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GASB STATEMENT NO. 67 REPORT

FOR THE

MONTANA TEACHERS' RETIREMENT SYSTEM

PREPARED AS OF JUNE 30, 2015

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October 20, 2015

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

Members of the Board:

Presented in this report is information to assist the Teachers' Retirement System of Montana in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 67. The information is presented for the period ending June 30, 2015.

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of July 1, 2015. The valuation was based upon data, furnished by the Executive Director and the Teachers' Retirement System staff, concerning active, inactive and retired members along with pertinent financial information.

To the best of our knowledge, this report is complete and accurate. The necessary calculations were performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems.

The calculations were prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, and, in our opinion, meet the requirements of GASB 67.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan 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 plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

Respectfully submitted,

Edward A. Macdonald, ASA, FCA, MAAA
President

Todd B. Green, ASA, FCA, MAAA
Principal and Consulting Actuary

EAM:TBG/jnw

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REPORT OF THE ANNUAL GASB STATEMENT NO. 67
REQUIRED INFORMATION FOR THE
MONTANA TEACHERS' RETIREMENT SYSTEM

PREPARED AS OF JUNE 30, 2015

SECTION I – INTRODUCTION

The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67), *"Financial Reporting for Pension Plans"*, in June 2012. The effective date is for plan years beginning after June 15, 2013. This report has been prepared as of June 30, 2015. Much of the material provided in this report is based on the data, assumptions and results of the annual actuarial valuation of the System as of July 1, 2015. The results of that valuation were detailed in a report dated September 26, 2015.

GASB 67 replaces GASB 25, and represents a significant departure from the requirements of that older statement. GASB 25 was issued as a "funding friendly" statement that required pension plans to report items consistent with the results of the plan's actuarial valuations, as long as those valuations met certain parameters. GASB 67 basically separates accounting from funding by creating disclosure and reporting requirements that may or may not be consistent with the basis used for funding the System.

A major change in GASB 67 is the requirement to determine the Total Pension Liability (TPL) utilizing the Entry Age Normal actuarial funding method. The Net Pension Liability (NPL) is then set equal to the TPL minus the System's Fiduciary Net Position (FNP) (basically the market values of assets). The benefit provisions recognized in the calculation of the TPL are summarized in Schedule B.

Among the assumptions needed for the liability calculation is a Single Equivalent Interest Rate (SEIR), as described by GASB 67. To determine the SEIR, the FNP must be projected into the future for as long as there are anticipated benefits payable under the plan's provision applicable to the members and beneficiaries of the System on the Measurement Date. If the FNP is not projected to be depleted at any point in the future, the long term expected rate of return on plan investments expected to be used to finance the benefit payments may be used as the SEIR.

If, however, the FNP is projected to be depleted, the SEIR is determined as the single rate that will generate a present value of benefit payments equal to the sum of the present value determined by discounting all projected benefit payments through the date of depletion by the long term expected rate of return, and the present value determined by discounting those benefits after the date of depletion by a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate. Our calculations indicate that the FNP is not projected to be depleted, so the bond rate is not used in the determination of the SEIR.

The sections that follow provide the results of all the necessary calculations, presented in the order laid out in GASB 67 for note disclosure and Required Supplementary Information (RSI).

SECTION II – FINANCIAL STATEMENT NOTES

The material presented herein will follow the order presented in GASB 67. Paragraph numbers are provided for ease of reference.

Paragraphs 30.a. (1)-(3): This information will be supplied by the System.

Paragraph 30.a. (4): The data required regarding the membership of the Montana Teachers' Retirement System were furnished by the System. The following table summarizes the membership of the System as of July 1, 2015, the Valuation Date.

Membership

	Number
Retired participants and beneficiaries currently receiving benefits	14,839
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	1,664
Inactive participants*	12,839
Active participants	
Full-Time	12,468
Part-Time	5,848
Total	47,658

* Participants who are former employees who have an employee account balance in the plan but are not otherwise vested in an employer provided benefit

Paragraphs 30.a. (5)-(6) and Paragraphs 30.b.-f.: This information will be supplied by the System.

Paragraph 31.a. (1)-(4): This information is provided in the following table. As stated earlier, the NPL is equal to the TPL minus the FNP. That result as of June 30, 2015 is presented in the following table.

