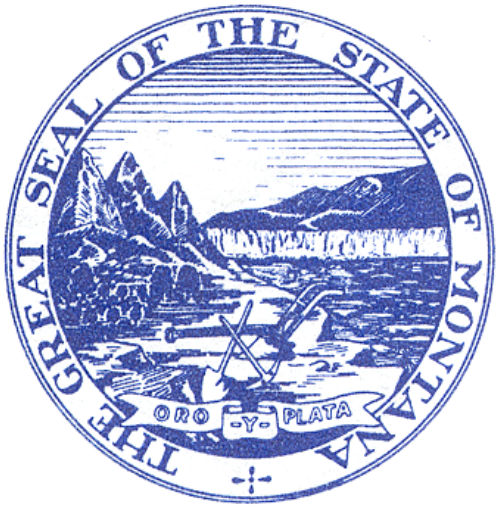
Teachers' Retirement System
State of Montana

ACTUARIAL VALUATION
(As of July 1, 2004)



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November 3, 2004

Teachers' Retirement Board
State of Montana
1500 Sixth Avenue
Helena, MT 59620-0139

Dear Members of the Board:

As requested, we have made an actuarial valuation of the Teachers' Retirement System of the State of Montana. The major findings of the valuation are contained in this report. They are summarized in Section 1. This report reflects the benefit provisions and contribution rates in effect as of July 1, 2004.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. It should be noted that if any data or other information is inaccurate or incomplete, our calculations might need to be revised.

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 which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

We further certify that all costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the System. Nevertheless, the emerging costs will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions. The Board of Trustees has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix A.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. Actuarial computations under GASB Statements No. 25 and 27 are for purposes of fulfilling financial accounting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals, and of GASB Statements No. 25 and 27. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. Any distribution of this report must be in its entirety including this cover letter, unless prior written consent from Milliman is obtained.

We would like to express our appreciation to Mr. David L. Senn, Executive Director of the System, and to members of his staff, who gave substantial assistance in supplying the data on which this report is based.

We, Mark C. Olleman and Karen I. Steffen, are members of the American Academy of Actuaries and Fellows of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

We respectfully submit the following report, and we look forward to discussing it with you.

Respectfully submitted,

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MCO/KIS/nlo

Teachers' Retirement System
State of Montana

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Section 1

Summary of Findings

As a result of the actuarial valuation of the benefits in effect under the Montana Teachers' Retirement System as of July 1, 2004, we recommend that the current employer contribution rate, 7.58% of members' salaries, be increased. The System does not currently meet the requirements of actuarial soundness because the contributions do not amortize the Unfunded Actuarial Accrued Liability over a reasonable period. The 7.58% employer contribution is composed of 7.47% from participating employers and 0.11% from the State General Fund. MCA 19-20-604 states that the employer contribution rate will be reduced by 0.11% when the amortization period of the System's unfunded actuarial accrued liability is 10 years or less according to the System's latest actuarial valuation.

An increase in the employer contribution rate of 2.87% (7.58% to 10.45%) as of July 1, 2005 is projected to maintain an amortization of the unfunded actuarial accrued liability over the 30 years beginning July 1, 2004. A 30-year amortization period is the maximum acceptable amortization period specified in Statements No. 25 and 27 of the Governmental Accounting Standards Board (GASB). It is also the trigger in the Retirement Board's funding policy for recommending to the legislature that funding be increased. The contribution increase could also be phased in over a number of years, or lessened by lowering the value of benefits provided for future members. Note that in a "contract rights" state such as Montana it is unlikely that any decrease in the value of future benefits could be made for current members.

The actuarial costs are calculated using the entry age actuarial cost method. This is the method used by most public plans. It is designed to provide a stable contribution rate as a percent of member pay. This actuarial valuation measures the adequacy of the contribution rates set in Montana State Law.

Experience

The 2004 actuarial valuation indicates that an actuarial loss occurred during the preceding two fiscal years. The loss is primarily due to lower returns on the assets than expected by the actuarial assumptions, and is reflected in the 1.6% and 2.1% net investment return on an actuarial basis for the past two years. The following chart compares the annual returns for the past four years.

Year	Market Return	Actuarial Return	Actuarial Return over 8.0% Assumption
7/1/2000 to 6/30/2001	(5.1)%	9.2%	1.2%
7/1/2001 to 6/30/2002	(7.3)%	3.8%	(4.2)%
7/1/2002 to 6/30/2003	6.2%	1.6%	(6.4)%
7/1/2003 to 6/30/2004	13.3%	2.1%	(5.9)%

Asset gains or losses result when the return on the actuarial value of assets differs from the actuarial investment return assumption of 8.0% (7.75% starting at July 1, 2004). The actuarial return on assets has under performed the assumption by about 12% (6.4% + 5.9%) in the last two years as shown in the last column of the chart. The asset loss in the last two years increased the unfunded actuarial accrued liability (UAAL) by about $302 million. Without the asset losses, the UAAL would be closer to $571 million instead of the $873 million shown in Table 8.

The root of these losses is the low market returns of (5.1)% and (7.3)% in the years ending 6/30/2001 and 6/30/2002. The asset valuation method spreads any market value gains or losses evenly over the five years after they occur. Therefore the first fifth of the loss for the year ending 6/30/2002 was recognized at 6/30/2002 and the last fifth will be recognized at 6/30/2006. At July 1, 2002 the System had $443 million in unrecognized asset losses. At July 1, 2004 the System has $131 million in unrecognized asset losses. This $131 million in unrecognized asset losses, if not offset by future gains, will cause the contributions needed to amortize the UAAL in future valuations to increase even further. Therefore, to stay financially sound in the future, the System will need either (1) future gains such as asset returns well over the new 7.75% assumption, or (2) an increase in contribution rates.

Assumption Changes

Effective July 1, 2004, the valuation incorporates the revised economic assumptions adopted by the Retirement Board at their May 14, 2004 meeting. The net investment return assumption was reduced from 8.00% to 7.75%, the general wage growth assumption was reduced from 5.00% to 4.50%, and the underlying inflation assumption was reduced from 4.00% to 3.50%. See Appendix A for a summary of assumptions including those changed for this 2004 valuation.

Benefit Changes

Their were no benefit improvements passed in the 2003 legislative session that influenced this valuation.

Contribution Changes

There have been no contribution changes since the July 1, 2000 actuarial valuation.

Impact of Changes

As stated earlier, an increase in the employer contribution rate of 2.87% (7.58% to 10.45%) as of July 1, 2005 is projected to maintain an amortization of the unfunded actuarial accrued liability over the 30 years beginning July 1, 2004. The effect of the asset losses and other experience on the employer contribution required to maintain a 30 year amortization period can be distributed approximately as follows.

Employer Contribution Rate to Maintain a 30 Year Amortization Period

July 1, 2002 Valuation 23.4 Year Contribution Rate		7.58%
If Amortized over 30 Years	–	0.67
Effect of Changes in Benefits and Contribution Rates	+	0.00
Effect of Changes in Actuarial Assumptions	+	0.67
July 1, 2002 Valuation 30 Year Contribution Rate Using New Economic Assumptions		7.58%
Effect of Experience Gains and Losses on Actuarial Accrued Liability:		
Expected Decrease from Extending the Amortization Period 2 years (July 1, 2032 to July 1, 2034)	-	0.19%
Retired Mortality (Gain)	-	0.01
Salary Gain / Loss		0.00
Loss from Other Causes	+	0.09
		- 0.11%
Effect of Experience Loss on Actuarial Assets		2.98%
July 1, 2004 Valuation 30-Year Contribution Rate		+10.45%

Teachers' Retirement System
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Section 2

Scope of the Report

This report presents the actuarial valuation of the Montana Teachers' Retirement System as of July 1, 2004.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets of the System. Sections 4 and 5 describe how the obligations of the System are to be met under the actuarial cost method in use.

