



Preliminary Financial Feasibility Study
for the
Triangle Parkway and
Western Wake Parkway

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EXECUTIVE SUMMARY

Background

In December 2005, mayors of five Wake County towns requested the NCTA conduct a financial feasibility study for building the Western and Southern Wake sections of the I-540 outer loop as a toll road. This is a summary of the results of that study.

The northern terminus of the proposed project lies within 3 miles of the Triangle Parkway, another project currently being evaluated as a toll facility by NCTA. Because these two projects are in such close proximity and are on approximately the same construction timetable, the evaluations of both projects have been combined to examine financing and building the projects as a single offering.

In addition, NCTA's financial advisor, PFM, Inc. of Philadelphia, PA, recommended the study include folding the 3-mile section of I-540 connecting the two projects between Highway 54 and Highway 55 as part of the offering. Based on that recommendation, NCTA instructed the three consulting firms participating in this evaluation to include this option into their scope of work.

This report consists of three principal components:

- A Traffic & Revenue Study that looked at various tolling scenarios for the projects and estimated by year the traffic count and revenue that would be generated by the facility in each operating configuration. This phase of the report was conducted by Wilbur Smith Associates (WSA), NCTA's traffic and revenue consultant.
- The Project Costs Estimates that included right-of-way, utility relocation and all design, engineering, environmental and construction costs from today forward. Costs were also projected for operations and maintenance over the life of the project. This work was done by HNTB, NCTA's general engineering consultant.
- A Financial Analysis that examined revenue and cost estimates generated by the above consultants. The Financial Analysis estimated the amount of bonds that can be sold, their general provisions and estimates of the interest rates and cost to sell. The Financial Analysis also incorporated operating and maintenance cost for the 35-year life of the project. This work was done by Public Financial Management, Inc., NCTA's financial advisor.

The results of these studies are summarized below. NCTA's conclusions and next steps follow.

Traffic & Revenue Study

This section summarized the results of a preliminary traffic and revenue study for the proposed Western and Southern Wake Parkway facilities in Wake County. The study was performed to a preliminary level of detail, using readily available travel demand modeling and other study inputs. It is not intended for use in support of actual project financing; considerably more detailed studies would be required for that purpose.

The study considered several alternative scenarios for implementation of the proposed Parkway project, both independently and in some cases, in combination with the proposed Triangle Parkway facility in Durham and Wake counties. A similar preliminary traffic and revenue study for that project was completed in early 2006.

Project Description

The proposed Western and Southern Wake Parkways would be part of an overall beltway system, designated as I-540, planned to encircle the Raleigh area. Portions of this have already been opened to traffic, while other portions are currently under construction.

The proposed Western Wake Parkway section would extend from a northern junction with NC 55 near Research Triangle Park to a southern junction with NC 55 near Holly Springs, covering a distance of about 12 miles. The Southern Wake Parkway portion, which has still not yet undergone environmental studies and is assumed to open at a later point in the future, would extend 16 miles from NC 55 to I-40 south of Raleigh. If both portions of the facility were constructed, it would provide an attractive new bypass facility allowing through motorists to avoid increasingly congested sections of I-40.

In addition, the portion of I-540 that extends from NC 54 to NC 55 (referred to as I-540P) also was examined as a possible toll road. This 2.7 mile long segment which is currently under construction will enable Triangle Parkway and Western Wake Parkway to function as a contiguous toll facility. The segment of I-540 from NC 54 to I-40 also is under construction but will not be tolled.

Triangle Parkway, addressed in a previous traffic and revenue study, would essentially extend NC 147 about five miles further south, intersecting with I-540 and terminating at McCrimmon Parkway. Triangle Parkway is assumed to be constructed in some of the scenarios considered in this analysis.

Corridor Growth Assessment

The proposed Western and Southern Parkway projects would be constructed in rapidly growing areas of the greater Triangle region. This is particularly true of the Western Wake Parkway area, which is expected to add more than 150,000 residents and jobs in the 25-year period between 2005 and 2030. These forecasts were included with the most recent versions of the regional travel demand model for the Raleigh/Durham area.

Growth is generally expected to occur earliest along the Western Wake portion of the project, primarily between Morrisville and Holly Springs. Significant economic growth is also forecast along the Southern Parkway corridor, particularly near I-40, but is expected later in the forecast period.