	Fiscal Year Ending June 30, 2015
Total Pension Liability	$ 5,351,391,599
Fiduciary Net Position	3,708,385,838
Net Pension Liability	$ 1,643,005,761
Ratio of Fiduciary Net Position to Total Pension Liability	69.30%

Paragraph 31.b.: This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The set of actuarial assumptions utilized in developing the TPL are outlined in Schedule C. The total pension liability was determined based on an actuarial valuation as of July 1, 2015, using the following actuarial assumptions:

Inflation	3.25 percent
Salary increases	4.00 to 8.51 percent, including inflation for Non-University Members; 5.00 percent for University Members including inflation
Investment rate of return	7.75 percent, net of pension plan investment expense, and including inflation

Mortality

Mortality among contributing members, service retired members, and beneficiaries:

For Males: 1992 Base Rates from the RP 2000 Healthy Annuitant Mortality Table for ages 50 and above and 1992 Base Rates from the RP 2000 Combined Healthy Annuitant Mortality Table for ages below 50, set back four years, with mortality improvements projected by Scale BB to 2018.

For Females: 1992 Base Rates from the RP 2000 Healthy Annuitant Mortality Table for ages 50 and above and 1992 Base Rates from the RP 2000 Combined Healthy Annuitant Mortality Table for ages below 50, set back two years, with mortality improvements projected by Scale BB to 2018.

Mortality among disabled members:

For Males: RP 2000 Disabled Mortality Table for Males, set forward one year, with mortality improvements projected by Scale BB to 2018.

For Females: RP 2000 Disabled Mortality Table for Females, set forward five years, with mortality improvements projected by Scale BB to 2018.

The actuarial assumptions used in the July 1, 2015 valuation were based on the results of the last actuarial experience study, dated May 1, 2014.

Paragraph 31.b.(1)

(a) Discount rate. The discount rate used to measure the total pension liability was 7.75 percent.

(b) Projected cash flows: The projection of cash flows used to determine the discount rate assumed that plan member contributions and Employer contributions will be made at the current contribution rates as set out in state statute. These rates are shown in the following page. In addition to these contributions the State will contribution $25 million annually to the System payable July 1st of each year:

MCA 19-20-605 requires each employer to contribute 9.85% of total compensation paid to all re-employed TRS retirees employed in a TRS reportable position. Pursuant to MCA 19-20-609, this amount shall increase by 1.00% for fiscal year 2014 and increase by 0.10% each fiscal year through 2024 until the total employer contribution is equal to 11.85% of re-employed retiree compensation.

History of Legislated Contributions
(as a Percent of Pay)

School District and Other Employers

	Members	Employers	General fund	Total employee & employer
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 to June 30, 2013	7.15%	7.47%	2.49%	17.11%
July 1, 2013 to June 30, 2014	8.15%	8.47%	2.49%	19.11%
July 1, 2014 to June 30, 2015	8.15%	8.57%	2.49%	19.21%
July 1, 2015 to June 30, 2016	8.15%	8.67%	2.49%	19.31%
July 1, 2016 to June 30, 2017	8.15%	8.77%	2.49%	19.41%
July 1, 2017 to June 30, 2018	8.15%	8.87%	2.49%	19.51%
July 1, 2018 to June 30, 2019	8.15%	8.97%	2.49%	19.61%
July 1, 2019 to June 30, 2020	8.15%	9.07%	2.49%	19.71%
July 1, 2020 to June 30, 2021	8.15%	9.17%	2.49%	19.81%
July 1, 2021 to June 30, 2022	8.15%	9.27%	2.49%	19.91%
July 1, 2022 to June 30, 2023	8.15%	9.37%	2.49%	20.01%
July 1, 2023 to June 30, 2024	8.15%	9.47%	2.49%	20.11%