The actuarial procedures and assumptions used in this valuation are described in Appendix A. The current benefit structure, as determined by the provisions of the governing law on July 1, 2004, is summarized in Appendix B. Schedules of valuation data classifying the data used in the valuation by various categories of contributing members, former contributing members, and beneficiaries make up Appendix C. Appendix D provides a brief summary of the System's recent experience. Comparative statistics are presented on the System's membership and contribution rates. Appendix E is a glossary of actuarial terms used in this report.

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Section 3

Assets

In many respects, an actuarial valuation can be regarded as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is July 1, 2004. On that date, the assets available for the payment of benefits are appraised. These assets are compared with the actuarial liabilities. The actuarial process thus leads to a method of determining what contributions by members and their employers are needed to strike a balance.

The asset valuation method being used is a five-year smoothing method. The expected return is determined each year based on the beginning of year market value and actual cash flows during the year. Any difference between the expected market value return and the actual market value return is recognized evenly over a period of five years.

Table 1 lists the assets held and their market value for the past two years. Table 2 summarizes the fund's activity during the past two years. Table 3 summarizes the determination of the actuarial value of assets. Table 4 shows when asset gains or losses will be recognized in the actuarial value of assets. Table 5 summarizes historical asset returns since July 1, 1994 including the amount recognized by the actuarial asset valuation method which was greater or lesser than the actuarial investment return assumption.

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Table 1

Statement of Fiduciary Net Assets
June 30, 2004 and June 30, 2003

	2004	2003
ASSETS		
Cash/Cash Equivalents-Short Term		
Investment Pool	$ 78,154,124	$ 67,248,556
Receivables:		
Accounts Receivable	14,337,374	15,568,694
Interest Receivable	8,055,656	8,927,249
Due from Primary Government	80,195	84,300
Total Receivables	$ 22,473,225	$ 24,580,243
Investments, at fair value:		
Mortgages	$ 54,989,718	$ 90,823,459
Investment Pools	2,189,335,826	1,926,576,113
Other Investments	9,708,721	11,326,655
Securities Lending Collateral	108,506,737	70,099,111
Total Investments	$ 2,362,541,002	$2,098,825,338
Assets Used in Plan Operations:		
Land and Buildings	$ 193,844	$ 193,844
Less: Accumulated Depreciation	(128,591)	(124,827)
Equipment	147,087	147,087
Less: Accumulated Depreciation	(126,281)	(121,066)
Prepaid Expense	3,517	2,992
Intangible Assets, net of amortization	776,505	3,320,631
Total Other Assets	$ 866,081	$ 3,418,661
TOTAL ASSETS	$2,464,034,432	$2,194,072,798
LIABILITIES		
Accounts Payable	$ 247,108	$ 212,760
Due to Primary Government	327,761	22,562
Securities Lending Liability	108,506,737	70,099,111
Compensated Absences	108,627	104,105
TOTAL LIABILITIES	$ 109,190,233	$ 70,438,538
NET ASSETS HELD IN TRUST FOR PENSION BENEFITS	$2,354,844,199	$2,123,634,260

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Table 2

Statement of Changes in Fiduciary Net Assets
Fiscal Year Ended June 30, 2004 and 2003

	2004	2003
ADDITIONS		
Contributions:		
Employer	$ 55,773,716	$ 53,276,950
Plan Member	51,382,941	50,221,491
Other	770,379	753,838
Total Contributions	$ 107,927,036	$ 104,252,279
Misc Income	$ 0	$ 4,011
Workers Comp. Dividend	199	213
Taxes	53	236
Investment Income:		
Net Appreciation in Fair Value of Investments	$ 152,473,601	$ 30,665,509
Investment Earnings	132,052,991	98,020,849
Security Lending Income	1,153,276	1,268,968
Investment Income	$ 285,679,868	$ 129,955,326
Less: Investment Expense	2,948,793	2,683,417
Less: Security Lending Expense	938,082	1,025,993
Net Investment Income	$ 281,792,993	$ 126,245,916
Total Additions	$ 389,720,281	$ 230,502,655
DEDUCTIONS		
Benefit Payments	$ 150,270,797	$ 140,229,496
Withdrawals	5,843,069	6,468,324
Administrative Expense	1,506,694	1,860,967
Loss on Intangible Asset	889,782	0
Total Deductions	$ 158,510,342	$ 148,558,787
NET INCREASE (DECREASE) IN FIDUCIARY NET ASSETS	$ 231,209,939	$ 81,943,868
NET ASSETS HELD IN TRUST FOR PENSION BENEFITS BEGINNING OF YEAR	2,123,634,260	2,041,691,136
Prior Period Adjustment		(744)
END OF YEAR	$2,354,844,199	$2,123,634,260

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Table 3

Determination of Actuarial Value of Assets
July 1, 2004

Determination of Recognized Investment Gains and Losses - Five-Year Smoothing

A. Expected investment return – Year Ended 6/30/2004		$ 167,963,268
B. Actual investment return – Year Ended 6/30/2004		$ 279,396,768
C. Gains/(losses) – 2004 [B – A]		$ 111,433,500
D. Gains/(losses) – 2003		$ (37,239,499)
E. Gains/(losses) – 2002		$ (338,875,181)
F. Gains/(losses) – 2001		$ (310,524,198)
G. Gains/(losses) – 2000		$ (3,684,142)
H. Gains/(losses) recognized at July 1, 2004* [1/5 C + 1/5 D + 1/5 E + 1/5 F + 1/5 G]		$ (115,777,904)

Determination of Actuarial Assets

Actuarial value of assets July 1, 2003		$ 2,481,697,476
Contributions less benefits	$ (48,186,830)	
Expected investment return	167,963,268	
Recognized investment gains/(losses)	(115,777,904)	3,998,534
Actuarial value of assets July 1, 2004		**2,485,696,010**
Unrecognized Loss		(130,851,811)
Market Value of Assets July 1, 2004 (Actuarial Value + Unrecognized Gain)		$ 2,354,844,199

Note: The actuarial value of assets is equal to the expected value plus a five-year smoothing of market value gains and losses. The actuarial asset method was adopted for the July 1, 2000 actuarial valuation with actuarial value of assets set equal to market value of assets at July 1, 1996.

