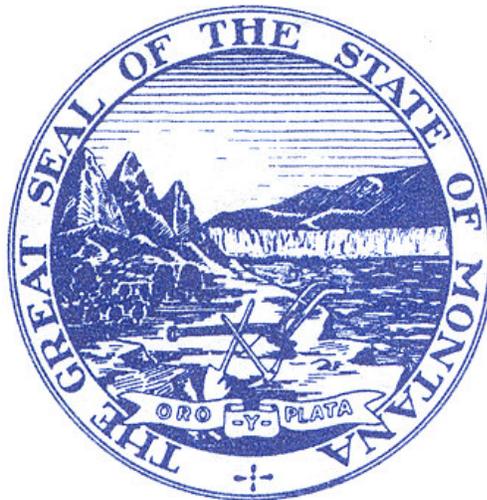


**Teachers' Retirement System
State of Montana**

**ACTUARIAL VALUATION
(As of July 1, 2008)**



Prepared by:

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September 30, 2008

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, 2008.

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. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may 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 Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations 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. We further certify that, in our opinion, each actuarial assumption used is reasonably related to the experience of the Plan and to reasonable expectations which, in combination, represent our best estimate of anticipated experience under the System.

Nevertheless, the emerging costs will vary from those presented in this report to the extent 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.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: system experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the system's funded status); and changes in the system's provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System's funding requirements and goals. 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.

Milliman's work product was prepared exclusively for the System for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning the System's operations, and uses the System'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.

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.

I, Mark C. Olleman, am a member of the American Academy of Actuaries and a Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Craig J. Glyde, am a member 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 respectfully submit the following report, and we look forward to discussing it with you.

Respectfully submitted,

A handwritten signature in dark ink that reads "Mark C. Olleman".

Mark C. Olleman, FSA, EA, MAAA
Consulting Actuary
Joint Board Enrollment # 08-05636

MCO/fyf

A handwritten signature in dark ink that reads "Craig Glyde".

Craig J. Glyde, EA, MAAA
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Teachers' Retirement System State of Montana

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Section 1

Summary of Findings

As a result of this actuarial valuation of the benefits in effect under the Montana Teachers' Retirement System as of July 1, 2008, we find the current schedule of contributions (shown in the "History of Legislated Contributions" below) to be sufficient to amortize the Unfunded Actuarial Accrued Liability (UAAL) of the Retirement System over 31.3 years. The net Funded Ratio is 79.9%. 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). Therefore, when measured by that standard, the System is not actuarially sound.

History of Legislated Contributions (as a Percent of Pay)

	<u>Members</u>	<u>Participating Employers</u>	<u>State General Fund</u>	<u>Total</u>
Prior to July 1, 2007	7.15%	7.47%	0.11%	14.73%
July 1, 2007 to June 30, 2009	7.15%	7.47%	2.11%	16.73%
July 1, 2009 and after	7.15%	7.47%	2.49%	17.11%

Contribution Increases to Amortize UAAL Over 30 Years

A contribution increase of 0.17% of pay (17.11% to 17.28%) as of July 1, 2009 is projected to maintain an amortization of the unfunded actuarial accrued liability (UAAL) over the 30 years beginning July 1, 2008. Alternatively, a contribution increase of 0.19% of pay (17.11% to 17.30%) starting two years later at July 1, 2011 is projected to maintain the same 30 year amortization. These increases could be made to the rate paid by either the participating employers or the State General Fund. Increases made to the employee contribution rates would need to be larger.

Calculations based on the Market Value of Assets

MCA 19-20-201 requires this report to show how market performance is affecting the actuarial funding of the Retirement System. The July 1, 2008 market value of assets is \$166 million less than the actuarial value of assets due to a negative 4.88% market return in the year ended June 30, 2008. If the market value of assets was used, the amortization period would be 44.7 years, and the net Funded Ratio would be 75.7%.

Based on market assets, a contribution increase of 1.57% of pay (17.11% to 18.68%) as of July 1, 2009 is projected to maintain an amortization of the unfunded actuarial accrued liability over the 30 years beginning July 1, 2008. Alternatively, a contribution increase of 1.75% of pay (17.11% to 18.86%) starting two years later at July 1, 2011 is projected to maintain the same 30 year amortization. Again these increases could be made to the rate paid by either the participating employers or the State General Fund.

Additional Details

MCA 19-20-604 states that the contribution from the State General Fund 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.

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.

Investment Experience

The market assets earned negative 4.88% net of investment and operating expenses. The actuarial assets earned 7.18% which is 0.57% less than the actuarial assumption of 7.75%. The return on the actuarial assets differs from the return on market assets because the actuarial value of assets spreads gains and losses over four years. The following chart compares the annual returns for the past eight years.

Year	Market Return	Actuarial Return	Market Return over Assumption*	Actuarial Return over Assumption*
7/1/2000 to 6/30/2001	(5.09)%	9.19%	(13.09)%	1.19%
7/1/2001 to 6/30/2002	(7.26)%	3.83%	(15.26)%	(4.17)%
7/1/2002 to 6/30/2003	6.16%	1.60%	(1.84)%	(6.40)%
7/1/2003 to 6/30/2004	13.31%	2.12%	5.31%	(5.88)%
7/1/2004 to 6/30/2005	8.04%	2.71%	0.29%	(5.04)%
7/1/2005 to 6/30/2006	8.91%	8.46%	1.16%	0.71%
7/1/2006 to 6/30/2007	17.64%	10.22%	9.89%	2.47%
7/1/2007 to 6/30/2008	(4.88)%	7.18%	(12.63)%	(0.57)%

* The actuarial assumption was 8.0% through 6/30/2004 and 7.75% thereafter.

Asset gains or losses result when the return on the actuarial value of assets differs from the actuarial investment return assumption of 7.75% (8.0% before July 1, 2004). The chart above shows that the actuarial return on assets has under performed the assumption more than it has exceeded the assumption in the last eight years. These losses have led to the need for additional contributions.

On a market value basis the System earned \$271 million more than anticipated by the 7.75% assumption in the year ended June 30, 2007 and \$401 million less than anticipated by the 7.75% assumption in the year ended June 30, 2008. The net result as of July 1, 2008 is that the market value of assets is \$166 million less than the actuarial value of assets. This \$166 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 over the new 7.75% assumption, or (2) an increase in contribution rates.

Recent Contribution Increases

As shown in the “History of Legislated Contributions” at the beginning of this section the employer contributions from the General Fund are scheduled to increase from 0.11% of pay prior to July 1, 2007 to 2.49% of pay at July 1, 2009. Additional one-time contributions of \$100 million and \$50 million were also made in the years ending June 30, 2006 and June 30, 2007 respectively. Finally, the supplemental contribution to ensure university member benefits are funded by university employers was increased from 4.04% to 4.72% of Optional Retirement Plan (ORP) member pay at July 1, 2007. These additional contributions helped bring the amortization period of the System’s Unfunded Actuarial Accrued Liability (UAAL) under 30 years at July 1, 2007. Unfortunately the low market returns of the year ended June 30, 2008 now require more contributions to keep the amortization period within 30 years.

Amortization Period Changes

The July 1, 2007 actuarial valuation calculated a 28.6 year amortization period for the Unfunded Actuarial Accrued Liability. If there were no assumption changes, or experience gains and losses, the amortization period would have been expected to decrease by 1.0 years to 27.6 at July 1, 2008. The new assumptions adopted in May 2008 increased the expected July 1, 2008 amortization period by 2.7 years to 30.3. The experience gains and losses from the year ending June 30, 2008 increased the amortization period by another 1.0 years. The resulting amortization period at July 1, 2008 is 31.3 years. Note that the 31.3 year amortization period is based on actuarial assets. If the market value of assets reflecting another \$166 million in unrecognized losses were used the amortization period would be 44.7 years.

