

Montana Firefighters' Unified Retirement System of the State of Montana

Actuarial Valuation as of June 30, 2015

Produced by Cheiron

September 2015

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September 29, 2015

Public Employees' Retirement Board
100 North Park, Suite 200
Helena, Montana 59620

Dear Members of the Board:

At your request, we have conducted the annual actuarial valuation of the Montana Firefighters' Unified Retirement System as of June 30, 2015. The results of the valuation are contained in this report. The purpose of the valuation is discussed in the Foreword.

This report contains information on the System's assets, as well as analyses which combine asset and liability performance and projections. The report also provides information regarding employer contribution levels and certain required disclosures for financial statements. The purpose of this report is to present the annual actuarial valuation of the Firefighters' Unified Retirement System. This report is for the use of the Public Employees' Retirement Board and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report. We also comment on the sources and reliability of both the data and the actuarial assumptions on which our findings are based. The results of this report are only applicable for Fiscal Year ending 2015 and rely on future system experience conforming to the underlying assumptions. To the extent that actual system experience deviates from the underlying assumptions, the results would vary accordingly.

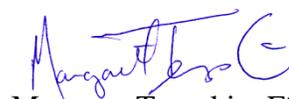
We hereby certify that, to the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This actuarial report was prepared exclusively for the Firefighters' Unified Retirement System for the purpose described herein. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron



Stephen T. McElhaney, FSA, FCA
Principal Consulting Actuary



Margaret Tempkin, FSA
Principal Consulting Actuary

FOREWORD

Cheiron has performed the Actuarial Valuation of the Firefighters' Unified Retirement System as of June 30, 2015. The purpose of this report is to:

- 1) **Measure and disclose**, as of the valuation date, the financial condition of the System;
- 2) **Indicate trends** in the financial progress of the System;
- 3) **Determine the sufficiency of the statutory contribution rate** paid by the employers for Fiscal Year 2015 to meet the requirements of an actuarial rate calculated as the normal cost, administrative expense, and a level percent of pay 30-year open amortization of the unfunded actuarial liability; and
- 4) **Provide information** and documentation as may be required for financial statements.

An actuarial valuation establishes and analyzes system assets and liabilities on a consistent basis, and traces the progress of both from one year to the next. It includes measurement of the system's investment performance as well as an analysis of actuarial liability gains and losses.

Section I presents a summary containing our findings and disclosing important trends experienced by the System in recent years.

Section II contains details on various asset measures, together with pertinent performance measurements.

Section III shows similar information on system liabilities, measured for actuarial, accounting, and government reporting purposes.

Section IV develops the employer contribution rate determined using actuarial techniques.

Section V includes certain required disclosures for financial statements.

The appendices to this report contain a summary of the System's membership at the valuation date, a summary of the major provisions of the System, and the actuarial methods and assumptions used in the valuation.

In preparing our report, we relied on information (some oral and some written) supplied by the staff of the Public Employee Retirement Administration. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Future results may differ significantly from the current results presented in this valuation report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

**SECTION I
BOARD SUMMARY**

General Comments

The period to amortize unfunded actuarial liability decreased from 11.3 years at the June 30, 2014 valuation to 9.7 years as of June 30, 2015. During the year ended June 30, 2015, the System's assets gained 4.52% on a market value basis. However, due to the System's asset-smoothing technique which recognizes only a portion of the gains and losses, the return on the actuarial asset value continues to reflect prior year investment gains and losses resulting in a return of 9.32%. This return was above the assumed rate of return of 7.75% and resulted in an actuarial gain on investments of \$4.7 million.

The System also experienced an actuarial gain on System liabilities resulting from salary growth, members retiring, terminating, becoming disabled, and dying at rates different from the actuarial assumptions. The experience gain deducted \$1.1 million from the expected actuarial liability, which represents a 0.24% decrease to the overall liabilities of the System. This type of activity is normal in the course of system experience. The System will experience actuarial gains and losses over time, because we cannot predict exactly how people will behave. When a system experiences alternating gains and losses that are small compared to the total actuarial liability, then the system's actuarial assumptions are considered reasonable.

As of the June 30, 2015 Actuarial Valuation, the System's unfunded actuarial liability was \$108.2 million. This is a decrease from last year's unfunded actuarial liability of \$118.1 million. The funded ratio increased from 72% at the prior valuation to 76% at June 30, 2015.

Montana Code Annotated (MCA) 19-2-407 requires an analysis of how market performance is affecting the actuarial funding of the Retirement System. It is our understanding of the Code to report certain key results on a market value of assets basis. The market value at June 30, 2015 was \$7.0 million more than actuarial value. If market value were used rather than actuarial value, the funded ratio on the valuation date would be 77%, and the amortization period for the unfunded actuarial liability would be 9.0 years.

GASB Statement No. 67 became effective for the plan year ending June 30, 2014. GASB Statement No. 68 became effective for the employers' Fiscal Years ending June 30, 2015. Actuarial information related to required disclosures under GASB 67 and GASB 68 will be provided in a separate report.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION I
BOARD SUMMARY

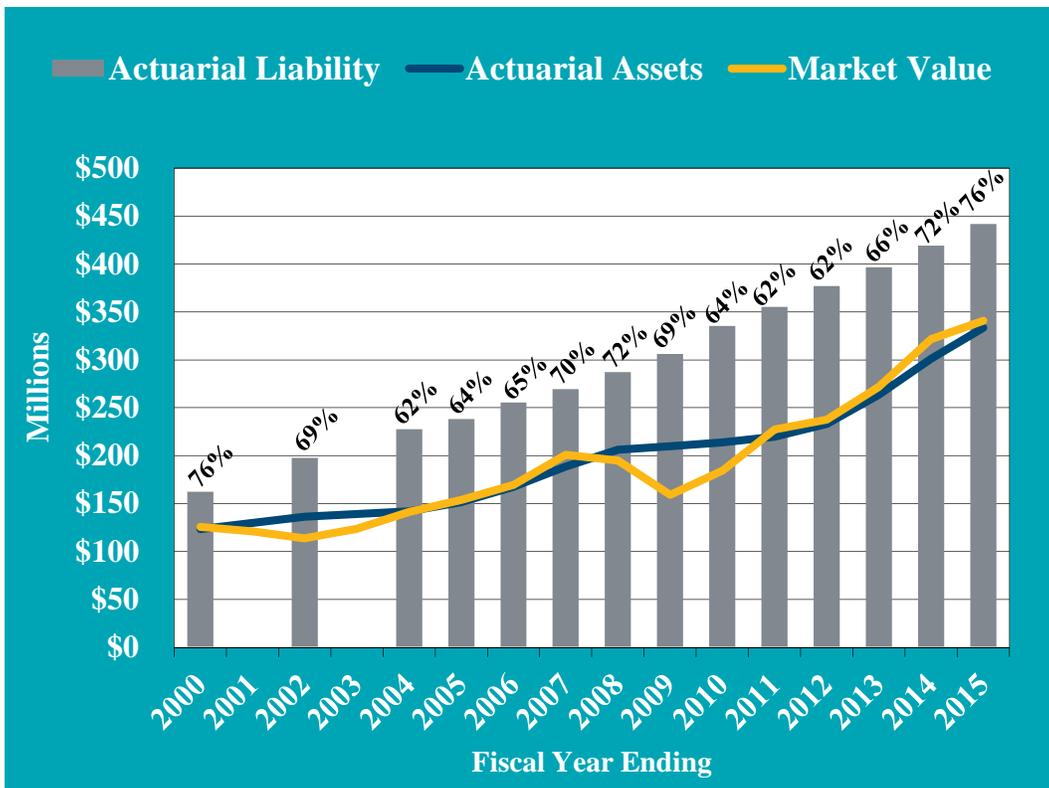
Trends

Assets and Liabilities

The market value of assets (MVA) increased over last year, gaining 4.52% from the value at the prior valuation. The determination of the System's actuarial value of assets reflects only a portion of the amount by which the return differs from the assumed rate of 7.75%.

Over the period July 1, 2010 to June 30, 2015, the System's assets returned approximately 7.4% per year measured at actuarial value, compared to a current valuation assumption of 7.75% per year.

For funding purposes, the target or Actuarial Liability amount is represented by the top of the gray bar. We compare the actuarial value of assets to this measure of liability in developing the funded percent. These are the percentages shown in the graph labels.



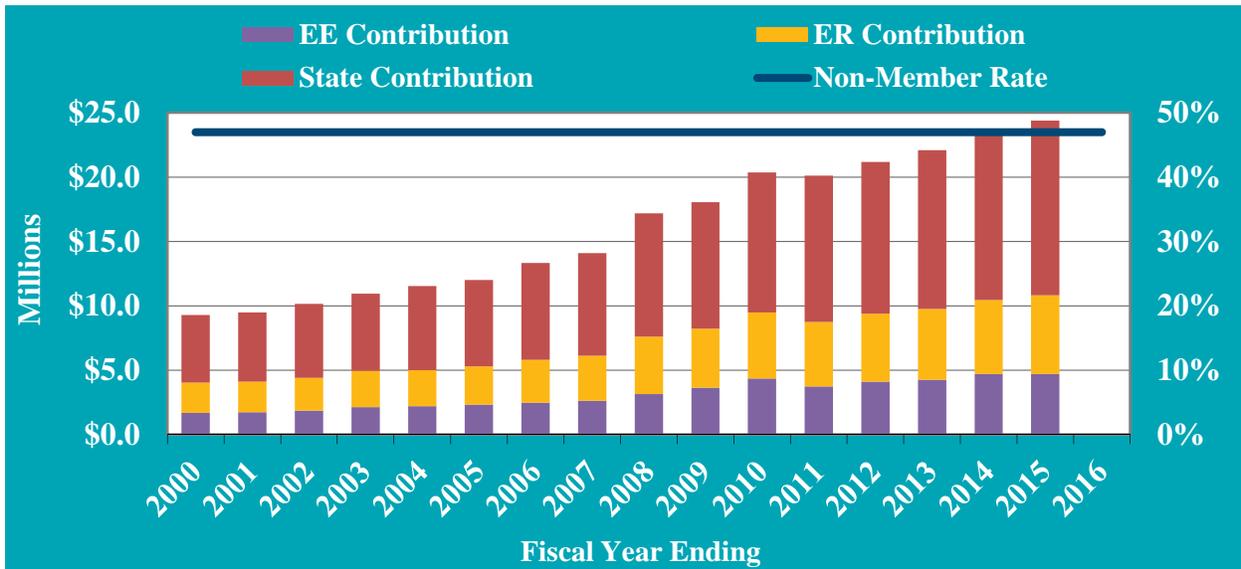
MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION I
BOARD SUMMARY

Contribution Rates

The stacked bars in this graph show the contributions made by members, employers, and the State (left-hand scale). The navy line shows the non-member contribution rate (or the employer plus the State rate) as a percent of payroll (right-hand scale).

The non-member and member contribution rates are set by State law. The actuarial valuation determines the extent to which the statutory contributions will meet the requirements of funding the System.



