

TRANSPORTATION PLANNING REPORT
STATE ROUTE 332
(CONCORD ROAD)
FROM NORTSHORE DRIVE
TO CAMPBELL STATION ROAD EXTENSION
KNOX COUNTY, TENNESSEE



PREPARED BY
 WILBUR SMITH ASSOCIATES

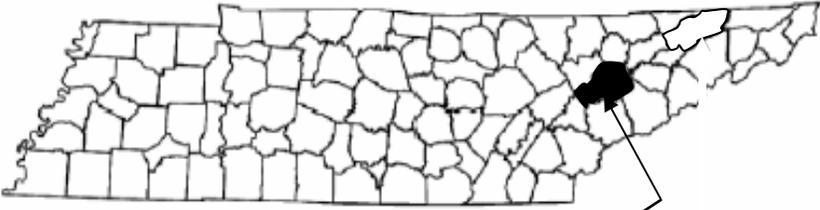
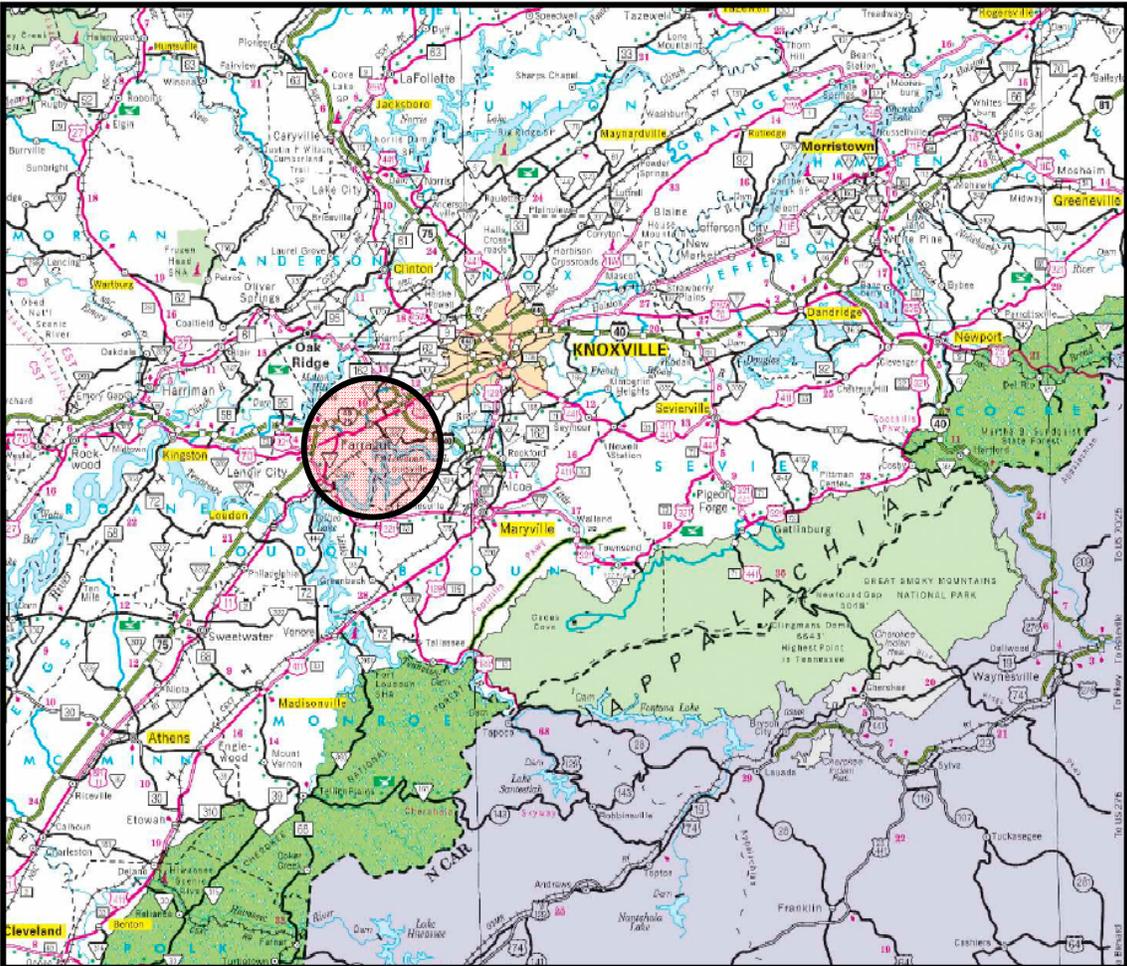
FOR
 KNOX COUNTY
 AND
 TOWN OF FARRAGUT

IN COOPERATION WITH THE
 TENNESSEE DEPARTMENT OF TRANSPORTATION
 PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING	<i>Ed Cole</i>	5/24/07
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION	<i>Steve Olsen</i>	5-18-07
TRANSPORTATION MANAGER PROJECT PLANNING DIVISION	<i>Bill Hart</i>	5/15/07

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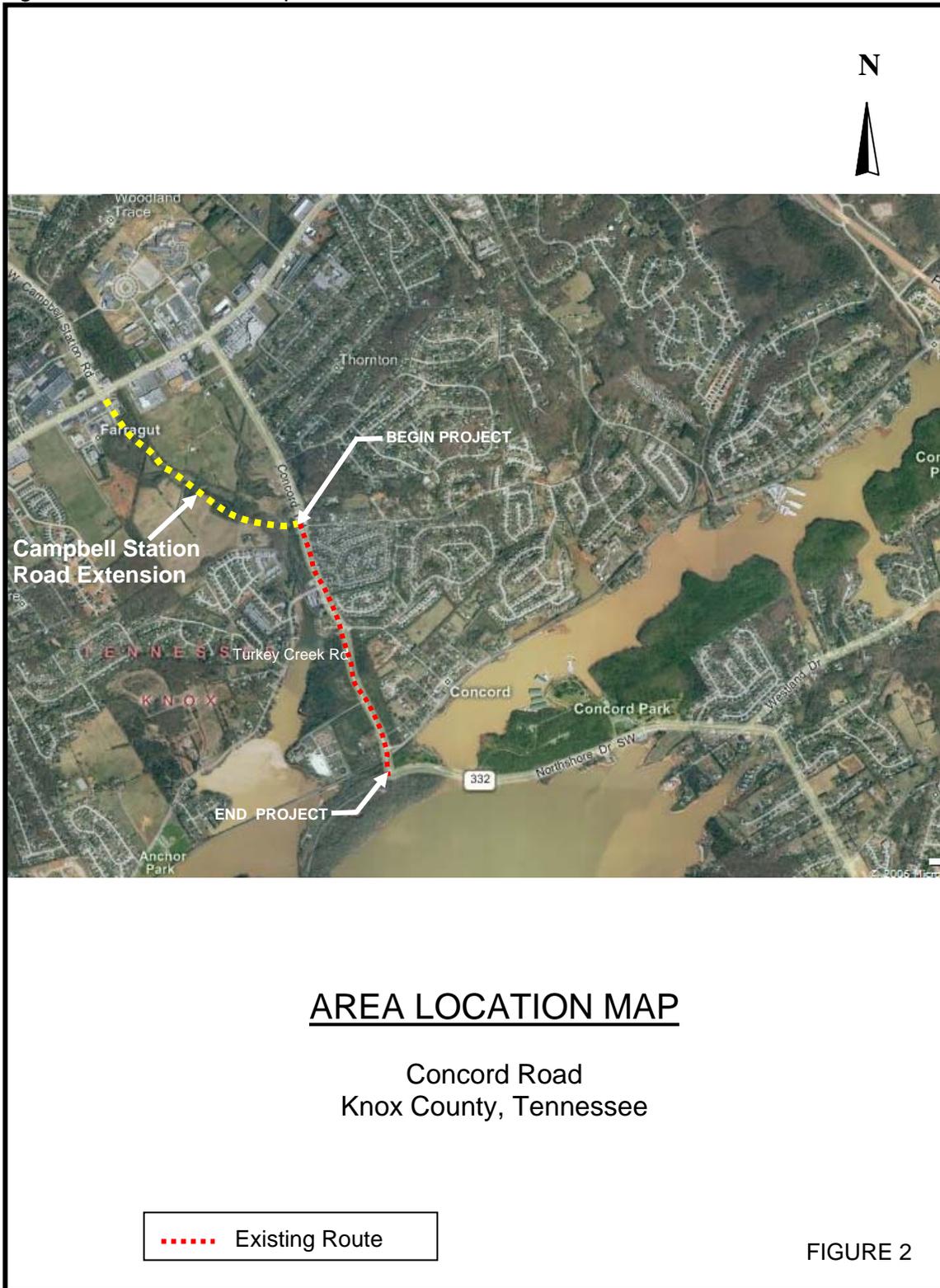
PROJECT VICINITY



