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September 30, 2003

The Honorable Grady L. Patterson, Jr.  
Treasurer, State of South Carolina  
116 Wade Hampton Building  
Columbia, SC 29201

Dear Treasurer Patterson:

I have completed my actuarial analysis of the Fund ("the Fund") for the South Carolina Tuition Prepayment Program ("SCTPP" or "the Program") as of June 30, 2003. This report presents my findings with respect to the Fund's expected cash flows and adequacy of the Fund. The analyses have been prepared in accordance with generally accepted actuarial principles and practices commonly applicable to similar types of arrangements.

Currently the expected value of liabilities is \$114,006,000 and the value of assets is \$95,607,000, for a difference of \$18,399,000 or 16.1% of liabilities. These results are based on assumptions approved by SCTPP personnel after consultation with me.

It should be noted that in performing my additional analysis, I have not assumed any further sales of prepaid tuition contracts. Generally the sale of additional contracts will generate positive additional surplus which will offset the existing excess of liabilities over assets.

I appreciate the opportunity to serve the State of South Carolina. Any questions about the report should be directed to me at (770) 752-5656.

Very truly yours,

Robert B. Crompton  
Consulting Actuary  
Actuarial Resources Corporation



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## I. EXECUTIVE SUMMARY

The following are the key findings of my analysis.

### *Adequacy of the Fund*

The Fund's liabilities exceed its assets by \$18,857,000. The key results are shown below.

Value as of June 30, 2003	Assets and Liabilities
Assets	
Investments	\$71,299,638
Future Contract Payments	23,284,148
Future Payments From BankAmerica	<u>1,023,264</u>
Total Assets	<u>\$95,607,050</u>
Liabilities and Surplus	
Future Contract Benefits	\$111,216,262
Future Expenses	<u>2,789,326</u>
Total Liabilities	\$114,005,588
Surplus	<u>(\$18,398,538)</u>
Total Liabilities and Surplus	<u>\$95,607,050</u>
Surplus as a Percent of Liabilities	-16.1%

### *Adequacy Methodology*

In making my projections of the surplus in the table immediately above, I assume that the Program will not sell any additional prepaid tuition contracts. This is a conservative limitation that provides a static "snapshot view" of the Program as of June 30, 2003.

### *Investment Strategy*

Based on discussions with Program personnel, the investment strategy of SCTPP is anticipated to be 40% allocation of assets to domestic equities and 60% allocation to fixed income securities.

The objective of the increase in equity investment is to provide higher portfolio returns than would be available from a portfolio consisting mainly of fixed income

investments. I have not reviewed the strategy nor am I expressing an opinion on the strategy.

Key economic assumptions are listed below.

<b>Key Assumptions</b>		
<b>Yield on Investments</b>		
2003/04 & 2004/05	(2 years)	6.8%
2005/06 & later		8.0%
<b>Asset Allocation</b>		
Cash & fixed income		60%
Equities		40%
<b>Tuition Inflation</b>		
2004/05 & 2005/06	(2 years)	8.5%
2006/07 & later		7.0%
<b>Bias Load</b>		
All Years		3.0%

The assumption for investment returns is based on the recommendation of South Carolina Treasury investment personnel, who considered the likely returns of a 60% fixed income, 40% equity portfolio.

The tuition inflation assumptions are based on a combination of statistical models of tuition increases and on actuarial judgment. My statistical models use information from the past 23 years. The rates shown in the table above represent my long-term average estimate of tuition inflation plus some conservatism.

### III. RELIANCES

In making the projections on which this report is based, I relied on the following information supplied to me as indicated below.

- Tuition and fee amounts at South Carolina public institutions of post-secondary education, supplied by the Office of the State Treasurer,
- Headcount at South Carolina public institutions of post-secondary education, supplied by the Office of the State Treasurer,
- Market value of assets of the Program's trust fund, supplied by the Office of the State Treasurer,
- Inventory of Program contracts, supplied by InTuition Solutions, Inc., the Program's records administrator,
- Assumptions regarding future investment returns on the Program's trust fund, supplied by the Office of the State Treasurer, after consultation with me regarding reasonableness and comparability to assumptions at other programs with similar investment profiles.