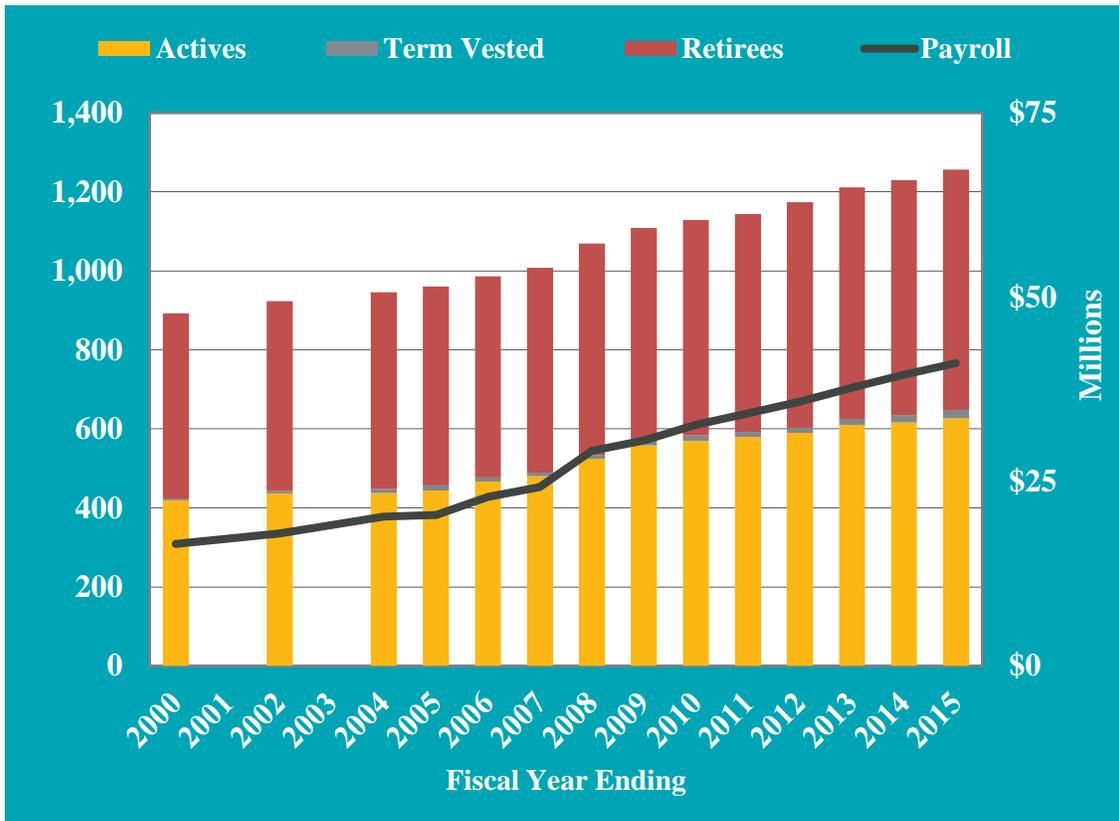
MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION I
BOARD SUMMARY

Participant Trends

The bars show the number of participants in each category and should be read using the left-hand scale. As with any maturing fund, this System continues to show growth in the number of retired members. The active-to-inactive ratio has increased slightly from 0.9 actives for each inactive in 2000 to 1.0 actives for each inactive today.

The black line shows the covered payroll in millions of the System and is read using the right-hand scale.

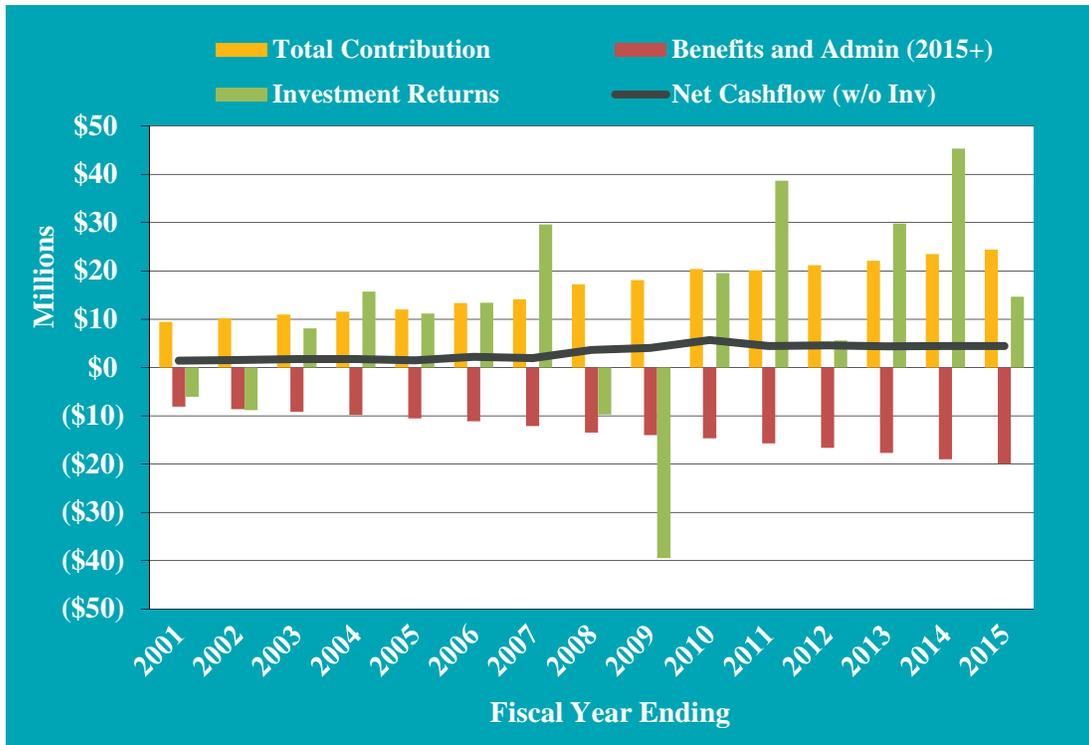


MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION I
BOARD SUMMARY

Net Cash Flow

This graph shows the historical contributions compared to benefit payments and, for 2015 and later, administrative expenses. The difference between these two measures is shown in the solid black line, and is the net cash flow (excluding investment returns).



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION I
BOARD SUMMARY

Future Outlook

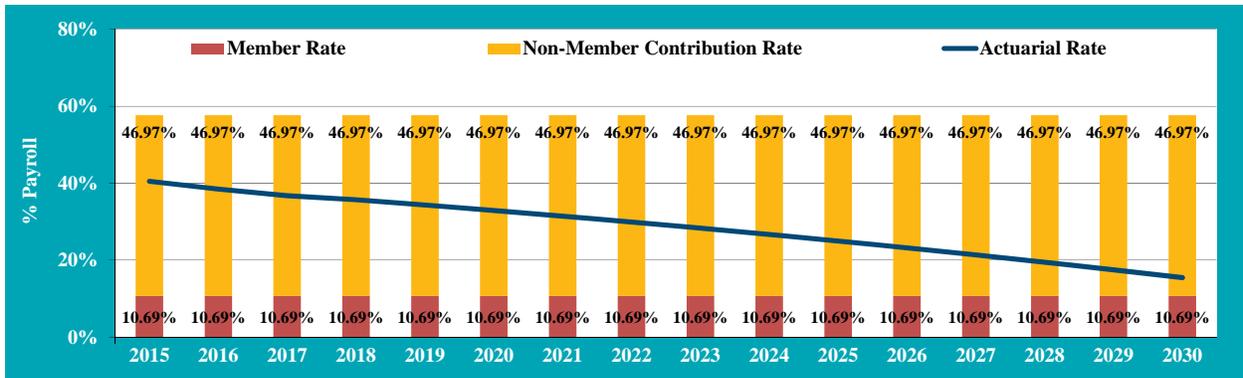
Baseline Projections

These graphs show the expected progress of the System over the next 15 years assuming the System's assets earn 7.75% on their *market value*, and that contributions continue to be made at the current statutory rates.

The values on top of the chart show that the funded status of the System is expected to increase from the current ratio of 76% and will reach 117% by the end of the 15-year period.



The chart below shows that the total contribution computed on an Actuarial Rate basis will decrease over the 15-year period as the System moves to fully funded. The Actuarial Rate is calculated as the normal cost, administrative expense, and a level percent of pay 30-year open amortization of the unfunded actuarial liability.

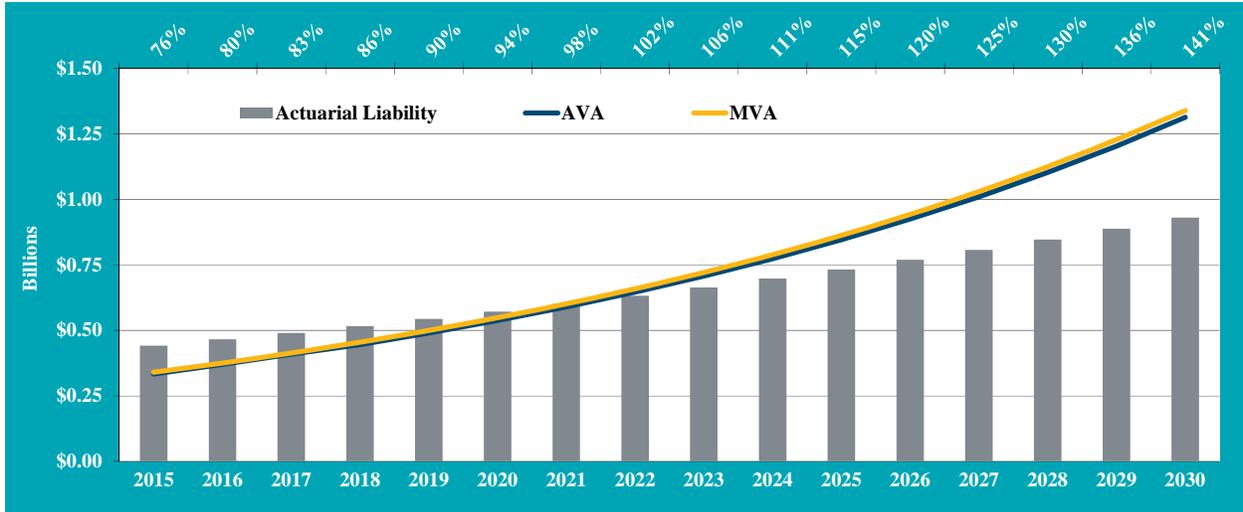


MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

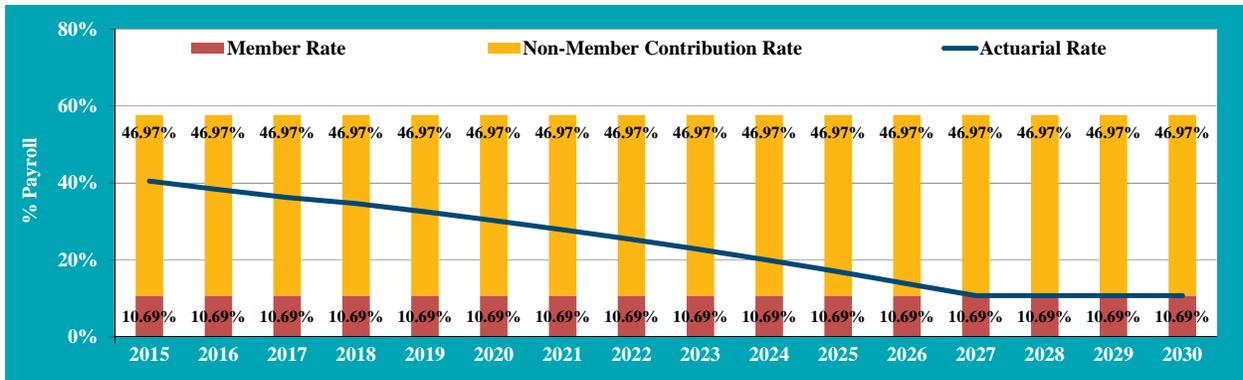
**SECTION I
 BOARD SUMMARY**

Projections with Asset Returns of 9.25%

The future funding status of this System will be impacted by the investment earnings. These two charts below show what the next 15 years would look like with a 9.25% annual return in each year (i.e., 1.5% greater than the assumed rate of return).



Compared to the baseline projections, the funded status improvement is even greater, and the Actuarial Rate drops further below the statutory contribution rates as projected surplus is applied to offset the normal cost. The non-member portion of the Actuarial Rate drops to zero in the last few years of the 15-year period.