KNOX COUNTY

FIGURE 1

Figure 2-Area Location Map



PROJECT LOCATION MAP
Concord Road
Knox County, Tennessee
(USGS Quadrangle: Lovell, TN 138-NW and Concord, TN 138-SW)

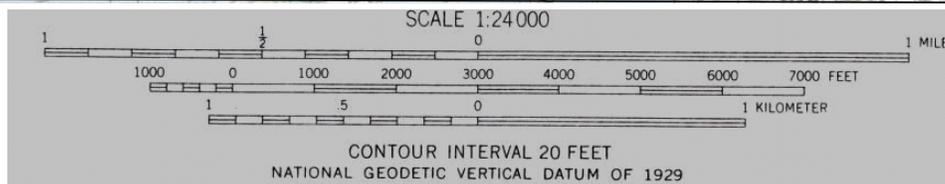
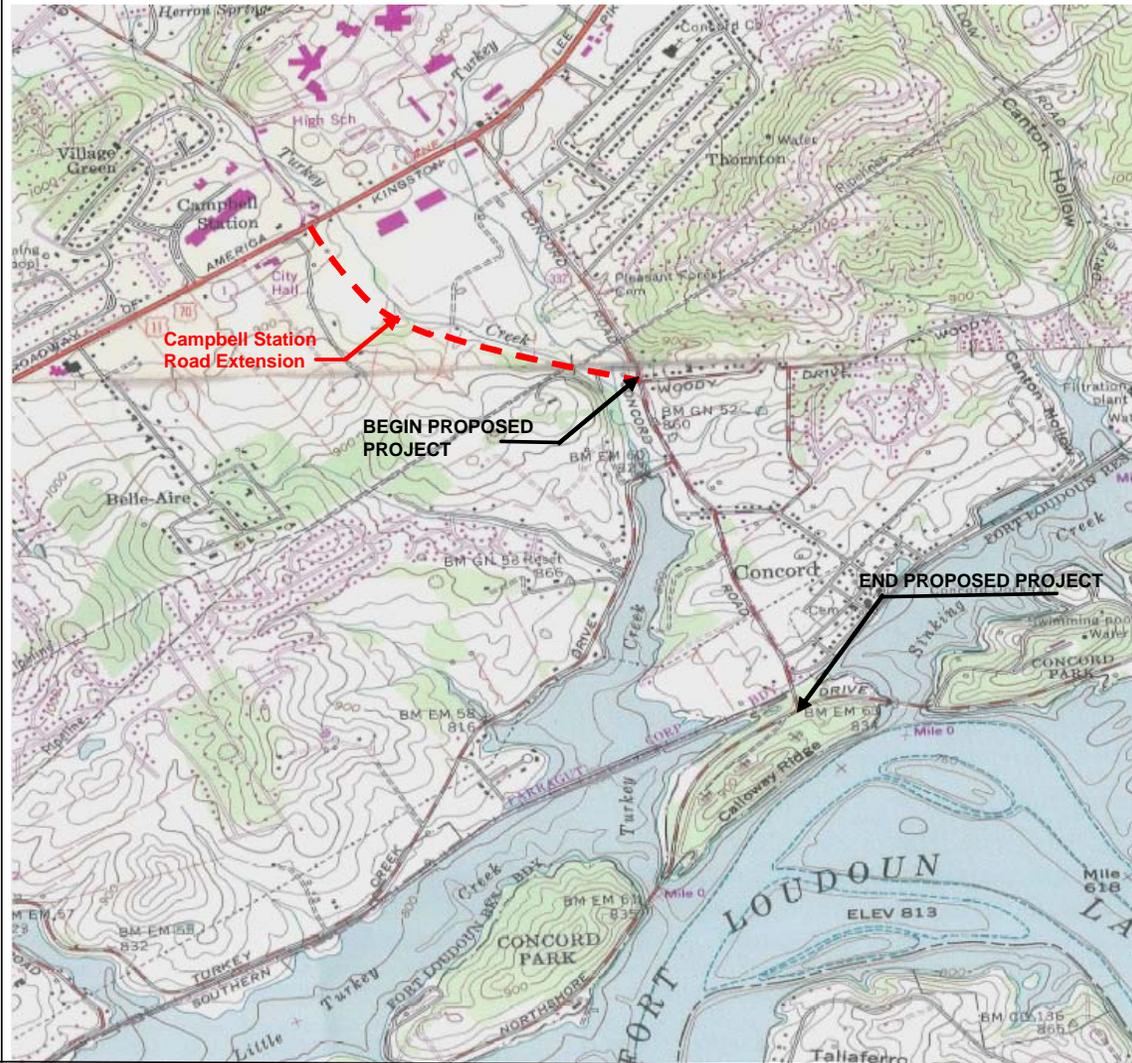


FIGURE 3

PURPOSE AND SCOPE OF STUDY

This Transportation Planning Report (TPR) was commissioned by the Tennessee Department of Transportation (TDOT) at the request of the Town of Farragut and Knox County to evaluate the need for and feasibility of widening Concord Road from a two-lane roadway to a five-lane roadway corridor from the new Campbell Station Road Extension to Northshore Drive. The purpose of this Transportation Planning Report (TPR) is to analyze existing and future traffic conditions on Concord Road (S.R. 332), and to make recommendations for the type of improvements most appropriate to address the identified concerns.

Traffic volumes along Concord Road have grown rapidly due to subdivision expansion throughout the Town of Farragut and western portions of Knox County. Concord Road runs approximately 1.8 miles connecting Kingston Pike (S.R. 1) to its intersection of Northshore Drive, where the S.R. 332 designation continues east into Knoxville. Most often, motorists access Northshore Drive via Concord Road as an alternate route to the highly utilized principal arterial, Kingston Pike.

Proposed improvements to Concord Road would result in a five-lane urban minor arterial matching the typical section of the Campbell Station Road Extension and extending to Northshore Drive. The objectives of this study are to determine the need for the improvement, develop a proposed plan for the project, analyze existing and future traffic conditions, estimate right-of-way and construction costs, and identify areas of potential environmental concern. In addition to documenting the geometric, safety and connectivity deficiencies, this TPR will also analyze the base year (2011) and design year (2031) "Level of Service" (LOS) for the study area.

Figure 1 illustrates the regional setting. An Area Location Map is shown in Figure 2. A Project Location Map (USGS Map Concord, TN Quadrangle 138-SW and Lovell, TN Quadrangle 138-NW) depicting the area topography shown in Figure 3.

EXISTING CONDITIONS

Concord Road is an urban minor arterial roadway which carries the designation State Route 332 from Northshore Drive to its terminus at Kingston Pike (S.R. 1). Traffic volumes are growing quite rapidly due to the major subdivision expansion that is

occurring within the Town of Farragut and areas in west Knox County. This has resulted in significant traffic congestion along Concord Road particularly during morning and afternoon peak traffic hours. Presently, the roadway width on Concord Road from Turkey Creek Road to Northshore Drive is insufficient resulting in limited lane capacity, a major impediment to safe and efficient traffic flow along this frequently traveled state route.

