

ACTUARIAL VALUATION
OF THE
NEVADA PREPAID TUITION PROGRAM

JUNE 30, 2008

By:

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Ladies and Gentlemen:

This report presents the results of the actuarial valuation of the Nevada Prepaid Tuition Program as of June 30, 2008.

Purpose

The main purposes of this report are:

- to calculate the actuarial present value of the obligations for prepaid tuition contracts purchased through June 30, 2008 and compare the value of those obligations with the assets in the Fund as of that date;
- to review the experience and changes in the actuarial assumptions and methods 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 Nevada Prepaid Tuition Program. We have relied on this data in preparing this report.

Certification

Based on the following, the Nevada Prepaid Tuition 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. This determination has been based on reasonable actuarial assumptions that represent the Program's best estimate of anticipated experience under the Prepaid Tuition Program

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taking into account past experience and future expectations. Since the results of the valuation are dependent on the actuarial assumptions used, actual results can be expected to deviate from the figures indicated in this report to the extent that future experience differs from those assumptions.

This report was prepared exclusively for the Nevada Prepaid Tuition Program for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning the Nevada Prepaid Tuition Program's operations, and uses the Nevada Prepaid Tuition Program'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.

Background

Chapter 353B of the Nevada Revised Statutes created the Nevada Prepaid Tuition Program to help families save for the cost of higher education. The Act created the Nevada Higher Education Tuition Trust Fund Board of Trustees (the "Board"). Section 353B.090 stated "The board shall develop a program for the prepayment of tuition at a guaranteed rate which is established based on the annual actuarial study required pursuant to NRS 353B.190 for undergraduate studies at a university or community college that is a member of the system."

This Act also created the Nevada Higher Education Tuition Trust Fund (the "Fund"), which consists of payments received pursuant to a prepaid tuition contract, a bequest, endowment or grant from the Federal Government or any other public or private source of money. All income derived from investments in the Fund and gains from a sale or exchange shall be credited to the Fund. Money in the Fund that is not expended during any biennium does not revert to the state general fund at any time.

The Nevada Prepaid Tuition Program offers four plan types; a University Plan providing 120 credit hours (8 semesters) of tuition at a state university, a University Plan providing 60 credit hours (4 semesters) of tuition at a state university, a Community College Plan providing 60 credit hours (4 semesters) of tuition at a state community college, and a Community College Plus University Plan providing 60 credit hours (4 semesters) of tuition at a state community college and 60 upper division level credit hours (4 semesters) of tuition at a state university.

Purchasers are allowed to pay for their contracts by choosing one of three payment options: 1) a single lump sum payment, 2) equal monthly payments until the beneficiary reaches college age, or 3) a five year plan of 60 equal monthly payments.

The purpose of this actuarial valuation is to estimate the obligations of the Prepaid Tuition Program for all future payments associated with Prepaid Contracts purchased as of the valuation date. The value of those obligations is then compared with the Fund Balance to determine the current financial position of the Prepaid Tuition Program.

Statutory Requirements

Section 353B.160(10) states that “if the annual actuarial study performed pursuant to NRS 353B.190 reveals that there is insufficient money to ensure the actuarial soundness of the trust fund, the board shall modify the terms of subsequent prepaid tuition contracts.”

“Actuarially sound” 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 Programs. For purposes of this report, we have assumed that the phrase “actuarially sound” when applied to the Fund, 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 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 represent "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. This methodology is described in the section below, Variability of Results and Valuation Basis.

Investment Policy

The Investment Policy for the Prepaid Tuition Program is determined by the Board and implemented by the State Treasurer. The Investment Policy is important because it sets forth acceptable investment allocations among asset classes. The asset allocation affects the magnitude and variability of investment returns realized and therefore the financial structure of the plan.