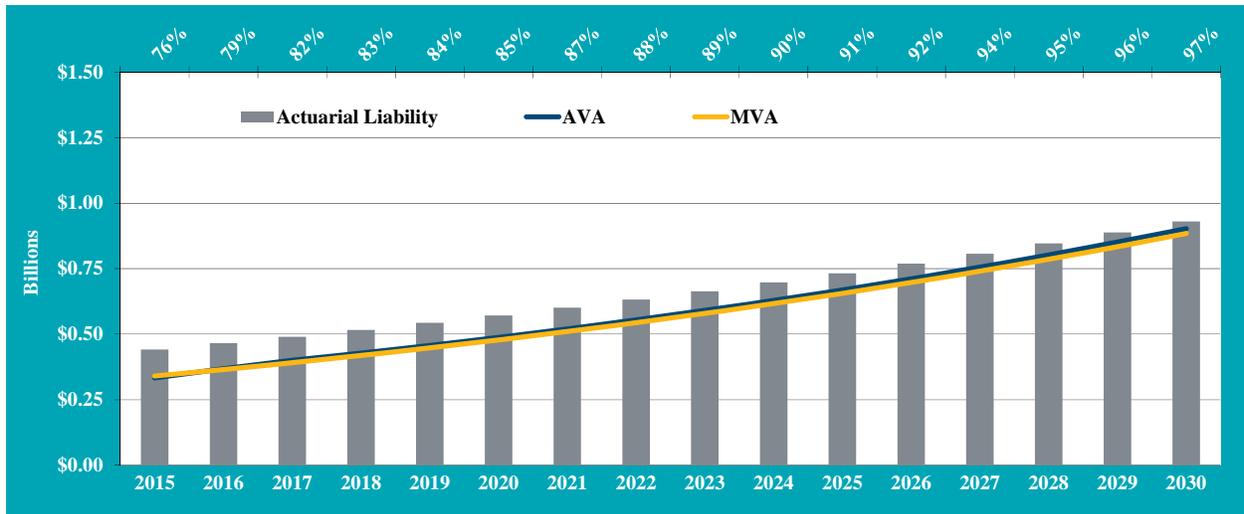


MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
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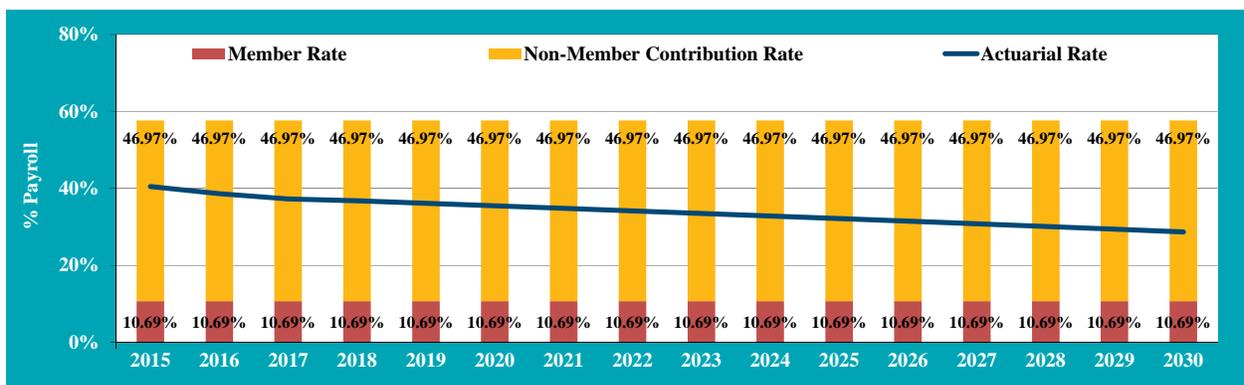
SECTION I
BOARD SUMMARY

Projections with Asset Returns of 6.25%

To further demonstrate how fluctuations in the earnings rate can impact funding, we show the anticipated system funding projections if the invested assets earn 6.25% per year over the entire 15-year period (i.e., 1.5% less than the assumed rate of return).



Under this scenario, the improvement in the funded status is less than under the baseline projection. The decrease in the Actuarial Rate is also less than under the baseline projection. However, the funded ratio is still anticipated to improve over this time which supports the position that the current statutory contribution rates will be sufficient to meet the benefit obligations if there is a slight drop in investment returns.



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION I
BOARD SUMMARY**

**Table I-1
Montana Firefighters' Unified Retirement System
Summary of Principal System Results**

Valuation as of:	June 30, 2014	June 30, 2015	% Change
<u>Participant Counts</u>			
Active Members	616	627	1.8%
Disabled Members*	10	9	(10.0%)
Retirees and Beneficiaries*	585	600	2.6%
Terminated Vested Members	19	21	10.5%
Terminated Non-Vested Members	66	71	7.6%
Total**	1,296	1,328	2.5%
Annual Salaries of Active Members	\$ 39,494,619	\$ 41,041,360	3.9%
Average Annual Salary	\$ 64,115	\$ 65,457	2.1%
Annual Retirement Allowances for Retired Members and Beneficiaries	\$ 19,207,518	\$ 20,322,164	5.8%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 419,013,363	\$ 441,834,268	5.4%
Actuarial Value of Assets (AVA)	300,949,326	333,629,221	10.9%
Unfunded AL (AVA/AL)	\$ 118,064,037	\$ 108,205,047	(8.4%)
Funded Ratio	71.8%	75.5%	
Present Value of Accrued Benefits (PVAB)	\$ 372,450,035	\$ 393,408,470	5.6%
Market Value of Assets	321,556,669	340,636,031	5.9%
Unfunded PVAB	\$ 50,893,366	\$ 52,772,439	3.7%
Accrued Benefit Funding Ratio	86.3%	86.6%	
Ratio of Actuarial Value to Market Value	93.6%	97.9%	
<u>Contributions as a Percentage of Payroll</u>			
Statutory Funding Rate	57.66%	57.66%	
Normal Cost Rate	26.51%	26.51%	
Administrative Expense	0.19%	0.19%	
Available for Amortization of UAL	30.96%	30.96%	
Period to Amortize	11.3 years	9.7 years	
Projected 30-year Level Funding Rate	42.31%	40.48%	
Projected Shortfall (Surplus)	(15.35%)	(17.18%)	

* Based on PERB categorization for the annual report. For actuarial valuation purposes, 63 members in 2014 and 63 members in 2015 were valued as disabled members with offsetting reductions to the number of retired members.

** A reconciliation between participant counts used in the valuation and counts used in the annual report appears at the beginning of Appendix A.

SECTION II ASSETS

Pension plan assets play a key role in the financial operation of the System and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely have an impact upon benefit levels, contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on the System's assets including:

- **Disclosure** of System assets at June 30, 2014 and June 30, 2015;
- Statement of the **changes** in market values during the year;
- Development of the **Actuarial Value of Assets**;
- An assessment of **investment performance**; and
- A projection of the System's expected **cash flows** for the next 10 years.

Disclosure

The market value of assets represents "snap-shot" or "cash-out" values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace.

The actuarial values are market values which have been smoothed and are used for evaluating the System's ongoing liability to meet its obligations.

The actuarial value of assets is the current market value, adjusted by a four-year smoothing of gains and losses on a market value basis. Each year's gain or loss is determined as the difference between the actual market return and the expected market return using the assumed rate of investment return.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION II
ASSETS

Table II-1 Changes in Market Values		
Value of Assets – June 30, 2014		\$ 321,556,669
<u>Additions</u>		
Member Contributions	\$ 4,710,082	
Employer Contributions	6,100,252	
Non-Employer Contributions	13,572,990	
Investment Return	14,640,156	
Other	<u>0</u>	
Total Additions	\$ 39,023,480	
<u>Deductions</u>		
Benefit Payments	\$ 19,747,008	
Administrative Expenses	<u>197,110</u>	
Total Deductions	\$ 19,944,118	
Value of Assets – June 30, 2015		\$ 340,636,031

**SECTION II
 ASSETS**

Actuarial Value of Assets (AVA)

The actuarial value of assets represents a “smoothed” value developed by the actuary to reduce, or eliminate, volatile results which could develop from short-term fluctuations in the market value of assets. For this System, the actuarial value has been calculated by taking the market value of assets less 75% of the investment gain (loss) during the preceding year, less 50% of the investment gain (loss) during the second preceding year, and less 25% of the investment gain (loss) during the third preceding year. The tables below illustrate the calculation of actuarial value of assets for the June 30, 2015 valuation.

Table II-2 Market Value Gain/(Loss)	
Value of Assets – June 30, 2014	\$ 321,556,669
Total Contributions	\$ 24,383,324
Benefit Payments	(19,747,008)
Administrative Expense	(197,110)
Expected Return at 7.75%	<u>25,089,451</u>
Expected Value at June 30, 2015	\$ 351,085,326
Actual Value at June 30, 2015	\$ 340,636,031
Investment Gain/(Loss)	\$ (10,449,295)

Table II-3 Develop Excluded Gain/(Loss)		
	Total Gain/(Loss)	Excluded Portion
Exclude 75% of 2015 Gain/(Loss)	\$ (10,449,295)	\$ (7,836,972)
Exclude 50% of 2014 Gain/(Loss)	\$ 24,076,673	\$ 12,038,337
Exclude 25% of 2013 Gain/(Loss)	\$ 11,221,779	\$ 2,805,445
Total Excluded Gain/(Loss) for AVA Calculation		\$ 7,006,810

Table II-4 Actuarial Value of Assets	
Market Value of Assets – June 30, 2015	\$ 340,636,031
Total Gain/(Loss) excluded	<u>7,006,810</u>
Actuarial Value of Assets – June 30, 2015	\$ 333,629,221

**SECTION II
 ASSETS**

Investment Performance

The market value of assets (MVA) returned 4.52% during Fiscal Year ended 2015, which is less than the assumed 7.75% return. A return of 9.32% on the AVA is primarily the result of the asset smoothing method being utilized for the calculation of the actuarial value of assets. Since only 25% of the gain or loss from the performance of the System is recognized in a given year, in periods of very good performance, the AVA can lag significantly behind the MVA. In a period of negative returns, the AVA does not decline as rapidly as the MVA.

Table II-5 Annual Rates of Return		
Year Ending June 30,	Market Value	Actuarial Value
2005	7.85%	5.47%
2006	8.66%	9.02%
2007	17.36%	11.44%
2008	(4.80%)	7.31%
2009	(20.08%)	(0.17%)
2010	11.99%	(0.83%)
2011	20.71%	0.84%
2012	2.42%	3.87%
2013	12.43%	11.05%
2014	16.53%	12.44%
2015	4.52%	9.32%

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION II
ASSETS**

**Table II-6
Projection of System's Benefit Payments and Contributions
(in thousands)**

Year Beginning July 1,	Expected Benefits	Expected Admin Expense	Expected Contributions*	Net Cash Flow (excluding Investment Return)	Expected Investment Return**	Net Cash Flow (including Investment Return)
2015	\$ 21,683	\$ 82	\$ 24,993	\$ 3,228	\$ 26,522	\$ 29,750
2016	22,744	86	25,993	3,163	28,825	31,988
2017	24,071	89	27,033	2,873	31,293	34,166
2018	25,375	93	28,114	2,646	33,932	36,578
2019	26,789	96	29,238	2,353	36,756	39,109
2020	28,296	100	30,408	2,012	39,774	41,786
2021	29,800	104	31,624	1,720	43,001	44,721
2022	31,347	108	32,889	1,434	46,457	47,891
2023	32,983	113	34,205	1,109	50,156	51,265
2024	34,735	117	35,573	721	54,114	54,835

* Expected contributions include Employer Contributions, State Contributions and Member Contributions. For illustration purposes, we have assumed that all contribution rates will remain level and that payroll will increase at the actuarially assumed rate of 4.00% per year.

** Expected investment return is based upon an assumed return of 7.75% per annum.

Expected benefit payments are projected for the closed group valued at June 30, 2015. Projecting any farther than 10 years using a closed-group would not yield reliable predictions due to the omission of new hires.

SECTION III LIABILITIES

In this section, we present detailed information on System liabilities including:

- **Disclosure** of System liabilities at June 30, 2014 and June 30, 2015;
- Statement of **changes** in these liabilities during the year;
- Details on the source of actuarial gains and losses between this valuation and the last; and
- Development of actuarial unfunded liability on a market value basis as required under MCA 19-2-407.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of Benefits:** Used for analyzing the financial outlook of the System, this represents the amount of money needed today to fully pay off all future benefits and expenses of the System for the current participants, assuming participants continue to accrue benefits and all of the assumptions are met.
- **Actuarial Liability:** Used for funding calculations, this liability is calculated taking the Present Value of Benefits and subtracting the present value of future Member Contributions and future Employer Normal Costs under an acceptable actuarial funding method. This method is referred to as the **Entry Age Normal (EAN)** funding method.
- **Present Value of Accrued Benefits:** Used for communicating the current level of liabilities, this liability represents the total amount of money needed today to fully pay off the current accrued obligations of the System, assuming no future accruals of benefits. These liabilities are used to assess whether the System can meet its current benefit commitments.

