Spring St E 0.4 mi.	Walden	1999-03-19
87	TN	Hamilton	Walnut Street Bridge	Walnut St., over the Tennessee River	Chattanooga	1990-02-23
88	TN	Hamilton	Wauhatchie Pike	Old Wauhatchie Pike	Lookout Mountain	2001-07-11
89	TN	Hamilton	Wiley United Methodist Church	504 Lookout St.	Chattanooga	1979-08-01
90	TN	Hamilton	Willard, Frances, House	615 Lindsay St.	Chattanooga	1980-02-29
91	TN	Hamilton	Williams Island	Address Restricted	Chattanooga	1973-04-11
92	TN	Hamilton	Woodland Mound Archeological District	Address Retricted	Chattanooga	1984-05-22
93	TN	Hamilton	Wyatt Hall	865 E. Third St.	Chattanooga	1986-10-23

APPENDIX L

OPTION 1 PLAN AND PROFILE

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	

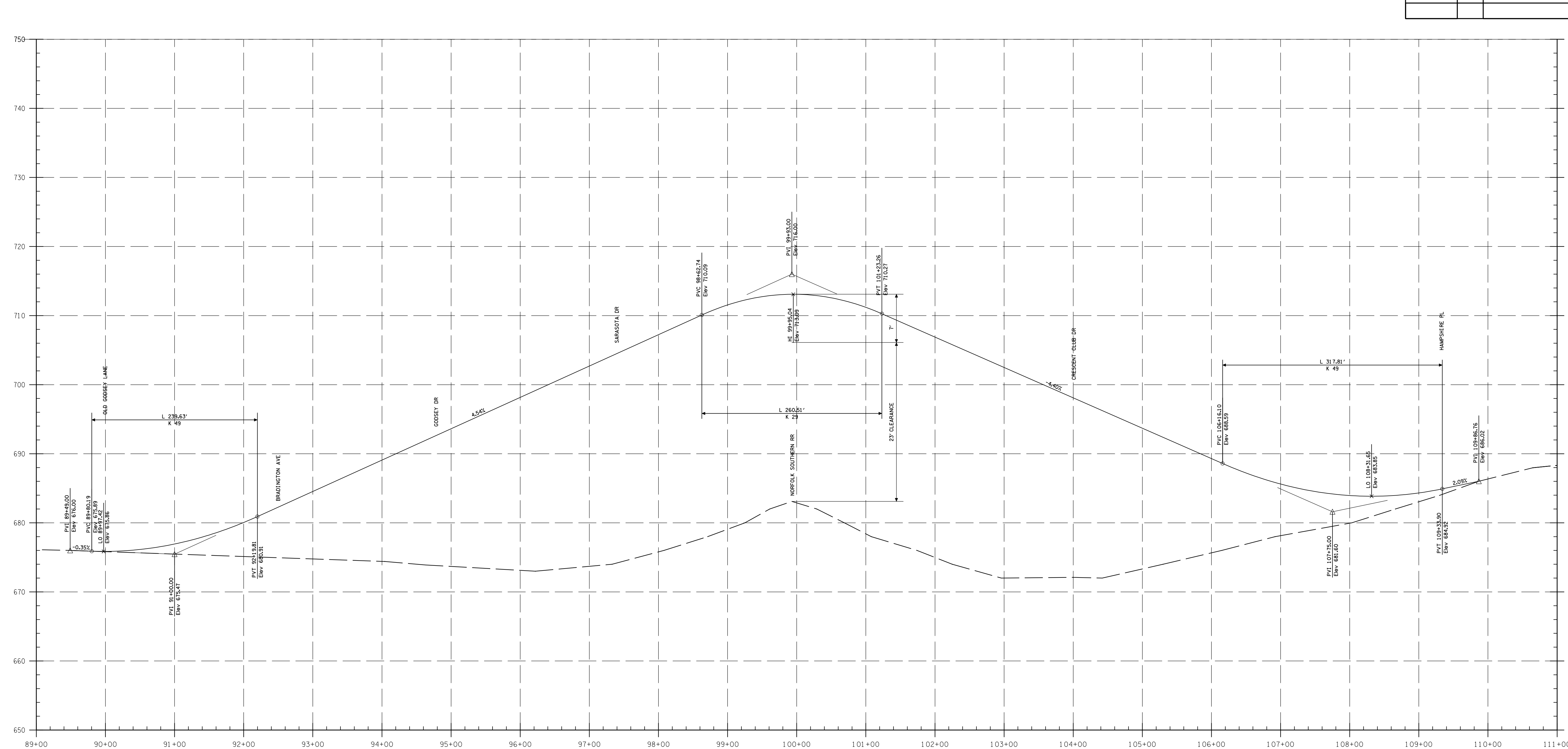
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

