Minnesota Legislative Commission on Pensions and Retirement

Replication of the Actuarial Valuation of the Public Employees Retirement Association of Minnesota Public Employees Police & Fire Plan as of July 1, 2013

Prepared by:

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January 31, 2014

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January 31, 2014

Minnesota Legislative Commission
on Pensions and Retirement
State Office Building, Room 55
100 Rev. Dr. Martin Luther King Jr. Boulevard
St. Paul, Minnesota 55155

Attention: Mr. Lawrence A. Martin, Executive Director

Ladies and Gentlemen:

The enclosed report presents the findings and comments resulting from a review and replication of the July 1, 2013 actuarial valuation of the Public Employees Police & Fire Plan (Fund) administered by the Public Employees Retirement Association of Minnesota (PERA). An overview of our major findings is included in the Executive Summary section of the report. More detailed commentary and information is provided in the sections that follow.

We pursued this analysis and review with a constructive mindset. We looked to identify any possible suggestions that might improve understanding of or confidence in the actuarial services being provided. Naturally, some of the comments may be viewed as personal preference or nit-picky in nature. While we are not trying to impose our own preferences or biases on the Fund or the retained actuary, neither did we hesitate to make such comments if we believed that some change, however minor, would improve the actuarial functions.

This report has been prepared for use by the Minnesota Legislative Commission on Pensions and Retirement (LCPR) in their oversight role with regard to the Fund. It has been prepared using Milliman valuation systems in a manner that would be used by Milliman to prepare a full actuarial valuation of the Fund. We recognize that there are hundreds of thousands of complex calculations performed by the actuarial valuation system. For this reason, even the smallest differences between valuation systems can produce noticeable differences in the valuation results between two different actuaries.

In preparing this report, we have relied without audit on the employee data, plan provisions, value of the plan assets and other plan financial information as provided by various involved entities including your office, PERA, Fund actuary and others. We have reviewed this data for reasonableness and for consistency with previously supplied information. If any of this information as summarized in this report is inaccurate or incomplete, the results shown could be materially affected and this report may need to be revised.

Actuarial assumptions, including discount rates, mortality tables, and others identified in this report, and actuarial cost methods are those used by the Fund Actuary and as prescribed by statute or adopted by the applicable Board and approved by the LCPR. These parties are responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods, and assumptions used in this valuation are those that have been so prescribed and are described in the Actuarial Basis of this report.

This valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

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

On the basis of the foregoing we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

Milliman's work is prepared solely for the use and benefit of the LCPR. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent unless allowed under the Legislative Commission on Pensions and Retirement Contract for Actuarial Review and Auditing Consulting Services dated July 18, 2013. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

Any distribution of the enclosed report must be in its entirety including this cover letter, unless prior written consent is obtained from Milliman, Inc. This report has been prepared in accordance with the terms and provisions of the Legislative Commission on Pensions and Retirement Contract for Actuarial Review and Auditing Consulting Services effective July 18, 2013.

We, William V. Hogan, FSA, and Timothy J. Herman, FSA, are actuaries for Milliman, Inc. We are members of the American Academy of Actuaries and Fellows of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

We look forward to making a personal presentation of our findings in briefings to the Minnesota Legislative Commission on Pensions and Retirement and to relevant staff members.

Respectfully submitted,

Milliman, Inc.

William V. Hogan

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Timothy J. Herman

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WVH/TJH/kf

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Executive Summary

Purpose and Scope of the Actuarial Replication Audit

In accordance with Minnesota Statutes, Section 356.214, Subdivision 4, the LCPR has engaged Milliman, Inc. to perform a replication of the July 1, 2013 actuarial valuation of the Fund administered by PERA.

In performing the replication of the actuarial valuation, we follow several well defined steps. These steps involve a review and cleansing of the data used in the actuarial valuation, an assessment of the plan provisions to be valued, an analysis of the actuarial assumptions to be applied, a review of the reported value of plan assets as of the valuation date, and preparation of the actuarial calculations using appropriate computer programming and summarizing the results. All of the above steps are to be applied in accordance with the requirements of Minnesota statutes and the Actuarial Standards For Actuarial Work adopted by the LCPR.

In conducting our work, we initially prepared the above steps independently from the work of the Fund Actuary. After completing that work, we conducted a review of some individual benefit trace information in order to identify any key differences in programming or technique. We then prepared a summary of the key valuation results, showing a comparative of our results to those of the Fund Actuary.

It is important to recognize that the actuarial valuation process, while very sophisticated in its calculation methodology, is still an estimate of the financial value of benefits payable on contingent events, most of which occur many years into the future. As such, a considerable amount of uncertainty and variability surrounds those estimates. As actuaries we recognize this fact and are comfortable that small differences (in percentages) in the results do not change the overall financial results portrayed in the valuation. Furthermore, the actuarial software used by different firms has implicit differences that create differences in the valuation numbers. For this reason, we believe the comparison of valuation results should be evaluated in terms of percentage differences. To provide some context to our comments, in a replication audit, where the differences that are identified can also be quantified, we generally expect to be within 1%-2% on the calculation of the present value of future benefits and within 4%-5% on the calculation of the actuarial accrued liability and normal cost. The wider range on the latter items is because there tends to be more variability in how different actuarial software programs allocate the total liability (present value of future benefits) to past and future years of service.

Please note, the actuarially required contribution rate includes a component for the amortization of the unfunded actuarial liability (UAL). For a given level of UAL, annual amortization payments are calculated as increasing by 3.75% per year ("level percent amortization"). If future experience follows the actuarial assumptions, this should result in amortization payments that keep pace with the assumed growth in overall compensation. Please note that with the current amortization period of 26 years, amortization payments in the short term will not be large enough to cover interest on the UAL, which means that as a dollar amount the UAL is expected to grow for several years. This situation is sometimes referred to as "negative amortization". The negative amortization will continue until the amortization period becomes short enough, and the amortization payments become large enough, such that the amortization payments will be enough to cover both interest and principal, and from that point forward the UAL as a dollar amount will start to decline progressively until ultimately reaching zero by the end of the amortization period.

Statement of Findings

In total, we found the actuarial calculations by the Fund Actuary to be within a reasonable degree of tolerance to the results that we have produced. As noted below, we encountered some variations on specific decrements or groups. Where we saw differences, we attempted to identify the reasons. In terms of total values, we are satisfied that the July 1, 2013 actuarial valuation results for the Fund as prepared by the Fund Actuary present a fair and reasonable representation of the present value of future benefits.

The following commentary provides our main conclusions on the various areas of our review:

- Plan Provisions: We started with the summary of plan provisions for the Fund that Milliman reviewed last year. We then applied any adjustments to these provisions as a result of legislative changes that were identified in the LCPR summaries. After reviewing the actuarial report prepared by the Fund Actuary, we believe that their summary of plan provisions is consistent with our understanding of the current plan provisions. We note that the definition of duty disability should be updated consistent with the recent change. This does not affect the actuarial calculations.

- Membership Data: Our raw data counts match up to within a few lives with the counts as summarized by PERA. After applying our own cleansing methods, our valuation data count was modestly different from the count as reported by the Fund Actuary. Our active data count matched exactly and our inactive data count was 7 lives lower.

  Given the total counts involved, our conclusion is that the Fund Actuary is reasonably reflecting the data received from PERA to within a reasonable degree of tolerance with our own determinations.