State and University Employers

	Members	Employers	General fund	Total employee & employer
Prior to July 1, 2007	7.15%	7.47%	0.11%	14.73%
July 1, 2007 to June 30, 2009	7.15%	9.47%	0.11%	16.73%
July 1, 2009 to June 30, 2013	7.15%	9.85%	0.11%	17.11%
July 1, 2013 to June 30, 2014	8.15%	10.85%	0.11%	19.11%
July 1, 2014 to June 30, 2015	8.15%	10.95%	0.11%	19.21%
July 1, 2015 to June 30, 2016	8.15%	11.05%	0.11%	19.31%
July 1, 2016 to June 30, 2017	8.15%	11.15%	0.11%	19.41%
July 1, 2017 to June 30, 2018	8.15%	11.25%	0.11%	19.51%
July 1, 2018 to June 30, 2019	8.15%	11.35%	0.11%	19.61%
July 1, 2019 to June 30, 2020	8.15%	11.45%	0.11%	19.71%
July 1, 2020 to June 30, 2021	8.15%	11.55%	0.11%	19.81%
July 1, 2021 to June 30, 2022	8.15%	11.65%	0.11%	19.91%
July 1, 2022 to June 30, 2023	8.15%	11.75%	0.11%	20.01%
July 1, 2023 to June 30, 2024	8.15%	11.85%	0.11%	20.11%

(c) **Long term rate of return:** The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every four years for the System. The most recent analysis, performed for the period covering fiscal years 2008 through 2013, is outlined in a report dated May 1, 2014. Several factors are considered in evaluating the long-term rate of return assumption including long term historical data, estimates inherent in current market data, and a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected return, net of investment expense and inflation) were developed by the investment consultant for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and then adding expected inflation. The capital market assumptions developed by the investment consultant are intended for use over a 10-year horizon and may not be useful in setting the long-term rate of return for funding pension plans which covers a longer timeframe. The assumption is intended to be a long term assumption and is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected returns in future years.

(d) **Municipal bond rate:** the discount rate determination does not use a municipal bond rate.

(e) **Periods of projected benefit payments:** Projected future benefit payments for all current plan members were projected through 2119.

(f) **Assumed asset allocation**: The target asset allocation and best estimates of arithmetic real rates of return for each major asset class as listed in the last actuarial experience study, dated May 1, 2014 are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Broad US Equity	36.00%	4.80%
Broad Int. Equity	18.00%	6.05%
Private Equity	12.00%	8.50%
Intermediate Bonds	23.40%	1.50%
Core Real Estate	4.00%	4.50%
High Yield Bonds	2.60%	3.25%
Non-Core Real Estate	4.00%	7.50%
Total	100.00%	

*Arithmetic mean

(g): **Sensitivity analysis**: disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the System, calculated using the discount rate of 7.75 percent, as well as what the System's net pension liability calculated using a discount rate that is 1-percentage-point lower (6.75 percent) or 1-percentage-point higher (8.75 percent) than the current rate:

	1% Decrease (6.75%)	Current Discount Rate (7.75%)	1% Increase (8.75%)
System's Net Pension Liability	$2,257,357,650	$1,643,005,761	$1,126,063,873

Paragraph 31.c.: The date of the actuarial valuation upon which the TPL is based is July 1, 2015. Roll forward procedures were not used.

SECTION III – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in the System's financial statements:

Paragraphs 32.a.-c.: The required tables of schedules are provided in Schedule A.

Paragraph 32.d.: The money-weighted rates of return will be supplied by the System.

Paragraph 34: The following information should be noted regarding the RSI:

Changes of benefit terms: The following changes to the plan provisions were made as identified:

2013:

HB 377 was passed which provides additional revenue and creates a two tier benefit structure. A Tier One Member is a person who first became a member before July 1, 2013 and has not withdrawn their member's account balance. A Tier Two Member is a person who first becomes a member on or after July 1, 2013 or after withdrawing their member's account balance, becomes a member again on or after July 1, 2013.

HB 377 temporarily reduced the Guaranteed Annual Benefit Adjustment (GABA) for Tier One Members hired prior to July 1, 2013 until certain funding parameters are met. This law was challenged in the Courts. In the initial Court Case, the Judge issued a Summary Judgment in favor of the plaintiffs. The Attorney General's Office, on behalf of the State and TRS, entered into a settlement agreement not to apple the decision to a higher court. Therefore, members Tier One Members hired prior to July 1, 2013 will continue to receive 1.5% GABA regardless of the funding condition of the System.

The second tier benefit structure for members hired on or after July 1, 2013 is summarized below.

