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January 31, 2003

The Honorable Grady L. Patterson, Jr.  
Treasurer, State of South Carolina  
116 Wade Hampton Boulevard  
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, 2002. 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 \$87,735,000 and the value of assets is \$75,403,000, for a difference of \$12,332,000 or 14% 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.

In preparing this report I have relied on contract information provided by InTuition Solutions, Inc. and on asset, investment return projections, expense and tuition cost information provided by Treasury personnel. I performed no independent audit or verification of these data.

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 \$12,332,000. The key results are shown below.

<b>Value as of June 30, 2002</b>	<b>Assets and Liabilities</b>
Assets	
Investments	\$48,052,485
Future Contract Payments	26,317,863
Future Payments From BankAmerica	<u>1,032,725</u>
Total Assets	<u>\$75,403,072</u>
Liabilities and Surplus	
Future Contract Benefits	\$85,123,796
Future Expenses	<u>2,611,434</u>
Total Liabilities	\$87,735,230
Surplus	<u>(\$12,332,158)</u>
Total Liabilities and Surplus	<u>\$75,403,072</u>
Surplus as a Percent of Liabilities	-14.1%

### *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, 2002.

### *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>		
2002/03 – 2004/05	(3 years)	6.8%
2005/06 & later		8.0%
<b>Asset Allocation</b>		
Cash & fixed income		60%
Equities		40%
<b>Tuition Inflation</b>		
2002/03		8.5%
2004/05 & 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 22 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; with the exception of contracts associated with the College of Charleston, which were supplied by the Office of the State Treasurer,
- 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 purchase 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***

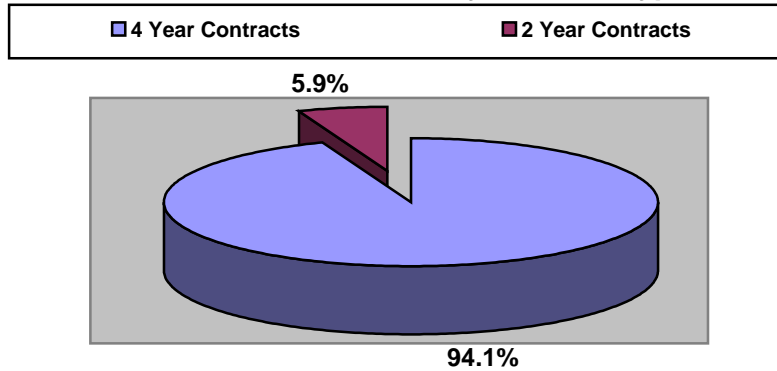
Benefits are available until the beneficiary is age 30. This limit may be extended to age 34 if the beneficiary has military service.

## V. SUMMARY OF CONTRACT DATA AND CURRENT ASSETS

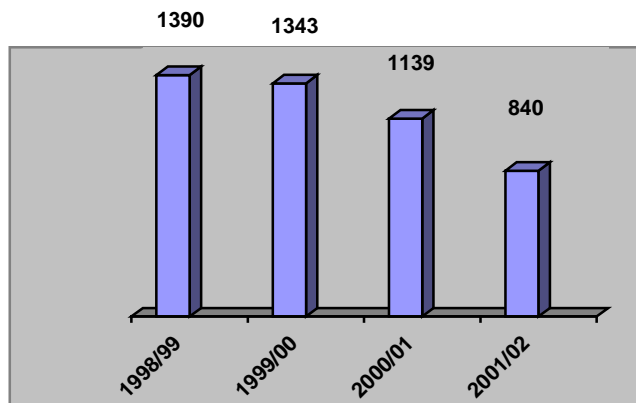
### *Contract Data*

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**

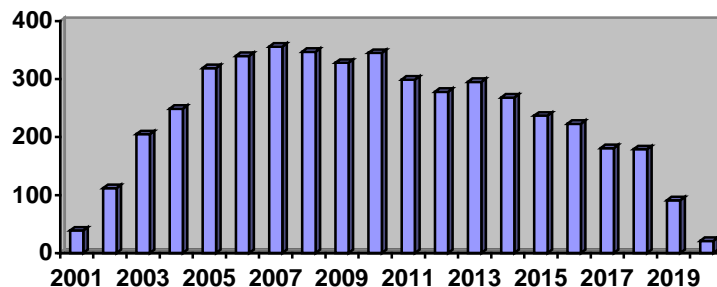


**Distribution of Contracts by Enrollment Year**





### Distribution By Year of Matriculation



### *Current Assets*

As of June 30, 2002 the Program’s assets were all in fixed income investments. Treasury personnel informed us that they intended to deploy assets according to the investment strategy at some point following June 30. Based on discussions with Treasury personnel, I believe that the final deployment of assets in October of 2002 does not impair the Program’s investment return assumption for 2002/03.

### Fund Investments

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

<b>Market value of assets held as of June 30, 2002</b>		
	<u>Amount</u>	<u>% Of Total</u>
Cash & Fixed Income Held by Treasury	\$48,052,485	100.0%
<b>TOTAL</b>	<u>\$48,052,485</u>	<u>100.0%</u>

### Investment Strategy

The investment strategy is designed to achieve a rate of return in excess of anticipated increases in tuition rates at each tuition level. The Fund's asset allocation anticipates that the amount invested in equities will move to approximately 40% and that the fixed income portion will be deployed in a mix of corporate bonds and government bonds.

## 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, 2002.

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>	
2002/03	8.5%
2004/05 & 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 three 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 three 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

<b>Records Expense Item</b>	<b>Expense Rate</b>
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 \$271,876. I assumed that this amount would increase at 3% 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.