- Actuarial Assumptions and Methods: In general, we believe that the assumptions and methods employed by the Fund Actuary are consistent with statutes and the Standards for Actuarial Work.

- Actuarial Value of Assets: We believe that the Fund Actuary has fairly and correctly presented the actuarial value of assets.

- Valuation System Results: Based upon our own valuation system results, we were able to match the Fund Actuary valuation results within 0.5% on the present value of future benefits and within 0.5% on the actuarial liabilities. We are about 0.34 percentage points lower on the Normal Cost. These values track very well to the Fund Actuary calculations in total. However, we note some differences in how those totals are split by decrement and group.

- Valuation Report: We believe the actuarial valuation report prepared by the Fund Actuary provides all of the information required by the Standards for Actuarial Work. Overall, the work by the Fund Actuary is comprehensive and thorough. We note that the Actuarial Standards call for identification of the Actuarial Gain or Loss related to mortality. The report provides this information for current benefit recipients.

- COLA: As part of legislation enacted in 2013, the annual Cost of Living Adjustment (COLA) applied to the pensions of retired Members was changed. Post-retirement increases were reduced from 1.5% per year to 1.0% per year. Increases revert to inflation up to 2.5% when a 90% funding ratio is reached for two consecutive years (funding ratio calculated using Market Value of Assets). For retirements after May 31, 2014, the first post-retirement increase will be delayed two years. The funding ratio threshold that must be attained to pay a 2.5% postretirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years. The funding ratio threshold that determines when a 1.0% postretirement benefit increase must be paid after returning to the 2.5% rate was changed from less than 90% for one year to less than 80% for one year or less than 85% for two consecutive years. The valuation by the Fund Actuary assumes that the lower 1.0% COLA will remain in place for all years. As stated in the Fund Actuary's report, this assumption is based on the projections that indicate the Fund is not expected to reach 90% in the next 15 years. We believe this assumption is reasonable. However, we do note that some legislative changes have been made which could improve this projection in future years.

Principal Valuation Results

This section provides a summary of the key measurements from the July 1, 2013 Actuarial Valuation. As the numbers show, we were able to reasonably match the primary data totals with those shown by the Fund Actuary in almost all cases.

Principal Valuation Results

	Actuarial Valuation as of	
	July 1, 2013 (Fund Actuary)	**July 1, 2013 (Milliman)**
Contributions (% of Payroll)		
Normal Cost Rate	18.90%	18.56%
UAAL Amortization Payment	10.90%	10.58%
Expenses	0.09%	0.09%
Total Required Contributions (Chapter 356)	29.89%	29.23%
Statutory Contributions (Chapter 353)	27.25%	27.25%
Contribution (Deficiency)/Sufficiency	(2.64)%	(1.98)%
Unfunded Actuarial Accrued Liability (dollars in thousands)		
Based upon AVA	$1,371,087	1,331,854
Based upon MVA	957,291	918,058
Funding Ratios (dollars in thousands)		
Accrued Benefit Funding Ratio		
Current Assets (AVA)	$5,932,945	5,932,945
Current Benefit Obligations	7,069,407	7,018,034
Funding Ratio	83.92%	84.54%
Accrued Liability Funding Ratio		
Current Assets (AVA)	$5,932,945	5,932,945
Current Assets (MVA)	6,346,741	6,346,741
Actuarial Accrued Liability	7,304,032	7,264,799
Funding Ratio (AVA)	81.23%	81.67%
Funding Ratio (MVA)	86.89%	87.36%
Projected Benefit Funding Ratio		
Current and Expected Future Assets	$8,355,999	8,392,994
Current and Expected Future Benefit Obligations	8,688,026	8,642,343
Funding Ratio	96.18%	97.11%
Participant Data		
Active Members		
Number	10,940	10,940
Projected Annual Earnings (dollars in thousands)	$822,003	$822,516
Average Projected Annual Earnings	75,137	75,184
Average Age	40.7	40.7
Average Service	12.7	12.7
Additional Members of Leave of Absence	0	0
Service Retirements	6,583	6,583
Survivors	1,131	1,126
Disability Retirements	1,865	1,865
Deferred Retirements	1,388	1,387
Terminated Other Non-vested	988	987
TOTAL	22,895	22,888

Plan Assets

Statement of Plan Net Assets for Year Ended June 30, 2013

(dollars in thousands)

We received asset information from PERA which provided assets by class as of June 30, 2013. We have reviewed these assets and summarized them below. Our summary exactly matches the summary provided by the Fund actuary in their Actuarial Valuation Report.

	Market Value	
	Fund Actuary	**Milliman**
Assets in Trust		
Cash, Equivalents, Short-term Securities	$ 161,583	$ 161,583
Fixed Income	1,456,052	1,456,052
Equity	3,797,435	3,797,435
SBI Alternative	919,315	919,315
Other	0	0
Total Assets in Trust	$6,334,385	$6,334,385
Assets Receivable	15,730*	15,730*
Amounts Payable	(3,374)	(3,374)
Net Assets Held in Trust for Pension Benefits	$6,346,741	$6,346,741

* Includes $11.534 million contribution from Minneapolis to be paid by July 15, 2013.

Plan Assets

Reconciliation of Plan Assets

(dollars in thousands)

The following exhibit shows the revenue, expenses and resulting assets of the Fund as reported by PERA for the Plan's Fiscal year July 1, 2012 to June 30, 2013.

We received this information directly from PERA and summarized it below. Our summary matches the summary provided by the Fund actuary.

	Market Value	
	Fund Actuary	**Milliman**
1. Fund Balance at Market Value at Beginning of Year	**$ 5,772,047**	**$ 5,772,047**
2. Contributions		
a. Member	$ 76,434	$ 76,434
b. Employer	125,995*	125,995*
c. Other Sources	0	0
d. Total Contributions	202,429	202,429
3. Investment Income		
a. Investment Income/(Loss)	$ 815,439	$ 815,439
b. Investment Expenses	(8,697)	(8,697)
c. Net Subtotal	806,742	806,742
4. Other	24	24
5. Total Income: *(2.d) + (3.c.) + (4.)*	**1,009,195**	**1,009,195**
6. Benefits Paid		
a. Annuity Benefits	$ (431,726)	$ (431,726)
b. Refunds	(2,020)	(2,020)
c. Total Benefits Paid	(433,746)	(433,746)
7. Expenses		
a. Other	0	0
b. Administrative	(755)	(755)
c. Total Expenses	(755)	(755)
8. Total Disbursements: *(6.c.) + (7.c.)*	**(434,501)**	**(434,501)**
9. Fund Balance at Market Value at End of Year	**$6,346,741**	**$6,346,741**
10. Approximate Return on Market Value of Assets	14.3%	14.3%

* Includes $11.534 million contribution from Minneapolis to be paid by July 15, 2013.

Plan Assets

Actuarial Asset Value
(dollars in thousands)

Based upon the assets reported to us by PERA and prior year actuarial valuation information regarding unrecognized asset returns, we have constructed the Actuarial Value of Assets for the July 1, 2013 Actuarial Valuation. Our calculation matches the Fund actuary.

