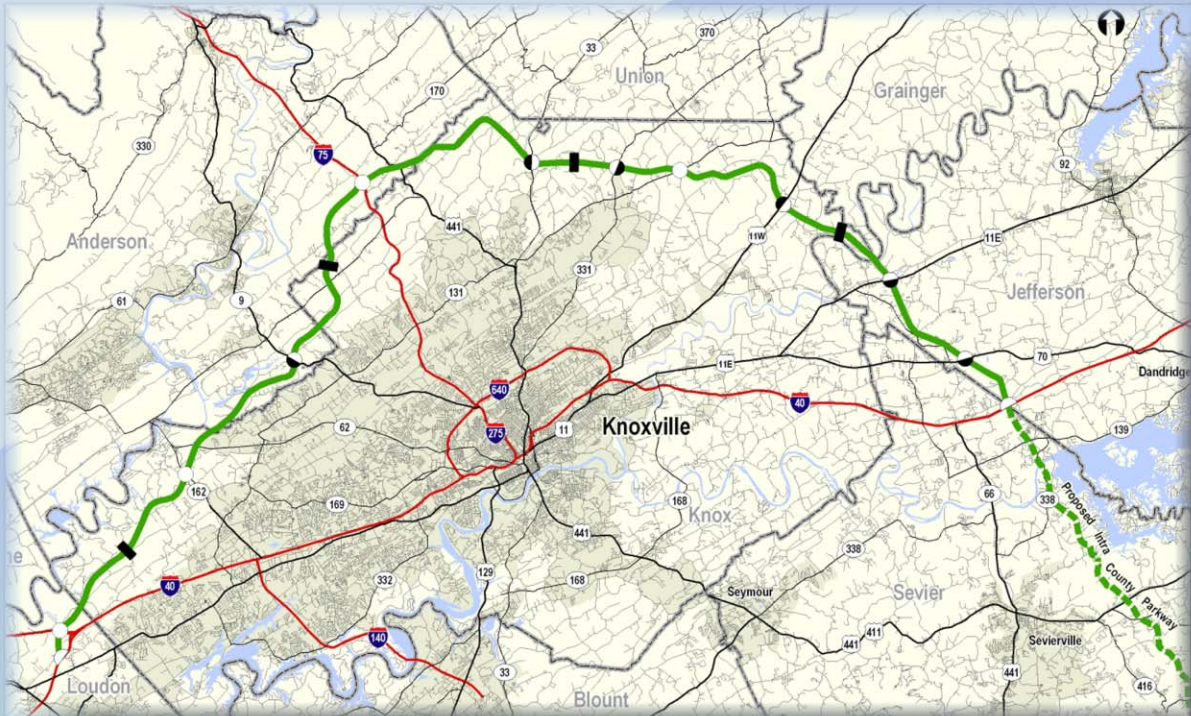


Draft Report

Tennessee Department of Transportation

Proposed SR 475

Conceptual Feasibility Report



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Prepared For



Prepared By



March 2007

EXECUTIVE SUMMARY

Across the country all levels of government are coming to grips with the fiscal challenges created by increased demand for new transportation infrastructure and the need to maintain the existing transportation networks within the constraints of existing funding mechanisms. In Tennessee, the public sector has financed transportation infrastructure through a combination of state and local taxes and fees and - for major projects - Federal grants derived from the allocation of the national motor fuel taxes. These resources have been combined to fund projects on a "pay-as-you-go" basis, meaning that projects have often been built in phases or increments as funds become available over a period of years.

Because of competing demands for its transportation funding dollar, Tennessee is faced with the reality that critical projects may face years of delay before funding is available. Delaying these projects results in hidden costs associated with inflation and unrealized economic development, especially for projects delayed several years. In addition, delaying projects that reduce emissions or eliminate safety hazards has obvious negative impacts on the quality of life issues for Tennessee residents.

In recognition of these factors, the Tennessee Department of Transportation retained the firm of Wilbur Smith Associates to begin exploring the potential for the use of tolls by the State to advance needed projects that would otherwise languish waiting for adequate funding. Wilbur Smith's scope of work included conducting preliminary traffic and revenue studies on State Route 475 (SR 475).

Wilbur Smith's assignment culminates in the preparation of Conceptual Feasibility Study. This report constitutes the Conceptual Feasibility Study for the approximately 59 mile proposed SR 475 project near Knoxville. The findings of this report should be considered conceptual in nature and are conditioned on the statements contained within this report.

In conducting this report, Wilbur Smith performed three basic analyzes: a preliminary traffic and revenue study; an estimate of project costs; and a conceptual plan of finance. Wilbur Smith also began applying various quantitative and qualitative criteria to the SR 475 project to help formulate a recommendation concerning the next steps in the process.