The following table discloses each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of System assets yields, for each respective liability type, a **net surplus** or an **unfunded liability**.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION III
LIABILITIES**

Table III-1		
Liabilities/Net (Surplus)/Unfunded		
	June 30, 2014	June 30, 2015
<u>Present Value of Benefits</u>		
Active Participant Benefits	\$ 263,121,452	\$ 275,430,893
Retiree and Inactive Benefits	263,382,739	276,879,242
Present Value of Benefits (PVB)	\$ 526,504,191	\$ 552,310,135
Market Value of Assets (MVA)	\$ 321,556,669	\$ 340,636,031
Future Member Contributions	43,803,467	44,942,590
Future Non-Member Contributions	192,464,812	197,469,921
Funding Shortfall/(Surplus)	(31,320,757)	(30,738,407)
Total Resources	\$ 526,504,191	\$ 552,310,135
<u>Actuarial Liability</u>		
Present Value of Benefits (PVB)	\$ 526,504,191	\$ 552,310,135
Present Value of Future Normal Costs (PVFNC)	107,490,828	110,475,867
Actuarial Liability (AL=PVB-PVFNC)	419,013,363	441,834,268
Actuarial Value of Assets (AVA)	300,949,326	333,629,221
Net (Surplus)/Unfunded (AL – AVA)	\$ 118,064,037	\$ 108,205,047
<u>Present Value of Accrued Benefits</u>		
Present Value of Benefits (PVB)	\$ 526,504,191	\$ 552,310,135
Present Value of Future Benefit Accruals (PVFBA)	154,054,156	158,901,665
Present Value of Accrued Benefits (PVAB=PVB-PVFBA)	\$ 372,450,035	\$ 393,408,470
Market Value of Assets (MVA)	321,556,669	340,636,031
Net Unfunded (PVAB – MVA)	\$ 50,893,366	\$ 52,772,439

**SECTION III
 LIABILITIES**

Changes in Liabilities

Each of the Liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- System amendments changing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in the System's assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure System assets

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the System. Below we present key changes in liabilities since the last valuation. On the next page, we provide more detail on the sources of the actuarial (gain)/loss as measured on the basis of actuarial liability.

Table III-2 Changes in Liabilities			
	Present Value of Benefits	Actuarial Liability	Present Value of Accrued Liability
Liabilities June 30, 2014	\$ 526,504,191	\$ 419,013,363	\$ 372,450,035
Liabilities June 30, 2015	552,310,135	441,834,268	393,408,470
Liability			
Increase (Decrease)	25,805,944	22,820,905	20,958,435
Change Due to:			
Actuarial (Gain)/Loss	NC *	(1,078,740)	NC*
Plan Changes	0	0	0
Benefits Accumulated and Other Sources	25,805,944	23,899,645	20,958,435

* NC = not calculated.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION III
LIABILITIES**

**Table III-3
Summary of Actuarial Gains and Losses as of June 30, 2015**

Actuarial Liabilities as of June 30, 2014	\$ 419,013,363
Normal Cost	11,066,391
Actual Benefit Payments	(19,747,008)
Interest	<u>32,580,262</u>
Expected Actuarial Liability as of June 30, 2015	\$ 442,913,008
Actuarial Liability as of June 30, 2015	\$ 441,834,268
Liability (Gain)/Loss	\$ (1,078,740)
Sources of Liability (Gain)/Loss	
Salary (Gain)/Loss	\$ (1,456,044)
New Participant (Gain)/Loss	309,316
Active Retirements (Gain)/Loss	302,177
Active Terminations (Gain)/Loss	95,901
Active Deaths (Gain)/Loss	(182,698)
Active Disability (Gain)/Loss	(214,337)
Inactive Mortality (Gain)/Loss	1,544,479
Other (Gain)/Loss	(1,477,534)
Actuarial Liability as of June 30, 2015	\$ 441,834,268
Liability (Gain)/Loss due to plan changes	\$ 0
Actuarial Value of Assets as of June 30, 2014	\$ 300,949,326
Net Cash Flow	4,439,206
Expected Earnings	<u>23,492,382</u>
Expected Actuarial Value of Assets as of June 30, 2015	\$ 328,880,914
Actuarial Value of Assets as of June 30, 2015	\$ 333,629,221
Investment (Gain)/Loss	\$ (4,748,307)
Total Liability (Gain)/Loss	<u>(1,078,740)</u>
Total Actuarial (Gain)/Loss	\$ (5,827,047)

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION III
LIABILITIES**

Table III-4 shows the actuarial liabilities as of the prior and current valuation dates. The unfunded actuarial liability is the difference between the actuarial liability and the actuarial value of assets. The funded ratio is the ratio of the actuarial value of assets to the actuarial liability.

Table III-4 Actuarial Liabilities for Funding		
	June 30, 2014	June 30, 2015
1. Actuarial Liabilities		
Retiree and Inactive Benefits	\$ 263,382,739	\$ 276,879,242
Active Member Benefits	<u>155,630,624</u>	<u>164,955,026</u>
Total Actuarial Liability	\$ 419,013,363	\$ 441,834,268
2. Actuarial Value of Assets	\$ 300,949,326	\$ 333,629,221
3. Unfunded Actuarial Liability	\$ 118,064,037	\$ 108,205,047
4. Funded Ratio	71.8%	75.5%

Montana Code Annotated (MCA) 19-2-407 requires an analysis of how market performance is affecting the actuarial funding of the System. Table III-5 presented below shows the same information as in Table III-4 above, but using market value of assets rather than actuarial value of assets.

Table III-5 Actuarial Liabilities on Market Value Basis (MCA 19-2-407)		
	June 30, 2014	June 30, 2015
1. Actuarial Liabilities		
Retiree and Inactive Benefits	\$ 263,382,739	\$ 276,879,242
Active Member Benefits	<u>155,630,624</u>	<u>164,955,026</u>
Total Actuarial Liability	\$ 419,013,363	\$ 441,834,268
2. Market Value of Assets	\$ 321,556,669	\$ 340,636,031
3. Unfunded Actuarial Liability	\$ 97,456,694	\$ 101,198,237
4. Funded Ratio	76.7%	77.1%

SECTION IV CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the System. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

For this System, the funding method employed is the **Entry Age Normal Actuarial Cost Method**. Under this method, there are three components to the total contribution: the **normal cost rate**, the **unfunded actuarial liability rate** (UAL rate), and the **administrative expense rate**. The normal cost rate is determined by taking the value, as of entry age into the System, of each member's projected future benefits. This value is then divided by the value, also at entry age, of each member's expected future salary. The normal cost rate is multiplied by current salary to determine each member's normal cost rate. Finally, the total normal cost rate is reduced by the member contribution rate to produce the employer normal cost rate. The difference between the EAN actuarial liability and the actuarial value of assets is the unfunded actuarial liability.

For purposes of determining the adequacy of the statutory funding rate, the UAL rate is calculated by subtracting the normal cost rate from the statutory rate. A calculation is then made to determine the period over which the UAL rate will amortize the unfunded actuarial liability. A second UAL rate is calculated based upon a 30-year amortization of the UAL in accordance with Board funding policy. However, this rate should not necessarily be construed as a recommended contribution level and this policy will not fully amortize the unfunded actuarial liability. All UAL payments are determined as a level percentage of pay, assuming that total pay increases by the annual inflation rate of 4.00%.

The assumed administrative expense rate is 0.19% of payroll. This rate, when applied to payroll, is intended to provide an allowance above the cost of funding the benefits to pay for the expense of operating this System.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION IV
CONTRIBUTIONS**

The tables below present and compare the contribution rates for the System for this valuation and the prior one.

Table IV-1 Statutory Basis		
	June 30, 2014	June 30, 2015
Statutory Funding Rates		
Members	10.69%	10.69%
Employers	14.36%	14.36%
State	32.61%	32.61%
Total	57.66%	57.66%
Normal Cost Rate	26.51%	26.51%
Administrative Expense	0.19%	0.19%
Funding Rate Available for Amortization	30.96%	30.96%
Unfunded Actuarial Liability (Surplus)	\$ 118,064,037	\$ 108,205,047
Years to Amortize*	11.3 years	9.7 years

* On a market value basis, the years to amortize the Unfunded Actuarial Liability were 9.0 years at June 30, 2014 and 9.0 years at June 30, 2015.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

**SECTION IV
 CONTRIBUTIONS**

Table IV-2 Calculated Actuarial Contribution Basis		
	June 30, 2014	June 30, 2015
Normal Cost Rate	26.51%	26.51%
Amortization Payment (30-years)	15.61%	13.78%
Administrative Expense	<u>0.19%</u>	<u>0.19%</u>
Total Calculated Contribution Rate	42.31%	40.48%
Less Statutory Rate	<u>57.66%</u>	<u>57.66%</u>
Shortfall (Surplus) in Statutory Rate	(15.35%)	(17.18%)

Table IV-3 Calculated Actuarial Contribution on Market Value (MCA 19-2-407)		
	June 30, 2014	June 30, 2015
Normal Cost Rate	26.51%	26.51%
Amortization Payment (30-years)	12.89%	12.89%
Administrative Expense	<u>0.19%</u>	<u>0.19%</u>
Total Calculated Contribution Rate	39.59%	39.59%
Less Statutory Rate	<u>57.66%</u>	<u>57.66%</u>
Shortfall (Surplus) in Statutory Rate	(18.07%)	(18.07%)

The following table projects results for the next five valuations (assuming all assumptions are met, including 7.75% return).

Table IV-4 Projected Actuarial Contribution Rates	
Valuation Year	Rate
2016	38.44%
2017	36.75%
2018	35.73%
2019	34.35%
2020	32.92%

SECTION V
FINANCIAL STATEMENT INFORMATION

The Government Finance Officers Association (GFOA) maintains a checklist of items to be included in a public retirement system's Comprehensive Annual Financial Report (CAFR) in order to receive recognition for excellence in financial reporting. Therefore, we have included certain schedules in this section for possible inclusion within the System's audited financial statements.

Tables V-1 through V-4 are exhibits which could be used with the CAFR report. Table V-1 is the Note to Required Supplementary Information, Table V-2 is a history of Financial Experience, Table V-3 is the Schedule of Funding Progress and Table V-4 is the Solvency Test which shows the portion of actuarial liability covered by assets.

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-1
Note To Required Supplementary Information

The information presented in the required supplementary schedules was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows.

Valuation date	June 30, 2015
Actuarial cost method	Entry Age Normal
Amortization method	Open
Remaining amortization period for Actuarial Contribution	30 years
Asset valuation method	Four-Year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.75%
General wage growth*	4.00%
Merit salary increases	0.0% - 7.3%
*Includes inflation at	3.00%

The actuarial assumptions used have been recommended based on the most recent review of the System's experience (completed in 2010) and adopted by the Retirement Board.