			June 30, 2013
1.	Market Value of Assets Available for Benefits		$6,346,741
2.	Determination of Average Balance		
a.	Total Assets Available at Beginning of Year		5,772,047
b.	Total Assets Available at End of Year		6,346,741
c.	Net Investment Income for Fiscal Year		806,742
d.	Average Balance *[a. + b. – c.]/2*		5,656,023
3.	Expected Return *[8.0% * 2.d.] (8.5% in 2012)*		452,482
4.	Actual Return		806,742
5.	Current Year Asset Gain/(Loss) *[4. – 3.]*		354,260
6.	Unrecognized Asset Returns		
		Original Amount	**Unrecognized Amount**
a.	Year Ended June 30, 2013	$ 354,260	$ 283,408
b.	Year Ended June 30, 2012	(307,690)	(184,614)
c.	Year Ended June 30, 2011	653,285	261,314
d.	Year Ended June 30, 2010	268,440	53,688
e.	Year Ended June 30, 2009	(1,395,085)	N/A
f.	Unrecognized Return Adjustment		413,796
7.	**Actuarial Value at End of Year** *(1. – 6.f.)*		**$5,932,945**
8.	Approximate Return on Actuarial Value of Assets During Fiscal Year		6.5%
9.	Ratio of Actuarial Value of Assets to Market Value of Assets		0.93

Development of Costs

Actuarial Valuation Balance Sheet

(dollars in thousands)

The actuarial balance sheet is based on the fundamental equation that at any given time the present value of benefits to be paid in the future must be equal to the assets on hand plus the present value of future contributions to be received. The total rate of contribution is determined as the amount which will make the total present and potential assets balance with the total present value of future benefits. The members' rate of contribution is fixed at the current schedule. The employer's rate of contribution is the balance required to cover the total rate of contribution.

The contributions made in excess of amounts required for current benefit payments are accumulated as a reserve to help meet benefit payments in later years. It is this reserve system which permits the establishment of a level rate of contribution each year.

	June 30, 2013 (Fund Actuary)	**June 30, 2013 (Milliman)**
A. Actuarial Value of Assets	$5,932,945	$5,932,945
B. Expected Future Assets		
1. Present Value of Expected Future Statutory Supplemental Contributions	1,039,060	1,082,505
2. Present Value of Future Normal Cost Contributions	1,383,994	1,377,544
3. Total Expected Future Assets (1. + 2.)	2,423,054	2,460,049
C. Total Current and Expected Future Assets	$8,355,999	$8,392,994
D. Current Benefit Obligations		
1. Benefit Recipients	4,333,475	4,345,082
2. Deferred Retirement with Augmentation	298,423	299,055
3. Former Members without Vested Rights	3,235	4,333
4. Active Members	2,434,274	2,369,564
5. Total Current Benefit Obligations	7,069,407	7,018,034
E. Expected Future Benefit Obligations	1,618,619	1,624,310
F. Total Current and Expected Future Benefit Obligations	8,688,026	8,642,343
G. Unfunded Current Benefit Obligations (D.5. – A.)	1,136,462	1,085,089
H. Unfunded Current and Future Benefit Obligations (F. – C.)	332,027	249,349

Development of Costs

Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate
(dollars in thousands)

In the tables that follow the Commentary in this section, we provide the calculations which ultimately determine the required supplemental contribution rate. From these tables, a critical calculation is the Actuarial Present Value of Projected Benefits. This calculation reflects the actuary's estimate of the total present value cost of all benefits yet to be paid by the Fund to the current members (active and inactive). In replication audits, we typically strive to be within 2% of the actuary's calculation. If that level cannot be achieved, then it is important to identify the differences in more detail. In general, our calculations are within the 2% threshold with the exception of Former Members without Vested Rights. It is our intent to review this component further in an effort to identify any other differences we may have compared to the Fund Actuary. The table below shows, as a percentage, the ratio of the numbers calculated by Milliman to the numbers reported by the Fund Actuary.

	Actuarial Present Value of Projected Benefits
Active Members	98.54%
Deferred Members	100.21
Former Members without Vested Rights	133.94
Benefit Recipients	100.27
Total	99.47%

The tables that follow the Actuarial Present Value of Projected Benefits are designed to determine how much of the Actuarial Present Value of Projected Benefits is to be funded by the future "normal cost" contributions (Actuarial Present Value of Future Normal Cost) versus how much belongs to past contributions (Actuarial Accrued Liability). This allocation does not change the total costs determined in the Actuarial Present Value of Projected Benefits. It simply allocates cost to past versus future based upon the Entry Age Normal Actuarial Cost Method. In replication audits, we typically look to be within 5% of the actuary's calculations for active member Actuarial Accrued Liability. The larger range recognizes that different valuation systems have different ways of rounding service and ages. In addition, the Entry Age Method requires projection of theoretical past amounts which can be handled somewhat differently between actuarial valuation systems. The table below shows, as a percentage, the ratio of the numbers calculated by Milliman to the numbers reported by the Fund Actuary.

	Actuarial Accrued Liability
Active Members	98.03%
Deferred Members	100.21
Former Members without Vested Rights	133.94
Benefit Recipients	100.27
Total	99.46%

Development of Costs

Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate
(dollars in thousands)

Once the Actuarial Accrued Liability is determined, it is compared to the Actuarial Value of Assets to determine the unfunded liability. The difference between these numbers is then amortized to the statutory amortization date of June 30, 2039 based upon the present value of future payrolls. Because this calculation is based upon the difference of two relatively close numbers, any change in one of the numbers can have a large impact when viewed as a percentage.

For example, if the Actuarial Accrued Liability is $1,000 and the Actuarial Value of Assets is $900, then unfunded liability is $100. If the Actuarial Accrued Liability is reduced by $25, the unfunded liability becomes $75. In this example, the reduction in the Actuarial Accrued Liability of 2.5% generates a reduction of 25% in both the unfunded liability and the supplemental contribution rate.

Based upon the above, it should be expected that small deviations in the amount of Actuarial Accrued Liability will have a larger impact on the supplemental contribution rate. It is evidenced here where our calculation of the Actuarial Accrued Liability is 0.5% less than the Fund Actuary but our supplemental contribution percentage rate is 2.9% less than the Fund Actuary.

Development of Costs

Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate

(dollars in thousands)

		Actuarial Present Value of Projected Benefits	
		Fund Actuary	Milliman
1.	Active Members		
	A. Retirement Annuities	$3,533,614	$3,471,443
	B. Disability Benefits	366,321	371,442
	C. Survivor's Benefits	52,781	52,460
	D. Deferred Retirements	96,968	93,330
	E. Refunds	3,209	5,199
	F. Total	4,052,893	3,993,873
2.	Deferred Retirements with Future Augmentation	298,423	299,055
3.	Former Members without Vested Rights	3,235	4,333
4.	Benefit Recipients	4,333,475	4,345,082
5.	Total	8,688,026	8,642,343

		Actuarial Present Value of Future Normal Costs	
		Fund Actuary	Milliman
1.	Active Members		
	A. Retirement Annuities	$1,042,967	$1,057,905
	B. Disability Benefits	214,384	211,798
	C. Survivor's Benefits	33,373	31,795
	D. Deferred Retirements	81,409	68,662
	E. Refunds	11,861	7,383
	F. Total	1,383,994	1,377,544
2.	Deferred Retirements with Future Augmentation	0	0
3.	Former Members without Vested Rights	0	0
4.	Benefit Recipients	0	0
5.	Total	1,383,994	1,377,544

