

**Volunteer Firefighters'  
Compensation Act  
of the  
State of Montana**

**Actuarial Valuation  
as of June 30, 2013**

**Produced by [Cheiron](#)**

**October 2013**

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October 31, 2013

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 Volunteer Firefighters' Compensation Act as of June 30, 2013. 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 discloses employer contribution levels and required disclosures under the Governmental Accounting Standards Board Statement No. 25. The purpose of this report is to present the annual actuarial valuation of the Volunteer Firefighters' Compensation Act. 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 2013 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.

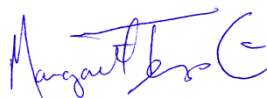
We hereby certify that, to the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out 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 Volunteer Firefighters' Compensation Act for the purpose described herein. This valuation report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,  
Cheiron



Stephen T. McElhaney, FSA, FCA  
Principal Consulting Actuary



Margaret A. Tempkin, FSA, EA  
Principal Consulting Actuary



## FOREWORD

Cheiron has performed the Actuarial Valuation of the Volunteer Firefighters' Compensation Act as of June 30, 2013. 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 annual required contribution** for Fiscal Year 2013 and compare such annual required contribution to the actual contributions being received; and
- 4) **Provide specific information** and documentation required by the Governmental Accounting Standards Board (GASB).

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 annual required contribution determined using actuarial techniques.

**Section V** includes the required disclosures under GASB Statement No. 25.

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.

The actuarial assumptions reflect our understanding of the likely future experience of the System, and the assumptions as a whole represent our best estimate for the future experience of the System. The results of this report are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the cost of the benefits would vary from our projections.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**SECTION I  
BOARD SUMMARY**

**General Comments**

This is the fifth valuation of the Volunteer Firefighters' Compensation Act performed by Cheiron.

The annual required contribution decreased from \$1,125,222 at the June 30, 2012 valuation to \$1,116,227 at the June 30, 2013 valuation. The required contribution is determined by amortizing the unfunded actuarial liability over a 20-year period. During the year ended June 30, 2013, the System's assets gained 12.01% on a market value basis. However, due to the System's asset-smoothing method which recognizes only a portion of the gains and losses, the return on the actuarial asset value was 11.11%. This return was above the assumed rate of return of 7.75% and resulted in an actuarial gain on investments of \$0.9 million. The assets also experienced a loss of approximately \$0.4 million due to retroactive benefit payments.

The System experienced an actuarial loss on system liabilities resulting from members retiring, terminating, becoming disabled, dying at rates different from the actuarial assumptions, and retroactive credited service adjustments. The loss added \$1.6 million to the actuarial liability. The System will experience actuarial gains and losses over time because we cannot predict exactly how people will behave; this type of activity is normal in the course of the System's experience. When a system experiences alternating gains and losses that are small compared to the total actuarial liability, then the system's actuarial assumptions are reasonable. However, the current loss is approximately 4.4% of liabilities. Retroactive credited service accounts for 1.5% of this loss. The additional 2.9% is comprised of lingering retroactive data adjustments and system experience.

As of the June 30, 2013 Actuarial Valuation, the System's unfunded actuarial liability was \$9.54 million. This is a decrease from last year's unfunded actuarial liability of \$9.61 million. The funded ratio increased from 73% at the prior valuation to 75% at June 30, 2013.

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, 2013 was \$0.8 million greater than actuarial value. If market value was used rather than actuarial value, the funded ratio on the valuation date would be 77%, up from 75% the prior year, and the required contribution would be \$1,041,808.

This report does not reflect any changes in pension accounting requirements from newly issued GASB Statements Nos. 67 and 68. Statement No. 67 will be effective for the plan year ending June 30, 2014. Statement No. 68 will be effective for most employers' fiscal years ending June 30, 2015. All references and calculations with respect to GASB reflect current Statements Nos. 25 and 27. In addition, in accordance with the System's funding policy, the contribution levels are compared to an amount that would satisfy the requirements for an Annual Required Contribution (ARC) under GASB No. 25. Since the concept of the ARC will disappear when GASB Nos. 67 and 68 become effective, the System may need to define a different calculation basis for measuring funding sufficiency.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**SECTION I  
BOARD SUMMARY**

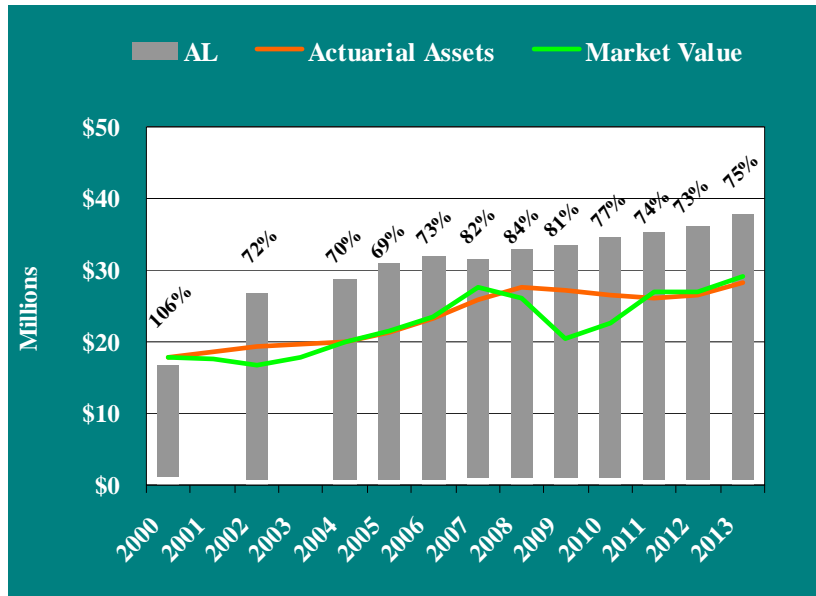
**Trends**

Assets and Liabilities

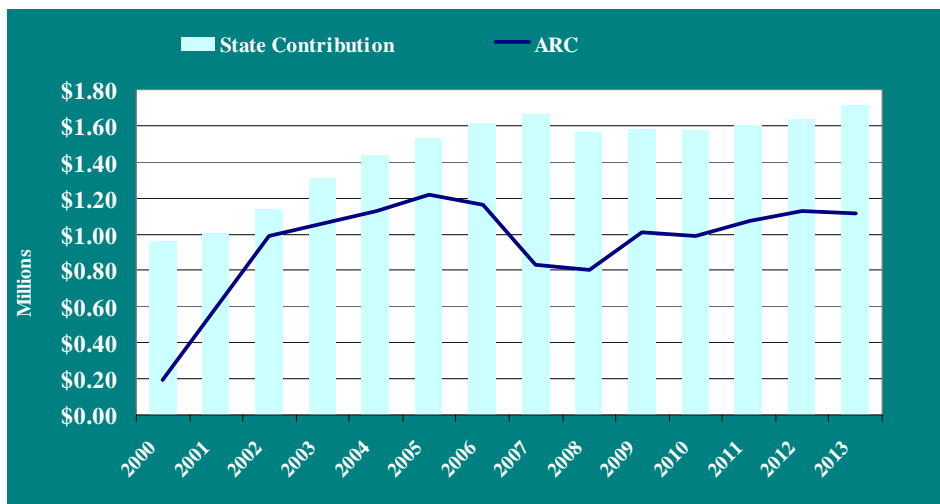
The market value of assets (MVA) increased over last year, gaining 12.01% from the value at the prior valuation. The determination of the System's actuarial value of assets reflects only a portion of the amount by which the return was above the assumed rate of 7.75%.

Over the period July 1, 2008 to June 30, 2013, the System's assets returned approximately 2.4% per year measured at actuarial value, compared to a current valuation assumption of 7.75% per year.

For funding purposes, the target 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.