#### IV. DESCRIPTION OF THE PROGRAM

The Program was created in 1997 by the South Carolina Legislature to "...assist the citizens of South Carolina with the expense of college by providing an advanced payment program for tuition at a fixed and guaranteed level for public colleges and universities." The Office of the South Carolina State Treasurer administers the Program. The Program is summarized below. This summary is provided for explanation purposes only, and the Program will be governed by the provisions of the enabling legislation and Treasury procedures.

##### *Types of Contracts Available*

There are currently two types of contracts available. Both types provide for tuition and mandatory fees imposed by public higher education institutions in the State of South Carolina.

The four-year college/university contract provides for up to eight semesters of tuition and fees at any accredited senior higher education institution. Program rules specify that this will not exceed 128 semester hours. The benefits provided for under this contract may also be used to provide for junior college tuition and fees or a combination of junior and senior college tuition and fees.

The two-year college/university contract provides for up to four semesters of tuition and fees at any accredited senior higher education institution. Program rules specify that this will not exceed 64 semester hours. The benefits provided for under this contract may also be used to provide for junior college tuition and fees or a combination of junior and senior college tuition and fees.

Both contracts require an enrollment fee at the time the enrollment form is submitted. Currently the enrollment fee is \$75.

##### *Payment Options Available*

There are currently three approved and published payment options for the Program:

- Lump-sum payments,
- 48 monthly installment payments and
- Extended payments, which are monthly installment payments which run until the year of anticipated matriculation of the beneficiary.

Additionally, the Program provides for additional forms of payment on an accommodation basis at the request of potential purchasers. These payment options typically provide for an initial lump sum coupled with installment payments.



### *Residency Requirements*

There is no residency requirement for contract purchasers. However, there is a residency requirement for the contract beneficiary. The beneficiary is required to meet South Carolina residency requirements, be 21 years of age or younger and not have completed the tenth grade at the time the enrollment form is submitted to SCTPP.

### *Refunds*

If the beneficiary dies or becomes disabled, then the purchaser will receive a refund equal to the lesser of the current Weighted Average Tuition or payments accumulated at interest. Applicable interest is determined by Treasury on a year-to-year basis.

If the beneficiary is awarded a scholarship, the contract owner may obtain a refund equal to the lesser of the current Weighted Average Tuition or payments accumulated at interest. This refund is available only after the beneficiary has reached his projected enrollment year.

Rollovers to the South Carolina Future Scholar Savings Program receive a refund equal to contract payments accumulated at 2% interest per year.

Voluntary terminations receive a refund equal to contract payments accumulated at 2% interest per year, less a deduction of the lesser of \$100 or 50% of the sum of all payments.

Involuntary terminations receive a refund equal to contract payments accumulated at 2% interest per year, less a deduction of the lesser of \$150 or 50% of the sum of all payments.

### *Change of Beneficiary*

Generally, a contract owner can change the beneficiary at any time provided that the new beneficiary is the same age or younger than the original beneficiary, and is a member of the current beneficiary's immediate family.

### *Age Limit on Benefits*

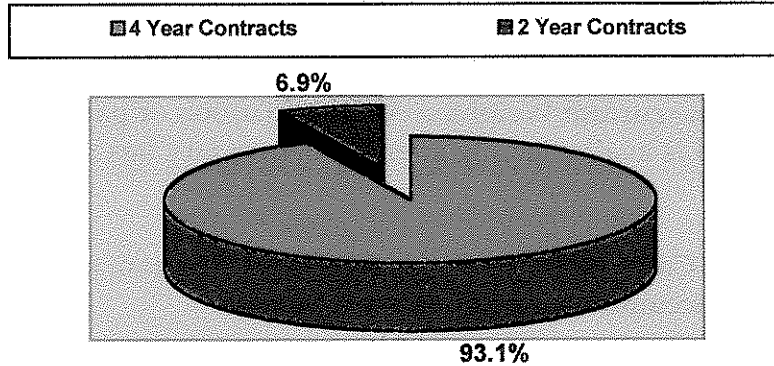
Benefits are available until the beneficiary is age 30. This limit may be extended to age 34 if the beneficiary has military service.