Development of Costs

Determination of Unfunded Actuarial Accrued Liability and Supplemental Contribution Rate
(dollars in thousands)

	Actuarial Accrued Liability	
	Fund Actuary	**Milliman**
A. Determination of Actuarial Accrued Liability (AAL)		
1. Active Members		
A. Retirement Annuities	$2,490,647	$2,413,538
B. Disability Benefits	151,937	159,643
C. Survivor's Benefits	19,408	20,665
D. Deferred Retirements	15,559	24,668
E. Refunds	(8,652)	(2,185)
F. Total	2,668,899	2,616,329
2. Deferred Retirements with Future Augmentation	298,423	299,055
3. Former Members without Vested Rights	3,235	4,333
4. Benefit Recipients	4,333,475	4,345,082
5. Total	7,304,032	7,264,799
B. Determination of Unfunded Actuarial Accrued Liability (UAAL)		
1. Actuarial Accrued Liability	$7,304,032	$7,264,799
2. Current Assets (AVA)	5,932,945	5,932,945
3. Unfunded Actuarial Accrued Liability (AVA)	1,371,087	1,331,854
4. Current Assets (MVA)	6,346,741	6,346,741
5. Unfunded Actuarial Accrued Liability (MVA)	957,291	918,058
C. Determination of Supplemental Contribution Rate*		
1. Present value of future payrolls through the amortization date of June 30, 2039	12,579,414	12,587,265
2. Supplemental Contribution Rate (AVA) (B.3. / C.1.)	10.90%	10.58%
3. Supplemental Contribution Rate (MVA) (B.5. / C.1.)	7.61%	7.29%

*The amortization of the unfunded actuarial accrued liability (UAAL) using the current amortization method results in initial payments less than the "interest only" payment on the UAAL. Payments less than the interest only amount will result in the UAAL increasing for an initial period of time.

Development of Costs

Determination of Contribution Sufficiency/(Deficiency)

(dollars in thousands)

In this section, we compare the statutory contributions provided under Chapter 353 of Minnesota statutes (353 contributions) to the required contributions under Chapter 356 of Minnesota statutes (356 contributions). The difference between these amounts results in a reported contribution sufficiency or deficiency.

With respect to the 353 contributions, the percentage is set by statute and we agree with the percentages reported by the Fund Actuary. The dollar amount is determined by applying the statutory percentage to the member compensation provided in the data file and projected (and annualized where necessary) with expected pay increases for the upcoming year. While reasonably close, our projection methodology was slightly different from the Fund Actuary resulting in a small dollar difference.

With respect to the 356 contributions, the total is equal to the sum of the Normal Cost (Entry Age Normal method) plus the supplemental contribution calculated earlier in this report plus an allowance for expected administrative expenses. Typically, in a replication audit, it is desirable to be within 5% of the actuary's Normal Cost. In this case, our Normal Cost percentage is 1.8% lower than the Fund Actuary. We further note that our components of Normal Cost are somewhat different from the Fund Actuary. This is not an uncommon result as the treatment of where to categorize certain costs on an "entry age" basis between actuarial valuation systems quite often results in these differences.

As mentioned earlier, the supplemental contributions are highly leveraged to the value of the Actuarial Accrued Liability and on the projected payroll. In this case, our supplemental contribution percentage is lower by 2.9% but this is based upon an Actuarial Accrued Liability that is lower by 0.5% and a projected payroll that is 0.1% higher.

Similar to the 353 contributions, we arrive at the same expense allowance percentage but our dollar contribution is different due to payroll projection methodology.

As a result of the above, our calculation of the Contribution Sufficiency/Deficiency is a deficiency of (1.98)%. This compares to a deficiency reported by the Fund Actuary of (2.64)%. The difference of 0.66% is primarily the result of the supplemental contribution and Normal Cost difference.

Development of Costs

Determination of Contribution Sufficiency/(Deficiency)

(dollars in thousands)

	Fund Actuary July 1, 2013 Percent of Payroll	Fund Actuary July 1, 2013 Dollar Amount	Milliman July 1, 2013 Percent of Payroll	Milliman July 1, 2013 Dollar Amount
A. Statutory Contributions – Chapter 353				
1. Employee Contributions	9.90%	$ 81,378	9.90%	$ 81,429
2. Employer Contributions	14.85	122,067	14.85	122,144
3. Supplemental Contributions				
a. Minneapolis Police	0.93	7,612	0.93	7,612
b. Minneapolis Fire	0.48	3,922	0.48	3,922
c. Virginia Fire	0.00	25	0.00	25
d. State Contributions	1.09	9,000	1.09	9,000
4. Total	27.25	224,004	27.25	224,132
B. Required Contributions – Chapter 356				
1. Normal Cost				
A. Retirement Benefits	14.27	117,299	14.29	117,538
B. Disability Benefits	2.96	24,331	2.85	23,442
C. Survivor Benefits	0.48	3,946	0.45	3,701
D. Deferred Retirement Benefits	1.03	8,467	0.87	7,156
E. Refunds	0.16	1,315	0.10	823
F. Total	18.90	155,358	18.56	152,659
2. Supplemental Contribution Amortization by June 30, 2039 of Unfunded Actuarial Accrued Liability	10.90	89,598	10.58	87,022
3. Allowance for Expenses	0.09	740	0.09	740
4. Total	29.89	245,696	29.23	240,421
C. Contribution Sufficiency/(Deficiency) (A.4. – B.4.)	(2.64)%	$ (21,692)	(1.98)%	$ (16,289)

Note: Projected annual payroll for fiscal year beginning on the valuation date:
$822,003 for Fund actuary and $822,516 for Milliman.

Actuarial Basis

Actuarial Cost Method

Liabilities and contributions in this report are computed using the Individual Entry Age Normal Cost Method. This method is prescribed by Minnesota Statutes.

The objective under this method is to fund each member's benefits under the Plan as payments which are level as a percentage of salary, starting at original participation date (or employment date), and continuing until the assumed date of retirement, termination, disability or death. For valuation purposes, entry age for each member is determined as the age at valuation minus years of service as of the valuation date.

At any given date, a liability is calculated equal to the contributions which would have been accumulated if this method of funding had always been used, the current plan provisions had always been in place, and all assumptions had been precisely accurate. The difference between this liability and the assets (if any) which are held in the Fund is the unfunded liability. The unfunded liability is typically funded over a chosen period in accordance with the amortization schedule.

A detailed description of the calculation follows:

The normal cost for each active member under the assumed retirement age is determined by applying to earnings the level percentage of salary which, if contributed each year from date of entry into the Plan until the assumed retirement (termination, disability or death) date, is sufficient to provide the full value of the benefits expected to be payable.

- The present value of future normal costs is the total of the discounted values of all active members' normal cost, assuming these to be paid in each case from the valuation date until retirement (termination, disability or death) date.
- The present value of projected benefits is calculated as the value of all benefit payments expected to be paid to the Plan's current members, including active and retired members, beneficiaries, and terminated members with vested rights.
- The accrued liability is the excess of the present value of projected benefits over the present value of future normal costs.
- The unfunded liability is the excess of the accrued liability over the assets of the Fund, and represents that part of the accrued liability which has not been funded by accumulated past contributions.