At this early stage sufficient information has not been developed to make a final conclusion concerning the feasibility of SR 475. There remain issues yet to be addressed that will significantly influence this outcome. However, based on the work conducted on the proposed SR 475 project pursuant to this assignment, WSA believes that this project warrants additional study as a tolled facility.

Specifically, Wilbur Smith recommends that TDOT undertake the following steps:

- Expand upon Knoxville Regional Travel Demand Model (KRTDM) socioeconomic data and trip tables in external zones affecting SR 475;

- Consider a phased implementation of the project beginning with the western segment already in the Long Range Transportation Plan (LRTP) and undergoing Environmental Impact Study (EIS) to accelerate the build schedule as well as provide working capital for the eastern segment;
- Reduce the inflationary impact on construction by revisiting the opening-year assumption to reflect funding the project with tolls, rather than through traditional funding mechanisms;
- Perform a project specific estimate of construction costs; and
- Retain either an investment bank or a financial advisor to prepare a more sophisticated financial model including both federal lending programs and 3P or concessionaire financings.

It should be noted that while the western portion of the proposed SR 475 project is included in the current iteration of the KRTDM, the eastern portion of the project is not. As such, certain travel patterns that may arise as a result of these network improvements are not present in the current model. The revision of the KRTDM to include the eastern portion of the proposed SR 475 prior to the trip generation/distribution phase of the travel demand modeling process may result in an increase in volume thought to be in the range of 5 to 10 percent. Since completing this analysis, TDOT has made known its intent to work with local planning staff to enhance the current travel demand model to include these improvements. These revisions should be finalized before any further study commences.

Having said this WSA believes that SR 475 has a reasonable expectation to be feasible as a toll facility. In addition, early results indicate that the western segment of the project has demonstrated independent financial viability and should be looked at in the context of both a stand-alone project and as the introductory phase to phased implementation.



Table of Contents

	<u>Page Number</u>
Introduction	1
Project Description	2
Evaluation Categories	3
Regional Transportation System	4
Environmental	4
Right-of-Way	5
Construction and Engineering	5
Corridor Socio-Economics	6
Traffic and Revenue	7
Financial	9
Next Steps	11

Illustrations

	<u>Follows Page</u>
Figure 1 – Project Location Map – SR 475	2

Tables

	<u>Page Number</u>
Table 1 – Feasibility Checklist	3
Table 2 - Construction and Engineering Costs	6
Table 3 - Annual Net Toll Revenue Forecasts	8
Table 4 - Bonding Capacity	9
Table 5 - Conceptual Plans of Finance	10

INTRODUCTION

Determining the feasibility of a toll project is an iterative process. The first step is to screen a project, or projects, to develop an initial understanding of the potential traffic and revenue characteristics thereof. This step usually requires either a Level 1 Sketch Level Analysis or a Preliminary Traffic and Revenue Study. Both are considered planning level studies designed to assist in furthering the normal planning process and are required for all transportation projects.

At the request of the Tennessee Department of Transportation (TDOT), Wilbur Smith Associates (WSA) has completed preliminary traffic and revenue studies for State Route 475 (SR 475) near Knoxville. One configuration or scenario of SR 475 was studied. This study was conducted to facilitate the planning process required for the proposed transportation facility. Depending upon a number of factors inherent in the transportation planning process, modifications and updates may be needed as competing routes and modes get added to regional plans, project configurations change, and land use patterns evolve.

Traffic and revenue studies, by themselves, do not determine project feasibility – though such studies are significant factors in undertaking such an analysis. As a result, subsequent planning steps are usually taken once a sketch or preliminary traffic and revenue study is completed and it has been determined that a project, or projects, has the potential to be feasible as a toll facility. This planning process often incorporates an analysis of the project in the context of a regional or statewide transportation plan, major investment studies, preferred alignments, preliminary design and engineering, and the development of preliminary plans of finance.

Separately, WSA developed estimates of project costs for the proposed configuration. The estimated project cost was used in analyzing the project's financial feasibility at this conceptual stage. Bonding capacity was estimated utilizing a traditional public toll authority financial model. These cost and bonding estimates (contained herein) are conceptual in nature and are provided as inputs into a screening process to help determine the direction that future planning efforts will take for the proposed project.

PROJECT DESCRIPTION

Figure 1 depicts the project location and its relationship to the surrounding transportation system. The proposed SR 475 project shown as a solid green line, is assumed to operate as a toll facility. Also shown in *Figure 1* as a green dashed line is the proposed Intra County Parkway. If constructed, this project would also operate as a toll facility.