(1) **Final Average Compensation**: average of earned compensation paid in five consecutive years of full-time service that yields the highest average
(2) **Service Retirement:** Eligible to receive a service retirement benefit if the member has been credited with at least five full years of creditable service and has attained the age of 60; or has been credited with 30 or more years of full-time or part-time creditable service and has attained age 55
(3) **Early Retirement**: Eligible to receive an early retirement allowance if a member is not eligible for service retirement but has at least five years of creditable service and attained age 55
(4) **Professional Retirement Option**: if the member has been credited with 30 or more years of service and has attained the age of 60 they are eligible for an enhanced allowance equal to 1.85% of average final compensation times all service at retirement. Otherwise, the multiplier used to calculate the retirement allowance will be equal to 1.67%

(5) **Annual Contribution**: 8.15% of member's earned compensation

(6) **Supplemental Contribution Rate**: On or after July 1, 2023, the TRS Board may require a supplemental contribution up to 0.5% if the following three conditions are met:

   a. The average funded ratio of the System based on the last three annual actuarial valuations is equal to or less than 80%; and
   b. The period necessary to amortize all liabilities of the System based on the latest annual actuarial valuation is greater than 20 years; and
   c. A State or employer contribution rate increase or a flat dollar contribution to the Retirement System Trust fund has been enacted that is equivalent to or greater than the supplemental contribution rate imposed by the TRS Board.

(7) **Disability Retirement:** A member will not be eligible for a disability retirement if the member is or will be eligible for a service retirement on the date of termination

(8) **Guaranteed Annual Benefit Adjustment (GABA)**:

   a. If the most recent actuarial valuation shows that Retirement System liabilities are at least 90% funded and the provision of the increase is not projected to cause the System's liabilities to be less than 85% funded, the GABA may increase from the 0.5% floor up to 1.5%, as set by the Board.

HB 377 increased revenue from the members, employers and the State as follows:

- Annual State contribution equal to $25 million paid to the System in monthly installments.
- One-time contribution payable to the Retirement System by the trustees of a school district maintaining a retirement fund. The one-time contribution to the Retirement System shall be the amount earmarked as an operating reserve in excess of 20% of the adopted retirement fund budget for the fiscal year 2013. This amount has been estimated to be $14.7 million payable October 1, 2013.
- 1% supplemental employer contribution. This will increase the current employer rates:
  - School Districts contributions will increase from 7.47% to 8.47%
  - The Montana University System and State Agencies will increase from 9.85% to 10.85%.
  - The supplemental employer contribution will increase by 0.1% each fiscal year for fiscal year 2014 thru fiscal year 2024. Fiscal years beginning after June 30, 2024 the total supplemental employer contribution will be equal to 2%.
- Members hired prior to July 1, 2013 (Tier 1) under HB 377 are required to contribute a supplemental contribution equal to an additional 1% of the member's earned compensation.
- Each employer is required to contribute 9.85% of total compensation paid to all re-employed TRS retirees employed in a TRS reportable position to the System.

Changes in actuarial assumptions and methods: The following changes to the actuarial assumptions were made as identified:

2014:

- Assumed rate of inflation was reduced from 3.50% to 3.25%
- Payroll Growth Assumption was reduced from 4.50% to 4.00%
- Assumed real wage growth was reduced from 1.00% to 0.75%
- Investment return assumption was changed from net of investment and administrative expensed to net of investment expenses only.
- Mortality among contributing members, service retired members, and beneficiaries was updated to the following:
    - For Males: 1992 Base Rates from the RP 2000 Healthy Annuitant Mortality Table for ages 50 and above and 1992 Base Rates from the RP 2000 Combined Healthy Annuitant Mortality Table for ages below 50, set back four years, with mortality improvements projected by Scale BB to 2018.
    - For Females: 1992 Base Rates from the RP 2000 Healthy Annuitant Mortality Table for ages 50 and above and 1992 Base Rates from the RP 2000 Combined Healthy Annuitant Mortality Table for ages below 50, set back two years, with mortality improvements projected by Scale BB to 2018.
- Mortality among disabled members was updated to the following:
    - For Males: RP 2000 Disabled Mortality Table for Males, set forward one year, with mortality improvements projected by Scale BB to 2018.
    - For Females: RP 2000 Disabled Mortality Table for Females, set forward five years, with mortality improvements projected by Scale BB to 2018.

Method and assumptions used in calculations of actuarially determined contributions.