Project Scenarios

The study addressed four alternative project scenarios/configurations, including:

- Scenario 1 – Western Wake Parkway only (between NC 55 north and NC 55 south);
- Scenario 1A – Western Wake Parkway plus Triangle Parkway as a toll facility, plus the addition of one toll plaza on I-540 between NC 54 and NC 55 (referred to as I-540P). This portion of I-540 is currently under construction and is expected to open to traffic in 2007;
- Scenario 1B – The same as Scenario 1A, except no toll plaza would be added on I-540 between NC 54 and NC 55; and
- Scenario 2 – Would include both Western Wake and Southern Wake Parkway projects, but for purposes of this study did not include additional tolling on either I-540 or the construction of Triangle Parkway.

Toll System and Rates

A combined cash/electronic toll system was assumed for purposes of this preliminary study. On the 12-mile Western Wake Parkway portion, one mainline plaza would be constructed together with toll plazas on selected interchange ramps in some locations. Under Scenario 1A, an additional mainline plaza would be constructed on Triangle Parkway and a section of I-540P. On the Southern Wake Parkway portion of the project (Scenario 2), two mainline plazas would be constructed, recognizing the 16-mile length of this facility.

A toll rate sensitivity analysis was conducted to determine optimum toll levels. This showed the maximum revenue would be generated from an opening-year toll rate at the Western Wake Parkway mainline plaza of \$1.50; for purposes of base-case revenue forecasts, a slightly lower opening-year toll of \$1.25 was shown.

Under Scenarios 1A and 1B, which included additional toll plazas on Triangle Parkway and/or I-540, tolls at all mainline plazas in the opening year (2011) would be \$1.00. Under all scenarios, tolls were assumed to increase periodically over the projection period, generally at intervals of five years.

Estimated Traffic and Revenue

A summary of estimated traffic and revenue is shown in Table ES-1. Annual revenue forecasts covering a 40-year projection period are shown for each of the four basic scenarios. These scenarios cover the “base case” revenue forecasts; alternative forecasts with slightly higher toll rates (and slightly higher revenues) were also developed but not used in the financial analysis prepared by others.

As might be expected, maximum revenue would ultimately come from Scenario 2, which would include construction of both Western and Southern Wake Parkway sections. However, since the Southern Wake Parkway may be some years off in the future, the study focused on various combinations of Western Wake Parkway. In this case, maximum revenue potential was found under Scenario 1A, which would include both Western Wake Parkway and Triangle Parkway plus a single mainline plaza on the I-540P section. Under that scenario, annual toll revenue would be expected to increase from

about \$13 million in 2011 to more than \$100 million by 2030. This would be a function both of traffic growth and periodic increases in toll rates.

Table ES-1
Annual Toll Transactions and Gross Revenue Forecasts
Proposed Western and Southern Wake Parkway
(Thousands)

