

ACTUARIAL VALUATION  
OF THE  
VIRGINIA PREPAID  
EDUCATION PROGRAM  
AS OF JUNE 30, 2012

By:

ALAN H. PERRY, FSA, CFA  
RICHARD L. GORDON, FSA, EA  
JILL M. STANULIS, EA



1550 Liberty Ridge Drive  
Suite 200  
Wayne, PA 19087-5572

Tel +1 610.687.5644  
Fax +1 610.687.4236

[www.milliman.com](http://www.milliman.com)

November 30, 2012

Board of the Virginia College Savings Plan  
Commonwealth of Virginia  
Virginia College Savings Plan  
9001 Arboretum Parkway  
Richmond VA 23236

Ladies & Gentlemen:

This report presents the results of the actuarial valuation of the Virginia Prepaid Education Program (VPEP) as of June 30, 2012.

### Purpose

The main purposes of this report are:

- to calculate the actuarial present value of the obligations under the prepaid tuition contracts purchased through June 30, 2012 and compare the value of those obligations with the assets in VPEP as of that date;
- to review the experience and changes in the actuarial assumptions during the last year and indicate their effects on the results; and
- to set forth the basis for the actuarial assumptions and methods utilized in those calculations.

The results contained in this report are based on contract data and preliminary financial statements provided by the Virginia College Savings Plan. We have relied on this data in preparing this report.

### Background

In 1994, the Virginia General Assembly established the Virginia Higher Education Tuition Trust Fund (subsequently renamed the Virginia College Savings Plan) to enhance the accessibility and affordability of higher education for all citizens of the Commonwealth. VPEP funds consist of payments received pursuant to prepaid tuition contracts, bequests, endowments or grants from the United States government, its agencies and instrumentalities, and any other available sources of funds, public or private. Any moneys remaining in VPEP at the end of a biennium shall remain in VPEP. Interest and income earned from the investment of such funds shall remain in VPEP.

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In 1998, the Virginia General Assembly passed legislation that requires the Governor to include in each year's state budget an amount to cover the Plan's obligations, which include VPEP, in the event "the Plan is unable to meet its current obligations." The Governor has included the provision in subsequent budget submissions to meet the VPEP obligations, and the General Assembly has included the provision in subsequent Appropriation Acts, including Chapter 3 of the 2012 Special Session I Acts of Assembly (2012 Appropriation Act).

### Program Design

The Virginia Prepaid Education Program is one of four Section 529 options offered by the Virginia College Savings Plan. Under VPEP, participants purchase tuition contracts that provide coverage of tuition and mandatory fees at a public university and/or community college in Virginia. At redemption, the contract pays the current tuition and mandatory fees at the Virginia public university or community college that the beneficiary attends. The benefits vary if the beneficiary does not attend a Virginia public university or community college. With the establishment of the Virginia Education Savings Trust, contract holders have the option of rolling over the value of their prepaid contract into a savings account. The value of the prepaid contract for such rollovers is the accumulated contributions at the reasonable rate of interest set by the Board. This option to roll over the contract has effectively added a minimum benefit to the Program.

### Statutory Requirements

The Code of Virginia, Title 23, Chapter 4.9 provides limited guidance for establishing the actuarial basis to evaluate the Virginia Prepaid Education Program. The Code requires an annual audit of the Program and states in part that if the annual accounting and audit "reveal that there are insufficient funds to ensure the actuarial soundness of VPEP, the Board shall be authorized to adjust the terms of subsequent prepaid tuition contracts or arrange refunds for current purchasers to ensure actuarial soundness."

"Actuarial soundness" is not a precise concept and there is no generally accepted understanding of the meaning of this phrase within the actuarial profession, especially with respect to prepaid tuition plans. For purposes of this report, we have assumed that the phrase "actuarially sound," when applied to the Virginia Prepaid Education Program, means that the Fund has sufficient assets (including the value of future installment payments due under current contracts) to cover the actuarially estimated value of the tuition obligations under those contracts (including any administrative costs associated with those contracts).

We have also interpreted these Sections to require that the actuarial liabilities be evaluated using sound actuarial principles that are generally consistent with the practices and principles widely used for retirement programs. Reference to other programs is necessary because of the innovative nature of a prepaid tuition program. No generally accepted standard of practice has evolved within the actuarial profession

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specifically addressing prepaid tuition programs. We chose the standards applicable to retirement programs because these programs generally provide for payments at some future date where that payment has a high probability of payment at, or close to, some specific age.

### Valuation Basis

The assumptions selected for this report are intended to be "best estimates".

The method for determining the "best estimate" liability for the Program reflects the possible variability of inflation, tuition, and investment returns and the correlation between each of these variables. The methodology is described in the section below, Variability of Results and Valuation Basis.