The new Campbell Station Road Extension which begins at Kingston Pike and travels southeasterly to Concord Road near its intersection with Turkey Creek Road provides an important link in the transportation system of Farragut and West Knox County. Previously motorists traveling from the Interstate 40/75/Campbell Station Road interchange to areas along Northshore Drive or Choto Road typically would use North Campbell Station Road, make a left at Kingston Pike and then a right onto Concord Road to proceed to Northshore Drive. The new roadway extension has eliminated the turning movements, providing a more direct and efficient route. Plans are currently being developed to widen N. Campbell Station Road from Parkside Drive to Jamestowne Boulevard to create a continuous five lane section from the interstate to Concord Road. Proposed improvements on Concord Road would extend the five lane corridor to Northshore Drive.

This project is considered a joint project with the Town of Farragut and Knox County and is listed in the Knoxville Regional Transportation Planning Organization (TPO) Long Range Transportation Plan as a requested Transportation Improvement Program (TIP) project for FY 2006-2008.

The northern terminus of the project is on Concord Road at its intersection with Turkey Creek Road and Summerdale Drive. This signalized intersection is also the terminus of the previously mentioned Campbell Station Road Extension project which included minor improvements to these neighborhood streets. The Town of Farragut is also recommending improvements on a second phase of Turkey Creek Road between Brixworth Boulevard and Virtue Road.

The southern terminus lies at the intersection of Northshore Drive and Concord Road. This "T" type intersection lies just outside the corporate limits of the Town of Farragut.

Northshore Drive is an urban minor arterial that runs generally east-west. The east leg, which originates inside of Knox County, carries the S.R. 332 designation from Concord Road. Beyond the immediate intersection area is the Town of Farragut to the north and unincorporated areas of Knox County to the east and west. Located immediately northeast of the intersection is the small community of Concord consisting of older homes and churches, some with historic significance.

TDOT is currently planning to improve the intersection of Northshore Drive and Concord Road by replacing the existing three-leg intersection with a single-lane roundabout. Recommendations included a single-lane roundabout with design flexibility to accommodate future multi-lane approaches. The flexibility lies in that the additional lanes on any of the approaches can be added and the roundabout would still be effective. For example, with the two lane roundabout in place, Concord Road can be widened and the roundabout configuration would still operate effectively. The right-turn bypass lanes constructed for the westbound and southbound right-turns are expected to operate at an acceptable level of service alleviating traffic delays and congestion at the intersection.

Traffic volumes at this stop-controlled intersection have become an increasing concern due to the rise in subdivision construction occurring in the Farragut and west Knox County areas. This resulted in the intersection study which began in 2002 performed by TDOT to evaluate the intersection and make recommendations for improvement to address identified concerns. This single lane roundabout is anticipated to significantly outperform the design of the standard intersection by reducing delay and the number of accidents. Furthermore, it is understood that the roundabout would be a context sensitive solution for this area with its neighboring parks, keeping in mind the historic character of the nearby Concord community. Construction of the roundabout is expected to begin by Spring 2007. The proposed roundabout will serve as the southern terminus of this Concord Road improvement project and must be taken into account during the preliminary design phase for this project.

PURPOSE AND NEED

Continued growth in Knox County and the Town of Farragut community will affect the existing transportation network within this regional corridor. As a result of current traffic

conditions, this TPR was conducted to assess the need and feasibility for roadway improvements on Concord Road in order to service the anticipated development growth and associated traffic demand in the area.

An improved Concord Road will complement the Campbell Station Road Extension by accommodating a greater flow of traffic in a safer environment. The improvement will also help accommodate traffic from neighborhoods along Northshore Drive and the Choto area which travel into and through Farragut. Improvement to the existing two-lane corridor should provide the needed area to encompass a feasible roadway placement that will meet the purpose and need of the project with the concurrence of Knox County and the Town of Farragut communities. This improved facility would provide convenience for motorists traveling from the Interstate 40/75 interchange to areas along Northshore Drive, Choto Road and portions of Loudon County.

Utilizing the annual average daily traffic (AADT) acquired from TDOT's Tennessee Roadway Information Management System (TRIMS) database for years 2003 through 2005 and the calculated vehicle miles of travel, a crash rate (crashes per one million vehicle miles) was calculated for the existing route. The calculated crash rate encompassing the entire project was calculated to be 3.95. This can be compared to the statewide average rate for these years of 2.51 for the two-lane urban minor arterial. The critical rate is a quality control measure that defines statistically how the actual rate differs significantly from the statewide average accident rate. The ratio of the actual rate to the critical rate indicates the severity of the problem. A ratio of over 1.0 suggests a likely safety deficiency problem. In this case the calculated ratio is 1.01. As the amount of traffic increases, this ratio will grow to reflect the dangerous safety deficiencies without significant improvements to Concord Road.

COMMUNITY PROFILE

As depicted on the Project Vicinity Map (Figure 1), the Concord Community is located in southwestern Knox County approximately fifteen miles west of downtown Knoxville, Tennessee. Closely adjacent to the Town of Farragut, its regional setting places it close to several neighboring counties including Loudon, Blount, and Anderson making it a prime location for residential, commercial, and employment opportunities.

The Concord community was established on a railroad with a river port consisting of 55 lots. Once considered the largest town in Knox County outside of Knoxville, Concord became the center of an abundant marble industry, shipping marble to areas throughout America. The effects of the Great Depression and the movement of the marble industry toward Knoxville resulted in the closing of quarries and neighboring businesses which changed the prosperity of Concord. Also during 1944, the construction of Fort Loudoun Dam in Lenoir City, Tennessee by the Tennessee Valley Authority (TVA) formed a lake which inundated much of the town and forced the railroad to be relocated. This reservoir also necessitated changes in the local road system and the creation of neighborhood parks. Today, Concord is basically a residential community with 75% to 80% of the residents occupying houses built before or shortly after the turn of the century. The westward growth of Knoxville created more subdivisions and commercial centers. In 1980, the Farragut Community was incorporated as the Town of Farragut in an effort to provide guidance over the rapid growth of housing and commercial development. The Concord village, though surrounded by subdivisions, has been relatively untouched by the remarkable building boom in West Knox County and was added to the National Register of Historic Places as a Historic District in 1987.

According to Knox County and the Town of Farragut, land use along the corridor primarily is commercial or zoned commercial but also includes residentially zoned property. The traffic circulation pattern within the study area relies heavily on the major arterials including Kingston Pike, Concord Road, and Campbell Station Road. These routes carry a considerable volume of traffic. Kingston Pike, (SR-1) is the only major arterial running east-west through the entire town. Kingston Pike roughly bisects the Town and carries a significant amount of through traffic from the surrounding area. Most of the Town's principal commercial areas are located along Kingston Pike, emphasizing its function as a major arterial within the Town. Concord Road and Campbell Station Road are minor arterials running north-south in Farragut. Campbell Station Road and Watt Road feed traffic northward directly onto Interstate 40/75 providing a vital link between Kingston Pike and the interstate. The study corridor, Concord Road links Kingston Pike with Northshore Drive, a main state road located on the southern edge of the town. During the morning peak traffic period, most traffic moves north and east as residents commute to work in Knoxville and Oak Ridge. This traffic circulation pattern reverses in the afternoon as workers return home.

LEVEL OF SERVICE

In addition to documenting the geometric, safety and connectivity deficiencies, this TPR will also analyze the base year (2011) and design year (2031) “Level of Service” (LOS) for the study area. The efficiency (or sufficiency) of roads is described by their LOS. The criteria are defined as shown in the “Level of Service” section of this report and reflect the ability of roads and intersections to accommodate motor vehicle traffic and subsequent physical and psychological comfort levels of drivers. The LOS analysis incorporates several factors including traffic volumes, number and width of lanes, terrain, directional split, vehicle types and shoulder widths. The results of the LOS calculations, as explained later in this document, indicate intersection deficiencies in both the base and design years.