Contributions



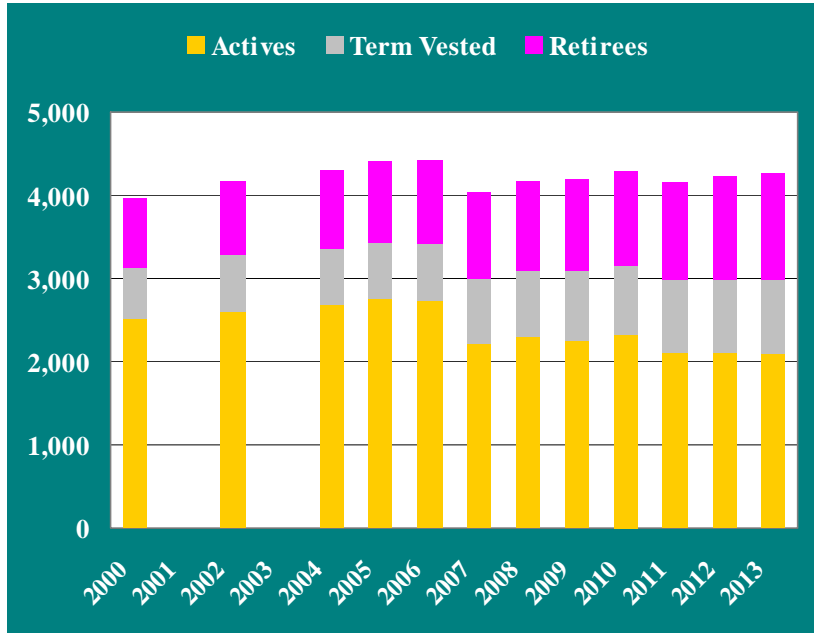
The bar in this graph show the contributions made by the State. The navy line shows the Annual Required Contribution (ARC) based upon a 20-year amortization of the unfunded actuarial liability.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
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**SECTION I  
BOARD SUMMARY**

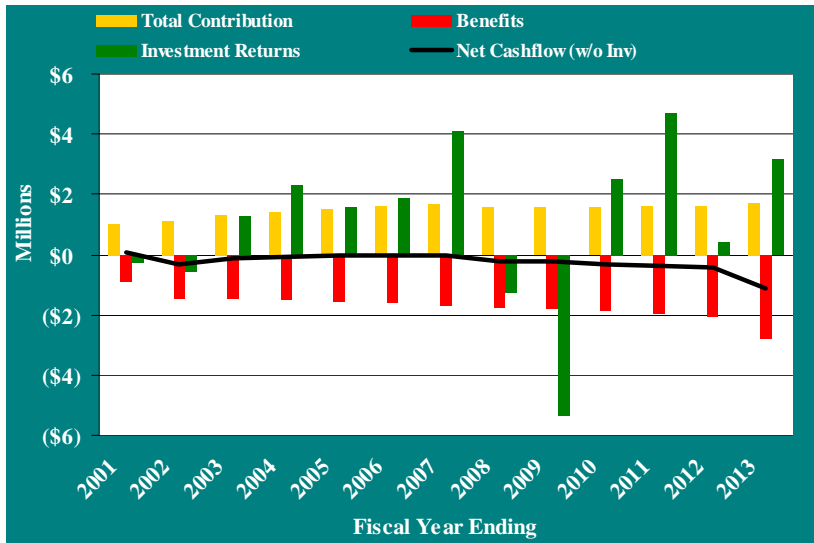
Participant Trends

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 decreased from 1.7 actives for each inactive in 2000 to 1.0 actives for each inactive today.



Net Cash Flow

This graph shows the historical contributions compared to benefit payments. The difference between these two measures is shown in the solid black line, and is the net cash flow (without including investment returns).



**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
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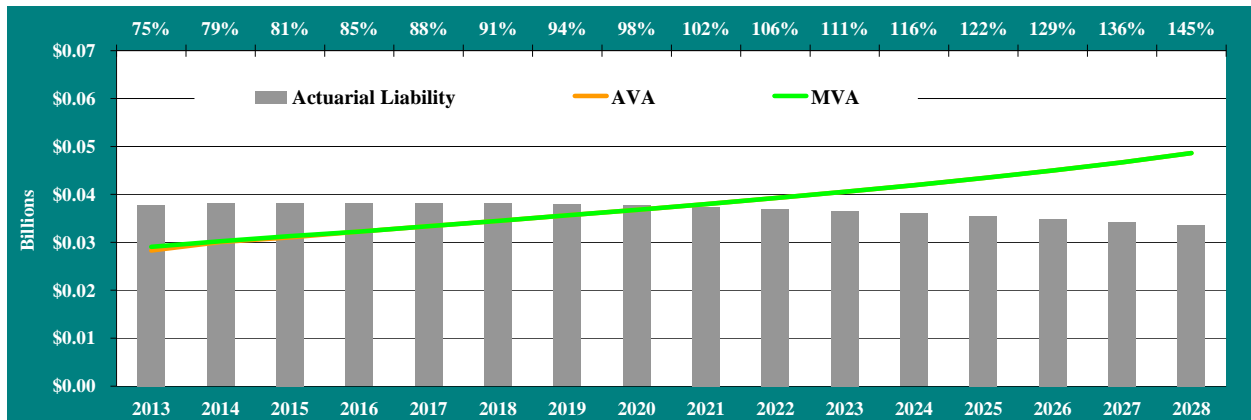
**SECTION I  
BOARD SUMMARY**

**Future Outlook**

Baseline Projections

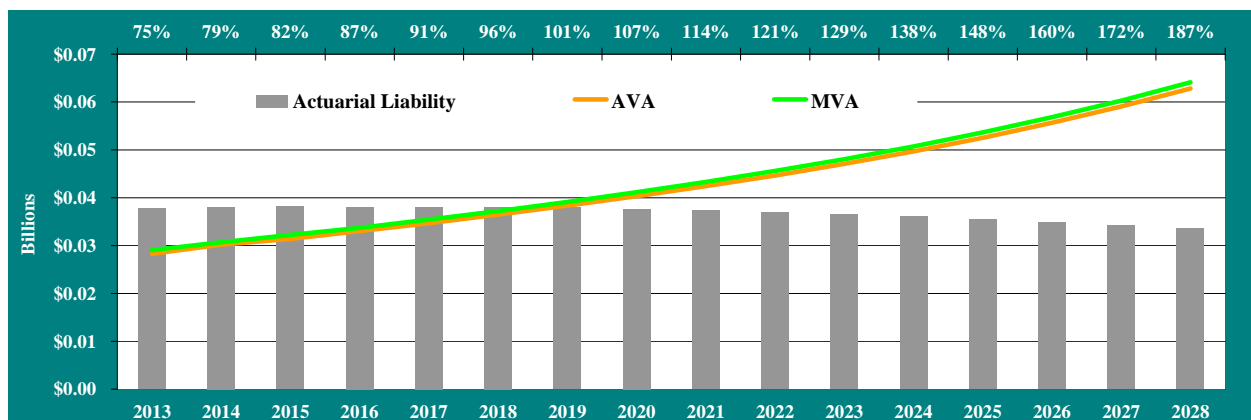
These graphs show the expected progress of the System over the next 15 years assuming the System's assets earn 7.75% on their *market value*, and that contributions continue to be made at the same amount as in the most recent fiscal year.

The chart below shows that the funded status of the System is expected to increase substantially over the 15-year period.



Projections with Asset Returns of 9.25%

The future funding status of this System will be largely driven by the investment earnings. Due to the size of assets, as compared to liabilities, the System is in a highly leveraged position. This means that relatively minor changes in market returns can have significant effects on the System's status. The chart below shows 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 improves to a greater extent during the 15-year period.