Funding and Benefits Policy

The Teachers’ Retirement System has adopted a Funding and Benefits Policy to provide general guidelines to help ensure decisions are made based on sound, consistent, and thoroughly examined criteria. The Funding and Benefits Policy includes guidance on the following topics:

1) Additional Funding

- a) The Funding and Benefits Policy states: “Whenever the amortization period of the unfunded liabilities for two consecutive valuations are projected to exceed 30 years based on the market value of assets, or the funded ratio is less than 85%, and the Board cannot reasonably anticipate that the amortization period would decline or the funded ratio improve without an increase in funding sources, it is the obligation of the Board to recommend to the legislature that funding be increased and/or liabilities be reduced.”
- b) Analysis: The amortization period at July 1, 2008 is 31.3 years based on actuarial assets and 44.7 years based on market assets. Assuming experience follows the actuarial assumptions, the amortization period is projected to remain above 30 years based on both measures for some time to come. The net funded ratio is currently 79.9%. Therefore, the guidance in the Board’s Funding and Benefits Policy indicates the Board should “recommend to the legislature that funding be increased and/or liabilities be reduced.”

2) Ultimate Goal

- a) The Funding and Benefits Policy states: “It is the ultimate goal of the TRB to eliminate the current Unfunded Actuarial Accrued Liability and to establish a Stabilization Reserve equal to at least 10% of the Actuarial Accrued Liability. Once the system has achieved this goal, any surplus funds that become available may be applied toward the cost of benefit enhancements and/or contribution reductions, provided, sufficient reserves are retained to reasonably allow for adverse experience and the contribution rates remain at least 1 percent above the normal cost.”

- b) Analysis: This goal is currently a long way off. This is represented by amortization periods of 31.3 years using actuarial assets and 44.7 years using market assets. Discipline will be required by all parties concerned to reach this goal, and may include contribution increases to get the amortization period within 30 years.

3) Benefit Enhancements

- a) The Funding and Benefits Policy states: "Proposed benefit enhancements must include additional funding sufficient to cover any increase in the normal cost and to amortize any increase in unfunded liabilities over a period not to exceed 25 years. In addition, as of the most recent actuarial valuation, the funded ratio must be 85% or greater before the Board will support legislation to enhance benefits."
- b) Analysis: Since the net funded ratio at July 1, 2008 of 79.9% is below 85% the Board's Funding and Benefits policy does not currently support enhanced benefits, even if funding of increased unfunded liabilities over 25 years is included.

Sensitivity to Future Experience

The valuation results are projections based on the actuarial assumptions. Actual experience will differ from these assumptions, either increasing or decreasing the ultimate cost. The following illustrations provide simple analyses on how the costs are affected by the various assumptions. We have amortized changes in the Unfunded Actuarial Accrued Liability (UAAL) over 25 years for the purpose of these illustrations.

Investment Return – The investment return assumption generally has the largest impact on the funding of the System.

Impact of Assuming 0.5% Lower Investment Return	
	<u>Funded Ratio</u>
Current Assumption 7.75%	79.9%
Lower Assumption 7.25%	<u>75.6%</u>
Change	-4.3%
	<u>Implied Contribution Increase / (Decrease)</u>
Normal Cost Rate	1.26%
25 year amortization of UAAL	<u>1.74%</u>
Total	3.00%

Impact of Assuming 0.5% Higher Investment Return	
	<u>Funded Ratio</u>
Current Assumption 7.75%	79.9%
Higher Assumption 8.25%	<u>84.3%</u>
Change	4.4%
	<u>Implied Contribution Increase / (Decrease)</u>
Normal Cost Rate	-1.10%
25 year amortization of UAAL	<u>-1.75%</u>
Total	-2.85%

Retirement – The age when members are expected to retire is another key actuarial assumption. This is particularly true for systems that have early provisions for unreduced retirement such as TRS' provision for full retirement after 25 years of service at any age. If members retire earlier than anticipated by the actuarial assumptions the System's funding may suffer. The illustration below represents the cost of benefits if all members retired as soon as they were eligible for a full benefit at 25 years of service or at age 60.

Impact of Assuming All Members Retiring at the Earlier of 25 Years of Service or Age 60	
	<u>Funded Ratio</u>
Current Assumption	79.9%
100% Retirement at 25/60	<u>74.8%</u>
Change	-5.1%
	<u>Implied Contribution Increase / (Decrease)</u>
Normal Cost Rate	1.27%
25 year amortization of UAAL	<u>2.76%</u>
Total	4.03%

The future funding status of the System will be determined by the System's experience. The System's actual asset returns and retirement rates, as well as member longevity, salary increases, withdrawal rates, disability rates and future legislation will all impact the funding status of the System. The entry age normal cost method and four year smoothing of asset gains and losses will help to provide a more orderly funding of the System's liabilities, but will not change the actual experience. The amortization period of the Unfunded Actuarial Accrued Liability is not likely to decrease by the expected 1.0 year with each passing actuarial valuation. Instead, the amortization period is expected to decrease more or less than 1.0 years each year, reflecting gains and losses due to experience different than the actuarial assumptions.

Assumption Changes

Active member demographic experience was examined in our experience study dated April 29, 2008. The Retirement Board adopted the recommendations presented in the report.

Generally, we recommended lower assumed probabilities for retirement, disability, and other terminations of employment. Lower probabilities of retirement imply members are retiring later. This tends to decrease the unfunded actuarial accrued liability and normal costs because there is more time for contributions to accumulate with investment income and a shorter period over which benefits are paid. Lower probabilities of disability tend to have a similar effect. However, lower probabilities of terminating employment mean more members will ultimately retire from the System therefore increasing costs. The most pronounced impact of lowering the probabilities of terminating employment is on the normal cost rate which is spread over a member's entire career. Therefore, although there was a small reduction in the unfunded actuarial accrued liability due to the changes in the retirement and disability assumptions, there was a significant increase in the normal cost rate from the changes in the termination assumption and the net impact was an increase in the amortization period of the unfunded actuarial accrued liability as detailed below.

The July 1, 2007 actuarial valuation had an amortization period of the unfunded actuarial accrued liability of 28.6 years, a normal cost rate of 10.40% of pay and an unfunded actuarial accrued liability funded by TRS contributions of \$768.9 million. The net impact of the assumptions recommended in the April 29, 2008 report on the measurements from the July 1, 2007 actuarial valuation would be to: increase the July 1, 2007 amortization period by 2.7 years, increase the normal cost rate from 10.40% to 10.87% of pay, and decrease the unfunded actuarial accrued liability funded by TRS contributions from \$768.9 million to \$756.1 million.

Our understanding is that the next experience study is currently planned to take place before the July 1, 2010 valuation and be a comprehensive experience study examining all assumptions.

Benefit Changes

No benefit changes are reflected in this valuation.

Contribution Changes

The contribution rate changes are documented at the beginning of this summary.

Method Changes

The only method change in this valuation is that a limit has been added that actuarial assets can not be less than 80% or more than 120% of market assets. This is consistent with our April 29, 2008 experience study report and had no impact on the results of this valuation.

Impact of Changes

The following table summarizes how experience has changed the Unfunded Actuarial Accrued Liability (UAAL) since the July 1, 2007 Actuarial Valuation. Further detail can be found in Table 12.

Changes in the Unfunded Actuarial Accrued Liability (UAAL)

(In millions)

July 1, 2007 Valuation UAAL funded by TRS contributions		\$768.9
Expected Increase	17.1	
New Assumptions	(10.6)	
Total Expected Increase		<u>6.5</u>
Expected July 1, 2008 UAAL		\$775.4
Experience Loss on Actuarial Liabilities	2.2	
Experience Loss on Actuarial Assets	17.0	
Total Experience Loss		<u>19.2</u>
July 1, 2008 Valuation UAAL funded by TRS contributions		\$794.6

Summary

- The System's market value investment return of -4.88% for the year ended June 30, 2008 is 12.63% less than the actuarial assumption of 7.75%. This represents an asset loss of \$401 million due to investment return less than anticipated. Only one fourth of this loss has been recognized in the July 1, 2008 actuarial assets. The July 1, 2008 market value of assets is \$166 million less than the actuarial value of assets. This \$166 million loss will be recognized in future actuarial valuations unless it is offset by returns larger than the 7.75% assumption.
- The amortization period of the Unfunded Actuarial Accrued Liability is 31.3 years. If market assets were used the amortization period would be 44.7 years. The guidance in the Board's Funding and Benefits Policy indicates the Board should "recommend to the legislature that funding be increased and/or liabilities be reduced." The Policy's ultimate goal is to increase the current net funded ratio of 79.9% above 110% to encourage stable contribution rates.
- The funding of the retirement system will be impacted by future experience which will sometimes be more favorable than the actuarial assumptions and sometimes less favorable. In particular, investment returns larger and smaller than the 7.75% assumption are expected to have significant impacts on the System's funding progress. In the long term, the favorable experience is needed to offset the less favorable experience. This is the reason for using an actuarial value of assets that smoothes gains and losses over four years.