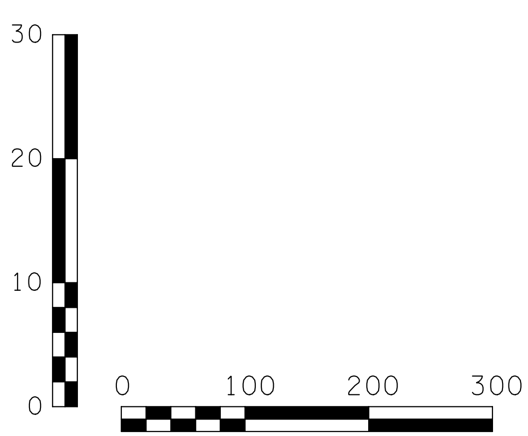
Figure L.1. Plan View, Hamill Road over RR

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

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	





STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure L.2. Profile, Hamill Road over RR

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

APPENDIX M

OPTION 1 COST ESTIMATE

Cost Data Sheet--Hamill Road over Railroad (Option 1)

Project: Hamill Road at Norfolk Southern Railroad, Hamilton County
Section: From Old Godsey Lane to Hampshire Place
Length: 2000 feet

Right of Way

Land (10.10 Acres)		$	1,201,000	
Improvements		$	2,056,000	
Damages		$	767,000	
Incidentals		$	93,000	
Relocation Payments	(4 residences)	$	116,000	
	(9 businesses & farms)	$	233,000	
	(0 non-profits)	$	-	
Total Right-of-Way Cost				**$ 4,466,000**

Utility Relocation

Reimbursable	$	385,000	
Non-reimbursable	$	-	
Total Adjustment Cost			**$ 385,000**

Construction

Clearing and Grubbing	$	20,000	
Earthwork	$	1,375,000	
Pavement Removal	$	32,000	
Drainage (Includes Erosion Control)	$	1,194,000	
Structures	$	1,680,000	
Railroad Crossing or Separation	$	-	
Paving	$	725,000	
Retaining Walls	$	109,000	
Maintenance of Traffic	$	100,000	
Topsoil	$	33,000	
Seeding	$	8,200	
Sodding	$	16,000	
Signing	$	1,000	
Lighting	$	100,000	
Signalization	$	-	
Fence	$	-	
Guardrail	$	65,000	
Rip-Rap or Slope Protection	$	50,000	
Other Construction Items (8.5%)	$	469,000	
Mobilization	$	270,000	
Construction Cost	$	6,247,200	
10% Eng. & Cont.	$	625,000	
Total Construction Cost			**$ 6,872,200**
Preliminary Engineering (10%)			**$ 625,000**

Total Cost **$ 12,348,200**

APPENDIX N

OPTION 2 PLAN AND PROFILE

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure N.1.
Plan View,
RR over
Hamill Road