**Includes $0 rounding adjustment.*

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Table 4

Schedule of Investment Gain/(Loss) Recognition

Year Ending 06/30	Market Value Investment Gain/(Loss) Over Expected	Investment Gain/(Loss) Recognized in Past Years				Investment Gain/(Loss) Recognized in Current Year	Investment Gain/(Loss) to be Recognized in Future Years			
		2000	2001	2002	2003	2004	2005	2006	2007	2008
1997	$166.1	$33.2	$33.2							
1998	$147.9	$29.6	$29.6	$29.6						
1999	$78.9	$15.8	$15.8	$15.8	$15.8					
2000	($3.7)	($0.7)	($0.7)	($0.7)	($0.7)	($0.7)				
2001	($310.5)		($62.1)	($62.1)	($62.1)	($62.1)	($62.1)			
2002	($338.9)			($67.8)	($67.8)	($67.8)	($67.8)	($67.8)		
2003	($37.2)				($7.4)	($7.4)	($7.4)	($7.4)	($7.4)	
2004	$111.4					$22.3	$22.3	$22.3	$22.3	$22.3
2005	$0.0						$0.0	$0.0	$0.0	$0.0
2006	$0.0							$0.0	$0.0	$0.0
2007	$0.0								$0.0	$0.0
2008	$0.0									$0.0

Total Gain/(Loss) Recognized at Each Valuation Date								
Recognized				Scheduled to be Recognized*				
$77.8	$15.7	($85.3)	($122.3)	($115.8)	($115.0)	($52.9)	$14.8	$22.3

Unrecognized Gain/(Loss) Remaining				
($130.9)	($15.8)	$37.1	$22.3	$0.0

** The total gain/(loss) actually recognized in each future year will include additional amortizations of future gains and/or losses.*

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Table 5

Historical Investment Returns*

Fiscal Year Ending	Market Returns	Actuarial Return	Actuarial Return Over 8.0% Assumption
June 30, 1995	15.7%	8.9%	0.9%
June 30, 1996	12.4	10.4	2.4
June 30, 1997	19.4	14.9	6.9
June 30, 1998	16.6	16.0	8.0
June 30, 1999	11.9	12.3	4.3
June 30, 2000	7.8	12.8	4.8
June 30, 2001	(5.1)	9.2	1.2
June 30, 2002	(7.3)	3.8	(4.2)
June 30, 2003	6.2	1.6	(6.4)
June 30, 2004	13.3	2.1	(5.9)

** Returns reflect all investment returns, including investment income and realized and unrealized investment gains and losses, and are net of investment expenses and administrative expenses paid by the System.*

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Section 4

Actuarial Present Value of Future Benefits

In the previous section, an actuarial valuation was related to an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, July 1, 2004. In this section, the discussion will focus on the commitments of the System, which will be referred to as its actuarial liabilities.

Table 6 contains an analysis of the actuarial present value of all future benefits for contributing members, for former contributing members, and for beneficiaries. The analysis is given by type of benefit.

The actuarial liabilities summarized in Table 6 include the actuarial present value of all future benefits expected to be paid with respect to each member covered as of the valuation date. For an active member, this value includes a measure of both benefits already earned and future benefits to be earned. Thus, for all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of their surviving beneficiaries.

The actuarial valuation does not recognize liabilities for employees who become members and participate in the System after the valuation date.

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Table 6

Actuarial Present Value of Future Benefits for Contributing Members, Former Contributing Members, and Beneficiaries

(All amounts are actuarial present values in millions)

	July 1, 2004 Total	July 1, 2002 Total
A. Active members		
Service retirement	$ 1,813.3	$ 1,699.6
Disability retirement	21.5	20.4
Survivors' benefits	42.7	40.8
Vested Retirement	31.5	29.2
Refund of Member Contributions	31.7	32.1
Total	$ 1,940.7	$ 1,822.1
B. Inactive members and annuitants		
Service retirement	$ 1,675.1	$ 1,430.9
Disability retirement	17.1	16.1
Beneficiaries*	107.2	90.8
Vested terminated members	54.6	47.0
Nonvested terminated members	11.3	13.6
Total	$ 1,865.3	$ 1,598.4
C. Grand Total	$ 3,806.0	$ 3,420.5

**Includes survivors of active and retired members, and children's benefits.*

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Section 5

Employer Contributions

In the previous two sections, attention has been focused on the assets and the present value of all future benefits of the System. A comparison of Tables 3 and 6 indicates that there is a shortfall in current actuarial assets to meet the present value of all future benefits for current members and beneficiaries. This is the universal experience in all but a fully closed-down fund where no further contributions of any sort are anticipated.

In an active system, there will always be a difference between the assets and the present value of all future benefits. This difference has to be funded with future contributions and investment returns. An actuarial valuation sets a schedule of future contributions that will deal with this funding in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. For this valuation, the entry age actuarial cost method has been used. Under this method, or essentially any actuarial cost method, the contributions required to meet the difference between current assets and the present value of all future benefits are allocated each year between two elements:

- A normal cost amount, which ideally is relatively stable as a percentage of salary over the years; and

- Whatever amount is left over, which is used to amortize what is called the unfunded actuarial accrued liability.

The two items described above, normal cost and unfunded actuarial accrued liability, are the keys to understanding the actuarial cost method. Let us first discuss the normal cost.

The normal cost is the theoretical contribution rate, which will meet the ongoing costs of a group of average new employees. Suppose that a group of new employees were covered under a separate fund from which all benefits and to which all contributions and associated investment return were to be paid. Under the entry age actuarial cost method, the normal cost contribution rate is that level percentage of pay which would be exactly right to maintain this fund on a stable basis. If experience were to follow the actuarial assumptions exactly, the fund would be completely liquidated with the last payment to the last survivor of the group.

We have determined the normal cost rates separately by type of benefit under the System. These are summarized in Table 7.

The term "fully funded" is often applied to a system where contributions for everyone at the normal cost rate will fully pay for the benefits of existing as well as new employees. Often, systems are not fully funded, either because of benefit improvements in the past that have not been completely paid for or actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial accrued liability (UAAL) exists.

Table 8 shows how the UAAL was derived for the System. Lines A and B show, respectively, the total present value of future benefits and the portion of the future liability that is expected to be paid from future normal cost contributions, both employer and employee. Line C shows the actuarial accrued liability: the portion of the present value of future benefits not provided by future normal cost contributions. Line D shows the actuarial value of assets available for benefits. Line E shows the unfunded actuarial accrued liability. Lines F and G show the impact of the present value of future scheduled ORP contributions (described below) on the unfunded actuarial accrued liability.

As can be seen from this discussion, a key consideration in the adequacy of the funding of the System is how the UAAL is being amortized. Table 9 shows that the current employer and member contribution rates are adequate to pay the total normal cost rate (10.34% of pay), but do not have enough left over to amortize the UAAL over a reasonable period. Therefore, the current basis is not sufficient to meet future requirements.

An increase in the employer contribution rate of 2.87% (7.58% to 10.45%) as of July 1, 2005 is projected to maintain an amortization of the unfunded actuarial accrued liability over the 30 years beginning July 1, 2004. A 30 year amortization period is the maximum acceptable amortization period specified in Statements No. 25 and 27 of the Governmental Accounting Standards Board (GASB). It is also the trigger in the Retirement Board's funding policy for recommending to the legislature that funding be increased.

The amortization of the UAAL assumes contributions made as a percent of pay for members of the Optional Retirement Plan (ORP) until June 30, 2033. Under Section 19-20-621, periodic separate valuations are to be performed to measure the liabilities of benefits to be paid under the Teachers' Retirement System (TRS) for Montana University System (MUS) members. As of the 1996 valuation, there was a $98.0 million difference, or shortfall, which is to be funded as a level percentage of future ORP salaries from July 1, 1997 to June 30, 2033. The single contribution rate determined as of July 1, 1997 was 3.97%. However, the following graded schedule for increasing the ORP contributions was adopted:

ORP Contribution Rate	Fiscal Years Ending
2.81%	June 30, 1998
3.12%	June 30, 1999
3.42%	June 30, 2000
3.73%	June 30, 2001
4.04%	June 30, 2002 to June 30, 2033

The July 1, 2000 actuarial valuation of the MUS calculated a $132.7 million difference or shortfall. The contribution schedule has not been changed. The value of future ORP payments included in the July 1, 2004 TRS valuation is $115.7 million. We will be completing an updated valuation of the MUS after this report is completed.

The unfunded actuarial accrued liability at any date after establishment of a system is affected by any actuarial gains or losses arising when the actual experience of the system varies from the experience anticipated by the actuarial assumptions used in the valuations. To the extent actual experience as it develops differs from the assumptions used, so also will the actual emerging costs differ from the estimated costs. The impact of these differences in actual experience from the assumptions is included in Section 1, the Summary of Findings.