	<b>Lump Sum</b>	<b>48 Months Payments</b>	<b>Extended Payments</b>
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, 2002

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 \$75,403,072 while the expected value of all liabilities is \$87,735,230. The expected present value of the excess of liabilities over assets is \$12,332,158.

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, 2002 are summarized in the table below.

<b>Progression of Surplus</b>	
Surplus at June 30, 2001	\$( 973,000)
Projected Decrease to June 30, 2002	( 78,000)
Loss from Unfavorable Tuition Inflation	(6,300,000)
Loss due to Unfavorable Investment Experience	(1,007,000)
Loss due to Additional Contributions	(3,820,000)
Changes Due to Change In Assumptions	(2,100,000)
Surplus at June 30, 2002	(\$ 12,332,000)

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, 2002. Note that existing assets are projected to be sufficient to meet future liabilities through 2016.

**PRESENT VALUE OF ASSETS AND LIABILITIES**

Fiscal Year Ending	Value of Assets	Present Value of Future Benefits And Expenses	Actuarial Reserve
2002	75,403,072.84	87,735,230.44	(12,332,157.61)
2003	78,383,885.97	91,654,630.30	(13,270,744.32)
2004	80,533,739.30	94,806,894.23	(14,273,154.94)
2005	81,389,235.14	96,732,964.62	(15,343,729.47)
2006	81,431,735.72	98,102,963.55	(16,671,227.83)
2007	79,715,667.89	97,820,593.94	(18,104,926.06)
2008	76,287,482.21	95,940,802.35	(19,653,320.14)
2009	71,398,831.69	92,724,417.44	(21,325,585.75)
2010	65,517,869.53	88,649,502.14	(23,131,632.61)
2011	58,405,694.47	83,487,857.69	(25,082,163.22)
2012	50,531,926.63	77,720,662.91	(27,188,736.28)
2013	42,083,939.58	71,547,774.76	(29,463,835.18)
2014	32,530,784.19	64,451,726.18	(31,920,942.00)
2015	22,132,998.79	56,707,616.14	(34,574,617.36)
2016	10,903,605.54	48,344,192.28	(37,440,586.74)
2017	(1,314,354.83)	39,221,478.85	(40,535,833.68)
2018	(13,757,293.47)	30,121,406.90	(43,878,700.38)
2019	(26,597,304.46)	20,891,691.94	(47,488,996.41)
2020	(38,780,153.61)	12,607,962.51	(51,388,116.12)
2021	(49,291,806.48)	6,307,358.93	(55,599,165.41)
2022	(58,107,913.79)	2,039,184.85	(60,147,098.64)
2023	(64,734,529.23)	324,337.30	(65,058,866.53)
2024	(67,879,691.69)	- 0 -	(67,879,691.69)



## 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, 2002 in order to gain a better understanding of the likelihood of various results. Stochastic analysis involves a large number (2 sets of 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.

Because the Program's assets had not been deployed into equities when I performed stochastic analysis, I performed the analysis both with and without small capitalization stocks, which have a higher average return and higher volatility than broad-based equity returns. The results of both bases are shown in the table below.

	Without Small Cap Stocks	With Small Cap Stocks
Proportion with Surplus	28.4%	31.9%
Largest Surplus	\$27,111,943	\$27,332,783
75 <sup>th</sup> Percentile Surplus	1,585,518	3,856,691
50 <sup>th</sup> Percentile Surplus	(11,386,001)	(8,453,607)
25 <sup>th</sup> Percentile Surplus	(28,855,053)	(23,837,289)
Smallest Surplus	(101,051,947)	(103,450,160)
Mean Surplus	(15,090,074)	(11,717,077)

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 28.4% and 31.9% indicate that there is greater than 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 without small-cap stocks are about \$1 million better than my projection. With small-cap stocks included in the asset mix, the results are nearly \$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	9.868% 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	(\$10,607,763)	\$1,724,395
2	(\$14,099,372)	(\$1,767,214)
3	(\$10,761,182)	\$1,570,976
4	(\$13,952,899)	(\$1,620,741)
5	(\$15,769,775)	(\$3,437,617)

## X. CHANGES IN ACTUARIAL ASSUMPTIONS

Since the last Actuarial Report, there have been three 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 Voluntary Termination Rates*

In prior years, the results were based on the assumption that there would be no voluntary contract terminations. Based on the Program's experience over the last few years, this appears to be unduly conservative, since voluntary contract terminations are a source of gain to the Program. The revised assumption for termination rates is based on the Program's experience extrapolated for experience seen at other prepaid tuition programs. The details of the termination rates are shown on **Page 10**.

### *Changes in Tuition Inflation Assumptions*

For the year 2002/03, the increase in the Weighted Average Tuition was 20% - significantly above last year's projected increase of 7%. This large increase was due to revenue shortfalls at South Carolina colleges and universities driven mainly by drops in legislative appropriations. Because the likelihood of continuing legislative appropriations shortfalls in the coming year, the tuition increase assumption has been set to 8.5% for 2003/04 before reverting to the ultimate rate of 7.0% for all succeeding years.

### *Changes in Investment Return Assumptions*

The Program's in-house investment advisor has indicated that 8.0% remains an appropriate long-term return assumption for the Program given a 40% equity and 60% fixed income mix. However, he believes that because of volatility in equity markets and because of current interest rates for fixed income securities, a lower overall return for the short-term is called for. The return for 2002/03 - 2004/05 has been set to 6.8%.

## XI. EXPECTED USE OF FUNDS

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

- Tuition payments - 93.8%
- Expenses - 3.0%
- Payments of refunds to contract owners - 3.3%

These results are shown graphically below.