Year	Scenario 1 Western Wake Parkway Only		Scenario 1-A Western Wake Parkway, Triangle Parkway and I-540 Tolled		Scenario 1-B Western Wake Parkway, Triangle Parkway Tolled		Scenario 2 Western & Southern Wake Parkway	
	Total Transactions	Total Revenue	Total Transactions	Total Revenue	Total Transactions	Total Revenue	Total Transactions	Total Revenue
2011	7,784	\$7,778	14,672	\$12,933	12,999	\$11,042	7,784	\$7,778
2012	11,255	11,180	21,194	18,581	18,782	15,876	11,255	11,180
2013	14,193	14,008	26,692	23,270	23,659	19,897	14,193	14,008
2014	16,314	15,989	30,632	26,550	27,158	22,718	16,314	15,989
2015	16,588	18,401	30,943	32,885	27,370	28,102	30,903	31,233
2016	17,607	19,475	33,223	35,282	29,318	30,051	36,665	36,046
2017	18,693	20,613	35,677	37,857	31,409	32,141	41,449	40,089
2018	19,849	21,819	38,316	40,623	33,656	34,380	44,970	43,127
2019	21,081	23,097	41,156	43,594	36,069	36,780	47,510	45,375
2020	20,990	27,102	41,917	51,320	36,876	43,319	47,306	53,954
2021	22,314	28,706	44,432	54,360	38,976	45,662	49,956	56,640
2022	23,728	30,410	47,113	57,589	41,209	48,139	52,778	59,478
2023	25,239	32,220	49,972	61,020	43,585	50,757	55,784	62,478
2024	26,855	34,143	53,020	64,664	46,114	53,525	58,987	65,651
2025	27,498	39,469	53,018	77,122	46,191	64,254	62,403	79,773
2026	28,634	41,037	55,841	81,178	48,636	67,585	66,046	83,878
2027	29,819	42,669	58,820	85,451	51,216	71,092	69,935	88,225
2028	31,054	44,366	61,962	89,952	53,939	74,785	74,088	92,828
2029	32,343	46,132	65,278	94,694	56,812	78,675	78,524	97,704
2030	31,198	55,120	64,502	106,040	56,208	88,139	77,872	116,881
2031	31,822	56,223	65,792	108,161	57,332	89,902	79,429	119,219
2032	32,459	57,347	67,108	110,325	58,479	91,700	81,018	121,603
2033	33,108	58,495	68,450	112,532	59,649	93,535	82,638	124,035
2034	33,770	59,665	69,819	114,783	60,842	95,406	84,291	126,516
2035	33,984	65,531	69,746	128,916	60,884	107,452	85,977	141,692
2036	34,664	66,842	71,141	131,495	62,102	109,601	87,697	144,526
2037	35,357	68,179	72,564	134,125	63,344	111,794	89,450	147,417
2038	36,065	69,543	74,016	136,808	64,611	114,030	91,239	150,366
2039	36,786	70,934	75,496	139,544	65,903	116,311	93,064	153,373
2040	37,085	76,173	75,637	152,009	66,127	126,370	94,926	168,016
2041	37,455	76,935	76,393	153,529	66,788	127,634	96,824	169,697
2042	37,830	77,704	77,157	155,064	67,456	128,910	98,761	171,394
2043	38,208	78,481	77,929	156,615	68,130	130,199	100,736	173,108
2044	38,590	79,266	78,708	158,181	68,812	131,501	102,750	174,839
2045	38,976	80,059	79,495	159,763	69,500	132,816	104,805	176,587
2046	39,366	80,859	80,290	161,360	70,195	134,144	106,902	178,384
2047	39,760	81,668	81,093	162,974	70,897	135,486	109,040	180,137
2048	40,157	82,485	81,904	164,604	71,606	136,841	111,220	181,939
2049	40,559	83,309	82,723	166,250	72,322	138,209	113,445	183,758
2050	40,965	84,143	83,550	167,912	73,045	139,591	115,714	185,599

Note: Forecasts for 2011 - 2013 reflect an assumed ramp-up to full traffic levels beginning in 2014 for Western Wake. Forecasts for 2015 - 2017 reflect an assumed ramp-up to full traffic levels beginning in 2018 for Southern Wake. Western Wake Parkway assumed to open in 2011. Southern Wake Parkway assumed to open in 2015.

Traffic and Revenue Conclusion

This preliminary traffic and revenue study found that there is considerable demand for the proposed Western Wake Parkway and ultimately, for the full Western and Southern Wake Parkway projects. The facilities would generate considerable benefits to both users and non-users and would be badly needed to support the very high-anticipated levels of population and economic growth in the corridor.

This preliminary study showed that there also is considerable revenue potential for constructing the project, particularly if both the Western Wake Parkway and Triangle Parkway are built. The addition of a mainline toll plaza for through trips on I-540P would significantly increase revenue potential.

Project Cost

The Triangle Parkway is being planned as a 3.5 mile, six-lane divided toll facility with full control of access. An additional 1.2 mile, four-lane extension to McCrimmon Parkway is also under consideration, for a total Triangle Parkway length of 4.7 miles. Access to I-540, Hopson Road, Davis Drive, and I-40/NC 147 will be provided via interchanges.

The Western Wake Parkway will extend from NC 55 near Morrisville to the NC 55 Bypass in Apex, for a total length of 12.6 miles. The six-lane divided toll facility will have interchanges with Green Level Road, US 64, Old US 1, US 1, and NC 55 Bypass.