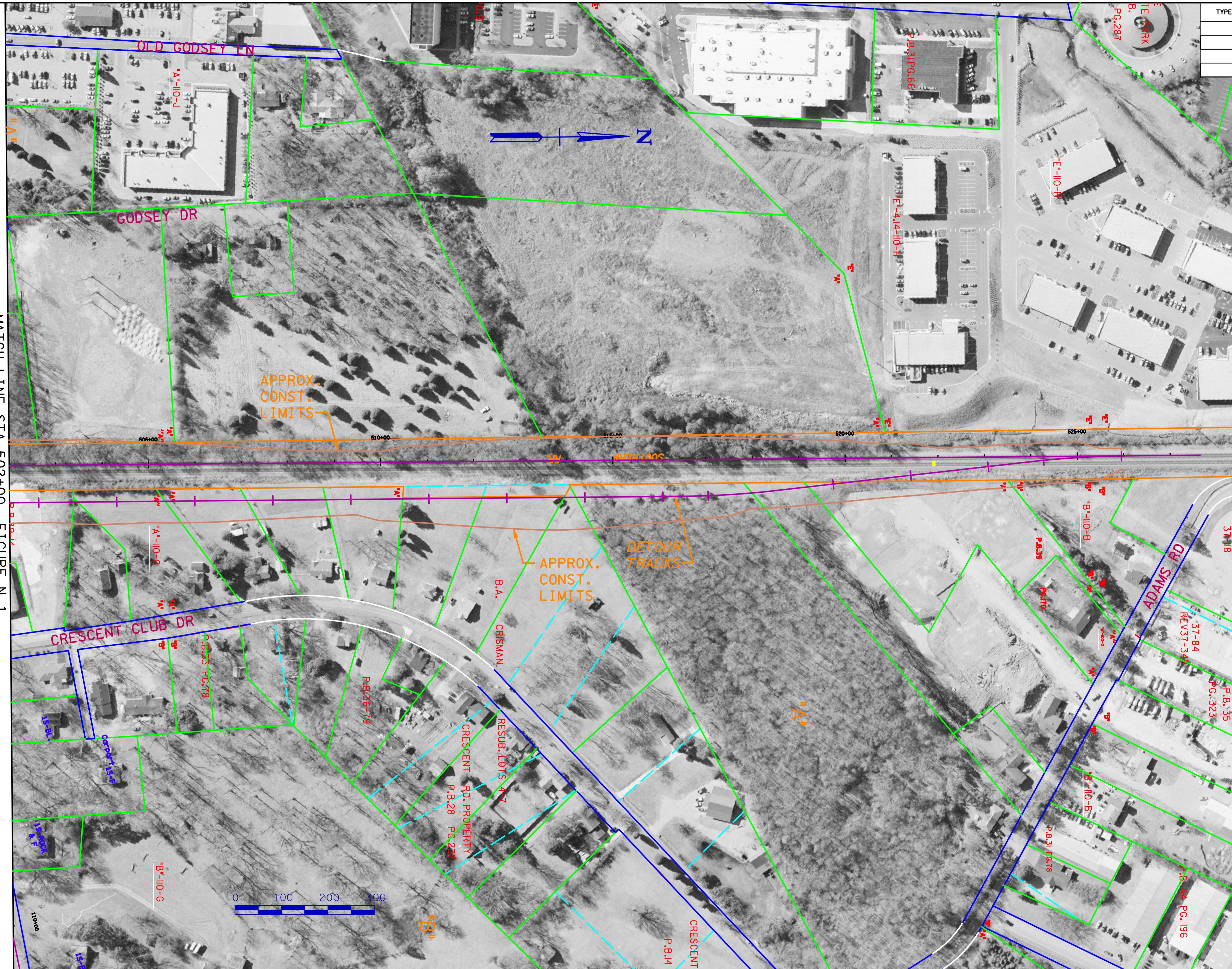
$$$$SYTIME$$$$
$$$$DGNSPEC$$$$

TENNESSEE D.O.T.
DESIGN DIVISION

FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	

MATCH LINE STA 502+00, FIGURE N.1.