### VPEP Investment Policy

On June 25, 2009, the Board of the Virginia College Savings Plan adopted a new target asset allocation strategy for the Virginia Prepaid Education Program.

The investment strategy is important because it sets forth acceptable investment allocations among asset classes. The asset allocation affects the magnitude and variability of expected investment returns and therefore the financial structure of the plan. For the valuation, we have assumed that Program investments will be allocated as shown below, based on the investment policy target allocations:

<u>Asset Category</u>	
Equities	32.5%
Core Fixed Income	25.0%
Non-Core Fixed Income	27.5%
Alternative Investments	15.0%

### Actuarial Assumptions

The actuarial assumptions used to prepare this report are summarized in Appendix C. The two most significant of those assumptions are the rates of investment return and tuition growth in the future. The Virginia College Savings Plan selected both of these assumptions. They are:

- the investment return assumption of 6.75% per year, net of investment related expenses (this is lower than the 7.00% assumption used to prepare the prior year's report); and,
- the annual tuition growth rate assumptions summarized in the table below.

	<u>Universities</u>		<u>Community Colleges</u>	
	<u>New assumption</u>	<u>Prior assumption</u>	<u>New assumption</u>	<u>Prior assumption</u>
Fall 2013	7.5%	10.0%	7.5%	7.5%
Fall 2014 and thereafter	7.5%	7.5%	7.5%	7.5%

### Summary of Results

The actuarial value of the obligations of the Virginia Prepaid Education Program as of June 30, 2012 is summarized below and compared with the total assets of the Program.

	<u>Present Value of Obligations For Future Payments</u>	<u>Value of Total Program Assets</u>	<u>Actuarial Reserve/ (Deficit)</u>
<i>(Amounts in Millions)</i>			
Virginia Prepaid Education Program:			
Tuition Obligations	\$2,148.3	n/a	n/a
Administrative Expenses	<u>27.0</u>	<u>n/a</u>	<u>n/a</u>
Grand Total	\$2,175.3	\$2,249.5	\$74.2

As indicated above, the Virginia Prepaid Education Program has assets that exceed the “best estimate” of the obligations by roughly \$74.2 million or 3.4%. Unfavorable future experience would adversely affect this position. It would be desirable to accumulate additional actuarial reserve over time that would positively affect this position.

The present value of future obligations for Administrative Expenses reflects the expected costs of maintaining each contract in place (as of June 30, 2012) until all tuition benefits have been paid and the expenses associated with making those payments. It does not include the future expenses of the Program associated with general overhead and marketing attributable to future contracts. The \$27.0 million administrative expense obligation is equivalent to about \$386 per contract.

### Actuarial Gain/Loss Analysis

During the 2012 fiscal year, the actuarial reserve position of the Program improved from a surplus of \$10.2 million to a surplus of \$74.2 million or 3.4% of obligations. Actuarial gains add to the reserve while actuarial losses decrease the reserve. This year's increase to the reserve is mostly attributable to lower than expected tuition increases, offset by lower than expected investment returns. Each of the factors affecting the change in the actuarial reserve/(deficit) is discussed below.

The actuarial surplus was expected to grow during the year by about \$0.7 million due to the passage of time. (The obligations are calculated as present values which grow with interest with the passage of time.)

The rate of return on Program investments (net of investment management fees) for the fiscal year was 1.0% on a time-weighted and 0.8% on a dollar-weighted basis. For the previous valuation, a 7.0% rate of return was assumed. This produced a net actuarial loss of approximately \$122.0 million.

The enrollment-weighted average university tuition and mandatory fee amount for the 2012-2013 school year increased by 3.7%, a smaller increase than the 10.0% rate assumed in the prior valuation. Enrollment-weighted tuition and mandatory fees at community colleges increased by about 5.9%, a smaller increase than the 7.5% rate assumed in the prior valuation. These smaller increases resulted in an actuarial gain of \$101.1 million.

Payouts for some of the contract holders are based on the account balance brought forward at the reasonable rate or the account balance brought forward at the actual rate of return on the portfolio. See Appendices C and F for an explanation of the assumptions and the payouts. During the past year the actual rate of return on the portfolio was 1.0% (6.0% less than the 7.0% assumption) and the reasonable rate remained well below the 4.0% assumed in last year's valuation. The lower than expected actual account balances and lower than expected reasonable rate balances resulted in an actuarial gain of approximately \$15.5 million.

The Program sold 3,119 new contracts during the year. Each contract was priced so as to contribute to the actuarial reserve. We estimate that the reserve was increased by about \$11.5 million from these new contracts.