For the Valuation, we have assumed that Program investments will be allocated as follows:

U.S. Large Cap Equity	33%
U.S. Mid-Cap Equity	11%
U.S. Small Cap Equity	11%
U.S. Fixed Income	45%

Actuarial Assumptions

The actuarial assumptions used to prepare this report are summarized in Appendix C. The two most significant of those assumptions are the rate of investment returns and tuition growth in the future. The Nevada Prepaid Tuition Program Board selected both of these assumptions. They are:

- the investment return assumption of 7.50% per year (this is the same as the investment return assumption used to prepare the prior year's report); and,
- the tuition growth assumptions are summarized in the table below.

	<u>Universities</u>	<u>Community Colleges</u>
Fall 2009	5.02%	4.80%
Fall 2010	4.96%	5.00%
Fall 2011 and later	6.00%	4.00%

We believe that the Board's 7.50% investment return assumption is somewhat optimistic, but well within what we consider a "reasonable range."

Summary of Results

The actuarial value of the obligations of the Prepaid Tuition Program as of June 30, 2008 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 Fund Assets*</u>	<u>Stabilization Reserve/(Deficit)</u>
<u>Prepaid Tuition Program:</u>			
Tuition Obligations	\$118,031,000	n/a	n/a
Administrative Expenses	<u>637,000</u>	<u>n/a</u>	<u>n/a</u>
Grand Total	\$118,667,000	\$119,447,456	\$780,456

* Total Fund Assets is the sum of the market value of program investments and the present value of installment contract receivables.

The present value of future obligations for Administrative Expenses reflects the expected costs of administering existing contracts 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.

As indicated above, the Fund has assets that exceed the best estimate of the obligations by roughly \$0.8 million or 0.7% of obligations. Unfavorable future experience would adversely affect this position. It would be desirable to increase the stabilization reserve over time to provide a cushion against the risk of adverse deviations in tuition and/or investment growth experience.

Actuarial Gain/Loss Analysis

During the 2008 fiscal year, the stabilization reserve/(deficit) position of the Program decreased from a stabilization reserve of \$8,618,975 to a stabilization reserve of \$780,456, which is 0.7% of obligations. The decrease is mostly attributable to an investment loss. Each of the factors affecting the stabilization reserve is discussed below.

The stabilization reserve was expected to grow during the year by \$661,420 due to the passage of time (the obligation is calculated as a present value which grows with interest each year).

During the 2008 fiscal year there were 232 enrollments. Each contract sold contributes to the stabilization reserve. We estimate that \$925,487 of stabilization reserve was generated by the new contracts. In the development of the 2008 fiscal year contract prices, the Program assumed that 500 new contracts would be sold. Since only 232 were actually sold, the Program received less revenue to cover expenses than anticipated. This reduced the stabilization reserve by \$164,257.

In the development of the 2008 fiscal year prices for new contracts, a \$453,113 budget was assumed. Actual administrative expenses paid out of the Trust were approximately \$416,859, resulting in a \$36,254 gain to the stabilization reserve.

The rate of return on Fund investments was approximately -4.5% on a dollar-weighted basis and -4.3% on a time-weighted basis. In the previous valuation, a 7.5% return was assumed. The investment loss decreased the stabilization reserve by \$12,719,777.

The tuition increases for fall 2010 and fall 2011 were set by the Nevada System of Higher Education. Increases for university tuition are about 1% lower than had been assumed last year while increases for community college are about 1% higher than had been assumed. In addition, the risk (volatility and correlation) assumptions for the economic model were updated. These changes increased the stabilization reserve by approximately \$2.2 million.

In summary, the stabilization reserve/(deficit) changes due to experience and assumption changes can be summarized as follows:

Stabilization Reserve / (Deficit) as of June 30, 2007	\$8,818,928
Interest on the reserve at 7.5% due to the passage of time	661,420
Addition to stabilization reserve from new contracts	925,487
Fewer new contracts sold than expected	(164,257)
Operating expense savings	36,254
Investment loss	(12,719,777)
Change in tuition and risk assumptions	2,220,000
Other	<u>1,002,401</u>
Stabilization Reserve / (Deficit) as of June 30, 2008	\$780,456

Variability of Results and Valuation Basis

The present values of the obligations shown above were based on assumptions that represent an estimate of anticipated experience under the Prepaid Tuition Program 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. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

A prime source of variation will be normal fluctuations that occur in the rate of increase in tuition, investment returns, inflation, etc. 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 and investment returns. Each of these scenarios is based on statistical factors such as standard deviation and correlation that were established by reviewing historical results and then adjusting where appropriate to reflect current conditions.