The table on the following page summarizes the key valuation results.

Summary of Key Valuation Results

	2008 Valuation	2007 Valuation	Percentage Change
1. Total Membership			
A. Active Members (Annual Pay \$1,000 or more)	17,771	17,628	0.8%
B. Active Members (Annual Pay under \$1,000)	521	548	(4.9%)
C. Vested Terminated Members	1,649	1,671	(1.3%)
D. Non-vested Terminated Members	9,574	8,963	6.8%
E. Retired Members and Beneficiaries	<u>11,788</u>	<u>11,356</u>	3.8%
F. Total Membership	41,303	40,166	2.8%
2. Annual Salaries			
A. Annual Total (<i>\$Thousands</i>)	\$ 657,435	\$ 629,501	4.4%
B. Annual Average per Active Member	\$ 36,995	\$ 35,710	3.6%
3. Average Annual Allowance Payable			
A. Service Retirement	\$ 18,816	\$ 18,249	3.1%
B. Disability Retirement	\$ 9,484	\$ 9,339	1.6%
C. Survivors & Beneficiaries	\$ 10,591	\$ 10,236	3.5%
D. All Payees	\$ 17,729	\$ 17,192	3.1%
4. Actuarial Accrued Liability (\$Millions)			
A. Active Members	\$ 1,724.1	\$ 1,684.0	2.4%
B. Inactive Members	73.7	73.4	0.4%
C. Retired Members and Beneficiaries	<u>2,313.0</u>	<u>2,171.1</u>	6.5%
D. Total AAL	\$ 4,110.8	\$ 3,928.5	4.6%
E. Less Present Value of Future University Supplemental Contributions	<u>157.1</u>	<u>153.4</u>	2.4%
F. AAL Funded by TRS Contributions	\$3,953.7	\$ 3,775.1	4.7%
5. Value of System Assets (\$Millions)			
A. Fair Value	\$ 2,993.4	\$ 3,209.3	(6.7%)
B. Smoothing Unrecognized Loss / (Reserve)	<u>165.7</u>	<u>(203.1)</u>	
C. Actuarial Value	3,159.1	3,006.2	5.1%
D. Ratio of Actuarial Value to Fair Value	105.5%	93.7%	
6. Funded Status (\$Millions)			
A. UAAL Funded by TRS Contributions	\$ 794.6	\$ 768.9	3.3%
B. Funded Ratio ($5C \div 4D$)	76.8%	76.5%	
C. Net Funded Ratio ($5C \div 4F$)	79.9%	79.6%	
7. Contribution Rates (Percent of Salaries)			
A. Statutory Funding Rate*	17.11%	17.11%	0.0%
B. Normal Cost Rate	<u>10.87%</u>	<u>10.40%</u>	4.5%
C. Available for Amortization of UAAL ($7A - 7B$)	6.24%	6.71%	(7.0%)
D. Period to Amortize	31.3	28.6	

* Statutory funding rate increases from 16.73% to 17.11% at July 1, 2009.

Teachers' Retirement System State of Montana

Section 2

Scope of the Report

This report presents the actuarial valuation of the Montana Teachers' Retirement System as of July 1, 2008.

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, 2008, 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.

Teachers' Retirement System State of Montana

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, 2008. 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 four-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 four years. The actuarial value of assets is not allowed to be greater than 120% or less than 80% of the market value of assets. The four-year smoothing method was adopted by the Board effective for the July 1, 2007 valuation. The actuarial value of assets was set equal to the market value of assets in the July 1, 2006 valuation.

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.

**Teachers' Retirement System
State of Montana**

Table 1

**Statement of Fiduciary Net Assets
June 30, 2008 and June 30, 2007**

	TOTAL TRS 2008	TOTAL TRS 2007
ASSETS		
Cash/Cash Equivalents-Short Term		
Investment Pool (Note A)	\$ 34,385,181	\$ 88,419,440
Receivables:		
Accounts Receivable	19,361,764	15,159,435
Interest Receivable	7,292,299	6,214,473
Due from Primary Government	3,327,119	170,489
Total Receivables	<u>\$ 29,981,182</u>	<u>\$ 21,544,397</u>
Investments, at fair value (Note A):		
Mortgages	\$ 27,120,606	\$ 31,399,861
Investment Pools	2,893,544,962	3,059,618,387
Other Investments	8,351,432	8,236,796
Securities Lending Collateral (Note A)	180,987,059	157,024,527
Total Investments	<u>\$ 3,110,004,059</u>	<u>\$ 3,256,279,571</u>
Assets Used in Plan Operations:		
Land and Buildings	\$ 193,844	\$ 193,844
Less: Accumulated Depreciation	(143,645)	(139,880)
Equipment	63,662	147,087
Less: Accumulated Depreciation	(48,999)	(131,200)
Prepaid Expense	647	9,812
Intangible Assets, net of amortization (Note D)	252,351	246,113
Total Other Assets	<u>\$ 317,860</u>	<u>\$ 325,776</u>
TOTAL ASSETS	<u>\$ 3,174,688,282</u>	<u>\$ 3,366,569,184</u>
LIABILITIES		
Accounts Payable	\$ 83,835	\$ 110,922
Due to Primary Government	18,603	34,740
Securities Lending Liability (Note A)	180,987,059	157,024,527
Compensated Absences (Note A)	158,675	139,888
OPEB Implicit Rate Subsidy	47,478	0
TOTAL LIABILITIES	<u>\$ 181,295,650</u>	<u>\$ 157,310,077</u>
NET ASSETS HELD IN TRUST FOR PENSION BENEFITS	<u>\$ 2,993,392,632</u>	<u>\$ 3,209,259,107</u>

**Teachers' Retirement System
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Table 2

**Statement of Changes in Fiduciary Net Assets
Fiscal Year Ended June 30, 2008 and 2007**

	TOTAL TRS 2008	TOTAL TRS 2007
ADDITIONS		
Contributions:		
Employer	\$ 67,930,235	\$ 61,935,701
Plan Member	59,560,549	56,500,655
Other	13,492,375	720,266
Total Contributions	<u>\$ 140,983,159</u>	<u>\$ 119,156,622</u>
Misc Income	\$ 15,654	\$ 15,633
Payment from Primary Government	0	50,000,000
Investment Income:		
Net Appreciation/(Depreciation) in Fair Value of Investments	\$ (236,359,446)	\$ 354,302,356
Investment Earnings	96,731,693	137,540,095
Security Lending Income (Note A)	9,544,163	5,815,626
Investment Income/(Loss)	<u>\$ (130,083,590)</u>	<u>\$ 497,658,077</u>
Less: Investment Expense	15,425,847	7,616,254
Less: Security Lending Expense (Note A)	7,802,791	5,509,847
Net Investment Income/(Loss)	<u>\$ (153,312,228)</u>	<u>\$ 484,531,976</u>
Total Additions	<u>\$ (12,313,415)</u>	<u>\$ 653,704,231</u>
DEDUCTIONS		
Benefit Payments	\$ 196,060,216	\$ 182,826,747
Withdrawals	5,694,601	5,594,541
Administrative Expense (Note D)	1,750,765	1,434,103
OPEB Expenses	47,478	0
Loss on Intangible Asset	0	501,575
Transfer out	0	205
Total Deductions	<u>\$ 203,553,060</u>	<u>\$ 190,357,171</u>
NET INCREASE (DECREASE) IN PLAN NET ASSETS	\$ (215,866,475)	\$ 463,347,060
NET ASSETS HELD IN TRUST FOR PENSION BENEFITS		
BEGINNING OF YEAR	3,209,259,107	2,745,771,047
Prior Period Adjustment	0	141,000
END OF YEAR	<u><u>\$ 2,993,392,632</u></u>	<u><u>\$ 3,209,259,107</u></u>

**Teachers' Retirement System
State of Montana**

Table 3

**Determination of Actuarial Value of Assets
July 1, 2008**

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

A. Expected investment return – Year Ended 6/30/2008	\$	246,362,679
B. Actual investment return – Year Ended 6/30/2008	\$	(155,094,817)
C. Gains/(losses) – 2008 [B-A]	\$	(401,457,496)
D. Gains/(losses) – 2007	\$	270,701,976
E. Gains/(losses) – 2006		N/A
F. Gains/(losses) – 2005		N/A
G. Gains/(losses) recognized at July 1, 2008* [$\frac{1}{4}$ C + $\frac{1}{4}$ D + $\frac{1}{4}$ E + $\frac{1}{4}$ F]	\$	(32,688,880)

Determination of Actuarial Assets

Actuarial value of assets July 1, 2007		\$ 3,006,232,625	
Contributions less benefits	\$ (60,771,658)		
Expected investment return	246,362,679		
Recognized investment gains/(losses)	<u>(32,688,880)</u>	<u>152,902,141</u>	
Actuarial value of assets July 1, 2008		3,159,134,766	
Unrecognized Gain/(Loss)		<u>(165,742,134)</u>	
Market Value of Assets July 1, 2008 (Actuarial Value + Unrecognized Gain/(Loss))		\$ 2,993,392,632	

* Includes rounding adjustment, if necessary.