The following actuarial methods and assumptions were used to determine actuarial contribution rates reported in that schedule:

Actuarial cost method	Entry age
Amortization method	Level percentage of pay, open
Remaining amortization period	26 years
Asset valuation method	4-year smoothed market
Inflation	3.25 percent
Salary increase	4.00 to 8.51 percent, including inflation for Non-University Members and 5.00% for University Members;
Investment rate of return	7.75 percent, net of pension plan investment expense, and including inflation

Schedule A

REQUIRED SUPPLEMENTARY INFORMATION

GASB 67 Paragraph 32.a.
SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total pension liability										
Service Cost	$ 73,820,438	$ 77,006,174								
Interest	390,555,879	373,456,442								
Benefit changes	-	-								
Difference between expected and actual experience	9,660,152	20,297,029								
Changes of assumptions	(4,670,553)	46,502,421								
Benefit payments	(303,675,300)	(285,182,358)								
Refunds of contributions	(5,368,359)	(4,788,688)								
Net change in total pension liability	$ 160,322,257	$ 227,291,020								
Total pension liability - beginning	$5,191,069,342	$4,963,778,322								
Total pension liability - ending (a)	$5,351,391,599	$5,191,069,342								
Plan net position										
Contributions - employer	$ 87,290,863	$ 83,439,612								
Contributions - member	72,215,797	70,468,354								
Contributions - non-employer contributing entities	43,389,534	64,923,320								
Misc. Income	27,297	6,000								
Net investment income	165,684,953	540,277,362								
Benefit payments	(303,675,300)	(285,182,358)								
Administrative expense	(2,035,081)	(2,022,636)								
Refunds of contributions	(5,368,359)	(4,788,688)								
Other	(140,631)	(58,073)								
Net change in plan net position	$ 57,389,073	$ 467,062,893								
Plan net position - beginning	$3,652,220,265	$3,185,064,406								
Prior Period Adjustment	$ (1,223,501)	$ 92,965								
Plan net position - ending (b)	$3,708,385,838	$3,652,220,265								
Net pension liability - ending (a) - (b)	**$1,643,005,761**	**$1,538,849,077**								

Schedule A
Continued

GASB 67 Paragraph 32.b.

SCHEDULE OF THE NET PENSION LIABILITY

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total pension liability	$ 5,351,391,599	$ 5,191,069,342								
Plan net position	3,708,385,838	3,652,220,265								
Net pension liability	$ 1,643,005,761	$ 1,538,849,077								
Ratio of plan net position to total pension liability	69.30%	70.36%								
Covered-employee payroll	$ 768,718,699	$ 750,604,063								
Net pension liability as a percentage of covered-employee payroll	213.73%	205.01%								

GASB 67 Paragraph 32.c.

SCHEDULE OF EMPLOYER AND NON-EMPLOYER CONTRIBUTING ENTITIES CONTRIBUTIONS

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Actuarially determined employer contribution	$130,680,397	$148,362,932	$130,533,530	$108,993,492	$ 91,879,263	$ 90,967,180	$ 80,997,968	$ 81,414,325	$ 40,807,133	$ 42,768,730
Actual contributions										
Employers	$ 87,290,863	$ 83,439,612	$ 74,113,191	$ 72,422,404	$ 72,879,950	$ 72,179,128	$ 66,850,644	$ 67,921,950	$ 61,943,986	$ 58,268,941
Non-employer contributing entities	43,389,534	64,923,320	17,521,347	16,843,766	17,437,366	17,241,610	14,147,324	13,492,375	720,266	693,226
Total	$130,680,397	$148,362,932	$ 91,634,538	$ 89,266,170	$ 90,317,316	$ 89,420,738	$ 80,997,968	$ 81,414,325	$ 62,664,252	$ 58,962,167
Annual contribution deficiency (excess)	$ -	$ -	$ 38,898,992	$ 19,727,322	$ 1,561,947	$ 1,546,442	$ -	$ -	$(21,857,119)	$(16,193,437)
Covered-employee payroll	$768,718,699	$750,604,063	$742,608,987	$735,586,961	$746,694,434	$747,037,330	$683,235,462	$657,435,444	$664,100,000	$636,000,000
Actual contributions as a percentage of covered-employee payroll	17.00%	19.77%	12.34%	12.14%	12.10%	11.97%	11.86%	12.38%	9.44%	9.27%

Schedule B

SUMMARY OF BENEFIT PROVISIONS VALUED

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.

Tier One Member

A person who became a member before July 1, 2013 and who has not withdrawn the member's account balance.

Tier Two Member

A person who became a member on or after July 1, 2013, or who after withdrawing the member's account balance, became a member again after July 1, 2013.