For each scenario, we determined whether the Fund would run out of money before all tuition and expense obligations were paid. By tabulating the results under all of these projections we estimated the probability of having the assets of the Prepaid Tuition Program exceed its obligations. Note that for this analysis, a scenario where the Fund comes up as little as one dollar short is considered a scenario where Fund assets do not exceed obligations. Also note that we have assumed there are no additional contracts sold and no changes are made to the asset mix throughout the projection period. We have also assumed that all future installment payments will be made.

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. They do not necessarily represent the “true” probability of future events, which, of course, are unknown. The assumptions are presented in detail in Appendix C.

(Amounts in Millions)

<u>Percentage of “Best Estimate” Reserve</u>	<u>Total Fund Value at June 30, 2008</u>	<u>Probability of Funds Exceeding Obligation</u>
80%	\$94.9	13%
90%	106.8	32%
100%	118.7	50%
101%	119.4	51% *
110%	130.5	66%
120%	142.4	79%
130%	154.3	88%
140%	166.1	93%
150%	178.0	96%

***Actual Fund Position**

The “Best Estimate” Reserve of \$118.7 million represents the level of assets necessary as of June 30, 2008 to achieve a 50% probability of sufficiency. This includes the present value of Installment Contract Receivables. The actual Fund balance at June 30, 2008 of \$119.4 million is approximately 101% of the actuarially determined “Best Estimate” Reserve. As indicated in the above table, this Fund balance is estimated to have a 51% probability of being adequate to satisfy all Program obligations. We believe the 51% figure should be viewed as a risk index. To date the Program has a goal to gradually build a Stabilization Reserve to help absorb the risk of adverse deviations in investment and tuition growth experience. As the Stabilization Reserve grows relative to the Program obligations, we would expect to see this risk index measure improve. We included in the table the probability of sufficiency associated with other funding levels to illustrate the sensitivity of this measure to the level of funding.

Data Reliance

In performing this analysis, we relied on data and other information provided by the Nevada Prepaid Tuition Program. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Cash Flow Projection

Appendix E shows a deterministic cash flow projection based on the actuarial assumptions. The starting Market Value of Investments as of July 1, 2008 is \$101.7 million. At the end of the 2029 Fiscal Year all tuition obligations associated with units already purchased are expected to have been paid, resulting in a residual stabilization reserve of \$8.4 million. Since the actuarial assumptions are intended to represent "best estimates" of future expenses, there is a 50% probability that results will be less favorable than indicated and a 50% probability that results will be more favorable.

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.

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

Respectfully submitted,

MILLIMAN, INC.



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



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Attachments

Nevada Prepaid Tuition Program

I. Statement of Assets as of June 30, 2008

<u>Investments</u>	<u>Market Value</u>
1) Equity	\$51,652,829
2) Fixed Income	48,187,179
3) Cash and Cash Equivalents	<u>1,839,959</u>
Total Market Value of Investments	\$101,679,967
Present Value of Installment Contract Receivables	<u>17,767,489</u>
Value of Total Fund Assets	\$119,447,456

II. Reconciliation of Investments

1) Investments at June 30, 2007	\$104,874,330
2) Contract Purchase Payments	6,499,062
3) Interest, Dividends, and Realized Gains and Losses	19,294,339
4) Net Unrealized Gains and Losses	(23,750,185)
5) Tuition Benefits Paid	(3,113,156)
6) Refunds Paid	(1,386,403)
7) Operating Expenses	(416,859)
8) Investment Management Fees	<u>(321,161)</u>
9) Investments at June 30, 2008	\$101,679,967
Dollar-weighted rate of return	-4.5%
Time-weighted rate of return	-4.3%