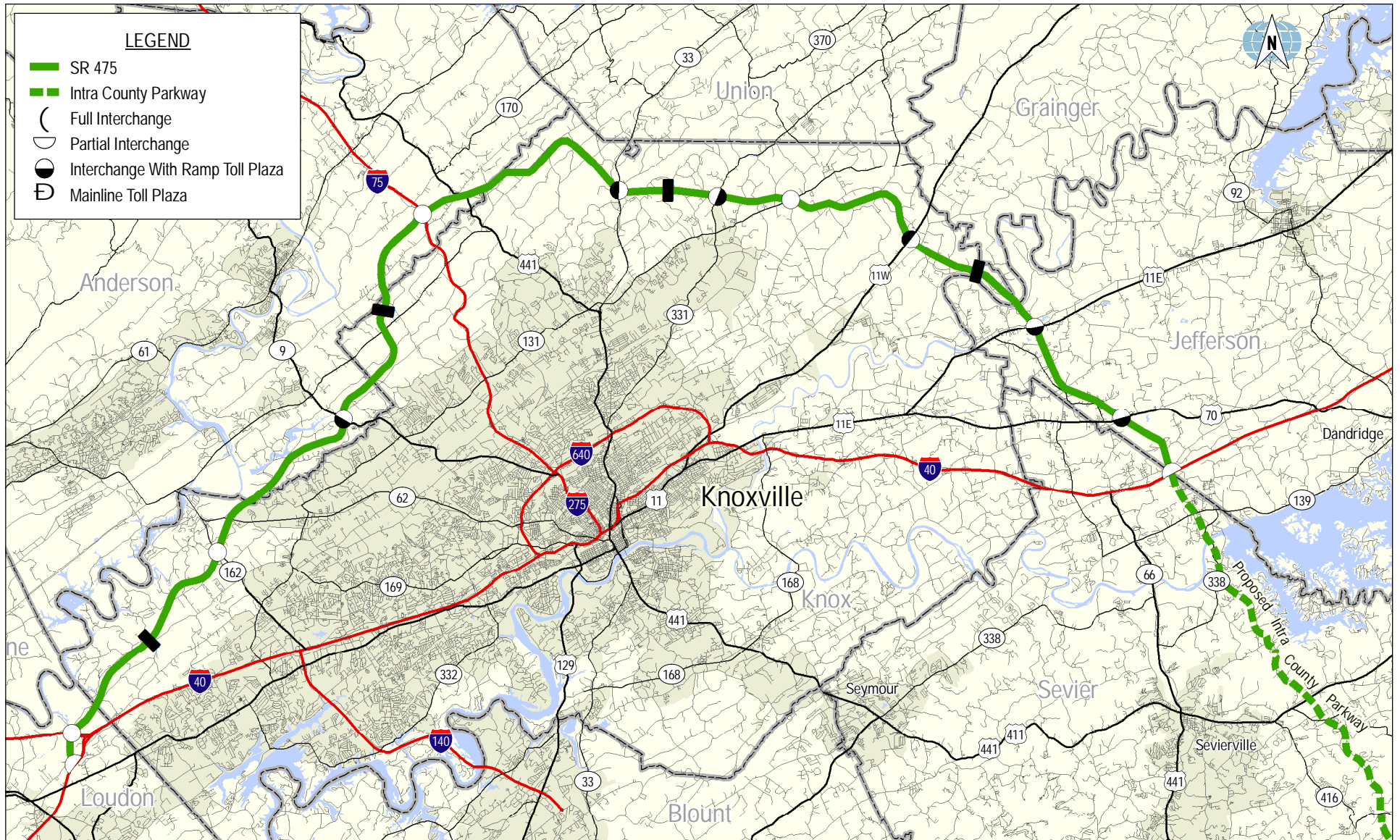
In general, SR 475 will be approximately 59 miles in length starting from its western terminus at a new, major interchange with I-40/I-75 west of Knoxville in Loudon County, to its eastern terminus at I-40 near Milepost 409. SR 475 would provide significant access improvements for the regional transportation network and would also provide an alternate route for I-75 traffic desiring to bypass Knoxville and the traffic congestion along I-40 and I-40/I-75 during the peak weekday travel periods.

Along this stretch of I-40 from I-75 at Milepost 368 to SR 66 at Milepost 407, average annual daily traffic (AADT) volumes have grown considerably since 1990. Between 1990 and 2000 AADTs have grown by over 40 percent along segments west of Knoxville, between 20 to 50 percent within the Knoxville city limits, and 75 to 120 percent between Knoxville and SR 66. Along this approximately 40 mile stretch of roadway, year 2005 AADTs range from approximately 90,000 along the six lane segment east of the existing I-40/I-75 Interchange, from 140,000 to 155,000 in the eight lane segment between I-140 and I-640, from 80,000 to 110,000 between I-640 west and I-640 east, and approximately 70,000 in the six lane segment between I-640 east and SR 66.