**Teachers' Retirement System
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Table 4

Schedule of Investment Gain/(Loss) Recognition (in Millions)

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 2008	Investment Gain/(Loss) to be Recognized in Future Years		
		2005	2006	2007		2009	2010	2011
2005	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0			
2006	\$0.0		\$0.0	\$0.0	\$0.0	\$0.0		
2007	\$270.7			\$67.7	\$67.7	\$67.7	\$67.7	
2008	(\$401.5)			(\$100.4)	(\$100.4)	(\$100.4)	(\$100.4)	(\$100.4)
2009	\$0.0				\$0.0	\$0.0	\$0.0	\$0.0
2010	\$0.0					\$0.0	\$0.0	\$0.0
2011	\$0.0							\$0.0

Total Gain/(Loss) Recognized at Each Valuation Date

Recognized			(\$32.7)	Scheduled to be Recognized**		
\$0.0	\$0.0	\$67.7		(\$32.7)	(\$32.7)	(\$32.7)

Unrecognized Gain/(Loss) Remaining			
(\$165.7)	(\$133.1)	(\$100.4)	\$0.0

* The current actuarial asset method was adopted for the July 1, 2007 actuarial valuation. Gains and losses recognized by prior methods are not shown in this exhibit.

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

**Teachers' Retirement System
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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)
Fiscal Year Ending	Market Returns	Actuarial Return	Actuarial Return Over 7.75% Assumption
June 30, 2005	8.04	2.71	(5.04)
June 30, 2006	8.91	8.46	0.71
June 30, 2007	17.64	10.22	2.47
June 30, 2008	(4.88)	7.18	(0.57)

* 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.

Teachers' Retirement System State of Montana

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. 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.

**Teachers' Retirement System
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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, 2008 Total	July 1, 2007 Total
A. Active members		
Service retirement	\$ 2,187.6	\$ 2,031.8
Disability retirement	15.8	24.6
Survivors' benefits	47.4	40.2
Vested Retirement	26.0	34.9
Refund of Member Contributions	27.5	34.0
Total	\$ 2,304.3	\$ 2,165.5
B. Inactive members and annuitants		
Service retirement	\$ 2,161.3	\$ 2,029.2
Disability retirement	18.8	18.7
Beneficiaries*	132.9	123.2
Vested terminated members	58.1	59.2
Nonvested terminated members	15.6	14.2
Total	\$ 2,386.7	\$ 2,244.5
C. Grand Total	\$ 4,691.0	\$ 4,410.0

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

Teachers' Retirement System State of Montana

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.

In an active system, there will always be a difference between the assets and the present value of all future benefits. 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. A description of the entry age actuarial cost method is provided in Appendix A. 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 an amount which is used to amortize is the UAAL.

The two items described above, normal cost and UAAL, 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, a 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 amount of assets available for benefits. Line E shows the UAAL. Lines F and G show the impact of the present value of future scheduled university supplemental contributions (described below) on the UAAL.

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 currently scheduled employer and member contribution rates are adequate to pay the total normal cost rate (10.87% of pay), and to pay additional amounts that will amortize (pay off) the UAAL over the next 31.3 years.

As was discussed in Section 3, the asset valuation method being used is a four-year smoothing method. In Tables 8 and 9, we have developed the UAAL, and the amortization period over which current contribution rates will eliminate the UAAL, on both an Actuarial Value of Assets basis and a Market Value of Assets basis. The key difference is that, under a Market Value of Assets basis, all investment gains and losses would be immediately recognized as they arise.

The amortization of the UAAL assumes university supplemental contributions are 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. The MUS valuations calculate contribution rates that finance the university member benefits with university contributions and reflect actual experience including investment returns. Therefore the university supplemental contribution rate has varied from time to time. Recently it has varied as follows:

Supplemental University 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, 2007
4.72%	June 30, 2008 to June 30, 2033*

* House Bill No. 63 enacted legislation that provided for increased university supplemental contributions, effective July 1, 2007.

The value of future supplemental university contributions included in the July 1, 2008 TRS valuation is \$157.1 million based on a 4.72% contribution rate until July 1, 2033.

The UAAL 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.

**Teachers' Retirement System
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Table 7

**Normal Cost Contribution Rates
As Percentages of Salary**

	July 1, 2008	July 1, 2007
	<u>Total</u>	<u>Total</u>
Service retirement	8.85%	7.96%
Disability retirement	0.11	0.17
Survivors' benefits	0.26	0.22
Vested retirement	0.45	0.63
Refund of member contributions	<u>1.20</u>	<u>1.42</u>
Total	10.87%	10.40%

**Teachers' Retirement System
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Table 8

**Unfunded Actuarial Accrued Liability
(All dollar amounts in millions)**

	July 1, 2008 (Actuarial Value of Assets Basis)*	July 1, 2007
A. Actuarial present value of all future benefits for present and former members and their survivors (Table 6)	\$ 4,691.0	\$ 4,410.0
B. Less actuarial present value of total future normal costs for present members	<u>580.2</u>	<u>481.5</u>
C. Actuarial accrued liability	\$ 4,110.8	\$ 3,928.5
D. Less assets available for benefits	<u>3,159.1</u>	<u>3,006.2</u>
E. Unfunded actuarial accrued liability	\$ 951.7	\$ 922.3
F. Less present value of future university supplemental contributions**	<u>157.1</u>	<u>153.4</u>
G. Unfunded actuarial accrued liability funded by TRS contributions	\$ 794.6	\$ 768.9

* *The numbers above are based on the actuarial value of assets. If the \$2,993.4 million market value of assets was used at July 1, 2008, then the unfunded actuarial accrued liability would be \$1,117.4 million and the unfunded actuarial accrued liability funded by TRS contributions would be \$960.3 million. The information in this footnote is provided in accordance with MCA 19-20-201, to show how market performance is affecting the actuarial funding of the retirement system.*

** *Paid by contributions to TRS made as a percentage of the salaries of the participants in the Optional Retirement Plan (ORP) to fund Montana University System member benefits. The percentage of salary will be a level 4.72% for the Fiscal Years through 2033.*

**Teachers' Retirement System
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Table 9

**Recommended Contribution Rates
As Percentages of Salary**

	<u>July 1, 2008 (Actuarial Value of Assets Basis)***</u>	<u>July 1, 2007</u>
A. Employer contribution rate*	9.96%	9.96%
B. Member contribution rate	<u>7.15</u>	<u>7.15</u>
C. Total contribution rate	17.11%	17.11%
D. Less total normal cost rate (Table 7)	<u>10.87</u>	<u>10.40</u>
E. Amount available to amortize unfunded actuarial accrued liability** (C – D)	6.24%	6.71%
F. Amortization period from Valuation Date**	31.3	28.6
G. 30 year amortization contribution rate increase**	0.17%	N/A
H. Total 30 year UAAL amortization rate (E + G)	6.41%	N/A
I. Total 30 year contribution rate (D + H)	17.28%	N/A

* The statutory employer rate increases from 9.58% to 9.96% at July 1, 2009. 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.

** As of July 1, 2008, the unfunded actuarial accrued liability does not amortize over 30 years. The employer contribution rate would have to be increased by 0.17% starting July 1, 2009 to maintain an amortization of the unfunded actuarial accrued liability over the 30-year period starting July 1, 2008. Alternatively, the employer contribution rate could be increased by 0.19% on July 1, of 2009 to achieve the same 30-year amortization.