## V. SUMMARY OF CONTRACT DATA AND CURRENT ASSETS

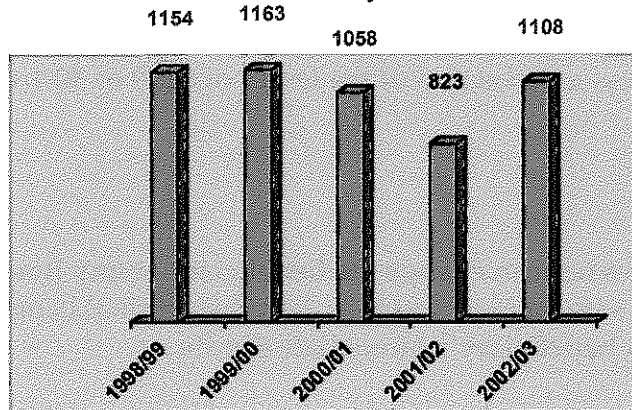
### *Contract Data*

Data on the number of outstanding contracts, contributions, was provided by Intuition, Inc., the Program's records administrator. The graphs below summarize the data provided concerning these contracts.

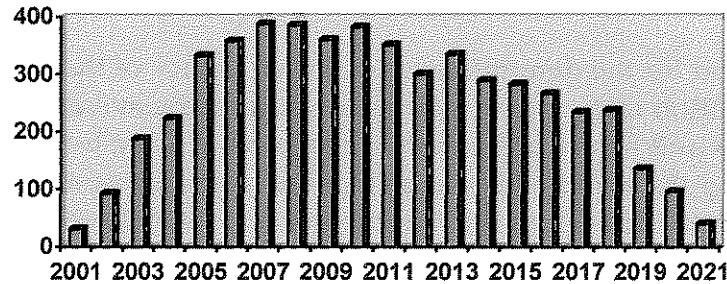
**Distribution of Contracts by Contract Type**



**Distribution of Contracts by Enrollment Year**



**Distribution By Year of Matriculation**



**Current Assets**

As of June 30, 2003 the Program’s assets were deployed in a mix of fixed income investments and equity investments. The allocation of assets to each class is shown in the following table.

**Fund Investments**

The market value of Program assets is shown in the table below.

<b>Market value of assets held as of June 30, 2003</b>		
	<u>Amount</u>	<u>% Of Total</u>
Cash & Fixed Income Held by Treasury	\$62,605,345	87.8%
Equity Investments	\$8,694,293	12.2%
<b>TOTAL</b>	<b>\$71,299,638</b>	<b>100.0%</b>

**Investment Strategy**

The investment strategy is designed to achieve a rate of return in excess of anticipated increases in the WAT. The Fund's asset allocation anticipates that the amount invested in equities will remain at approximately 40% and that the fixed income portion will remain at approximately 60%.

## VI. ACTUARIAL METHODS AND ASSUMPTIONS

### *Methods*

The actuarial method for the determination of the adequacy of the Fund consists of projecting future tuition rates, future expenses based on the average anticipated number of contracts and future utilization of contracts. Future benefits and expenses are discounted using the assumed investment yield as the interest discount rate. The assumed discount rate is based on the current and anticipated mix of assets of the Fund.

For the projection of future benefits, the analysis proceeds as follows:

- Project future tuition rates for all years under consideration. Future tuition is based on the assumptions for tuition inflation.
- Determine the nominal cost of future benefit payments
- Determine the nominal value of expenses.
- Determine the nominal value of future contract payments and revenue from Bank of America.
- Determine the present value of future contract benefits, future expenses and future revenue based on the investment yield assumptions.
- Perform projections for all of the Program's beneficiaries to determine if the Fund is adequate in the aggregate.
- In making my projections of the surplus, I assume that the Program will not sell any more contracts. This is a conservative limitation that provides a static "snapshot view" of the Program as of June 30, 2003.

A dynamic view of the Program, which would include a reasonable projection of future contributions, provides a more realistic view of the Program since the Program is run with the intention of continuing to accept contributions. New contracts are projected to provide additional amounts of surplus, which provides protection against adverse fluctuations in experience.

*Assumptions*

Actuarial assumptions used to determine financial soundness of programs are of two general types: economic and demographic. Demographic assumptions determine the expected exposure to financial claims and generally answer the question "How and when will people use their contractual benefits?" Economic assumptions are concerned with the expected level of benefit usage and answer the question "What is the expected value of benefit usage?" The assumptions that I used were those that were approved by the South Carolina Treasury, after consultation with us.

