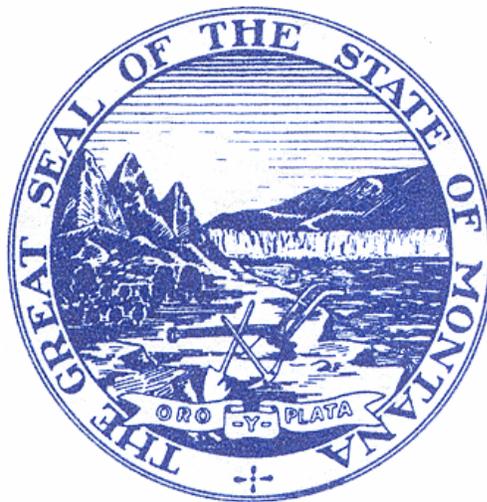**Teachers' Retirement System**
State of Montana

ACTUARIAL VALUATION
(As of July 1, 2006)

Prepared by:

Mark C. Olleman
Fellow, Society of Actuaries
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October 6, 2006

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, 2006.

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 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. 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. 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.

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.

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

Respectfully submitted,

Mark C. Olleman, FSA, EA, MAAA
Consulting Actuary
Joint Board Enrollment # 05-05636

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Teachers' Retirement System
State of Montana

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**Teachers' Retirement System
State of Montana**

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, 2006, we recommend contributions be increased above the current employer contribution rate, 7.58% of members' salaries. The System does not currently meet the requirements of actuarial soundness because the contributions do not amortize the Unfunded Actuarial Accrued Liability over 30 years. 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 3.38% (7.58% to 10.96%) as of July 1, 2007 is projected to maintain an amortization of the unfunded actuarial accrued liability over the 30 years beginning July 1, 2006. 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 a one-time infusion of cash such as was made on January 1, 2006.

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.

Additional $100 Million Contribution

An additional one-time contribution of $100 million was made at January 1, 2006. This made a large and immediate impact on the funding of TRS. If not for this contribution, we estimate the required contribution increase to maintain a 30 year amortization would have been 4.34% instead of 3.38% (0.96% of pay larger) and the July 1, 2006 Unfunded Actuarial Accrued Liability funded by TRS contributions would have been $966.9 million instead of $863.1 million ($103.8 million larger).

Investment Experience

The System experienced an asset gain over the last year. The market assets earned 8.91% net of investment and operating expenses. The actuarial assets earned 8.46% which is 0.71% above the actuarial assumption of 7.75%. The following chart compares the annual returns for the past six years.

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Year	Market Return	Actuarial Return	Actuarial Return over 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)%
7/1/2004 to 6/30/2005	8.0%	2.7%	(5.0)%
7/1/2005 to 6/30/2006	8.9%	8.5%	0.7%

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 actuarial return on assets has under performed the assumption by about 20% in the last six years (combined) as shown in the accumulation of the last column of the chart. These losses have led to a need for increased contributions.

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 recognition of these two years of market losses kept the actuarial return on assets below the assumption until this past year. The Retirement Board adopted the market value of assets to be used as the actuarial value assets for this report at their May, 2006 meeting. Therefore, there are no unrecognized asset gains or losses as of July 1, 2006.

Future Experience

The future funding status of the System and any changes in future contribution rates will be determined by the System's experience. In the future, the System's actual asset returns, salary increases, and retirement, withdrawal, disability and death rates will all impact the funding status of the System. The entry age normal cost method will help to provide a more orderly funding of the System's liabilities, but will not change the actual experience. The actuarially determined contribution rate may not be stable, and will reflect gains and losses.

Summary

Although the January 1, 2006 one-time contribution of $100 million made a substantial impact on the funding of TRS, the System still does not meet the requirements of actuarial soundness. This is because the contributions do not amortize the Unfunded Actuarial Accrued Liability over a reasonable period. To stay financially sound in the future, the System will need either (1) future gains such as asset returns well over the 7.75% assumption, or (2) additional contributions. Additional contributions could take the form of a one time increase in contribution rates, a set of contribution increases graded in over a number of years, or large additional contributions made outside the percent of pay contributions such as the $100 million contributed at January 1, 2006. All these options are shown in Table 7 and its footnotes.

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Assumption Changes

The mortality assumptions were changed for this valuation. Our study of the System's mortality was documented in our May 2006 report and the Board adopted new assumptions at their May 2006 Board meeting.

Benefit Changes

No benefit changes since the July 1, 2005 valuation are reflected in this valuation.

Contribution Changes

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

Method Changes

The Retirement Board adopted the market value of assets to be used as the actuarial value of assets for this report at their May 2006 meeting. There are therefore no unrecognized asset gains or losses in this valuation. There were $10 million in unrecognized asset losses in the July 1, 2005 actuarial valuation.