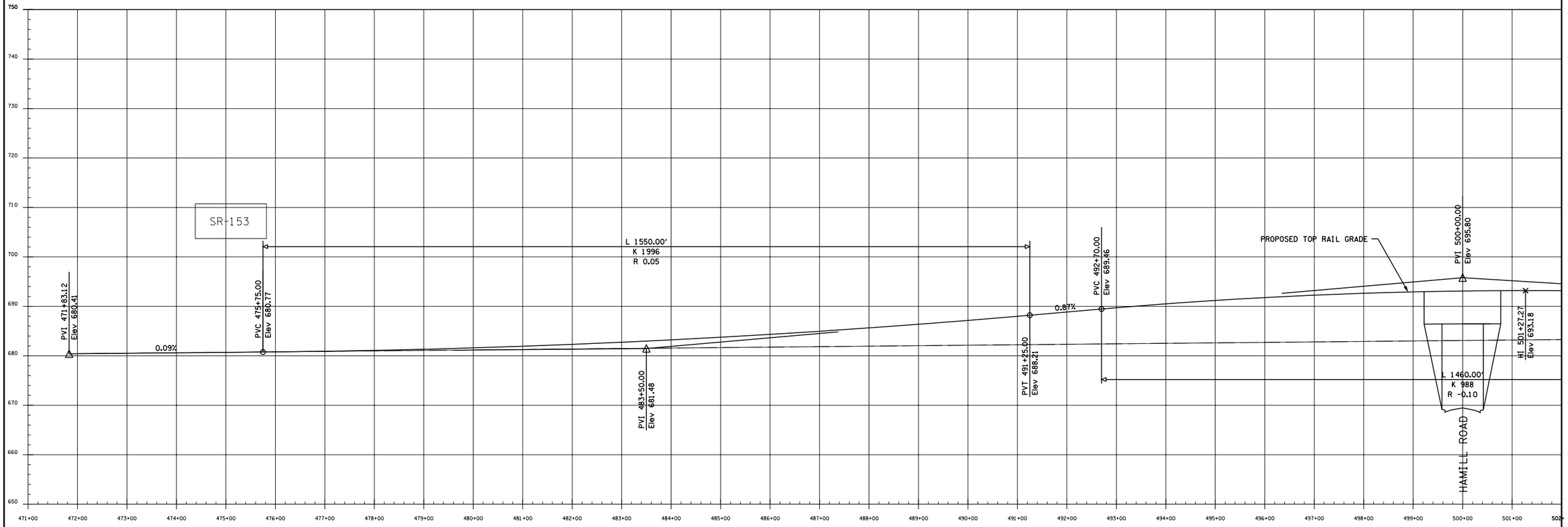
$$$$SYTIME$$$$$$
$$$DGNSPEC$$

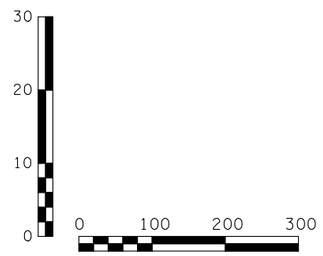
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure N.2.
Plan View,
RR over
Hamill Road