*** The numbers above are based on the actuarial assets. Based on market assets, the amortization period at July 1, 2008 would be 44.7 years. Based on market assets, the required increase in the employer contribution rate to achieve a 30 year amortization would be 1.57% at July 1, 2009 or 1.75% at July 1, 2011. The information in this footnote is provided in accordance with MCA 19-20-201, to show how market performance is affecting the actuarial funding of the retirement system.

Teachers' Retirement System State of Montana

Table 10

Illustration of Projected TRS Contribution Rates Reflecting 31.3 Year Amortization of UAAL

Investment Assumption: 7.75%
 General Wage Increases: 4.50%
 Contribution Increase effective July 1, 2009: 0.38%

Fiscal Year	TRS Payroll			Total TRS Contribution	Normal Cost	Amortization	Amortization Payment	Amortization Payment Discounted to Valuation Date
	non-MUS	MUS	Total	Rate	Rate	Rate	Payment	Valuation Date
2009	641,361,268	34,183,140	675,544,408	16.73%	10.87%	5.86%	39,586,902	38,136,680
2010	670,222,526	31,558,223	701,780,749	17.11%	10.87%	6.24%	43,791,119	39,152,556
2011	700,382,539	28,954,203	729,336,742	17.11%	10.87%	6.24%	45,510,613	37,763,261
2012	731,899,753	26,475,228	758,374,981	17.11%	10.87%	6.24%	47,322,599	36,442,496
2013	764,835,242	23,832,770	788,668,012	17.11%	10.87%	6.24%	49,212,884	35,172,324
2014	799,252,828	21,401,947	820,654,775	17.11%	10.87%	6.24%	51,208,858	33,966,442
2015	835,219,206	19,058,419	854,277,625	17.11%	10.87%	6.24%	53,306,924	32,814,917
2016	872,804,070	16,876,445	889,680,515	17.11%	10.87%	6.24%	55,516,064	31,716,779
2017	912,080,253	14,740,561	926,820,814	17.11%	10.87%	6.24%	57,833,619	30,664,331
2018	953,123,864	12,636,091	965,759,955	17.11%	10.87%	6.24%	60,263,421	29,654,434
2019	996,014,438	10,894,748	1,006,909,186	17.11%	10.87%	6.24%	62,831,133	28,694,157
2020	1,040,835,088	9,258,824	1,050,093,912	17.11%	10.87%	6.24%	65,525,860	27,772,439
2021	1,087,672,667	8,007,687	1,095,680,354	17.11%	10.87%	6.24%	68,370,454	26,893,819
2022	1,136,617,937	6,896,952	1,143,514,889	17.11%	10.87%	6.24%	71,355,329	26,049,126
2023	1,187,765,744	5,852,923	1,193,618,667	17.11%	10.87%	6.24%	74,481,805	25,234,787
2024	1,241,215,202	4,982,690	1,246,197,892	17.11%	10.87%	6.24%	77,762,748	24,451,403
2025	1,297,069,887	4,227,837	1,301,297,724	17.11%	10.87%	6.24%	81,200,978	23,696,061
2026	1,355,438,031	3,543,839	1,358,981,870	17.11%	10.87%	6.24%	84,800,469	22,966,556
2027	1,416,432,743	3,021,832	1,419,454,575	17.11%	10.87%	6.24%	88,573,965	22,263,141
2028	1,480,172,216	2,500,440	1,482,672,656	17.11%	10.87%	6.24%	92,518,774	21,582,062
2029	1,546,779,966	2,151,249	1,548,931,215	17.11%	10.87%	6.24%	96,653,308	20,924,857
2030	1,616,385,065	1,811,158	1,618,196,223	17.11%	10.87%	6.24%	100,975,444	20,288,236
2031	1,689,122,392	1,493,079	1,690,615,471	17.00%	10.87%	6.13%	103,634,728	19,324,868
2032	1,765,132,900	1,270,919	1,766,403,819	17.00%	10.87%	6.13%	108,280,554	18,738,914
2033	1,844,563,881	1,081,719	1,845,645,600	17.00%	10.87%	6.13%	113,138,075	18,171,277
2034	1,927,569,255	868,510	1,928,437,765	17.00%	10.87%	6.13%	118,213,235	17,620,795
2035	2,014,309,872	722,994	2,015,032,866	17.00%	10.87%	6.13%	123,521,515	17,087,744
2036	2,104,953,816	561,351	2,105,515,167	17.00%	10.87%	6.13%	129,068,080	16,570,808
2037	2,199,676,738	480,318	2,200,157,056	17.00%	10.87%	6.13%	134,869,628	16,070,216
2038	2,298,662,191	406,812	2,299,069,003	17.00%	10.87%	6.13%	140,932,930	15,584,855
2039	2,402,101,989	333,975	2,402,435,964	17.00%	10.87%	6.13%	147,269,325	15,114,204
2040	2,510,196,579	281,387	2,510,477,966	17.00%	10.87%	6.13%	146,167,690	4,397,379

Present Value of Future Amortization Payments: 794,981,921

Teachers' Retirement System State of Montana

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.

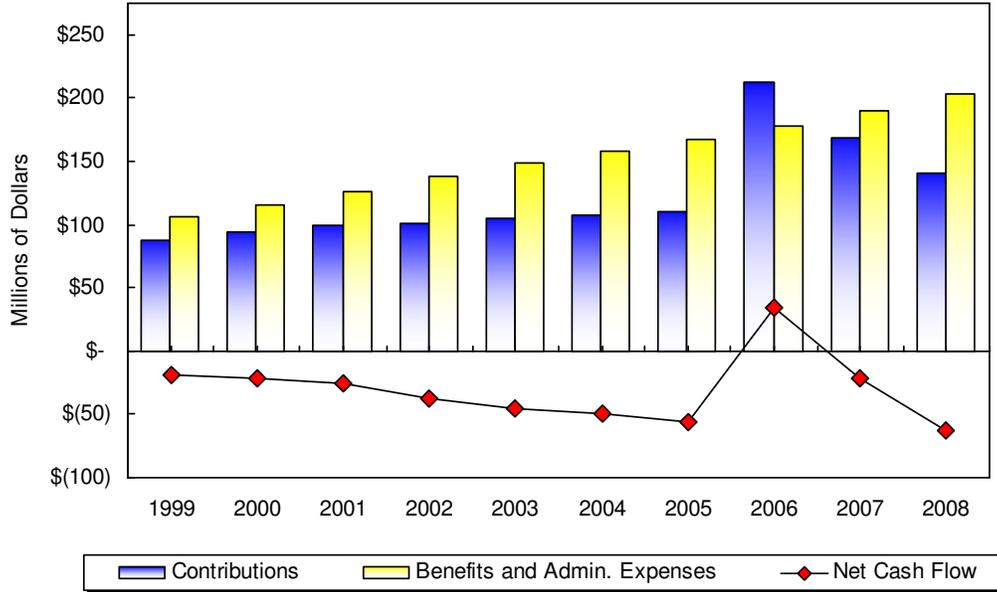
The chart on the following page and Table 11 show that in 1999 the System had a small negative cash flow. In the year ended June 30, 2008, the System's benefits and administrative expenses exceeded contributions by \$63 million. At the current contribution rates, benefits and administrative expenses are projected to continue to exceed contributions in future years, and this deficit is projected to increase to \$151 million for the year ending June 30, 2018.

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.