In addition to the LOS analysis, projected traffic volumes for the base and design years are included in this report and are depicted in the Project Data Table and on the traffic schematic. The base year (2011) average daily traffic (ADT) on Concord Road is 19,400 vehicles per day with 6 percent trucks. This ADT projection increases to 34,920 in the design year (2031).

Traffic volumes on Concord Road are anticipated to grow rather aggressively. Based on data provided by TDOT and the regional Transportation Planning Organization, the rate of traffic growth on Concord Road is expected to be at four percent per year. In order to evaluate traffic conditions, capacity and level of service were calculated using the **2000 Highway Capacity Manual, Special Report 209** published by the Transportation Research Board (TRB). Level of service is a qualitative statement of the acceptability of traffic conditions on a roadway or intersection. There are six levels of service ranging from “A” to “F” with “F” representing the worst.

Signalized and unsignalized intersections are evaluated based on estimated delays, which are related to level of service (LOS). The table below presents a summary of the delay criteria for the various levels of service under STOP control and signalized control. Within urban areas, LOS D generally is considered the minimum acceptable LOS. Another important measure typically reported for intersections is the volume-to-capacity ratio, or V/C. This is a measure of the portion of capacity being used. Lower V/C values are desirable.

Table 1: LOS Criteria

LOS	Average Control Delay (seconds/vehicle)	
	2-Way STOP	Traffic Signal
A	0 to 10	0 to 10
B	>10 to 15	>10 to 20
C	> 15 to 25	> 20 to 35
D	> 25 to 35	> 35 to 55
E	> 35 to 50	> 55 to 80
F	> 50	> 80

The level of service for roadways is measured differently. For two-lane roadways, the key determinant of LOS is freedom to travel at the unimpeded free-flow speed. This freedom is constrained by no-passing zones as drivers may be caught behind slower vehicles. Similarly, for multilane highways LOS is reflective of speed and its constraint by the density of vehicles on the roadway. The table of LOS values for the various determinants for roadways is too large to report here.

The LOS analysis completed for this study utilized existing peak hour traffic volumes (2006), the projected base year (2011) peak hour traffic volumes and design year (2031) peak hour traffic volumes with existing geometry as well as with the proposed improvement of Concord Road to a five-lane section. One intersection was evaluated (Concord Road at Turkey Creek Road). This intersection is currently signalized. There are other at-grade STOP-controlled intersections along the study corridor, but these are local street intersections not expected to significantly impact traffic conditions. Current and future traffic conditions are tabulated below. The Appendix to this report contains a more detailed summary of traffic volumes and levels of service at each planning horizon.

Table 2: LOS Summary

Location	Criteria	Existing geometry ¹						Proposed geometry ²			
		2006		2011		2031		2011		2031	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
SR 332/ Turkey Creek Road	Delay	25.0	16.0	37.7	18.1	189.2	54.0	21.1	16.5	54.6	48.4
	LOS	C	B	D	B	F	D	C	B	D	D
	V/C	0.69	0.52	0.81	0.63	1.39	0.95	0.59	0.56	0.93	0.91
SR 332 (Roadway)	LOS ³	E		E		F ⁴		B		D	
	Notes:	<ol style="list-style-type: none"> 1. Existing lanes at intersection, two lanes on Concord Road south of Turkey Creek Road. 2. Five lanes on SR 332 north and south of Turkey Creek Road. 3. LOS for roadways is for either peak hour. 4. Not reported by analysis software, assumed to be LOS F. 									

The proposed widening of Concord Road to a five-lane section will provide needed capacity for intersection and roadway operations. The intersection of Concord Road at Turkey Creek Road is projected to decline to LOS F conditions with a V/C exceeding 1.0 before 2031. The two-lane roadway is currently at failing conditions as passing is prohibited throughout the study section. Upon widening to five lanes, the added capacity will render LOS D or better results for the roadway and intersection through 2031.

SAFETY

WSA reviewed the crash history within the study area. TDOT provided a tabulation of crashes and the crash summary report for the segment between log miles 1.03 and 1.79. The period covered is 2003 through 2005. Table 3 below presents a summary of the data. Locations where two or more crashes occurred within the period are identified.

Table 3: Crash Data

Sidestreet	Log mile	Total #	Type of crash								Wet Pavement
			F	PI	PDO	Angle	RE	SS	HO	Other	
Turkey Creek Road	1.200	3	0	1	2	1	1	0	1	0	1
None given	1.210	4	0	2	2	1	2	0	0	1	2
Loop Road	1.360	2	0	1	1	2	0	0	0	0	1
None given	1.690	2	0	0	2	0	2	0	0	0	0
None given	1.790	7	0	2	5	4	2	0	0	1	0
Other	Varies	12	0	4	8	2	4	3	0	3	2
Total	N/A	30	0	10	20	10	11	3	1	5	6

Abbreviations:

F = fatality

PI = personal injury

PDO = property damage only

RE = rear-end

SS = sideswipe

HO = head-on

Wet pavement crashes (six of 30) are not remarkable. Lighting conditions were not provided by log mile, but overall 21 of the 30 crashes were during daylight conditions. Thus, the need for roadway lighting is not indicated by the crash data. The predominant crash patterns are rear-end and angle, so the provision of left-turn lanes at intersections or a continuous two-way left-turn lane throughout the study area is indicated as a need. It will provide a refuge for left-turn vehicles out of the through lane helping to minimize rear-end crashes. Further, the turn lane will facilitate two-stage gap acceptance at STOP-controlled intersections whereby drivers turning left onto SR 332 may wait for acceptable gaps in traffic from their left, proceed into the center turn lane, then wait for acceptable gaps in traffic from their right. It is expected that the proposed widening of SR 332 to five lanes will improve safety within the corridor.

The roadway section crash rate is 3.95 accidents per million vehicle miles, and the critical rate for the section is 3.91 accidents per million vehicle miles. The ratio of actual to critical rates is 1.01, so the section does not qualify as a Hazard Elimination Safety Project.

PROPOSED IMPROVEMENT

This includes a No-Build option, which, as the name implies, denotes that only minor improvements including safety improvements and normal maintenance will be made to the existing road and its study intersections. During the field review, new roadway options were discussed with TDOT, Knox County and Town of Farragut representatives. Since the project corridor is only \pm 3,960 feet long and is bounded by heavy residential subdivisions to the east and Fort Loudon Lake to the west, there were no feasible options to test alternate alignments for the horizontal alignment. Therefore, one roadway "Build" option is recommended. The Build Option will be developed with careful consideration of study area keeping in mind the objectives of Knox County and the Town of Farragut to provide an efficient transportation link from southwestern Knox County to Interstate 40/75.

The proposal would involve upgrading this existing two-lane section of Concord Road to an improved five-lane segment consistent with the recently completed Campbell Station Road Extension. Approximately 3,960 feet of Concord Road is proposed for improvement to a five lane urban section including sidewalks, curbs and gutters and bike lanes to match the roadway extension.

The alignment for the Build Option is depicted on Figure 3, the Project Corridor Topography map. The Build Option is proposed to improve roadway connectivity from Turkey Creek Road to Northshore Drive. A 300 feet corridor width will be utilized based on the vicinity of the option within the project limits. This corridor width should provide the needed area to encompass a feasible roadway placement that would meet the purpose and need of the project. The proposed Build Option alignment would begin at its northern terminus at Turkey Creek Road and run approximately 3,960 feet along the existing centerline. The proposed roundabout to be located at the intersection of Northshore Drive and Concord Road is scheduled for a Spring 2007 letting. The design of the roundabout may dictate the alignment of the Concord Road improvements. The proposed improvement of the Concord Road alignment would include tying into the roundabout.

The Build Option includes the replacement of the existing bridge over the Norfolk Southern Railway. During the roadway construction, the existing bridge would remain open for traffic while the new bridge is installed in phases. An option would be to build the complete new structure on new alignment. This TPR includes a cost estimate for the bridge replacement as well as a cost for the maintenance of traffic during the removal and replacement of the bridge.