Impact of Changes

The following table summarizes how experience has changed the Unfunded Actuarial Accrued Liability (UAAL) since the July 1, 2005 Actuarial Valuation.

Changes in the Unfunded Actuarial Accrued Liability (UAAL)

(In millions)

July 1, 2005 Valuation UAAL funded by TRS contributions		$903.3
Expected Increase without Assumption change	44.9	
New Mortality Assumptions	24.0	
Total Expected Increase		68.9
Expected July 1, 2006 UAAL		$972.2
Retired Mortality Gain		(6.2)
Active Member Experience		
Salary Gain	($1.3)	
Withdrawal Loss	6.5	
Retirement Gain	(4.1)	
Active Member Mortality Gain	(0.2)	
Active Member Disability Loss	0.3	
Total Active Member Experience Loss		$1.2
Experience Gain on Actuarial Assets		(17.9)
Loss from Other Causes		17.6
July 1, 2006 UAAL before $100 million contribution		966.9
$100 million contribution at January 1, 2006		($103.8)
July 1, 2006 Valuation UAAL funded by TRS contributions		$863.1

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

Summary of Key Valuation Results

		2006 Valuation	2005 Valuation	Percentage Change
1.	**Total Membership**			
	A. Active Members (Annual Pay $1,000 or more)	17,555	17,542	0.1%
	B. Active Members (Annual Pay under $1,000)	544	697	-22.0%
	C. Vested Terminated Members	1,684	1,649	2.1%
	D. Non-vested Terminated Members	8,542	8,569	-0.3%
	E. Retired Members and Beneficiaries	11,019	10,664	3.3%
	F. Total Membership	39,344	39,121	0.6%
2.	**Annual Salaries**			
	A. Annual Total *($Thousands)*	$ 606,989	$ 585,885	3.6%
	B. Annual Average per Active Member	$ 34,576	$ 33,399	3.5%
3.	**Average Annual Allowance Payable**			
	A. Service Retirement	$ 17,452	$ 16,951	3.0%
	B. Disability Retirement	$ 9,049	$ 8,794	2.9%
	C. Survivors & Beneficiaries	$ 9,877	$ 9,584	3.1%
	D. All Payees	$ 16,436	$ 15,954	3.0%
4.	**Actuarial Accrued Liability** *($Millions)*			
	A. Active Members	$ 1,627.0	$ 1,547.8	5.1%
	B. Inactive Members	72.8	69.9	4.1%
	C. Retired Members and Beneficiaries	2,033.8	1,909.3	6.5%
	D. Total AAL	$ 3,733.6	$ 3,527.0	5.9%
	E. Less Present Value of Future University Supplemental Contributions	124.7	126.2	-1.2%
	F. AAL Funded by TRS Contributions	$ 3,608.9	$3,400.8	6.1%
5.	**Value of System Assets** *($Millions)*			
	A. Fair Value	$ 2,745.8	$ 2,487.1	10.4%
	B. Smoothing Unrecognized Loss / (Reserve)	0.0	10.4	
	C. Actuarial Value	2,745.8	2,497.5	9.9%
	D. Ratio of Actuarial Value to Fair Value	100.0%	100.4%	
6.	**Funded Status** *($Millions)*			
	A. Unfunded Actuarial Accrued Liability Funded by TRS Contributions*	$ 863.1	$ 903.3	-4.5%
	B. Funded Ratio *(5C ÷ 4D)*	73.5%	70.8%	
	C. Net Funded Ratio *(5C ÷ 4F)*	76.1%	73.4%	
7.	**Contribution Rates** *(percent of salaries)*			
	A. Statutory Funding Rate	14.73%	14.73%	0.0%
	B. Normal Cost Rate	10.37%	10.35%	0.2%
	C. Available for Amortization of UAL *(7A – 7B)*	4.36%	4.38%	-0.5%
	D. Period to Amortize	Does not amortize	Does not amortize	
	E. Projected 30-Year Level Funding Rate	18.11%	18.79%	-3.6%
	F. Projected Shortfall (Surplus) *(7E – 7A)* *	3.38%	4.06%	-16.7%

* Had $100 million not been contributed at January 1, 2006 we estimate the July 1, 2006 UAAL shown on line 6A would have been $966.9 million and the projected shortfall shown on line 7F would have been 4.34%.

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, 2006.