The Prepaid Program received \$35.2 million in administrative fee revenue from all the VCSP programs, including CollegeAmerica. Total agency operating expenses were \$16.6 million, of which \$4.5 million was expected to be provided by the VPEP expense reserve. The balance of the fee revenue, \$23.1 million, is an increase to the reserve.

The assumption for the rate of return on investments was decreased from 7.00% per annum to 6.75% per annum. This decreased the reserve by \$29.4 million.

The assumption for future tuition growth for universities was decreased from 10.0% for fall 2013 and 7.5% per year thereafter to 7.5% per year. The tuition growth assumption for community colleges was unchanged. The change resulted in an increase to the reserve of approximately \$34.8 million.

The assumption for the reasonable rate was changed from 4.0% in all years to 0.04% for 2012-2013 and then 4.0% thereafter. The volatility and correlation assumptions for the investment returns and tuition increases were updated. The combined impact of these changes was a \$13.2 million increase to the reserve.

Other experience gains added about \$15.5 million to the reserve. These could be from rollovers, more beneficiaries attending colleges with lower tuition levels than assumed in last year's valuation or other variations from the actuarial assumptions.

In summary, the effect of experience and assumption changes on the actuarial reserve/ (deficit) can be summarized as follows:

*(Amounts in Millions)*

Actuarial Reserve / (Deficit) as of June 30, 2011	\$ 10.2
Interest on the reserve at 7.00%	0.7
Investment gain (loss)	(122.0)
Tuition gain (loss)	101.1
Lower than expected account balances	15.5
Sales of new contracts	11.5
Administrative fee revenue from VCSP	23.1
Change in investment return assumption	(29.4)
Change in tuition assumption	34.8
Change in other assumptions	13.2
Other gains	15.5
Actuarial Reserve / (Deficit) as of June 30, 2012	\$ 74.2

Valuation Basis

The present values of the obligations shown above were based on assumptions which represent an estimate of anticipated experience under the Fund that are reasonably related to past educational cost and investment data. Differences between those projections and actual amounts will depend on the extent to which future experience conforms to the assumptions made for this analysis.

A prime source of variation will be normal fluctuations that occur in the rate of increase in tuition, investment returns, and expense inflation. One way of estimating the range of possible outcomes is to stochastically model the financial operation of the Program using “Monte Carlo” techniques. This approach involves preparing 1,000 projections of financial results under randomly derived scenarios of tuition growth, investment returns, and expense inflation. Each of these scenarios is based on statistical factors such as standard deviation and correlation that were established by reviewing historical results adjusted where appropriate to reflect current conditions. By tabulating the results under all of these projections we estimated the probability that current assets, along with all anticipated contract payments plus investment returns, will be sufficient to cover the obligations of the Virginia Prepaid Education Program.

We have summarized in the table below the results of this process. It is important to understand that these results are only illustrative of the range of results that are possible and are dependent on the assumptions utilized. The assumptions are presented in Appendix C.

*(Amounts in Millions)*

<u>Percentage of “Best Estimate” Reserve</u>	<u>Total VPEP Fund Value at June 30, 2012</u>	<u>Probability of VPEP Funds Exceeding Obligation</u>
80%	\$1,740.2	8%
90%	1,957.8	26%
100%	2,175.3	50%
103.4%	2,249.5	59%*
110%	2,392.8	72%
120%	2,610.4	85%
130%	2,827.9	92%
140%	3,045.4	97%
150%	3,262.9	99%

\*actual Fund position.

The present value of obligations for future payments shown previously is the amount of assets necessary to have a 50% probability of meeting all program obligations, including administrative costs, associated with current contracts. The actual VPEP fund balance at June 30, 2012 of \$2,249.5 million is 103.4% of the actuarially determined “Best Estimate” Reserve amount of \$2,175.3 million. As indicated in the above table, this VPEP fund balance is estimated to have a 59% probability of being adequate to satisfy all Program obligations using current assumptions.



### Cash Flow Projection

The table in Appendix E shows a cash flow projection based on a set of deterministic assumptions that produce the same Present Value of Obligations for Future Payments as the “best estimate” actuarial assumptions used in the Monte Carlo simulations. The deterministic cash flow projection assumes that University and Community College tuition increase 7.5% per year, and Plan assets earn 6.52% each year. The starting Market Value of Invested Assets as of July 1, 2012 is \$2,004.7 million. At the end of the 2037 Fiscal Year all tuition obligations associated with contracts already purchased are expected to have been paid resulting in a final cumulative surplus of \$359.8 million. Since the actuarial assumptions are intended to represent “best estimates” of future expenses, there is a 50% chance that actual results will be better than this projection and a 50% chance that actual results will be worse.