It has been estimated that traffic volumes in the Knoxville metropolitan area have increased to a point that the existing interstate system is functioning at approximately 160 percent above design capacity and approximately 136 percent above absolute capacity during peak traffic demand periods, in many instances. These volumes result in reduced speeds, congestion and restricted maneuverability, and higher accident rates, among other impacts. The construction of SR 475 would help alleviate these problems.

This analysis assumes that the entire configuration is open to traffic in its entirety in year 2020. For purposes of this study, SR 475 would be constructed as a four-lane, full access-controlled, divided highway on new alignment with 70 mile per hour design speeds. The proposed SR 475 project is approximately 59 miles in length, and will begin at a major interchange with I-75/I-40 west of Knoxville in Loudon County. From this location, the project continues in a northeasterly direction for approximately 26 miles to an interchange with I-75 just north of the Knox/Anderson County Line. Between these two points, full-access interchanges are proposed at SR 162 and SR 9. This portion of the proposed project is the only segment currently included in the Knoxville Urban Area Metropolitan Planning Organization's long-range transportation plan and transportation improvement program.

From the I-75 Interchange, the project continues on an east-west orientation for approximately 20 miles with proposed interchanges at SR 33, SR 131, SR 331 and U.S. 11W. From U.S. 11W south of Blaine, the project extends in a southeasterly direction for approximately 13 miles terminating at I-40 at approximately Milepost 409 in the vicinity of the Jefferson/Sevier County Line. Full-access interchanges along this segment are proposed at U.S. 11E and U.S. 70.



Also shown in *Figure 1* are the proposed locations of mainline and ramp toll plazas. Toll plazas have been located on certain interchange ramps to ensure that no toll-free travel would occur on the facility. Under this tolling concept; motorists using any portion of the project would pass through at least one toll plaza. Additionally, based on direction by TDOT, toll collection was assumed to accommodate both cash and electronic toll collection (ETC) customers. As recommended by TDOT, at this time no discount was assumed to be given to those patrons utilizing ETC.

EVALUATION CATEGORIES

WSA has developed a checklist of items that could impact the feasibility of a new toll facility. These items are listed in *Table 1* and are organized around seven main categories. Each of these main categories contains multiple subcategories or criteria. To a great extent the items on the checklist are interdependent. It is important to note that the applicability and/or the weight given to a specific factor are dependent upon the characteristics and objectives of the toll project and the sponsoring agency. In the final analysis toll projects, regardless if developed by a public entity or through a public private partnership, are essentially public assets and subject to public policy of the sponsoring entity.

As mentioned above, the applicability and/or weighting of any of the sub-categories contained in *Table 1* are dependent upon project specific factors. This Conceptual Feasibility Report is not intended to provide an extensive analysis of each of these characteristics. The type of analysis needed to determine a project's feasibility is the part of a project's planning process.

One of the functions of the planning process is to define what issues are relevant to a project and the respective weight of these issues. As such, this analysis will be focused on the major categories rather than trying to determine the applicability of each of the sub items.

Table 1
Feasibility Checklist

Regional Transportation System

- a) Traffic movements to be served
- b) Existing Alternative Routes
- c) Future planned networks
- d) Other planned transportation improvements

Environmental

- a) Major Investment Study
- b) Designation of preferred alignment
- c) Cost implications of mitigation requirements
- d) Projected timeline for environmental clearance
- e) Full EIS versus environmental assessment (FONSI)

Right-of-Way

- a) Number of takes
- b) Project costs
- c) Acquisition timetable
- d) 4F Issues
- e) Utility Issues

Construction/Engineering

- a) Uniqueness of engineering/construction requirements
- b) Required Permits
- c) Constructability
- d) Construction schedule
- e) Project Costs
- f) Bonding requirements

Corridor Socio-Economic Data

- a) Land use plans
- b) Population growth
- c) Projected non-residential activity
- d) Income Levels
- e) Household size

Traffic and Revenue

- a) Project configuration
- b) Project interconnectivity
- c) Value of time calculations
- d) Time/distance savings
- e) Corridor share
- f) Toll regimes
- g) Typical movements

Financial Considerations

- a) Project financial structure
- b) State/Local contribution
- c) Federal programs

Regional Transportation System

Toll facilities need to fit within the overall regional transportation system; in this case overseen by the Knoxville Regional Transportation Planning Organization (TPO). A portion of the proposed configuring of SR 475 as discussed in this study is currently identified in the 2005-2030 Knoxville Regional Long Range Transportation Plan as “SR 475,” also known as the Knoxville Regional Parkway. It is described as “an access controlled highway crossing portions of Anderson, Knox, and Loudon Counties that will bypass the congested I-40/75 corridor in West Knoxville”. It has since been decided that TDOT will submit to have SR 475 added to the National Highway System and seek classification as a Tennessee Parkway or State Scenic Highway.