Change in Actuarial Cost Method

None

Asset Valuation Method

The assets are valued based on a five-year moving average of expected and market values (five-year average actuarial value) determined as follows:

At the end of each plan year, an average asset value is calculated as the average of the market asset value at the beginning and end of the fiscal year net of investment income for the fiscal year;

The investment gain or (loss) is taken as the excess of actual investment income over the expected investment income based on the average asset value as calculated above;

The investment gain or (loss) so determined is recognized over five years at 20% per year;

The asset value is, the sum of the market asset value plus the scheduled recognition of investment gains or (losses) during the current and the preceding four fiscal years.

Summary of Actuarial Assumptions

The following assumptions were used in valuing the liabilities and benefits under the plan. All assumptions are prescribed by Statutes, the LCPR, or the Board of Trustees.

Investment Return	Pre-retirement - 8.00% per annum for the time period after June 30, 2013 through June 30, 2017, and 8.50% per annum thereafter. Post-retirement - 7.00% per annum for the time period after June 30, 2013 through June 30, 2017, and 7.50% per annum thereafter.
Benefit Increases After Retirement	Payment of 1.00% annual benefit increases after retirement are accounted for by using the 7.50% post-retirement assumption (7.0% during 4-year select period), as required by Minnesota Statute.
Payroll Growth	3.75% per year compounded annually
Salary Increases	Reported salary for prior fiscal year, with new hires annualized, increased to current fiscal year and annually for each future year according to the ultimate rates in the rate table based upon service.
Mortality	
Healthy Pre-retirement	RP 2000 non-annuitant generational mortality table projected with scale AA, white collar adjustment, set back two years for males and females.
Healthy Post-retirement	RP 2000 annuitant generational mortality table projected with scale AA, white collar adjustment.
Disabled	RP 2000 healthy annuitant mortality table, white collar adjustment, set forward eight years for males and females.
Retirement	Members retiring from active status are assumed to retire according to the age related rates as shown in rate table. Members who have attained the highest assumed retirement age will retire in one year.
Withdrawal	Select and ultimate rates based on actual plan experience. Ultimate rates after the third year are shown in the rate table. Select rates are as follows: First Year: 8.00%; Second Year: 5.00%; Third Year: 3.50%
Disability	Age-related rates based on actual experience; see table of sample rates. All incidences are assumed to be duty-related.
Allowance for Combined Service Annuity	Liabilities for former members are increased by 30.00% to account for the effect of some members having eligibility for a Combined Service Annuity.
Administrative Expenses	Prior year administrative expenses expressed as percentage of prior year projected payroll.
Return of Contributions	All employees withdrawing after becoming eligible for a deferred benefit are assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Commencement of Deferred Benefits	Members receiving deferred annuities (including current terminated deferred members) are assumed to begin receiving benefits at age 55.
Percentage Married	85% of male and 65% of female active members are assumed to be married. Actual marital status is provided for members in payment status.
Age of Spouse	Male members are assumed to have a beneficiary three years younger and female members are assumed to have a beneficiary four years older. For members in payment status, actual spouse date of birth is used, if provided.
Eligible Children	Retiring members are assumed to have no dependent children.

Summary of Actuarial Assumptions (continued)

Form of Payment	Married members retiring from active status are assumed to elect subsidized joint and survivor form of annuity as follows: Males: 15% elect Straight Life option 10% elect 25% J&S option 20% elect 50% J&S option 20% elect 75% J&S option 35% elect 100% J&S option Females: 60% elect Straight Life option 5% elect 25% J&S option 15% elect 50% J&S option 5% elect 75% J&S option 15% elect 100% J&S option Members receiving deferred annuities (including current terminated deferred members) are assumed to elect a straight life annuity.
Eligibility Testing	Eligibility for benefits is determined based upon the age and service on the date the decrement is assumed to occur. Age is calculated as the age nearest birthday at the valuation date. Service at the valuation date is as reported by the fund. For mid-year decrements, 0.5 is added to each calculated age and service.
Decrement Operation	Withdrawal decrements do not operate during retirement eligibility.
Service Credit Accruals	It is assumed that members accrue one year of service credit per year.
Changes in Actuarial Assumptions	The post-retirement investment rate assumption was changed from 7.00% (6.50% for the select period ending June 30, 2017) to 7.50% (7.00% for the select period ending June 30, 2017) to reflect the post-retirement benefit increase change from 1.5% to 1.0%.
Unknown Data for Members	Where data reported by PERA was missing or incomplete, the following assumptions were applied: Age: 47 Gender: Male Salary: Prior year salary if available, otherwise high five salary with a 10% load to account for salary increases. If neither prior year salary nor high five salary was available, $35,000 was assumed.

Summary of Actuarial Assumptions (continued)

Summary of Rates

	Mortality Rates (%)					
	Healthy Pre-Decrement *		Healthy Post-Decrement*		Disabled	
Age	Male	Female	Male	Female	Male	Female
20	0.03%	0.02%	0.10%	0.03%	0.12%	0.04%
25	0.04	0.02	0.11	0.03	0.15	0.06
30	0.04	0.02	0.11	0.04	0.23	0.09
35	0.05	0.04	0.18	0.07	0.34	0.13
40	0.08	0.06	0.27	0.10	0.52	0.21
45	0.11	0.08	0.41	0.16	0.57	0.29
50	0.17	0.13	0.60	0.24	0.57	0.47
55	0.27	0.21	0.54	0.35	0.92	0.74
60	0.45	0.37	0.66	0.56	1.58	1.24
65	0.85	0.68	1.16	0.91	2.67	2.09
70	1.56	1.22	1.93	1.52	4.75	3.50

* The rates shown above are further adjusted in the valuation to apply generational mortality improvement using projection scale AA.

	Ultimate Withdrawal		Disability	
Age	**Male**	**Female**	**Male**	**Female**
20	6.01%	6.01%	0.11%	0.11%
25	3.24	3.24	0.13	0.13
30	1.90	1.90	0.16	0.16
35	1.46	1.46	0.19	0.19
40	1.26	1.26	0.29	0.29
45	0.91	0.91	0.54	0.54
50	0.50	0.50	1.04	1.04
55	0.11	0.11	2.03	2.03
60	0.00	0.00	0.00	0.00

Summary of Actuarial Assumptions (concluded)

Summary of Rates

Age	Retirement
50	13%
51	10
52	10
53	10
54	13
55	30
56	20
57	20
58	20
59	20
60	25
61	25
62	35
63	35
64	35
65	50
66	50
67	50
68	50
69	50
70+	100

Salary Scale	
Year	Increase
1	13.00%
2	11.00
3	9.00
4	8.00
5	6.50
6	6.10
7	5.80
8	5.60
9	5.40
10	5.30
11	5.20
12	5.10
13	5.00
14	4.90
15	4.80
16	4.80
17	4.80
18	4.80
19	4.80
20	4.80
21	4.70
22	4.60
23+	4.50

Summary of Plan Provisions – Police & Fire Plan

This summary of provisions reflects the interpretation of applicable Statutes for purposes of preparing this valuation. This interpretation is not intended to create or rescind any benefit rights in conflict with any Minnesota Statutes.