Economic Assumptions

Economic assumptions are used to estimate the annual tuition rates at two and four year colleges, increases in Fund expenses, and Fund earnings on assets invested. Because inflation is a major component of the rate of increase in tuition rates and of investment returns, I considered these rates together. I believe that the difference in these rates is more important than the absolute level of the rates. The following paragraphs describe the economic assumptions used in this study.

*Federal Income Tax*

I assumed that Fund earnings are exempt from Federal Income Tax.

*Annual Tuition Rates and Bias Load*

My assumptions were guided by my observations of historic tuition increases, trends in postsecondary enrollment in South Carolina and the level of legislative appropriations for postsecondary schools in South Carolina.

The Bias Load assumption accounts for Program enrollment at institutions that are more expensive than the Weighted Average Tuition. The choice of this assumption was based on a review of Program experience and what I have seen in other prepaid tuition programs.

The assumptions for tuition inflation and bias load are shown in the table immediately below.

<b>Tuition Inflation</b>		
2004/05 & 2005/06		8.5%
2006/07 & later		7.0%
<b>Bias Load</b>		
All Years		3.0%

### *Fund Earnings Rate*

In setting my assumptions for the yield on assets, I relied on input from Treasury personnel

My investment yield assumptions are as follows:

6.8% for the two years ending June 30, 2005 and  
8.0% for all future years thereafter.

These assumptions are based upon the recommendation of the Program's in-house investment advisor. The rate of 6.8% over the next two years encompasses both the uncertainty regarding equity returns over the short term as well as the current low interest rates available on fixed income securities. The ultimate rate of 8.0% represents the investment advisor's long-term outlook for a portfolio consisting of 40% equities and 60% fixed income.

Although I do not expect the Fund to realize these exact rates in any year, I believe they represent reasonable earnings rates over the time horizon of this report. In some years the Fund will have yields in excess of the assumed rate, while in other years the Fund will earn less than this rate.

### *Annual Expenses*

The Program incurs expenses for records administration and for day-to-day operations of Treasury staff who work with the Program. In making my projections, I used the Program's current records administration expenses, which are incurred based on inventory counts, and an additional aggregate expense for all other expense incurrals. The records administration expenses are assumed to increase at 2% per year. The actual current expense rates are shown in the table

Records Expense Item	Expense Rate
Active contracts, pre-matriculation	\$3.25 per month
Paid in full contract, pre-matriculation	\$1.40 per month
Tuition payments	\$5.00 per payment
All contracts, post-matriculation	\$1.40 per month

The aggregate expenses for the Program, excluding records administration, are \$370,000. I assumed that this amount would increase at 2% per year.

### Demographic Assumptions

The demographic assumptions used in this report are based on my experience with similar types of liabilities. My choice of assumptions is based on recent experience and my best estimates as to future events. These assumptions are as follows:

*Mortality and Disability*

I assumed that there would be no terminations due to death or disability.

*At-Will Termination of Contract*

My projections include assumptions regarding voluntary termination of contracts prior to matriculation. These assumptions vary by payment type and by number of years from contract purchase. These assumptions are shown in the following table.

	Lump Sum	48 Months Payments	Extended Payments
Year of purchase	1.5%	5.0%	8.0%
Year of purchase+1	0.5%	4.0%	7.0%
Year of purchase+2	0.5%	1.0%	5.0%
Year of purchase+3	0.5%	0.5%	4.0%
Year of purchase+4	0.5%	0.5%	1.0%
Thereafter	0.5%	0.5%	0.5%

*Matriculation Percent*

All beneficiaries are assumed to matriculate at the matriculation date specified in the application, except for those who are projected to terminate, die or become disabled.

*Utilization of Benefits*

Four-year contract beneficiaries are assumed to use their benefits ratably over four years, while two-year contract beneficiaries are assumed to use their benefits ratably over two years. However, for contracts which are passed their anticipated matriculation date, but have not used any benefits, all benefits are projected to be used completely over the next two years.

I believe that this is a conservative assumption since experience at other prepaid tuition programs, and universities in general, indicates that the average student takes somewhat longer than four years to complete a four-year degree.