Final Compensation

Tier One Members

Average of highest three consecutive years of earned compensation.

Tier Two Members

Average of highest five 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

Tier One Members

Eligibility: 25 years of service or age 60 with five years of service.

Benefit: The retirement benefit is equal to 1/60 of final compensation for each year of service.

Tier Two Members

Eligibility: Age 55 with 30 years of service or age 60 with five years of service.

Benefit: A member age 60 with at least 30 years of creditable service will receive a retirement allowance equal to 1.85% of final compensation for each year of service. Otherwise, the multiplier used to calculate the retirement allowance will equal 1/60 of final compensation for each year of service.

Early Retirement Benefits

Tier One Member

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 actuarially reduced by the lesser of the number of years equal to the age of the participant at the early retirement subtracted from age 60 or the number of years of service at early retirement subtracted from 25 years of service.

Tier Two Member

Eligibility: Five years of service and age 55.

Benefit: The retirement benefit is calculated in the same manner as described for normal retirement, but the benefit is actuarially reduced by the lesser of the number of years equal to the age of the participant at the early retirement subtracted from age 60 or the number of years of service at early retirement subtracted from 30 years of service.

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. A Tier Two Member is not eligible for a disability retirement if the member is or will be eligible for a service retirement on or before the member's date of determination.

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 Tier One Member: 7.15% of compensation. Tier One members are required to contribute a Supplemental Contribution equal to an additional 1% of compensation. The Board may decrease the Supplemental Contribution if the average funded ratio of the System based on the last three actuarial valuations is equal to or greater than 90% and the period necessary to amortize the unfunded liabilities of the System based on the most recent actuarial valuation is less than 15 years. Following one or more decreases in the supplemental contribution the Board may increase the supplemental contribution to a rate not to exceed 1% if the average funded ratio of the System based on the last three annual actuarial valuations is equal to or less than 80% and the period necessary to amortize all liabilities of the System based on the most recent annual actuarial valuation is greater than 20 years.

Tier Two Member: 8.15% of compensation. The Board may require a Tier Two member to contribute a Supplemental Contribution if the average funded ratio of the System based on the last three actuarial valuations is equal to or less than 80% and the period necessary to amortize the unfunded actuarial accrued liability is greater than 20 years and a State or employer contribution rate increase or a flat dollar contribution to the System has been enacted which is equivalent to or greater than the Supplemental Contribution Rate imposed by the Board. A singe Tier Two Supplemental Contribution Rate increase cannot exceed 0.5% of compensation and in total cannot exceed 9.15% of compensation. The Board may decrease the Supplemental Contribution if the average funded ratio of the System based on the previous three annual actuarial valuations is equal to or greater than 90%; and the period necessary to amortize the unfunded actuarial accrued liability is less than 15 years.

Employer: 9.96% of compensation. Employers are required to contribute a supplemental contribution equal to 1% for fiscal year 2014 and increase by 0.1% each fiscal year through 2024. The Board may decrease the Employer Supplemental Contribution if the average funded ratio of the System based on the last three actuarial valuations is equal to or greater than 90% and the period necessary to amortize the unfunded actuarial accrued liability based on the most recent valuation is less than 15 years and the GABA has been increased to the maximum allowable. Following one or more decreases in the Supplemental Contribution Rate the Board may increase the Supplemental Contribution Rate to a rate not to exceed 1% if the average funded ratio of the System based on the last three actuarial valuations is equal to or less than 80% and the period necessary to amortize the unfunded actuarial accrued liability is greater than 20 years.

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.

State Supplemental Contribution: $25 million per year on an annual basis payable on July 1st of each year.

Re-employed Retirees: Each employer is required to contribute 9.85% of total compensation paid to all re-employed TRS retirees employed in a TRS reportable position. This amount shall increase by 1.00% for fiscal year 2014 and increase by 0.10% each fiscal year through 2024 until the total employer contribution is equal to 11.85% of re-employed retiree compensation.

Interest on Member contributions

Effective July 1, 2014, the interest credited on member contributions is reduced from 0.25% to 0.20% per annum.

Guaranteed Annual Benefit Adjustment (GABA)

On January 1 of each year, 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, for Tier One Members, the retirement allowance will be increased by 1.5%.