Plan Year	July 1 through June 30
Eligibility	All full-time and certain part-time police officers and fire fighters, and certain paramedics, who are not contributing to any other local retirement fund.
Contributions	see below
State Contributions	$9 million paid annually on October 1 until both PERA P&F and MSRS State Patrol become 90% funded (on a Market Value of Assets basis).
Allowable Service	Police & Fire service during which member contributions were made. May also include certain leaves of absence and military service.
Average Salary	Average of the five highest successive years of annual salary. Average salary is based on all Allowable Service if less than five years.
Salary	Includes amounts deducted for deferred compensation or supplemental retirement plans, net income from fees and sick leave payments funded by the employer. Excludes unused annual leaves and sick leave payments, severance payments, Workers' Compensation benefits and employer-paid flexible spending accounts, cafeteria plans, healthcare expense accounts, day-care expenses, fringe benefits and the cost of insurance coverage.
Vesting	see below

Contributions

	Member	Employer
Percent of Salary		
Current	9.60%	14.40%
January 1, 2014	10.20%	15.30%
January 1, 2015 & later	10.80%	16.20%

Member contributions are "picked up" according to the provisions of Internal Revenue Code 414(h).

Vesting

	Vesting Percent if First Hired		
Years of Service	Before 7/1/2010	After 6/30/2010 & before 7/1/2014	After 6/30/2014
<3	0%	0%	0%
3 – 4	100%	0%	0%
5	100%	50%	0%
6	100%	60%	0%
7	100%	70%	0%
8	100%	80%	0%
9	100%	90%	0%
10	100%	100%	50%
11	100%	100%	55%
12	100%	100%	60%
13	100%	100%	65%
14	100%	100%	70%
15	100%	100%	75%
16	100%	100%	80%
17	100%	100%	85%
18	100%	100%	90%
19	100%	100%	95%
20+	100%	100%	100%

Summary of Plan Provisions - Police & Fire Plan **(continued)**

Retirement	
Normal Retirement Benefit	
Age/Service Requirements	Age 55 and at least partially vested. Proportionate retirement annuity is available at age 65 and one year of allowable Service.
Amount	3.00% of Average Salary for each year of Allowable Service (up to 33 years if hired after June 30, 2014), pro-rata for completed months. For members hired after June 30, 2014, the normal retirement annuity must not exceed 99% of the Average Salary. A pro-rata share of member contributions will be refunded at retirement for service more than 33 years for members hired after June 30, 2014.
Early Retirement	
Age/Service Requirements	Age 50 and at least partially vested.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date and 0.10% (0.20% for members enrolled in the plan after June 30, 2007) reduction for each month the member is under age 55. If the effective date of retirement is after June 30, 2019, the reduction is 5/12% for each month that the member is under age 55 at the time of retirement. The change in early retirement factors will be phased in over a five-year period for retirements occurring between July 1, 2014 and June 30, 2019.
Form of Payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 25%, 50%, 75% or 100% Joint and Survivor with bounce back feature without additional reduction.
Benefit Increases	Benefit recipients receive a future annual 1.0% post-retirement benefit increase. The annual adjustment will match inflation, up to 2.5%, any time the Fund exceeds a 90% funded ratio on a market value basis for two consecutive years. If the adjustment is increased to 2.5% and the funded ratio on a market value basis falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. For retirements after May 31, 2014, the first increase will be delayed two years. Members retired under laws in effect before July 1, 1973 receive an additional lump sum payment each year. In 1989, this lump sum payment is the greater of $25 times each full year of Allowable Service or the difference between $400 times each full year of Allowable Service and the sum of benefits paid from any Minnesota public pension plan plus cash payments from the Social Security Administration for the preceding fiscal year July 1, 1988 through June 30, 1989. In each following year, the lump sum payment will increase by the same percentage increase that is applied to regular annuities paid from the Fund. Effective January 1, 2002, annual lump sum payment is divided by 12 and paid as a monthly life annuity in the annuity form elected.

Summary of Plan Provisions - Police & Fire Plan (continued)

Disability

Duty Disability Benefit

Age/Service Requirement	Physically or mentally unable to perform normal duties as a police officer or fire fighter as a direct result of an act of duty that is inherently dangerous and specific to protecting property and personal safety of others. Members age 55 or older with 20 or more years of Allowable Service are not eligible to apply for duty disability benefits.
Amount	60.00%, plus an additional 3.00% for each year of service in excess of 20 years, of Average Salary paid until Normal Retirement Age, or for 60 months, whichever is later. The retirement benefit is then recalculated but is never lower than the disability benefit. If a member became disabled prior to July 1, 1997 but did not commence their benefit before July 1, 1997, the benefit is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in post-retirement interest rates from 5.00% to 6.00%.

Regular Disability Benefit

Age/Service Requirement	Physically or mentally unable to perform normal duties as a police officer or fire fighter with one year of Allowable Service. Members age 55 or older with 15 or more years of Allowable Service are not eligible to apply for regular disability benefits.
Amount	45.00% of Average Salary, paid until Normal Retirement Age, or for 60 months, whichever is later. The retirement benefit is then recalculated but is never lower than the disability benefit. Benefits for total and permanent regular disability are calculated as 3.00% of Average Salary for each year of Allowable Service, with a minimum of 45.00% of Average Salary. If a member became disabled prior to July 1, 1997 but did not commence his or her benefit before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in post-retirement interest rates from 5.00% to 6.00%.
Benefit Increases	Same as for retirement.

Retirement benefit

Age/Service Requirement	Upon cessation of disability benefits.
Amount	Any optional annuity continues. Otherwise, the larger of the disability benefit paid before age 55 or the normal retirement benefit available at age 55, or an actuarially equivalent optional annuity.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.

Summary of Plan Provisions - Police & Fire Plan (continued)

Death	
Surviving Spouse Benefit	
Age/Service Requirement	Death of active member or regular disabled member with surviving spouse whose disability benefit accrued before July 1, 2007, who is vested at death (service requirement is waived if death occurs in the line of duty).
Amount	50.00% of salary (60.00% if death occurs in the line of duty after June 30, 2007) averaged over last six months. Benefit paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991. If a member becomes deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit Increases	Same as for retirement.
Surviving Dependent Children's Benefit	
Age/Service Requirement	Non-duty related death of active member or regular disabled member with eligible dependent child.
Amount	10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 50.00% of salary and maximum of 70.00% of salary. Benefits paid until child marries, dies, or attains age 18 (age 23 if full-time student).
Duty Disability Surviving Spouse Benefit	
Age/Service Requirement	Member who is totally and permanently disabled who dies before age 55 or within five years of the effective date of the disability benefit, whichever is later.
Amount	60.00% of salary averaged over last six months. Benefits paid until spouse's death but no payments while spouse is remarried prior to July 1, 1991.
Benefit Increases	Same as for retirement.
Duty Disability Surviving Dependent Children's Benefit	
Age/Service Requirement	Death of a member with an eligible dependent child who was disabled in the line of duty and died as a direct result of the disability.
Amount	10.00% of salary averaged over last six months for each child. Family benefit minimum (including spouse's benefit) of 60.00% of salary and maximum of 80.00% of salary. Benefits paid until child marries, dies, or attains age 18 (age 23 if full-time student). If a member became deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.