The rate of employer contributions to the System is composed of the normal cost, amortization of the unfunded actuarial liability, and an allowance for administrative expenses. The normal cost is a level percent of payroll cost which will pay for projected benefits at retirement for each participant. The actuarial liability is that portion of the present value of projected benefits that will not be paid by future normal costs. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial liability. The allowance for administrative expenses is based upon the System's recent history of administrative expenses.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-2
Analysis Of Financial Experience

Gain and Loss in Accrued Liability During Years Ended June 30
Resulting from Differences Between Assumed Experience and Actual Experience

Type of Activity	Gain (or Loss) for Year ending June 30, (expressed in thousands)					
	2010	2011	2012	2013	2014	2015
Investment Income on Actuarial Assets	\$ (18,762)	\$ (14,918)	\$ (8,621)	\$ 7,762	\$ 12,459	\$ 4,748
Combined Liability Experience	<u>(1,396)</u>	<u>(804)</u>	<u>(2,047)</u>	<u>1,384</u>	<u>160</u>	<u>1,079</u>
(Loss)/Gain During Year from Financial Experience	\$ (20,158)	\$ (15,722)	\$(10,668)	\$ 9,146	\$ 12,619	\$ 5,827
Non-Recurring Items	<u>(9,873)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Composite Gain (or Loss) During Year	\$ (30,031)	\$ (15,722)	\$(10,668)	\$ 9,146	\$ 12,619	\$ 5,827

Table V-3
Schedule Of Funding Progress
 (expressed in thousands)

Valuation Date June 30,	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Funded Ratio	Unfunded AAL (UAAL)	Covered Payroll	UAAL as a Percentage of Covered Payroll
2015	\$ 333,629	\$ 441,834	76 %	\$ 108,205	\$ 41,627	260 %
2014	300,949	419,013	72 %	118,064	39,892	296 %
2013	263,483	396,769	66 %	133,286	37,963	351 %
2012	233,121	377,211	62 %	144,090	36,177	398 %
2011	219,959	355,188	62 %	135,229	34,852	388 %
2010	213,755	335,463	64 %	121,708	33,339	365 %

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

SECTION V
FINANCIAL STATEMENT INFORMATION

Table V-4
Solvency Test
Aggregate Accrued Liabilities for
(expressed in thousands)

Valuation Date June 30,	Active Member Contributions (1)	Retirees & Beneficiaries (2)	Active Member Employer Financed Contributions (3)	Actuarial Value of Reported Assets	Portion of Accrued Liabilities Covered by Reported Assets		
					(1)	(2)	(3)
2015	\$ 41,278	\$ 274,505	\$ 126,051	\$ 333,629	100 %	100 %	14 %
2014	38,805	260,538	119,670	300,949	100 %	100 %	1 %
2013	36,441	248,723	111,606	263,483	100 %	91 %	0 %
2012	34,790	235,553	106,868	233,121	100 %	84 %	0 %
2011	33,089	219,842	102,257	219,959	100 %	85 %	0 %
2010	31,422	207,715	96,326	213,755	100 %	88 %	0 %

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Reconciliation of Participant Counts						
	Active	Disabled	Retirees and Beneficiaries	Terminated Vested Members	Terminated Non-Vested Members	Total
Participant counts used for valuation	627	63	547	21	71	1,329
Disabled members having attained normal retirement age		(54)	54			0
Beneficiaries of Disabled Members						0
Beneficiaries with less than one year of certain payments remaining						0
Other Adjustments			(1)			(1)
Participant counts shown in Annual Financial Report	627	9	600	21	71	1,328

This chart is presented for informational purposes only. The counts shown in the valuation line were used for preparation of the liabilities disclosed within this report. The counts disclosed for the Annual Financial Report and the Board Summary (page 9) match the CAFR reports at the request of the Board. The differences between the counts have no material effect upon the liability calculation.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**APPENDIX A
MEMBERSHIP INFORMATION**

The following table shows a reconciliation of the participants used in the previous valuation to this valuation.

	Status Reconciliation						Total
	Active	Retired	Vested	Non Vested	Disabled	Survivor	
Members on July 1, 2014	616	373	19	66	63	160	1,297
New Hires	37	0	0	0	0	0	37
Rehires	6	(1)	(2)	(2)	(1)	0	0
Retired	(15)	20	(2)	(2)	0	(1)	0
Terminated Vested	(6)	0	6	0	0	0	0
Terminated Non Vested	(9)	0	0	9	0	0	0
Active Deaths	0	0	0	0	0	0	0
Became Disabled	(1)	0	0	0	1	0	0
In Pay Deaths	0	(13)	0	0	0	(5)	(18)
Survivors	0	0	0	0	0	14	14
Cash Out	(1)	0	0	0	0	0	(1)
Members on July 1, 2015	627	379	21	71	63	168	1,329

The salaries used in the tables and charts which follow are different than the salaries used for the Board Summary on page 9. For this Appendix A, the valuation projected salaries to be paid for the following fiscal year, whereas for the Board Summary, salaries are applicable in the year ending on the valuation date.

The benefits for retirees and beneficiaries used for the tables and charts which follow are different than the benefits used for the Board Summary on page 9. For this Appendix A, the valuation projected benefits to be paid for the following fiscal year (including Guaranteed Annual Benefit Adjustment (GABA) where applicable), whereas for the Board Summary, annual benefits are as of the valuation date.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of Active Members
 by Age and Service as of June 30, 2015**

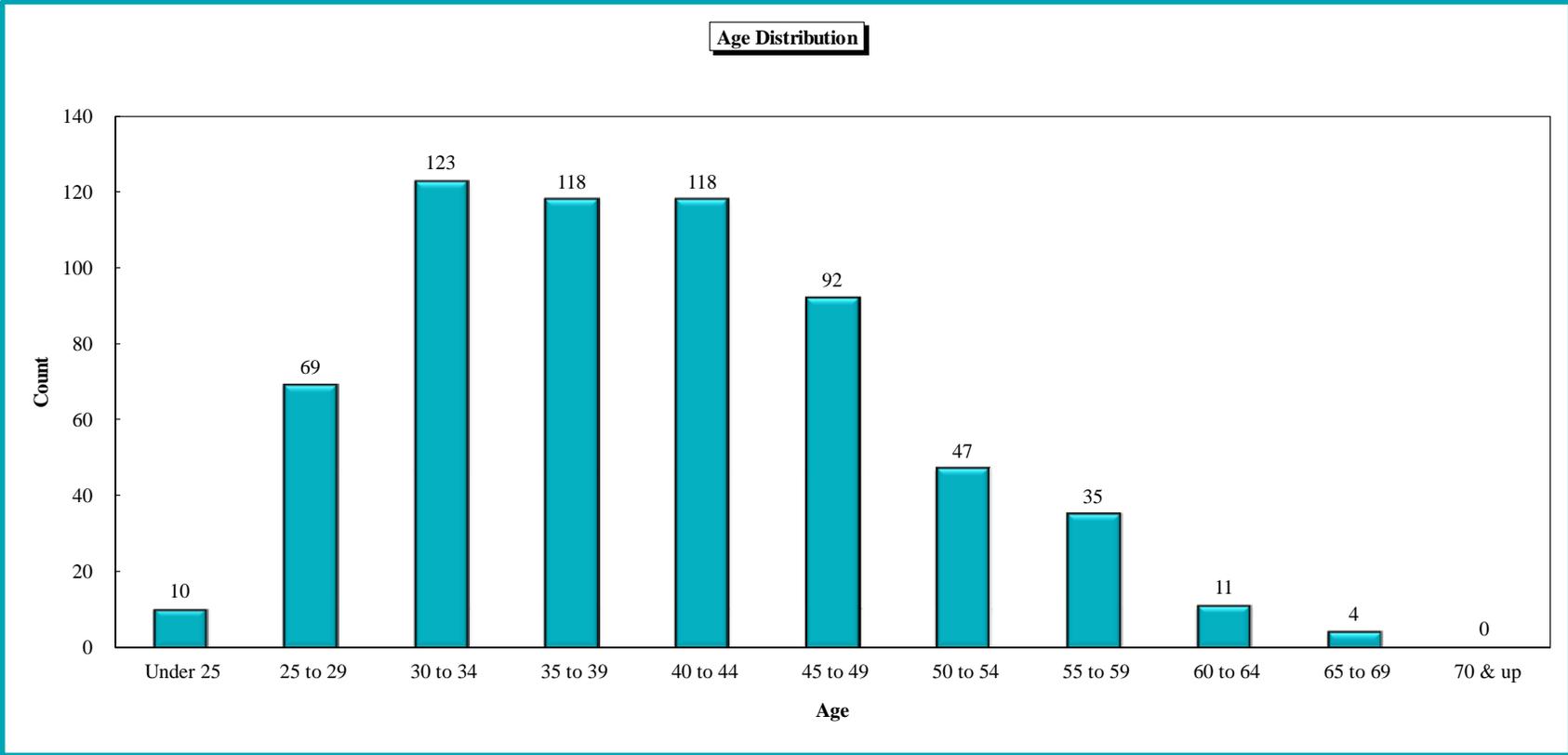
COUNTS BY AGE/SERVICE

Age	Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	2	8	0	0	0	0	0	0	0	0	0	10
25 to 29	10	50	9	0	0	0	0	0	0	0	0	69
30 to 34	8	46	58	11	0	0	0	0	0	0	0	123
35 to 39	6	17	57	36	2	0	0	0	0	0	0	118
40 to 44	3	11	28	37	35	3	1	0	0	0	0	118
45 to 49	2	3	7	24	33	21	2	0	0	0	0	92
50 to 54	0	0	2	3	12	13	17	0	0	0	0	47
55 to 59	2	1	2	1	3	11	9	4	2	0	0	35
60 to 64	0	1	1	1	1	0	6	0	1	0	0	11
65 to 69	0	0	3	0	1	0	0	0	0	0	0	4
70 & up	0	0	0	0	0	0	0	0	0	0	0	0
Total	33	137	167	113	87	48	35	4	3	0	0	627

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

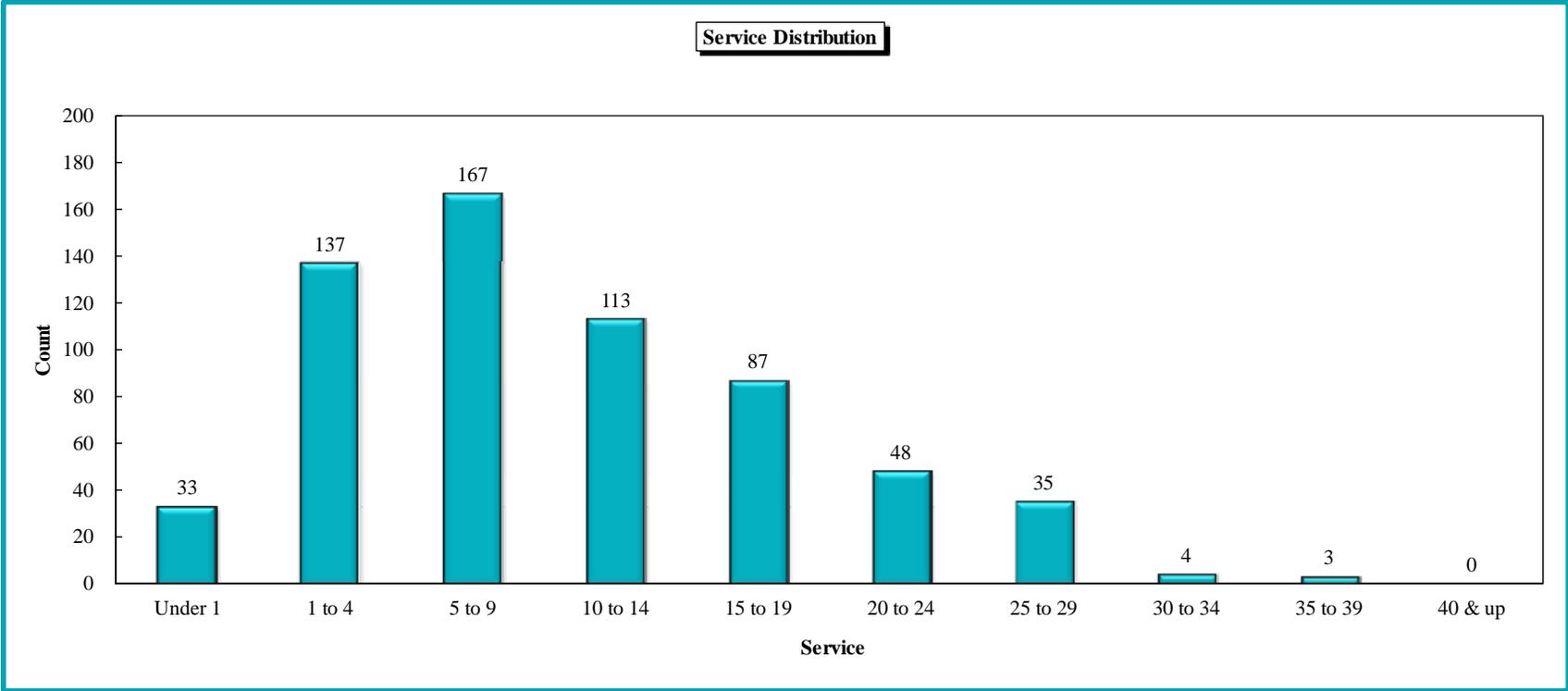
APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of Active Members
by Age as of June 30, 2015**



APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of Active Members
by Service as of June 30, 2015**



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**APPENDIX A
MEMBERSHIP INFORMATION**

**Montana Firefighters' Unified Retirement System Distribution of Active Members
by Age and Service as of June 30, 2015**