For Tier Two Members, the retirement allowance will be increased by an amount equal to or greater than 0.5% but no more than 1.5% if the most recent actuarial valuation shows the System to be at least 90% funded and the provisions of the increase is not projected to cause the funded ratio to be less than 85%.

Schedule C

Actuarial Procedures and Assumptions

Retirement, disablement and termination of employment assumptions reflect the five-year experience study for the period ending 2009 adopted by the Board on May 13, 2010.

The assumed rates of mortality are based a five-year experience study for the period ending 2013 adopted by the Board on May 13, 2014.

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

Tables A-3 through A-6 give rates of decrement for service retirement, disablement, mortality, and other terminations of employment.

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 11.16% of members' salaries. The employer contribution rate will increase by 0.10% each year beginning July 1, 2014 until the total employer contribution rate equals 11.96%.

Administrative and Investment Expenses

The investment expenses of the System are assumed to be funded by investment earnings in excess of 7.75% per year.

Administrative expenses are assumed to equal 0.28% of payroll.

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 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 net of investment expenses, compounded annually. (Adopted effective July 1, 2014)

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

Tier 1 Members:

> On January 1 of each year, the retirement allowance payable is 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.

Tier 2 Members:

> On January 1 of each year, the retirement allowance payable is assumed to increase by 0.5% 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 C-2. In addition to increases in salary due to merit and longevity, this scale includes an assumed 4.0% 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 C-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 May 13, 2010. The rates for University Members were adopted May 13, 2010.

Disablement

The rates of disablement used in this valuation are illustrated in Table C-4. These rates were adopted May 13, 2010.

Mortality

The mortality rates used in this valuation are illustrated in Table C-5. A written description of each table used is included in Table C-1. These rates were adopted July 1, 2014.

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 C-6. These rates were adopted May 13, 2010.

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 C-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. For part-time members earning more than $1,000, total credited service is adjusted based on the ratio of actual earnings to annualized earnings. The liability and normal cost calculations for these members are based on the adjusted service and actual earnings for the prior year.

Part-time members earning less than $1,000 during the last year were valued at their current member contribution balance.

Optional Retirement Program

ORP payroll as of June 30, 2015 was $221,811,639.

Effective for fiscal years after June 30, 2007 until June 30, 2033, the Optional Retirement Program contribution rate is 4.72%, pursuant to MCA 19-20-621.

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 & Dependent Children

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. For members who die prior to age 50, dependent children are assumed to be eight years old. For members who die after age 50 but prior to age 55, children are assumed to be 13 years old. Members who die after age 55 are assumed to have no dependent children under the age of 18.

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.

Table C-1

Summary of Valuation Assumptions

I.	Economic assumptions		
	A.	General wage increases* (Adopted July 1, 2014)	4.00%
	B.	Investment return (Adopted July 1, 2004)	7.75%
	C.	Price Inflation Assumption (Adopted July 1, 2014)	3.25%
	D.	Growth in membership	0.00%
	E.	Postretirement benefit increases (Starting three years after retirement)	
		Tier One	1.50%
		Tier Two	0.50%
	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 May 13, 2010)	Table A-3
	C.	Disablement (adopted May 13, 2010)	Table A-4
	D.	Mortality among contributing members, service retired members, and beneficiaries. The tables include margins for mortality improvement which is expected to occur in the future. For Males: 1992 Base Rates from the RP 2000 Healthy Annuitant Mortality Table for ages 50 and above and 1992 Base Rates from the RP 2000 Combined Healthy Annuitant Mortality Table for ages below 50, set back four years, with mortality improvements projected by Scale BB to 2018 (adopted July 1, 2014). For Females: 1992 Base Rates from the RP 2000 Healthy Annuitant Mortality Table for ages 50 and above and 1992 Base Rates from the RP 2000 Combined Healthy Annuitant Mortality Table for ages below 50, set back two years, with mortality improvements projected by Scale BB to 2018 (adopted July 1, 2014).	Table A-5
	E.	Mortality among disabled members For Males: RP 2000 Disabled Mortality Table for Males, set forward one year, with mortality improvements projected by Scale BB to 2018 (adopted July 1, 2014). For Females: RP 2000 Disabled Mortality Table for Females, set forward five years, with mortality improvements projected by Scale BB to 2018 (adopted July 1, 2014).	Table A-5
	F.	Other terminations of employment (adopted May 13, 2010)	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.