Summary of Plan Provisions - Police & Fire Plan (continued)

Death (continued)	
Surviving Spouse Optional Annuity	
Age/Service Requirement	Active member dies before age 55. Benefits commence when member would have been age 55 or as early as age 50 if qualified for early retirement, benefits commence immediately if member had 30 years of service.
Amount	Survivor's payment of the 100% joint and survivor benefit the member could have elected if terminated. Alternatively, spouse may elect refund of deceased's contributions with interest if there are no dependent children. If a member became deceased prior to July 1, 1997 and the beneficiary was not eligible to commence their survivor benefits before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997, and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Benefit Increases	Same as for retirement.

Summary of Plan Provisions - Police & Fire Plan (continued)

Termination	
Refund of Contributions	
Age/Service Requirements	Termination of public service.
Amount	If member terminated before July 1, 2011, member's contributions credited with 6% interest compounded annually prior to July 1, 2011 and 4% interest thereafter. If member terminated after June 30, 2011, member's contributions credited with 4% interest compounded annually. A deferred annuity may be elected in lieu of a refund if vested.
Deferred Benefit	
Age/Service Requirements	Partial or fully vested.
Amount	Benefit computed under law in effect at termination and increased by the following "augmentation" percentage compounded annually for terminations prior to 2012: 0.00% before July 1, 1971; 5.00% from July 1, 1971 to January 1, 1981; 3.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of January 1 of the year following attainment of age 55 and January 1, 2012; 5.00% (2.50% if hired after June 30, 2006) thereafter until the earlier of the date the annuity begins and January 1, 2012; and 1.00% from January 1, 2012 thereafter. Members who terminate after 2011 will receive no future augmentation. If a member terminated employment prior to July 1, 1997 but was not eligible to commence their pension before July 1, 1997, the benefit payable is calculated under the laws in effect before July 1, 1997 and an actuarial increase shall be made for the change in the post-retirement interest rates from 5.00% to 6.00%.
Form of Payment	Same as for retirement.
Optional Form Conversion Factors	Actuarially equivalent factors based on RP-2000 for healthy annuitants, white collar adjustment, projected to 2027 using scale AA, no setbacks, blended 90% males, and 7.0% interest.

Summary of Plan Provisions - Police & Fire Plan (continued)

Combined Service Annuity	Members are eligible for combined service benefits if they: Meet minimum retirement age for each plan participated in and total public service meets the vesting requirements of each plan; or Have three or more years of service under PERA and the covered fund(s) (if hired prior to July 1, 2010). Other requirements for combined service include: (a) Member must have at least six months of allowable service credit in each plan worked under. (b) Member may not be in receipt of a benefit from another plan. Members who meet the above requirements must have their benefit based on the following: (a) Allowable service in all covered plans are combined in order to determine eligibility for early retirement. (b) Average salary is based on the high five consecutive years during their entire service in all covered plans.
Changes in Plan Provisions	Member contributions as a percent of pay will increase from 9.6% to 10.2% beginning January 1, 2014 and to 10.8% beginning January 1, 2015. Employer contributions will increase from 14.4% to 15.3% beginning January 1, 2014 and to 16.2% beginning January 1, 2015. State contributions of $9 million will be made annually on October 1 beginning in 2013. Contributions continue until both PERA P&F and MSRS State Patrol reach 90% funding (on a Market Value of Assets basis). Vesting requirement changed to 50% vested after 10 years grading to 100% vested after 20 years for members hired after June 30, 2014. For members hired after June 30, 2014, allowable service used to determine benefits is limited to 33 years, with a refund of the pro-rata share of employee contributions for excess years of service. For retirements after June 30, 2019, reduction for early retirement is 5/12% per month for each month that the member is under age 55 at the time of retirement (phased in over five-year period for retirements occurring between July 1, 2014 and June 30, 2019). Post-retirement increases were reduced from 1.5% per year to 1.0% per year. Increases revert to inflation up to 2.5% when a 90% funding ratio is reached for two consecutive years (funding ratio calculated using Market Value of Assets). For retirements after May 31, 2014, the first post-retirement increase will be delayed two years. The funding ratio threshold that must be attained to pay a 2.5% postretirement benefit increase to benefit recipients was changed from 90% for one year to 90% for two consecutive years. The funding ratio threshold that determines when a 1.0% postretirement benefit increase must be paid after returning to the 2.5% rate was changed from less than 90% for one

Summary of Plan Provisions - Police & Fire Plan (concluded)

Changes in Plan Provisions (continued)	year to less than 80% for one year or less than 85% for two consecutive years. The definition of Duty Disability was changed to add a requirement that an act of duty "that is inherently dangerous".

Summary of Plan Provisions – Minneapolis Police Relief Association

Normal Retirement Benefit	Monthly benefits are equal to the number of units multiplied by the unit values described herein. Units are based on service, as follows: **Service** / **Units** 20 — 35.0 units 21 — 36.6 units 22 — 38.2 units 23 — 39.8 units 24 — 41.4 units 25 or more — 43.0 units Members must be at least age 50 with 5 years of service to receive this benefit.
Unit Values	**Calendar Year** / **Unit Value** 2012 — $ 104.651 2013 — 109.011 2014 — 114.825 2015 — 124.031 Unit values after 2015 are assumed to increase 1.0% per year.
Surviving Spouse's Benefit	Annual benefit based on 23 units for the surviving spouse of an active or retired member. Upon retirement, members may choose an alternative form of payment that provides 50%, 75% or 100% of their benefit to their spouse after their death. The units are adjusted if one of these alternate forms is selected.
Surviving Children's Benefit	Annual benefit based on 8 units for each surviving child of an active or retired member. Benefits continue to age 18 or if the child is a full-time student, to age 22. The total benefit for surviving children and spouse combined is limited to 41 units.
Contributions	Member and employer contributions equal to 8% of the monthly unit value multiplied by 80 are required for each member. After 25 years of service, member contributions are paid to a separate health insurance account.
Benefit Increases	Benefit recipients receive a future annual 1.0% post-retirement benefit increase. The annual adjustment will match inflation, up to 2.5%, any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.5% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. For retirements after January 1, 2015, the first increase will be delayed two years.

Summary of Plan Provisions – Minneapolis Firefighters' Relief Association

Normal Retirement Benefit	Monthly benefits are equal to the number of units multiplied by the unit values described herein. Units are based on service, as follows: **Service** / **Units** 15 / 25.0 units 16 / 26.6 units 17 / 28.2 units 18 / 29.8 units 19 / 31.4 units 20 / 35.0 units 21 / 36.6 units 22 / 38.2 units 23 / 39.8 units 24 / 41.4 units 25 or more / 43.0 units Members must be at least age 50 with 5 years of service to receive this benefit. Members may choose among alternative survivor payment forms which modify the number of units payable to the member and their spouse. A member who is single at the time of retirement and who has at least 25 years of service may choose to receive 43.3 units on the condition of a reduced survivor payment to any future spouse.
Unit Values	**Calendar Year** / **Unit Value** 2013 / $100.775 2014 / 104.264 2015 / 124.031 Unit values after 2015 are assumed to increase 1.0% per year.
Disability Benefit	Annual benefit based on 41 units for the disabled member.
Surviving Spouse's Benefit	Annual benefit based on 23 units for the surviving spouse of an active or retired member and 22 units for the surviving spouse of a disabled member. Upon retirement, members may choose an alternative form of payment that provides 50%, 75% or 100% of their benefit to their spouse after their death. The units are adjusted if one of these alternate forms is selected.
Surviving Children's Benefit	Annual benefit based on 8 units for each surviving child of an active or retired member. Benefits continue to age 18 or if the child is a full-time student, to age 22. The total benefit for surviving children and spouse combined is limited to 43 units.
Contributions	Member and employer contributions equal to 8% of the monthly unit value multiplied by 80 are required for each member. After 25 years of service, member contributions are paid to a separate health insurance account.