AVERAGE SALARY BY AGE/SERVICE

Age	Service											Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up			
Under 25	\$ 48,743	\$ 49,710	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 49,516
25 to 29	\$ 38,414	\$ 55,172	\$ 59,063	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 53,251
30 to 34	\$ 43,194	\$ 57,512	\$ 63,104	\$ 65,971	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 59,974
35 to 39	\$ 51,505	\$ 57,923	\$ 65,093	\$ 70,361	\$ 75,363	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 65,150
40 to 44	\$ 51,674	\$ 58,191	\$ 60,220	\$ 69,097	\$ 77,810	\$ 72,113	\$ 64,212	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 68,151
45 to 49	\$ 57,306	\$ 90,913	\$ 65,903	\$ 67,264	\$ 73,010	\$ 80,283	\$ 95,507	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 73,362
50 to 54	\$ -	\$ -	\$ 91,157	\$ 52,559	\$ 77,088	\$ 76,921	\$ 86,785	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 79,582
55 to 59	\$ 59,601	\$ 110,044	\$ 54,938	\$ 85,822	\$ 66,671	\$ 75,490	\$ 81,336	\$ 94,129	\$ 76,766	\$ -	\$ -	\$ -	\$ 77,641
60 to 64	\$ -	\$ 74,653	\$ 62,385	\$ 91,530	\$ 43,952	\$ -	\$ 81,194	\$ -	\$ 84,768	\$ -	\$ -	\$ -	\$ 76,768
65 to 69	\$ -	\$ -	\$ 91,775	\$ -	\$ 75,963	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 87,822
70 & up	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 46,214	\$ 57,548	\$ 63,948	\$ 68,714	\$ 75,039	\$ 77,763	\$ 84,279	\$ 94,129	\$ 79,434	\$ -	\$ -	\$ -	\$ 66,473

The salary shown in the above chart was used for valuation purposes and assumes pay increases for the year.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

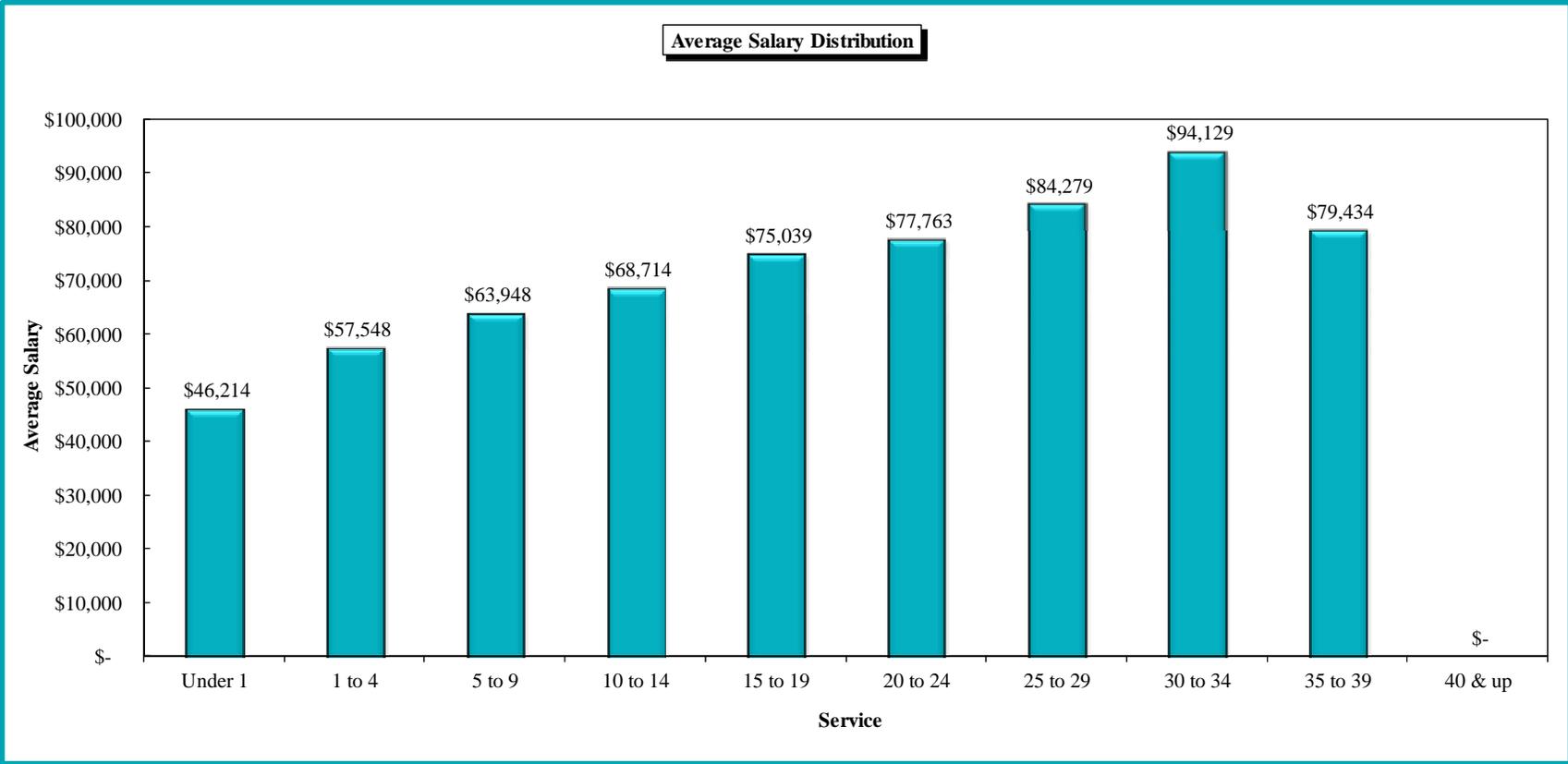
Montana Firefighters' Unified Retirement System Distribution of Active Members
by Age as of June 30, 2015



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of Active Members
by Service as of June 30, 2015**



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of Retired
Members, Survivors, and Disabled Members as of June 30, 2015**

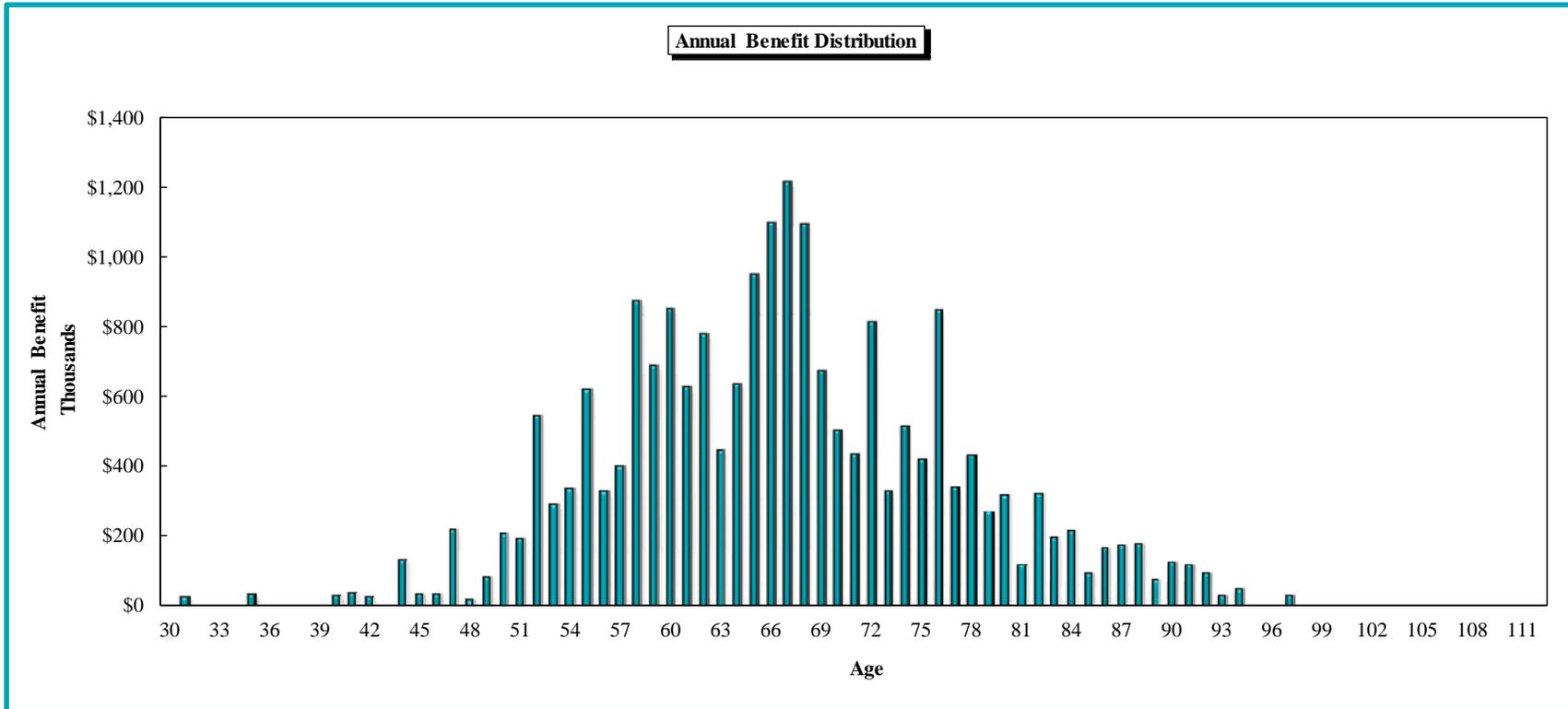
Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	\$0	73	9	\$327,789
25	0	\$0	74	17	\$512,018
26	0	\$0	75	12	\$417,862
27	0	\$0	76	29	\$846,855
28	0	\$0	77	13	\$339,578
29	0	\$0	78	13	\$430,006
30	0	\$0	79	14	\$270,329
31	1	\$23,964	80	15	\$317,094
32	0	\$0	81	4	\$116,150
33	0	\$0	82	12	\$318,847
34	0	\$0	83	7	\$194,737
35	1	\$29,676	84	8	\$211,336
36	0	\$0	85	4	\$91,522
37	0	\$0	86	8	\$164,188
38	0	\$0	87	9	\$170,657
39	0	\$0	88	7	\$174,771
40	1	\$27,802	89	5	\$70,854
41	2	\$34,345	90	5	\$124,791
42	1	\$22,985	91	5	\$117,380
43	0	\$0	92	4	\$91,935
44	5	\$132,170	93	1	\$27,790
45	1	\$31,657	94	2	\$47,293
46	1	\$30,690	95	0	\$0
47	7	\$214,913	96	0	\$0
48	2	\$18,374	97	1	\$26,060
49	4	\$77,897	98	0	\$0
50	6	\$206,369	99	0	\$0
51	4	\$191,689	100	0	\$0
52	13	\$541,049	101	0	\$0
53	12	\$289,441	102	0	\$0
54	13	\$335,160	103	0	\$0
55	17	\$621,050	104	0	\$0
56	11	\$326,910	105	0	\$0
57	10	\$396,354	106	0	\$0
58	22	\$872,712	107	0	\$0
59	18	\$687,032	108	0	\$0
60	21	\$848,575	109	0	\$0
61	16	\$626,983	110	0	\$0
62	19	\$779,511	111	0	\$0
63	11	\$447,301	112	0	\$0
64	20	\$636,204	113	0	\$0
65	20	\$949,254	114	0	\$0
66	26	\$1,098,007	115	0	\$0
67	29	\$1,218,908	116	0	\$0
68	28	\$1,094,310	117	0	\$0
69	18	\$671,606	118	0	\$0
70	12	\$502,683	119	0	\$0
71	12	\$433,391	120	0	\$0
72	22	\$813,681			
			Totals	610	\$20,642,492

The chart above reflects the counts and benefits used for valuation purposes as a result of data processing. The benefit amounts shown have been projected using a half year COLA assumption where applicable.

MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

Montana Firefighters' Unified Retirement System Distribution of Retired
Members, Survivors, and Disabled Members as of June 30, 2015



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
 ACTUARIAL VALUATION AS OF JUNE 30, 2015

APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of
 Terminated Vested Members as of June 30, 2015**

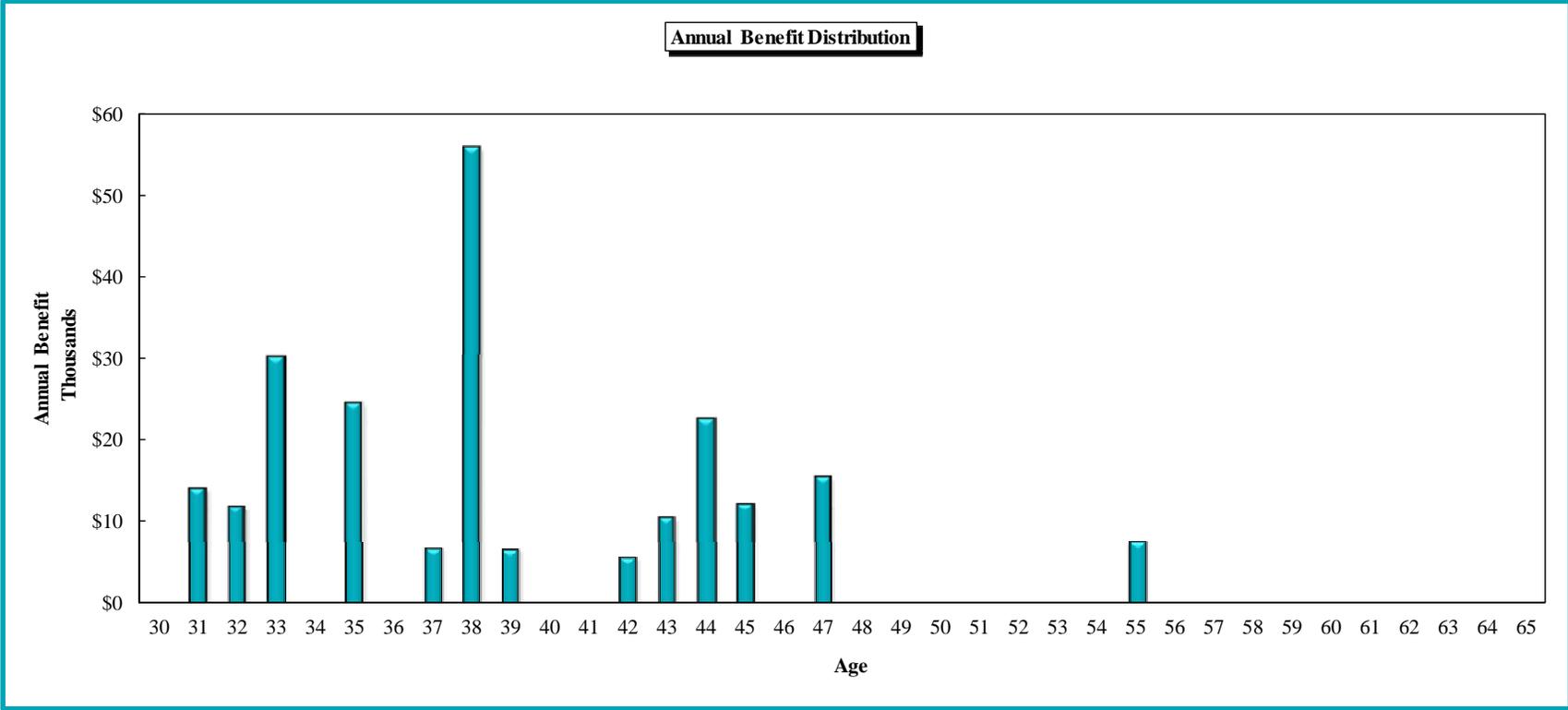
Age	Count	Annual Benefit*	Account Balance*	Age	Count	Annual Benefit*	Account Balance*
<25	0	\$0	\$0	73	0	\$0	\$0
25	0	\$0	\$0	74	0	\$0	\$0
26	0	\$0	\$0	75	0	\$0	\$0
27	0	\$0	\$0	76	0	\$0	\$0
28	0	\$0	\$0	77	0	\$0	\$0
29	0	\$0	\$0	78	0	\$0	\$0
30	0	\$0	\$0	79	0	\$0	\$0
31	1	\$14,070	\$0	80	0	\$0	\$0
32	1	\$11,839	\$0	81	0	\$0	\$0
33	3	\$30,272	\$0	82	0	\$0	\$0
34	0	\$0	\$0	83	0	\$0	\$0
35	2	\$24,482	\$0	84	0	\$0	\$0
36	0	\$0	\$0	85	0	\$0	\$0
37	1	\$6,839	\$0	86	0	\$0	\$0
38	5	\$56,161	\$0	87	0	\$0	\$0
39	1	\$6,747	\$0	88	0	\$0	\$0
40	0	\$0	\$0	89	0	\$0	\$0
41	0	\$0	\$0	90	0	\$0	\$0
42	1	\$5,759	\$0	91	0	\$0	\$0
43	1	\$10,436	\$0	92	0	\$0	\$0
44	2	\$22,603	\$0	93	0	\$0	\$0
45	1	\$12,081	\$0	94	0	\$0	\$0
46	0	\$0	\$0	95	0	\$0	\$0
47	1	\$15,456	\$0	96	0	\$0	\$0
48	0	\$0	\$0	97	0	\$0	\$0
49	0	\$0	\$0	98	0	\$0	\$0
50	0	\$0	\$0	99	0	\$0	\$0
51	0	\$0	\$0	100	0	\$0	\$0
52	0	\$0	\$0	101	0	\$0	\$0
53	0	\$0	\$0	102	0	\$0	\$0
54	0	\$0	\$0	103	0	\$0	\$0
55	1	\$7,697	\$0	104	0	\$0	\$0
56	0	\$0	\$0	105	0	\$0	\$0
57	0	\$0	\$0	106	0	\$0	\$0
58	0	\$0	\$0	107	0	\$0	\$0
59	0	\$0	\$0	108	0	\$0	\$0
60	0	\$0	\$0	109	0	\$0	\$0
61	0	\$0	\$0	110	0	\$0	\$0
62	0	\$0	\$0	111	0	\$0	\$0
63	0	\$0	\$0	112	0	\$0	\$0
64	0	\$0	\$0	113	0	\$0	\$0
65	0	\$0	\$0	114	0	\$0	\$0
66	0	\$0	\$0	115	0	\$0	\$0
67	0	\$0	\$0	116	0	\$0	\$0
68	0	\$0	\$0	117	0	\$0	\$0
69	0	\$0	\$0	118	0	\$0	\$0
70	0	\$0	\$0	119	0	\$0	\$0
71	0	\$0	\$0	120	0	\$0	\$0
72	0	\$0	\$0				
				Totals	21	\$224,442	\$0

* payable at the greater of age 50 or current age (use current age if member has 20 years of service)

The chart above reflects the counts and benefits used for valuation purposes as a result of data processing.

APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of
Terminated Vested Members as of June 30, 2015**



MONTANA FIREFIGHTERS' UNIFIED RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2015

**APPENDIX A
MEMBERSHIP INFORMATION**

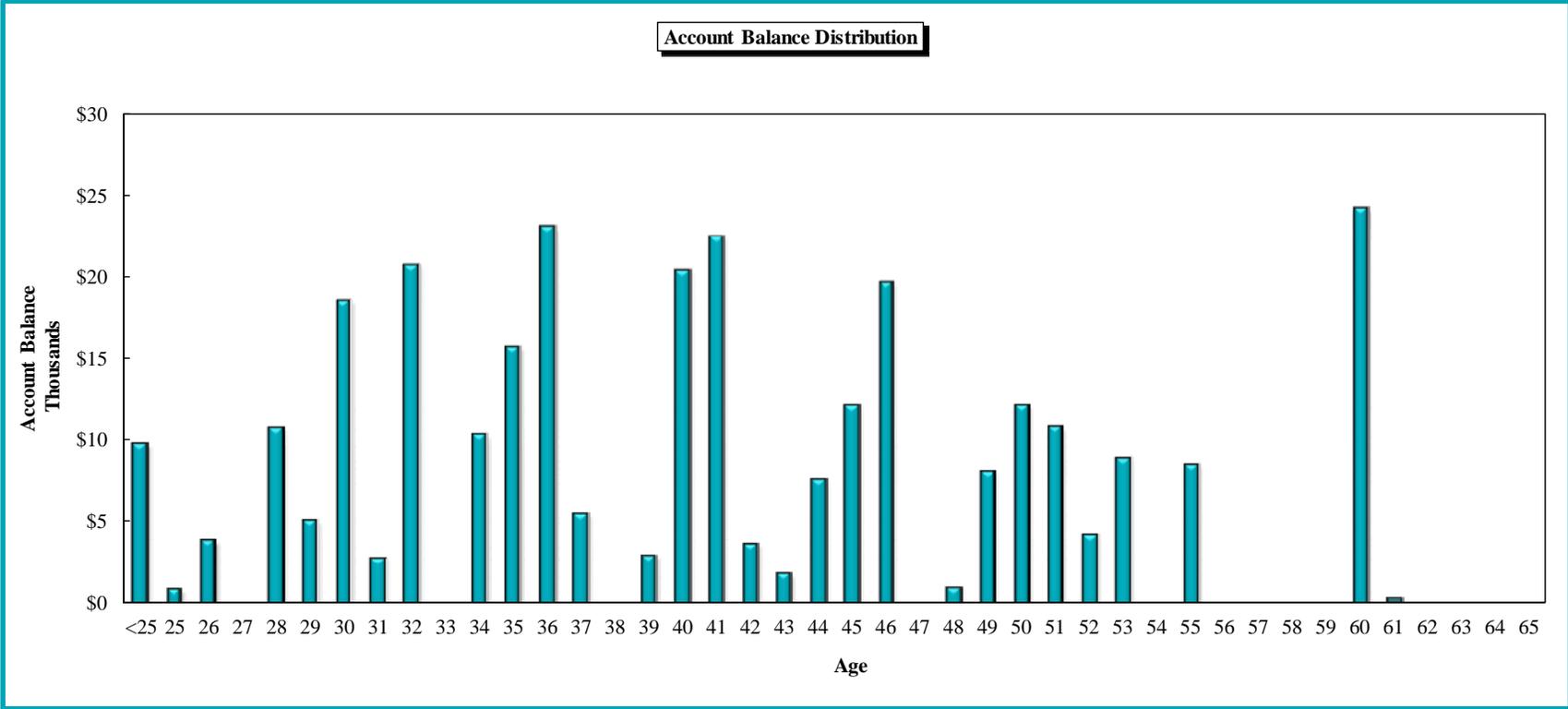
**Montana Firefighters' Unified Retirement System Distribution of
Terminated Non-Vested Members as of June 30, 2015**

Age	Count	Account Balance	Age	Count	Account Balance
<25	6	\$9,766	73	0	\$0
25	2	\$821	74	0	\$0
26	1	\$3,842	75	0	\$0
27	0	\$0	76	0	\$0
28	2	\$10,718	77	0	\$0
29	5	\$5,041	78	0	\$0
30	6	\$18,568	79	0	\$0
31	1	\$2,760	80	0	\$0
32	3	\$20,751	81	0	\$0
33	0	\$0	82	0	\$0
34	2	\$10,323	83	0	\$0
35	1	\$15,655	84	0	\$0
36	4	\$23,153	85	0	\$0
37	4	\$5,425	86	0	\$0
38	1	\$137	87	0	\$0
39	2	\$2,898	88	0	\$0
40	4	\$20,408	89	0	\$0
41	5	\$22,488	90	0	\$0
42	2	\$3,622	91	0	\$0
43	1	\$1,748	92	0	\$0
44	1	\$7,600	93	0	\$0
45	2	\$12,129	94	0	\$0
46	3	\$19,697	95	0	\$0
47	0	\$0	96	0	\$0
48	1	\$884	97	0	\$0
49	1	\$8,039	98	0	\$0
50	2	\$12,097	99	0	\$0
51	1	\$10,813	100	0	\$0
52	2	\$4,141	101	0	\$0
53	1	\$8,841	102	0	\$0
54	1	\$20	103	0	\$0
55	1	\$8,434	104	0	\$0
56	0	\$0	105	0	\$0
57	0	\$0	106	0	\$0
58	0	\$0	107	0	\$0
59	0	\$0	108	0	\$0
60	2	\$24,305	109	0	\$0
61	1	\$278	110	0	\$0
62	0	\$0	111	0	\$0
63	0	\$0	112	0	\$0
64	0	\$0	113	0	\$0
65	0	\$0	114	0	\$0
66	0	\$0	115	0	\$0
67	0	\$0	116	0	\$0
68	0	\$0	117	0	\$0
69	0	\$0	118	0	\$0
70	0	\$0	119	0	\$0
71	0	\$0	120	0	\$0
72	0	\$0			
			Totals	71	\$295,400

The chart above reflects the counts and benefits used for valuation purposes as a result of data processing.