The cost of constructing both projects, including right-of-way, environmental permits and mitigation, utility relocation, engineering and design, and construction is approximately \$796.8 million, of which \$160.6 million is attributed to Triangle Parkway and \$636.2 million will be spent on Western Wake Parkway. These costs have been inflated annually from estimates in 2006 dollars through the anticipated opening day in 2011.

Using reasonable costs for similar facility types, HNTB developed a planning level cost estimate for the annual O&M (operation and maintenance) cost of the proposed Triangle Parkway and Western Wake Parkway network. Based on this analysis, this toll facility system is expected to cost \$6.2 million to operate and maintain in the opening year (2011). This cost will increase annually with inflation.

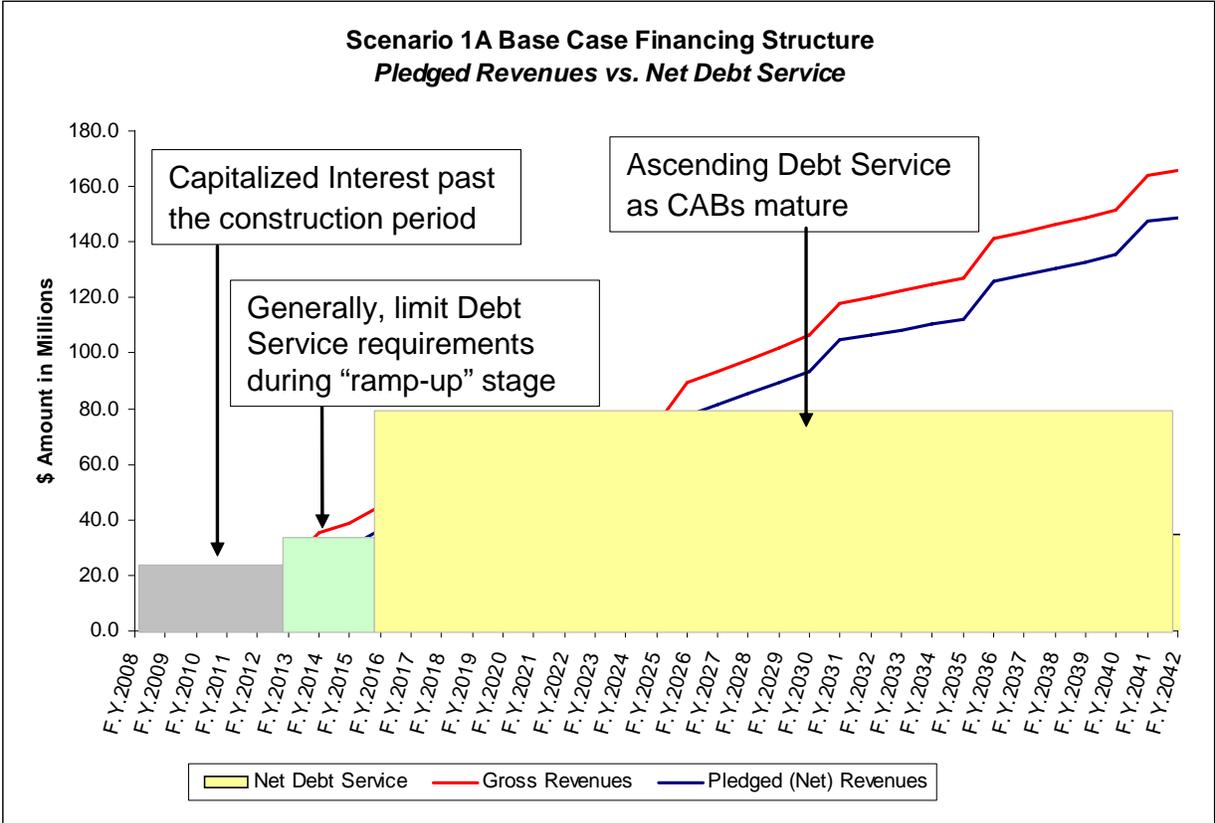
The Reserve Maintenance Fund (RMF) is an annual amount the facilities will need to set aside for major scheduled rehabilitation costs. The RMF costs were calculated for a ten year cycle and distributed evenly over the cycle to develop an annual cost. An annual RMF cost was calculated for each ten year cycle in the study period. The annual RMF set-aside for the first ten years is approximately \$1.5 million.