### Variability of Results

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: future experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and increases or decreases expected as part of the natural operation of the methodology used for these measurements. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

### Data Reliance

In performing this analysis, we relied on data and other information (some oral and some in writing) provided by the staff of the Virginia College Savings Plan. This information includes, but is not limited to, contractual provisions, contract holder data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

### Actuarial Assumptions

All costs, liabilities, and other factors for VPEP have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Program and reasonable expectations). Further, the actuarial assumptions in the aggregate are reasonable and are related to the experience of the Program and to reasonable expectations. The following actuarial assumptions were set by the Virginia College Savings Plan:

- 1) the investment return assumption of 6.75% per year, and;
- 2) the tuition growth assumption for universities of 7.5% per year and the tuition growth assumption for community colleges of 7.5% per year.

### Certification

Based on the foregoing assumptions, the Virginia Prepaid Education Program has sufficient assets, including the value of future installment payments, to cover the actuarially estimated value of the tuition obligations under all contracts outstanding as of the valuation date (including any administrative costs associated with those contracts). This determination has been based on reasonable actuarial assumptions that represent the Virginia College Savings Plan's best estimate of anticipated experience under the Program taking into account past experience and future expectations.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

### Third Party Distribution

This report was prepared exclusively for the Virginia College Savings Plan for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning the Virginia College Savings Plan's operations, and uses the Virginia College Savings Plan's data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

### Qualifications

We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

The consultants who worked on this assignment are actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

We look forward to reviewing the results of our analyses with you at your earliest convenience.

Respectfully submitted,



Alan H. Perry, FSA, CFA  
Member American Academy of Actuaries



Richard L. Gordon, FSA, EA  
Member American Academy of Actuaries



Jill M. Stanulis, EA  
Member American Academy of Actuaries

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## Virginia Prepaid Education Program

### I. Statement of Assets as of June 30, 2012

<u>Investments</u>	<u>Market Value</u>
1) Equities	\$ 716,754,329
2) Fixed Income including Accrued Interest	1,154,561,180
3) REIT Fund and Real Estate	64,122,676
4) Cash & Cash Equivalents	57,477,229
5) Prepaid Expenses	11,273
6) Other Receivables	3,059,942
7) Accounts Receivable	8,115,060
8) Property, Plant & Equipment	3,572,058
9) Payables	(1,971,366)
10) Accrued Liabilities	(985,531)
11) Other Payables	<u>(29,682)</u>
Total Market Value of Investments	\$ 2,004,687,168
Present Value of Installment Contract Receivables	<u>244,795,653</u>
Value of Total Fund Assets	\$ 2,249,482,821

### II. Reconciliation of Investments

1) Investments at June 30, 2011	\$ 1,968,100,218
2) Adjustment to match Financial Statements	(1,091,350)
3) Contract Purchase Payments	131,349,899
4) Application Fees	319,446
5) Administrative Fee Revenue	35,172,454
6) Interest and Dividends	54,695,627
7) Realized and Unrealized Gains/(Losses)	(32,791,517)
8) Tuition Payments, Refunds and Rollovers	(129,059,433)
9) Administrative Expenses	(16,611,826)
10) Investment Management Fees	(5,039,724)
11) Net Transfers to the Commonwealth	<u>(356,626)</u>
12) Investments at June 30, 2012	\$ 2,004,687,168
Time-weighted rate of return	1.0%
Dollar-weighted rate of return	0.8%

### Appendix A

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Virginia Prepaid Education Program  
Participant Data as of June 30, 2012 – Number of Contracts\*  
 Virginia Prepaid Education Program