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Table 7

Normal Cost Contribution Rates
As Percentages of Salary

	July 1, 2004 Total	July 1, 2002 Total
Service retirement	7.87%	7.86%
Disability retirement	0.15	0.15
Survivors' benefits	0.26	0.26
Vested retirement	0.63	0.60
Refund of member contributions	1.43	1.46
Total	10.34%	10.33%

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Table 8

Unfunded Actuarial Accrued Liability
(All dollar amounts in millions)

	July 1, 2004	July 2, 2002
A. Actuarial present value of all future benefits for present and former members and their survivors (Table 4)	$ 3,806.0	$ 3,420.5
B. Less actuarial present value of total future normal costs for present members	446.8	440.4
C. Actuarial accrued liability	$ 3,359.2	$ 2,980.1
D. Less actuarial value of assets available for benefits (Table 3)	2,485.7	2,484.8
E. Unfunded actuarial accrued liability	$ 873.5	$ 495.3
F. Less present value of future ORP contributions*	115.7	111.8
G. Unfunded actuarial accrued liability funded by TRS contributions	$ 757.8	$ 383.5

**Paid by contributions to TRS made as a percentage of the salaries of the participants in the Optional Retirement Plan (ORP). The percentage of salary will be a level 4.04% for the Fiscal Years through 2033.*

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Table 9

Recommended Contribution Rates
As Percentages of Salary

	July 1, 2004	July 1, 2002
A. Employer contribution rate*	7.58%	7.58%
B. Member contribution rate	7.15	7.15
C. Total contribution rate	14.73%	14.73%
D. Less total normal cost rate (Table 7)	10.34	10.33
E. Amount available to amortize unfunded actuarial accrued liability**	4.39%	4.40%
F. Amortization period from Valuation Date***	N/A	23.4 years

* *In accordance with MCA 19-20-604, the employer contribution rate will be reduced by 0.11% when the amortization period of the System's unfunded actuarial accrued liability is 10 years or less according to the System's latest actuarial valuation. This is reflected in all relevant calculations in this report.*

** *In addition, a percentage of the salaries of the participants in the Optional Retirement Plan (ORP) is available to help amortize the unfunded actuarial accrued liability.*

*** *The amortization period as of July 1, 2002 was 23.4 years; thus, the expected period as of July 1, 2004 is 21.4 years assuming no changes in benefits or assumptions. As of July 1, 2004, the unfunded actuarial accrued liability does not amortize over a reasonable period. The employer contribution rate would have to be increased by 2.87% starting July 1, 2005 to maintain an amortization of the unfunded actuarial accrued liability over the 30-year period starting July 1, 2004. Alternatively, the employer contribution rate could be increased by 0.84% on July 1, of 2005, 2007, 2009 and 2011 for a total increase of 3.36%. This graded increase would achieve the same 30-year amortization.*

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Section 6

Cash Flows

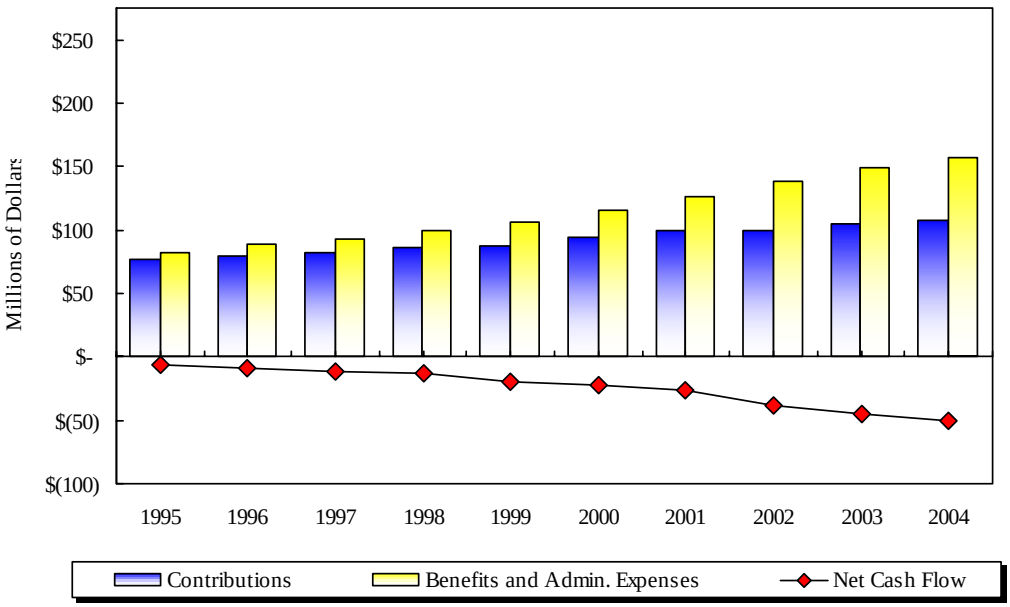
The fundamental equation for funding a retirement system is that benefits and administrative expenses must be provided for by contributions (past and future) and investment income. When a retirement system matures, benefits and administrative expenses often exceed contributions. In this case we say the system has a "negative cash flow." Mature systems are characterized by negative cash flows and large pools of assets. This is natural. Actuarial funding is designed to accumulate large pools of assets which will in turn provide investment income and finance negative cash flows when systems mature. If the fund is looked at as a whole, investment income is usually larger than the difference between contributions and benefit payments. The retirement system's investment strategy should maximize potential returns at a prudent level of risk while providing for needed cash flows.

The Table 10 shows that in 1995 the System had a small negative cash flow. In the year ended June 30, 2004 the System's benefits and administrative expenses exceeded contributions by $50 million. At the current contribution rates this is projected to increase to $138 million for the year ending June 30, 2014.

As long as the System had a positive cash flow, there was no need to plan where the funds would come from to pay benefits since benefits could be paid by incoming contributions. A negative cash flow, as defined above, requires planning what funds will be used to pay the difference between benefits and contributions. We are providing these projections to aid in developing the investment strategy for the System's assets.

The projected contributions and administrative expenses are based on the actual amounts for the year ended June 30, 2004. Contributions are assumed to increase at the general wage increase assumption of 4.5%. Expenses are assumed to increase at the underlying inflation assumption of 3.5%. The future employer contribution rate is assumed to stay at 7.58% for the purpose of these projections.