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	





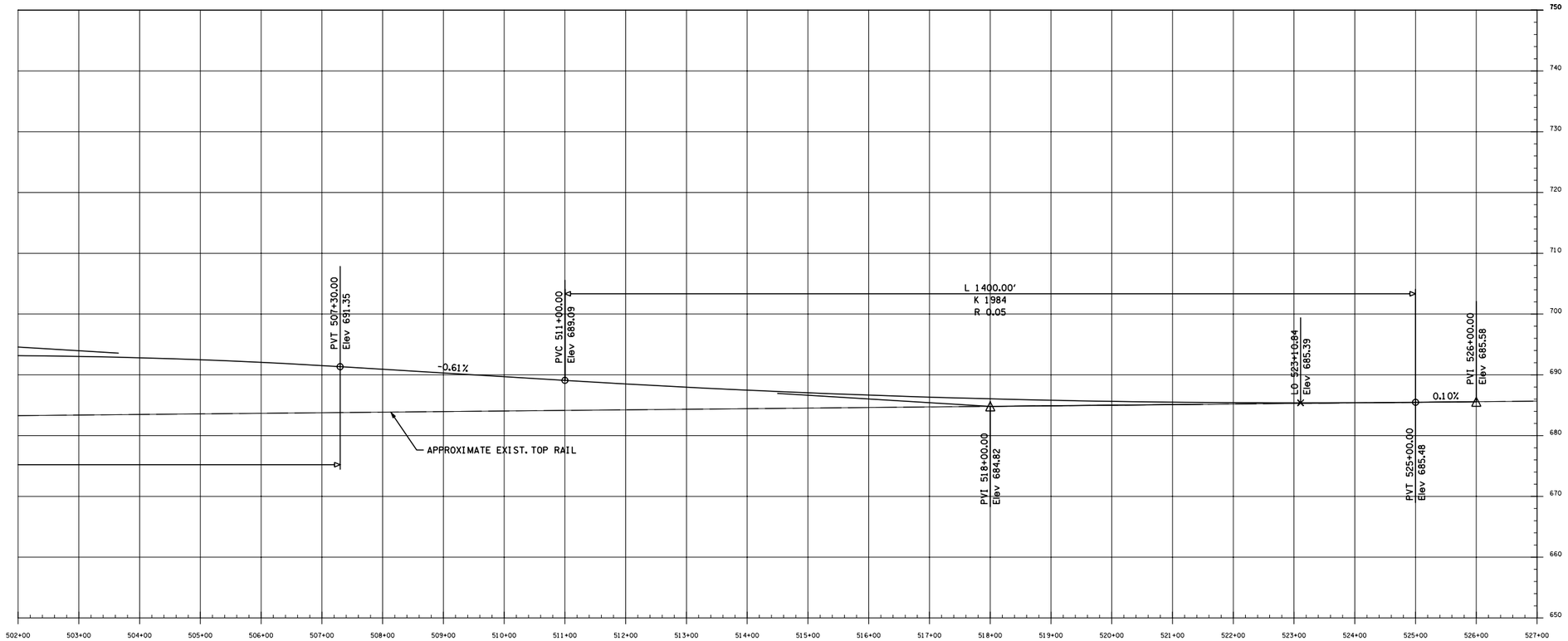
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

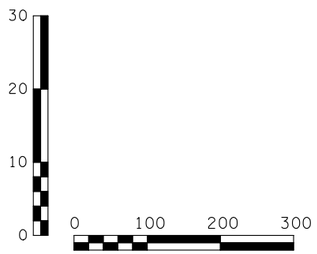
Figure N.3.
Profile,
RR over
Hamlll Road

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

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	





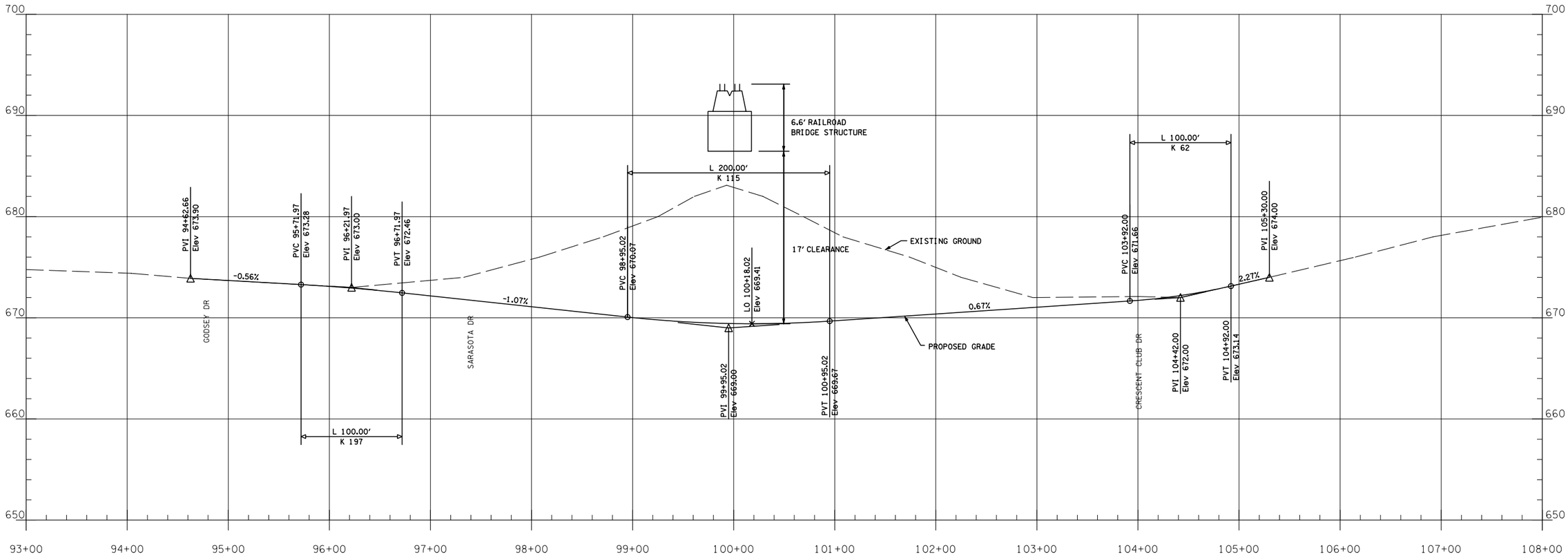
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