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, 2006, 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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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, 2006. 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 market value of assets is used as the actuarial value of assets in this valuation. This method was adopted for the July 1, 2006 valuation; prior to this date, any gains or losses on assets were 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 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, 2006 and June 30, 2005

	TOTAL TRS 2006	TOTAL TRS 2005
ASSETS		
Cash/Cash Equivalents-Short Term Investment Pool (Note B)	$ 71,802,925	$ 31,855,506
Receivables:		
Accounts Receivable	15,236,623	15,321,348
Interest Receivable	5,556,602	5,709,232
Due from Primary Government	249,859	165,768
Total Receivables	$ 21,043,084	$ 21,196,348
Investments, at fair value (Note B):		
Mortgages	$ 36,712,095	$ 43,153,151
Investment Pools	2,607,713,723	2,382,433,759
Other Investments	8,056,730	7,949,031
Securities Lending Collateral	51,930,374	107,020,752
Total Investments	$ 2,704,412,922	$ 2,540,556,693
Assets Used in Plan Operations:		
Land and Buildings	$ 193,844	$ 193,844
Less: Accumulated Depreciation	(136,118)	(132,354)
Equipment	147,087	147,087
Less: Accumulated Depreciation	(129,561)	(127,921)
Prepaid Expense	4,452	3,126
Intangible Assets, net of amortization	607,086	691,795
Total Other Assets	$ 686,790	$ 775,577
TOTAL ASSETS	$ 2,797,945,721	$ 2,594,384,124
LIABILITIES		
Accounts Payable	$ 88,974	$ 77,551
Due to Primary Government	29,446	32,212
Securities Lending Liability (Note B)	51,930,374	107,020,752
Compensated Absences (Note B)	125,880	117,069
TOTAL LIABILITIES	$ 52,174,674	$ 107,247,584
NET ASSETS HELD IN TRUST FOR PENSION BENEFITS	$ 2,745,771,047	$ 2,487,136,540

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Teachers' Retirement System
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Table 2

Statement of Changes in Fiduciary Net Assets
Fiscal Year Ended June 30, 2006 and 2005

	TOTAL TRS 2006	TOTAL TRS 2005
ADDITIONS		
Contributions:		
Employer	$ 58,268,941	$ 57,150,364
Plan Member	53,292,921	52,900,262
Other	693,226	655,812
Total Contributions	$ 112,255,088	$ 110,706,438
Misc Income	$ 3,968	$ 98
Transfer in from Primary Government	100,000,000	0
Investment Income:		
Net Appreciation/(Depreciation) in Fair Value of Investments	$ 153,737,011	$ 112,888,982
Investment Earnings	74,818,519	79,373,616
Security Lending Income (Note B)	3,918,769	2,460,271
Investment Income/(Loss)	$ 232,474,299	$ 194,722,869
Less: Investment Expense	3,859,788	3,701,090
Less: Security Lending Expense (Note B)	3,827,250	2,287,406
Net Investment Income/(Loss)	$ 224,787,261	$ 188,734,373
Total Additions	$ 437,046,317	$ 299,440,909
DEDUCTIONS		
Benefit Payments	$ 171,956,507	$ 161,247,366
Withdrawals	4,876,148	4,340,382
Administrative Expense	1,579,155	1,560,820
Total Deductions	$ 178,411,810	$ 167,148,568
NET INCREASE (DECREASE) IN PLAN NET ASSETS	$ 258,634,507	$ 132,292,341
NET ASSETS HELD IN TRUST FOR PENSION BENEFITS BEGINNING OF YEAR	2,487,136,540	2,354,844,199
END OF YEAR	$ 2,745,771,047	$ 2,487,136,540

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Table 3

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

* *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.*

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, 2006. In this section, the discussion will focus on the commitments of the System, which will be referred to as its actuarial liabilities.

Table 4 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 4 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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Teachers' Retirement System
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Table 4

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

(All amounts are actuarial present values in millions)

	July 1, 2006 Total	July 1, 2005 Total
A. Active members		
Service retirement	$ 1,964.7	$ 1,870.9
Disability retirement	23.8	22.1
Survivors' benefits	39.1	43.5
Vested Retirement	33.6	31.9
Refund of Member Contributions	32.8	32.0
Total	$ 2,094.0	$ 2,000.4
B. Inactive members and annuitants		
Service retirement	$ 1,896.2	$ 1,780.3
Disability retirement	18.5	17.7
Beneficiaries*	119.1	111.3
Vested terminated members	59.8	57.0
Nonvested terminated members	13.0	12.9
Total	$ 2,106.6	$ 1,979.2
C. Grand Total	$ 4,200.6	$ 3,979.6

*   *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 1 and 4 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. 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. 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

- 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 5.

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 6 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 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 7 shows that the current employer and member contribution rates are adequate to pay the total normal cost rate (10.37% 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 3.38% (7.58% to 10.96%) as of July 1, 2007 is projected to maintain an amortization of the UAAL over the 30 years beginning July 1, 2006. 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 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. 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 supplemental university contributions was adopted:

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, 2033

The July 1, 2004 actuarial valuation of the MUS calculated a $144.4 million difference or shortfall between the value of MUS member benefits (not including GABA) and the value of MUS assets and future MUS member contributions. The contribution schedule has not been changed. The value of future supplemental university contributions included in the July 1, 2006 TRS valuation is $124.7 million based on a 4.04% contribution rate until July 1, 2033.