Cash Flow History



Cash Flow Projections

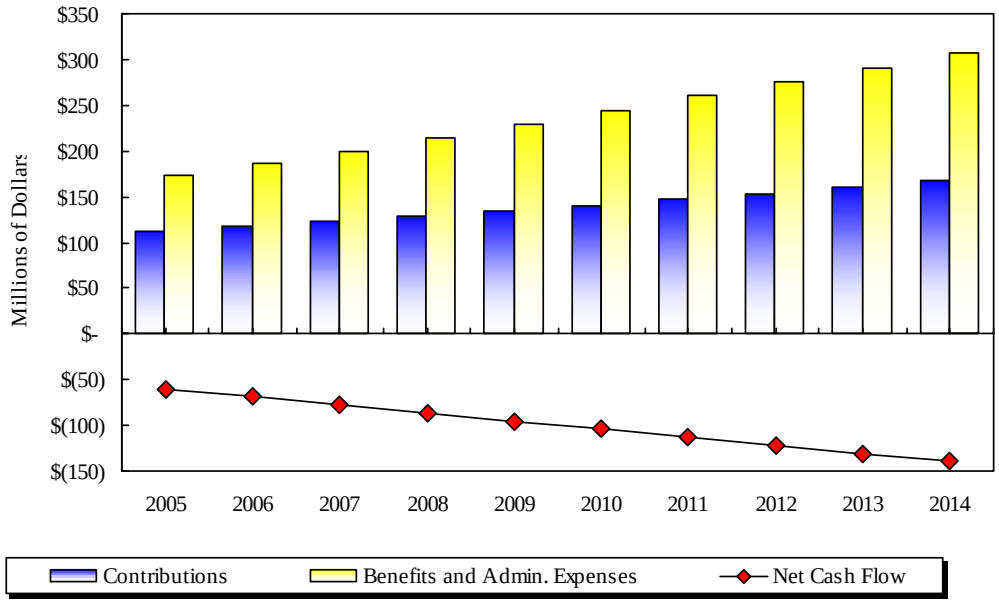


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Table 10

Cash Flow History and Projections

Historical Cash Flows*

Year Ended June 30,	Contributions	Benefits & Administrative Expenses	Net Cash Flow
1995	$ 77	$ 83	$ (6)
1996	80	89	(9)
1997	82	93	(11)
1998	87	100	(13)
1999	88	107	(19)
2000	94	116	(22)
2001	100	126	(26)
2002	100	138	(38)
2003	104	149	(45)
2004	108	158	(50)

Projected Cash Flows*

Year Ending June 30,	Contributions	Benefits & Administrative Expenses	Net Cash Flow
2005	$ 113	$ 174	$ (61)
2006	118	187	(69)
2007	123	200	(77)
2008	129	215	(86)
2009	134	230	(96)
2010	141	245	(104)
2011	147	260	(113)
2012	153	276	(123)
2013	160	291	(131)
2014	168	306	(138)

* Millions of Dollars

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Appendix A

Actuarial Procedures and Assumptions

The actuarial assumptions used in this valuation were adopted by the Board for the July 1, 2004 Actuarial Valuation. The Board adopted new economic assumptions at the May 14, 2004 Retirement Board Meeting. Active demographic assumptions were reviewed in the 2002 Investigation of Experience Study. Retired demographic assumptions were last reviewed in the 2000 Investigation of Experience Study.

Tables A-3 through A-6 give rates of decrement for service retirement, disablement, mortality, and other terminations of employment. These rates of decrement are referred to in actuarial literature as the absolute rate of decrement, or q'_x. Table A-7 shows the assumed probability of retaining membership in the System among members terminating with five or more years of service.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate is defined to equal the total of the individual normal costs, divided by the total pay rate.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the unfunded actuarial accrued liability. The unfunded actuarial accrued liability is amortized as a level percentage of the projected salaries of present and future members of the System.

Records and Data

The data used in the valuation consist of financial information; records of age, sex, service, salary, contribution rates, and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data were supplied by the System and are accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.

Employer Contributions

At the time of this valuation, the total employer contribution rate for normal costs and amortization of the unfunded actuarial accrued liability was 7.58% of members' salaries. In accordance with MCA 19-20-604, the employer contribution rate will be reduced by 0.11% when the amortization period of the System's unfunded actuarial accrued liability is 10 years or less according to the System's latest actuarial valuation.

Administrative and Investment Expenses

The administrative and investment expenses of the System are assumed to be funded by investment earnings in excess of 7.75% per year. (Adopted effective July 1, 2004)

Valuation of Assets - Actuarial Basis

The actuarial asset valuation method spreads asset gains and losses over five years. The expected return is determined each year based on the beginning of year market value and actual cash flows during the year. Any difference between the expected market value return and the actual market value return is recognized evenly over a period of five years. The gains and losses are measured starting with the year ended June 30, 1997. Adopted in the July 1, 2000 actuarial valuation.

Investment Earnings

The annual rate of investment earnings of the assets of the System is assumed to be 7.75% per year, compounded annually. (Adopted effective July 1, 2004)

Interest on Member Contributions

Interest on member contributions is assumed to accrue at a rate of 5% per annum, compounded annually. This assumption was set as of July 1, 2004.

Postretirement Benefit Increases

On January 1 of each year, the retirement allowance payable must be increased by 1.5% if the retiree's most recent retirement effective date is at least 36 months prior to January 1 of the year in which the adjustment is to be made.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table A-2. In addition to increases in salary due to merit and longevity, this scale includes an assumed 4.5% annual rate of increase in the general wage level of the membership. The merit and longevity increases for the MUS members did not show a pattern of increasing or decreasing with service at the time of our most recent study. Therefore, the MUS members have a flat 1% merit and longevity assumption. The general wage increase assumption was adopted July 1, 2004 and the merit and longevity scales were adopted July 1, 2002.

Montana University System (MUS) members are assumed to have a 0.63% higher average final compensation to account for the larger than average annual compensation increases observed in the years immediately preceding retirement.

Service Retirement

Table A-3 shows the annual assumed rates of retirement among members eligible for service retirement. Separate rates are used when a member is eligible for reduced benefits, for the first year a member is eligible for full benefits, and for the years following the first year a member is eligible for full benefits. The rates for General Members were adopted July 1, 2002. The rates for University Members were adopted July 1, 2002.

Disablement

The rates of disablement used in this valuation are illustrated in Table A-4. The rates for General Members were adopted July 1, 2002. The rates for University Members were adopted July 1, 1996.

Mortality

The mortality rates used in this valuation are illustrated in Table A-5. A written description of each table used is included in Table A-1. These rates were adopted July 1, 2000.

Other Terminations of Employment

The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table A-6. These rates were adopted July 1, 2002.

Benefits for Terminating Members

Members terminating with less than five years of service are assumed to request an immediate withdrawal of their contributions with interest. Table A-7 shows the assumed probability of retaining membership in the System among members terminating with five or more years of service. These rates were adopted July 1, 2002.

We estimated the present value of future benefits for terminated vested members based on their available contribution account.

Part-Time Employees

The valuation data for active members identify part-time members, but give no indication as to the number of hours worked. As done in the past, we imputed a "part-time percentage" by comparing the pay received with their annual equivalent full-time salary. Part-time members earning less than $1,000 during the last year were valued at their current member contribution balance.

Optional Retirement Program

The total contribution received for the fiscal year ending June 30, 2004 was $4,673,484. Based on a contribution rate of 4.04%, we assumed the total ORP payroll for the fiscal year to be $115,680,297 ($4,673,484 divided by 4.04%).

Buybacks, Purchase of Service, and Military Service

The active liabilities and normal cost were increased to 100.5% of their original value to fund this additional service based on a study of the System's experience for the five calendar years 1995 through 1999. Effective July 1, 2000.

Probability of Marriage

If death occurs in active status, all members are assumed to have an eligible surviving spouse and two children. The spouse is assumed to be the same age as the member.