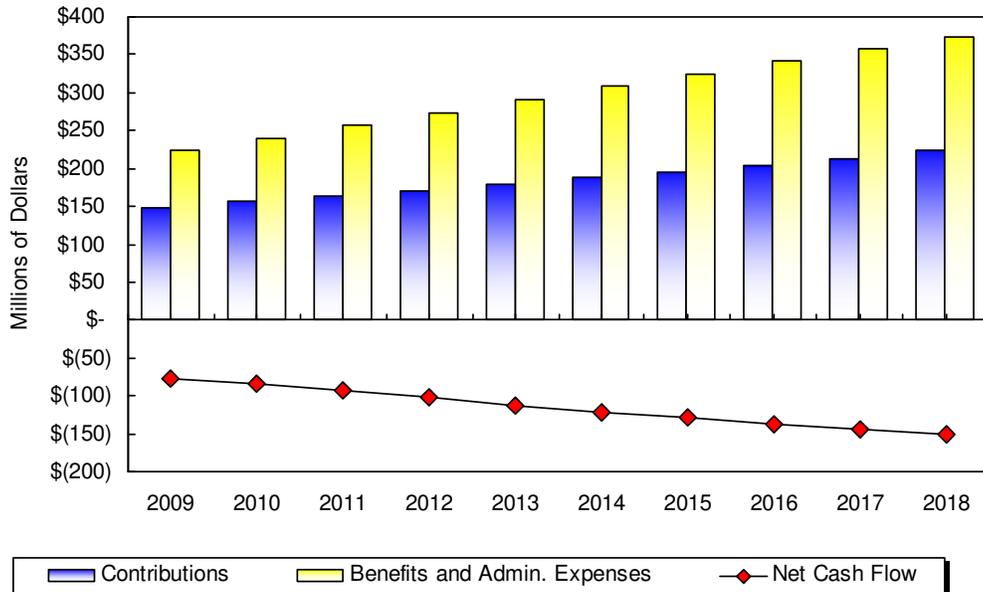
The projected contributions and administrative expenses are based on the actual amounts for the year ended June 30, 2008. Contributions are assumed to increase at the general wage increase assumption of 4.5%. Expenses are assumed to increase at the underlying inflation assumption of 3.5%. The future employer contribution rate is assumed to be 9.58% for the fiscal year ending June 30, 2009, increasing to 9.96% effective July 1, 2009.

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Cash Flow History



Cash Flow Projections



**Teachers' Retirement System
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Table 11

Cash Flow History and Projections

<u>Year Ended June 30.</u>	Historical Cash Flows*		
	<u>Contributions</u>	<u>Benefits & Administrative Expenses</u>	<u>Net Cash Flow</u>
1999	\$ 88	\$ 107	\$ (19)
2000	94	116	(22)
2001	100	126	(26)
2002	100	138	(38)
2003	104	149	(45)
2004	108	158	(50)
2005	111	167	(56)
2006	212 **	178	34
2007	169 ***	190	(21)
2008	141	204	(63)

<u>Year Ending June 30.</u>	Projected Cash Flows*		
	<u>Contributions</u>	<u>Benefits & Administrative Expenses</u>	<u>Net Cash Flow</u>
2009	\$ 147	\$ 224	\$ (77)
2010	157	240	(83)
2011	164	257	(93)
2012	171	273	(102)
2013	179	291	(112)
2014	187	308	(121)
2015	196	325	(129)
2016	204	341	(137)
2017	214	358	(144)
2018	223	374	(151)

* Millions of Dollars

** Reflects \$100 million transfer to TRS

*** Reflects \$50 million transfer to TRS

Teachers' Retirement System State of Montana

Section 7

Actuarial Gains or Losses

An analysis of actuarial gains or losses is performed in conjunction with all regularly scheduled valuations.

The results of our analysis of the financial experience of the System in the two most recent regular actuarial valuations are presented in Table 12. Each gain or loss shown represents our estimate of how much the given type of experience caused the Unfunded Actuarial Accrued Liability or Funding Reserve to change in the period since the previous actuarial valuation.

Gains and losses shown due to demographic sources are approximate. Demographic experience is analyzed in greater detail in our periodic assumption studies.

Non-recurring gains and losses result from changes in the actuarial assumptions and benefit improvements.

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Table 12

**Analysis of Actuarial Gains or Losses*
(Dollar Amounts in Millions)**

	UAAL (Gain)/Loss		
	2007 - 2008	2006 - 2007	2005 - 2006
Investment Income.			
Investment income was (greater) less than expected. Based on actuarial value of assets.	\$ 17.0	(\$67.7)	(\$17.9)
Pay Increases.			
Pay increases were (less) greater than expected.	4.8	2.5	(1.3)
Age & Service Retirements.			
Members retired at (older) younger ages or with (less) greater final average pay than expected.	(1.0)	(0.9)	(4.1)
Disability Retirements.			
Disability claims were (less) greater than expected.	0.2	0.2	0.3
Death-in-Service Benefits.			
Survivor claims were (less) greater than expected.	0.3	(1.0)	(0.2)
Withdrawal From Employment.			
(More) less reserves were released by withdrawals than expected.	1.7	7.2	6.5
Death After Retirement.			
Retirees (died younger) lived longer than expected.	(6.3)	0.5	(6.2)
Other.			
Miscellaneous (gains) and losses.	<u>2.5</u>	<u>(1.6)</u>	<u>17.6</u>
Total (Gain) or Loss During Period From Financial Experience.	\$ 19.2	\$(60.8)	\$ (5.3)
Non-Recurring Items.			
Changes in actuarial assumptions caused a (gain) loss.	(10.6)	0.0	24.0
Changes in benefits caused a (gain) loss.	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Composite (Gain) Loss During Period.	\$ 8.6	\$(60.8)	\$ 18.7

* Effects related to gains are shown in parentheses. Numerical results are expressed as a (decrease) increase in the Unfunded Actuarial Accrued Liability (UAAL). Gains decrease the UAAL and losses increase the UAAL.

Teachers' Retirement System State of Montana

Appendix A

Actuarial Procedures and Assumptions

For the July 1, 2008 valuation, retirement, disablement and termination of employment assumptions have been updated to reflect the Retirement Board's actions at the May 8, 2008 Retirement Board Meeting. These actions reflect the recommended changes in the 2001-2007 Investigation of Active Member Demographic Experience report.

The current asset valuation method was adopted for the July 1, 2007 valuation.

The current mortality assumptions were adopted for the July 1, 2006 valuation.

Economic assumptions were reviewed in the 2004 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 UAAL. The UAAL 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 UAAL was 9.58% of members' salaries. The employer contribution rate will increase to 9.96% at July 1, 2009. 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 UAAL 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.

Valuation of Assets - Actuarial Basis

The actuarial asset valuation method spreads asset gains and losses over four 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 four years. The gains and losses are measured starting with the year ended June 30, 2007. The actuarial value of assets is not allowed to be greater than 120% or less than 80% of the market assets. (Adopted effective July 1, 2007.)

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 has received benefits for 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, 2008. The rates for University Members were adopted July 1, 2008.

Disablement

The rates of disablement used in this valuation are illustrated in Table A-4. These rates were adopted July 1, 2008.

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, 2006.

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, 2008.

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 the greater of the present value of their deferred benefit at age 60 or 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. Their accumulated service was divided by this percentage to reflect their full benefit. 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, 2008 was \$7,644,302. Based on a contribution rate of 4.72%, we assumed the total ORP payroll for the fiscal year to be \$161,955,551 (\$7,644,302 divided by 4.72%).

Effective for fiscal years after June 30, 2007 until June 30, 2033, the Optional Retirement Program contribution rate is 4.72%, as described in House Bill No. 63.

Buybacks, Purchase of Service, and Military Service

The active liabilities and normal cost (excluding liabilities and normal cost in respect of Return of Employee Contributions) 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, 2008.

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.

Records with no Birth Date

New records with no birth date are assumed to be 25 years old. Records that are not new and have no birth date used the same birth date as the prior year's valuation.