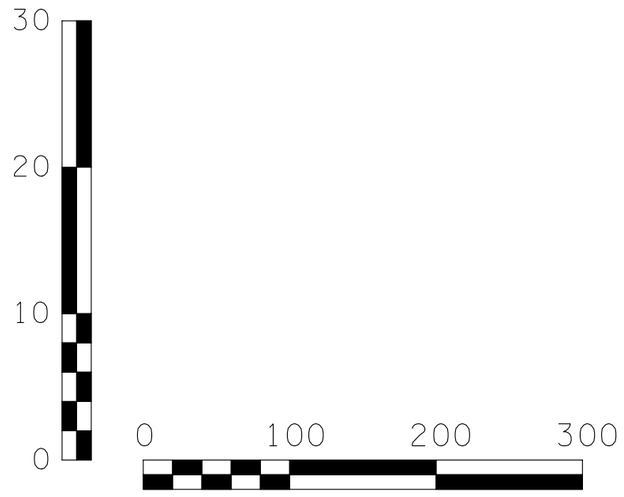
Figure N.4. Profile, RR over Hamill Road

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

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2008	99107-7086-04	





STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Figure N.5.
Profile,
Hamill Road
under RR

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

APPENDIX O

OPTION 2 COST ESTIMATE

Cost Data Sheet--Railroad over Hamill Road (Option 2)

Project: Hamill Road at Norfolk Southern Railroad, Hamilton County
Section: From Old Godsey Lane to Crescent Club Drive
Length: 1400 feet

Right of Way				
Land (11.69 Acres)		$	803,000	
Improvements		$	526,000	
Damages		$	213,000	
Incidentals		$	156,000	
Relocation Payments	(2 residences)	$	36,000	
	(4 businesses & farms)	$	104,000	
	(0 non-profits)	$	-	
Total Right-of-Way Cost				**$ 1,838,000**
Utility Relocation				
Reimbursable		$	274,000	
Non-reimbursable		$	-	
Total Adjustment Cost				**$ 274,000**
Construction				
Clearing and Grubbing		$	23,000	
Earthwork		$	328,000	
Pavement Removal		$	16,000	
Drainage (Includes Erosion Control)		$	1,179,000	
Structures		$	1,152,000	
Railroad Crossing or Separation		$	3,904,000	
Paving		$	435,000	
Retaining Walls		$	-	
Maintenance of Traffic		$	100,000	
Topsoil		$	91,000	
Seeding		$	23,000	
Sodding		$	12,000	
Signing		$	700	
Lighting		$	75,000	
Signalization		$	-	
Fence		$	-	
Guardrail		$	-	
Rip-Rap or Slope Protection		$	16,000	
Other Construction Items (8.5%)		$	626,000	
Mobilization		$	350,000	
	Construction Cost	$	8,330,700	
	10% Eng. & Cont.	$	834,000	
Total Construction Cost				**$ 9,164,700**
Preliminary Engineering (10%)				**$ 834,000**
Total Cost				**$ 12,110,700**