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Table A-1

Summary of Valuation Assumptions
(July 1, 2004)

I.	Economic assumptions		
	A.	General wage increases* (Adopted July 1, 2004)	4.50%
	B.	Investment return (Adopted July 1, 2004)	7.75%
	C.	Price Inflation Assumption (Adopted July 1, 2004)	3.50%
	D.	Growth in membership	0.00%
	E.	Postretirement benefit increases (Starting three years after retirement)	1.50%
	F.	Interest on member accounts (Adopted July 1, 2004)	5.00%
II.	Demographic assumptions		
	A.	Individual salary increase due to promotion and longevity (General Member assumptions adopted July 1, 2002) (University Member assumptions adopted July 1, 2000)	Table A-2
	B.	Retirement (adopted July 1, 2002)	Table A-3
	C.	Disablement (adopted July 1, 2002) (General Member assumptions adopted July 1, 2002) (University Member assumptions adopted July 1, 1996)	Table A-4
	D.	Mortality among contributing members, service retired members, and beneficiaries 1994 Group Annuity Mortality Table, with ages set back 3 years for males and ages set back 1 year for females. (adopted July 1, 2000)	Table A-5
	E.	Mortality among disabled members Based on the IRS Social Security Disabled Mortality Tables published in Revenue Ruling 96-7. Males are 70% of the Male IRS table to age 80, grading into the 1983 Group Annuity Mortality Table for Males between ages 80 and 85. Females are 85% of the IRS table at all ages. (adopted July 1, 2000)	Table A-5
	F.	Other terminations of employment (adopted July 1, 2002)	Table A-6
	G.	Probability of retaining membership in the System upon vested termination (adopted July 1, 2002)	Table A-7

* *Montana University System (MUS) members are assumed to have a 0.63% higher average final compensation to account for the larger than average annual compensation increases observed in the years immediately preceding retirement.*

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Table A-2

Future Salaries

	General Members			University Members		
Years of Service	Individual Merit & Longevity	General Wage Increase	Total Salary Increase	Individual Merit & Longevity	General Wage Increase	Total Salary Increase
1	4.51%	4.50%	9.01%	1.00%	4.50%	5.50%
2	4.09	4.50	8.59	1.00	4.50	5.50
3	3.46	4.50	7.96	1.00	4.50	5.50
4	2.94	4.50	7.44	1.00	4.50	5.50
5	2.52	4.50	7.02	1.00	4.50	5.50
6	2.21	4.50	6.71	1.00	4.50	5.50
7	1.89	4.50	6.39	1.00	4.50	5.50
8	1.68	4.50	6.18	1.00	4.50	5.50
9	1.47	4.50	5.97	1.00	4.50	5.50
10	1.31	4.50	5.81	1.00	4.50	5.50
11	1.16	4.50	5.66	1.00	4.50	5.50
12	1.00	4.50	5.50	1.00	4.50	5.50
13	0.84	4.50	5.34	1.00	4.50	5.50
14	0.68	4.50	5.18	1.00	4.50	5.50
15	0.58	4.50	5.08	1.00	4.50	5.50
16	0.47	4.50	4.97	1.00	4.50	5.50
17	0.37	4.50	4.87	1.00	4.50	5.50
18	0.26	4.50	4.76	1.00	4.50	5.50
19	0.21	4.50	4.71	1.00	4.50	5.50
20	0.16	4.50	4.66	1.00	4.50	5.50
21	0.11	4.50	4.61	1.00	4.50	5.50
22 & Up	0.00	4.50	4.50	1.00	4.50	5.50

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Table A-3

Retirement
Annual Rates

	General Members			University Members		
Age	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter
45		18.0%	9.5%		5.0%	4.9%
46		18.0	9.5		5.0	4.9
47		12.5	9.5		5.0	4.9
48		12.5	9.5		5.0	4.9
49	*	12.5	9.5	*	5.0	4.9
50	4.0%	12.5	9.5	1.9%	8.0	4.9
51	4.0	16.0	9.5	2.2	8.0	4.9
52	4.5	16.0	9.5	2.5	8.0	6.0
53	4.5	16.0	9.5	2.8	8.0	6.0
54	5.0	16.0	9.5	3.1	12.0	6.0
55	5.5	22.0	14.0	3.4	15.0	6.0
56	6.0	22.0	14.0	3.7	15.0	6.0
57	6.5	22.0	14.0	4.0	15.0	7.0
58	6.5	22.0	15.0	4.3	15.0	7.0
59	7.0	22.0	18.0	4.7	15.0	9.0
60	*	22.0	22.0	*	19.0	10.0
61		22.0	22.0		19.0	14.0
62		27.0	27.0		24.0	24.0
63		22.0	22.0		14.0	14.0
64		25.0	25.0		20.0	20.0
65		35.0	35.0		33.0	33.0
66		30.0	30.0		23.0	23.0
67		24.0	24.0		23.0	23.0
68		22.0	22.0		23.0	23.0
69		22.0	22.0		23.0	23.0
70		**	**		**	**

* *All benefits are unreduced after attaining age 60. Reduced benefits are not available before age 50.*
** *Immediate retirement is assumed at age 70 or over.*

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Table A-4

Disablement
Annual Rates

Age	General Members	University Members
25	.010%	.003%
30	.010	.006
35	.020	.012
40	.040	.021
45	.080	.036
50	.130	.055
55	.180	.083
60	.260	.126

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Table A-5

Mortality
Annual Rates

	Contributing Members, Service Retired Members and Beneficiaries		Disabled Members	
Age	Men	Women	Men	Women
25	.06%	.03%	1.92%	1.02%
30	.07	.03	2.15	1.26
35	.08	.04	2.39	1.50
40	.09	.07	2.69	1.75
45	.13	.09	3.01	2.04
50	.19	.13	3.36	2.38
55	.32	.21	3.72	2.77
60	.56	.39	4.07	3.23
65	1.01	.76	4.46	3.76
70	1.80	1.27	5.13	4.36
75	2.85	2.04	6.22	5.32
80	4.52	3.54	7.50	6.84
85	7.55	6.10	11.48	9.30

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Table A-6

Other Terminations of Employment
Among Members Not Eligible to Retire
Annual Rates

Years of Service	General Members	University Members
1	30.0%	33.0%
2	16.0	17.0
3	11.0	13.0
4	9.0	11.0
5	8.0	9.0
6	7.7	8.3
7	7.3	7.7
8	7.0	7.0
9	6.6	6.6
10	6.2	6.2
11	5.8	5.8
12	5.4	5.4
13	5.0	5.0
14	4.6	4.6
15	4.2	4.2
16	3.8	3.8
17	3.4	3.4
18 and up	3.0	3.0

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Table A-7

Probability of Retaining Membership in the System
Upon Vested Termination

Age	Probability of Retaining Membership
25	54%
30	54
35	58
40	58
45	60
50	70
55	75

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Appendix B

Summary of Benefit Provisions

Effective Date	September 1, 1937
Vesting Period	5 years. No benefits are payable unless the member has a vested right, except the return of employee contributions with interest.
Final Compensation	Average of highest 3 consecutive years of earned compensation.
Normal Form of Benefits	Life only annuity. All benefits cease upon death; however, in no event will the member receive less than the amount of employee contributions with interest.
Normal Retirement Benefits	
Eligibility:	25 years of service or age 60 and 5 years of service.
Benefit:	The retirement benefit is equal to 1/60 of final compensation for each year of service.
Early Retirement Benefits	
Eligibility:	5 years of service and age 50.
Benefit:	The retirement benefit is calculated in the same manner as described for normal retirement, but the benefit is reduced 1/2 of 1% for each of the first 60 months early and 3/10 of 1% for each of the next 60 months early.