Table 8 illustrates the pattern of the total TRS contribution rate needed to amortize the UAAL over the next 30 years. The amortization payments for each year and their present values are also shown.

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.

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Teachers' Retirement System
State of Montana

Table 5

Normal Cost Contribution Rates
As Percentages of Salary

	July 1, 2006 Total	July 1, 2005 Total
Service retirement	7.94%	7.87%
Disability retirement	0.16	0.16
Survivors' benefits	0.22	0.26
Vested retirement	0.63	0.63
Refund of member contributions	1.42	1.43
Total	10.37%	10.35%

Teachers' Retirement System
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Table 6

Unfunded Actuarial Accrued Liability
(All dollar amounts in millions)

	July 1, 2006	July 1, 2005
A. Actuarial present value of all future benefits for present and former members and their survivors (Table 4)	$ 4,200.6	$ 3,979.6
B. Less actuarial present value of total future normal costs for present members	467.0	452.6
C. Actuarial accrued liability	$ 3,733.6	$ 3,527.0
D. Less actuarial value of assets available for benefits	2,745.8	2,497.5
E. Unfunded actuarial accrued liability	$ 987.8	$ 1,029.5
F. Less present value of future university supplemental contributions*	124.7	126.2
G. Unfunded actuarial accrued liability funded by TRS contributions**	$ 863.1	$ 903.3

* *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 4.04% for the Fiscal Years through 2033.*

** *Had $100 million not been contributed at January 1, 2006 we estimate the July 1, 2006 UAAL shown on line G would have been $966.9 million.*

Teachers' Retirement System
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Table 7

Recommended Contribution Rates
As Percentages of Salary

	July 1, 2006	July 1, 2005
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)	10.37	10.35
E. Amount available to amortize unfunded actuarial accrued liability** (C – D)	4.36%	4.38%
F. Amortization period from Valuation Date**	N/A	N/A
G. 30 year amortization contribution rate increase**	3.38%	4.06%
H. Total 30 year UAAL amortization rate (E + G)	7.74%	8.44%
I. Total 30 year contribution rate (D + H)	18.11%	18.79%

*   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, 2006, the unfunded actuarial accrued liability does not amortize over a reasonable period. The employer contribution rate would have to be increased by 3.38% starting July 1, 2007 to maintain an amortization of the unfunded actuarial accrued liability over the 30-year period starting July 1, 2006. Alternatively, the employer contribution rate could be increased by 1.00% on July 1, of 2007, 2009, 2011 and 2013 for a total increase of 4.00%. This graded increase would achieve the same 30-year amortization. A third alternative would be to contribute $100 million as a one-time event at July 1, 2007 and increase the employer contribution rate by 2.53% at July 1, 2007.

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Table 8

Illustration of TRS Contribution Rates
Needed to Meet a 30-Year Amortization Policy

Investment Assumption:	7.75%	
General Wage Increases:	4.50%	
Contribution Increase effective July 1, 2007:	3.38%	