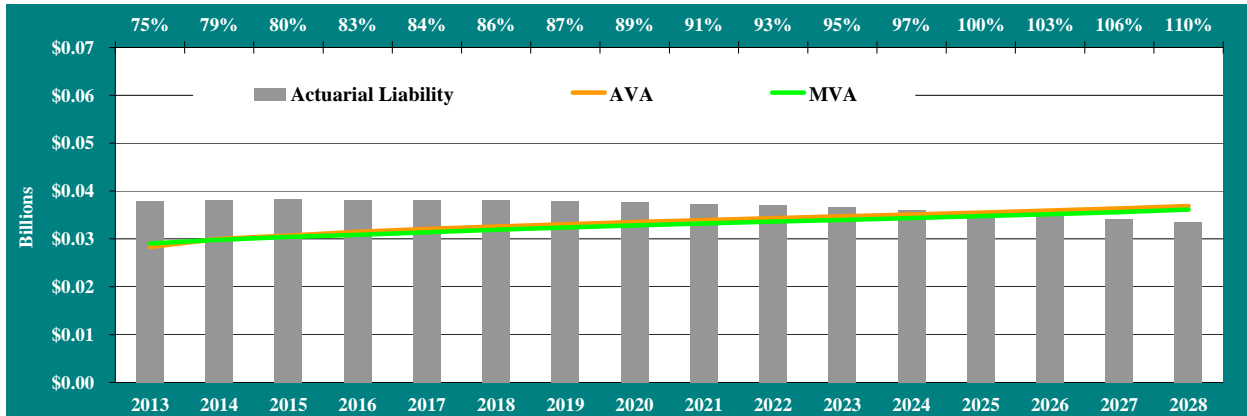


MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
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SECTION I  
BOARD SUMMARY

Projections with Asset Returns of 6.25%

To further demonstrate how the future funding of this System will be driven by investment earnings, 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 funded status increases to a lesser extent but still exceeds 100% by the end of the 15-year period.

MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

SECTION I  
BOARD SUMMARY

Valuation as of:	June 30, 2012	June 30, 2013	% Change
<b>Table I-1</b>			
<b>Montana Volunteer Firefighters' Compensation Act</b>			
<b>Summary of Principal System Results</b>			
<b><u>Participant Counts</u></b>			
Active Members	2,106	2,101	(0.2%)
Disabled Members	0	0	N/A
Retirees and Beneficiaries	1,242	1,285	3.5%
Terminated Vested Members	879	884	0.6%
Terminated Non-Vested Members	<u>0</u>	<u>0</u>	N/A
Total*	4,227	4,270	1.0%
Annual Retirement Allowances for Retired Members and Beneficiaries	\$ 2,118,240	\$ 2,234,880	5.5%
<b><u>Assets and Liabilities</u></b>			
Actuarial Liability (AL)	\$ 36,145,701	\$ 37,829,887	4.7%
Actuarial Value of Assets (AVA)	<u>26,530,929</u>	<u>28,294,471</u>	6.6%
Unfunded AL	9,614,772	9,535,416	(0.8%)
Funded Ratio (AVA/AL)	73.4%	74.8%	
Present Value of Accrued Benefits (PVAB)	\$ 30,671,423	\$ 32,104,007	4.7%
Market Value of Assets	<u>27,013,221</u>	<u>29,067,228</u>	7.6%
Unfunded PVAB	\$ 3,658,202	\$ 3,036,779	(17.0%)
Accrued Benefit Funding Ratio	88.1%	90.5%	
Ratio of Actuarial Value to Market Value	98.2%	97.3%	
<b><u>Contributions</u></b>			
Normal Cost	\$ 199,294	\$ 197,941	(0.7%)
Amortization Payment	<u>925,928</u>	<u>918,286</u>	(0.8%)
Total	\$ 1,125,222	\$ 1,116,227	(0.8%)
Actual Contributions for Preceding Fiscal Year	\$ 1,635,400	\$ 1,711,321	
Amortization Period Based on Actual Contributions **	9.3 years	8.5 years	

\* A reconciliation of the counts for annual report purposes to counts for valuation purposes appears at the beginning of Appendix A.

\*\* Per Montana Code 19-17-404, for years 2012 and 2013, the pension trust is considered actuarially sound, thus there are no restrictions on pension benefits for future retirees.

**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, State contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on system assets including:

- **Disclosure** of system assets at June 30, 2012 and June 30, 2013;
- 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 VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

SECTION II  
ASSETS

<b>Value of Assets – June 30, 2012</b>		<b>\$ 27,013,221</b>
<b><u>Additions</u></b>		
State Contributions	\$ 1,711,321	
Investment Return	<u>3,382,542</u>	
<b>Total Additions</b>	<b>\$ 5,093,863</b>	
<b><u>Deductions</u></b>		
Benefit Payments	\$ 2,833,712	
Administrative Expenses	<u>206,144</u>	
<b>Total Deductions</b>	<b>\$ 3,039,856</b>	
<b>Value of Assets – June 30, 2013</b>		<b>\$ 29,067,228</b>

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**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, 2013 valuation.

<b>Table II-2 Market Value Gain/(Loss)</b>	
Value of Assets – June 30, 2012	\$ 27,013,221
Total Contributions	\$ 1,711,321
Benefit Payments	(2,833,712)
Expected Return at 7.75%	<u>2,050,843</u>
Expected Value at June 30, 2013	\$ 27,941,673
Actual Value at June 30, 2013	\$ 29,067,228
Investment Gain/(Loss)	\$ 1,125,555

<b>Table II-3 Develop Excluded Gain/(Loss)</b>		
	Total Gain/(Loss)	Excluded Portion
Exclude 75% of 2013 Gain/(Loss)	\$ 1,125,555	\$ 844,166
Exclude 50% of 2012 Gain/(Loss)	\$ (1,628,075)	\$ (814,038)
Exclude 25% of 2011 Gain/(Loss)	\$ 2,970,515	\$ 742,629
Total Excluded Gain/(Loss) for AVA Calculation		\$ 772,757

<b>Table II-4 Actuarial Value of Assets</b>	
Market Value of Assets – June 30, 2013	\$ 29,067,228
Total Gain/(Loss) excluded	<u>772,757</u>
Actuarial Value of Assets – June 30, 2013	\$ 28,294,471

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**SECTION II  
ASSETS**

**Investment Performance**

The market value of assets (MVA) returned 12.01% during the fiscal year ended 2013, which is more than the assumed 7.75% return. A return of 11.11% on the actuarial value of assets (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.

<b>Table II-5 Annual Rates of Return</b>		
<b>Year Ending June 30,</b>	<b>Market Value</b>	<b>Actuarial Value</b>
2005	7.74%	6.49%
2006	8.58%	9.10%
2007	17.52%	11.47%
2008	(4.65%)	7.37%
2009	(20.69%)	(0.37%)
2010	12.30%	(1.30%)
2011	20.98%	(0.14%)
2012	1.67%	2.97%
2013	12.01%	11.11%

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**SECTION II  
ASSETS**

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

<b>Year Beginning July 1,</b>	<b>Expected Benefits</b>	<b>Expected Contributions*</b>	<b>Net Cash Flow (excluding Investment Return)</b>	<b>Expected Investment Return**</b>	<b>Net Cash Flow (including Investment Return)</b>
2013	\$ 2,748	\$ 1,711	\$ (1,037)	\$ 2,213	\$ 1,176
2014	2,951	1,711	(1,240)	2,297	1,057
2015	3,143	1,711	(1,432)	2,371	939
2016	3,046	1,711	(1,335)	2,448	1,113
2017	3,115	1,711	(1,404)	2,532	1,128
2018	3,179	1,711	(1,468)	2,617	1,149
2019	3,248	1,711	(1,537)	2,703	1,166
2020	3,306	1,711	(1,595)	2,791	1,196
2021	3,349	1,711	(1,638)	2,882	1,244
2022	3,388	1,711	(1,677)	2,977	1,300

\* Expected contributions only include expected State contributions. For illustration purposes, we have assumed State contributions will remain at the same level as the most recent fiscal 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, 2013. Projecting any further than ten 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, 2012 and June 30, 2013,
- 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, assuming participants continue to accrue benefits and all of our assumptions are met.
- **Actuarial Liability:** Used for funding calculations and GASB disclosures, this liability is calculated by 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 also required for accounting purposes (FASB ASC Topic No. 960) and 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 type, a **net surplus** or an **unfunded liability**.



MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

**SECTION III  
LIABILITIES**

**Table III-1  
Liabilities/Net (Surplus)/Unfunded**

	June 30, 2012	June 30, 2013
<b><u>Present Value of Benefits</u></b>		
Active Participant Benefits	\$ 11,868,560	\$ 12,231,208
Retiree and Inactive Benefits	25,152,961	26,463,726
<b>Present Value of Benefits (PVB)</b>	<b>\$ 37,021,521</b>	<b>\$ 38,694,934</b>
Market Value of Assets (MVA)	\$ 27,013,221	\$ 29,067,228
Funding Required by Future State Contributions	10,008,300	9,627,706
<b>Total Resources</b>	<b>\$ 37,021,521</b>	<b>\$ 38,694,934</b>
<b><u>Actuarial Liability</u></b>		
Present Value of Benefits (PVB)	\$ 37,021,521	\$ 38,694,934
Present Value of Future Normal Costs (PVFNC)	875,820	865,047
<b>Actuarial Liability (AL = PVB – PVFNC)</b>	<b>36,145,701</b>	<b>37,829,887</b>
Actuarial Value of Assets (AVA)	26,530,929	28,294,471
<b>Net (Surplus)/Unfunded (AL – AVA)</b>	<b>\$ 9,614,772</b>	<b>\$ 9,535,416</b>
<b><u>Present Value of Accrued Benefits</u></b>		
Present Value of Benefits (PVB)	\$ 37,021,521	\$ 38,694,934
Present Value of Future Benefit Accruals (PVFBA)	6,350,098	6,590,927
<b>Present Value of Accrued Benefits (PVAB = PVB – PVFBA)</b>	<b>\$ 30,671,423</b>	<b>\$ 32,104,007</b>
Market Value of Assets (MVA)	27,013,221	29,067,228
<b>Net Unfunded (PVAB – MVA)</b>	<b>\$ 3,658,202</b>	<b>\$ 3,036,779</b>

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**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 increasing 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 the following:

- 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.

	<b>Present Value of Benefits</b>	<b>Actuarial Liability</b>	<b>Present Value of Accrued Liability</b>
Liabilities June 30, 2012	\$ 37,021,521	\$ 36,145,701	\$ 30,671,423
Liabilities June 30, 2013	38,694,934	37,829,887	32,104,007
Liability			
Increase (Decrease)	1,673,413	1,684,186	1,432,584
Change Due to:			
Actuarial (Gain)/Loss	NC*	1,074,687	NC*
Plan Changes	0	0	0
Retroactive Credited Service	537,000	537,000	537,000
Benefits Accumulated and			
Other Sources	1,136,413	72,499	895,584

\* NC = not calculated.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**SECTION III  
LIABILITIES**

**Table III-3  
Summary of Actuarial Gains and Losses as of June 30, 2013**

Actuarial Liabilities as of July 1, 2012	\$ 36,145,701
Normal Cost	199,294
Actual Benefit Payments	(2,833,712)
Interest	<u>2,706,917</u>
Expected Actuarial Liability as of July 1, 2013	\$ 36,218,200
Actual Liability as of July 1, 2013	\$ 37,829,887
Liability (Gain)/Loss	\$ 1,611,687
Sources of Liability (Gain)/Loss	
Salary (Gain)/Loss	\$ 0
New Participant (Gain)/Loss	372,608
Active Retirements (Gain)/Loss	(77,911)
Active Terminations (Gain)/Loss	(155,692)
Active Deaths (Gain)/Loss	23,323
Active Disability (Gain)/Loss	0
Inactive Mortality (Gain)/Loss	195,254
Other (Gain)/Loss	717,105
Liability (Gain)/Loss due to Plan Changes	\$ 0
Liability (Gain)/Loss due to Retroactive Credited Service	\$ 537,000
Actuarial Value of Assets as of July 1, 2012	\$ 26,530,929
Net Cash Flow	(1,122,391)
Expected Earnings	<u>2,013,466</u>
Expected Actuarial Value of Assets as of July 1, 2013	27,422,004
Actual Actuarial Value of Assets as of July 1, 2013	\$ 28,294,471
Investment (Gain)/Loss	\$ (872,467)
Asset (Gain)/Loss due to Retroactive Payments	\$ 445,950
Total Asset (Gain)/Loss	\$ (426,517)
Total Liability (Gain)/Loss	<u>1,611,687</u>
Total Actuarial (Gain)/Loss	\$ 1,185,170

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**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.

<b>Table III-4 Actuarial Liabilities for Funding</b>		
	<b>June 30, 2012</b>	<b>June 30, 2013</b>
1. Actuarial Liabilities		
Retiree and Inactive Benefits	\$ 25,152,961	\$ 26,463,726
Active Member Benefits	<u>10,992,740</u>	<u>11,366,161</u>
<b>Total Actuarial Liability</b>	<b>\$ 36,145,701</b>	<b>\$ 37,829,887</b>
2. Actuarial Value of Assets	\$ 26,530,929	\$ 28,294,471
3. Unfunded Actuarial Liability	\$ 9,614,772	\$ 9,535,416
4. Funded Ratio	73.4%	74.8%

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.

<b>Table III-5 Actuarial Liabilities on Market Value Basis (MCA 19-2-407)</b>		
	<b>June 30, 2012</b>	<b>June 30, 2013</b>
1. Actuarial Liabilities		
Retiree and Inactive Benefits	\$ 25,152,961	\$ 26,463,726
Active Member Benefits	<u>10,992,740</u>	<u>11,366,161</u>
<b>Total Actuarial Liability</b>	<b>\$ 36,145,701</b>	<b>\$ 37,829,887</b>
2. Market Value of Assets	\$ 27,013,221	\$ 29,067,228
3. Unfunded Actuarial Liability	\$ 9,132,480	\$ 8,762,659
4. Funded Ratio	74.7%	76.8%

**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 Actuarial Cost Method**. Under this method, there are two components to the total contribution: the **normal cost** and the **unfunded actuarial liability payment** (UAL payment). The normal cost 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 service. The EAN actuarial liability is the portion of the present value future projected benefits that will not be paid by future normal costs. The difference between the EAN actuarial liability and the actuarial value of assets is the unfunded actuarial liability.

Under the adopted funding policy, the annual required contribution is computed as the normal cost plus an amount that will amortize the UAL over a 20-year period. All UAL payments are determined as a level dollar amounts.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
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**SECTION IV  
CONTRIBUTIONS**

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

<b>Table IV-1 Annual Required Contribution</b>		
	<b>June 30, 2012</b>	<b>June 30, 2013</b>
Normal Cost	\$ 199,294	\$ 197,941
Amortization Payment (20-years)	<u>925,928</u>	<u>918,286</u>
<b>Total Annual Required Contribution</b>	<b>\$ 1,125,222</b>	<b>\$ 1,116,227</b>
Actual Contributions for Preceding Fiscal Year	\$ 1,635,400	\$ 1,711,321
 Amortization Period Based on Actual Contributions	 9.3 years	 8.5 years

<b>Table IV-2 Calculated Contribution on Market Value (MCA 19-2-407)</b>		
	<b>June 30, 2012</b>	<b>June 30, 2013</b>
Normal Cost	\$ 199,294	\$ 197,941
Amortization Payment (20-years)	<u>879,482</u>	<u>843,867</u>
<b>Total Calculated Contribution Rate</b>	<b>\$ 1,078,776</b>	<b>\$ 1,041,808</b>
Actual Contributions for Preceding Fiscal Year	\$ 1,635,400	\$ 1,711,321
 Amortization Period Based on Actual Contributions	 8.6 years	 7.6 years

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

<b>Table IV-3 Projected Calculated Contributions</b>	
<b>Valuation Year</b>	<b>Amount</b>
2014	\$ 970,923
2015	890,481
2016	763,669
2017	656,229
2018	540,461

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
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**SECTION V  
ACCOUNTING STATEMENT INFORMATION**

Accounting Standard Codification Topic No. 960 of the Financial Accounting Standards Board specifies certain information for a plan to disclose regarding its funded status. Statement No. 25 of the Governmental Accounting Standards Board (GASB) establishes standards for disclosure of pension information by public employee retirement systems (PERS) and governmental employers in notes to financial statements and supplementary information.