Death Benefit	
Eligibility:	5 years of service.
Benefit:	The death benefit is equal to 1/60 of final compensation for each year of service accrued at date of death, with an actuarial adjustment based on the relation of the member's age at death to the beneficiary's age. A monthly benefit of $200 is paid to each child until age 18. In addition, a lump-sum benefit of $500 is paid upon the death of an active or retired member.
Disability Benefit	
Eligibility:	5 years of service.
Benefit:	The disability benefit is equal to 1/60 of final compensation for each year of service accrued at date of disability. The minimum benefit is 1/4 of the final compensation.
Withdrawal Benefits	With less than 5 years of service, the accumulated employee contributions with interest are returned. With more than 5 years, the member may elect a refund of contributions with interest or leave the contributions and interest in the System and retain a vested right to retirement benefits.
Contributions	Member: 7.15% of compensation. Employer: 7.58% of compensation. MCA 19-20-604 specifies that the employer contribution rate will be reduced by 0.11% when the amortization period of the System's unfunded actuarial accrued liability is 10 years or less according to the System's latest actuarial valuation.
Interest on Member Contributions	Interest on member contributions is currently being credited at a rate of 4.0% per annum.
Cost-of-Living Adjustments	On January 1 of each year, the retirement allowance payable must be increased by 1.5% if the retiree's most recent retirement effective date is at least 36 months prior to January 1 of the year in which the adjustment is to be made.

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Appendix C

Valuation Data

This valuation is based upon the membership of the System as of July 1, 2004. Membership data were supplied by the System and accepted for valuation purposes without audit. However, tests were performed to ensure that the data are sufficiently accurate for valuation purposes.

Table C-1 contains summaries of the data for contributing members. For full-time members, values shown in the tables are the numbers of members and their total and average annual salaries. For part-time members, only the numbers of members are shown.

Active Members	Number	Annual Salaries in Millions
Full-Time Members	12,601	$ 510.8
Part-Time Members*	5,013	60.3
Total Contributing Members*	17,614	$ 571.2
Active Members with Annual Compensation less than $1,000	637	
Total Active Members	18,251	

** Excludes part-time members with annual compensation less than $1,000.*

Table C-2 presents distributions of the following:

- Members receiving service retirement benefits.
- Members receiving disability retirement benefits.
- Survivors of deceased retired members receiving benefits.
- Survivors of deceased active members.
- Child beneficiaries.
- Terminated vested members.

Table C-3 is a reconciliation of membership data from July 1, 2002 to July 1, 2004.

The following is a summary of retired members and beneficiaries currently receiving benefits:

Type of Annuitant	Number	Annual Benefits in Thousands	Average Annual Benefits
Service Retirement	8,969	$ 146,841	$ 16,372
Survivors of Deceased Retired Members	772	7,963	10,315
Total Service Retirement (including survivors)	9,741	154,804	15,892
Disability Retirement	199	1,686	8,471
Survivors of Deceased Active Members	407	3,219	7,909
Child Beneficiaries	28	67	2,400
Total Annuitants	10,375	$ 159,776	$ 15,400

Terminated Members with Contributions Not Withdrawn*	Number
Vested Terminated Members	1,620
Non-Vested Terminated Members	7,861
Total Terminated Members	9,481

* *Includes 209 records provided in the active data with salary equal to zero and contributions greater than zero.*

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Table C-1

Active Members Distribution of Full-Time Employees and Salaries

as of July 1, 2004

Number of Employees - By Age Group - All Members

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	17	62	17	1	-	-	-	-	-	-	-	-	97
25 to 29	13	226	230	338	124	-	-	-	-	-	-	-	931
30 to 34	12	92	118	239	612	106	-	-	-	-	-	-	1,179
35 to 39	14	77	67	134	377	526	87	-	-	-	-	-	1,282
40 to 44	15	75	61	132	301	390	441	143	-	-	-	-	1,558
45 to 49	19	56	58	127	285	391	424	572	163	-	-	-	2,095
50 to 54	10	45	60	101	281	359	420	511	605	213	-	-	2,605
55 to 59	10	37	23	47	155	253	287	316	343	453	76	-	2,000
60 to 64	2	9	13	18	53	65	82	93	119	133	109	12	708
65 to 69	1	2	-	2	9	12	19	17	8	18	24	9	121
70 and up	-	2	-	3	2	2	2	3	3	4	3	1	25
Totals	113	683	647	1,142	2,199	2,104	1,762	1,655	1,241	821	212	22	12,601

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Table C-1

Active Members Distribution of Full-Time Employees and Salaries
as of July 1, 2004

Annual Salaries in Thousands - By Age Group - All Members

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	208	1,470	409	24	-	-	-	-	-	-	-	-	2,111
25 to 29	168	5,736	6,027	9,105	3,701	-	-	-	-	-	-	-	24,737
30 to 34	117	2,422	3,355	6,949	19,887	4,003	-	-	-	-	-	-	36,733
35 to 39	142	2,148	1,986	3,963	12,703	20,700	3,770	-	-	-	-	-	45,412
40 to 44	186	2,127	1,577	4,053	10,449	15,884	19,739	6,474	-	-	-	-	60,489
45 to 49	247	1,579	1,672	4,168	9,640	16,192	19,169	27,286	7,790	-	-	-	87,743
50 to 54	155	1,325	1,878	3,256	10,138	14,686	18,950	24,604	29,915	10,578	-	-	115,485
55 to 59	110	1,210	744	1,757	5,790	10,454	13,264	16,286	18,255	23,765	3,828	-	95,463
60 to 64	31	249	489	646	2,156	2,566	3,853	4,586	6,182	7,380	6,114	592	34,844
65 to 69	17	49	-	92	320	509	975	1,004	484	986	1,576	716	6,728
70 and up	-	45	-	48	39	35	64	214	166	246	162	44	1,063
Totals	1,381	18,360	18,137	34,061	74,823	85,029	79,784	80,454	62,792	42,955	11,680	1,352	510,808

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Table C-1

Active Members Distribution of Full-Time Employees and Salaries
as of July 1, 2004

Average Annual Salary - By Age Group - All Members

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	12,215	23,706	24,038	24,370	-	-	-	-	-	-	-	-	21,757
25 to 29	12,955	25,381	26,204	26,939	29,847	-	-	-	-	-	-	-	26,571
30 to 34	9,755	26,327	28,436	29,077	32,496	37,764	-	-	-	-	-	-	31,157
35 to 39	10,127	27,900	29,648	29,576	33,696	39,354	43,333	-	-	-	-	-	35,424
40 to 44	12,420	28,361	25,849	30,702	34,713	40,729	44,761	45,272	-	-	-	-	38,825
45 to 49	12,989	28,194	28,835	32,818	33,824	41,412	45,209	47,703	47,793	-	-	-	41,882
50 to 54	15,499	29,443	31,301	32,238	36,077	40,907	45,118	48,149	49,446	49,664	-	-	44,332
55 to 59	11,042	32,697	32,367	37,380	37,354	41,322	46,215	51,538	53,221	52,462	50,366	-	47,732
60 to 64	15,252	27,710	37,581	35,907	40,676	39,477	46,985	49,308	51,947	55,490	56,092	49,298	49,212
65 to 69	17,385	24,436	-	45,977	35,544	42,385	51,312	59,069	60,553	54,768	65,672	79,550	55,604
70 and up	-	22,353	-	15,975	19,696	17,385	32,199	71,412	55,494	61,423	54,023	43,649	42,533
Totals	12,224	26,881	28,034	29,827	34,026	40,413	45,280	48,613	50,598	52,321	55,094	61,417	40,537

Teachers' Retirement System
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Table C-1

Active Members Distribution of Part-Time Employees and Salaries
as of July 1, 2004

Number of Employees - By Age Group - All Members

	Completed Years of Service												
Age	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	137	26	15	7	1	-	-	-	-	-	-	-	186
25 to 29	201	135	48	59	10	-	-	-	-	-	-	-	453
30 to 34	85	80	52	78	128	20	-	-	-	-	-	-	443
35 to 39	106	100	55	87	81	77	11	-	-	-	-	-	517
40 to 44	108	106	95	148	161	59	53	11	1	-	-	-	742
45 to 49	96	107	98	150	218	109	47	44	4	-	-	-	873
50 to 54	81	108	87	101	221	129	68	35	26	3	-	-	859
55 to 59	42	74	41	56	105	98	52	21	12	29	-	-	530
60 to 64	35	29	30	30	49	37	19	16	11	7	7	1	271
65 to 69	7	5	20	16	19	16	5	3	1	3	4	-	99
70 and up	3	7	3	4	11	4	7	1	-	-	-	-	40
Totals	901	777	544	736	1,004	549	262	131	55	42	11	1	5,013