Participant Data as of June 30, 2012

Matriculation Year	Plan Type																								Total by Payout Year	Percent of Total
	Total Years of Community College Purchased												Total Years of University Purchased													
	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	0	0	0	0	0	0			
2000-2001	1	0	0	0	0	0	6	0	1	0	0	0	0	0	0	0	0	1	3	1	36	1	50	0.1%		
2001-2002	1	0	1	0	0	0	23	0	3	0	1	0	1	0	0	0	0	4	4	0	61	2	101	0.1%		
2002-2003	2	0	0	0	0	0	18	4	3	0	0	0	0	0	0	1	0	14	8	3	91	10	154	0.2%		
2003-2004	2	1	0	2	1	0	16	0	10	1	0	0	2	0	0	0	0	9	15	4	169	9	241	0.3%		
2004-2005	4	1	0	1	0	0	26	1	13	0	1	0	4	0	0	0	1	28	23	6	218	14	341	0.5%		
2005-2006	5	0	0	0	0	0	46	2	18	0	2	0	2	0	0	0	2	48	58	9	369	33	594	0.9%		
2006-2007	3	5	1	0	1	0	42	3	35	1	1	1	5	0	0	0	1	58	58	25	489	52	781	1.1%		
2007-2008	5	2	0	2	0	0	66	2	53	1	0	0	9	1	0	0	0	65	118	19	713	63	1119	1.6%		
2008-2009	4	6	3	3	0	0	59	11	76	2	0	0	5	2	0	0	3	107	142	50	1130	103	1706	2.4%		
2009-2010	5	12	0	5	0	0	98	3	128	3	0	1	11	2	0	0	1	162	250	84	2937	117	3819	5.5%		
2010-2011	30	9	5	9	1	0	134	5	144	5	0	1	14	2	0	1	3	261	348	121	2950	133	4176	6.0%		
2011-2012	25	14	9	6	0	0	170	9	162	1	2	0	20	2	1	0	3	356	526	127	3034	131	4598	6.6%		
2012-2013	53	21	9	12	2	0	190	8	140	3	0	1	34	1	1	1	1	577	629	138	3107	149	5077	7.3%		
2013-2014	44	18	11	17	2	0	163	6	161	2	1	1	21	1	2	1	0	2	506	649	144	3052	128	4932	7.1%	
2014-2015	60	13	8	19	1	1	176	16	164	3	0	0	32	0	0	0	1	636	611	167	3032	143	5083	7.3%		
2015-2016	45	15	6	6	0	0	171	21	139	1	0	0	18	2	0	1	0	3	585	668	123	2972	123	4899	7.0%	
2016-2017	53	11	6	8	0	1	137	17	153	0	3	0	13	1	0	0	0	2	556	564	153	2758	126	4562	6.5%	
2017-2018	45	21	3	6	0	0	121	10	137	5	1	0	18	1	0	0	0	1	534	506	143	2525	141	4218	6.0%	
2018-2019	31	11	3	6	0	0	95	7	135	3	0	0	15	3	0	1	0	1	469	485	105	2412	152	3934	5.6%	
2019-2020	34	21	3	8	1	1	83	8	127	3	0	0	18	1	0	0	0	2	409	461	108	2129	134	3551	5.1%	
2020-2021	40	10	3	4	2	0	80	9	100	3	0	0	11	2	0	0	0	0	336	370	90	1784	104	2948	4.2%	
2021-2022	40	10	0	4	2	0	80	5	90	1	0	1	11	3	0	1	0	4	373	386	98	1716	121	2946	4.2%	
2022-2023	36	5	3	4	1	0	75	5	66	4	0	0	3	3	1	0	0	0	346	348	68	1208	40	2216	3.2%	
2023-2024	34	4	2	6	2	0	56	7	63	3	2	0	7	0	0	0	2	302	257	65	1107	47	1966	2.8%		
2024-2025	31	2	2	4	0	1	38	5	50	0	0	1	5	1	0	0	0	1	232	240	48	838	57	1556	2.2%	
2025-2026	28	3	4	3	0	0	34	4	33	4	0	0	3	0	0	0	0	1	215	167	27	672	36	1234	1.8%	
2026-2027	11	2	1	3	1	0	34	6	23	0	0	0	9	0	0	0	0	1	184	152	16	507	13	963	1.4%	
2027-2028	18	4	1	1	1	0	31	0	21	1	1	1	5	0	1	0	0	0	181	146	30	441	30	914	1.3%	
2028-2029	16	2	2	1	0	0	23	1	9	0	0	0	1	0	0	0	0	0	133	94	11	317	8	618	0.9%	
2029-2030	10	0	0	1	0	0	25	0	8	0	0	0	2	0	0	0	0	0	80	56	6	226	8	422	0.6%	
2030-2031	5	0	1	0	0	0	3	2	5	0	1	1	1	0	0	0	0	0	21	20	2	62	4	128	0.2%	
<b>Total</b>	721	223	87	141	18	4	2319	177	2270	50	16	9	300	28	6	6	1	36	7788	8362	1991	43062	2232	69847		
<b>Percent of Total</b>	1.0%	0.3%	0.1%	0.2%	0.0%	0.0%	3.3%	0.3%	3.2%	0.1%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%	11.2%	12.0%	2.9%	61.7%	3.2%			

\* Table only includes contracts with at least one year of tuition remaining.

Virginia Prepaid Education Program

Participant Data as of June 30, 2012 – Remaining Years of Tuition

<u>Expected Payout Year</u>	<u>University Years</u>	<u>Community College Years</u>
2012-2013	18,217	1,225
2013-2014	17,256	971
2014-2015	16,865	860
2015-2016	16,463	883
2016-2017	15,117	830
2017-2018	14,639	792
2018-2019	13,993	722
2019-2020	12,913	652
2020-2021	11,741	596
2021-2022	10,764	547
2022-2023	9,368	485
2023-2024	8,048	421
2024-2025	6,798	354
2025-2026	5,491	296
2026-2027	4,449	249
2027-2028	3,607	211
2028-2029	2,858	169
2029-2030	2,189	131
2030-2031	1,547	93
2031-2032	962	54
2032-2033	521	33
2033-2034	212	17
2034-2035	71	8
2035-2036	24	3
2036-2037	<u>5</u>	<u>1</u>
Total	194,118	10,603

## Virginia Prepaid Education Program

### Summary of Actuarial Assumptions

#### Investment / Economic Assumptions for Simulation Model:

The standard deviation and correlation assumptions are based on actual historical returns and tuition growth. Expected return assumptions are based on Milliman's investment assumptions, but are adjusted so that the expected annualized return on the portfolio is 6.75%, which is the assumption set by the Board.