The FASB ASC Topic No. 960 disclosures provide a quasi “snap shot” view of how the System’s assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if the System were to terminate.

The GASB-25 actuarial liability is the same as the actuarial liability amount calculated for funding purposes.

Both the present value of accrued benefits (FASB ASC Topic No. 960) and the actuarial liability (GASB-25) are determined assuming that the System is on-going and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Liabilities are discounted at the assumed valuation interest rate of 7.75% per annum.

FASB ASC Topic No. 960 specifies that a comparison of the present value of accrued (accumulated) benefits with the market value of the assets as of the valuation date must be provided. GASB Statement No. 25 requires the actuarial liability be compared with the actuarial value of assets for funding purposes. The relevant amounts as of June 30, 2013 are exhibited in Table V-1.

Tables V-2 through V-5 are exhibits to be used with the System’s CAFR report. Table V-2 is the Note to Required Supplementary Information, Table V-3 is a history of gains and losses in Accrued Liability, Table V-4 is the Schedule of Funding Progress, and V-5 is the Solvency Test which shows the portion of Accrued Liability covered by Assets.

MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

<b>Table V-1</b>		
<b>Accounting Statement Information</b>		
	<b>June 30, 2012</b>	<b>June 30, 2013</b>
<b>A. FASB ASC Topic No. 960 Basis</b>		
1. Present Value of Benefits Accrued and Vested to Date		
a. Members Currently Receiving Payments	\$ 17,465,120	\$ 18,611,739
b. Former Vested Members	7,687,841	7,851,987
c. Active Members	<u>5,518,462</u>	<u>5,640,281</u>
2. Total Present Value of Accrued Benefits (1 (a) + 1(b) + 1(c))	\$ 30,671,423	\$ 32,104,007
3. Assets at Market Value	<u>27,013,221</u>	<u>29,067,228</u>
4. Unfunded Present Value of Accrued Benefits (2 – 3)	\$ 3,658,202	\$ 3,036,779
5. Ratio of Assets to Present Value of Accrued Benefits (3 / 2)	88.1%	90.5%
<b>B. GASB No. 25 Basis</b>		
1. Actuarial Liabilities for retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$ 25,152,961	\$ 26,463,726
2. Actuarial Liabilities for current employees	<u>10,992,740</u>	<u>11,366,161</u>
3. Total Actuarial Liability (1 + 2)	\$ 36,145,701	\$ 37,829,887
4. Net Actuarial Assets available for benefits	<u>26,530,929</u>	<u>28,294,471</u>
5. Unfunded Actuarial Liability (3 – 4)	\$ 9,614,772	\$ 9,535,416



MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

**Table V-2**  
**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, 2013
Actuarial cost method	Entry Age
Amortization method	Open
Remaining amortization period	20 years
Asset valuation method	Four-Year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.75%
General wage growth*	N/A
Merit salary increases	N/A
*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 and amortization of the unfunded actuarial liability. The normal cost is a level 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.

MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

**Table V-3**  
**Analysis of Financial Experience\***

**Gain and Loss in Accrued Liability During Years Ended June 30**  
**Resulting from Differences Between Assumed Experience and Actual Experience**  
*Gain (or Loss) for Year ending June 30,*  
*(expressed in thousands)*

Type of Activity	2008	2009	2010	2011	2012	2013
Investment Income on Actuarial Assets	\$ (212)	\$ (2,301)	\$ (2,517)	\$ (2,082)	\$ (1,242)	\$ 872
Combined Liability Experience	<u>1</u>	<u>396</u>	<u>27</u>	<u>354</u>	<u>(144)</u>	<u>(1,075)</u>
(Loss)/Gain During Year from Financial Experience	\$ (211)	\$ (1,905)	\$ (2,490)	\$ (1,728)	\$ (1,386)	\$ (203)
Non-Recurring Items	<u>0</u>	<u>0</u>	<u>170</u>	<u>(151)</u>	<u>0</u>	<u>(983)</u>
Composite Gain (or Loss) During Year	\$ (211)	\$ (1,905)	\$ (2,320)	\$ (1,879)	\$ (1,386)	\$ (1,186)

**Table V-4**  
**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
2013	\$ 28,294	\$ 37,830	75 %	\$ 9,536	N/A	N/A
2012	26,531	36,146	73 %	9,615	N/A	N/A
2011	26,183	35,195	74 %	9,012	N/A	N/A
2010	26,575	34,512	77 %	7,937	N/A	N/A
2009	27,239	33,548	81 %	6,309	N/A	N/A
2008	27,544	32,735	84 %	5,191	N/A	N/A

\* Years prior to 2009 were taken from reports prepared by prior actuary.

MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

**SECTION V**  
**ACCOUNTING STATEMENT INFORMATION**

**Table V-5**  
**Solvency Test\***

Valuation Date June 30,	Aggregate Accrued Liabilities for (expressed in thousands) Active				Portion of Accrued Liabilities Covered by Reported Assets		
	Active Member Contributions (1)	Retirees & Beneficiaries (2)	Member Employer Financed Contributions (3)	Actuarial Value of Reported Assets	(1)	(2)	(3)
2013	\$ 0	\$ 18,612	\$ 19,218	\$ 28,294	N/A	100 %	50 %
2012	0	17,465	18,681	26,531	N/A	100 %	49 %
2011	0	16,483	18,712	26,183	N/A	100 %	52 %
2010	0	15,846	18,665	26,575	N/A	100 %	57 %
2009	0	14,498	19,050	27,239	N/A	100 %	67 %
2008	0	20,129	12,606	27,544	N/A	100 %	59 %

\* Years prior to 2009 were taken from reports prepared by prior actuary.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**APPENDIX A  
MEMBERSHIP INFORMATION**

<b>Reconciliation of Participant Counts</b>						
	<b>Active</b>	<b>Disabled</b>	<b>Retirees and Beneficiaries</b>	<b>Terminated Vested Members</b>	<b>Terminated Non-Vested Members</b>	<b>Total</b>
Participant counts used for valuation	2,101	-	1,285	884	6,790	11,060
Disabled members having attained normal retirement age		-	-			-
Beneficiaries of Disabled Members						-
Beneficiaries with less than one year of certain payments remaining			-			-
Other Adjustments						-
Participant counts shown in Annual Financial Report	2,101	-	1,285	884	6,790	11,060

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 6) match the CAFR reports at the request of the Board. The differences between the counts, if any, have no material effect upon the liability calculation.

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 6. For this Appendix A, the valuation projected benefits are to be paid for the following fiscal year, whereas for the Board Summary, annual benefits are as of the valuation date.

**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Montana Volunteer Firefighters' Compensation Act Distribution of Active Members  
by Age and Service as of June 30, 2013**