The existing transportation system, a hub and spoke system, centers on the Knoxville urban area. Interstates 40 and 75, the primary “spokes” in the system provide access to and from Knoxville and are the primary route for through trips. Arterials like the Clinton Highway (US 25W) and Oak Ridge Highway/Western Avenue (SR63) provide local access. As proposed, SR 475 would offer a connection between these local arterials and the interstate system, increasing mobility for both passenger vehicles as well the movement of freight and other commercial traffic. In doing so, it is expected that a significant portion of traffic will be diverted off of local roads and the section of I-40 and I-75 closest to Knoxville, both of which are frequently congested at peak travel times. In doing so, SR-475 is expected to take significant strain off of local roads and improve travel times for through trips. Alternatively, the Knoxville Regional Transportation Planning Organization has indicated that in order to meet the growing needs of regional traffic, a number of primary arterials would need to be expanded between I-40 and I-75, the cost of which would be prohibitive due to right of way requirements. Construction of SR 475 would mitigate the need for these costly improvements while simultaneously improving service levels and reducing total vehicle miles traveled (VMT) on the local transportation network.

To date, WSA is not aware of any similar studies having been conducted for the eastern portion of SR-475 running from I-75 in at the western terminus to I-40 at the south-eastern terminus. However, this segment is identified in the LRTP as a future corridor of interest and the logical conclusion of the proposed SR-475/ Knoxville Regional Parkway project.

Environmental

Toll facilities are not exempt from applicable federal and state environmental review requirements. The environmental clearance process has a significant impact on the feasibility of any transportation project, but especially so in the case of a toll facility. In addition to the typical environmental studies needed for an Environmental Impact Statement (EIS), toll projects need to study the economic impact of charging tolls on the facility.

Besides time, the most significant impact of the environmental process, are the costs of mitigation required by the EIS document. Whether from longer or more difficult alignments, wetland mitigation costs, or more difficult construction requirements, these requirements can add considerable costs to any transportation project. For a toll project, the environmental process can change the amount of project costs that can be paid for solely by toll revenue.

At this time, an EIS has been undertaken for the western portion of the proposed SR 475 project. Per the EIS, the primary concerns regarding the potential impact of this project are the displacement of families and businesses, an increase in noise levels, temporary construction impacts, and stream, wetland, and floodplain impacts. Depending on the alignment ultimately chosen, relocations would range from 59 to 116 residences, 5 to 7 businesses, and 1 to 2 nonprofit entities. With respect to environmental impact, impacts would range from 0.6 miles of affected floodplains; 3.8 acres to 18.8 acres of potential wetland impacts; 135 to 1,100 feet of stream rechannelization; 19 to 30 archeological sites; and 89 to 107 acres of prime farmland could be affected, again, depending on the alignment ultimately chosen.

We would note as well that depending on the final alignment, the proposed project will cross the Clinch River at several points. While additional river crossings are felt to be beneficial from a mobility standpoint, our experience is that crossing bodies of water, especially those considered to be navigable, present unique challenges during the environmental clearance process which can result in extended schedules and increased project costs.

Right-of-Way

Right-of-way for transportation projects is typically acquired subject to eminent domain procedures. As such, the right-of-way acquisition process is established by federal and state laws and requirements. These requirements are typically applied regardless of whether a toll facility is being developed as a public toll facility or through the use of a public-private partnership. In rare cases landowners will donate or “proctor” right-of-way for toll facilities in order to benefit from increased land values resulting from improved access provided by the facility.

Generally, specific right-of-way takings are not identified until after a preferred alignment is identified pursuant to the normal EIS process. The availability and cost of the required right-of-way is often a factor in determining a preferred alignment. This is true for all transportation projects, including toll facilities.

With the exception of those displacements and relocations referred to above and information obtained in the Draft EIS, WSA is not aware of any analysis of right-of-way impacts and costs that have been undertaken for the proposed SR 475 project.

Construction and Engineering

As part of its assignment WSA has made conceptual level estimates of construction and engineering costs. In developing the estimated engineering and construction costs for SR 475, TDOT’s cost estimate worksheet was used to determine the 2007 costs. This worksheet has been used for several years by TDOT in its planning office to develop estimates of engineering, right of way, and construction costs for project planning purposes only. The cost estimation worksheet is based on per lane and per mile cost factors. The calculations take into account factors including location (rural, suburban, urban, etc.) and terrain (flat, hilly, mountainous, etc.).