*Dropout Rate*

All beneficiaries are assumed to use 100% of their contractual benefits once they have enrolled in college.

*Frequency of Beneficiary Replacement*

Since all surviving beneficiaries are expected to matriculate and are expected to use their benefits until completion, the assumption is made that no replacement of beneficiaries will occur.



## VII. ADEQUACY OF THE FUND AS OF JUNE 30, 2003

In determining the adequacy of the Fund, I estimated the future disbursements for higher education expenses of beneficiaries, expenses and refunds for terminated contracts. I also projected the future assets based on current assets and expected earnings on assets. I believe these estimates are reasonable based on the information available and my past experience and judgment.

The estimates of the prospective assets and liabilities of the Fund are summarized in the table on the following page and demonstrate the financial position of the Fund. The value of all assets is \$95,607,050 while the expected value of all liabilities is \$114,005,588. The expected present value of the excess of liabilities over assets is \$18,398,538.

The Program's surplus is the amount of funds over and above that amount which is necessary to meet benefit usage and expenses on my baseline assumptions. Surplus provides protection for events that are more adverse than my baseline assumptions.

The surplus will change from year to year due to positive and negative cash flows and due to the change in the present value of future benefit usage and expense payments because of the passage of time. The surplus will also change due to the variance of experience from the assumptions. These variances include tuition increases, investment income and expenses.

The surplus will also change due to the growth of the program and due to the updating of the assumptions to reflect the Program's emerging experience. The changes for the year ending June 30, 2003 are summarized in the table below.

<b>Progression of Surplus</b>	
Surplus at June 30, 2002	(\$ 12,332,158)
Projected Decrease to June 30, 2003	(838,587)
Loss from Unfavorable Tuition Inflation	(10,042,845)
Gain due to Favorable Investment Experience	2,088,121
Loss due to Additional Contract Sales	(1,871,071)
Changes Due to Change In Assumptions	(3,186,346)
Miscellaneous Gains and Losses <sup>1</sup>	7,784,348
Surplus at June 30, 2003	(\$ 18,398,538)

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<sup>1</sup> Miscellaneous Gains include gains from early receipt of contract payments, expense gains/losses and gains/losses due to contract terminations varying from our projections

In the following chart I show the value of expected future benefit usage, expected future payments, current assets and expected surplus as of the end of each future year for contracts in place as of June 30, 2003. Note that existing assets are projected to be sufficient to meet future liabilities through 2017.

**PRESENT VALUE OF ASSETS AND LIABILITIES**

Fiscal Year Ending	Value of Assets	Present Value of Future Benefits And Expenses	Actuarial Reserve
2003	95,607,050	114,005,588	(18,398,538)
2004	98,528,941	118,295,811	(19,766,869)
2005	100,261,671	121,486,881	(21,225,210)
2006	101,135,118	124,171,715	(23,036,596)
2007	99,944,561	124,934,129	(24,989,567)
2008	96,659,609	123,755,631	(27,096,023)
2009	91,274,707	120,644,828	(29,370,121)
2010	84,624,725	116,450,102	(31,825,377)
2011	76,359,413	110,835,667	(34,476,254)
2012	66,943,753	104,282,177	(37,338,424)
2013	56,898,349	97,327,259	(40,428,910)
2014	45,404,558	89,170,565	(43,766,007)
2015	33,082,843	80,452,372	(47,369,530)
2016	19,773,155	71,033,994	(51,260,839)
2017	4,882,478	60,345,494	(55,463,016)
2018	(10,666,386)	49,334,542	(60,000,929)
2019	(27,521,573)	37,379,912	(64,901,485)
2020	(44,257,951)	25,935,922	(70,193,873)
2021	(60,121,525)	15,787,951	(75,909,476)
2022	(74,356,467)	7,725,769	(82,082,236)
2023	(85,583,906)	3,164,909	(88,748,815)
2024	(95,190,879)	757,841	(95,948,720)
2025	(99,965,152)	- 0 -	(99,965,152)

## VIII. STOCHASTIC TESTING

I believe that when there is a significant amount of uncertainty about conditions prevailing in the future it is important to test for adequacy under other possible assumptions.