Fiscal Year Ending	TRS Payroll non-MUS	TRS Payroll MUS	TRS Payroll Total	Total TRS Contribution Rate	Normal Cost Rate	Amortization Rate	Amortization Payment	Amortization Payment Discounted to Valuation Date
2007	584,561,264	39,169,839	623,731,103	14.73%	10.37%	4.36%	27,194,676	26,198,429
2008	610,866,521	36,148,079	647,014,600	18.11%	10.37%	7.74%	50,078,930	44,774,333
2009	638,355,514	33,277,850	671,633,364	18.11%	10.37%	7.74%	51,984,422	43,135,022
2010	667,081,513	30,385,864	697,467,377	18.11%	10.37%	7.74%	53,983,975	41,572,332
2011	697,100,181	27,390,200	724,490,381	18.11%	10.37%	7.74%	56,075,555	40,077,058
2012	728,469,689	24,747,465	753,217,154	18.11%	10.37%	7.74%	58,299,008	38,669,284
2013	761,250,825	22,044,033	783,294,858	18.11%	10.37%	7.74%	60,627,022	37,321,056
2014	795,507,112	19,510,775	815,017,887	18.11%	10.37%	7.74%	63,082,384	36,039,479
2015	831,304,932	17,183,258	848,488,190	18.11%	10.37%	7.74%	65,672,986	34,820,892
2016	868,713,654	15,026,893	883,740,547	18.11%	10.37%	7.74%	68,401,518	33,659,030
2017	907,805,768	13,017,793	920,823,561	18.11%	10.37%	7.74%	71,271,744	32,548,873
2018	948,657,028	11,068,318	959,725,346	18.11%	10.37%	7.74%	74,282,742	31,483,950
2019	991,346,594	9,393,927	1,000,740,521	18.11%	10.37%	7.74%	77,457,316	30,468,176
2020	1,035,957,191	7,906,487	1,043,863,678	18.11%	10.37%	7.74%	80,795,049	29,495,209
2021	1,082,575,264	6,653,714	1,089,228,978	18.11%	10.37%	7.74%	84,306,323	28,563,380
2022	1,131,291,151	5,631,117	1,136,922,268	18.11%	10.37%	7.74%	87,997,784	27,669,666
2023	1,182,199,253	4,679,747	1,186,879,000	18.11%	10.37%	7.74%	91,864,435	26,807,870
2024	1,235,398,219	3,894,792	1,239,293,011	18.11%	10.37%	7.74%	95,921,279	25,978,411
2025	1,290,991,139	3,240,707	1,294,231,846	18.11%	10.37%	7.74%	100,173,545	25,178,705
2026	1,349,085,741	2,633,220	1,351,718,961	18.11%	10.37%	7.74%	104,623,048	24,405,653
2027	1,409,794,599	2,170,614	1,411,965,213	18.00%	10.37%	7.63%	107,732,946	23,323,532
2028	1,473,235,356	1,726,867	1,474,962,223	18.00%	10.37%	7.63%	112,539,618	22,611,738
2029	1,539,530,947	1,433,712	1,540,964,659	18.00%	10.37%	7.63%	117,575,603	21,924,437
2030	1,608,809,839	1,171,892	1,609,981,731	18.00%	10.37%	7.63%	122,841,606	21,258,834
2031	1,681,206,282	919,244	1,682,125,526	18.00%	10.37%	7.63%	128,346,178	20,613,874
2032	1,756,860,565	755,398	1,757,615,963	18.00%	10.37%	7.63%	134,106,098	19,989,775
2033	1,835,919,290	622,259	1,836,541,549	18.00%	10.37%	7.63%	140,128,120	19,385,071
2034	1,918,535,658	474,072	1,919,009,730	18.00%	10.37%	7.63%	146,420,442	18,798,645
2035	2,004,869,763	359,596	2,005,229,359	18.00%	10.37%	7.63%	152,999,000	18,230,398
2036	2,095,088,902	270,407	2,095,359,309	18.00%	10.37%	7.63%	159,875,915	17,679,636

Present Value of Future Amortization Payments: 862,682,747

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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 9 shows that in 1997 the System had a small negative cash flow. In the year ended June 30, 2006, contributions exceeded the System's benefits and administrative expenses by $34 million, due to a one-time cash contribution of $100 million. At the current contribution rates, however, expenses are projected to again exceed contributions in the year ending June 30, 2007, and this deficit is projected to increase to $167 million for the year ending June 30, 2016.

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, 2006. 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.

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Cash Flow History
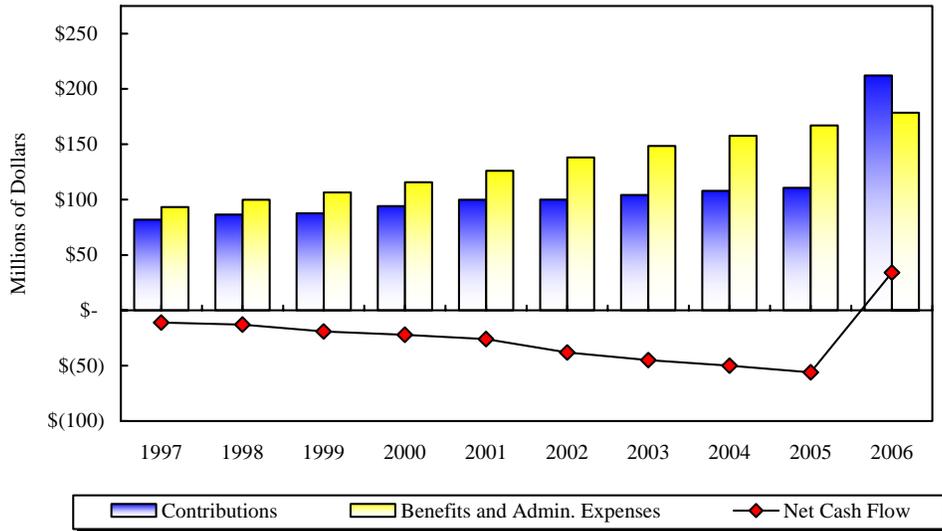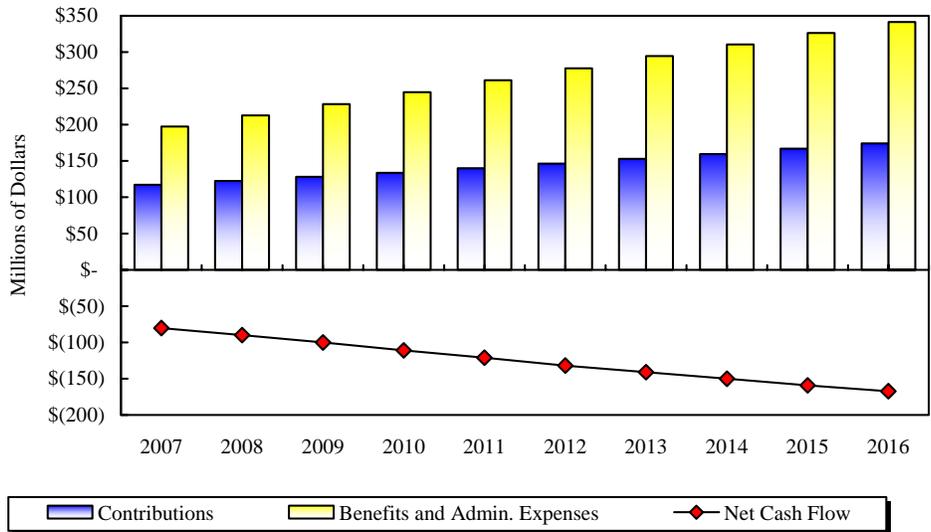
Legend: Contributions | Benefits and Admin. Expenses | Net Cash Flow