In addition to standard road construction costs, toll equipment costs were developed for the project. Costs estimated for the anticipated toll equipment also include electronic toll collection (ETC) system components such as ETC antenna and reader units, the tolling zone controllers, automatic coin machines, vehicle detection and

classification devices, vehicle detector loops, traffic signals, overhead canopy lights, various power supplies, violation enforcement system cameras, and traffic control gates (in the automatic lanes).

WSA also estimated the cost of the communications infrastructure that would be required to support each of the analyzed tolling concepts. In addition to the direct equipment costs, estimates for the required civil work were prepared, including the cost of procuring and installing tolling gantries at each of the tolling zone locations. Other toll system costs were estimated for toll system design, development, and deployment. These costs include the Toll System Contractor's program management, software development, development of the system design documentation, factory and integration testing, equipment installation, and field testing to confirm that the delivered system meets the toll specification requirements. The capital costs of the toll system host and the other back office subsystems (including ETC account management and violation processing) were also estimated. These are all one-time costs that are associated with the procurement and deployment of the tolling system on the project.

Project costs were inflated to 2016, the assumed first year of construction. An inflation rate of 10% is applied to the project cost for the first three years through 2010 and a 3% inflation rate is applied to the project cost from 2010 until the year of construction. *Table 2* sets forth the estimated project cost for the project. The numbers are in millions of dollars and have been inflated to 2016, the assumed year when construction starts. These estimates exclude costs that would have been expended prior to financing such as environmental costs, preliminary engineering, and right-of-way. As the project becomes better defined during the normal planning process these project costs will need to be refined. Additional factors that could impact these estimates include mitigation costs, bridge lengths, and specific subsurface conditions. The final alignment will also impact estimated project costs.

Construction/Engineering	\$ 478.4
Toll Systems	<u>\$ 77.8</u>
Estimated Project Cost	\$ 556.2

Corridor Socio-Economics

Future economic growth potential is important for the study of any new start-up toll facility. However, for a facility such as the proposed SR 475 toll facility, which would be constructed as a beltway around Knoxville and the growing Knoxville metropolitan area, the significance of an economic analysis is particularly important.

The socioeconomic forecast developed by the Knoxville Regional Transportation Planning Organization (KRTPO) included in the KRTDM was used in the analysis. Since this was a preliminary traffic and revenue study, an independent economic analysis was not conducted; however, an independent economic analysis would be necessary for any study that would be used in support of project financing.

A major element in this economic assessment was reviewing both the historical and forecasted growth in population, households, employment and median household income. The historical growth trend assessment was performed focusing on both the study area's nine counties and major cities. In assessing the socioeconomic/demographic forecasts, WSA collected forecasts prepared by a third party source, Woods and

Poole, Economics, in addition to those prepared by KRTPO. Both the historical trend data and the third-party forecasts were used to check the reasonableness of the forecasts prepared by KRTPO. This process provides a reasonableness check of the forecasts used in the modeling process.

In general, the study area is forecast to exhibit relatively modest economic growth based on the socioeconomic forecasts contained in the KRTDM. As this analysis is considered to be preliminary in nature and not to be used in support of project financing, the socioeconomic forecasts (as well as other parameters and techniques) will be subject to considerable review in any subsequent, more detailed study.

Traffic and Revenue

Traffic and revenue reports consider known and measurable factors that influence the choices of tens of thousands of daily traveling decisions. Sophisticated models are built based on regional travel demand models, that reflect socio-economic data, existing and future funded transportation networks, and actual travel time data.

For purposes of the preliminary traffic and revenue study, SR 475 was assumed to open to traffic in its entirety in year 2020. It would be constructed as a four-lane, full access-controlled, divided highway on new alignment with 70 mile per hour design speeds. The proposed SR 475 project is approximately 59 miles in length, and will begin at a major interchange with I-75/I-40 west of Knoxville in Loudon County. From this location, the project continues in a northeasterly direction for approximately 26 miles to an interchange with I-75 just north of the Knox/Anderson County Line. Between these two points, full-access interchanges are proposed at SR 162 and SR 9. This portion of the proposed project is the only segment currently included in the Knoxville Urban Area Metropolitan Planning Organization's long-range transportation plan and transportation improvement program.

From the I-75 Interchange, the project continues on an east-west orientation for approximately 20 miles with proposed interchanges at SR 33, SR 131, SR 331 and U.S. 11W. From U.S. 11W south of Blaine, the project extends in a southeasterly direction for approximately 13 miles terminating at I-40 at approximately Milepost 409 in the vicinity of the Jefferson/Sevier County Line. Full-access interchanges along this segment are proposed at U.S. 11E and U.S. 70.

Figure 1 indicates the proposed locations of mainline and ramp toll plazas. Toll plazas have been located on certain interchange ramps to ensure that no toll-free travel would occur on the facility. Under this tolling concept, motorists using any portion of the project would pass through at least one toll plaza.