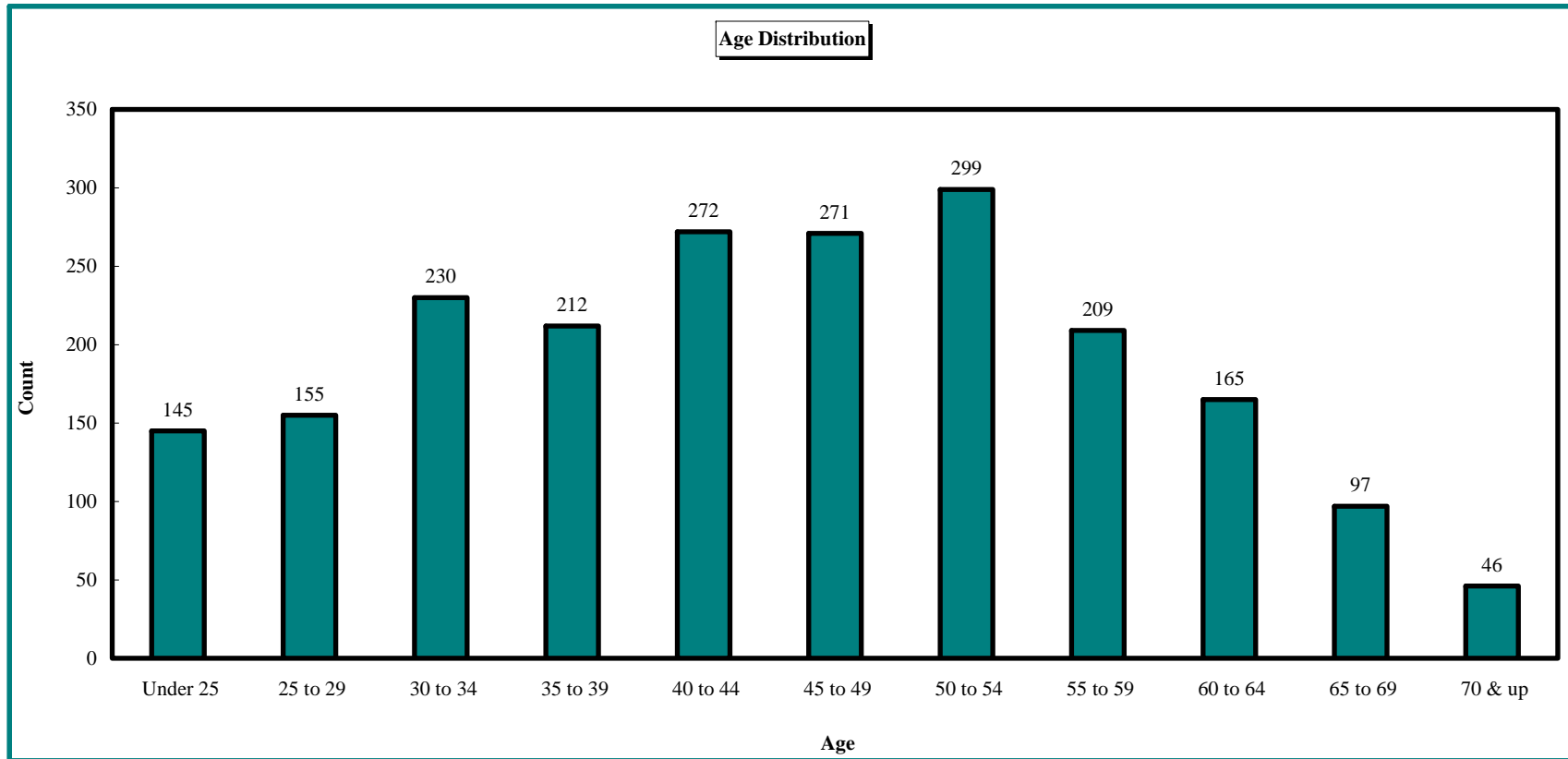
**COUNTS BY AGE/SERVICE**

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	0	121	24	0	0	0	0	0	0	0	0	145
25 to 29	0	92	58	5	0	0	0	0	0	0	0	155
30 to 34	0	113	89	27	1	0	0	0	0	0	0	230
35 to 39	0	73	74	51	13	1	0	0	0	0	0	212
40 to 44	0	92	82	65	20	13	0	0	0	0	0	272
45 to 49	0	52	70	69	37	29	13	1	0	0	0	271
50 to 54	0	49	59	70	46	45	22	8	0	0	0	299
55 to 59	0	21	46	46	39	28	23	6	0	0	0	209
60 to 64	0	36	42	33	26	14	10	2	1	1	1	165
65 to 69	0	11	27	21	16	14	6	1	1	0	0	97
70 & up	0	8	11	12	7	3	3	2	0	0	0	46
<b>Total</b>	<b>0</b>	<b>668</b>	<b>582</b>	<b>399</b>	<b>205</b>	<b>147</b>	<b>77</b>	<b>20</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2,101</b>

MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

APPENDIX A  
MEMBERSHIP INFORMATION

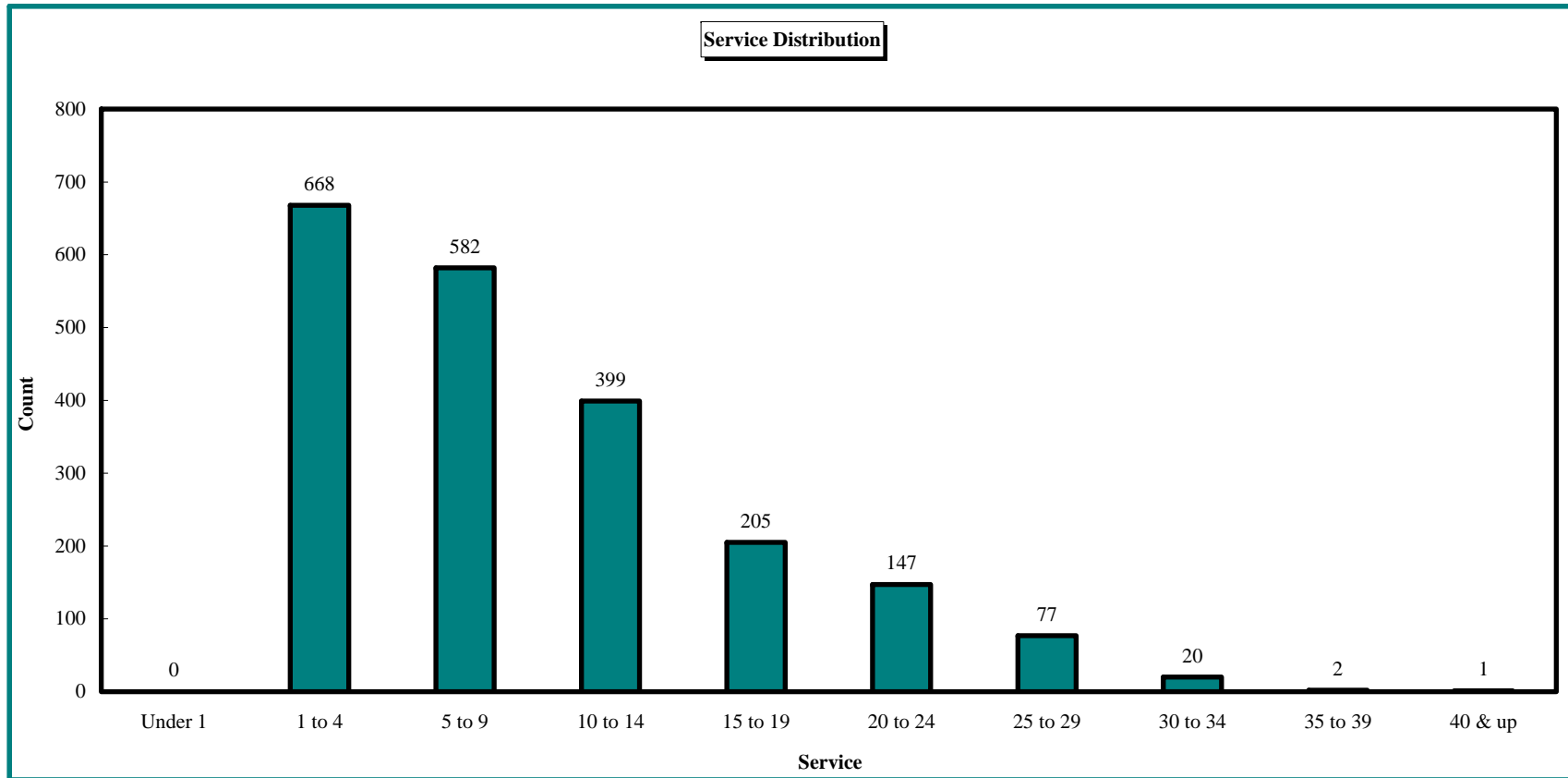
Montana Volunteer Firefighters' Compensation Act Distribution of Active Members  
by Age as of June 30, 2013



MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

APPENDIX A  
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Montana Volunteer Firefighters' Compensation Act Distribution of Active Members  
by Service as of June 30, 2013