APPENDIX A
MEMBERSHIP INFORMATION

**Montana Firefighters' Unified Retirement System Distribution of
Terminated Non-Vested Members as of June 30, 2015**



**APPENDIX B
 ACTUARIAL ASSUMPTIONS AND METHODS**

A. Long-Term Assumptions Used to Determine Plan Costs and Liabilities

1. Demographic Assumptions

a. Healthy Retirees, Beneficiaries and Non-Retired Members

Male and Female RP-2000 Combined Employee and Annuitant Mortality Tables. To reflect mortality improvements since the date of the table and to project future mortality improvements, the tables are projected to 2015 using scale AA.

Sample Rates of Healthy Mortality		
Age	Male	Female
50	0.163%	0.130%
55	0.272%	0.241%
60	0.530%	0.469%
65	1.031%	0.900%
70	1.770%	1.553%
75	3.062%	2.492%
80	5.536%	4.129%
85	9.968%	7.076%
90	17.271%	12.588%

b. Disabled Inactive Mortality

Male and Female RP-2000 Combined Employee and Annuitant Mortality Tables with no projections. No future mortality improvement is assumed.

Sample Rates of Disabled Inactive Mortality		
Age	Male	Female
50	0.214%	0.168%
55	0.362%	0.272%
60	0.675%	0.506%
65	1.274%	0.971%
70	2.221%	1.674%
75	3.783%	2.811%
80	6.437%	4.588%
85	11.076%	7.745%
90	18.341%	13.168%

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

c. Rates of Active Disability

Sample Rates of Active Disability	
Age	Rate
22	0.00%
27	0.10%
32	0.10%
37	0.10%
42	0.50%
47	0.50%
52	0.50%
57	0.50%
62	0.00%

All disabilities are assumed to be permanent and without recovery.

d. Termination of Employment (Prior to Normal Retirement Eligibility)

Service	Rate
0	4%
1	4%
2	2%
3	2%
4	2%
5-9	2%
10-14	2%
15 & over	1%

e. Probability of Electing a Refund of Member Contributions upon Termination

Age at Term.	Probability of Electing Refund	
	Non-Vested	Vested
Under 35	100%	50%
35-39	100%	20%
40-44	100%	20%
45-49	100%	20%
50 & Over	100%	0%

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

f. Retirement

Annual Retirement Rates	
Age	20 years or more
<50	5%
50 – 54	10%
55 – 59	25%
60 – 62	50%
63 & over	100%

Vested terminations are assumed to retire at their earliest unreduced eligibility.

g. Merit/Seniority Salary Increase (in addition to across-the-board increase)

Service based table plus an annual inflation rate of 4.00% (rates shown below exclude amount for inflation).

Service	Annual Increase
1	7.3%
2	5.6%
3	4.4%
4	3.5%
5	2.8%
6	2.2%
7	1.7%
8	1.3%
9	1.0%
10	0.7%
11-15	0.4%
16-20	0.2%
21 & over	0.0%

h. Family Composition

Female spouses are assumed to be three years younger than males.

100% of non-retired employees are assumed married for both male and female employees.

Actual marital characteristics are used for pensioners.

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

i. Vested Benefits for Terminated Members

Vested benefits for members who terminated during years ending June 30, 2009 and later were estimated based upon compensation and service information in the census data. For members who terminated prior to June 30, 2008, vested benefits valued were the same as had been calculated by the prior actuary for the June 30, 2008 actuarial valuation.

2. Economic Assumptions

- | | |
|--|--|
| a. Rate of Investment Return: | 7.75% (net of investment expenses) |
| b. Rate of Wage Inflation: | 4.00%
(3.00% inflation plus 1.00% real wage growth) |
| c. Interest on Member Contributions: | 3.50% |
| d. Rate of Increase in Total Payroll: | 4.00%
(for amortization and non-GABA post retirement increases) |
| e. Administrative Expenses as a Percentage of Payroll | 0.19% |

3. Changes since Last Valuation

None.

4. Rationale for Demographic and Economic Actuarial Assumptions

The actuarial assumptions (other than the administrative expense rate) were adopted by the Board based upon the results of an actuarial experience study covering the period July 1, 2003 through June 30, 2009. The administrative expense rate is based upon actual recurring administrative expenses during the period July 1, 2008 through June 30, 2013.

APPENDIX B
ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Funding Method

The Entry Age Normal Actuarial Cost method is used to determine costs. Under this funding method, a normal cost is determined as a level percent of pay individually for each active employee.

The actuarial liability is that portion of the present value of projected benefits that will not be paid by future normal costs. The difference between this liability and funds accumulated as of the same date is referred to as the unfunded actuarial liability.

The portion of the actuarial liability in excess of plan assets is amortized to develop an additional cost or savings which is added to each year's employer normal cost. Under this cost method, actuarial gains and losses are directly reflected in the size of the unfunded actuarial liability.

2. Actuarial Value of Assets

For purposes of determining the unfunded actuarial liability, we use an actuarial value of assets. The asset adjustment method dampens the volatility in asset values that could occur because of fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process.

The actuarial value of assets is the current market value, adjusted by a four-year smoothing of gains and losses on a market value basis. Each year's gain or loss is determined as the difference between the actual market return and the expected market return using the assumed rate of investment return.

3. Amortization Method

The unfunded actuarial liability is amortized as a level percentage of future payroll. The valuation determines the period over which the statutory contributions will fully amortize the unfunded actuarial liability.

4. Changes since Last Valuation

None.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

1. Membership

The Plan is a multiple-employer cost sharing plan that covers firefighters in cities of the first and second class, and those in other cities where the city has elected to participate. The plan also covers firefighters hired by the Montana Air National Guard on or after October 1, 2001.

2. Contributions

For members not electing a Guaranteed Annual Benefit Adjustment (GABA), members contribute 9.5% of their compensation. For members electing GABA, members contribute 10.7% of their compensation. Interest is credited at rates determined by the Board.

Member contributions are made through an “employer pick-up” arrangement which results in deferral of taxes on the contributions.

The employer contributes 14.36% of each member’s compensation.

Beginning July 1, 2013, employers of retirees who return to work contribute 14.36% of the working retiree’s compensation.

The State contributes 32.61% of each member’s compensation.

3. Service Credit

Service used to determine the amount of retirement benefit. One month of service credit is earned for each month where the member is paid for 160 hours. This includes certain transferred and purchased service.

4. Membership Service

Service used to determine eligibility for vesting, retirement or other FURS benefits. One month of membership service is earned for any month member contributions are made to FURS regardless of hours worked.

5. Highest Average Compensation (HAC)

Highest Average Compensation is the average of the highest 36 consecutive months (or shorter period of total service) of compensation paid to the member. Compensation generally means total compensation paid, excluding overtime, holiday payments, shift differential payments, compensatory time payments, payments in lieu of sick leave or annual leave, and also excludes maintenance, allowances and expenses. Compensation is specifically defined in law for FURS. For a part-time firefighter, compensation is calculated as 15% of the regular compensation of a newly confirmed full-time firefighter.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

For members hired on or after July 1, 2013, the Highest Average Compensation calculations initially exclude amounts over 110% of the compensation included for each previous year with this excess compensation, if any, divided by the member's total months of service credit and added to the compensation for each month considered part of the member's HAC.

Bonuses paid on or after July 1, 2013 to any member will not be treated as compensation for retirement purposes. No member or employer contributions will be paid on bonuses.

6. Service Retirement

Eligibility: 20 years of membership service.

- Benefit:
- (i) For a member hired on or after July 1, 1981, or a member who has elected to be covered by GABA, 2.5% of HAC multiplied by years of service credit.
 - (ii) For a member hired prior to July 1, 1981 and who had not elected to be covered by GABA, the greater of (i) or:
 - (a) if membership service is less than 20, 2% of HAC multiplied by years of service credit, and
 - (b) if membership service is greater or equal to 20, 50% of highest average compensation plus 2% of HAC multiplied by years of service credit in excess of 20.

7. Early Retirement

Eligibility: Age 50 with five years of membership service.

Benefit: Normal retirement benefit calculated using highest average compensation and service credit at early retirement.

8. Disability Benefit

Eligibility: Any active member.

Benefit: The greater of (a) 50% of highest average compensation or (b) 2.5% of highest average compensation multiplied by years of service credit.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

9. Survivor's Benefit

Eligibility: Active or retired member.

Benefit: For deaths of active members with less than 20 years of membership service, a monthly survivor benefit to the surviving spouse (or equally to dependent children if there is no surviving spouse or after a surviving spouse dies, for as long as they remain dependent children) equal to 50% of highest average compensation. For active or inactive members with more than 20 years of membership service, a benefit equal to the accrued retirement benefit.

10. Vesting

Eligibility: Employees who separate from service with at least five years of membership service.

Benefit: Accrued normal retirement benefit, payable at normal or early retirement date. In lieu of a pension, a member may receive a refund of accumulated contributions. Upon application for a refund of contributions, a member's vested right to a monthly benefit shall be forfeited.

11. Withdrawal of Employee Contributions

Eligibility: Terminates service and is not eligible for other benefits.

Benefit: Accumulated employee contributions. Upon receipt of a refund of contributions, a member's vested right to a monthly benefit is forfeited.

12. Retirement Benefits - Form of Payment

The retirement benefit is paid for the retired member's life. Upon the death of the retired member, the benefit is paid to the surviving spouse. If there is no surviving spouse, or after the death of a surviving spouse, benefits are paid to the dependent children, if any, for as long as they remain dependent children.

13. Post Retirement Benefit Increases

For retired members who became active members on and after July 1, 1997 and those who elected to be covered under the GABA and who have been retired at least 12 months, a GABA will be paid each year in January equal to 3%.

For retired members who were hired prior to July 1, 1997 and who did not elect GABA, the minimum benefit adjustment is provided equal to 50% of the current base compensation of a newly confirmed active firefighter of the employer that last employed the member as a firefighter.

APPENDIX C
SUMMARY OF PLAN PROVISIONS

14. Changes since Last Valuation

General Revisions Bill - House Bill 101, effective January 1, 2016:

- FURS Membership from PERS Membership - If a PERS member transfers employment to a FURS covered position and fails to elect FURS membership within 90 days, the default is PERS membership. 19-9-301(26), MCA

**APPENDIX D
GLOSSARY**

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; inflation; rates of investment earnings, and asset appreciation or depreciation; and other relevant items.

2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a Normal Cost and an Actuarial Liability.

3. 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.

4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits which will not be paid by future Normal Costs. It represents the value of the past Normal Costs with interest to the valuation date.

5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The Actuarial Present Value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made. As a simple example: assume you owe \$100 to a friend one year from now. Also, assume there is a 1% probability of your friend dying over the next year, in which case you won't be obligated to pay him. If the assumed investment return is 10%, the actuarial present value is:

$$\begin{array}{ccccccc} \frac{\text{Amount}}{\$100} & \times & \frac{\text{Probability of Payment}}{(1 - .01)} & \times & \frac{1/(1+\text{Investment Return})}{1/(1+.1)} & = & \$90 \end{array}$$

6. Actuarial Valuation

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

**APPENDIX D
GLOSSARY**

7. 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. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values. This way, long-term costs are not distorted by short-term fluctuations in the market.

8. Actuarially Equivalent

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

9. Amortization Payment

The portion of the pension plan contribution which is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. Entry Age Normal 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.

11. Funded Percentage

The ratio of the Actuarial Value of Assets to the Actuarial Liabilities.

12. Inflation (CPI)

The assumed increase in dollar related values in the future due to the general increase in the cost-of-living. The usual measure for inflation is the Consumer Price Index (CPI).

13. Investment Return Assumption

The assumed interest rate used for projecting dollar related values in the future.

14. Mortality Table

A set of percentages which estimate the probability of death at a particular point in time. Typically, the rates are annual and based on age and gender.

**APPENDIX D
GLOSSARY**

15. 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.

16. Projected Benefits

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

17. Unfunded Actuarial Liability

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