The projected gross revenue, operating expenses, and net revenue for the Proposed SR 475 are presented in Table 3.

Table 3
Annual Net Toll Revenue Forecasts
Proposed SR 475

Year	Gross Toll Revenue	Toll Operating Expense	Net Toll Operating Revenue
2020	\$ 25,741,000	\$ 3,995,000	\$ 21,746,000
2021	36,339,000	4,099,000	32,240,000
2022	44,704,000	4,206,000	40,498,000
2023	50,088,000	4,315,000	45,773,000
2024	53,033,000	4,427,000	48,606,000
2025	56,151,000	4,542,000	51,609,000
2026	59,453,000	4,660,000	54,793,000
2027	62,949,000	4,781,000	58,168,000
2028	66,650,000	4,905,000	61,745,000
2029	70,569,000	5,033,000	65,536,000
2030	74,719,000	5,164,000	69,555,000
2031	76,916,000	5,241,000	71,675,000
2032	79,177,000	5,320,000	73,857,000
2033	81,505,000	5,400,000	76,105,000
2034	83,901,000	5,481,000	78,420,000
2035	86,368,000	5,563,000	80,805,000
2036	88,907,000	5,646,000	83,261,000
2037	91,521,000	5,731,000	85,790,000
2038	94,212,000	5,817,000	88,395,000
2039	96,982,000	5,904,000	91,078,000
2040	99,833,000	5,992,000	93,841,000
2041	102,768,000	6,082,000	96,686,000
2042	105,789,000	6,173,000	99,616,000
2043	108,899,000	6,265,000	102,634,000
2044	112,101,000	6,359,000	105,742,000
2045	115,397,000	6,454,000	108,943,000
2046	118,790,000	6,551,000	112,239,000
2047	122,282,000	6,649,000	115,633,000
2048	125,877,000	6,748,000	119,129,000
2049	129,578,000	6,849,000	122,729,000
2050	133,388,000	6,952,000	126,436,000
2051	137,310,000	7,056,000	130,254,000
2052	141,347,000	7,162,000	134,185,000
2053	145,503,000	7,269,000	138,234,000
2054	149,781,000	7,378,000	142,403,000
2055	154,185,000	7,489,000	146,696,000
2056	158,718,000	7,601,000	151,117,000
2057	163,384,000	7,715,000	155,669,000
2058	168,187,000	7,831,000	160,356,000
2059	173,132,000	7,948,000	165,184,000

Notes: Ramp up was assumed to be 61%, 81%, and 95% in years 1, 2, and 3, respectively.

An annualization factor of 335 was used to calculate annual totals.

It is important to note that over the course of conducting the preliminary traffic and revenue studies for the SR 475, it was discovered that the eastern portion of SR 475 between I-75 east and I-40 was not included in the Knoxville Regional Travel Demand Model's highway network and trip tables. It is WSA's belief that had these trip tables been in place traffic volumes would have been 5 to 10 percent greater.

More detailed discussion of the projections is contained within the January 2007 Proposed SR 475 Preliminary Traffic and Revenue Study prepared by WSA.

Financial

A preliminary bonding capacity analysis was performed for the proposed SR 475 project. This analysis was performed to estimate the amount of project costs that could be paid for with proceeds from bonds supported by toll revenues. This analysis is based on the revenue numbers forecasted in the preliminary traffic and revenue studies and presented above in *Table 3*. This analysis utilizes a bond sizing model typical of financings for other toll roads within the United States that have been recently issued by public authorities. The interest rate assumptions are indicative of WSA's understanding of current market conditions, which are subject to change based upon factors outside the control of WSA and TDOT.

Potential bonding capacity was calculated for both a net and a gross revenue pledge. Under a net pledge operations and maintenance are paid prior to debt services. This pledge provides comfort that the facility will be operated and revenues collected.

Under a gross revenue pledge, debt service is paid prior to operations and maintenance being paid. This results in an increase in bonding capacity. For a gross pledge to be financable, TDOT or some other entity would have to guarantee to pay the operations and maintenance costs should toll revenue be insufficient to pay debt service and operations and maintenance. These costs would be subject to reimbursement from future revenue.

Table 4 sets forth the estimated bonding capacity SR 475 under both a net and gross revenue pledge scenario. These estimates are net of financing costs, capitalized interest, and a debt services reserve—typical costs and reserves which are either paid or funded out of proceeds from financings.