The Build Option incorporates a five-lane section with four-12 foot traffic lanes and a two-way left turn lane. In addition, curbs and gutters, sidewalks, and bike lanes are recommended. The Town of Farragut has long understood the need to develop alternate modes through the Town and is continually adding new sidewalks, greenways and bike lanes as an ongoing project to improve pedestrian and bike safety. The Knoxville TPO Regional Bicycle Plan encourages that appropriate bicycle and pedestrian facilities be implemented as a part of city and county capital improvement (new and reconstruction) projects in order to address the present and future needs of bicyclists and pedestrians.

The Build Option will also result in the right-of-way acquisition and utility relocations along Concord Road and may result in displacement of some businesses. The necessary right-of-way to build the project will vary depending on the terrain, proposed land uses, and environmental considerations.

Some advantages of the No-Build Option include less disruption of the existing land use patterns and no disruption of the area due to construction. Also mitigation measures to moderate environmental impacts would not be necessary. This proposed improvement as envisioned by Knox County and the Town of Farragut would reduce traffic congestion, improve levels of service and enhance safety to pedestrians, bicyclists, and motorists.

Overall, improvement to Concord Road would enhance access to Interstate 40/75 from Northshore Drive, Choto Road and other sections of West Knox County and Loudon County and provide enhanced access to commercial and residential sites along the route. Besides providing for improved local and regional accessibility, other primary beneficial effects of the build option include: improved safety and operating conditions

along the project corridor; increased traffic capacity; and enhancement of future planned growth by local and/or regional land use planning agencies. It is emphasized that the justification for this project is to create an accessible and fully functional travel route between the study area and the interstate. Traffic demand along Concord Road would actually increase with the Build Option resulting in traffic conditions of LOS D or better.

RECOMMENDATION

The proposed widening of Concord Road from the intersection of the Campbell Station Road Extension to Northshore Drive will enhance access to residential and commercial areas from the southwest section of Knox County to the Kingston Pike corridor and also provide a more convenient access to the Interstate 40/75/Campbell Station Road interchange. Besides providing for improved local and regional accessibility, other primary beneficial effects of the Build Option includes: (1) improved safety and operating conditions along the project corridor; (2) increased traffic capacity; (3) enhancement of future planned growth by local and/or regional land use planning agencies; and, (4) expansion of the local alternative mode system through the construction of bike lanes and sidewalks.

The proposed five-lane section will complement the Campbell Station Road Extension and improve traffic flow from neighborhoods along Northshore Drive and the Choto area, into and through Farragut. It is emphasized that the justification for this project is to create an accessible and fully functional travel route between the study area and the interstate. As stated earlier, traffic demand along Concord Road would actually increase with the Build Option resulting in traffic conditions of LOS D or better.

PRELIMINARY ENVIRONMENTAL ANALYSES

A preliminary investigation into the proposed project's environmental impacts within the "Area of Potential Effects" (APE) is reflected on the attached "Preliminary Environmental Evaluation" checklist. The APE is the geographical area in which an activity may directly or indirectly impact the environment. Possible environmentally sensitive areas within the project limits include the Historic Village of Concord and other commercial, business and residential areas along the route. A more comprehensive analysis of potential environmental impacts will be completed at a later date to comply with the National Environmental Policy Act (NEPA).

In assessing the historical/architectural resources existing along the Concord Road corridor, supporting historical documents were obtained by Town of Farragut's Folklife Museum which features a remarkable collection of artifacts and literature of the Farragut and the Concord area. Additional historical information can be obtained from the Tennessee State Historic Preservation Office (TN-SHPO) as well as the Historic Preservation Office of the Knoxville-Knox County Metropolitan Planning Organization. Information indicated the National Register listed and eligible resources in the general project vicinity include the Historic Village of Concord and Callaway's Landing. The Historic Village of Concord is located immediately northeast of the project's southern terminus. Although, the historic district may fall outside of the project area of potential effect, this determination will not be definitive until plans are available and the field survey has been conducted. Callaway's Landing, located at 1117 Concord Road includes several contributing resources and approximately fifty acres of associated farmland. This determination is tentative pending the field survey and examination of plans. Although, TDOT and TN-SHPO have indicated the historical significance of these areas within the project corridor, a field survey and a historical/archaeological assessment of the project area is recommended to possibly identify additional resources.

Hazardous Materials spills on highways are a potential source of water quality degradation and a possible public health hazard. In the event of any accidents regarding hazardous material spills, the Tennessee Emergency Management Agency (TEMA) would have the responsibility and authority for coordination of all state and local agencies. In the event hazardous substances/waste are encountered within the proposed right-of-way, their disposition shall be subject to the applicable sections of the Federal Resource Conservation and Recovery Act (RCRA), as amended; and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended; and the Tennessee Hazardous Waste Management Act of 1983.

Alterations to streams and other aquatic sites designated as waters of the State or waters of the United States require either individual or general Aquatic Resource Alteration Permits (ARAP) from the State of Tennessee, individual or Nationwide 404 U.S. Army Corps of Engineers permits, and, where applicable, a TVA 26a permit or letter

of no objection. Construction projects disturbing one or more acres of land require storm water control permits issued by the State of Tennessee pursuant to the National Pollutant Discharge Elimination System. For any project that affects water flowing into a sinkhole or cave, or for any impact that may affect the ground water via a sinkhole, a Class B Injection Well permit may be required. This process involves obtaining a permit before the project is let if sinkholes are known to exist. If sinkholes are encountered after construction begins, the appropriate TDOT offices will be notified and the appropriate steps taken to comply with the laws, regulations, and permits. These and any other permit requirements identified in the project development process will be complied with.

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

A preliminary geotechnical review of the APE did not reveal anything that would affect the construction of the build option. It was noted that the project alignment should avoid historic Callaway's Landing which runs parallel to the project on the west.

Preliminary Environmental Evaluation

If preliminary field reviews indicate the presence of any of the following facilities and/or Economic, Social, and Environmental categories (ESE), place an "X" in the blank opposite the item. Where more than one option is to be considered, place its letter designation in the blank. A more comprehensive analysis of the impacts will be completed at a later date to comply with the National Environmental Policy Act (NEPA).