Cash Flow Projections

Legend: Contributions | Benefits and Admin. Expenses | Net Cash Flow

Teachers' Retirement System
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Table 9

Cash Flow History and Projections

Historical Cash Flows*

Year Ended June 30,	Contributions	Benefits & Administrative Expenses	Net Cash Flow
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)
2005	111	167	(56)
2006	212 **	178	34

Projected Cash Flows*

Year Ending June 30,	Contributions	Benefits & Administrative Expenses	Net Cash Flow
2007	$ 117	$ 197	$ (80)
2008	123	213	(90)
2009	128	228	(100)
2010	134	245	(111)
2011	140	261	(121)
2012	146	278	(132)
2013	153	294	(141)
2014	160	310	(150)
2015	167	326	(159)
2016	174	341	(167)

*   Millions of dollars.
**   Reflects $100 million transfer to TRS.

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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, 2006 Actuarial Valuation. The Board adopted new mortality assumptions at the May 19, 2006 Retirement Board Meeting. Active demographic assumptions were reviewed in the 2002 Investigation of Experience Study. 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 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

Market value is used as the actuarial basis for the valuation of assets. Adopted in the July 1, 2006 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.

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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, 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, 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 the greater of the present value of their deferred benefit or their available contribution account.

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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, 2006 was $5,512,447. Based on a contribution rate of 4.04%, we assumed the total ORP payroll for the fiscal year to be $136,446,708 ($5,512,447 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.

Blank or Missing Data

There were 77 cases where the Date of Birth for an active participant was missing in the 2006 data. In these cases, the participant was assumed to have been hired at age 25.

There was 1 active member record in the 2006 data with a blank sex field. Sex was assigned randomly based on the male/female percentage of the entire active population.

Teachers' Retirement System
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Table A-1

Summary of Valuation Assumptions
(July 1, 2006)

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 — Table A-5

For Males: RP 2000 Combined Mortality Table for Males, set back 3 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 2 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 3 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 3 years, with mortality improvements projected by Scale AA to 2008 (adopted July 1, 2006).

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 | | | University | | |
| | Members | | | 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

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%	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

| 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

Teachers' Retirement System
State of Montana

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

Teachers' Retirement System
State of Montana

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

Teachers' Retirement System
State of Montana

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.

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, 2006. 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	12,715	$ 549.3
Part-Time Members*	4,840	57.7
Total Contributing Members*	17,555	$ 607.0
Active Members with Annual Compensation less than $1,000	544	
Total Active Members	18,099	

* 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, 2005 to July 1, 2006.