Summary of Plan Provisions – Minneapolis Firefighters' Relief Association (concluded)

Benefit Increases	Benefit recipients receive a future annual 1.0% post-retirement benefit increase. The annual adjustment will match inflation, up to 2.5%, any time the Fund exceeds a 90% funded ratio for two consecutive years. If the adjustment is increased to 2.5% and the funded ratio falls below 80% for one year or 85% for two consecutive years the post-retirement benefit increase will be lowered to 1.0%. A benefit recipient who has been receiving a benefit for at least 12 full months as of June 30 will receive a full increase. Members receiving benefits for at least one month but less than 12 full months as of June 30 will receive a pro rata increase. For retirements after January 1, 2015, the first increase will be delayed two years.

Public Employees Police & Fire Plan

Active Members as of June 30, 2013

	Years of Service								
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	100	70	0	0	0	0	0	0	170
25-29	191	596	321	0	0	0	0	0	1,108
30-34	117	390	1,055	218	0	0	0	0	1,780
35-39	55	161	575	883	177	0	0	0	1,851
40-44	43	116	349	683	916	118	0	0	2,225
45-49	33	45	155	335	581	591	182	0	1,922
50-54	25	18	64	136	259	332	389	72	1,295
55-59	7	19	23	47	77	92	101	81	447
60-64	5	15	13	21	27	7	23	19	130
65+	0	3	2	0	1	1	2	3	12
ALL	576	1,433	2,557	2,323	2,038	1,141	697	175	10,940

Average Annual Earnings

	Years of Service								
Age	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	25,667	43,564	0	0	0	0	0	0	33,036
25-29	30,395	53,228	65,063	0	0	0	0	0	52,720
30-34	35,427	56,931	68,994	72,087	0	0	0	0	64,523
35-39	35,898	54,994	68,438	74,623	77,322	0	0	0	70,101
40-44	40,588	52,121	67,633	74,724	79,186	83,361	0	0	74,068
45-49	45,875	53,056	68,174	74,119	81,267	84,858	88,737	0	79,508
50-54	63,562	47,167	69,376	76,889	79,248	84,987	88,652	88,462	82,572
55-59	60,279	51,261	61,980	73,491	78,798	84,377	89,101	91,263	81,649
60-64	66,351	38,108	61,132	62,550	72,580	73,210	83,781	92,405	70,510
65+	0	22,744	69,963	0	112,608	61,659	82,266	81,941	66,065
ALL	34,884	53,542	68,047	74,342	79,539	84,610	88,560	90,074	71,265

Public Employees Police & Fire Plan

Service Retirements as of June 30, 2013

	Years Retired							
Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	0	0	0	0	0	0	0	0
50-54	97	292	1	0	0	0	0	390
55-59	93	499	413	0	0	0	0	1,005
60-64	35	242	596	484	3	2	0	1,362
65-69	11	98	197	827	230	0	2	1,365
70-74	0	12	43	343	505	49	0	952
75-79	0	5	5	151	283	200	9	653
80-84	1	3	1	50	138	171	101	465
85+	0	5	1	50	69	135	131	391
ALL	237	1,156	1,257	1,905	1,228	557	243	6,583

Average Annual Benefit

	Years Retired							
Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	0	0	0	0	0	0	0	0
50-54	51,755	46,581	52,561	0	0	0	0	47,883
55-59	59,163	56,119	46,289	0	0	0	0	52,361
60-64	44,463	52,744	51,408	46,870	48,376	52,000	0	49,848
65-69	58,676	43,431	44,810	51,128	47,022	0	52,000	49,034
70-74	0	25,315	31,643	49,502	58,442	44,758	0	52,888
75-79	0	38,746	51,646	45,151	57,830	50,816	41,191	52,327
80-84	20,344	26,999	36,026	48,672	52,275	51,504	53,653	51,637
85+	0	33,640	1,294	53,280	53,233	53,960	44,667	50,237
ALL	53,774	51,360	47,965	49,272	55,152	51,260	48,334	50,781

Public Employees Police & Fire Plan

Survivors as of June 30, 2013

	Years Since Death							
Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	18	76	49	16	6	2	0	167
50-54	2	16	15	2	4	2	3	44
55-59	7	18	24	12	10	6	1	78
60-64	6	33	25	23	7	13	10	117
65-69	12	42	50	55	27	14	14	214
70-74	12	45	34	58	26	17	11	203
75-79	20	45	43	62	35	16	16	237
80-84	13	57	56	77	52	28	23	306
85+	9	59	66	146	101	53	65	499
ALL	99	391	362	451	268	151	143	1,865

Average Annual Benefit

	Years Since Death							
Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	15,316	17,191	18,371	22,431	28,436	23,927	0	18,322
50-54	26,442	42,244	32,924	19,644	41,257	44,140	30,364	36,508
55-59	29,139	29,329	30,443	30,888	40,079	41,153	25,446	32,133
60-64	30,534	32,857	30,352	29,360	50,569	36,687	31,960	32,924
65-69	39,314	31,586	29,104	30,542	37,405	27,666	30,451	31,575
70-74	22,791	31,123	29,720	32,644	31,225	32,087	34,613	31,113
75-79	31,006	28,451	31,236	29,702	30,728	31,782	31,806	30,287
80-84	29,425	27,067	32,593	27,404	28,982	30,365	25,260	28,755
85+	27,011	28,881	22,961	28,510	26,337	27,216	23,198	26,524
ALL	27,341	27,747	27,715	29,116	30,428	30,423	26,860	28,584

Public Employees Police & Fire Plan

Disability Retirements as of June 30, 2013

	Years Disabled							
Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	24	63	61	19	8	1	0	176
50-54	8	23	43	38	13	3	0	128
55-59	6	29	70	62	17	1	0	185
60-64	2	6	81	113	30	2	0	234
65-69	1	6	24	121	71	5	0	228
70-74	0	2	4	24	69	9	1	109
75-79	0	0	2	6	10	26	1	45
80-84	0	0	0	1	1	3	7	12
85+	0	0	0	0	0	1	8	9
ALL	41	129	285	384	219	51	17	1,126

Average Annual Benefit

	Years Disabled							
Age	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	41,039	34,717	34,952	31,096	32,134	39,667	0	35,180
50-54	54,607	35,044	39,503	35,755	38,898	34,533	0	38,355
55-59	45,662	47,521	46,616	38,775	42,803	50,883	0	43,772
60-64	31,096	37,338	47,813	51,875	49,607	33,466	0	49,470
65-69	27,094	52,431	40,388	49,252	53,097	46,964	0	49,453
70-74	0	48,599	49,273	43,560	52,818	39,506	49,581	49,443
75-79	0	0	45,694	37,932	46,930	46,222	49,581	45,325
80-84	0	0	0	44,476	29,080	46,678	49,744	46,817
85+	0	0	0	0	0	49,581	52,863	52,498
ALL	43,538	38,815	42,893	45,553	49,732	43,977	51,193	44,861

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