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Table A-1

Summary of Valuation Assumptions (July 1, 2008)

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, 2008)	Table A-3
C.	Disablement (adopted July 1, 2008)	Table A-4
D.	Mortality among contributing members, service retired members, and beneficiaries	Table A-5
	For Males: RP 2000 Combined Mortality Table for Males, set back three years, with mortality improvements projected by Scale AA to 2008 (adopted July 1, 2006).	
	For Females: RP 2000 Combined Mortality Table for Females, set back two years, with mortality improvements projected by Scale AA to 2008 (adopted July 1, 2006).	
E.	Mortality among disabled members	Table A-5
	For Males: RP 2000 Disabled Mortality Table for Males, set back three years, with mortality improvements projected by Scale AA to 2008 (adopted July 1, 2006).	
	For Females: RP 2000 Disabled Mortality Table for Females, set forward three years, with mortality improvements projected by Scale AA to 2008 (adopted July 1, 2006).	
F.	Other terminations of employment (adopted July 1, 2008)	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

Years of Service	General Members			University Members		
	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

**Teachers' Retirement System
State of Montana**

Table A-3

**Retirement
Annual Rates**

Age	General Members			University Members		
	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%	7.0%		9.0%	5.0%
46		18.0	7.0		9.0	5.0
47		12.5	7.0		9.0	5.0
48		12.5	7.0		9.0	5.0
49	*	12.5	7.0	*	9.0	5.0
50	3.0%	12.5	7.0	1.9%	9.0	5.0
51	3.0	16.0	7.5	2.2	9.0	5.0
52	3.0	16.0	8.0	2.5	9.0	5.0
53	3.0	16.0	8.5	2.8	9.0	5.0
54	3.0	16.0	9.0	3.1	9.0	5.0
55	5.0	24.0	11.0	3.4	15.0	5.0
56	5.0	24.0	12.0	3.7	15.0	6.0
57	5.0	24.0	13.0	4.0	15.0	6.0
58	5.0	24.0	14.0	4.3	15.0	6.0
59	5.0	24.0	16.0	4.7	15.0	7.0
60	*	17.0	21.0	*	15.0	10.0
61		21.0	21.0		14.0	14.0
62		25.0	25.0		20.0	20.0
63		22.0	22.0		14.0	14.0
64		23.0	23.0		20.0	20.0
65		33.0	33.0		28.0	28.0
66		26.0	26.0		21.0	21.0
67		22.0	22.0		21.0	21.0
68		20.0	20.0		21.0	21.0
69		20.0	20.0		21.0	21.0
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**

<u>Age</u>	<u>All Members</u>
25	.010%
30	.010
35	.020
40	.030
45	.050
50	.080
55	.100
60	.120

**Teachers' Retirement System
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Table A-5

**Mortality
Annual Rates**

Age	Contributing Members, Service Retired Members and Beneficiaries		Disabled Members	
	Men	Women	Men	Women
25	.03%	.02%	1.97%	.68%
30	.04	.02	2.17	.69
35	.05	.04	2.17	.67
40	.09	.05	2.17	.66
45	.11	.08	2.08	.85
50	.15	.12	2.23	1.31
55	.23	.20	2.69	1.89
60	.41	.38	3.32	2.43
65	.78	.73	3.99	3.19
70	1.45	1.29	4.90	4.33
75	2.42	2.17	6.15	6.01
80	4.22	3.55	8.30	8.30
85	7.55	5.91	11.43	11.86

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Table A-6

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

Years of Service	All Members
1	36.0%
2	16.0
3	12.0
4	9.0
5	7.0
6	6.5
7	6.0
8	5.5
9	5.1
10	4.7
11	4.3
12	3.9
13	3.5
14	3.2
15	2.9
16	2.6
17	2.3
18	2.0
19	1.9
20	1.8
21	1.7
22	1.6
23	1.5
24	1.5

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Table A-7

**Probability of Retaining Membership in the System
Upon Vested Termination**

<u>Age</u>	<u>Probability of Retaining Membership</u>
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	Five 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 three 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 five years of service.
Benefit:	The retirement benefit is equal to 1/60 of final compensation for each year of service.
Early Retirement Benefits	
Eligibility:	Five 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: Five 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: Five 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 five years of service, the accumulated employee contributions with interest are returned. With more than five 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: 9.58% of compensation, 9.96% starting July 1, 2009.

MCA 19-20-604 specifies that the employer contribution rate will be reduced by 0.11% when the amortization period of the System's UAAL 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 2.0% 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 has received benefits for at least 36 months prior to January 1 of the year in which the adjustment is to be made.

**Teachers' Retirement System
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Appendix C

Valuation Data

This valuation is based upon the membership of the System as of July 1, 2008. 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	12,694	\$ 592.5
Part-Time Members*	<u>5,077</u>	<u>64.9</u>
Total Contributing Members*	17,771	\$ 657.4
Active Members with Annual Compensation less than \$1,000	<u>521</u>	
Total Active Members	18,292	

* 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, 2007 to July 1, 2008.

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	10,257	\$ 192,995	\$ 18,816
Survivors of Deceased Retired Members	<u>888</u>	<u>10,407</u>	<u>11,720</u>
Total Service Retirement (including survivors)	11,145	203,402	18,251
Disability Retirement	203	1,925	9,484
Survivors of Deceased Active Members	408	3,581	8,778
Child Beneficiaries	<u>32</u>	<u>77</u>	<u>2,400</u>
Total Annuitants	11,788	\$ 208,985	\$ 17,729

Terminated Members with Contributions Not Withdrawn	Number
Vested Terminated Members	1,649
Non-Vested Terminated Members	<u>9,574</u>
Total Terminated Members	11,223

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Table C-1

**Active Members Distribution of
Full-Time Employees and Salaries
as of July 1, 2008**

Number of Employees

Age	Completed Years of Service											Totals		
	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+	
<25	23	78	18	-	1	-	-	-	-	-	-	-	-	120
25 to 29	42	291	273	383	125	-	-	-	-	-	-	-	-	1,114
30 to 34	17	142	141	222	670	82	-	-	-	-	-	-	-	1,274
35 to 39	9	100	85	150	437	558	84	-	-	-	-	-	-	1,423
40 to 44	8	54	54	108	285	359	499	74	-	-	-	-	-	1,441
45 to 49	10	58	48	100	272	281	402	460	136	-	-	-	-	1,767
50 to 54	5	43	53	91	227	283	347	431	506	129	-	-	-	2,115
55 to 59	3	28	26	51	175	204	336	339	411	456	120	-	-	2,149
60 to 64	2	20	12	23	65	97	146	165	165	168	193	19	-	1,075
65 to 69	-	5	3	-	15	20	19	25	18	19	27	21	-	172
70 and up	1	2	-	1	3	4	2	5	3	6	5	12	-	44
Totals	120	821	713	1,129	2,275	1,888	1,835	1,499	1,239	778	345	52	-	12,694



This work product was prepared solely for the Montana Teachers' Retirement System. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

**Teachers' Retirement System
State of Montana**

Table C-1

**Active Members Distribution of
Full-Time Employees and Salaries
as of July 1, 2008**

Annual Salaries in Thousands

Age	Completed Years of Service												Totals	
	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+		
<25	304	2,257	540	-	35	-	-	-	-	-	-	-	-	3,136
25 to 29	569	8,607	8,493	12,229	4,328	-	-	-	-	-	-	-	-	34,226
30 to 34	248	4,546	4,710	7,711	25,565	3,602	-	-	-	-	-	-	-	46,382
35 to 39	160	3,456	2,839	5,454	17,568	25,837	4,128	-	-	-	-	-	-	59,442
40 to 44	110	1,780	2,022	4,071	11,753	16,766	25,983	3,960	-	-	-	-	-	66,445
45 to 49	148	1,798	1,775	3,789	11,058	12,900	21,126	25,333	7,311	-	-	-	-	85,238
50 to 54	74	1,647	2,023	3,520	9,454	13,317	18,426	23,436	28,951	7,671	-	-	-	108,519
55 to 59	61	1,016	1,033	2,104	7,657	9,576	17,025	18,828	23,529	26,953	7,013	-	-	114,795
60 to 64	32	819	414	849	3,117	4,672	7,635	9,211	10,261	11,213	11,738	1,210	-	61,171
65 to 69	-	252	96	-	799	1,002	941	1,375	1,158	1,258	1,840	1,451	-	10,172
70 and up	11	83	-	36	148	155	288	290	142	410	404	1,021	-	2,988
Totals	1,717	26,261	23,945	39,763	91,482	87,827	95,552	82,433	71,352	47,505	20,995	3,682	-	592,514

**Teachers' Retirement System
State of Montana**

Table C-1

**Active Members Distribution of
Full-Time Employees and Salaries
as of July 1, 2008**

Average Annual Salary

Age	Completed Years of Service												Totals	
	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+		
<25	13,198	28,934	30,013	-	34,602	-	-	-	-	-	-	-	-	26,127
25 to 29	13,558	29,578	31,110	31,929	34,622	-	-	-	-	-	-	-	-	30,724
30 to 34	14,569	32,017	33,404	34,736	38,156	43,928	-	-	-	-	-	-	-	36,407
35 to 39	17,754	34,558	33,404	36,358	40,201	46,303	49,140	-	-	-	-	-	-	41,772
40 to 44	13,802	32,959	37,441	37,694	41,240	46,702	52,070	53,510	-	-	-	-	-	46,110
45 to 49	14,826	31,005	36,984	37,889	40,656	45,906	52,553	55,072	53,758	-	-	-	-	48,239
50 to 54	14,792	38,310	38,170	38,681	41,647	47,056	53,101	54,375	57,216	59,467	-	-	-	51,309
55 to 59	20,473	36,300	39,716	41,260	43,754	46,941	50,669	55,539	57,247	59,108	58,445	-	-	53,418
60 to 64	15,876	40,953	34,536	36,912	47,957	48,161	52,293	55,821	62,188	66,747	60,817	63,663	-	56,902
65 to 69	-	50,325	32,164	-	53,272	50,115	49,504	55,019	64,317	66,219	68,143	69,110	-	59,143
70 and up	10,539	41,340	-	35,514	49,496	38,708	144,181	58,055	47,438	68,388	80,851	85,077	-	67,921
Totals	14,307	31,987	33,585	35,219	40,212	46,518	52,072	54,992	57,588	61,062	60,856	70,805	-	46,677