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Table C-2

Distribution of Inactive Lives

Members Receiving Service Retirement Benefits as of July 1, 2004

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	28	$ 532	$ 19,016
50 to 54	430	8,185	19,035
55 to 59	1,251	24,738	19,775
60 to 64	1,798	34,885	19,402
65 to 69	1,606	29,418	18,317
70 to 74	1,317	21,728	16,498
75 to 79	934	12,728	13,627
80 to 84	689	7,738	11,231
85 to 89	501	4,226	8,435
90 and up	415	2,664	6,420
Total	8,969	146,841	16,372

Members Receiving Disability Retirement Benefits as of July 1, 2004

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	12	$ 97	$ 8,121
50 to 54	27	218	8,077
55 to 59	38	361	9,505
60 to 64	32	297	9,285
65 to 69	27	257	9,511
70 to 74	18	161	8,937
75 to 79	20	154	7,698
80 to 84	13	73	5,632
85 to 89	10	58	5,798
90 and up	2	9	4,506
Total	199	1,686	8,471

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Table C-2

Distribution of Inactive

Survivors of Deceased Retired Members as of July 1, 2004

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	30	$ 249	$ 8,291
50 to 54	25	232	9,275
55 to 59	40	450	11,241
60 to 64	66	836	12,667
65 to 69	80	921	11,509
70 to 74	109	1,395	12,799
75 to 79	106	1,167	11,011
80 to 84	150	1,393	9,290
85 to 89	102	869	8,517
90 and up	64	452	7,063
Total	772	7,963	10,315

Survivors of Deceased Active Members as of July 1, 2004

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	78	$ 423	$ 5,418
50 to 54	43	334	7,770
55 to 59	55	459	8,343
60 to 64	49	523	10,668
65 to 69	38	337	8,869
70 to 74	38	378	9,941
75 to 79	36	343	9,522
80 to 84	38	282	7,416
85 to 89	16	80	4,972
90 and up	16	62	3,844
Total	407	3,219	7,909

Teachers' Retirement System
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Table C-2

Distribution of Inactive Lives

Terminated Vested Members as of July 1, 2004
Number of Persons

Age	Number
<25	-
25 to 29	6
30 to 34	81
35 to 39	157
40 to 44	203
45 to 49	311
50 to 54	393
55 to 69	334
60 to 64	111
65 to 69	20
70 & above	4
Total	1,620

Child Beneficiaries as of July 1, 2004
Number of Persons

Age	Number
<5	2
5 to 6	2
7 to 8	2
9 to 10	7
11 to 12	3
13 to 14	6
15 to 16	6
17 to 18	-
Total	28

Teachers' Retirement System
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Table C-3

Data Reconciliation

	Active Contributing Members	Vested Terminated Members	Service Retired Members	Disabled Members	Survivors and Beneficiaries
July 1, 2002 Valuation	17,446	1,485	8,438	200	1,130
Refunds and NonVested Terminations	(1,864)	(112)			
Vested Terminations	(413)	413			
Service Retirements	(887)	(90)	977		
Disability Retirements	(15)	(1)		16	
Deaths with Beneficiary	(21)	(3)	(151)	(8)	183
Deaths without Beneficiary			(331)	(10)	(96)
New Entrants	3,254				
Rehires	114	(95)	(18)	(1)	
Other	-	23	54	2	(10)
July 1, 2004 Valuation	17,614	1,620	8,969	199	1,207

Teachers' Retirement System
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Appendix D

Comparative Schedules

This section contains tables that summarize the experience of the System shown in present and past valuation reports.

Table D-1 shows a summary of the active members covered as of the various valuation dates.

Table D-2 shows a summary of the retired and inactive members as of the various valuation dates.

Table D-3 summarizes the contribution rates determined by each annual actuarial valuation.

Teachers' Retirement System
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Table D-1

Active Membership Data

	Active Members								
Valuation Date (July 1)	Full-Time Members	Part-Time Members**	Total Contributing Members**	Part-Time Members Annual Compensation less than $1,000	Annual Full-Time Salaries in Thousands	Average Full-Time Annual Salary	Average Age**	Average Years of Service**	Average Hire Age**
1987	13,105	1,955	15,060	*	$340,481	$25,981	*	*	*
1989	12,546	2,541	15,087	*	339,866	27,090	*	*	*
1992	13,502	3,141	16,643	*	401,092	29,706	42.4	11.6	30.8
1994	14,938	2,637	17,575	377	416,968	27,914	42.5	11.0	31.5
1996	13,251	5,444	18,695	1,295	424,085	32,004	43.3	11.6	31.7
1998	13,545	4,647	18,192	776	459,191	33,901	44.0	12.1	31.9
2000	13,289	4,245	17,534	886	477,160	35,906	44.5	12.2	32.3
2002	12,796	4,650	17,446	723	486,204	37,997	45.0	12.2	32.8
2004	12,601	5,013	17,614	637	510,808	40,537	45.6	12.2	33.4

* *Not available.*

** *Excludes part-time active members with annual compensation less than $1,000.*

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Table D-2

Retired and Inactive Membership Data

	All Annuitants					Terminated Members	
Valuation Date (July 1)	Number	Annual Benefits in Thousands	Average Annual Benefit	Average Current Age	Average Age at Retirement	Number Vested Terminated	Number Non-Vested Terminated
1987	6,036	$ 43,236	$ 7,163	*	*	*	*
1989	6,330	49,546	7,827	*	*	*	*
1992	6,927	63,483	9,165	*	*	*	*
1994	7,530	78,183	10,383	*	*	1,105	5,722
1996	7,896	87,351	11,063	*	*	1,152	6,479
1998	8,362	99,040	11,844	69.6	57.3	1,190	8,158
2000	9,021	117,227	12,995	69.3	57.0	1,256	9,308
2002	9,768	139,131	14,244	69.1	56.8	1,485	8,231
2004	10,375	159,776	15,400	69.1	56.7	1,620	7,861

* *Not available.*

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Table D-3

Contribution Rates

Valuation Date (July 1)	Contribution Rates			Normal Cost Rate	UAAL Rate*
	Employee	Employer	Total		
1992	7.044%	7.459%	14.503%	9.876	4.627%
1994	7.044%	7.470%	14.514%	9.494	5.020%
1996	7.044%	7.470%	14.514%	9.328	5.186%
1998	7.044%	7.470%	14.514%	8.880	5.634%
2000	7.15%	7.58%	14.73%	9.71	5.02%
2002	7.15%	7.58%	14.73%	10.33	4.40%
2004	7.15%	7.58%	14.73%	10.34%	4.39%

* The unfunded actuarial accrued liability rate is the amount available to amortize the unfunded actuarial accrued liability. It is equal to the total contribution rate, minus the normal cost rate.

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Appendix E

Glossary

The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the Teachers' Retirement System Retirement System. Defined terms are capitalized throughout this Appendix.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

Actuarial Gain (Loss)

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

Amortization Payment

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Entry Age Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Actuarial Accrued Liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Unfunded Actuarial Accrued Liability

The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

Accrued Benefit

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Projected Benefits

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

Unaccrued Benefit

The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.