I have performed stochastic analysis of the Program as of June 30, 2003 in order to gain a better understanding of the likelihood of various results. Stochastic analysis involves a large number (5,000 in this case) of statistically generated scenarios based on the statistical parameters of investment returns and tuition inflation. Stochastic analysis provides information on how likely it is that the Program will not have a deficit based on current contracts. The results of both bases are shown in the table below.

	Results
Proportion with Surplus	27.7%
Largest Surplus	\$35,887,924
75 <sup>th</sup> Percentile Surplus	\$1,255,210
50 <sup>th</sup> Percentile Surplus	(\$12,971,795)
25 <sup>th</sup> Percentile Surplus	(\$30,701,535)
Smallest Surplus	(\$182,802,125)
Mean Surplus	(\$17,337,799)

The most important measures from the table immediately above are the *Proportion with surplus* and the *50<sup>th</sup> Percentile Surplus amounts*. The *Proportion with surplus* probabilities of 27.7% indicates that there is approximately a ¼ probability that the Program will have a surplus.

The *50<sup>th</sup> Percentile Surplus amounts* measure is a “best-estimate” measure of results. If my assumptions are neither conservative (that is they understate results) nor aggressive (that is they overstate results) then the 50<sup>th</sup> Percentile measure should be close to my projected result. The table above indicates that my assumptions are somewhat conservative since the results of stochastic analysis are about \$5.4 million better than my projection.

The *Smallest Surplus* measure indicates what happens if economic events continue adversely for the lifetime of the current contracts – continued economic recession resulting in small appropriations leading to high tuition increases, coupled with negative returns in the equity market until the end of the projection horizon.

**IX. BREAK-EVEN INVESTMENT RETURN & SENSITIVITY TESTING**

I calculated the necessary levelized investment return necessary to provide a break-even result on the Program's surplus. This break-even return rate is shown in the table below.

Break-even investment return	10.33% per year
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I also investigated the effect of variances in both university inflation and investment yield assumptions from those anticipated by the adequacy test assumptions. These scenarios are described below and are based on level adjustments to the baseline adequacy assumptions discussed earlier in this report.

- 1) Tuition inflation lower than adequacy test assumptions by 0.25% every year.
- 2) Tuition inflation higher than adequacy test assumptions by 0.25% every year.
- 3) Investment yields higher than adequacy test assumptions by 0.25% every year.
- 4) Investment yields lower than adequacy test assumptions by 0.25% every year.
- 5) Tuition inflation higher and investment yields lower than adequacy test assumptions by 0.25% every year.

The Surplus for each of these scenarios is shown below.

<b>Sensitivity Testing Results</b>		
<u>Scenario</u>	<u>Surplus</u>	<u>Variance From Baseline</u>
1	(\$16,230,788)	\$2,167,750
2	(\$20,619,458)	(\$-2,220,920)
3	(\$16,349,935)	\$2,048,603
4	(\$20,510,374)	(\$-2,111,836)
5	(\$22,793,050)	(\$-4,394,512)

## X. CHANGES IN ACTUARIAL ASSUMPTIONS

Since the last Actuarial Report, there have been two material changes in the assumptions used for the projections on which the results are based. These changes and their rationale are discussed below.

### *Changes In Expenses*

The budgeted amount of expenses other than for Records Administration increased for 2003/04 compared to 2002/03 (\$370,000 vs. \$270,000). This increase is attributable to marketing expenses that were not anticipated when I performed by 2002 projections. I have incorporated the new amount in my projections. The change in expense assumptions lowers the projected surplus by \$326,880.

### *Changes in Tuition Inflation Assumptions*

For the year 2003/04, the increase in the Weighted Average Tuition was 16% - significantly above last year's projected increase of 8.5%. Because the possibility of continuing high tuition increases, the tuition increase assumption has been set to 8.5% for 2004/05 & 2005/06 before reverting to the ultimate rate of 7.0% for all succeeding years. The effect of this change was to reduce the projected surplus by \$2,859,466.

**XI. EXPECTED USE OF FUNDS**

The Fund is expected to pay benefits and expenses in the following proportions:

- Tuition payments - 94.5%
- Expenses - 2.4%
- Payments of refunds to contract owners - 3.1%

These results are shown graphically below.