	<u>Inflation</u>	<u>Reasonable Rate</u>	<u>Global Equity</u>	<u>Non-Core Fixed Income</u>	<u>Core Fixed Income</u>	<u>Alternative Investments</u>	<u>University Tuition</u>	<u>CC Tuition</u>
Expected Arithmetic Mean Annual Return	2.50%	4.00%	9.50%	6.00%	4.35%	9.10%	7.58%	7.64%
Standard Deviation	2.00%	2.00%	17.70%	10.70%	4.55%	17.90%	4.70%	7.35%
Correlation:								
Inflation	1.00	0.54	0.23	0.02	0.13	0.23	0.15	-0.01
Reasonable Rate		1.00	0.26	0.17	0.35	0.01	-0.05	-0.46
Global Equity			1.00	0.58	0.09	0.61	0.05	-0.03
Non-Core Fixed Income				1.00	0.59	0.46	0.32	0.39
Core Fixed Income					1.00	-0.12	0.28	0.26
Alternative Investments						1.00	-0.08	-0.02
University Tuition							1.00	0.80
CC Tuition								1.00

Based on the economic assumptions above, the expected long-term annualized compound rate of return on investments is 6.75%. The expected long-term annualized compound rate of tuition growth is 7.5% per year for university and community college tuition. The Reasonable Rate for 2012-2013 was set equal to 0.04% for all simulations.

#### Matriculation and Bias:

It is assumed that 80% of beneficiaries will attend a public university in Virginia, 10% will attend a private university in Virginia and 10% will attend a university in another state. Weighted average tuition for four-year public universities in Virginia was adjusted with a 10.0% load to add a bias for matriculation at more expensive schools. The highest tuition for a public university in Virginia was assumed to be 50% higher than weighted average tuition. Out-of-state students are assumed to receive a benefit equal to the payments made on the contract plus interest at the composite reasonable rate of return.

## Virginia Prepaid Education Program

### Summary of Actuarial Assumptions (continued)

#### Combination Contracts:

For combination contracts (those with both university and community college tuition years), the community college value is assumed to be 30% of the university value (as determined by the Virginia College Savings Plan). For combination contracts not currently in payout, the community college years are assumed to be paid prior to the university years. For combination contracts currently in payout with university and community college years left, a portion of the remaining university and community college years are assumed to be paid each year. For combination contracts currently in payout with only university years or community college years remaining, the appropriate remaining years are assumed to be paid.

Utilization: It is assumed that participants will begin utilizing their contract at the following rates, and then redeem one year of tuition per year until the contract is depleted:

Years since Matriculation Year	Number of Years of Tuition Purchased							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
0	35%	60%	60%	85%	85%	100%	100%	100%
1	20%	10%	20%	7%	8%			
2	15%	15%	10%	5%	7%			
3	10%	5%	5%	3%				
4	10%	5%	5%					
5	5%	5%						
6	5%							



Virginia Prepaid Education Program

Summary of Actuarial Assumptions  
(continued)

Forfeiture: It is assumed that contracts will be forfeited prior to the year of matriculation at the following sample rates:

<u>Years Prior to Matriculation</u>	<u>Rate</u>
17	0.07%
14	0.03%
11	0.03%
8	0.02%
5	0.04%
2	0.10%

Expenses: The expenses included in the present value of future obligations are those relating to:

Annual Maintenance Expense per Contract = \$55.37

Annual Distribution Cost per Contract in Payment Status = \$13.84

These expenses are assumed to increase annually at the rate of inflation plus 0.5%.