Appendix A

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Nevada Prepaid Tuition Program
Participant Data as of June 30, 2008

Number of Contracts by Plan Type

Matriculation Year	University Plan (4 yrs)	Community College Plus University Plan	Community College Plan	University Plan (2 yrs)	Total
2002	21	6	1		28
2003	56	14	4		74
2004	168	28	8	3	207
2005	276	32	15	4	327
2006	325	48	24	13	410
2007	396	65	15	14	490
2008	411	62	31	20	524
2009	492	67	24	25	608
2010	539	69	21	24	653
2011	533	68	27	21	649
2012	554	68	33	20	675
2013	584	56	24	21	685
2014	516	59	21	29	625
2015	534	49	34	21	638
2016	575	55	21	25	676
2017	496	51	26	18	591
2018	500	42	21	17	580
2019	417	29	10	12	468
2020	214	32	14	14	274
2021	236	25	18	13	292
2022	205	19	11	8	243
2023	140	18	8	4	170
2024	105	15	3	4	127
2025	<u>66</u>	<u>6</u>	<u>2</u>	<u>2</u>	<u>76</u>
Total	8,359	983	416	332	10,090

Estimated number of years of university tuition in force 34,002

Estimated number of years of community college tuition in force 2,527

Appendix B

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Nevada Prepaid Tuition Program

Summary of Actuarial Assumptions

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 7.50%, which is the assumption set by the Board.

	General Price Inflation	U.S. Large Cap Equity	U.S. Mid Cap Equity	U.S. Small Cap Equity	U.S. Fixed Income	Nevada University Tuition*	Nevada Community College Tuition*
Expected Arithmetic Annual Return	2.50%	10.00%	11.00%	11.00%	5.30%	6.10%	4.10%
Standard Deviation	3.00	17.20	19.40	22.25	7.45	4.70	4.95
Correlation with:							
Inflation	1.00	-0.19	-0.08	-0.01	-0.27	0.04	-0.03
Large Cap		1.00	0.88	0.80	0.45	0.12	0.47
Mid Cap			1.00	0.96	0.49	0.22	0.54
Small Cap				1.00	0.39	0.30	0.64
Fixed Income					1.00	0.09	0.35
University Tuition						1.00	0.68
Community College Tuition							1.00

*University tuition is increased 5.02% in 2009 and 4.96% in 2010 and Community College tuition is increased 4.80% in 2009 and 5.00% in 2010.

Equivalent Deterministic Economic Assumptions:

The assumptions shown below, used deterministically, would produce the same "best estimate" obligation developed by the Simulation Model assumptions shown above and used in the valuation.

Consumer Price Index (CPI) Inflation Rate	2.50%, per annum
Investment Returns	7.35%, per annum
University Tuition Growth: Fall 2009	5.02%, per annum
University Tuition Growth: Fall 2010	4.96%, per annum
University Tuition Growth: Thereafter	6.00%, per annum
Community College Tuition Growth: Fall 2009	4.80%, per annum
Community College Tuition Growth: Fall 2010	5.00%, per annum
Community College Tuition Growth: Thereafter	4.00%, per annum

Appendix C
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Nevada Prepaid Tuition Program

Summary of Actuarial Assumptions
(continued)

Percentage of Contracts Requesting a Refund or Rollover Each Year:

<u>Years Since Enrollment</u>	<u>Extended Payment Contract</u>	<u>60-Payment Contract</u>	<u>Lump Sum Contract</u>
1 - 3	5.00%	3.00%	0.50%
4	3.50%	1.25%	0.50%
5	2.00%	1.20%	0.50%
6 or higher	0.50%	0.50%	0.50%

Expenses:

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

Annual Maintenance Expense per Contract = \$6.27

Annual Distribution Cost per Contract in Payment Status = \$10.44

A monthly processing expense of \$1.50 has been netted out in calculating the present value of Installment Contract receivables.