**Teachers' Retirement System
State of Montana**

Table C-1

**Active Members Distribution of
Part-Time Employees
as of July 1, 2008**

Number of Employees

Age	Completed Years of Service												Totals	
	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+		
<25	105	26	4	1	-	-	-	-	-	-	-	-	-	136
25 to 29	192	112	41	51	27	-	-	-	-	-	-	-	-	423
30 to 34	114	73	47	57	70	18	-	-	-	-	-	-	-	379
35 to 39	119	108	69	75	81	54	23	-	-	-	-	-	-	529
40 to 44	109	111	78	119	149	39	48	21	-	-	-	-	-	674
45 to 49	92	104	82	119	210	95	35	27	20	-	-	-	-	784
50 to 54	72	78	68	104	213	130	69	31	19	15	-	-	-	799
55 to 59	51	74	58	89	176	124	95	37	16	17	9	-	-	746
60 to 64	41	33	35	40	76	59	48	20	15	5	6	2	-	380
65 to 69	13	16	9	19	29	21	20	9	6	2	1	3	-	148
70 and up	7	6	7	8	26	12	3	4	1	2	1	2	-	79
Totals	915	741	498	682	1,057	552	341	149	77	41	17	7	-	5,077

**Teachers' Retirement System
State of Montana**

Table C-2

Distribution of Inactive Lives

Members Receiving Service Retirement Benefits as of July 1, 2008

<u>Age</u>	<u>Number of Persons</u>	<u>Annual Benefits in Thousands</u>	<u>Average Annual Benefits</u>
<50	27	\$ 611	\$ 22,637
50 to 54	262	5,153	19,666
55 to 59	1,093	23,135	21,166
60 to 64	2,222	47,616	21,429
65 to 69	2,213	46,120	20,840
70 to 74	1,572	30,247	19,241
75 to 79	1,177	20,200	17,163
80 to 84	762	10,568	13,869
85 to 89	521	5,898	11,320
90 and up	408	3,447	8,449
Total	10,257	192,995	18,816

Members Receiving Disability Retirement Benefits as of July 1, 2008

<u>Age</u>	<u>Number of Persons</u>	<u>Annual Benefits in Thousands</u>	<u>Average Annual Benefits</u>
<50	10	\$ 95	\$ 9,470
50 to 54	14	136	9,698
55 to 59	35	330	9,426
60 to 64	46	489	10,629
65 to 69	27	266	9,842
70 to 74	25	251	10,040
75 to 79	18	147	8,171
80 to 84	15	129	8,572
85 to 89	7	52	7,444
90 and up	6	32	5,254
Total	203	1,925	9,484

**Teachers' Retirement System
State of Montana**

Table C-2

Distribution of Inactive Lives

Survivors of Deceased Retired Members as of July 1, 2008

<u>Age</u>	<u>Number of Persons</u>		<u>Annual Benefits in Thousands</u>		<u>Average Annual Benefits</u>
<50	32	\$	218	\$	6,820
50 to 54	26		268		10,324
55 to 59	45		507		11,272
60 to 64	87		1,093		12,567
65 to 69	114		1,571		13,779
70 to 74	123		1,794		14,588
75 to 79	114		1,524		13,365
80 to 84	132		1,458		11,042
85 to 89	135		1,264		9,362
90 and up	80		710		8,875
Total	888		10,407		11,720

Survivors of Deceased Active Members as of July 1, 2008

<u>Age</u>	<u>Number of Persons</u>		<u>Annual Benefits in Thousands</u>		<u>Average Annual Benefits</u>
<50	76	\$	426	\$	5,601
50 to 54	36		257		7,136
55 to 59	50		458		9,161
60 to 64	62		636		10,257
65 to 69	44		482		10,962
70 to 74	39		371		9,522
75 to 79	36		378		10,508
80 to 84	30		335		11,175
85 to 89	25		186		7,432
90 and up	10		52		5,180
Total	408		3,581		8,778

**Teachers' Retirement System
State of Montana**

Table C-2

Distribution of Inactive Lives

**Terminated Vested Members as of July 1, 2008
Number of Persons**

Age	Number
<25	-
25 to 29	4
30 to 34	79
35 to 39	156
40 to 44	197
45 to 49	261
50 to 54	360
55 to 69	412
60 to 64	147
65 to 69	30
70 & above	3
Total	1,649

**Child Beneficiaries as of July 1, 2008
Number of Persons**

Age	Number
<5	1
5 to 6	1
7 to 8	1
9 to 10	5
11 to 12	7
13 to 14	4
15 to 16	9
17 to 18	4
Total	32

**Teachers' Retirement System
State of Montana**

Table C-3

Data Reconciliation

	Active Contributing <u>Members</u>	Vested Terminated <u>Members</u>	Service Retired <u>Members</u>	Disabled <u>Members</u>	Survivors and <u>Beneficiaries</u>
July 1, 2007 Valuation	17,628	1,671	9,881	203	1,272
Refunds and NonVested Terminations	(1,152)	(82)	-	-	-
Change to Annual Pay under \$1,000	(108)	(10)	-	-	-
Vested Terminations	(231)	231	-	-	-
Service Retirements	(533)	(79)	612	-	-
Disability Retirements	(8)	-	-	8	-
Deaths with Beneficiary	(19)	(1)	(82)	(5)	107
Deaths without Beneficiary	(11)	(3)	(160)	(3)	(66)
New Entrants	1,521	-	-	-	-
Rehires	684	(77)	(14)	-	-
Other	-	(1)	20	-	15
July 1, 2008 Valuation	17,771	1,649	10,257	203	1,328

Teachers' Retirement System State of Montana

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 State of Montana

Table D-1

Active Membership Data

Valuation Date (July 1)	Active Members								
	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
2005	12,523	5,019	17,542	697	523,909	41,836	45.8	12.4	33.4
2006	12,715	4,840	17,555	544	549,268	43,198	46.0	12.5	33.5
2007	12,634	4,994	17,628	548	568,351	44,986	46.2	12.5	33.7
2008	12,694	5,077	17,771	521	592,514	46,677	46.1	12.3	33.8

* *Not available.*

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

**Teachers' Retirement System
State of Montana**

Table D-2

Retired and Inactive Membership Data

Valuation Date (July 1)	All Annuitants					Terminated Members	
	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
2005	10,664	170,129	15,954	69.3	56.7	1,649	8,569
2006	11,019	181,114	16,436	69.3	56.5	1,684	8,542
2007	11,356	195,237	17,192	69.3	56.6	1,671	8,963
2008	11,788	208,985	17,729	69.4	56.7	1,649	9,574

* Not available.

**Teachers' Retirement System
State of Montana**

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%
2005	7.15%	7.58%	14.73%	10.35%	4.38%
2006	7.15%	7.58%	14.73%	10.37%	4.36%
2007	7.15%	9.58%	16.73%	10.40%	6.33%
2008	7.15%	9.58%***	16.73%	10.87%	5.86%

* The UAAL rate is the amount available to amortize the UAAL. It is equal to the total contribution rate, minus the normal cost rate.

** The 1999 Legislation which passed the 1.5% GABA, also added a 0.11% state general fund contribution.

*** This rate increases to 9.96% at July 1, 2009.

Teachers' Retirement System State of Montana

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.

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.

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.

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.

Market Value of Assets

The fair value of cash, investments and other property belonging to a pension plan that could be acquired by exchanging them on the open market.

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.

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.

Unfunded Actuarial Accrued Liability

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