## Virginia Prepaid Education Program

### Derivation of Enrollment-Weighted Average Tuition and Mandatory Fees at Four Year Universities

<u>University</u>	<u>Tuition and Fees 2012-2013</u>	<u>Matriculation/ Orientation Fees</u>	<u>In-State FTE Enrollment for Academic Year 2010-2011</u>	<u>Percent Distribution</u>
Christopher Newport	\$10,572	\$250	4,431	3.55%
George Mason	9,620	180	15,875	12.72%
James Madison	8,808	175	12,528	10.04%
Longwood	10,890	0	3,974	3.18%
Mary Washington	9,306	150	3,302	2.65%
Norfolk State	6,860	287	4,350	3.48%
Old Dominion	8,450	75	15,049	12.05%
Radford	8,590	275	7,423	5.95%
University of Virginia	12,014	210	10,228	8.19%
UVA - Wise	8,107	0	1,519	1.22%
Virginia Commonwealth	9,885	25	19,267	15.43%
Virginia Military Institute	13,835	0	1,113	0.89%
Virginia Tech	10,923	175	18,387	14.73%
Virginia State	7,420	0	3,498	2.80%
William and Mary	13,570	200	<u>3,894</u>	<u>3.12%</u>
<b>Weighted Average</b>	<b>\$9,816</b>	<b>\$142</b>	124,838	100.00%
<b>Matric/Orient Fees per Year</b>		\$40		
<b>Total Weighted Average Tuition And Fees</b>	<b>\$9,856</b>			

Matriculation/Orientation Fees per year are calculated assuming a mean university contract length of 3.5 years.

## Virginia Prepaid Education Program

### Derivation of Enrollment-Weighted Average Tuition and Mandatory Fees at Community Colleges

<u>School</u>	Fall Undergraduate		<u>Percent Distribution</u>
	<u>Tuition and Fees 2012-2013</u>	<u>Headcount for Academic Year 2010-2011</u>	
Blue Ridge	\$4,697	4,983	2.53%
Central Virginia	4,144	5,466	2.77%
Dabney S. Lancaster	4,064	1,521	0.77%
Danville	4,048	4,534	2.30%
Eastern Shore	4,048	1,052	0.53%
Germanna	4,264	7,582	3.85%
J Sargeant Reynolds	4,339	12,629	6.41%
John Tyler	4,037	10,518	5.34%
Lord Fairfax	4,095	7,005	3.56%
Mountain Empire	4,080	3,404	1.73%
New River	4,066	5,178	2.63%
Northern Virginia	4,808	48,996	24.87%
Patrick Henry	4,059	3,289	1.67%
Paul D Camp	4,053	1,656	0.84%
Piedmont Virginia	4,085	5,551	2.82%
Rappahannock	4,118	3,757	1.91%
Richard Bland	3,658	1,587	0.81%
Southside Virginia	4,064	6,353	3.22%
Southwest Virginia	4,032	3,755	1.91%
Thomas Nelson	4,035	11,086	5.63%
Tidewater	4,859	31,308	15.89%
Virginia Highlands	4,064	2,948	1.50%
Virginia Western	4,323	8,778	4.46%
Wytheville	4,064	<u>4,068</u>	<u>2.06%</u>
<b>Weighted Average Tuition and Fees</b>	<b>\$4,426</b>	197,004	100.00%

Appendix D  
(Page 2 of 3)

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## Virginia Prepaid Education Program

### History of Enrollment-Weighted Average Tuition and Mandatory Fees at Four Year Universities and Community Colleges in Virginia

<u>Academic Year</u>	<u>University Tuition and Fees</u>	<u>% Increase</u>	<u>Community College Tuition and Fees</u>	<u>% Increase</u>
1986-1987	\$2,080	10.3%		
1987-1988	2,240	7.7%		
1988-1989	2,377	6.1%	\$778	
1989-1990	2,544	7.0%	798	2.5%
1990-1991	2,702	6.2%	894	12.0%
1991-1992	2,985	10.5%	1,050	17.4%
1992-1993	3,357	12.5%	1,230	17.1%
1993-1994	3,659	9.0%	1,320	7.3%
1994-1995	3,789	3.6%	1,359	3.0%
1995-1996	3,949	4.2%	1,445	6.3%
1996-1997	4,002	1.3%	1,445	0.0%
1997-1998	4,095	2.3%	1,445	0.0%
1998-1999	4,217	3.0%	1,445	0.0%
1999-2000	3,721	(11.8%)	1,159	(19.8%)
2000-2001	3,793	1.9%	1,159	0.0%
2001-2002	3,843	1.3%	1,159	0.0%
2002-2003	4,122	7.3%	1,671	44.3%
2003-2004	5,033	22.1%	1,882	12.6%
2004-2005	5,559	10.5%	2,006	6.5%
2005-2006	5,990	7.8%	2,135	6.4%
2006-2007	6,529	9.0%	2,269	6.3%
2007-2008	6,966	6.7%	2,404	5.9%
2008-2009	7,562	8.6%	2,584	7.5%
2009-2010	7,912	4.6%	2,781	7.6%
2010-2011	8,803	11.3%	3,285	18.1%
2011-2012	9,507	8.0%	4,179*	27.2%*
2012-2013	9,856	3.7%	4,426	5.9%

\* Starting with the 2011-2012 year, Community College Tuition and Fees is measured as an enrollment-weighted average. Prior to that, a non-enrollment-weighted average was used.