Financial Analysis

Public Financial Management, Inc, NCTA’s financial advisor, used estimated capital costs, maintenance expenses, and net toll revenues as provided by HNTB and WSA to analyze the financing capacity of the various traffic and revenue scenarios prepared by WSA. Given the significant growth in projected revenues over time, PFM’s financing scenarios assumed the following debt structuring parameters:

- Capitalized Interest during construction
- Capital Appreciation Bonds
- Senior/Subordinate Lien Structure
- Ascending Debt Service
- Cash Debt Service Reserve Fund
- Net Toll Revenue Pledge
- R&R and O&M Reserves
- “BBB” Category Credit Ratings

PFM evaluated Scenarios 1, 1A and 1B including both base case toll rates and maximum toll rates for Western Wake. Scenario 2 included Southern Wake, which is considered too preliminary with respect to the NEPA process to include in the proposed 2007 financing for Western Wake at this time. Given the significantly higher revenues associated with Scenario 1A, that financing plan produced the greatest revenue potential and resulted in the smallest funding gap. The graphic below depicts the finance plan structure.



PFM estimated that net toll revenues could support approximately \$309 million in non-recourse NCTA revenue bonds plus the maximum TIFIA loan of \$286 million, to finance the \$810 million complete project. This includes capital costs, capitalized interest, debt service reserve and costs of issuance. This financing plan resulted in a \$215 million funding gap. PFM states that the 70% to 75% self-supporting result for Scenario 1A is very good compared to other recent proposed toll roads. It should also be noted that toll revenues would also pay all maintenance, renewal and replacement over the life of the project, thus reducing the drain on regional transportation resources.

PFM also calculated the annual revenues that would be needed from a governmental source to close the project funding gap. They calculated that \$12 million per year from 2008 through 2042 would be needed to eliminate the funding shortfall. Under this plan, PFM estimated that net toll revenues plus the annual supplemental payments could support approximately \$532 million in non-recourse NCTA revenue bonds plus the maximum TIFIA loan of \$288 million, against \$820 million of financed capital costs, capitalized interest, debt service reserve and costs of issuance.

The addition of tolls on 540P in Scenario 1A appreciably improved net revenues. For Scenario 1B, which does not include tolls on 540P, the funding gap is \$262 million and it would take \$18.5 million of annual supplemental revenues to close the gap.

PFM reported that annual supplemental revenues from a stable governmental source could benefit the finance plan in several ways. The additional revenue increases bonding and loan capacity, improves the credit ratings, and reduces debt service coverage requirements. The revenue during construction and ramp-up years helps to reduce the amount of needed capitalized interest and capital appreciation bonds. Therefore, the debt structure is more efficient and the cost of borrowing is lower.

PFM also reported that the debt structure they have assumed and the need for governmental support to close a funding gap are typical for start-up toll roads and should be expected. State DOT contributions upfront and over time are common, and governmental subordinate loan programs such as TIFIA are frequently used. PFM is not aware of any start-up toll roads in the past decade that have not needed significant government support, or if they didn't get significant support, that didn't become financially distressed.

PFM's conclusion from their financial analysis was that the combination of Triangle Parkway, Western Wake, and tolls on I-540P creates a good candidate toll road project which could be financially feasible with a subordinate TIFIA loan and relatively little government support when compared to the size of the capital costs being financed.

NCTA Conclusions and Next Steps

In comparison to other projects, as identified by HNTB, the combined Wake Parkway Project appears to be financially feasible especially using the “Supplemental Revenue” approach to financing as calculated by PFM.

Project Delivery

If these questions are resolved quickly, then NCTA will proceed on a schedule that is projected to have the roads open to the public by Fall 2010 for Triangle Parkway and by Fall 2011 for the Western Wake Parkway. The I-540P section is currently projected to open in early 2007.

Based on estimates by an informal panel of experienced DOT engineers, building the roads as toll projects could deliver them to the public a full 10 years before opening as a conventionally-financed road.

Next Steps

The NCTA Board must decide if it wishes to proceed with:

- An Investment Grade Traffic and Revenue Study
- Completion of the necessary environmental reviews
- Further study of an integrated design for the projects
- Development of a design-build RFP
- Preparation of bond financing plans