Table 4		
Bonding Capacity		
(Million \$)		
	<u>Net Pledge</u>	<u>Gross Pledge</u>
Bonding Capacity	\$ 580.50	\$ 642.70
Financial Costs and Reserves	<u>\$ 100.20</u>	<u>\$ 119.20</u>
Net Bonding Capacity	\$ 480.30	\$ 523.50

The bonding capacity analyses were based on the following major assumptions:

- Project bonds are a combination of Current Interest Bonds and Capital Appreciation Bonds with 40-year maturities
- Both series of project bonds are issued at parity (i.e. both have equal claims to revenue)
- Project bonds have debt service coverage ratios of 1.75X for both series
- Both series have investment grade ratings
- All reserve funds are invested at 4% per annum
- Each project is open for traffic as indicated in *Table 3*
- Interest is capitalized during the assumed construction period for each project
- Financing costs assumed to equal 2.5% of bond size
- Debt Service Reserve is funded at closing from proceeds and estimated to equal 10% of total bond size

The bonding capacity analysis is provided for planning purposes only and is not intended to supplant the analysis that will be required by a financial advisor or underwriter as part of the financing process. The analysis is based on prevailing market rates and conditions for similar revenue bond offerings as of the date of this report. Changes in financial market conditions and further refinements by a financial advisor could materially alter the results of the bond sizing model.

A project's financial feasibility is dependent upon total available funding sources being adequate to pay for project costs. *Table 5* sets forth the conceptual plans of finance for SR 475. These conceptual plans of finance are based on the estimated project costs shown in *Table 2*, revenue and operating costs set forth in *Table 3*, and bonding capacities shown in *Table 4*.

	<u>Net Pledge</u>	<u>Gross Pledge</u>
<i>Sources</i>		
Bonding Capacity	\$ 546.7	\$ 603.3
Investment Earnings	\$ 33.8	\$ 39.4
Public Contribution	<u>\$ 75.8</u>	<u>\$ 32.6</u>
Total Sources	\$ 656.3	\$ 675.3
<i>Uses</i>		
Project Costs	\$ 556.1	\$ 556.1
Financing Costs	\$ 45.5	\$ 58.9
Debt Service Reserve	<u>\$ 54.7</u>	<u>\$ 60.3</u>
Total Uses	\$ 656.3	\$ 675.3

Each of the line items shown in the conceptual plans of finance are discussed below:

<i>Bonding Capacity:</i>	The amount of debt that can be supported from a given revenue stream.
<i>Investment Earnings:</i>	Interest and earnings on unused bond proceeds. Bond proceeds are held in trust and drawn down over time to pay for project costs.
<i>Public Contribution:</i>	Public funding needed to cover difference, if any, between net bonding capacity and project costs.
<i>Project Costs:</i>	Estimated engineering, construction, and toll system costs of a project.
<i>Financing Costs:</i>	Transaction costs of a financing paid to underwriters, bond counsel, rating agencies, etc. This line item includes interest paid to bondholders during the construction of a project.
<i>Debt Service Reserve:</i>	Reserve account funded out of proceeds of a bond offering to provide funds to cover unforeseen circumstances resulting in operational deficiencies.

As shown in *Table 5*, on a conceptual level each of SR 475 plans requires a public contribution in order to cover all project and financing costs.

NEXT STEPS

At this early stage sufficient information has not been developed to make a final conclusion concerning the feasibility of SR 475. There remain issues yet to be addressed that will significantly influence this outcome. However, based on the work conducted on the proposed SR 475 pursuant to this assignment, WSA believes that this project warrants additional study as a tolled facility.

Specifically, Wilbur Smith recommends that TDOT undertake the following steps:

- Expand upon KRTDM socioeconomic data and trip tables in external zones affecting SR 475
- Consider a phased implementation of the project beginning with the western segment already in the LRTP and undergoing EIS to accelerate the build schedule as well as provide working capital for the eastern segment
- Reduce the inflationary impact on construction by revisiting the opening-year assumption to reflect funding the project with tolls, rather than through traditional funding mechanisms;
- Perform a project specific estimate of construction costs; and
- Retain either an investment bank or a financial advisor to prepare a more sophisticated financial model including both federal lending programs and 3P or concessionaire financings.

It should be noted that while the western portion of the proposed SR 475 project is included in the current iteration of the KRTDM, the eastern portion of the project is not. As such, certain travel patterns that may arise as a result of these network improvements are not present in the current model. The revision of the KRTDM to include the eastern portion of the proposed SR 475 prior to the trip generation/distribution phase of the travel demand modeling process may result in an increase in volume thought to be in the range of 5 to 10 percent. Since completing this analysis, TDOT has made known its intent to work with local planning staff to enhance the current travel demand model to include these improvements. These revisions should be finalized before any further study commences.

Having said this WSA believes that SR 475 has a reasonable expectation to be feasible as a toll facility. In addition, early results indicate that the western segment of the project has demonstrated independent financial viability and should be looked at in the context of both a stand-alone project and as the introductory phase to phased implementation.