#### Compounded Increase in Average Tuition

Over last 5 years:	7.2%	13.0%
Over last 10 years:	9.1%	10.2%
Over last 15 years:	6.0%	7.7%
Over last 20 years:	5.5%	6.6%
Over last 25 years:	6.1%	n/a

Appendix D  
(Page 3 of 3)

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## Virginia Prepaid Education Program

### Cash Flow Projection (amounts in millions)

<u>Fiscal Year</u>	<u>Beginning Balance</u>	<u>Installment Payments*</u>	<u>Tuition Benefits</u>	<u>Expenses</u>	<u>Investment Income</u>	<u>Ending Balance</u>
2013	\$2,004.7	\$56.7	\$192.5	\$4.1	\$123.0	\$1,987.8
2014	1,987.9	49.8	194.0	4.1	121.6	1,961.1
2015	1,961.1	42.3	203.2	3.9	119.4	1,915.7
2016	1,915.7	35.0	214.9	3.7	115.5	1,847.6
2017	1,847.6	27.3	213.5	3.1	110.8	1,769.1
2018	1,769.1	21.0	222.4	2.9	105.2	1,670.0
2019	1,670.0	18.1	228.4	2.7	98.3	1,555.3
2020	1,555.3	15.2	226.4	2.4	90.8	1,432.5
2021	1,432.5	12.7	221.7	2.1	83.0	1,304.4
2022	1,304.4	10.2	219.1	1.9	74.7	1,168.3
2023	1,168.3	8.1	206.3	1.6	66.4	1,034.9
2024	1,034.9	6.2	191.5	1.4	58.3	906.5
2025	906.5	4.6	175.1	1.1	50.7	785.6
2026	785.6	3.3	153.4	0.9	43.9	678.5
2027	678.5	2.2	134.3	0.7	37.7	583.4
2028	583.4	1.2	117.6	0.6	32.5	498.9
2029	498.9	0.7	100.4	0.4	27.6	426.4
2030	426.4	0.1	83.0	0.3	23.8	367.0
2031	367.0	0.0	62.9	0.2	20.8	324.7
2032	324.7	0.0	42.0	0.1	19.1	301.7
2033	301.7	0.0	24.7	0.1	18.6	295.5
2034	295.5	0.0	10.8	0.0	18.6	303.3
2035	303.3	0.0	4.0	0.0	19.6	318.9
2036	318.9	0.0	1.5	0.0	20.8	338.2
2037	338.2	0.0	0.3	0.0	21.9	359.8

\* Future installment payments for contracts as of June 30, 2012.

### Appendix E

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## Virginia Prepaid Education Program

### Prepaid Tuition Benefits

For beneficiaries attending a Virginia public college, university, or community college, VPEP will pay the full amount of in-state undergraduate tuition and all mandatory fees for a normal full-time course load for a general course of study on a semester-by-semester basis for the type of school and number of years purchased. VPEP payments to in-state public schools will not exceed the actual cost of the in-state undergraduate tuition and mandatory fees. The contract-holder has the option to transfer the total amount of all payments, accumulated at the reasonable rate of return, to the Virginia Education Savings Trust (VEST), and request a distribution from VEST to pay for qualified higher education expenses.

For beneficiaries attending a Virginia independent (private) college or university, VPEP will pay to the Virginia private school, including certain private career schools, the lesser of 1) the payments made on the contract plus the actual rate of return earned on the VPEP Trust or 2) the highest in-state undergraduate tuition and mandatory fees at a Virginia public school in the same academic year the benefits are used. All payments will be made directly to the school on a semester-by-semester basis following the school's add-drop period. The student or his or her family is responsible for any additional expenses not covered by VPEP. The contract-holder has the option to transfer the total amount of all payments, accumulated at the reasonable rate of return, to the Virginia Education Savings Trust, and request a distribution from VEST to pay for qualified higher education expenses.

For beneficiaries attending an out-of-state public or private college or university, VPEP will pay the lesser of 1) the payments made on the contract plus interest at the composite reasonable rate of return or 2) the average in-state undergraduate tuition and mandatory fees at Virginia public schools for the same academic year the benefits are used. All payments will be made directly to the school on a semester-by-semester basis. The student or his or her family is responsible for any additional expenses not covered by VPEP. The contract-holder has the option to transfer the total amount of all payments, accumulated at the reasonable rate of return, to the Virginia Education Savings Trust, and request a distribution from VEST to pay for qualified higher education expenses.

The reasonable rate of return tracks the quarterly performance of the Institutional Money Funds Index as reported in the Money Fund Monitor by iMoneyNet.

### Appendix F

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