**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Montana Volunteer Firefighters' Compensation Act Distribution of  
Retired Members and Survivors as of June 30, 2013**

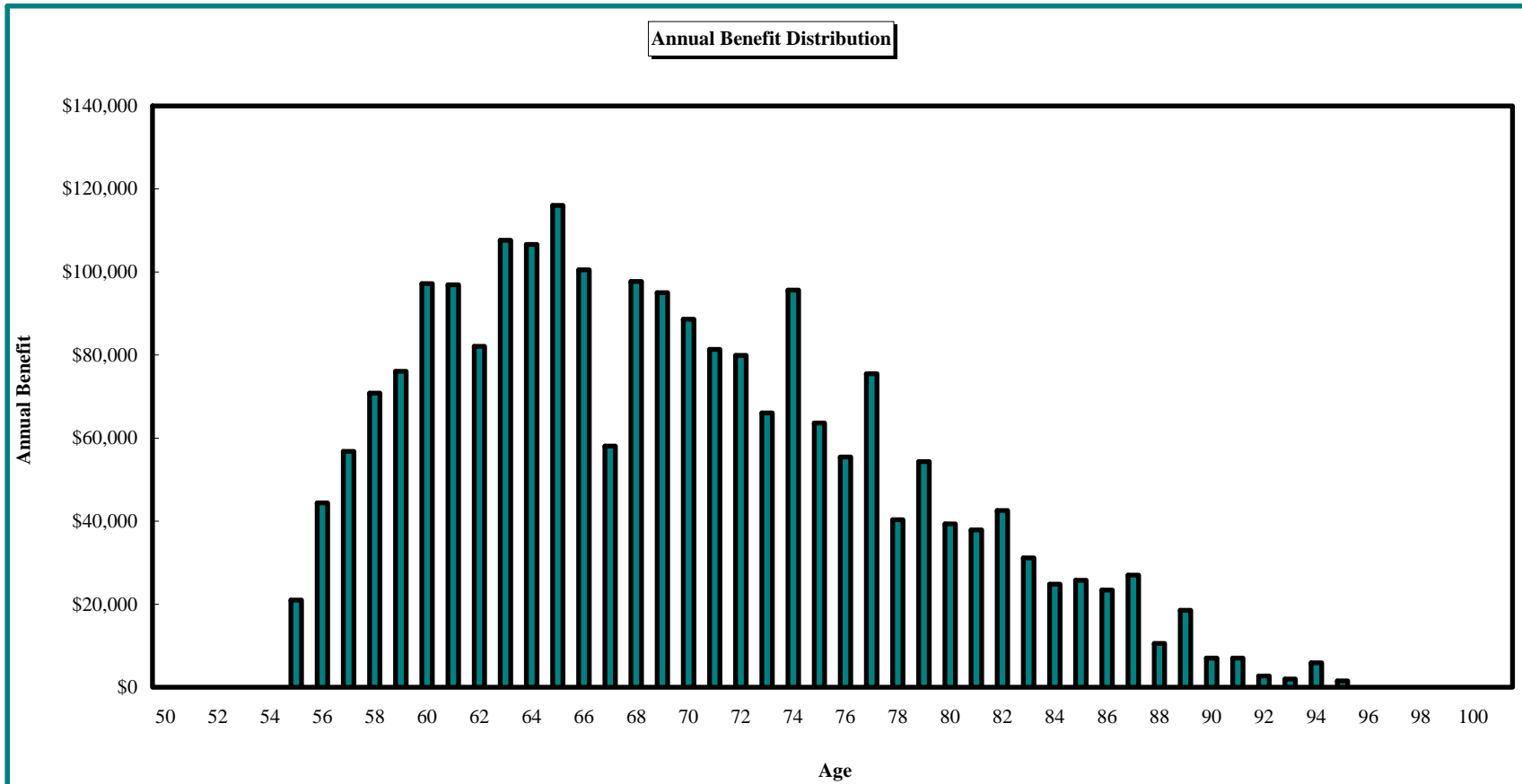
Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	\$0	73	41	\$66,060
25	0	\$0	74	58	\$95,670
26	0	\$0	75	42	\$63,630
27	0	\$0	76	32	\$55,440
28	0	\$0	77	44	\$75,510
29	0	\$0	78	25	\$40,320
30	0	\$0	79	34	\$54,360
31	0	\$0	80	23	\$39,330
32	0	\$0	81	23	\$37,890
33	0	\$0	82	25	\$42,570
34	0	\$0	83	19	\$31,140
35	0	\$0	84	16	\$24,840
36	0	\$0	85	14	\$25,740
37	0	\$0	86	15	\$23,400
38	0	\$0	87	17	\$27,000
39	0	\$0	88	6	\$10,530
40	0	\$0	89	12	\$18,540
41	0	\$0	90	5	\$7,020
42	0	\$0	91	5	\$7,020
43	0	\$0	92	2	\$2,700
44	0	\$0	93	1	\$1,980
45	0	\$0	94	3	\$5,850
46	0	\$0	95	1	\$1,530
47	0	\$0	96	0	\$0
48	0	\$0	97	0	\$0
49	0	\$0	98	0	\$0
50	0	\$0	99	0	\$0
51	0	\$0	100	0	\$0
52	0	\$0	101	0	\$0
53	0	\$0	102	0	\$0
54	0	\$0	103	0	\$0
55	10	\$20,970	104	0	\$0
56	20	\$44,370	105	0	\$0
57	27	\$56,790	106	0	\$0
58	33	\$70,830	107	0	\$0
59	36	\$76,050	108	0	\$0
60	51	\$97,200	109	0	\$0
61	53	\$96,930	110	0	\$0
62	48	\$82,080	111	0	\$0
63	61	\$107,640	112	0	\$0
64	63	\$106,650	113	0	\$0
65	66	\$116,010	114	0	\$0
66	58	\$100,530	115	0	\$0
67	34	\$58,050	116	0	\$0
68	58	\$97,740	117	0	\$0
69	58	\$95,040	118	0	\$0
70	53	\$88,650	119	0	\$0
71	48	\$81,360	120	0	\$0
72	45	\$79,920			
			Totals	1,285	\$2,234,880



MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

APPENDIX A  
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Montana Volunteer Firefighters' Compensation Act Distribution of Retired Members  
and Survivors as of June 30, 2013



**MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013**

**APPENDIX A  
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**Montana Volunteer Firefighters' Compensation Act Distribution of  
Terminated Vested Members  
as of June 30, 2013**