Expenses are assumed to increase at a rate equal to CPI + .5%.

Appendix C
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Nevada Prepaid Tuition Program

Recent History of Per Credit Hour Tuition in Nevada

<u>Academic Year</u>	<u>Average Community College Tuition</u>	<u>Percent Increase</u>	<u>University Tuition</u>	<u>Percent Increase</u>
1982-1983	\$17.00		\$31.00	
1983-1984	20.92	23.0%	36.00	16.1%
1984-1985	20.88	-0.2	36.00	0.0
1985-1986	20.88	0.0	36.00	0.0
1986-1987	20.89	0.0	36.00	0.0
1987-1988	21.36	2.3	36.00	0.0
1988-1989	21.35	-0.1	40.00	11.1
1989-1990	21.34	0.0	40.00	0.0
1990-1991	24.00	12.4	46.00	15.0
1991-1992	26.00	8.3	49.00	6.5
1992-1993	28.00	7.7	55.50	13.3
1993-1994	29.50	5.4	55.50	0.0
1994-1995	30.50	3.4	58.00	4.5
1995-1996	33.50	9.8	61.00	5.2
1996-1997	36.50	9.0	64.00	4.9
1997-1998	38.00	4.1	66.50	3.9
1998-1999	39.50	3.9	69.00	3.8
1999-2000	41.00	3.8	71.50	3.6
2000-2001	42.50	3.7	74.00	3.5
2001-2002	44.00	3.5	76.50	3.4
2002-2003	44.50	1.1	79.00	3.3
2003-2004	47.25	6.2	85.00	7.6
2004-2005	49.00	3.7	91.00	7.1
2005-2006	50.75	3.6	98.00	7.7
2006-2007	52.50	3.5	105.25	7.4
2007-2008	54.75	4.3	116.75	10.9
2008-2009	57.25	4.6	129.50	10.9

Annualized Increase in Tuition

Over last 5 years:	3.9%	8.8%
Over last 10 years:	3.8	6.5
Over last 20 years:	5.1	6.0
Over last 26 years:	4.8	5.7

Appendix D

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Nevada Prepaid Tuition Program

Deterministic Cash Flow Projection

(\$Millions)

<u>Fiscal Year</u>	<u>Beginning Balance</u>	<u>Monthly Payments</u>	<u>Tuition Benefits</u>	<u>Contract Expenses</u>	<u>Investment Income</u>	<u>Ending Balance</u>
2009	\$101.7	\$4.5	\$7.4	\$0.078	\$7.4	\$106.1
2010	106.1	3.8	9.1	0.082	7.6	108.3
2011	108.3	3.1	10.6	0.085	7.6	108.3
2012	108.3	2.4	11.7	0.086	7.6	106.5
2013	106.5	1.8	11.6	0.074	7.5	104.1
2014	104.1	1.5	12.5	0.072	7.1	100.1
2015	100.1	1.3	13.0	0.069	6.8	95.1
2016	95.1	1.1	13.7	0.066	6.5	88.9
2017	88.9	0.9	14.4	0.063	6.0	81.3
2018	81.3	0.8	14.5	0.058	5.3	72.8
2019	72.8	0.6	15.0	0.054	4.6	62.9
2020	62.9	0.5	14.9	0.049	3.9	52.4
2021	52.4	0.4	12.9	0.041	3.2	43.1
2022	43.1	0.3	11.4	0.034	2.5	34.5
2023	34.5	0.2	9.4	0.027	2.1	27.4
2024	27.4	0.1	7.3	0.019	1.6	21.8
2025	21.8	0.0	6.5	0.016	1.2	16.5
2026	16.5	0.0	5.1	0.011	1.0	12.4
2027	12.4	0.0	3.3	0.007	0.7	9.8
2028	9.8	0.0	1.9	0.004	0.7	8.6
2029	8.6	0.0	0.7	0.001	0.5	8.4

Appendix E

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