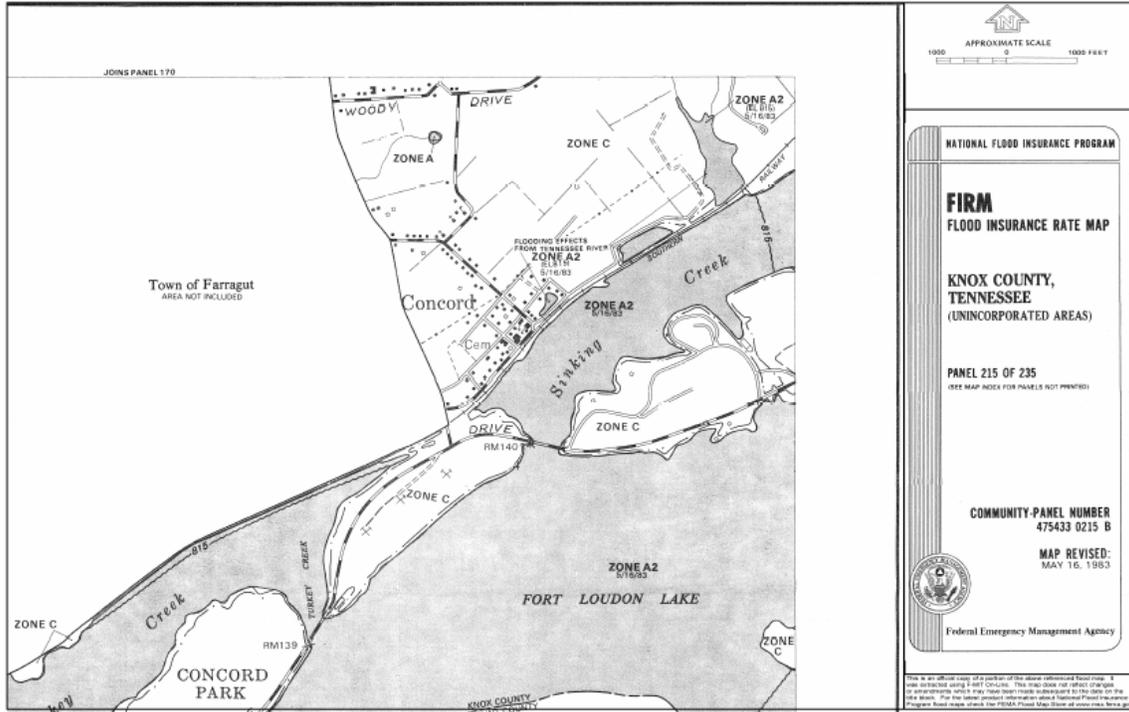
- | | | |
|------|--|-------------------|
| 1.) | Hazardous Material Site or Underground Storage Tanks..... | <u> X </u> |
| 2.) | Floodplains..... | <u> </u> |
| 3.) | Historical, archaeological, cultural or natural landmarks, or cemeteries..... | <u> X </u> |
| 4.) | Airport..... | <u> </u> |
| 5.) | Residential establishment..... | <u> X </u> |
| 6.) | Urban area, city, town, or community.....
(Town of Farragut, Pop. 17,720 U.S. Census) | <u> X </u> |
| 7.) | Commercial area, shopping center..... | <u> X </u> |
| 8.) | Institutional usages: | |
| | a. School or other educational institution..... | <u> </u> |
| | b. Hospital or other medical facility..... | <u> </u> |
| | c. Church or other religious institution..... | <u> </u> |
| | d. Public Building, e.g., fire station..... | <u> </u> |
| | e. Defense installation..... | <u> </u> |
| 9.) | Agricultural land usage..... | <u> X </u> |
| 10.) | Forested land..... | <u> </u> |
| 11.) | Industrial park, factory..... | <u> </u> |
| 12.) | Recreational usages: | |
| | a. Park or recreational area, State Natural Area..... | <u> </u> |
| | b. Wildlife refuge or wildlife management area..... | <u> </u> |
| 13.) | Waterway: | |
| | a. Lake..... | <u> X </u> |
| | b. Pond..... | <u> </u> |
| | c. River..... | <u> X </u> |
| | d. Stream..... | <u> </u> |
| | e. Spring..... | <u> </u> |
| 14.) | Railroad Crossings..... | <u> X </u> |
| 15.) | Project coordinated with MPO/RPO and/or local officials..... | <u> X </u> |
| 16.) | Other..... | <u> </u> |

REVIEW TEAM-FIELD INVESTIGATION

A preliminary field investigation within the environs of the proposed project was performed on Thursday, September 21, 2006. The items discussed during the course of the field investigation are summarized in the Appendix (TPR Field Review- Concord Road). Those representatives in attendance included:

Name	Agency
Darryl Smith	Town of Farragut
Ruth Hawk	Town of Farragut
Gary Palmer	Town of Farragut
Charlie Graves	TDOT Planning- Headquarters
Glenda Tyus	TDOT Planning-Headquarters
Paul Lane	TDOT Planning-Headquarters
Dironna F. Moore	TDOT Environmental- Headquarters
Christie Brown	TDOT Design- Region 1 Office
Maysoon Haddad	TDOT Design- Region 1 Office
Nathan Vatter	TDOT Traffic – Region 1 Office
Cindy Pionke	Knox County -Engineering and Public Works
Mike Conger	Knoxville TPO
Thanh Duong	Wilbur Smith Associates
Dawn Michelle Foster	Wilbur Smith Associates
John Sexton	Wilbur Smith Associates

Figure 4-FEMA Flood Plain Maps



TYPE	YEAR	PROJECT NO.	SHEET NO.
FUNCT.	2007	CONCORD ROAD	2

KNOX COUNTY

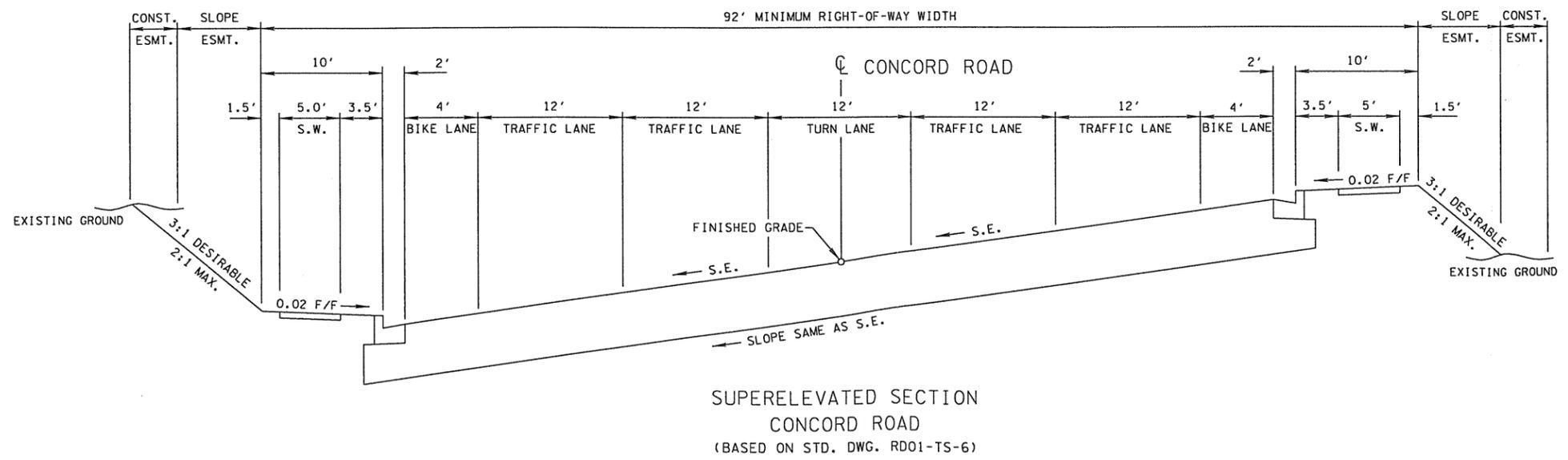
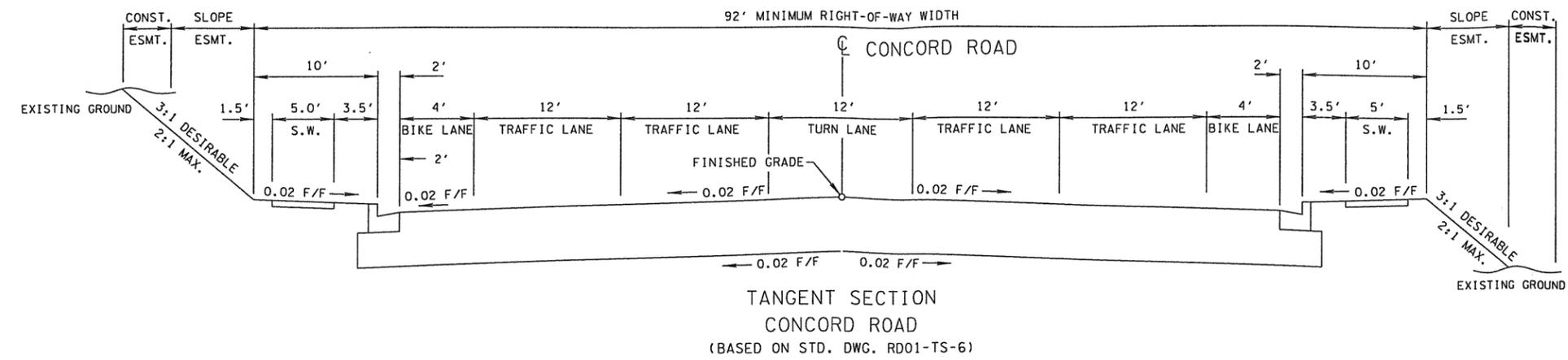