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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	9,564	$ 166,913	$ 17,452
Survivors of Deceased Retired Members	815	8,910	10,933
Total Service Retirement (including survivors)	10,379	175,823	16,940
Disability Retirement	205	1,855	9,049
Survivors of Deceased Active Members	405	3,364	8,306
Child Beneficiaries	30	72	2,400
Total Annuitants	11,019	$ 181,114	$ 16,436

Terminated Members with Contributions Not Withdrawn	Number
Vested Terminated Members	1,684
Non-Vested Terminated Members	8,542
Total Terminated Members	10,226

Teachers' Retirement System
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Table C-1

Active Members Distribution of
Full-Time Employees and Salaries
as of July 1, 2006

Number of Employees - By Age Group - All Members

Age	0	1	2	3 to 4	5 to 9	Completed Years of Service 10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	Totals
<25	18	84	25	2	-	-	-	-	-	-	-	-	129
25 to 29	33	267	248	302	152	-	-	-	-	-	-	-	1,002
30 to 34	18	106	99	236	637	86	-	-	-	-	-	-	1,182
35 to 39	9	81	61	144	446	530	91	-	-	-	-	-	1,362
40 to 44	12	61	73	124	292	365	438	111	-	-	-	-	1,476
45 to 49	13	62	51	97	280	324	376	538	152	-	-	-	1,893
50 to 54	10	42	33	82	250	339	415	440	562	166	-	-	2,339
55 to 59	3	33	31	59	172	226	370	368	388	529	112	1	2,292
60 to 64	4	13	8	33	53	62	126	126	124	151	130	13	843
65 to 69	1	5	1	4	9	14	22	19	20	20	27	21	163
70 and up	-	-	1	-	4	4	1	4	7	4	4	5	34
Totals	121	754	631	1,083	2,295	1,950	1,839	1,606	1,253	870	273	40	12,715

Teachers' Retirement System
State of Montana

Table C-1

Active Members Distribution of
Full-Time Employees and Salaries
as of July 1, 2006

Annual Salaries in Thousands - By Age Group - All Members

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	240	2,089	649	46	-	-	-	-	-	-	-	-	3,024
25 to 29	445	6,915	7,000	8,754	4,774	-	-	-	-	-	-	-	27,888
30 to 34	260	2,964	3,097	7,400	22,170	3,499	-	-	-	-	-	-	39,390
35 to 39	136	2,361	2,023	4,828	16,445	22,545	4,156	-	-	-	-	-	52,494
40 to 44	179	1,741	2,359	4,023	10,781	15,912	20,916	5,495	-	-	-	-	61,406
45 to 49	200	1,808	1,651	3,245	10,011	13,940	18,015	27,134	8,019	-	-	-	84,023
50 to 54	127	1,393	1,110	3,001	9,658	14,971	19,962	22,413	29,760	8,758	-	-	111,153
55 to 59	59	1,124	1,129	2,149	6,727	9,741	17,679	19,309	21,241	29,044	6,035	55	114,292
60 to 64	78	319	283	1,372	2,322	2,627	6,156	6,734	6,912	9,249	7,728	745	44,525
65 to 69	28	155	48	144	459	652	1,003	973	1,116	1,158	1,944	1,460	9,140
70 and up	-	-	25	-	149	136	176	251	408	237	283	268	1,933
Totals	1,752	20,869	19,374	34,962	83,496	84,023	88,063	82,309	67,456	48,446	15,990	2,528	549,268

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Teachers' Retirement System
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Table C-1

Active Members Distribution of
Full-Time Employees and Salaries
as of July 1, 2006

Average Annual Salary - By Age Group - All Members

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	13,321	24,874	25,942	22,780	-	-	-	-	-	-	-	-	23,436
25 to 29	13,474	25,900	28,228	28,985	31,406	-	-	-	-	-	-	-	27,832
30 to 34	14,465	27,964	31,281	31,355	34,803	40,690	-	-	-	-	-	-	33,325
35 to 39	15,099	29,154	33,165	33,528	36,872	42,538	45,668	-	-	-	-	-	38,542
40 to 44	14,920	28,537	32,322	32,447	36,920	43,594	47,754	49,503	-	-	-	-	41,603
45 to 49	15,421	29,159	32,364	33,457	35,752	43,024	47,912	50,435	52,756	-	-	-	44,386
50 to 54	12,677	33,168	33,627	36,594	38,632	44,163	48,101	50,940	52,953	52,757	-	-	47,521
55 to 59	19,802	34,055	36,431	36,419	39,109	43,103	47,781	52,469	54,745	54,903	53,887	55,039	49,866
60 to 64	19,534	24,538	35,349	41,573	43,807	42,365	48,856	53,444	55,745	61,252	59,448	57,298	52,817
65 to 69	28,245	31,090	48,142	35,905	50,984	46,582	45,590	51,228	55,803	57,903	71,982	69,518	56,075
70 and up	-	-	24,764	-	37,330	33,882	176,047	62,738	58,323	59,341	70,689	53,689	56,866
Totals	14,486	27,679	30,703	32,281	36,381	43,089	47,886	51,251	53,836	55,685	58,571	63,206	43,198