Table C-2

Future Salaries

	General Members			University Members		
Years of Service	Individual Merit & Longevity	General Wage Increase	Total Salary Increase	Individual Merit & Longevity	General Wage Increase	Total Salary Increase
1	4.51%	4.00%	8.51%	1.00%	4.00%	5.00%
2	4.09	4.00	8.09	1.00	4.00	5.00
3	3.46	4.00	7.46	1.00	4.00	5.00
4	2.94	4.00	6.94	1.00	4.00	5.00
5	2.52	4.00	6.52	1.00	4.00	5.00
6	2.21	4.00	6.21	1.00	4.00	5.00
7	1.89	4.00	5.89	1.00	4.00	5.00
8	1.68	4.00	5.68	1.00	4.00	5.00
9	1.47	4.00	5.47	1.00	4.00	5.00
10	1.31	4.00	5.31	1.00	4.00	5.00
11	1.16	4.00	5.16	1.00	4.00	5.00
12	1.00	4.00	5.00	1.00	4.00	5.00
13	0.84	4.00	4.84	1.00	4.00	5.00
14	0.68	4.00	4.68	1.00	4.00	5.00
15	0.58	4.00	4.58	1.00	4.00	5.00
16	0.47	4.00	4.47	1.00	4.00	5.00
17	0.37	4.00	4.37	1.00	4.00	5.00
18	0.26	4.00	4.26	1.00	4.00	5.00
19	0.21	4.00	4.21	1.00	4.00	5.00
20	0.16	4.00	4.16	1.00	4.00	5.00
21	0.11	4.00	4.11	1.00	4.00	5.00
22 & Up	0.00	4.00	4.00	1.00	4.00	5.00

Table C-3

Retirement
Annual Rates

	General Members			University Members		
Age	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter
45		8.0%	5.5%		17.0%	8.0%
46		8.0	5.5		17.0	8.0
47		8.0	5.5		17.0	8.0
48		8.0	5.5		17.0	8.0
49	*	8.0	5.5	*	17.0	8.0
50	5.0%	8.0	5.5	7.0%	17.0	8.0
51	5.0	8.0	6.3	7.0	17.0	8.0
52	5.0	8.0	8.0	7.0	17.0	8.0
53	5.0	9.0	7.3	7.0	17.0	8.0
54	5.0	9.0	8.2	7.0	17.0	8.0
55	7.0	9.0	9.8	7.0	15.0	8.0
56	7.0	12.0	11.3	7.0	15.0	8.0
57	7.0	11.8	12.5	7.0	15.0	8.0
58	7.0	14.8	13.1	7.0	15.0	8.0
59	7.0	17.4	14.8	7.0	15.0	8.0
60	*	14.6	17.0	*	15.0	8.5
61		21.3	25.0		14.0	14.5
62		23.8	25.0		20.0	19.0
63		11.4	25.0		14.0	14.5
64		19.0	25.0		20.0	18.0
65		40.0	35.0		28.0	26.0
66		8.0	20.0		21.0	21.0
67		30.0	20.0		21.0	24.5
68		6.0	20.0		21.0	19.5
69		6.0	20.0		21.0	30.0
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.

Table C-4

Disablement
Annual Rates

Age	All Members
25	.005%
30	.005
35	.008
40	.028
45	.044
50	.063
55	.084
60	.100

Table C-5

Mortality
Annual Rates

	Contributing Members, Service Retired Members and Beneficiaries		Disabled Members	
Age	Men	Women	Men	Women
25	0.03%	0.02%	2.26%	0.75%
30	0.04	0.02	2.26	0.75
35	0.05	0.04	2.26	0.75
40	0.08	0.06	2.26	0.75
45	0.11	0.09	2.38	1.15
50	0.15	0.14	3.03	1.65
55	0.55	0.26	3.67	2.18
60	0.58	0.41	4.35	2.80
65	0.79	0.68	5.22	3.76
70	1.23	1.11	6.58	5.22
75	2.03	1.85	8.70	7.23
80	3.48	3.03	11.55	10.02
85	5.90	5.03	14.84	14.00
90	10.39	8.79	19.98	19.45
95	17.93	15.29	28.39	23.75

Table C-6

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

Years of Service	All Members
1	36.5%
2	20.5
3	14.6
4	10.5
5	8.5
6	7.0
7	6.4
8	5.8
9	5.4
10	5.0
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

Table C-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