PLATE
STAKE
PORTABLE
SYTIME
DCNSPEC

COST DATA SHEET
 Concord Road
 Knox County, Tennessee

Section: From Campbell Station Road Extension to Northshore Drive (SR-332)
 Length: Approximately 3,800 feet

Right-of-Way

Land, (4.2 acres) -----	\$	567,000
Improvements -----	\$	10,000
Damages -----	\$	175,000
Incidentals (24 tracts) -----	\$	171,000
Relocation Payments (0 residences) -----	\$	400,000
(2 business & farm)		
(0 non-profits)		
 Total Right-of-Way Cost-----	\$	1,323,000

Utility Relocation

Reimbursable -----	\$	90,000
Non-reimbursable -----	\$	530,000
 Total Adjustment Cost-----	\$	620,000

Construction

Clear and Grubbing -----	\$	28,000
Earthwork -----	\$	767,000
Pavement Removal -----	\$	16,000
Drainage (Includes Erosion Control)+Culvert -----	\$	445,000
Structures -----	\$	1,229,000
Railroad Crossing or Separation -----	\$	0
Paving -----	\$	1,089,000
Retaining Walls -----	\$	100,000
Maintenance of Traffic -----	\$	38,000
Topsoil -----	\$	11,000
Seeding -----	\$	8,000
Sodding -----	\$	12,000
Signing -----	\$	4,000
Lighting -----	\$	0
Signalization -----	\$	0
Fence -----	\$	0
Guardrail-----	\$	8,000
Rip Rap or Slope Protection -----	\$	10,000
Other Construction Items(8.5%) -----	\$	320,000
Mobilization -----	\$	61,000
Construction Cost -----	\$	4,146,000
10% Eng. And Cont. -----	\$	415,000
Total Construction Cost-----	\$	4,561,000
Preliminary Engineering (10%) -----	\$	456,100

Total Cost----- **\$ 6,960,100**

DATA TABLE
 State Route 332 (Concord Road)
 Knox County

From: Campbell Station Road Extension
 To: Northshore Drive (SR-332)

<u>Item</u>	<u>Existing</u>	<u>Proposed</u>
Functional Class	Urban Minor Arterial	Urban Minor Arterial
System Class	STP	STP
Length - Miles	0.75	0.75
Cross Section Feet	22'/50'	68'/96'
Base Year ADT(2011)	19,400	19,400
Projected Future ADT(2031)	34,920	34,920
Percent Trucks	6	6
Estimated Right-of-Way Acquisition(Acres)	N/A	4.2
Estimated Right-of-Way Tracts Affected	N/A	24
Estimated Family Displacements	N/A	0
Estimated Business Displacements	N/A	2
Estimated Right-of-Way Cost	N/A	\$ 1,323,000
Estimated Utility Cost Reimbursable	N/A	\$ 90,000
Estimated Utility Cost Non-Reimbursable	N/A	\$ 530,000
Estimated Construction Cost	N/A	\$ 4,561,000
Estimated Preliminary Engineering Cost	N/A	\$ 456,100
Total Estimated Section Cost	N/A	\$ 6,960,100

TENNESSEE DEPARTMENT OF TRANSPORTATION
DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE:	SR-332- CONCORD ROAD	ALTERNATE:	A
SECTION:		REGION:	1
COUNTY:	KNOX	PROJECT #:	N/A

LOCATION

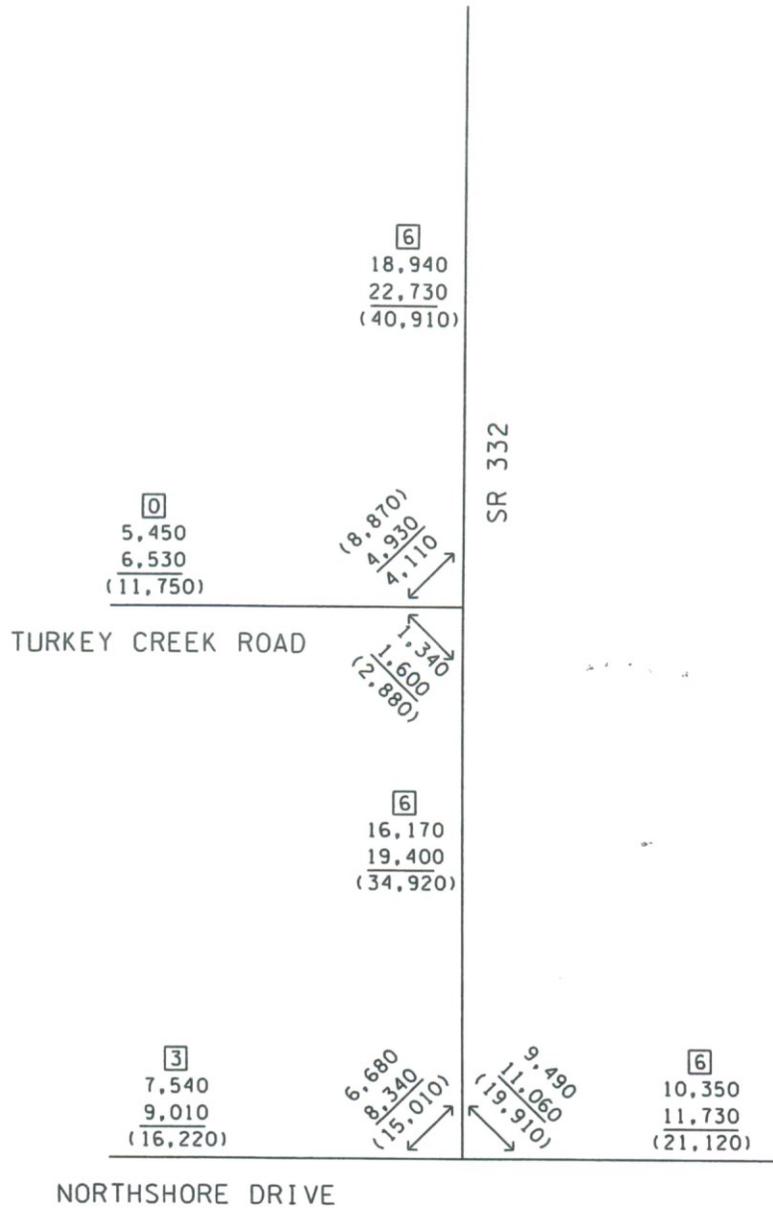
From:	Campbell Station Road Extension
To:	Northshore Drive (SR-332)

PARAMETER	CRITERIA
2011 ADT	19,400
2031 ADT	34,920
PERCENT TRUCKS(DHV)	6%
DHV(10% ADT 2031)	3,490
FUNCTIONAL CLASSIFICATION	Urban Minor Arterial
MINIMUM DESIGN SPEED	40 MPH
ACCESS CONTROL	N/A
MAXIMUM CURVE	10° 00'(S.E.=0.04'/,)
MAXIMUM GRADE	10.0 %
MINIMUM STOPPING DISTANCE	275'-325'
SURFACE WIDTH	2@24'
NUMBER OF LANES	4
USABLE SHOULDER WIDTH	2@6''(includes Curb & Gutter and Bike Lane)
MEDIAN WIDTH **	12'(turn lane)
MINIMUM RIGHT-OF-WAY	*92'
SIGNALIZATION	Possible upgrade in system at Turkey Creek

REMARKS: *Easements will be required outside of Right-of-Way

** 4-Lane Bridge Replacement over Railroad

TRAFFIC SCHEMATICS



KNOX COUNTY
TOWN OF FARRAGUT
SR 332 TPR

LEGEND:

2006 ADT	21,800
2011 ADT	<u>25,900</u>
2031 ADT	<u>(37,500)</u>
ADT TRUCK %	$\boxed{3}$

DATE: DECEMBER 11, 2006
JWS

CRASH HISTORY

TENNESSEE DEPARTMENT OF TRANSPORTATION

COUNTY KNOX Date: 01/08/07
 Route SR 332
 Location FROM WATERORD RD TO NEAR SECOND DR
 Highway Type = TWO LANE URBAN
 DATA YEARS = 2003 - 2005
 AADT YEARS USED= 2005 TRIMS
 ANALYZED BY = DH
 COMMENTS = SR332URBAN MIN ARTERIAL

SECTION= MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE					
BLM	ELM	Length	AADT	VMT	
1.03	1.79	0.76	9,130	6,939	
0.00		0.00		0	
0.00		0.00		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	
		0.76	9,130	6,939	

AADT YEAR SOURCE = 2005 Trims 2003 - 2005					
Two Lane Urban					
		Total	Fatal	Injury	
No. of Crashes	=	30	0	10	
No. of Years	=	3			
SW avg. rate	=	2.51	0.01	0.72	
01-02-03 S/W RATES					
Actual to S/W Avg.	=				
Exposure	=	7.5980			
Actual Rate (A)	=	3.95	0.00	1.32	
Critical Rate (C)	=	3.91			
Severity Index	=	0.3333			
Ratio of A/C	=	1.01 DOES NOT QUALIFY FOR CONSIDERATION AS A HES PROJECT			

Crash Summary Report

Date: 01/05/2007

County: KNOX

Route: SR332

Spcl Cse: 0-NONE

Cnty Seq: 1

Begin LogMile: 1.03

End LogMile: 1.79

Begin Date: 01/01/2003

End Date: 12/31/2005

Statistics

Fatal Accidents:	0
Tot Killed:	0
Injury Acc:	10
Tot Injr:	13
Prop Damage Acc:	20
Total Accidents:	30

Weather Conditions

No Adverse Conditions:	24	Sleet and Fog:	0
Rain:	6	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	0	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Accidents Involving

Pedestrians:	0
Hazardous Cargo:	0
Construction Zones:	6
Fixed Objects:	2
Heavy Trucks:	0
Bicycles:	0

Manner of Collision

Rear End:	11
Head On:	1
Rear-to-Rear:	0
Angle:	10
Sideswipe Same Dir:	1
Sideswipe Opp. Dir:	2
Unknown:	0

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	2
Dry:	19
Other:	0
Unknown:	0

Accident Location

Along Roadway:	10
At Intersection:	20
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	0
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	0
Other Animal:	0
Motor Vehicle in Transport:	7
Motor Vehicle in Transport in Other Rdway:	0
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	2
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	0
Daylight:	21
Dusk:	1
Dark/Lighted:	2
Dark/Not Lighted:	6
Not Indicated:	0

ROUTE FEATURE DESCRIPTION LISTING

KNOX County - SR332

COUNTY: KNOX

COUNTY NO. 47

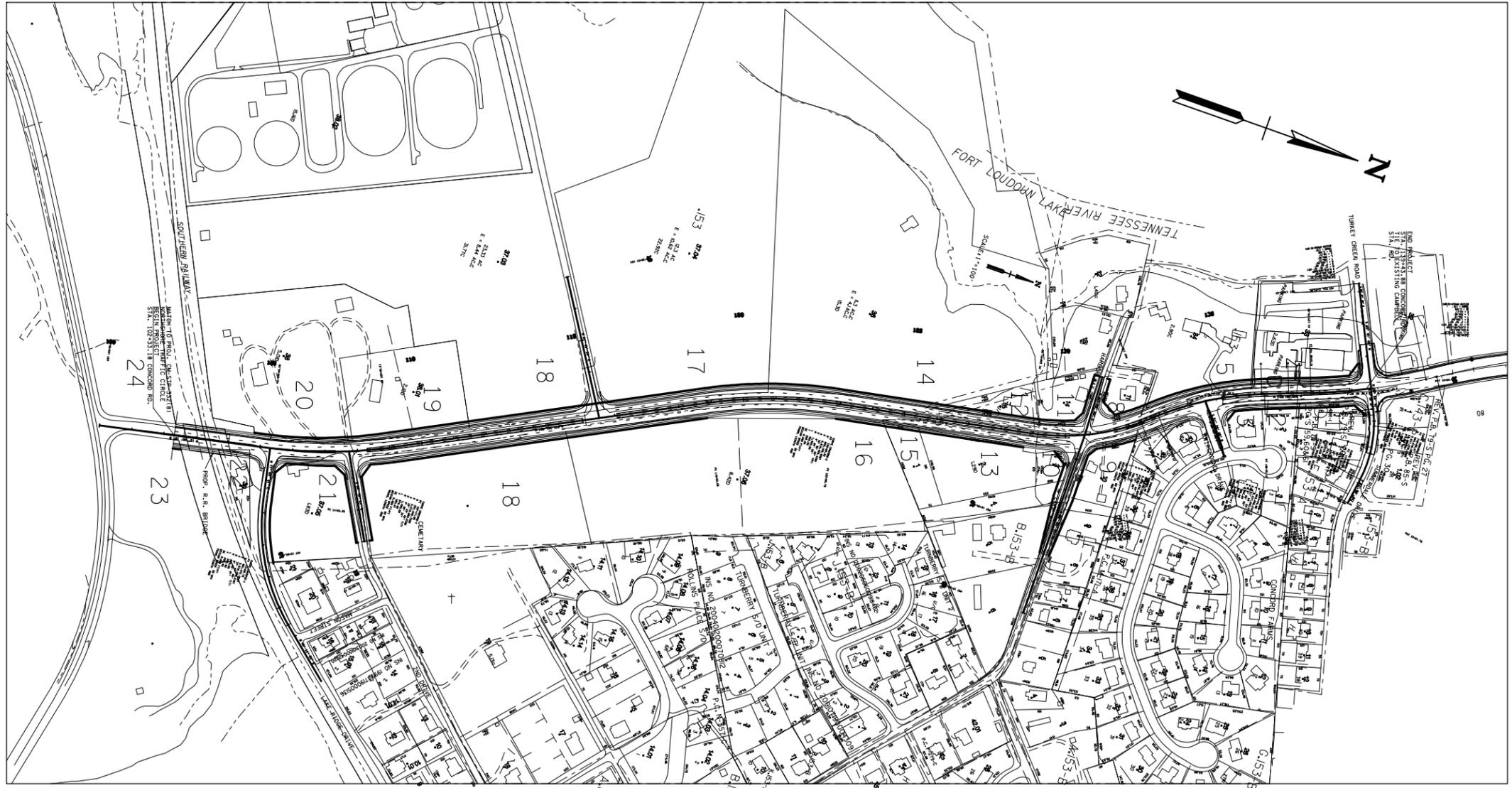
ROUTE: SR332

SPECIAL CASE: None

CTY SEQ: 1

LOG MILE	ITEM CODE	ROUTE FEATURE	DESC CODE
1.030	5	G236 WATERFORD RD LT.	530
1.200	9	TRAFFIC SIGNAL	905
1.200	4	2416 TURKEY CREEK RD RT.	420
1.200	5	G232 SUMMERDALE DR LT.	530
1.300	5	Z999 FAIRGROUND DR LT.	530
1.360	5	B854 LOOP RD RT. & LT.	510
1.380	9	CULVERT: BRANCH	980
1.800	5	B858 SECOND DR LT.	530
1.850	5	B854 LAKE RIDGE DR LT.	530
1.870	2	OVERHEAD [47S24060001]: SOUTHERN RWY	211
1.890	1	LEAVE FARRAGUT CITY LIMITS	135
1.950	9	1-WAY STOP	901
1.950	4	1135 NORTHSHORE DR RT.	420
1.950	0	90 DEGREE LT. TURN	922
1.950	9	BEGIN 40 MPH	932
1.950	0	BEGIN S NORTHSHORE DR	920

TYPE	YEAR	PROJECT NO.	SHEET NO.



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