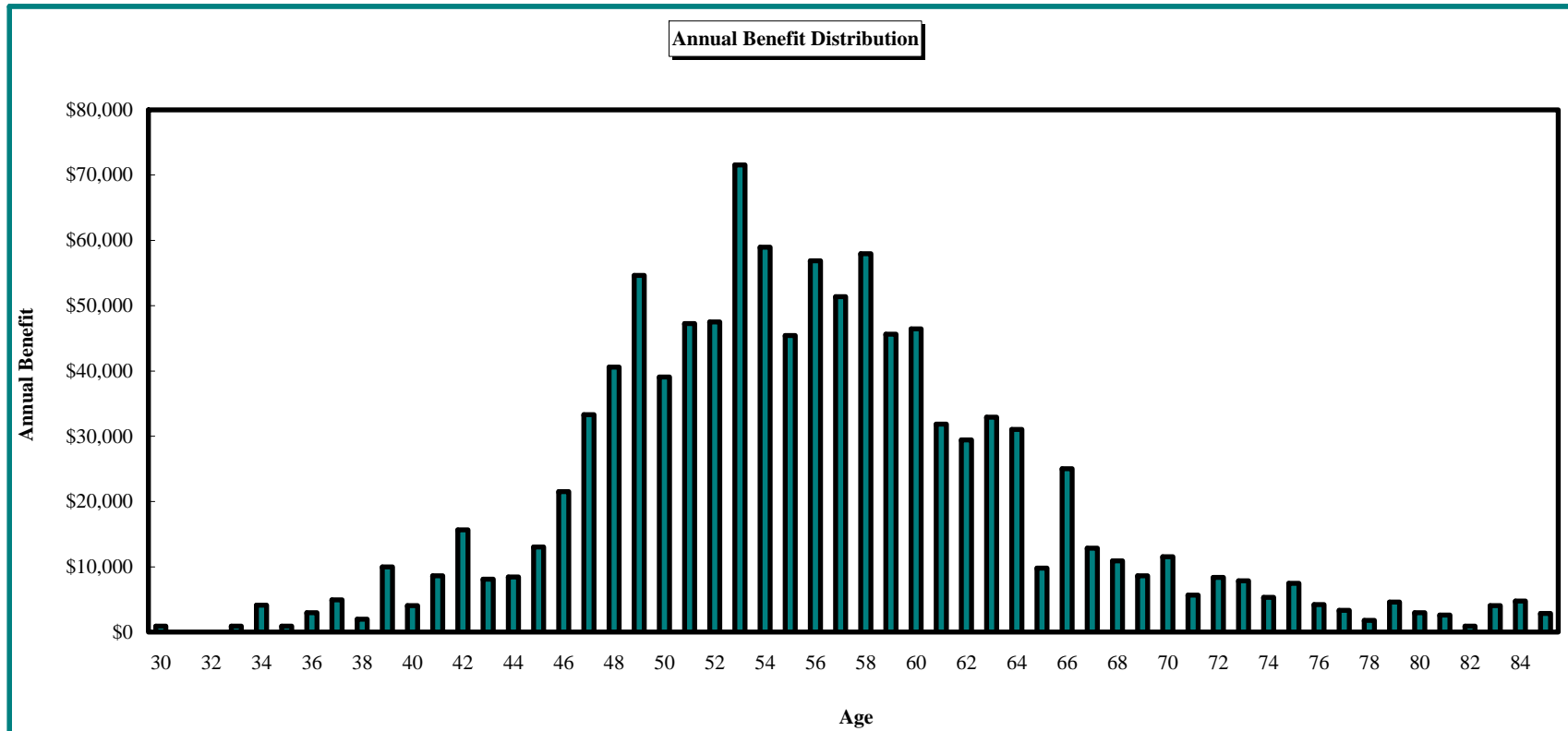
Age	Count	Annual Benefit*	Age	Count	Annual Benefit*
<25	0	\$0	73	7	\$7,830
25	0	\$0	74	5	\$5,310
26	0	\$0	75	6	\$7,470
27	0	\$0	76	4	\$4,230
28	0	\$0	77	3	\$3,330
29	0	\$0	78	1	\$1,800
30	1	\$900	79	3	\$4,590
31	0	\$0	80	3	\$2,970
32	0	\$0	81	2	\$2,610
33	1	\$900	82	1	\$900
34	4	\$4,140	83	4	\$4,050
35	1	\$900	84	4	\$4,770
36	3	\$2,970	85	2	\$2,880
37	4	\$4,950	86	0	\$0
38	2	\$1,980	87	0	\$0
39	9	\$9,990	88	0	\$0
40	4	\$4,050	89	0	\$0
41	8	\$8,640	90	0	\$0
42	14	\$15,660	91	0	\$0
43	8	\$8,100	92	0	\$0
44	8	\$8,460	93	0	\$0
45	11	\$13,050	94	0	\$0
46	17	\$21,510	95	0	\$0
47	34	\$33,300	96	0	\$0
48	37	\$40,590	97	0	\$0
49	47	\$54,630	98	0	\$0
50	30	\$39,060	99	0	\$0
51	39	\$47,250	100	0	\$0
52	37	\$47,520	101	0	\$0
53	54	\$71,550	102	0	\$0
54	42	\$58,950	103	0	\$0
55	36	\$45,450	104	0	\$0
56	42	\$56,880	105	0	\$0
57	41	\$51,390	106	0	\$0
58	43	\$57,960	107	0	\$0
59	36	\$45,630	108	0	\$0
60	37	\$46,440	109	0	\$0
61	25	\$31,860	110	0	\$0
62	26	\$29,430	111	0	\$0
63	29	\$32,940	112	0	\$0
64	26	\$31,050	113	0	\$0
65	10	\$9,810	114	0	\$0
66	21	\$25,020	115	0	\$0
67	12	\$12,870	116	0	\$0
68	10	\$10,890	117	0	\$0
69	8	\$8,640	118	0	\$0
70	10	\$11,520	119	0	\$0
71	5	\$5,670	120	0	\$0
72	7	\$8,370			
			<b>Totals</b>	<b>884</b>	<b>\$1,073,610</b>

\* Payable at the greater of age 60 or current age (use the greater of age 55 or current age if member has 20 years of service)

MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT  
ACTUARIAL VALUATION AS OF JUNE 30, 2013

APPENDIX A  
MEMBERSHIP INFORMATION

Montana Volunteer Firefighters' Compensation Act Distribution of  
Terminated Vested Members  
as of June 30, 2013



**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.

<b>Sample Rates of Healthy Mortality</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
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.

<b>Sample Rates of Disabled Inactive Mortality</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
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%

**c. Rates of Active Disability**

None assumed.

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**d. Termination of Service (Prior to Normal Retirement Eligibility)**

<b>Annual Rates of Termination</b>	
<b>Service</b>	<b>Rate</b>
<4	20.00%
4 – 9	15.00%
10 & over	10.00%

**e. Retirement**

<b>Age</b>	<b>Annual Retirement Rates</b>	
	<b>10-19 Years</b>	<b>20 years or more</b>
<55	0.00%	0.00%
55 – 59	0.00%	40.00%
60 – 69	20.00%	40.00%
70 & over	100.00%	100.00%

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

**f. Family Composition**

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

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

Actual marital characteristics are used for pensioners.

**g. Vested Benefits for Terminated Members**

Vested benefits for members who terminated during the years ending June 30, 2009 and later were estimated based upon 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.

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**2. Economic Assumptions**

- a. Rate of Investment Return:** 7.75% (net of expenses)
- b. Rate of Increase in Inflation:** 3.00%

**3. Changes since Last Valuation**

None.

**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 dollar amount individually for each active member.

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 over a rolling 20-year period, as level dollar amounts.

**4. Changes since Last Valuation**

None.

**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

**1. Membership**

The plan is a state-wide retirement and disability plan. The plan covers volunteer firefighters serving with qualified volunteer fire companies in unincorporated areas throughout the state. All members are unpaid volunteers and the State of Montana is the only contributor to the Plan.

**2. Contributions**

There are no member contributions.

The State contributes 5.0% of certain premium taxes collected.

**3. Credit for Service**

To receive a year of credit for service, a volunteer firefighter must serve with a fire company for an entire fiscal year and received a minimum of 30 hours of training. Fractional years are not credited.

**4. Service Retirement**

**Eligibility:** Age 55 with 20 years of credit for service, or age 60 with 10 years of credit for service.

**Benefit:** \$7.50 per month for each year of credit for service.

For VFCA members retiring prior to July 1, 2011, maximum service is 30 years.

VFCA members retiring on or after July 1, 2011, will receive \$7.50 per month for each additional year of credited service after 30 years. *Only VFCA members retiring on or after July 1, 2011, qualify for this benefit.*

Benefit Reduction: A retiree's benefit will be capped at, or reduced to, \$225 a month (30 years of credited service) if at any time the amortization period becomes greater than 20 years.

**5. Disability Benefit**

**Eligibility:** Any current member on the fire companies' roster.

**Benefit:** The greater of (a) \$75 per month, or (b) \$7.50 per month per year of service (up to 30 years of service).



**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

**6. Survivor's Benefit**

Eligibility: 10 years of credit for service or a retired member.

Benefit: 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 the full benefit otherwise payable to the member. Survivor benefits terminate when benefits have been paid for a total of 40 months, including any benefits paid to the retired member prior to death.

**7. Changes since Last Valuation**

None.

**APPENDIX D  
GLOSSARY**

**1. Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; 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 as follows:

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

**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 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.