Completed Years of Service

Teachers' Retirement System
State of Montana

Table C-1

Active Members Distribution of
Part-Time Employees
as of July 1, 2006

Number of Employees - By Age Group - All Members

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	108	32	13	1	1	-	-	-	-	-	-	-	155
25 to 29	157	115	58	50	27	-	-	-	-	-	-	-	407
30 to 34	85	69	54	48	81	24	-	-	-	-	-	-	361
35 to 39	106	97	63	66	79	63	30	-	-	-	-	-	504
40 to 44	102	97	90	108	154	50	42	20	-	-	-	-	663
45 to 49	72	90	66	135	237	122	50	37	18	-	-	-	827
50 to 54	89	77	68	126	213	126	69	34	19	8	-	-	829
55 to 59	54	56	47	79	123	119	71	35	19	15	6	-	624
60 to 64	30	29	18	51	57	47	40	17	10	5	9	-	313
65 to 69	11	7	6	24	22	10	9	2	6	1	3	1	102
70 and up	5	6	2	12	13	11	3	2	1	-	-	-	55
Totals	819	675	485	700	1,007	572	314	147	73	29	18	1	4,840

Completed Years of Service

Teachers' Retirement System
State of Montana

Table C-2

Distribution of Inactive Lives

Members Receiving Service Retirement Benefits as of July 1, 2006

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	20	$ 392	$ 19,597
50 to 54	351	6,794	19,355
55 to 59	1,230	25,065	20,378
60 to 64	1,973	39,840	20,193
65 to 69	1,854	36,241	19,547
70 to 74	1,440	25,752	17,883
75 to 79	1,042	15,705	15,072
80 to 84	710	8,926	12,572
85 to 89	522	5,121	9,810
90 and up	422	3,078	7,294
Total	9,564	166,913	17,452

Members Receiving Disability Retirement Benefits as of July 1, 2006

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	12	$ 117	$ 9,729
50 to 54	16	152	9,471
55 to 59	47	426	9,056
60 to 64	36	387	10,759
65 to 69	23	214	9,326
70 to 74	21	177	8,434
75 to 79	24	216	8,984
80 to 84	11	75	6,835
85 to 89	13	81	6,247
90 and up	2	10	5,089
Total	205	1,855	9,049

Teachers' Retirement System
State of Montana

Table C-2

Distribution of Inactive

Survivors of Deceased Retired Members as of July 1, 2006

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	31	$ 201	$ 6,471
50 to 54	25	252	10,080
55 to 59	48	550	11,467
60 to 64	75	905	12,072
65 to 69	91	1,182	12,993
70 to 74	110	1,503	13,664
75 to 79	109	1,388	12,733
80 to 84	147	1,426	9,702
85 to 89	105	878	8,366
90 and up	74	624	8,430
Total	815	8,910	10,933

Survivors of Deceased Active Members as of July 1, 2006

Age	Number of Persons	Annual Benefits in Thousands	Average Annual Benefits
<50	85	$ 445	$ 5,234
50 to 54	33	219	6,625
55 to 59	58	512	8,835
60 to 64	52	587	11,279
65 to 69	42	453	10,789
70 to 74	30	222	7,387
75 to 79	44	442	10,056
80 to 84	34	343	10,076
85 to 89	20	106	5,294
90 and up	7	36	5,117
Total	405	3,364	8,306

Teachers' Retirement System
State of Montana

Table C-2

Distribution of Inactive Lives

Terminated Vested Members as of July 1, 2006
Number of Persons

Age	Number
<25	-
25 to 29	5
30 to 34	74
35 to 39	158
40 to 44	220
45 to 49	299
50 to 54	389
55 to 69	377
60 to 64	127
65 to 69	33
70 & above	2
Total	1,684

Child Beneficiaries as of July 1, 2006
Number of Persons

Age	Number
<5	-
5 to 6	1
7 to 8	3
9 to 10	3
11 to 12	4
13 to 14	8
15 to 16	6
17 to 18	5
Total	30

Teachers' Retirement System
State of Montana

Table C-3

Data Reconciliation

	Active Contributing Members	Vested Terminated Members	Service Retired Members	Disabled Members	Survivors and Beneficiaries
July 1, 2005 Valuation	17,542	1,649	9,242	200	1,222
Refunds and NonVested Terminations	(1,309)	(51)	-	-	-
Vested Terminations	(231)	231	-	-	-
Service Retirements	(449)	(55)	504	-	-
Disability Retirements	(7)	(3)	-	10	-
Deaths with Beneficiary	(16)	(2)	(50)	(4)	72
Deaths without Beneficiary	(5)	(4)	(154)	(1)	(50)
New Entrants	1,387	-	-	-	-
Rehires	643	(92)	(3)	-	-
Other	-	11	25	-	6
July 1, 2006 Valuation	17,555	1,684	9,564	205	1,250

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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
State of Montana

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
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

* 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

*   *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%

*   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.

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

Teachers' Retirement System
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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.

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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.

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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.